

ABSTRAK

RANCANG BANGUN SISTEM MONITORING CUACA LINGKUNGAN SEKITAR MENGGUNAKAN SENSOR DHT22 DAN SENSOR AS3935 MENGGUNAKAN ARDUINO NANO

(2026: xii + 47 Halaman + 22 Gambar + 5 Tabel + Lampiran)

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PROGRAM STUDI DIII TEKNIK ELEKTRONIKA

JURUSAN TEKNIK ELEKTRO

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Penelitian ini bertujuan untuk merancang dan membangun sistem monitoring cuaca dan deteksi petir berbasis Arduino Nano menggunakan sensor DHT22 dan sensor AS3935. Sensor DHT22 digunakan untuk mengukur suhu dan kelembaban udara, sedangkan sensor AS3935 digunakan untuk mendeteksi aktivitas petir dan menampilkan estimasi jarak petir. Data hasil pembacaan ditampilkan pada LCD 16×2 I2C, sedangkan LED dan buzzer berfungsi sebagai indikator ketika petir terdeteksi.

Metode penelitian meliputi tahap perancangan, perakitan, pemrograman, dan pengujian sistem. Hasil penelitian menunjukkan bahwa sensor DHT22 mampu membaca suhu pada rentang 27,7°C–34,3°C dan kelembaban 69%–88% dengan selisih pengukuran suhu sebesar 0,4°C–3,1°C terhadap data pembanding. Sensor AS3935 mampu mendeteksi aktivitas petir, menampilkan estimasi jarak pada LCD, serta mengaktifkan LED dan buzzer sesuai dengan program yang dirancang. Berdasarkan hasil tersebut, sistem dapat digunakan sebagai alat monitoring cuaca dan deteksi petir secara real-time.

Kata kunci: **Arduino Nano, DHT22, AS3935, Monitoring Cuaca, Deteksi Petir.**

ABSTRACT

DESIGN AND DEVELOPMENT OF AN ENVIRONMENTAL WEATHER MONITORING SYSTEM USING DHT22 SENSOR AND AS3935 SENSOR WITH ARDUINO NANO

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This research aims to design and build a weather monitoring and lightning detection system based on Arduino Nano using a DHT22 sensor and an AS3935 sensor. The DHT22 sensor is used to measure air temperature and humidity, while the AS3935 sensor is used to detect lightning activity and display an estimated distance of the lightning. The readings are shown on a 16×2 I2C LCD, while the LED and buzzer serve as indicators when lightning is detected.

The research method included the stages of design, assembly, programming, and system testing. The results showed that the DHT22 sensor could read temperatures ranging from 27.7°C–34.3°C and humidity from 69%–88%, with a temperature measurement difference of 0.4°C–3.1°C compared to the reference data. The AS3935 sensor could detect lightning activity, display an estimated distance on the LCD, and activate the LED and buzzer according to the programmed setup. Based on these results, the system can be used as a tool for real-time weather monitoring and lightning detection.

Keywords: Arduino Nano, DHT22, AS3935, Weather Monitoring, Lightning Detection.