IOT BASED SMART IRRIGATION SYSTEM

Akanksha P.Pandit[1], Shubham A. Chavan[2], Pravin V. Bdgar[3], Vishal R. Sanap[4] , Monal D. Pawar[5]

[1234]*UG Students, Department of Electrical Engineering, Amrutvahini College of Engineering, Sangamner, Maharashtra, India.*

[5]*Assistant Professor, Department of Electrical Engineering, Amrutvahini College of Engineering, Sangamner, Maharashtra, India.*

ABSTRACT

Agriculture is a primary occupations in our country 17% of our countries GDP is based on agricultural and around 50% of populations engaged in agriculture. this project has been made keeping the farmer as well as the environment of country. IOT is a shared network of object where these object interact through internet. One of the important applications of IOT is smart agricultural. Smart agriculture reduced westage of water, fertilizers and increase the crop yield.IOT helps farmers to improve many things by providing air temperature, humidity, moisture and soil temperature by using various sensors. Which is sent on web through WiFi module ESP8266 in which microcontroller MEGA328P is used. And PIR sensor is for animal instruction.

Keywords*: IOT, microcontroller, GDP, sensors, WiFi.*

1. INTRODUCTION

Since long time ago human beings has been farming according to need. Agriculture depends on various factors like climate, soil, temperature, moisture, and the increasing population therefore now we need to improve the technology for agriculture the world is trending towards new technologies and implementation in the field of agriculture too. Many researches are done in this field. till now only human being are connected to each other by internet but now by using IOT in our project we can use it for improve the techniques of farming, there are still some problems are faced in the agricultural field such as running of crops by animals, water logging and unawareness of soil and air.

Our project aims to solve this problems by improving the efficiency of the farmers as well as improving the quality of the crop and field. In addition our project is design for IOT based monitoring system to analyze crop, environment and the methode to improve the efficiency of the decision making by analyzing the output static

1.1 LITERATURE SURVEY

In our country many farmers uses manual method of checking the various parameters which is the oldest method for checking parameters like moisture in air and soil, water logging, temperature, humidity etc. in this method the farmers themselves verify all the parameters and calculate the readings but now this is the time for improvement in the technology related to agriculture using the technology in the field of agriculture plays an important role in increasing the benefits and it can overcome the problems as well as reducing the efforts it helps to increase the agriculture yield it is done by the whole computing system from sensors to tools that observe data from the field and accurately feed the data into the system through wireless communication which is used to give the accurate data of soil, moisture, humidity, temperature, etc. from various locations of the field it helps to farm controller to take the

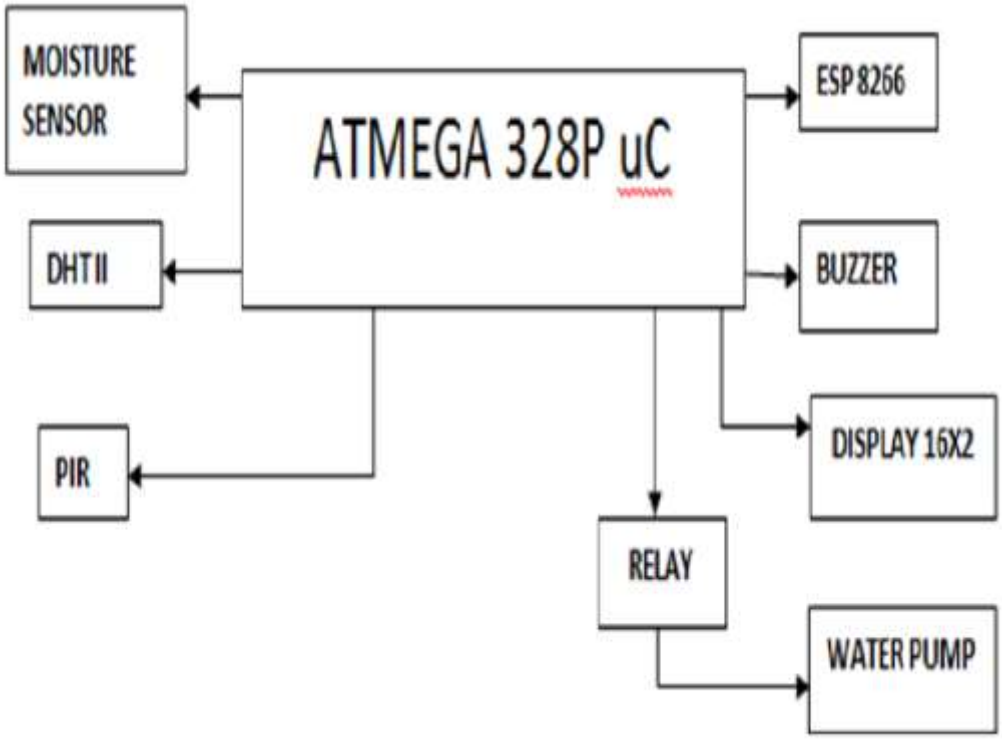
various decisions whether the irrigation is enabled or not, it is useful for saving the water in large amount. And we can take good crop by using appropriate amount of waterby using the wireless IOT system.

1.2 SYSTEM OVERVIEW

These following components are used

- Moisture sensor
- DHT-2
- PIR
- Esp8266
- Buzzer
- Display 16*2
- Water pump

- **Block Diagram**



2. HARDWEAR USED

- MOISTURE SENSOR
  This is the moisture sensor which is used for testing the moisture of the soil when the soilis having water shortage module out put is high level or eles it is low. Soil moisture content may be determined via its effect on dielectric constant by measuring the capacitance between two electrodes implanted in the soil. Where the soil moisture is predominantly in the form of free water. the dielectric constant is directly

proportional to the moisture content. The readout from the probe is not linear with water content and is influenced by soil type and soil temperature. Therefore, careful calibration is required.

