

WIRELESS CHARGING STATION USING IOT FOR ELECTRIC VEHICLES

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ABSTRACT

A Wireless Charging Station using IoT for Electric Vehicles (EVs) involves the integration of Wireless Charging Technology with the Internet of Things (IoT) to provide a convenient and efficient charging solution for EVs. This System aims to eliminate the need for a physical connection between the charging station and the EV, enabling a seamless charging experience. This technology offers benefits such as ease of use, reduced wear and tear on charging equipment, and the potential for smart charging management.

Keywords: WPT (Wireless Power Transfer), IoT, EVs, WCS (Wireless Charging System).

I. INTRODUCTION

Consider a future scenario in which driverless Electric Vehicles (EVs) eliminates the needs of physical condition. A Wireless Charging Station using IoT for Electric Vehicles (EVs) addresses the growing need for convenient and efficient charging solutions in the EV industry. With the increasing adoption of EVs, there is a demand for charging infrastructure that can provide seamless and hassle-free charging experiences.

Traditional charging methods require physical connections between the charging station and the EV, which can be inconvenient and prone to wear and tear. The integration of wireless charging technology with IoT offers a promising solution to overcome these limitations.

The integration of IoT capabilities further enhances the functionality and efficiency of wireless charging stations. Operators can remotely access and manage the charging infrastructure, monitor energy consumption, and gather valuable data on charging patterns. This data can be utilized to optimize charging infrastructure deployment, manage energy demand, and improve overall charging efficiency.

In conclusion, the introduction of a wireless charging station using IoT for EVs addresses the need for convenient efficient charging solutions in the electric vehicle industry. By integrating wireless charging technology with IoT capabilities, this solution offers a seamless and intelligent charging experience, enhancing the usability and sustainability of electric vehicles (EVs).

1.1 OBJECTIVES

- To charge vehicles wirelessly and efficiently
- Interoperability
- Intelligent charging management
- Communication and Data security
- Scalability and Flexibility

II. METHODOLOGY

2.1. SYSTEM ANALYSIS

In this chapter, we will discuss and analyze the developing process of the Wireless Charging Station including hardware and software requirement specification (SRS), and compare existing and proposed systems. The functional and non-functional requirements are included in the SRS part to provide a complete description and overview of system requirements before the developing process is carried out. Besides that, existing vs proposed provides a view of how the proposed system will be more efficient than the existing one.

Software Requirements

- Arduino

Hardware Requirements

- NODE MCU
- Arduino NANO
- Power MOSFET
- Relay
- LCD Display (16*2)
- RFID Reader

