

ABSTRAK

RANCANG BANGUN SISTEM KONTROL AKSES *AUTHORIZED OCCUPANT* PADA GUDANG BAHAN HABIS PAKAI JURUSAN TEKNIK ELEKTRO MENGGUNAKAN RFID, *FINGERPRINT*, DAN *INTERNET OF THINGS* (IoT)

(2026: 108 Halaman + 27 Gambar + 21 Tabel + Daftar Pustaka + Lampiran)

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TEKNIK ELEKTRO

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Kemajuan teknologi *Internet of Things* (IoT) telah mendorong pengembangan sistem keamanan yang lebih modern untuk mengatasi kelemahan metode penguncian konvensional. Laporan akhir ini bertujuan merancang dan mengimplementasikan sistem kontrol akses *smart room* berbasis RFID dan *fingerprint* sebagai metode autentikasi ganda untuk meningkatkan keamanan ruangan. Sistem yang dikembangkan menggunakan Arduino Mega 2560 sebagai pengendali utama, ESP32 sebagai modul komunikasi IoT, sensor RFID RC522, *fingerprint* R073, *magnetic lock*, LCD, dan *buzzer*. Tahapan pembuatan laporan akhir meliputi perancangan perangkat keras, pengembangan perangkat lunak, integrasi sistem, serta pengujian kinerja. Hasil pengujian menunjukkan bahwa sistem mampu melakukan verifikasi identitas pengguna, mengontrol akses pintu secara otomatis, dan menyediakan fitur monitoring secara real-time. Penerapan kombinasi RFID dan *fingerprint* terbukti memberikan tingkat keamanan yang lebih baik dibandingkan penggunaan satu metode autentikasi. Sistem ini dapat diterapkan pada gudang, ruang kerja, maupun area lain yang membutuhkan pengelolaan akses dengan tingkat keamanan tinggi.

Kata Kunci: *Smart door Lock*, RFID, *Fingerprint*, *Internet of Things*, Sistem Kontrol Akses, Arduino.

ABSTRACT

DESIGN OF AN AUTHORIZED OCCUPANT ACCESS CONTROL SYSTEM IN A CONSUMPTION MATERIALS WAREHOUSE OF THE ELECTRICAL ENGINEERING DEPARTMENT USING RFID, FINGERPRINT, AND INTERNET OF THINGS (IoT)

(2026: 108 Pages + 27 Figures + 21 Tables + References + Appendices)

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ELECTRICAL ENGINEERING

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The advancement of the Internet of Things (IoT) has driven the development of more advanced security systems to overcome the limitations of conventional locking methods. This final report aims to design and implement a smart room access control system based on RFID and fingerprint technology as a dual-authentication method to enhance room security. The developed system utilizes an Arduino Mega 2560 as the main controller, an ESP32 as the IoT communication module, an RC522 RFID sensor, an R073 fingerprint sensor, a magnetic lock, an LCD, and a buzzer. The development process of the final report includes hardware design, software development, system integration, and performance testing. The testing results demonstrate that the system is capable of verifying user identities, automatically controlling door access, and providing real-time monitoring features. The implementation of the combined RFID and fingerprint authentication methods has proven to provide a higher level of security than the use of a single authentication method. This system can be implemented in warehouses, workspaces, and other areas that require secure access management with a high level of security.

Keywords: Smart door Lock, RFID, Fingerprint, Internet of Things (IoT), Access Control System, Arduino.