IJCRT.ORG ISSN : 2320-2882

INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

An International Open Access, Peer-reviewed, Refereed Journal

# IOT BASED IRRIGATION, MONITORING& CONTROLLING SYSTEM

[1]K.Usha Priya, [2]P.Manisha,[3] M. Surender kumar, [4]Mr.V.Chandra Sekhar Reddy

.TEC(IV-CSE),Students,Department Of Computer Science And Engineering[123]
Associate Proffesor,Department Of Computer Science And Engineering[4]
Ace Engineering College, Hyderabad,Telangana,India

***Abstract:*** **Abstract: This work is primarily about the improvement of current agricultural practices by using modern technologies for betterment of agriculture and modernization the traditional agriculture system. Internet of Things(IoT) plays a crowning role in smart agriculture. The project will help root level farmers to get into smart irrigation in term of agriculture. Which provide greater service in less cost in irrigation and lowest man power. Smart irrigation is an empirical concept because IoT sensors capable of providing information about their agriculture fields and making irrigation automated by Internet of Things. The feature of this paper includes monitoring temperature, humidity, pH and water level in agricultural field through sensors. The data from sensors are sent to Web server database using wireless transmission. Controlling of all these operations will be through any remote smart device or computer connected to internet and rain condition is also applied to the operations. It will be performed by interfacing sensors, IFTT app, Smart agriculture app, Wi-Fi and raspberry pi.**

**Keywords: Internet of Things, Smart irrigation, Raspberry pi, Smart Agriculture.**

## I. INTRODUCTION

The Proposed system is to eliminate the manual operation and to implement an entire automatic irrigation system. This system requires additional sensors with respect to the size of the farmer's land. By the implementation of this system, the farmers can able to know about their crops health in all seasons by login with their respective user id into the mobile app to check the status of their irrigation system. In case of power cut, the system can connect to a mini up because the system consumes only less power or once the power reconnects; the system will automatically connects to the Wi-Fi and starts operating automatically. The values from the sensors are sent to the microcontroller. The microcontroller will send this information to the cloud which is connected to the mobile app.

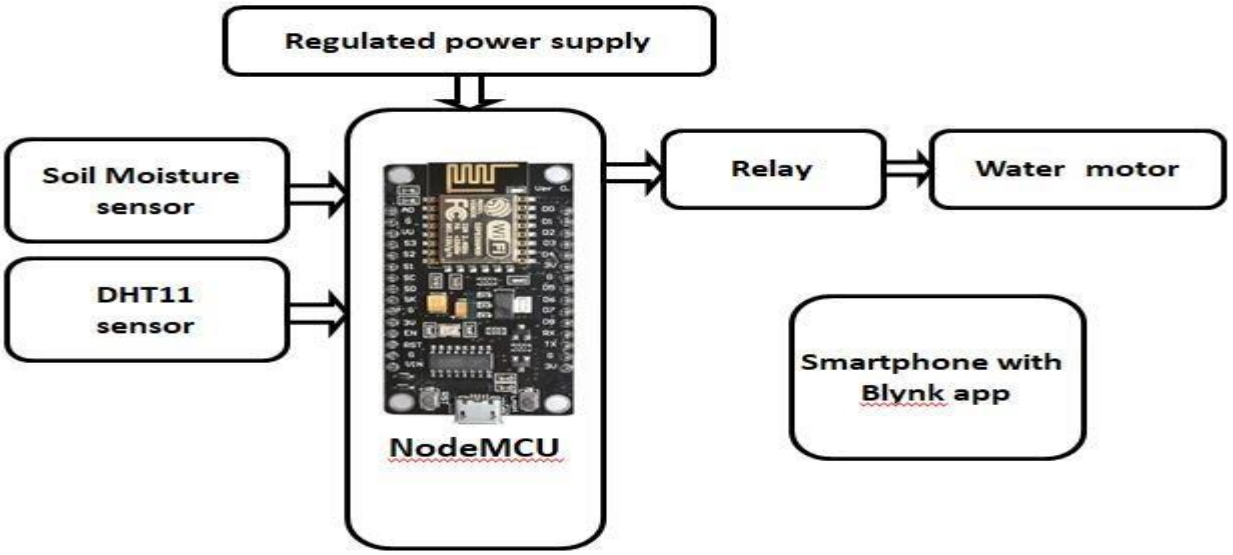
## II. LITERATURE SURVEY

The GSM module is used to control the irrigation system by sending text messages and alert messages from the module for a flood control system. Then, it is overcome by this system and it consists of a water flow level sensor which is used to measure and monitor the flow level of water in the drip irrigation pipe lines to minimize the excess of water by enhancing the plant growth. But for wheat and paddy fields always having excess of water in the field.

