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Charging Station for E-Vehicle using Solar with IOT for Multiple Users

Dhananjaya M K[1], Varsha S[2], Supriya P[3], Asha L[4]

Assistant Professor, Department of CSE, R.R Institute of Technology, Bengaluru, India[1]

UG Students, Department of CSE, R.R Institute of Technology, Bengaluru, India[2,3,4]

ABSTRACT: The main idea of this paper is to reduce greenhouse gas emission and fossil fuel. This paper is about charging E-vehicle module using the Solar panel, availability of maximum power is viewed by IOT(internet of things) device and the maximum power generated by the solar is being tracked using the MPPT(maximum power point tracking) controller. The whole setup is connected to the Arduinouno, the battery level generated and distributed amount of the battery is viewed using an LCD (liquid crystal display). This set up can charge multiple vehicles using solar cell. GSM (global system for mobile) modem is used to get an alert message for any reduction and access of power occurred in the system. A web page is used to check the availability status of charge, keep track the power transferred to the charging module and also displays the available location of the charging station.

KEYWORDS: Arduino- UNO R3, Solar panel, MPPT controller, DC-DC converter, Modem, Servo motor, Battery, GSM, LDR sensors.

I. INTRODUCTION

As 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. Moreover, these threats of disruption of supplies have brought the focus on to alternate drive train technologies. In further years there will be more solar electric vehicle will be introduced due to these reasons: (1)Reduction of emission of fossil fuel for extracting power from renewable resources. (2) Intelligent compliance to electronic requirements that facilitate the monitoring the availability of used power using IOT. (3) Tracking of sun's radiation throughout a time. Electric vehicle confines the outlook of passenger a vehicle that draws current from the rechargeable battery. There are three types of electric vehicle: hybrid electric vehicle (HEV), plug-in hybrid (PHEV), battery electric vehicle (BEV) and extended range electric vehicle(EREV). The main objective of the paper 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 charging station can be monitored frequently at any moment and stored in the cloud in a graph pattern (think speak).

II. RELATED WORK

These non-renewable fossil fuels have the added disadvantage of releasing large quantities of harmful sculpture dioxide, nitrogen oxides, and especially carbon dioxide into the environment while burning. Each of these compounds are directly indicted in the problematic global warming phenomenon. These emission problems are the chief motivation for the increasing attention to the electrification of mobility. In realization of the present work, actual relevant studies have been identified regarding the design, the optimization, the simulation of solar charging stations for electrical vehicles, different approaches being critically analyzed, but also the current state of the global implementation of these energy generating systems, technique based upon the green charging solar station concept for green electrical vehicles.Analyzing voltages every time and uploading on IOT for monitoring and we can take action if voltage is not proper. Low power consumption and reduced man power.

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III. METHODOLOGY

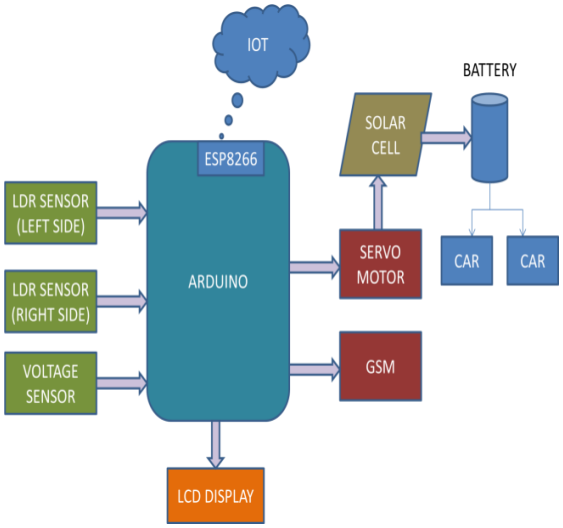

Fig 3.1: System Architecture

As a solar PV array plays a vital role in aproject,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 the converter together with thebuck regulator which stabilizes thepower.The entire DC-DC converter setup maintains the reliability of output from the cell and it should unbiased output when it exceeds the expected result in order to avoid a hysteresis loss. Initially, DC-DC converter accepts the DC input voltage and also provide s output as DC voltage in next level whether lower or higher depends on the requirement such that converter output voltage matches the power supply required to the module.

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 UNO is a microcontroller board with digital input and six can be used as an analog input. Program for tracking, delivering and displaying the required power output supply can be loaded on it as follows from the easy-to-use ARDUINO computer program.

