

Green House Monitoring System Using IOT

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Abstract: In today's world it is necessary to protect the flowers, vegetables from the insects and the excessive temperature. So we built up the green house observing framework utilizing IOT. The framework presented in this paper is a propelled answer for checking the natural condition in the nursery and make the extraction anyplace in the earth. The innovation behind this can be IOT, which interfaces things to the web and associate whole universe of things in a network. This framework manages checking the ecological conditions such as temperature, humidity, moisture with the assistance of particular sensors. And sends these information to the things peak which is an open source web of things application and API to store and recover information .This is done by using Node-MCU ESP8266 which is an open source IOT platform. Using the things-speak we plot the sensor related data and analyze it.

Keywords- IOT, NodeMCU8266, Sensors, Code Composer Studio, MSP430G2553 Board.

1.Introduction

Before going to discuss the greenhouse monitoring system it is necessary to understand the greenhouse and greenhouse effects. A greenhouse is also known as greenhoth. It is a erection where plants are developed. It usually has a glass or transparent plastic roof which protects plants from insects and excessive temperature. A greenhouse effect or impact is an inartificial procedure that warms the soil surface, when the sun's radiation arrives at the earth's environment, few of these energy is return back to air or space and some of these are absorbed and re-radiated by greenhouse gases such as water vapors, carbon dioxide, methane, nitrous oxide.

Greenhouse contains the environmental parameter like humidity, temperature, moisture etc. Sometimes what happen due to the shortage of knowledge or information among farmers.It is impossible to perform their activities accurately. They usually performs their activities based on their own knowledge or observation. Many times this observation may gets wrong and lead to unexpected result.So that to prevents plants from this unexpected result this system is developed which gives the proper and accurate results. Based on this result farmer should able to take the appropriate action. In this proposed framework we monitor the temperature, humidity, soil moisture with the help of respective sensors. Sensors senses the data and given to the MSP430G2553 controller. For interfacing of sensors code composer studio is used. The controller receives the sensor related data and performs some necessary action and gives these data to the NodeMCU 8266.NodeMCU is an open source IOT platform. It is used to provide the internet connectivity. To interface the NodeMCU Arduino IDE is used. With the use of NodeMCU these sensors data is send to the cloud.To store sensors data in the cloud Thingspeak server is used. Thingspeak is an open souece IOT platform and API that enables user to collect, store, analyze the data .In Thingspeak we created three fields such as temperature, moisture, humidity. This fields shows the data in graphical manner. With the use of this graphical representation farmers are able to monitor the temperature,humidity,moisture from the remote location with the help of Thingspeak server.Based on this graph farmer is able to take the appropriate action for example if the temperature is exceeds then turn on the cooling fan.

2.Literature Surveys

- The remote estimation and control of greenhouse based on GSM-SMS for controlling the devices by the SMS in green house. The fundamental reason for this framework origination is the remote control of the climatic parameters that impacts the creation in greenhouse.This proposed framework utilized a few sensors.These sensors give applicable data that is utilized to control their various gadgets, for example, D.C fan,bulb,water pump by SMS.The methodology utilized in this framework furnishes a proprietor with a remote control staying away from the expected to play out the control activity on location.[1]
- GSM based monitoring and controlling various parameters is easy and beneficial than the bluetooth but the disadvantage of those system is different AT commands.[2]
- This framework gives a model of a keen green house, which encourages the farmers to carryout the work in a homestead naturally without the utilization of much hand worked assessments. The water system of horticulture field is completed utilizing programmed brief water system, which works as indicated by the dirt dampness limit set as needs be so as ideal measure of water is connected to the plants.[3]
- The proposed framework for controlling and checking condition inside the green house which comprises of neighborhood and focal stations. Nearby station are utilized to gauge parameter and to control the actuators and for every neighborhood station a PIC microcontroller is introduced which gets the information and send it to focal station and get the control flag that are required for the task of the actuators.[4]

3.Problem Statement

As we can see everywhere automation is used but it is based on Bluetooth and GSM technology .The drawback of Bluetooth technology is limited range and drawback of GSM is it's AT commands. But now a days everyone wants to monitor the things from the remote location. Agriculture is one of the leading factor. To monitor the plant from the remote location it is necessary that what technology should used. To overcome the drawback of GSM and Bluetooth technology this IOT based system is proposed.

