

ABSTRACT

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PROTOTIPE KENDALI JARAK JAUH BUKA TUTUP PINTU GERBANG OTOMATIS MENGGUNAKAN MOTOR *STEPPER 28BYJ-48* BERBASIS *IOT (INTERNET OF THINGS)*

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(xv + 70 + appendices)

Innovation in home gate access control technology becomes increasingly important as the need for convenience and security increases. Manual gates are often inefficient and troublesome, especially in bad weather conditions and high crime rates, so this research aims to design an IoT-based automatic gate prototype with ESP32 integrated with the Blynk application on smartphones and a 28BYJ-48 5 VDC stepper motor drive. The system is equipped with an HY-SRF05 ultrasonic sensor that detects objects to avoid the risk of being pinched when the gate closes, an SG90 servo motor for gate locking, and an LDR sensor for automatic lighting control. The test results show that the prototype functions well at an operating voltage of 5 VDC and a power of 0.74 Watts. The stepper motor rotates the gear connected to the rack by 9.7 cm with a power of 0.66 watts and a torque of 5.3×10^{-3} N.m. The motor opens the gate at 14.2 RPM in 3.9 seconds and closes at 9.8 RPM in 6.17 seconds. The ultrasonic sensor effectively detects objects at a distance of < 9 cm. The locking mechanism and automatic lighting system operate as per their functions. When the light resistance is low, the light LED will turn off, while when the light resistance is high, the light LED will turn on. The INVERS feature allows the lamp to be controlled by the opposite of the LDR sensor work.

Bibliography (2016 – 2024)