International Journal of Scientific Research in Engineering and Management (IJSREM)
Volume: 04 Issue: 05 | May -2020 ISSN: 2582-3930

IOT Based Energy Efficient Environmental Monitoring Alerting and Control System

COLLEGE: Padmabhushan Vasantdada Pratishthan College Of Engineering

PROJECT GUIDE: Mr. Rajesh Morey

Sanket Sadashiv More, Nikhil Suryakant Rajgude, Prasad Sunil Deshmukh, Abhijeet Shahaji Mane,

ABSTRACT:

Internet of Things (IoT) is expected to play a major role in our lives through pervasive systems of sensor networks encompassing our environment. These systems are designed to monitor vital physical phenomena generating data which can be transmitted and saved at cloud from where this information can be accessed through applications and further actions can be taken. This paper presents the implementation and results of an environmental monitoring system which employs sensors for temperature and humidity of the surrounding area. This data can be used to trigger short term actions such as remotely controlling heating or cooling devices or long term statistics. The sensed data is uploaded to cloud storage and an Android application accesses the cloud and presents the results to the end users. The system employs Arduino UNO board, DHT11 sensor, ESP8266 Wi-Fi module, which transmits data to open IoT API service ThingSpeak where it is analyzed and stored. An Android application is developed which accesses the cloud and displays results for end users via REST API Web service. The experimental results show the usefulness of the system.

KEYWORDS:

IoT, Smart Agriculture[Irrigation], Humidity, Temperature

INTRODUCTION

Internet of Things (IoT) is expected to revolutionize our world by enabling us to monitor and control vital phenomena in our environment through the use of devices capable of sensing, processing and wirelessly transmitting data to remote storage like cloud which stores, analyzes and presents this data in useful form. From the cloud this information can be accessed through various front end user interfaces such as web or mobile applications, depending upon suitability and requirements. Internet lies at the heart of this transformation playing its role in efficient, reliable and swift communication of data from devices to the cloud and from the cloud to the end users. In this new paradigm, the concept of the typical end system or host in the Internet is modified and hosts comprise of devices or things hence the name Internet of Things. The “things” are capable of sensing and transmitting data such as temperature, pressure, humidity, noise, pollution, object detection, patient vitals etc.

BLOCK DIAGRAM:

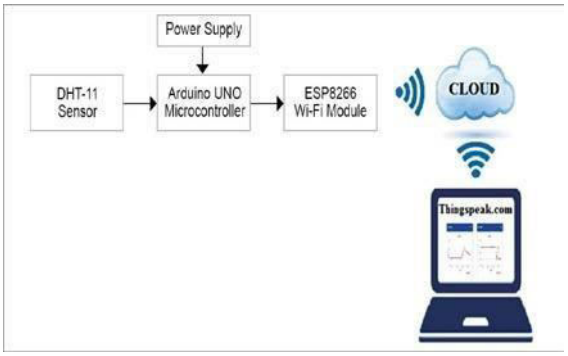

Fig:-1

Block Diagram:-Humidity And Temprature Sensor

WORKING:

Environmental monitoring is an important IoT application which involves monitoring the surrounding environment and reporting this data for effective short term measures such as remotely controlling the heating or cooling devices and long term data analyses and measures. This paper presents the implementation details and results of an environmental monitoring system. The system comprises of a central Arduino UNO board which interfaces at the input with temperature and humidity monitoring sensor DHT11 and at the output with ESP8266 Wi-Fi module which transmits the sensed data through Internet to a remote cloud storage open IoT API ThingSpeak. Through ThingSpeak, MATLAB analytics are carried out on data and trigger is generated. A mobile application is developed based on Android operating system and data is retrieved from ThingSpeak for user display from anywhere in the world. The developed is a low cost system which gives insight into the design and implementation of a complete IoT application involving all aspects from sensing and wireless transmission to cloud storage and data retrieval from cloud via a mobile application. It involves comprehensive study and deployment of Arduino development board, its interfacing with input and output modules such as sensors and Wi-Fi module, the usage of ThingSpeak open source API and finally the development of a mobile application based on the Android operating system

PIN DIAGRAM:-

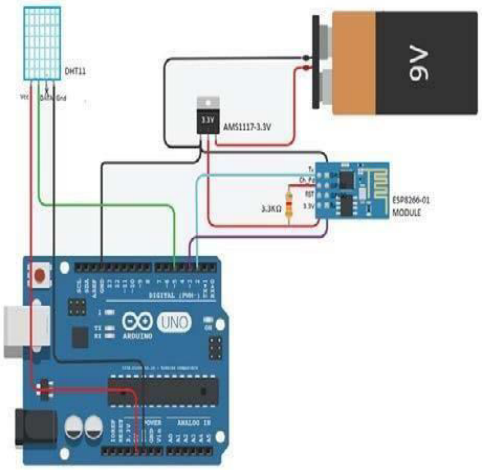

Fig:-2

COMPONENTS:-

Arduino UNO

The Arduino is an open source electronics platform based on easy to use hardware and software.

