ABSTRACT

Development of an Internet of Things (IOT) based parking system that uses ultrasonic sensors and the ESP8266 module and introduces RFID as part of the security solution. This system is designed to increase efficiency and safety in managing parking in home garages. Ultrasonic sensor technology is used to detect the vehicle's distance from the garage wall, allowing users to monitor and control parking status in real-time via the Blynk application on mobile devices. RFID integration ensures only authorized vehicles can access the garage with Blynk-controlled servos acting as actuators to automatically open and close the door latch. By combining these components, this research aims to present a solution that not only increases user safety but also reduces the potential for human error in manual parking management. This research aims to calculate distance measurements between ultrasonic sensors and rulers, as well as implementing the Blynk platform for real-time monitoring and control of parking systems via smartphone. System security is also enhanced by the use of RFID UID Tags for restricted access to parking areas. The ultrasonic sensor is capable of measuring distance with a minimum accuracy of 2 cm and a maximum of 400 cm. RFid testing is carried out by measuring the reading distance on the card and RFid testing uses 2 types of cards, namely, access accepted and access denied. Servo testing is increasing the accuracy of the servo angle starting from 0˚, 30˚, 45˚ and 90˚ using an arc. Ultrasonic sensor test results for sensor measurements with a measuring ruler have a measurement error rate of 6,38%. Blynk connectivity test results indicate that all parking system components function optimally only when both Blynk controls are activated. RFID is effective up to 3 cm, and the servo motor is accurate. Blynk works optimally for real-time control and monitoring.

Keywords: *ESP8266, Internet Of Things, RFID, Servo, Ultrasonic*