International Research Journal of Education and Technology
Peer Reviewed Journal
ISSN 2581-7795

WIRELESS DATA STATION FOR ELECTRIC VEHICLE

Mr. S. Srinivasan., Assistant professor,
Mr. S. Jayanthan.,
Mr. A. Kingslin.,
Department of Electrical and Electronics Engineering, PERI Institute of Technology, Chennai.

ABSTRACT

As the production of electric vehicle has scaled up in the recent years to meet the objective of lowering the carbon footprinted eco-friendly transportation. The raise in the production of electric vehicles in accordance with hike in the price of petroleum and diesel has shifted the huge market share of the automobile industry from ICE engines to the battery powered engines. The shift in turn pushes the demand for installation of such EV charging base station requires high capital and sophisticated spatial infrastructure in densely populated area. Therefore, this project proposes the wireless data transfer system for electric vehicles which is cost effective and reliable. The system is best suited foe densely populated areas, parking arenas at theatres, malls, parks, etc., The wireless sensor network is implemented to effectuate adaptive intelligent system, therefore leading to better accuracy and modularity.

I.INTRODUCTION

The advent of electric vehicles has brought about a significant shift in transportation towards sustainability and reduced emissions. However, one of the critical challenges faced by EV owners is the availability and convenience of charging infrastructure. Traditional charging methods often required physical connection to the power source, which can be inconvenient and cumbersome for users. To address this challenge, the concept of wireless Data for EVs has gained traction in recent years. Wireless Data offers the convenience of charging, making it more user-friendly and efficient. Moreover, the integration of artificial intelligence into wireless Data systems has the potential to further enhance their performance and functionality.

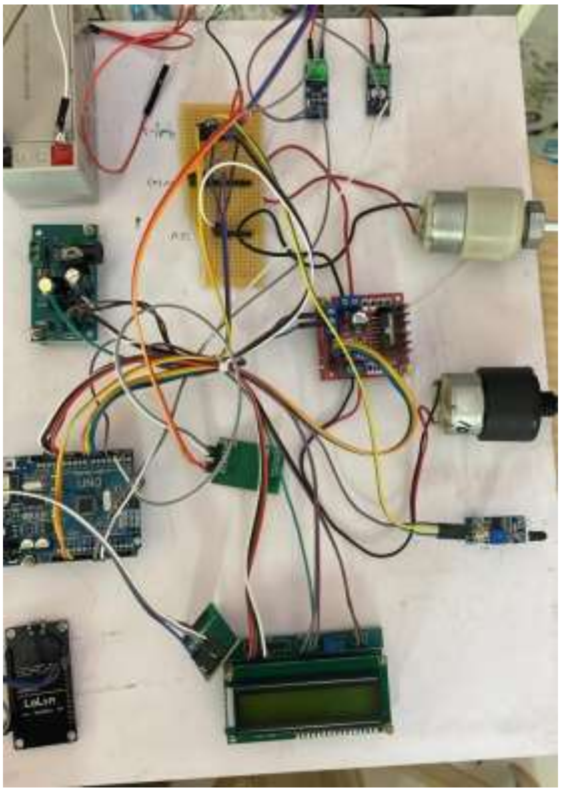
Overall, the wireless Data station for EVs project represent a significant step towards advancing the adoption of electric vehicles by offering a smarter, more efficient, and user-friendly charging solution. By harnessing the power wireless technology, the project aims to accelerate the transition to a sustainable transportation ecosystem while providing enhanced convenience and accessibility for EV owners.

II.PROPOSED SYSTEM

International Research Journal of Education and Technology
Peer Reviewed Journal
ISSN 2581-7795

Using a 12v battery connected for supply. The current sensor and voltage sensor are connected to the ADC to determine the battery status. The ADC is connected to the IR sensor to detect the EV station. The IR sensor is typically connected to an Arduino Uno to interface with it and utilize its processing capabilities for interpreting the signals received from the IR sensor. The L298N driver is connected to the motor to control its speed and direction. An Arduino can be connected to an LCD (Liquid Crystal Display) to display the status of an electric vehicle (EV). Using LoRa TX to transmit the status to a station. Using LoRa RX to receive information from LoRa TX.

III.KIT PROTOTYPE



IV. BLOCK DIAGRAM DESCRIPTION

* POWER 12V: This is the source of the power that we supply to the kit. Battery 12v and 1.21 amps

* ADC: Power supplier they convert the voltage into 12v, 5v and ground, power supplier has 3 pins. They are, GND, 12v and 5v pins.

* DC VOLTAGE SENSOR: A DC voltage sensor detects and measures direct current levels. It typically consists of a voltage divider circuit with a sensing element. The sensor provides an output signal proportional to the input voltage, often in the form of analog or digital signals. These sensors are crucial in various applications, including power monitoring, battery management, and industrial automation. Calibration and accuracy are essential for reliable voltage measurements. They come in different ranges and accuracies to suit specific needs.

