Abstract

Know days, the Greenhouse has been improved and developed by using modern technologies. The target of the paper is designing and implementing an intelligent cooling/heating system, the system should be built by employing a low power consumption and efficient device that called Thermo-electric cooler (Peltier).

The main goal of this system is to make the temperature inside the greenhouse under control and provide the plants with appropriate environments to ensure healthy products. The system implementation should be divided into two parts: hardware and software.

The hardware part is compromising the process of designing and implementing a control circuit that works on deriving the Peltier according control signals that come from the microcontroller. The second part (Software) is about designing a fuzzy controller that act as a brain of the system and manages the entire process until reaching the desired set-points. The Fuzzy controller depend on two inputs the error (Err) and change of the error (ΔErr). The overall
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system is implemented based on a standalone microcontroller with a simple sensor and actuator.

The prescribed system has been tested with several experiments using various transition set points. The experiments results show an accepted response that suitable for greenhouse applications.

References


Index Terms

Computer Science

Control Systems
Keywords

The Greenhouse Technology, Temperature Control, Fuzzy Controller, Thermo-electric cooler.