

ABSTRAK

SISTEM OTOMATISASI PENGOLAHAN AIR SUMUR BERBASIS INTERNET OF THINGS (IoT) MENGGUNAKAN SENSOR ULTRASONIK DAN SENSOR TURBIDITY

2025 : 54 halaman + 31 gambar + 8 tabel + Lampiran

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Penelitian ini membahas perancangan dan implementasi sistem otomatisasi pengolahan air sumur berbasis Internet of Things (IoT) menggunakan sensor turbidity dan sensor ultrasonik untuk meningkatkan efisiensi dan akurasi proses penjernihan air. Sistem ini dikendalikan oleh mikrokontroler ESP32 yang terintegrasi dengan modul RTC untuk mengatur durasi koagulasi menggunakan tawas sebagai bahan utama, serta memonitor kondisi air secara real-time melalui aplikasi Blynk. Hasil pengujian menunjukkan bahwa sistem mampu menurunkan kekeruhan air sumur dari 100 NTU menjadi sekitar 20 NTU secara otomatis, dengan dosis tawas optimal sebesar 30 gram untuk 120 liter air. Seluruh proses mulai dari deteksi kejernihan, perhitungan dosis, hingga aktivasi pompa dilakukan secara otomatis, sehingga sistem ini layak dijadikan solusi efektif, efisien, dan berkelanjutan untuk pengolahan air sumur di wilayah yang belum memiliki akses air bersih.

Kata kunci : Pengolahan Air Sumur, Internet of Things (IoT), ESP32, Sensor Ultrasonik, Sensor Turbidity, RTC DS1307.

ABSTRACT

Internet of Things (IoT)-Based Well Water Treatment Automation System

Using Ultrasonic and Turbidity Sensors

2025 : 54 pages + 31 figures + 8 tables + Appendices

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This research discusses the design and implementation of an Internet of Things (IoT)-based well water treatment automation system using turbidity sensors and ultrasonic sensors to improve the efficiency and accuracy of the water purification process. This system is controlled by an ESP32 microcontroller integrated with an RTC module to regulate the coagulation duration using alum as the main ingredient, as well as monitoring water conditions in real-time through the Blynk application. Test results show that the system is able to reduce the turbidity of well water from 100 NTU to around 20 NTU automatically, with an optimal alum dosage of 30 grams for 120 liters of water. The entire process from clarity detection, dosage calculation, to pump activation is carried out automatically, so this system is worthy of being an effective, efficient, and sustainable solution for well water treatment in areas that do not have access to clean water.

Keywords: Well Water Treatment, Internet of Things (IoT), ESP32, Ultrasonic Sensor, Turbidity Sensor, RTC DS130