

# Abstract

Today agriculture is changing in response to the requirements of modern society, where ensuring food supply through practices such as water conservation, reduction of agrochemicals and the required planted surface, which guarantees high quality crops are in demand. Greenhouses have proven to be a reliable solution to achieve these goals; however, a greenhouse as a mean for protected agriculture has the potential to lead to serious problems. The most of these are related to the inside greenhouse climate conditions where controlling the temperature and relative humidity (RH) are the main objectives of engineering. Achieving appropriate climate conditions to ensure high yield and quality crops reducing energy consumption have been the objective of investigations for some time. Different schemes in control theories have been applied in this field to solve the aforementioned problems.

The proposed system consists of two stations: Sensor Station and Central Station to allow for better monitoring of the climate condition inside greenhouse. The sensor station is equipped with several sensor elements such as temperature, humidity and light. The communication between the sensor station and the central station is achieved via ZigBee wireless modules. This system is able to collect the information about the main environmental parameters, such as; Temperature, Humidity and Light inside the greenhouse. The analog signals of different sensors are converted into digital values utilizing the capability of XBee via it's analog to digital converters of the end devices without using microcontroller. These information are transmitted in wireless manner to central computer to be processed and making a decision based on simple fuzzy controller to initiate suitable digital command signals via digital outputs of XBee to regulated the greenhouse

parameters for specific crop. The collected data and the generate control signals are stored on database to be analyzed for enhancement of the crop growing purposes.