The system developed by [5] will not notify the required amount of fertilizer to the farmer. Mobile app is not provided for the framers for ease of use. The developed system [6] requires human power to irrigate the garden and it will not notify the farmer with proper notifications about the crops or plants. It has interfaced the sensors with the microcontroller with wireless communication. If the sensor disconnects due to power failure, again it cannot connect to the system automatically.

Deals with the smart irrigation system with microcontroller is integrated with raspberry pi to transfer the data. It also deals with the smart irrigation system with water efficiency to reduce wastage of water. Is also same but its disadvantage is fully manually controlled system. Involves a wireless short distance mesh network to collect the sensor parameters to make a decision for the irrigation system development. The mesh network consists of Xbee module which is used to transfer data in the means of radio frequency. The Xbee in module provides only a short distance network transmission since there is no proficiency for satellite network system.

## III. BLOCK DIAGRAM



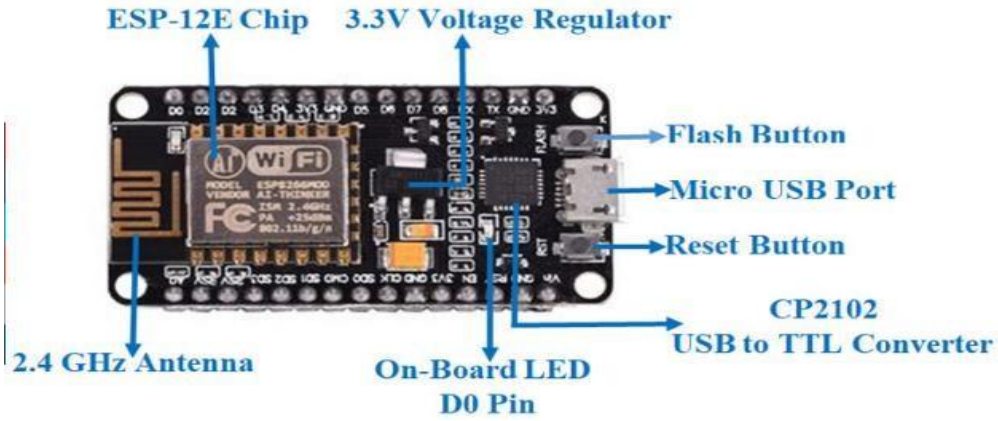

## IV. WORKING OF THE PROJECT

The main controlling device of the whole system is NodeMCU. Soil moisture sensor, DHT11 sensor, water motor along with relay and LED are fed to the Node MCU. The Node MCU continuously read the data from sensors and takes the necessary action accordingly. And upload the sensor data into the blynk app so user can check the sensor data in app and also based on that sensor data user control the motor from any where in the world through app using IOT technology . To perform this task, nodeMCU is programmed using embedded C language and Software is Arduino IDE.

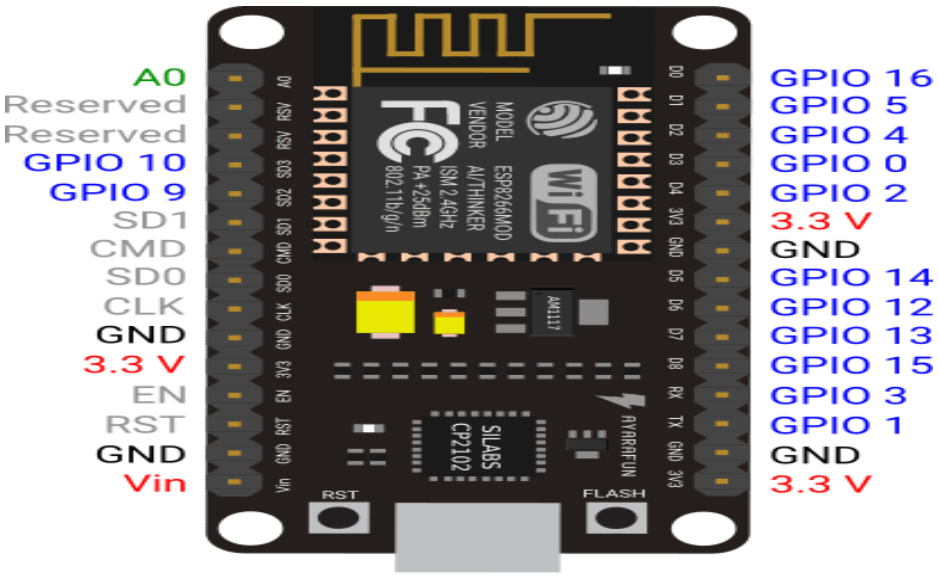
1. NodeMCU
2. DHT11(temperature sensor)
3. YL-69(soil moisture sensor)
4. Water pump(9v)
5. Motor Driver
6. Battery(9v)
7. Led(5v)

