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## Portable EV Charging Station

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### ABSTRACT

For electric vehicles, traveling range and charging infrastructure are the two major issues affecting its adoption over conventional vehicles. To overcome the issue it's important to provide charging options at multiple places. But due to high initial investment and infrastructure needs it's difficult to provide multiple charging stations. Here low cost and compact EV charging station will help to establish EV utilization. In this project, an cost effective and compact system will be design which will work as an portable charging station to provide alternative for conventional EV charging stations. This system will allow small shop owners to start the EV charging station. Also with solar power, it will reduce the dependency of AC supply from conventional grid network to charge the EVs. This will help to increase the number of charging stations. Ultimately, number of multiple options will be available along roadside for EV charging. This will help to use of EVs for long distances.

**Key word:** Protection of EV battery, monitoring Different parameters of EV Charging, Visualize charging status

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### Introduction

To satisfy the fuel need for petroleum vehicles become costly day by day. To solve this problem, use of electric vehicle is the best solution. Electric vehicles are the best alternative for transportation to minimize use of petroleum products & reduction in pollution levels caused due to resources used presently. Government pushing people and researchers towards electric vehicles. Though charging mechanism and billing methods are still in the development phase. So now a day's world is shifting towards electrified mobility to reduce the pollutant emissions caused by nonrenewable fossil fueled vehicles and to provide the alternative to pricey fuel for transportation. In this project, an cost effective and compact system will be design which will work as an portable charging station to provide alternative for conventional EV charging stations. This system will allow small shop owners to start the EV charging station. This will help to increase the number of charging stations. Also with solar power, it will reduce the dependency of AC supply from conventional grid network to charge the EVs. Ultimately, number of multiple options will be available along roadside for EV charging. This will help to use of EVs for long distances.

### Survey and Specification

1. Electric Vehicle Charging Station Challenges and Opportunities: A Future Perspective
2. IoT Remote Control of Plug-in Electric Vehicle Charging Loads for Smart Energy Management of Virtual Power Plants
3. Development of an IoT System with Smart Charging Current Control for Electric Vehicles
4. Impact of EV home charger on distribution transformer overloading in an urban area

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### Literature Review

“Electric Vehicle Charging Station Challenges and Opportunities: A Future Perspective” This paper reviews about the basic terminologies of charging station like charging station types, levels. To overcome these challenges, various technologies are discussed along with brief introduction of lithium ion batteries charging strategies and Battery Management System (BMS). Since, Indian Government is concentrating towards environmental friendly ecosystem and as per its mission to reduce carbon emission from the transport sector, deployment of EV's and installation of EVCS is the biggest concern. Since, government has reduced the tax on EV's and providing subsidy for installing charging station, this is an easy task.

“IoT Remote Control of Plug-in Electric Vehicle Charging Loads for Smart Energy Management of Virtual Power

Plants”The paper states that the grid integration of plug-in electric vehicles (PEVS) requires a comprehensive analysis and effective control strategies to prevent any violation of the electrical constraints of the power systems. When

renewable energy sources (RESs) are available, they can be used to supply the energy demand of the PEVs. In this study, a photovoltaic (PV) power plant and IoT based remote control of PEV charging are proposed as a virtual

“Development of an IoT System with Smart Charging Current Control for Electric Vehicles” This paper presents the development and test of an Internet of Things (IoT) system for monitoring and control of electric. Vehicles The IoT

architecture, which was developed using the Firebase platform, allows the synchronization of the vehicles’ data to the online server, as well as the access to the data outside of the vehicle, through the Internet. The smart charging system proposed in this paper allows the control of the electric vehicle’s battery charging current in real-time, based on the

demand at the residence (home current), which is measured using a residential wireless sensor network (WSN)

“Impact of EV home charger on distribution transformer overloading in an urban area” This paper assesses the impact of EV home charging on transformer overloading considering two critical factors, Which are penetration level and

driving performance. Test scenarios are confined by a low-voltage distribution. System with household load profiles. Test results show that the transformer overloading indexes are unacceptable. When EV penetration level reaches 75 percent. The overloading indexes become significantly poorer when the EV Driving performance is lower.

## Discussion and Methodology

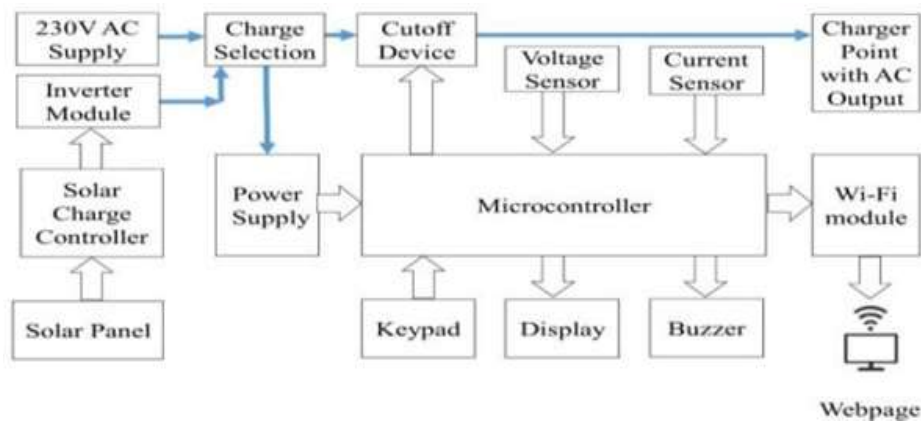


Figure 1. block diagram Diagram

In this system, current sensor and voltage sensor are used to measure the power delivered to charge the vehicle. Both sensors will send signal to microcontroller. Microcontroller will calculate and measure the billing amount and display it. With the keypad and display user can set charging time or billing amount. Once the set value crosses, microcontroller will switch off the supply using cut off device. Microcontroller will send values and alert to the webpage through wifi module. Buzzer is used to provide audio signal. Power supply will provide the required power to every circuit element.

Proposed system will provide 230V AC output for EV charging with power meter. This makes proposed system

compatible with every vehicle charger so that every vehicle can be charged. To reduce the dependency on AC supply from grid, solar power is used along with solar charge controller and DC-AC inverter circuit to generate alternative AC supply.

## Conclusion

After study the literature work of project We understand the methodology and approach used in proposed system of Portable EV Charging station to overcome the problems and issues which were arise from existing system.The approaches and functionalities applied in Portable EV Charging Station will make this portal a perfect platform for costumer and also we can use at out side

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