

ABSTRACT

Traditional power outlets have evolved with the emergence of "smart plugs," which are WiFi-based devices controlled through communication networks. Numerous innovations and studies have explored the use of smart plugs to remotely control loads via the internet, with some even utilizing renewable energy sources such as solar power. In this research, we present a smart plug equipped with QR code control features, enabling users to efficiently manage connected loads. Additionally, this smart plug is equipped with sensors to measure power consumption, current, and voltage, displaying real-time data on connected devices. Our smart plug system integrates the ESP32 microcontroller as the core unit, along with ACS712 and ZMPT101B sensors for sequential electrical current and voltage measurements. The calculated parameters are electrical current and voltage, enabling users to accurately monitor energy consumption, current, and voltage levels. Through conducted testing, the authors evaluate the accuracy of the ACS712 and ZMPT101B sensors. The results indicate an error of 11.39% for electrical current measurements using the ACS712 sensor and an error of 0.022% for voltage measurements using the ZMPT101B sensor. This study introduces an innovative smart plug that allows control through QR codes and provides real-time measurement and load information.

Keywords: electrical outlet ,smart plug, qr code ,zmpt101b, acs712