

ABSTRAK

SISTEM OTOMASI PENGOLAHAN AIR SUMUR BERBASIS *INTERNET OF THINGS* (IOT) MENGGUNAKAN FILTER MULTIFUNGSI MENURUNKAN TDS (*TOTAL DISSOLVED SOLIDS*)

(2025 : xiii+ 61 Halaman + 34 Gambar + 11 Tabel + Daftar Pustaka + Lampiran)

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Pengolahan air sumur menjadi air bersih merupakan tantangan penting, terutama di wilayah yang tidak memiliki akses PDAM. Salah satu parameter yang mencerminkan kualitas air adalah Total Dissolved Solids (TDS), yang menunjukkan jumlah zat terlarut dalam air. Pada laporan akhir ini, dirancang sebuah sistem otomatisasi pengolahan air sumur berbasis Internet of Things (IoT) yang dilengkapi dengan filter multifungsi dan sensor TDS. Sistem ini bekerja secara otomatis memantau kualitas air dan mengaktifkan proses filtrasi bila nilai TDS melebihi ambang batas. Proses penyaringan dilakukan secara berlapis menggunakan pasir silika, ferrolite, zeolit, dan karbon aktif untuk menurunkan kadar TDS secara signifikan. Mikrokontroler ESP32 digunakan sebagai pusat pengendali yang memproses data sensor dan mengatur kerja pompa serta katup otomatis. Berdasarkan hasil pengujian, sistem ini mampu meningkatkan efektivitas dan efisiensi proses penyaringan air, serta mengurangi ketergantungan pada pengujian manual yang rentan terhadap kesalahan. Sistem ini diharapkan dapat menjadi solusi berkelanjutan dalam memenuhi kebutuhan air bersih bagi masyarakat.

Kata Kunci : *Internet of Things (IoT)*, Air Sumur, Filter Multifungsi, *Total Dissolved Solids (TDS)*, Otomatisasi, ESP32.

ABSTRACT

WELL WATER PROCESSING AUTOMATION SYSTEM BASED ON THE INTERNET OF THINGS (IOT) USING A MULTIFUNCTIONAL FILTER TO REDUCE TDS (TOTAL DISSOLVED SOLIDS)

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Processing well water into clean water is a significant challenge, especially in areas without access to the local water utility (PDAM). One parameter that reflects water quality is Total Dissolved Solids (TDS), which indicates the amount of dissolved substances in the water. In this final report, we design an automated well water treatment system based on the Internet of Things (IoT), equipped with a multifunctional filter and TDS sensor. This system automatically monitors water quality and activates the filtration process when the TDS value exceeds the threshold. The filtration process is carried out in layers using silica sand, ferrolite, zeolite, and activated carbon to significantly reduce TDS levels. An ESP32 microcontroller serves as the ;control center, processing sensor data and regulating the operation of automatic pumps and valves. Based on testing results, this system can increase the effectiveness and efficiency of the water filtration process and reduce reliance on error-prone manual testing. This system is expected to be a sustainable solution to meet the community's clean water needs.

Keywords: *Internet of Things (IoT), Well Water, Multifunctional Filter, Total Dissolved Solids (TDS), Automation, ESP32.*