ABSTRAK

RANCANGAN SISTEM KONTROL DAN *MONITORING* PADA TANAMAN KAILAN BERBASIS *INTERNET OF THINGS* (IoT) DI *GREENHOUSE* CENTER PALEMBANG

Karya Tulis Ilmiah Berupa Laporan Akhir, 2025
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Rancang Sistem Kontrol Dan *Monitoring* Pada Tanaman Kailan Berbasis *Internet of Things* (IoT) di Greenhouse Center Palembang
(2025 : 87 halaman + 14 tabel + 24 gambar + 10 lampiran)

Greenhouse merupakan fasilitas pertanian tertutup yang memungkinkan pengendalian lingkungan tumbuh tanaman secara optimal. Di Greenhouse Center Palembang diperlukan sistem otomatis untuk meningkatkan efisiensi budidaya tanaman kailan. Penelitian laporan akhir ini bertujuan merancang sistem kontrol dan *monitoring* berbasis *Internet of Things* (IoT) guna memantau parameter lingkungan secara *realtime* dan mengendalikan perangkat pendukung secara otomatis.

Sistem ini menggunakan sensor TDS (*Total Dissolved Solids*) untuk mengukur kadar zat terlarut, sensor pH untuk memantau keasaman larutan, dan sensor ultrasonik untuk mendeteksi ketinggian air yang semuanya terhubung dengan *mikrokontroler* ESP32. Data dikirim ke aplikasi Telegram dan dapat diakses melalui perangkat seluler. Hasil pengujian menunjukkan sistem bekerja efektif dalam mendukung pemantauan dan pengendalian lingkungan serta berpotensi meningkatkan efisiensi dan produktivitas dalam budidaya Kailan secara presisi.

Kata Kunci : *Internet of Things* (IoT), *Greenhouse*, Tanaman Kailan, Sensor TDS (*Total Dissolved Solids*), Sensor pH, dan Sensor *Ultrasonik.*

ABSTRACT

CONTROL AND MONITORING SYSTEM DESIGN ON INTERNET OF THINGS (IoT) BASED GARDEN PLANTING IN GREENHOUSE CENTER PALEMBANG

Scientific Writing in the Form of Final Report, 2025

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*Design of Internet of Things (*IoT*)-based Control and Monitoring System for Kailan Plants at Greenhouse* Center Palembang

(2025 : 87 *pages* + 14 *tables* + 24 *figures* + 10 *attachments)*

Greenhouse is a closed agricultural facility that allows optimal control of the plant growing environment. In Greenhouse Center Palembang, an automatic system is needed to increase the efficiency of kailan cultivation. This final report research aims to design an Internet of Things (IoT) based control and monitoring system to monitor environmental parameters in realtime and control supporting devices automatically.

This system uses a TDS *(Total Dissolved Solids) sensor to measure solute levels, a* pH *sensor to monitor the acidity of the solution, and an ultrasonic sensor to detect the water level, all of which are connected to an ESP32 microcontroller. Data is sent to the Telegram application and can be accessed via mobile devices. The test results show the system works effectively in supporting environmental monitoring and control and has the potential to increase efficiency and productivity in precision cultivation of Kailan.*

Keywords : *Internet of Things (IoT), Greenhouse, Chickpea Plants, TDS (Total Dissolved Solids) Sensor, pH Sensor, and Ultrasonic Sensor.*