

ABSTRAK

RANCANG BANGUN SISTEM PENGISIAN GALON OTOMATIS BERBASIS QRIS MENGGUNAKAN PENGENDALIAN VOLUME AIR

2026

(2026 : xvi+63 Halaman + Daftar Tabel + Daftar Gambar + Daftar Lampiran)

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Penelitian ini bertujuan untuk merancang dan merealisasikan sistem pengisian galon otomatis berbasis QRIS menggunakan pengendalian volume air. Sistem dikembangkan menggunakan mikrokontroler ESP32 sebagai pengendali utama, sensor debit air YF-S201 untuk mengukur volume air, serta modul QRIS sebagai media akses pengoperasian sistem. Pengujian dilakukan untuk mengetahui kinerja sistem, akurasi pengukuran volume air, serta kemampuan sistem dalam menghentikan proses pengisian secara otomatis sesuai volume yang telah ditentukan. Hasil pengujian kalibrasi sensor menunjukkan rata-rata kesalahan sebesar 19,34%, sedangkan pengujian berdasarkan variabel waktu menghasilkan rata-rata kesalahan sebesar 14,61%. Pada pengujian pengisian galon penuh dengan target volume 19 liter diperoleh rata-rata kesalahan sebesar 5,53%. Hasil penelitian menunjukkan bahwa sistem mampu melakukan pengisian galon secara otomatis setelah pembayaran QRIS terverifikasi dan menghentikan proses pengisian ketika volume air yang ditentukan telah tercapai. Dengan demikian, sistem yang dirancang dapat berfungsi sesuai tujuan dan dapat diterapkan sebagai solusi otomatisasi pengisian galon berbasis pengendalian volume air.

Kata kunci: otomatisasi, QRIS, sensor debit air, YF-S201, volume air.

ABSTRACT

DESIGN AND CONSTRUCTION OF AN AUTOMATIC GALLON FILLING SYSTEM BASED ON QRIS USING WATER VOLUME CONTROL

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This research aims to design and implement an automatic gallon filling system based on QRIS using water volume control. The system was developed using an ESP32 microcontroller as the main controller, a YF-S201 water flow sensor to measure water volume, and a QRIS payment module as the system access medium. Testing was conducted to evaluate system performance, water volume measurement accuracy, and the ability of the system to automatically stop the filling process according to the predetermined volume. The sensor calibration test resulted in an average error of 19.34%, while testing based on time variation produced an average error of 14.61%. In the full gallon filling test with a target volume of 19 liters, the average error obtained was 5.53%. The results show that the system is capable of performing automatic gallon filling after QRIS payment verification and stopping the filling process when the specified water volume has been reached. Therefore, the proposed system can operate according to its intended function and can be applied as an automation solution for gallon filling based on water volume control.

Keywords: *automation, QRIS, water flow sensor, YF-S201, water volume.*