Dashboard Creation for Electric Vehicle Integration

Process of Working:

The Electric Vehicle Dashboard Integration project is designed to provide real-time monitoring and intelligent control over key battery parameters in electric vehicles. The system begins with a set of battery sensors, and voltage measurement inputs. These sensors are connected directly to the battery pack and continuously gather data such as battery temperature, voltage level, and state of charge.

This sensor data is then transmitted to a central microcontroller, the ESP32, which acts as the brain of the system. The ESP32 processes the incoming data and calculates important metrics, including the battery charge percentage based on the measured voltage. It then displays this information locally on a compact OLED screen, allowing users to instantly see the battery status without needing an external device.

In addition to local display, the ESP32 uses its built-in Wi-Fi connectivity to send the battery data to a backend server. This server is built using the Flask framework in Python, and it serves as a central data hub. The ESP32 transmits the data using the HTTP protocol, and the server stores this data temporarily in memory

Once the data reaches the backend, it becomes accessible to a web-based dashboard. The dashboard is created using HTML, CSS, JavaScript, and the Chart.js library for dynamic data visualization. Through this dashboard, users can remotely monitor key battery statistics such as voltage, and charge level. The dashboard updates in real-time.

We conclude, the EV Dashboard Integration system efficiently combines sensor data collection, real-time processing, wireless communication, and intuitive web visualization to ensure safe, efficient, and user-friendly battery monitoring for electric vehicles.

Connection Diagram:

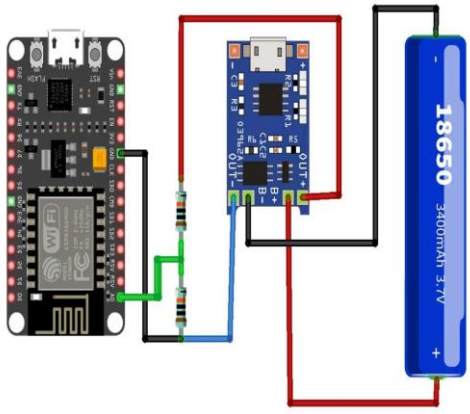

Figure:1

Software Output:

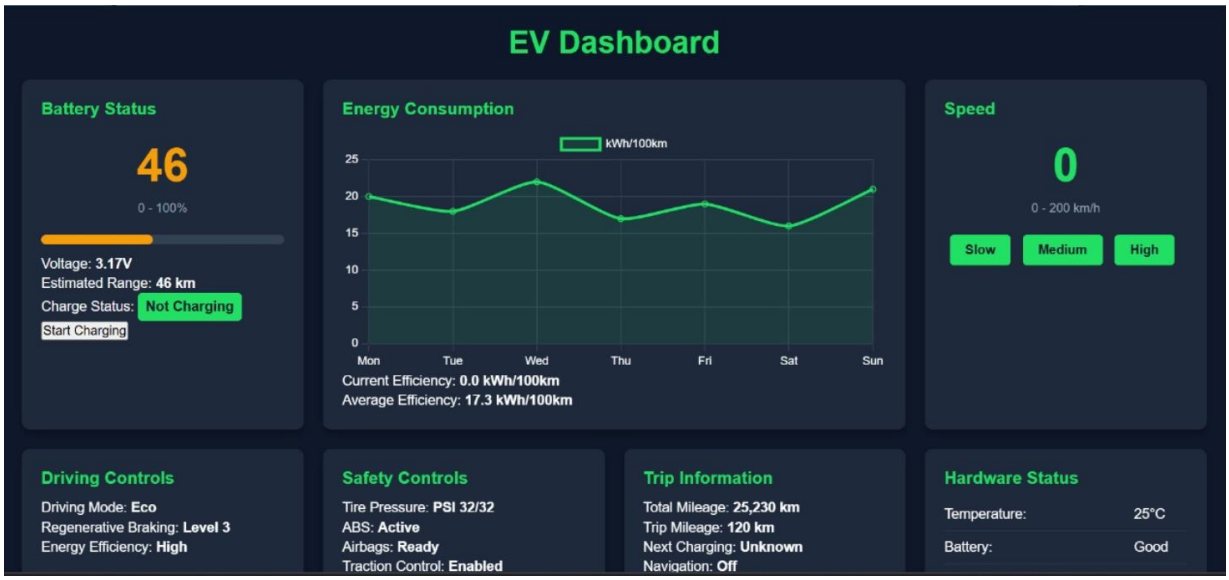

Figure:2

Hardware output:

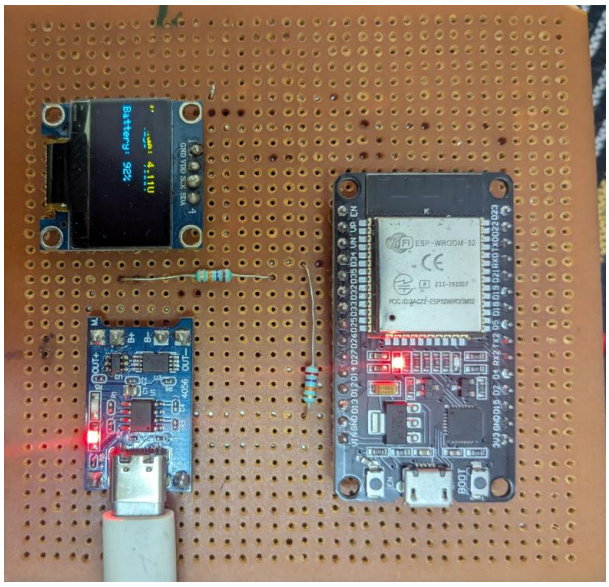

Figure:3

This project shows a smart and efficient solution for real-time electric vehicle battery monitoring, enhancing safety, performance, and user convenience.