



WIRELESS GREENHOUSE AUTOMATION SYSTEM

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ABSTRACT: In wireless controlled greenhouse automation system several measuring component is required to operate an wireless controlled greenhouse automation system. In this wireless controlled greenhouse automation system we use Node MSU8266 Microcontroller to as an brain and we also use soil moisture sensor and temperature sensor to measure the various parameters and to work properly. In this wireless controlled greenhouse automation system we use dc water pump and dc fan to control temperature and soil dryness and to operate the dc water pump and dc fan we use relay module.

**Key Components :Hardware - Node MCU8266, DHT22, Soil moisture sensor, DC water pump, Exhaust fan, Relay module
Software - Arduino IDE, Blynk android application**

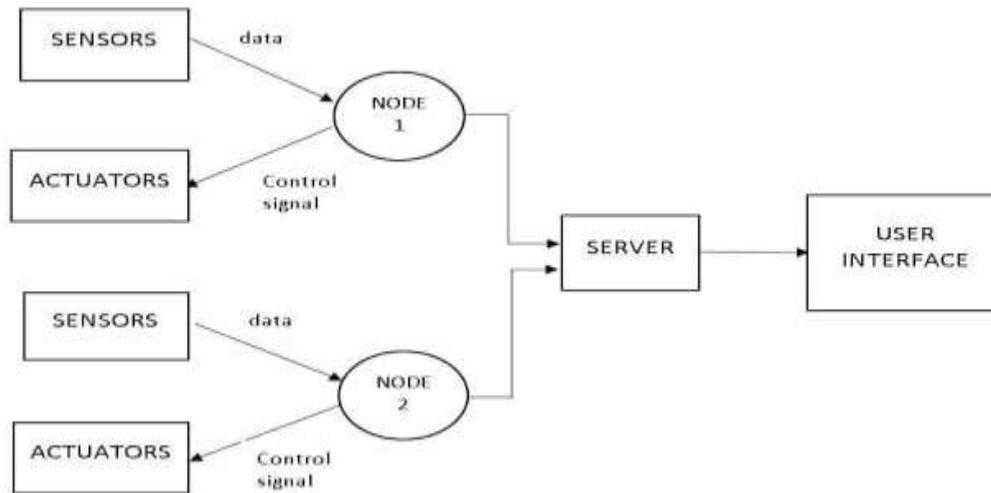
1. INTRODUCTION

The purpose of a greenhouse is to control the greenhouse growing environment. Plants require temperature, soil moisture, light, humidity, air (Oxygen, Carbon Dioxide and Nitrogen), and nutrients in a limited range to grow the plants. Plants also require some type of physical support for roots and shoots. Plants also depend upon symbiotic relationships with fungi and insects to grow and reproduce. The greenhouse covering helps to control many of these factors to help increase plant growth and reproduction. A greenhouse is a place where plants are grown. It ranges from small part to huge structures with different models such as roof or transparent glass.

The primary heating mechanism of green house is convection.Ventilation is one of the most important components in a modern greenhouse. If there is no proper ventilation, plants can become prone to problems. The main purpose of ventilation is to regulate the temperature and air movement to prevent plant to pathogens and fresh air. Previously, human labour plays a very critical role in monitoring plants. Some plants need 24 hours attention so that the qualities of the plant must be controlled. But, this type of manual practice is time consuming.

2. Block Diagram

The wireless controlled greenhouse automation system work can be understood by block diagram.



With the help of block diagram we can understand how the wireless greenhouse automation system works properly. By the given block diagram we can understand that from the sensor data provided to the node and then server. At the server data converted into human readable and sends it to application to see user data properly. After check the data server sends an control signal to the actuators to work properly. This process is continuously work until power supply provided. In this process various conditions are checked to work wireless greenhouse automation system properly.

3. Hardware Requirements

Various hardware components are required to work the wireless controlled greenhouse automation system properly.

1. Node MCU8266 :



NODE MCU 8266

this system we use Node MCU8266 as an brain of this system. This microcontroller is Wi-Fi (2.4 GHz) connected microcontroller. It is use to receive (Rx) and transmit (Tx) the data between sensors, actuators and mobile application.

2. Soil moisture sensor : To measure the moisture in soil we use soil moisture sensor. It has two large exposed pads which functions together as a variable resistor and the pads also works as probe of sensor.

3. Temperature sensor (DHT22): Temperature (humidity) sensor is use to measure the temperature as well as humidity present in environment. In the wireless greenhouse automation system DHT22 temperature sensor is perfect to use.

