

ABSTRACT

This project focuses on the design and implementation of an automated water level control system for a hydroponic water tank, powered by an ESP32 microcontroller. The system utilizes an A02YYUW ultrasonic sensor to continuously monitor the water level in real-time, and a solenoid valve serves as the actuator to regulate the inflow of water into the tank. The ESP32 plays a crucial role as the central controller-processing sensor data and automatically triggering the solenoid valve when the water level drops below a specified threshold. Additionally, ESP32 sends sensor reading and solenoid valve status to Firebase, which are then displayed on a web interface for real-time monitoring. This system is designed to ensure that the water supply remains aligned with the needs of hydroponic plants while minimizing manual intervention from hydroponic farmers. Test results confirm that the system operates accurately and responsively in maintaining the desired water level. The implementation of this solution promotes water efficiency and enhances the sustainability of the hydroponic system through automation.

Keywords: Hydroponic, ESP32, A02YYUW, Solenoid Valve, Automatic Control