Fig -1: Moisture Sensor

- DHT-11

DHT11 Temperature & Humidity Sensor features a temperature & humidity sensor complex with a calibrated digital signal output. This sensor includes a resistive-type humidity measurement component and an NTC temperature measurement component The calibration coefficients are stored as programmes in the OTP memory, which are used by the sensor's internal signal detecting process. From this up-to-20 meter signal transmission is possible.

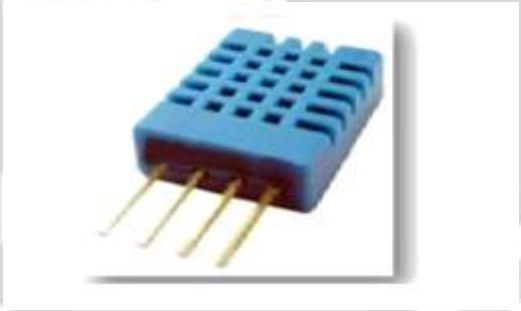


Fig -2: DHT-11

- BUZZER

The buzzer is used to worn the farmer for the work ,also we are able to use it as a security for the system

Fig -3: Buzzer

- DISPLAY

The display used in the project is 16*2 display. Which is used to show the various numerical data on the screen .

Fig -4: Display

- WATER PUMP

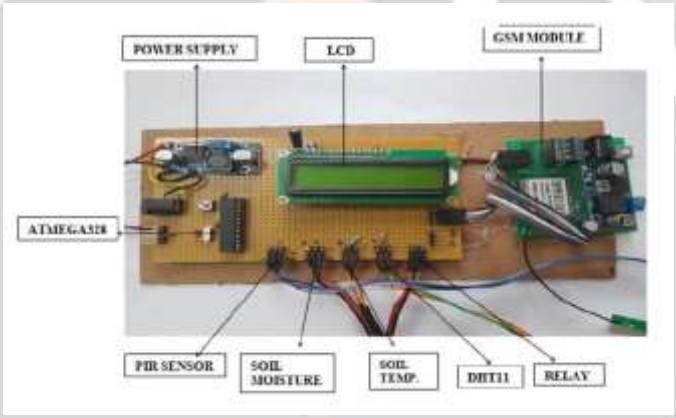
A submersible pump (or sub pump, electric submersible pump) is a device which has a sealed motor close-coupled to the pump body. That is for water lifting for the agricultural field.

- GSM MODULE

  GSM is an international is stands for Global System for mobile communication. GPRS is used for transmitting data in the GSM network.

- PIR SENSOR

  PIR sensor is another name for passive infrared, pyroelectric or IR motion sensor, since it senses an intrusion based on the IR levels. When something warm like an animal passes in front of the slots then the first slot detects some change in IR level and creates a positive differential change between the two slots. These changing levels of IR are detected by the PIR.

- 

SOFTWARE USED:

a)Python:
Python is an interpreted high-level programming language for general-purpose programming. Created by Guido van Rossum and first released in 1991, Python has a design philosophy that emphasizes code readability, and a syntax that allows programmers to express concepts in fewer lines of code,[25][26] notably using significant whitespace. It provides constructs that enable clear programming on both small and large scales.

b) ThingSpeak:

ThingSpeak is an open source Internet of Things application and API to store and retrieve data from things using the HTTP protocol over the Internet or via a Local Area Network. ThingSpeak enables the creation of sensor logging applications, location tracking applications, and a social network of things with status updates.
ThingSpeak was launched as a service in support of IoT applications.

2. Graph Plots: The outputs of sensors are shown below:

Chart -1:Temperature Measurement

Chart-2: Humidity Measurement

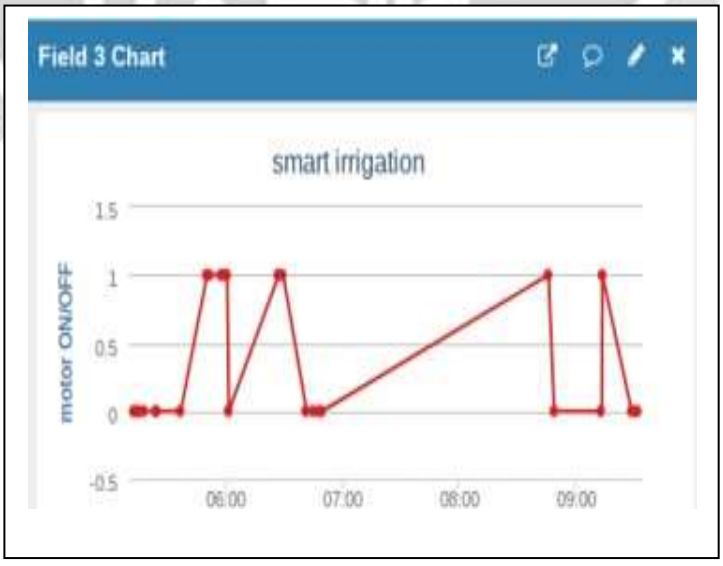


Chart-3: Moisture Measurement

4. CONCLUSIONS

All observations and experimental tests prove that this project is a complete solution to the field activities irrigation problems. Implementation of such a system in the field can definitely help to improve the yield of the crops and aids to manage the water resources effectively reducing the wastage.

5. ACKNOWLEDGEMENT

We express our sincere thankfulness to our Project Guide Mrs. T. VINEELA for her successful guidance to our project. Without the help it would be a tough job for us to accomplish this task. We thank our guide for her consistent guidance, encouragement and motivation throughout our period of work. We also thank our Head of the Department (ECE) Dr. K.GIRIBABU for providing us all the necessary facilities.

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