DESIGN AND IMPLEMENTATION OF A MICROCONTROLLER-BASED AUTOMATED SPRINKLER SYSTEM FOR THE CAVITE STATE UNIVERSITY COFEE NURSERY

A Design Project
Submitted to the Faculty of the
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Bachelor of Science in Computer Engineering

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ABSTRACT

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The study, Design and Implementation of the Automated Sprinkler System for the Cavite State University Coffee Nursery was designed and constructed at Brgy. Palangue 2, Naic, Cavite, from August 2004 to January, 2005. This was tested and evaluated at the Cavite State University Central Experiment Station Coffee Nursery from Frebruary 9 to 14, 2005.

The general objective of the study was to design and implement an automated sprinkler system for the coffee nursery. Specifically, it aimed to: design and construct a microcontroller circuit for the sprinkler system; design and construct moisture sensors; develop a software that will control the system; and test and evaluate the system and conduct a cost computation.

The sprinklers operate in an automatic manner through the aid of moisture sensors, which five pairs of resistive rods maintained the soil moisture level. The soil moisture value from the sensor was processed by microcontroller to control the solenoid valve. If the soil moisture level is below the trigger level, then the solenoid valve will open. But if the soil moisture level is higher than the trigger level, the solenoid valve will be closed. The sensors will continue checking the soil moisture. The LCD (Liquid Crystal Display) will display the soil moisture level, the duration of watering, and the history of watering up to sixty days.

The main part of this automation was the Z86E40 Microcontroller. The programming language used to develop the software was Assembly language. The overall application of the software in the design was to control the operation of the solenoid valve and monitor the status of the soil whether its moisture content is increasing or decreasing as determined by the moisture sensors and the operation being performed by the solenoid valve was on or off function.

The evaluation of the system was focused on the overall operation of the automated sprinkler system. The variable quantities that were determined are the amount of water flowing randomly in selected sprinkler nozzles. The system was observed and evaluated by the proponents, instructors and workers in the greenhouse. The evaluation focused mainly on the technical side. The comparison between manual and automated one was observed.

TABLE OF CONTENTS