

ABSTRAK

SISTEM MONITORING LEVEL DAN VOLUME AIR TOREN BERBASIS IOT MENGGUNAKAN ESP32 DENGAN MONITORING DAN NOTIFIKASI BERTINGKAT PERUBAHAN LEVEL AIR

(Jodi Setiawan 2026: 48 Hal)

Ketersediaan air yang cukup merupakan kebutuhan penting dalam kehidupan sehari-hari, namun pemantauan level air pada toren masih sering dilakukan secara manual sehingga berpotensi menyebabkan keterlambatan pengisian, pemborosan air, maupun luapan air. Penelitian ini bertujuan untuk merancang dan membangun sistem monitoring level dan volume air toren berbasis Internet of Things (IoT) menggunakan ESP32 serta mengimplementasikan notifikasi bertingkat berdasarkan kondisi volume air. Sistem menggunakan sensor ultrasonik JSN-SR04T untuk mengukur jarak permukaan air, kemudian data diolah oleh ESP32 menjadi informasi level air dalam bentuk persentase dan volume air dalam satuan liter. Hasil pengolahan data ditampilkan pada LCD 16×2 I2C dan website monitoring berbasis web server ESP32 secara real-time, serta dikirimkan melalui Telegram sebagai notifikasi bertingkat dengan kategori penuh, setengah, hampir habis, dan sedikit lagi habis. Pengujian dilakukan pada rentang jarak 0–18 cm untuk mengetahui kinerja sistem dalam membaca perubahan level air. Hasil pengujian menunjukkan bahwa sistem mampu mengukur level air, mengonversi data menjadi persentase dan volume air, serta menampilkan informasi dengan baik pada LCD dan website monitoring. Selain itu, sistem berhasil mengirimkan notifikasi Telegram sesuai dengan perubahan kategori volume air yang terdeteksi. Dengan demikian, sistem yang dirancang dapat digunakan untuk memantau level dan volume air toren secara real-time serta memberikan informasi kondisi air secara otomatis kepada pengguna.

Kata Kunci: Internet of Things, ESP32, JSN-SR04T, monitoring air, volume air, Telegram.

ABSTRACT

IOT-BASED WATER TANK LEVEL AND VOLUME MONITORING SYSTEM USING ESP32 WITH MONITORING AND TIERED NOTIFICATIONS FOR WATER LEVEL CHANGES

(Jodi Setiawan 2026: 48 Pages)

Adequate water availability is an important necessity in daily life. However, monitoring water levels in water tanks is still often carried out manually, which may lead to delayed refilling, water wastage, and water overflow. This study aims to design and develop an Internet of Things (IoT)-based water tank level and volume monitoring system using ESP32 and to implement tiered notifications based on water volume conditions. The system uses a JSN-SR04T ultrasonic sensor to measure the distance to the water surface. The measured data are then processed by the ESP32 into water level information in percentage and water volume in liters. The processed information is displayed on a 16×2 I2C LCD and an ESP32 web server-based monitoring website in real time, and is also sent through Telegram as tiered notifications with the categories of full, half-full, nearly empty, and almost empty. Testing was conducted over a distance range of 0–18 cm to evaluate the system's performance in detecting changes in water level. The test results show that the system is capable of measuring the water level, converting the data into percentage and volume, and displaying the information properly on the LCD and monitoring website. In addition, the system successfully sends Telegram notifications according to changes in the detected water volume category. Therefore, the developed system can be used to monitor water tank levels and volumes in real time and automatically provide users with information about the water condition.

Keywords: Internet of Things, ESP32, JSN-SR04T, water monitoring, water volume, Telegram.