4. Water pump : water pump is use to provide water to the plants by the input signal from the soil moisture sensor.

5. Exhaust fan : Ventilation is main point in plants without ventilation plants faces problem to grow. Exhaust fan is work by getting input signal from temperature sensor (DHT22).

6. Power supply : To work the circuit power supply is needed without power supply circuit can not work.

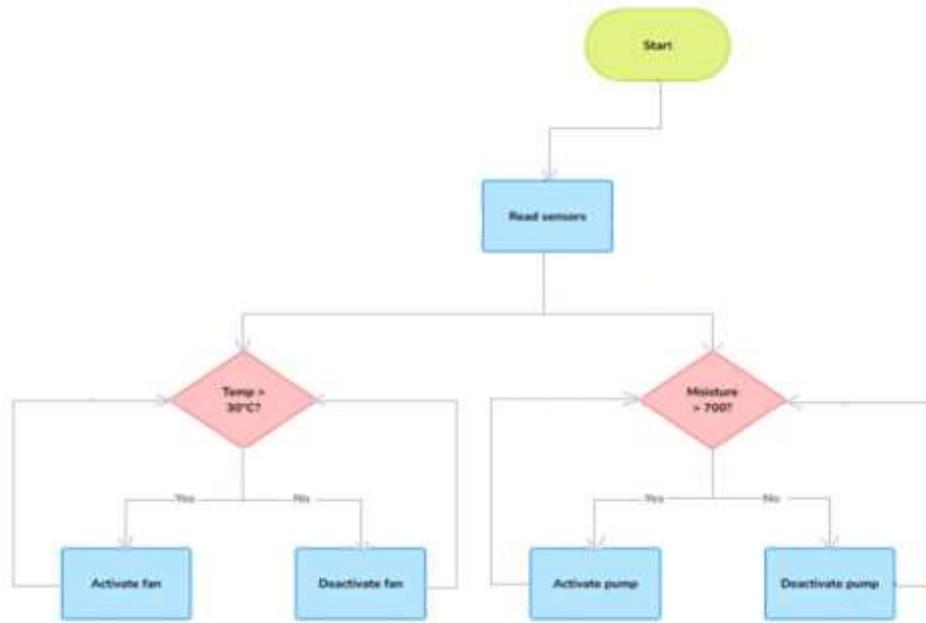
4. Software requirements

There is two main software is required to work wireless greenhouse automation system properly

1. **Arduino IDE:** With the help of Arduino IDE we can write, compile and upload the code in the microcontroller NODE MCU8266.
2. **Blynk :** It is an open source platform to develop an mobile application which can connect with electroins and IOT devices.

5. FLOW CHART

With the help of flow chart we can understand how system works



With the help of given flowchart we can control the systems work (sensors). Here we can monitor the temperature sensor (DHT22) with exhaust fan and Soil moisture sensor with water pump. Both the water pump and fan work on a specific condition and the condition is that, If temperature range is greater than 30 Degree than fan turn ON, otherwise fan turn OFF and other condition is soil moisture in greater 700 than the pump turn ON otherwise pump turn OFF. This loop is continuously run without end.

6. PROBLEM STATEMENT

Cultivating various plants in environmental conditions which do not support their own growth is a challenging task for farmers. One must keep keen vigilance on the growth and development at regular intervals. If there are any sudden climatic changes, then the plants get adversely affected. The required amount of temperature, soil moisture, humidity, air and nutrients to be provided for the plants is to be monitored properly for better growth. Thus, in order to grow plants properly and provide necessary environmental conditions, greenhouse monitoring and automation system is needed.

7. RESULT

This wireless greenhouse automation system uses sensors (DHT22, soil moisture) and wireless communication (BLYNK app) to monitor and control greenhouse environments, optimizing plants and resource usage. This type of system can provide real-time monitoring of temperature, humidity and soil moisture, It can automatically adjust irrigation, ventilation, and cooling based on these measurements, potentially increasing growth of plants and reducing water and energy consumption

8.CONCLUSION

Agriculture is seeing an increased need for application of automation. There is also a real need for engineering students to understand, specify and automation equipment. The system may be programmed remotely over the internet and immediate results of parameter changes may be seen. A control system was designed and programmed to control and acquire data. The prototype of the system worked according to the specifications and quite satisfactorily. The developed system is suitable for both large scale agribusiness as well as small agriculture farm.

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