**NodeMCU**

The **NodeMCU** (Node **MicroController** Unit) is an open source software and hardware development environment that is built around a very inexpensive System-on-a-Chip (SoC) called the ESP8266



**Pin out of node MCU**

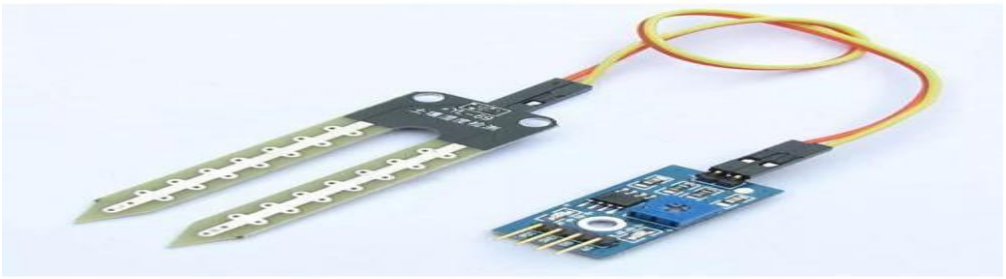



**NodeMCU ESP8266 Specifications & Features •**

NodeMCU ESP8266 Specifications & Features

- Microcontroller: Tensilica 32-bit RISC CPU Xtensa LX106
- Operating Voltage: 3.3V
- Input Voltage: 7-12V
- Digital I/O Pins (DIO): 16
- Analog Input Pins (ADC): 1
- UARTs: 1
- SPIs: 1
- I2Cs: 1
- Flash Memory: 4 MB
- SRAM: 64 KB
- Clock Speed: 80 MHz
- USB-TTL based on CP2102 is included onboard, Enabling Plug n Play
- PCB Antenna
- Small Sized module to fit smartly inside your IoT projects

**Soil moisture sensor**

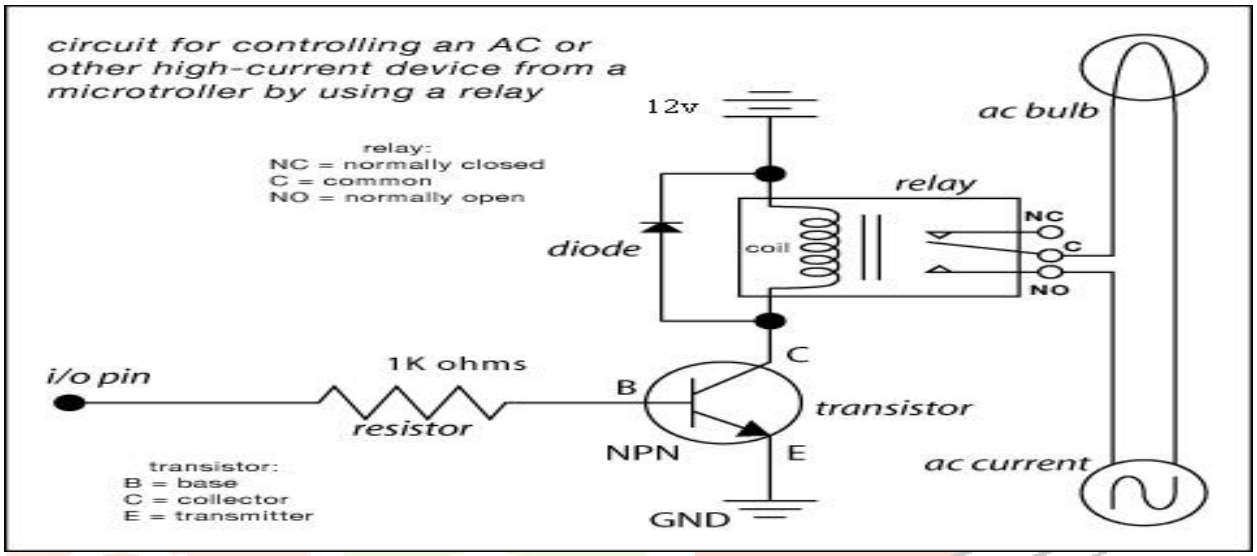


**Working of Sensor**

- The soil moisture sensor consists of two probes which are used to measure the volumetric content of water. The two probes allow the current to pass through the soil and then it gets the resistance value to measure the moisture value.
- When there is more water, the soil will conduct more electricity which means that there will be less resistance. Therefore, the moisture level will be higher. Dry soil conducts electricity poorly, so when there will be less water, then the soil will conduct less electricity which means that there will be more resistance. Therefore, the moisture level will be lower.
- This sensor can be connected in two modes; Analog mode and digital mode. First, we will connect it in Analog mode and then we will use it in Digital mode.