In IOT we will upload the voltage data on thing speak and sending message using GSM module to mobile. Voltage sensor will check the how many voltages are coming. If it is more or less it will send message tomobile.

IV. EXPERIMENTAL RESULTS

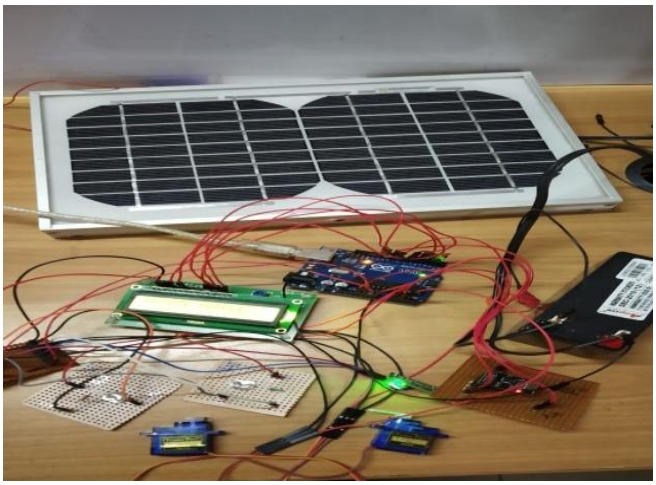

Fig 4.1: Initial stages of integration of components

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Fig 4.2: Tracking of solar rays on the LDR sensors

Fig 4.3: Display of voltage consumed

Fig 4.4: Uploading voltage and battery status to the cloud

V. CONCLUSION

Internet of Things (IOT) based battery sensor monitors the real-time 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. Multiple vehicles can be charged at a time. 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.

REFERENCES

[1] "On-Chip Photovoltaic power harvesting System with Low-Overhead Adaptive MPPT for IoT nodes" by SarojMondal, Roy Paily, Volume:04, Issue:05, Oct.2017.

[2] H.Anandakumar and K. Umamaheswari, "Supervised machine learning techniques in cognitive radio networks during cooperative spectrum handovers," Cluster Computing, vol. 20, no. 2, pp. 1505–1515, Mar. 2017.

[3] ARoshini and H. Anandakumar, "Hierarchical cost effective leach for heterogeneous wireless sensor networks," 2015 International Conference on Advanced Computing and Communication Systems, Jan. 2015.

[4] H. Anandakumar and K. Umamaheswari, "An Efficient Optimized Handover in Cognitive Radio Networks using Cooperative Spectrum Sensing," Intelligent Automation & Soft Computing, pp. 1–8, Sep. 2017.

| e-ISSN: 2320-9801, p-ISSN: 2320-9798| www.ijircce.com | Impact Factor: 7.488 |

||Volume 8, Issue 7, July 2020||

[5] M.Suganya and H.Anandakumar, "Handover based spectrum allocation in cognitive radio networks," 2013 International Conference on Green Computing, Communication and Conservation of Energy (ICGCE), Dec. 2013.
[6] H.Anandakumar and K. Umamaheswari, "A bio-inspired swarm intelligence technique for social aware cognitive radio handovers," Computers & Electrical Engineering, vol. 71, pp. 925–937, Oct. 2018.
[7] Chowdhury, N.; Hossain, C.A.; Zishan, S.R.; Brenna, M.; Longo, M. Eco-Friendly Transportation System inProposed Permanent Campus of American International University-Bangladesh. In Proceedings of the 6thInternational Conference on Clean Electrical Power (ICCEP), Santa MargheritaLigure, Italy, 27–29 June 2017;pp. 1–5.
[8] García-Olivares, A.; Solé, J.; Osychenko, O. Transportation in a 100% renewable energy system. Energy Convers.Manag. **2018**, 158, 266–285. [CrossRef]
[9] Bangladesh Development Board. Annual Report (2016–2017).
[10] Iodice, P.; Senatore, A. Atmospheric pollution from point and diffuse sources in a National Interest PrioritySite located in Italy. Energy Environ. **2016**, 27, 586–596. [CrossRef]
[11] Costagliola,M.A.; Prati,M.V.; Florio, S.; Scorletti, P.; Terna,D.; Iodice, P.; Buono,D.; Senatore, S. Performances and emissions of a 4-stroke motorcycle fuelled with ethanol/gasoline blends. Fuel **2016**, 183, 470–477. [CrossRef]