4.Block Diagram

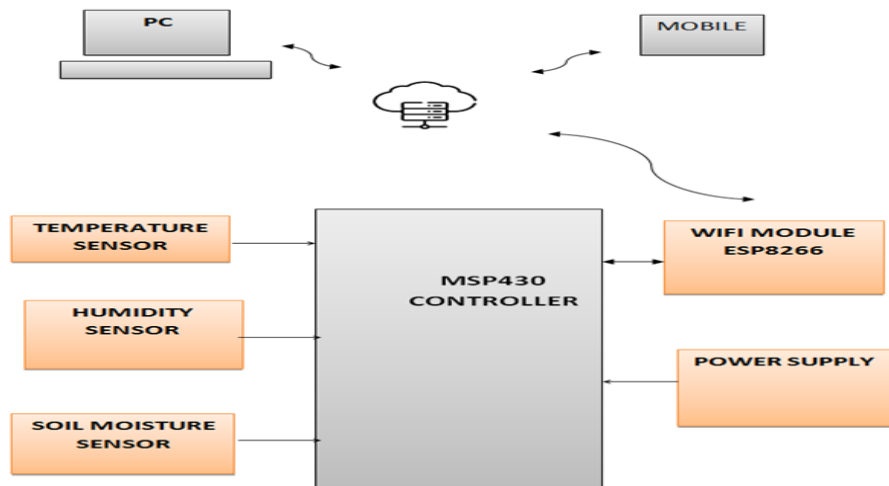


Figure 1.Block Diagram

It is a MSP430 controller based circuits which monitors and records the values of various parameters such as temperature, humidity, moisture. And all these values are continuously updated and monitors. We see all these values on the thingspeak server. The important sensors are used in this project are listed below..

- Temperature Sensor
- Humidity Sensor
- Soil Moisture Sensor

MSP430 Controller

In this system we used the MSP430 family controller i.e MSP430G2553. We choose this controller because of it's many advantages one of them is that ultra low power consumption.

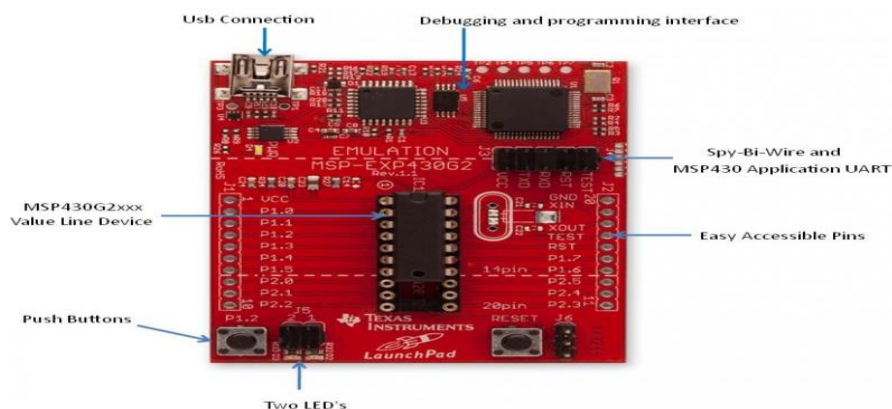


Fig.2 MSP430 launchpad

The MSP430G2x13 and MSP430G2x53 arrangement are ultra-low-control blended flag microcontrollers with inherent 16-bit clocks, up to 24 I/O capacitive-contact empowered pins, a flexible simple comparator, and inherent correspondence capacity utilizing the widespread sequential correspondence interface. Likewise the MSP430G2x53 relatives have a 10-bit simple to-computerized (A/D) converter.

Temperature Sensor

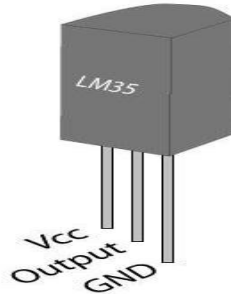


Fig.3 Temperature Sensor

In our project we use LM35 sensor for temperature measurement. LM35 is one kind of typically used temperature sensor that can be used to check temperature with an electrical yield like the temperature (in celcius).It can measure temperature even more precisely differentiation and thermistor. This sensor makes a high return voltage than thermocouples and may not increased. the scale factor is 0.01V/celcius.

