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Portable EV Charging Station with Advanced IoT Connectivity

Prof. P. R. Gaikwad[1], Hase Kasturi Satish[2], Kadnor Tejashri Navnath[3], Mane Nikita Vasant[4], Parbat Aditya Sarjerao[5]

[1]Assistant Professor, Department of Electronics & Telecommunication Engineering
[2,3,4,5]Students, Department of Electronics & Telecommunication Engineering
Amrutvahini College of Engineering, Sangamner, A.Nagar, MH

Abstract: *The increasing adoption of electric vehicles (EVs) is driving the need for accessible and cost-effective charging infrastructure. One of the significant challenges in this transition is the high initial investment and infrastructure requirements for traditional charging stations. To address these challenges, this project presents the design and implementation of a Portable EV Charging Station with Advanced IoT Connectivity. The proposed system utilizes a microcontroller (ATmega328p) to manage key functions, including power measurement, billing, and real-time monitoring of the charging process. Equipped with current and voltage sensors, the system accurately measures the power delivered to the EV and calculates the associated billing amount. Users can interact with the system through a keypad and LCD display, setting parameters such as charging time or billing amount. The system also integrates a Wi-Fi module (ESP8266) for remote monitoring and control via a webpage, allowing users to track charging sessions in real-time from anywhere. The use of a relay and cutoff device ensures safety by disconnecting the power supply once the set conditions are met. The design is compact, cost-effective, and scalable, making it ideal for deployment in residential areas, commercial spaces, and public places. By offering a portable and user-friendly solution, this project aims to expand the availability of EV charging stations, ultimately supporting the widespread adoption of electric vehicles and contributing to the transition toward sustainable transportation.*

Keywords: Portable EV Charging Station, IoT Connectivity, Microcontroller, Power Measurement, Remote Monitoring

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