

ABSTRAK

RANCANG BANGUN SISTEM AKSES LABORATORIUM DENGAN IDENTIFIKASI SUHU TUBUH MAHASISWA BERBASIS SENSOR MLX90614

(2026:xiii + 50 Halaman + 25 Gambar + 5 Tabel + Daftar Pustaka + Lampiran)

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Suhu tubuh merupakan salah satu indikator penting dalam menilai kondisi kesehatan seseorang. Pengukuran suhu secara konvensional memerlukan kontak langsung sehingga berisiko menularkan penyakit dan membutuhkan waktu relatif lama. Penelitian ini merancang sistem akses laboratorium berbasis identifikasi suhu tubuh non-kontak menggunakan sensor inframerah MLX90614 yang dipadukan dengan mikrokontroler ESP32, sensor ultrasonik HC-SR04 untuk menjaga jarak pembacaan optimal, serta LCD dan buzzer sebagai indikator output. Sistem dirancang agar dapat mendeteksi suhu tubuh mahasiswa secara otomatis, cepat, dan real-time sebelum mengizinkan akses masuk laboratorium. Pengujian dilakukan terhadap lima responden dengan membandingkan hasil pembacaan sensor MLX90614 terhadap alat ukur thermogun sebagai referensi. Hasil pengujian menunjukkan sensor mampu membaca suhu pada rentang 36,5°C–37,1°C dengan selisih terhadap thermogun berkisar 0,1°C–0,4°C. Hal ini membuktikan sensor MLX90614 memiliki akurasi tinggi dan layak digunakan sebagai sistem pendeteksi suhu tubuh otomatis yang ekonomis untuk mendukung keamanan dan kesehatan di lingkungan laboratorium.

Kata Kunci : MLX90614, ESP32, Suhu Tubuh, Non kontak, Akses Laboratorium

ABSTRACT

DESIGN AND CONTRUCTION OF A LABORATORY ACCESS SYSTEM WITH STUDENT BODY TEMPERATURE IDENTIFICATION BASED ON THE MLX90614 SENSOR

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Body temperature is an important indicator for assessing a person's health condition. Conventional temperature measurement requires direct contact, which poses a risk of disease transmission and takes relatively longer time. This study designs a laboratory access system based on non-contact body temperature identification using the MLX90614 infrared sensor combined with an ESP32 microcontroller, an HC-SR04 ultrasonic sensor to maintain optimal reading distance, and an LCD and buzzer as output indicators. The system is designed to automatically, quickly, and in real time detect students' body temperature before granting laboratory access. Testing was conducted on five respondents by comparing the MLX90614 sensor readings with a thermogun as the reference device. The results show that the sensor could read temperatures within the range of 36.5°C–37.1°C, with a difference of 0.1°C–0.4°C compared to the thermogun. This proves that the MLX90614 sensor has high accuracy and is suitable for use as an economical automatic body temperature detection system to support security and health in laboratory environments.

Keywords : MLX90614, ESP32, Body Temperature, Non Contact, Laboratory Access