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Computer Controlled Portable Greenhouse Climate Control System for Enhanced Energy Efficiency¹ ANTHONY DATSENKO, STEVE MYER, ALBERT PETTIES, RYAN HUSTEK, MARK THOMPSON, Kettering University — This paper discusses a student project at Kettering University focusing on the design and construction of an energy efficient greenhouse climate control system. In order to maintain acceptable temperatures and stabilize temperature fluctuations in a portable plastic greenhouse economically, a computer controlled climate control system was developed to capture and store thermal energy incident on the structure during daylight periods and release the stored thermal energy during dark periods. The thermal storage mass for the greenhouse system consisted of a water filled base unit. The heat exchanger consisted of a system of PVC tubing. The control system used a programmable LabView computer interface to meet functional specifications that minimized temperature fluctuations and recorded data during operation. The greenhouse was a portable sized unit with a 5' x 5' footprint. Control input sensors were temperature, water level, and humidity sensors and output control devices were fan actuating relays and water fill solenoid valves. A Graphical User Interface was developed to monitor the system, set control parameters, and to provide programmable data recording times and intervals.

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