

ABSTRAK

RANCANG BANGUN KOTAK OBAT PINTAR BERBASIS IOT MENGUNAKAN MIKROKONTROLER SEBAGAI PENGINGAT JADWAL MINUM OBAT KELUARGA

(2026 : 54 Halaman + 27 Gambar + 10 Tabel + Daftar Pustaka + Lampiran)

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Kepatuhan dalam mengonsumsi obat sesuai jadwal merupakan salah satu faktor penting dalam keberhasilan terapi pengobatan. Namun, kesibukan aktivitas sehari-hari sering menyebabkan seseorang lupa mengonsumsi obat tepat waktu. Penelitian ini bertujuan merancang dan membangun kotak obat pintar berbasis *Internet of Things* (IoT) menggunakan mikrokontroler ESP32 dan modul *Real Time Clock* (RTC) DS3231 sebagai sistem pengingat jadwal minum obat keluarga. Sistem dilengkapi dengan sensor ultrasonik, LCD, buzzer, LED, dan Telegram Bot untuk memberikan pengingat, mendeteksi pengambilan obat, serta mengirimkan notifikasi secara *real-time*. Metode yang digunakan meliputi studi literatur, perancangan perangkat keras dan perangkat lunak, perakitan sistem, serta pengujian fungsional. Hasil pengujian menunjukkan bahwa sistem mampu memberikan pengingat sesuai jadwal, membuka kompartemen obat secara otomatis, mendeteksi pengambilan obat, dan mengirimkan notifikasi melalui Telegram. Dengan demikian, kotak obat pintar yang dirancang dapat membantu meningkatkan kedisiplinan pengguna dalam mengonsumsi obat sesuai jadwal sehingga mendukung keberhasilan terapi pengobatan.

Kata kunci: *Internet of Things*, ESP32, RTC DS3231, Kotak Obat Pintar, Telegram Bot.

ABSTRACT

DESIGN AND DEVELOPMENT OF AN IOT-BASED SMART MEDICINE BOX USING A MICROCONTROLLER AND RTC MODULE AS A FAMILY MEDICATION REMINDER SYSTEM

(2026 : 54 Pages + 27 Picture + 10 Tables + Bibliography + Appendix)

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Medication adherence is an important factor in the success of medical treatment. However, busy daily activities often cause people to forget to take their medication on time. This study aims to design and develop an Internet of Things (IoT)-based smart medicine box using an ESP32 microcontroller as a family medication reminder system. The system is equipped with ultrasonic sensors, an LCD, a buzzer, LEDs, and a Telegram Bot to provide reminders, detect medication retrieval, and send real-time notifications. The research methods include literature review, hardware and software design, system assembly, and functional testing. The test results show that the system is capable of providing automatic reminders according to the scheduled time, opening the medicine compartment automatically, detecting medication retrieval, and sending notifications via Telegram. Therefore, the proposed IoT-based smart medicine box can help improve users' medication adherence and support the effectiveness of medical treatment.

Keywords: *Internet of Things, ESP32, DS3231 RTC, Smart Medicine Box, Telegram Bot.*