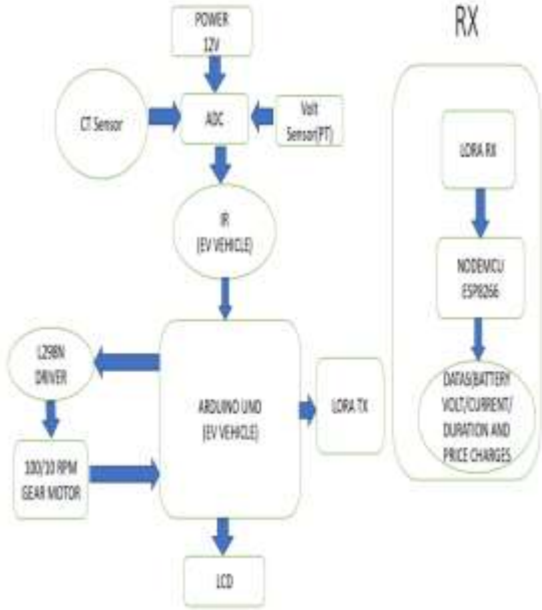
* DC CURRENT SENSOR: A DC current sensor measures the flow of direct current in a circuit. It typically utilizes a hall-effect sensor or a shunt resistor to detect current levels. The sensor provides an output signal proportional to the current, often in the form of voltage or current signals. These sensors are vital for monitoring power consumption, controlling motor speed, and ensuring safety in electrical systems. Calibration and proper installation are necessary to ensure accurate current measurements. They come in various types, including clamp-on, PCB-mounted, and split-core sensors, catering to different application needs.

* INFRARED SENSOR: IR sensors detect infrared radiation emitted by objects. They consist of an IR emitter and a receiver. When an object enters the sensor's field, it reflects or emits IR light, triggering the

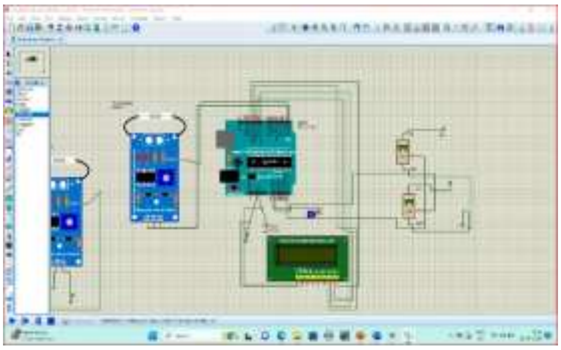
receiver. Used in proximity sensing, motion detection, and remote controls, IR sensors find applications in security systems, automation, and consumer electronics. Their effectiveness depends on factors like range, sensitivity, and ambient light interference. Calibration and proper placement optimize their performance in various environments.

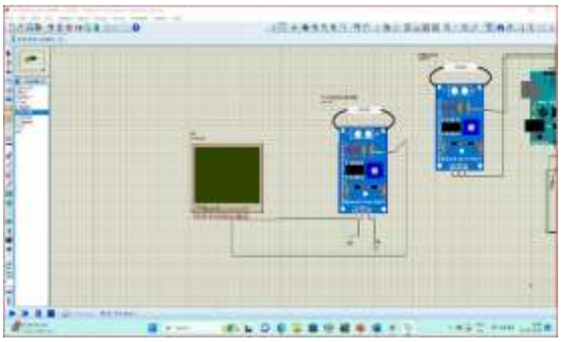
* LORA TX: LoRa (Long Range) TX (transmitter) modules enable long-distance wireless communication using low-power, spread-spectrum technology. They operate in unlicensed bands and offer high penetration and low power consumption. LoRa TX modules transmit data packets over long distances, making them suitable for IoT, smart city, and industrial applications. They utilize chirp spread spectrum modulation for robust communication in noisy environments. LoRaWAN networks often employ these modules for connecting remote sensors and devices to gateways. Configuration parameters such as frequency, spreading factor, and transmission power impact performance and range.

* LORA TX: LoRa TX (transmitter) modules enable long-range wireless communication using LoRa modulation. They transmit data packets over distances of several kilometers with low power consumption. LoRa TX modules are widely used in IoT, smart agriculture, and asset tracking applications. They operate in unlicensed ISM bands, providing flexibility in deployment. Parameters like spreading factor and transmission power affect range and data rate. LoRa technology offers excellent penetration and resilience to interference for reliable connectivity.



V. SIMULATION PROTOYPE





VI. CONCLUSION

Magnetic resonance wireless data transfer is the most effective technology which is reliable for electric vehicle charging in the modern era. As the technology is the most efficient and cost effective, it is preferred. Moreover, the employment of wireless sensor network increases accuracy and optimizes network stability. The innovative AI approach of charging circuit installed in the LCD unit is intelligent automated and faster compared to installing a fixed base station. The system is also reliable and modular when compared to the existing fixed stations.

REFERENCES

[1] Santosh Soni and Manish Shrivastav SN Applied Sciences 2019 SN Applied Sciences (2019) 1:1052.

[2] Qing Zhang, Wenzheng Xu, Weifa Liang, Jian Peng, Tang Liu and Tian Wang Wireless Networks Springer (2018) 10:1007.

[3] Shiva Prakash and Vikas Saroj Springer Wireless Networks 2019 Springer (2019) 10.1007. Muhammad adil, Jehad ali, Qui thanh Hoai ta, Muhammad attique and Tae-sun chung Digital.

[4] Object Identifier 2020 IEEE (2020) 10.1109. Tu W, Xu X, Ye T, Cheng Z A study on wireless charging for prolonging the lifetime of wireless sensor networks Sensors 17(7):1560.

[5] R. Senthil Kumar, K Mohana Sundaram and K. S. Tamilselvan Hybrid Reference Current Generation Theory for Solar Fed UPFC System Energies March 2021 vol. 14 no. 6 pp.1527.

[6] K.R. Sugavanam, R. Senthil Kumar, S. Sri Krishna Kumar, S. Karthikumar and V Tamilmullai Design of FLC for OVR Reduction of Negative Output KY Converter