It can be powered by connecting it to computer or AC to DC adapter. It is based on ATMEG 328.

Specifications:-

Microcontroller ATmega 328p

Operating voltage 5V

EEPROM 1KB

Frequency 16 Mhz

Fig:-3 Arduino Uno

DHT11 Sensor

The DHT11 is a both temperature and humidity Sensor.

It has 3 pins VCC, GND and data pin.

Specifications:-

PCB size 22.0mm X 20.5mm X 1.6mm

Working voltage 3.3 or 5V DC

Operating voltage 3.3 or 5V DC

Measurement Range 20-95%RH, 0-50^{0}C

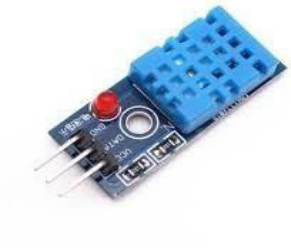

Fig:-4 DHT 11 Sensor

Wi-Fi Module (ESP8266)

The ESP8266 WiFi Module is a self contained SOC with integrated TCP/IP protocol stack that can give any microcontroller access to your WiFi network. The ESP8266 is capable of either hosting an application or offloading all Wi-Fi networking functions from another application processor. Specifications:-

Frequency range : 2.4GHz - 2.5GHZ Operating

voltage : 3.0v~3.6v

Operating current: Average value 80mA

Fig:-5 WI-FI Module

Summary

In designing the Arduino based system for monitor and control of four parameters which is needed for green house i.e.

temperature, humidity, soil moisture and light intensity has been followed. By continuously monitoring the status of

parameters, we can control these green house parameters and reduce wastage. The measurement which obtained result has

shown that the system's performance is reliable and accurate.The smart agriculture software is appropriate with the purpose

in the starting that is to get parameters value from green house and input to control components in green house. Here

automatic greenhouse predefined sensors design could help to improve productivity of plants. We are introducing the facility

that provides remote control to user. Then in this system using Bluetooth technology which reduce the cost of network usage

to a extent by using Bluetooth when in the range of few meters with the devices. In this system is scalable and allows

number of different devices to be added with no major

changes. It can be conclude that the system, which are

software and hardware is work properly and accurate.

CONCLUSION

Hence, the paper proposes a concept of mixing the stateof the-art generation into the rural field to show the conventional methods of irrigation to modern methods for that reason making easy effective, and cost-effective cropping. Some extent of automation is brought permitting the idea of tracking the sphere and the crop situations with in a few lengthy-distance tiers using cloud offerings. The benefits like water saving and hardwork saving are initiated the usage of sensors that work automatically as they're programmed. this concept of modernization of agriculture is easy, low-cost and operable. For this reason, the paper proposes an idea of combining the modern generation into the agricultural subject to show the conventional strategies of irrigation to trendy strategies therefore making clean productive, and within your budget cropping. A few quantity of automation is added permitting the concept of tracking the sphere and the crop situations inside some lengthy distance degrees using cloud offerings. The advantages like water saving and labour saving are initiated the usage of sensors that paintings automatically as they're programmed.

SUGGESTION FOR FUTURE USE:

For Future world, some recommendation can be made like,addition of soil sensors,PH sensors,water sensors for measurement of different parameters.

Large ability of our Indian agriculture is but untapped and we still have miles to tour in this arena of studies as we've specifics oil textures in different area so four kingdom. farmers may be benefitted through the real implementation of this projected software. real demanding situations that had been faced and which can be but to be triumph over in fact are the inter-networking of the node sin an agricultural area and in designing a user pleasant software this is without difficulty comprehensible for the farmers.

REFERENCES

[1]. J. Yick, B. Mukherjee, and D. Ghosal, "Wireless sensor network survey," Computer Networks-Elsevier, vol. 52, no. 12, pp. (2292-2330), Aug. 2008.

[2]. Shen Jin, Song Jingling, Han Qiuyan, Wang Shengde, and YangYan,"A Remote Measurement and Control System for

Greenhouse Based on GSM-SMS", IEEE 8th International Conference on Electronic Measurement and Instrument,pp.

(45-82), 2007.

[3]. Stipanicev, D.; D.; Marasovic, J., "Networked embedded greenhousemonitoring and control," in Control Applications,

2003. CCA2003.Proceedings of 2003 IEEE Conference on, vol. 2,no.,pp.(1350-1355) vol.2, (23-25) June 2003.

ACKNOWLEDGEMENT

I would like to express my special thanks of gratitude to my project guide MR. Rajesh Morey, as well as our principal DR.ALAM SHAIKH who gave us this golden opportunity to do this wonderful projecton the topic Humidity & Temperature Measurement Using IOT, which also helped us in doing a lot of research and I came to know about so many new things and I am really thankful to them. Secondly, I would like to thank my project members Sanket More, Nikhl Rajgude Prasad Deshmukh, Abhijeet Mane,who helped me alot in finishing this project within the limited time. We are making this project not only for marks to also increase my knowledge.