Humidity Sensor

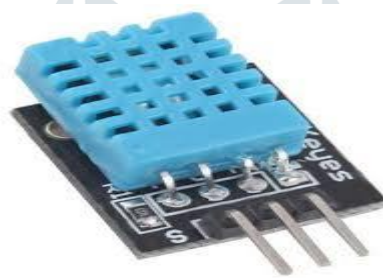


Fig.4 Humidity Sensor (DHT11)

The DHT11 is an essential ultra ease computerized temperature and dampness sensor. A humidity sensor detects, measures and reports the relative stickiness in air. Thus it quantifies both dampness and temperature.But in our undertaking it is utilized for to gauge humidity not temperature.

Soil Moisture Sensor

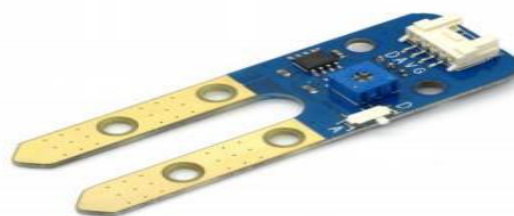


Fig.5 Soil Moisture Sensor

Soil Moisture sensor estimates the water content in the soil. Soil Moisture Sensor estimates the water content present in the soil indirectly.Based on certain properties of soil like electrical obstruction, dielectric consistent, or connection with neutrons, as an intermediary for the dampness content. The connection between the deliberate property and soil dampness must be adjusted and may change contingent upon natural factors, for example, soil type, temperature, or electric conductivity. Reflected microwave radiation is influenced by the dirt dampness and is utilized for remote detecting in hydrology and horticulture. Compact test instruments can be utilized by ranchers or nursery workers.

5.Result

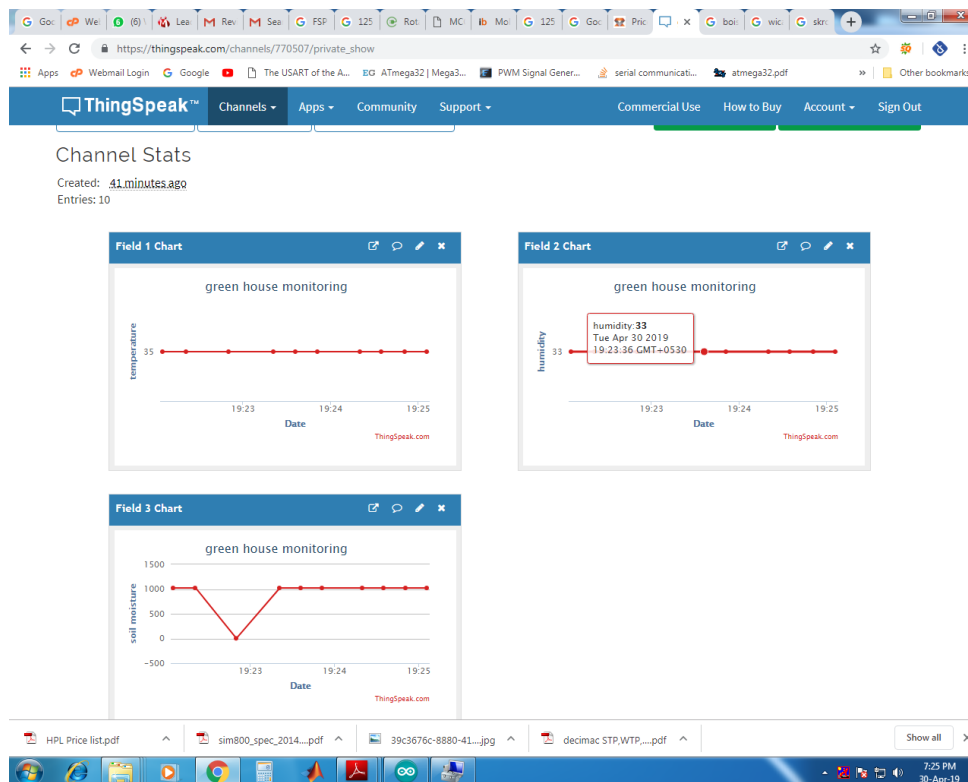


Fig.6 Result

6.Conclusion

This paper describes various aspects of greenhouse monitoring using IOT. This system prevents plants from the insects and pests. This system consist of temperature, humidity, moisture sensor .So by using IOT we can monitor this parameter from the remote location. There is no need to go to the farm. The proposed system used MSP430 controller so power consumption is very low. This system helps in increasing the agricultural production and economic growth of country.

7.Future Scope

The proposed system only monitor the temperature, humidity, moisture. In future we can interface more sensors like light sensor, PH sensor etc. And also in future we can control this system from the remote location using android mobile app.

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