

ABSTRAK

RANCANG BANGUN *HARDWARE* DISPENSER MINUMAN DENGAN SISTEM MONITORING PADA SENSOR RASPBERRY PI BERBASIS *INTERNET OF THINGS (IoT)*

(2025:xxv+ Halaman+Gambar + Tabel + Lampiran)

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Perkembangan teknologi *Internet of Things* (IoT) telah mendorong inovasi berbagai perangkat otomatis yang mampu memberikan kemudahan dan efisiensi dalam kehidupan sehari-hari. Salah satunya adalah pengembangan dispenser minuman otomatis yang dilengkapi sistem monitoring berbasis IoT. Penelitian ini bertujuan untuk merancang dan membangun perangkat keras dispenser minuman dengan sistem monitoring pada sensor Raspberry Pi. Alat ini memanfaatkan beberapa sensor, seperti sensor ultrasonik untuk mendeteksi volume cairan, sensor warna TCS3200 untuk mengenali jenis cangkir, serta sensor flow meter untuk mengukur jumlah cairan yang dikeluarkan. Raspberry Pi berfungsi sebagai pusat kendali yang memproses data sensor dan mengendalikan aktuator pompa melalui relay. Hasil pengujian menunjukkan bahwa sistem dapat mendeteksi keberadaan cangkir pada jarak optimal 2–4 cm, mengenali warna cangkir dengan akurasi tinggi, memantau level cairan secara real-time, dan mengontrol pengeluaran minuman secara otomatis dengan durasi pengisian yang seragam. Sistem ini diharapkan dapat memberikan solusi praktis dalam otomasi penyajian minuman.

Kata Kunci: Dispenser Minuman Otomatis, Raspberry Pi, Sensor Ultrasonik, IoT, Monitoring Jarak Jauh

ABSTRACT

HARDWARE DESIGN OF A DRINK DISPENSER WITH MONITORING SYSTEM ON A RASPBERRY PI SENSOR BASED ON THE INTERNET OF THINGS (IoT)

(2025:xiv+ Pages + Images + Tables + Attachments)

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The development of Internet of Things (IoT) technology has driven the innovation of various automated devices that can provide convenience and efficiency in everyday life. One of them is the development of an automatic beverage dispenser equipped with an IoT-based monitoring system. This research aims to design and build beverage dispenser hardware with a monitoring system on a Raspberry Pi sensor. This tool utilizes several sensors, such as an ultrasonic sensor to detect liquid volume, a TCS3200 color sensor to recognize cup types, and a flow meter sensor to measure the amount of liquid dispensed. The Raspberry Pi functions as a control center that processes sensor data and controls the pump actuator through a relay. Test results show that the system can detect the presence of a cup at an optimal distance of 2–4 cm, recognize cup color with high accuracy, monitor liquid levels in real-time, and control beverage dispensing automatically with a uniform filling duration. This system is expected to provide a practical solution in beverage serving automation.

Keywords: Automatic Drink Dispenser, Raspberry Pi, Ultrasonic Sensor, IoT, Remote Monitoring