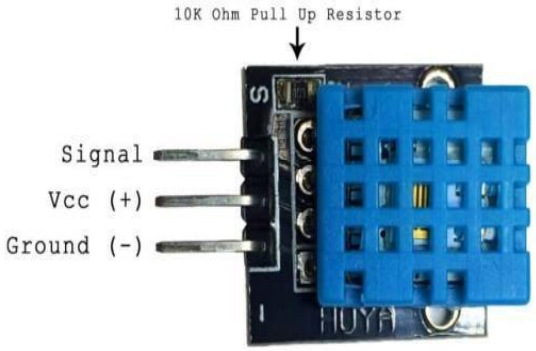
**Relay**

- Relay is an electromagnetic switch. . It consists of a coil of wire surrounding a soft iron core, an iron yoke, which provides a low reluctance path for magnetic flux, a movable iron armature, and a set, or sets, of contacts; two in the relay pictured. The armature is hinged to the yoke and mechanically linked to a moving contact or contacts.
- When an electric current is passed through the coil, the resulting magnetic field attracts the armature and the consequent movement of the movable contact or contacts either makes or breaks a connection with a fixed contact. Relay is an electromagnetic switch. . It consists of a coil of wire surrounding a soft iron core, an iron yoke, which provides a low reluctance path for magnetic flux, a movable iron armature, and a set, or sets, of contacts; two in the relay pictured. The armature is hinged to the yoke and mechanically linked to a moving contact or contacts.
- When an electric current is passed through the coil, the resulting magnetic field attracts the armature and the consequent movement of the movable contact or contacts either makes or breaks a connection with a fixed contact**.**




**Humidity Sensor DHT11**

A humidity sensor senses, measures and regularly reports the relative humidity in the air. It measures both moisture and air temperature. Relative humidity, expressed as a percent, is the ratio of actual moisture in the air to the highest amount of moisture air at that temperature can hold. The warmer the air is, the more moisture it can hold, so relative humidity changes with fluctuations in temperature.




- Relative humidity
- Resolution: 16Bit
- Repeatability: ±1% RH
- Interchangeability: fully interchangeable

- Response time: 1 / e (63%) of 25℃ 6s 1m / s air 6s
- Temperature
- Resolution: 16Bit
- Range: At 25℃ ±2℃
- Electrical Characteristics
- Power supply: DC 3.5～5.5V
- Supply Current: measurement 0.3mA standby 60μ A
- Sampling period: more than 2 seconds
- Pin Description
- 1, the VDD power supply 3.5～5.5V DC
- 2 DATA serial data, a single bus
- 3, NC, empty pin
- 4, GND ground, the negative power

## V. CONCLUSION

The device provides an automated solution to continuously monitor the moisture availability in the paddy fields and turns OFF the motor automatically .It reduces the burden to human beings and being a device the OFF timings are strictly implemented which is going to be the important in cultivation.

## VI. ACKNOWLEDGEMENT

We would like to thank our guides Associate Prof. Mr .V. Chendra Sekar Reddy andAssociate Prof. Mrs. Soppari Kavitha for their continuous support and guidance. Due to their guidance, we were able to complete our project successfully. Also, we are extremely grateful to Dr. M. V. VIJAYA SARADHI, Head of the Department of Computer Science and Engineering, Ace Engineering College for his support and invaluable time.

## VII. FUTURE SCOPE OF PROJECT

1.By adding solar panel we can save the electrical energy.
2.We can add GSM module we can get the alert message if any abnormal condition.
3.We can add Raspberry pi processor and some sensors like NPK sensor, PH sensor, So the user can check his field every time and keep the field safe.

## VIII. REFERANCES

1.N. Putjaika, S. Phusae, A. Chen-Im, P. Phunchongharn and K. Akkarajitsakul, "A control system in an intelligent farming by using arduino technology", *2016 Fifth ICT International Student Project Conference (ICT-ISPC)*, pp. 53-56, 2016.
2.A. Abdullah, S. A. Enazi and I. Damaj, "AgriSys: A smart and ubiquitous controlled-environment agriculture system", *2016 3rd MEC International Conference on Big Data and Smart City (ICBDSC)*, pp. 1-6, 2016.
3.P. B. Chikankar, D. Mehetre and S. Das, "An automatic irrigation system using ZigBee in wireless sensor network", *2015 International Conference on Pervasive Computing (ICPC)*, pp. 1-5, 2015.
4.J. John, V. S. Palaparthy, S. Sarik, M. S. Baghini and G. S. Kasbekar, "Design and implementation of a soil moisture wireless sensor network", *2015 Twenty First National Conference on Communications (NCC)*, pp. 1-6, 2015.
5. K. Ahmed and M. Gregory, "Integrating Wireless Sensor Networks with Cloud Computing", *2011 Seventh International Conference on Mobile Ad-hoc and Sensor Networks*, pp. 364-366, 2011.