III. MODELLING AND ANALYSIS

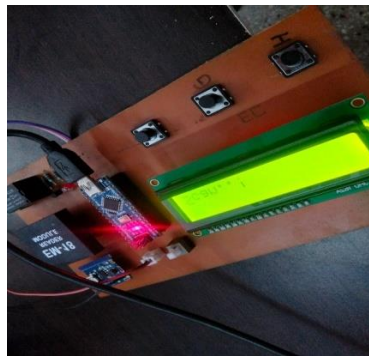


Figure: 1

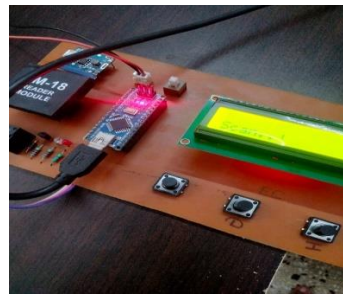


Figure: 2

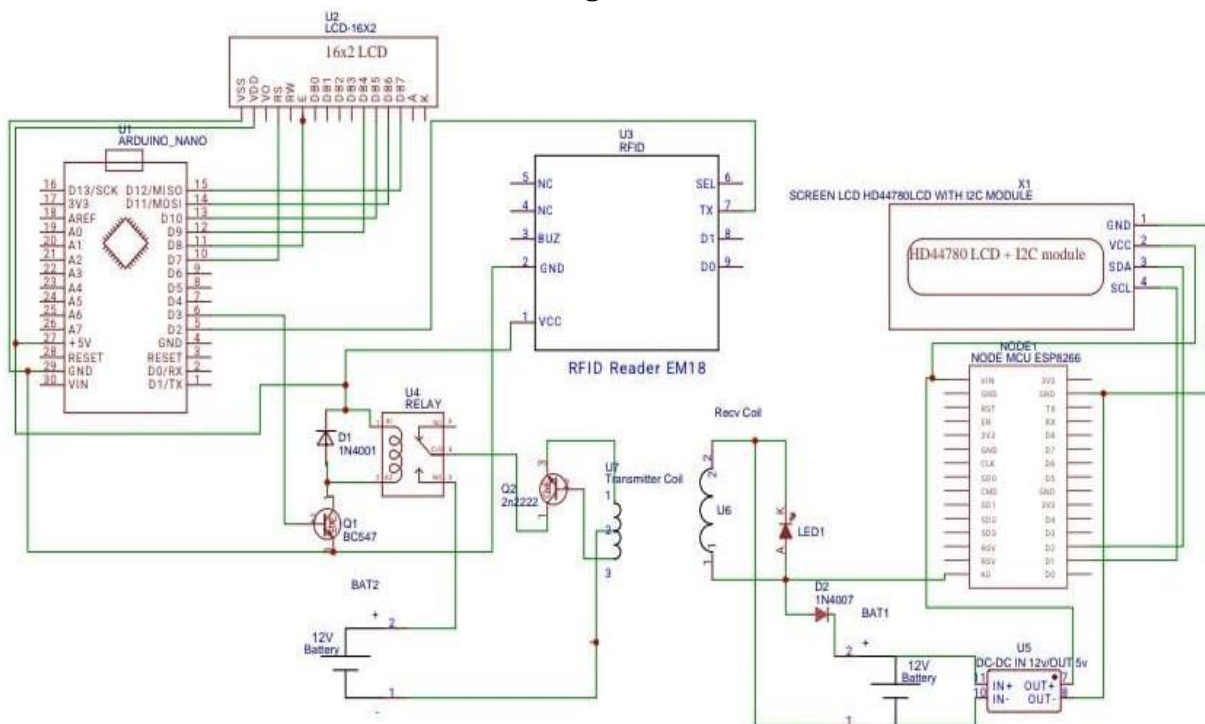


Figure: 3 Schematic Diagram of wireless charging module

IV. FUTURE SCOPE

- Wireless Charging eliminates the need for physical connectors and cables, providing a more user-friendly and seamless charging experience. This convenience can encourage more people to switch to EVs, thereby promoting sustainable transportation.
- Integrating IoT technology into wireless charging stations enables advanced functionalities. IoT can facilitate real-time monitoring of charging stations, allowing operators to remotely manage and optimize charging operations. This can include monitoring charging status, detecting faults, and scheduling charging sessions based on demand and energy availability.
- IoT connectivity can enable smart grid integration, by leveraging IoT connectivity, wireless charging stations can communicate with the power grid, enabling bidirectional energy flow.
- The data collected through IoT-enabled wireless charging stations can provide valuable insights. By analyzing charging patterns, energy consumption, and user behaviour, stakeholders can gain a better understanding of EV charging dynamics.

V. CONCLUSION

Well, after analyzing all the data and factors, it seems that the implementation of wireless charging stations using IoT for electric vehicles has tremendous potential in revolutionizing the charging process. Not only does it eliminate the need for physical contact, making it more convenient and safe for users, but it also allows for better monitoring and management of the charging process through IoT technology. With the increasing popularity of EVs, this innovation could greatly improve the overall charging experience and contribute to a greener future.

While there are still some challenges that need to be addressed before wireless charging can be widely adopted, the technology is advancing rapidly. It is expected that wireless charging will become a major part of the EV charging infrastructure in the coming years.

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