



e-ISSN: 2319-8753 | p-ISSN: 2347-6710

# IJIRSET

International Journal of Innovative Research in  
**SCIENCE | ENGINEERING | TECHNOLOGY**



# INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN SCIENCE | ENGINEERING | TECHNOLOGY

Volume 11, Issue 5, May 2022

**ISSN** INTERNATIONAL  
STANDARD  
SERIAL  
NUMBER  
INDIA

Impact Factor: 8.118

# IoT for Drip Irrigation

**Prof. Sogarwal A. M.<sup>1</sup>, Toshniwal S.S.<sup>2</sup>, Jadhav Abhijit Ramesh<sup>3</sup>, Kuche Vikas Babulal<sup>4</sup>,  
Shinde Vaibhav Ashok<sup>5</sup>, Kasbe Sandesh Sahebrao<sup>6</sup>, Tawde Ghanasham Manohar<sup>7</sup>,  
Pathan Mujahidkhan Murtujakhan<sup>8</sup>**

Lecturer, Department of Civil Engineering, MGM's Polytechnic College, Aurangabad, Maharashtra,  
India<sup>1,2</sup>

Diploma Student, Department of Civil Engineering, MGM's Polytechnic College, Aurangabad,  
Maharashtra, India<sup>3,4,5,6,7,8</sup>

**ABSTRACT:** Internet of things (IOT) has become very popular and it is growing rapidly in the field of communication. This paper describes the control and monitor of drip irrigation process using IOT and Image processing techniques. The automated system includes a database to analyze the water requirement of plant. The database contains a predefined soil moisture values and it is editable according to the soil type of the place where we implement this system. Different types of soils will have different moisture values and moisture values will also change in accordance with the climate. Our proposed system uses a soil moisture sensor to take the soil moisture reading from the field in real time to water them in an automated way by switching the drip service ON/OFF using a website. India's major income source is depending on agriculture therefore the development of agriculture is important. In today also most of the irrigation systems are operated manually. The available traditional techniques are like drip irrigation, sprinkler irrigation etc. By the use of Drip Irrigation we can save water and fertilizer provided to the crops.

**KEYWORDS:** : IoT, Environment, water consumption less.

## I. INTRODUCTION

The internet of things (iot) is the network of physical objects devices, vehicles, buildings and other items embedded with electronics, software, sensors, and network connectivity that enables these objects to collect and exchange data. The lot allows objects to be sensed and controlled remotely across existing network infrastructure, creating opportunities for more direct integration of the physical world into computer based systems, and resulting in improved efficiency, accuracy and economic benefit, when iot is augmented with sensors and actuators, the technology becomes an instance of the more general class of cyber physical systems, which also encompasses technologies such as smart grids, smart homes, intelligent transportation and smart cities. The applications of internet of things in agriculture target conventional farming operations to meet the increasing demands and decrease production losses. Iot in agriculture uses robots, drones, remote sensors, and computer imaging combined with continuously progressing machine learning and analytical tools for monitoring crops, surveying, and mapping the fields, and provide data to farmers for rational farm management plans to save both time and money

## II. RELATED WORK

The Whole Lot Ecosystem Is Made Up Of Sensors That Can Detect Real-Time Weather. Conditions Such As Humidity, Rainfall, Temperature And More Very Accurately. To Make Our Greenhouses Smart, The Lot System Has Enabled Weather Stations To Automatically Adjust The Climate Conditions According To A Particular Set Of Instructions. The Adoption Of The Lot System In Greenhouses Has Eliminated Human Intervention, Thus Making The Entire Procedure Cost-Effective And Increasing Accuracy At The Same Time.

- Iot Solutions Are Focused On Optimizing The Use Of Resources Like Water, Energy, And Land.
- Precision Farming Using The Lot System Relies On The Data Collected From Diverse Sensors In.

- The Field Which Helps Farmers Accurately Allocate Just Enough Resources To Within One Plant. Lot In The Agriculture Industry Has Helped The Farmers To Keep The Quality Of Crops And
  - Fertility Of The Land, Thus Enhancing The Product Volume And Quality. lot System Solutions In Agriculture
- Introduce Automation, For Example, Demand-Based.
- Irrigation, Fertilizing And Robot Harvesting

### III.METHODOLOGY

IoT has brought huge benefits such as efficient use of water, optimization of inputs and many more. IoT based smart farming Improves the entire agriculture by monitoring the field in real-time. With the help of sensors and interconnectivity, the IoT in agriculture has not only saved the time of the farmers but has also reduced the extravagant use of resources such as water and electricity.

#### Flow Chart

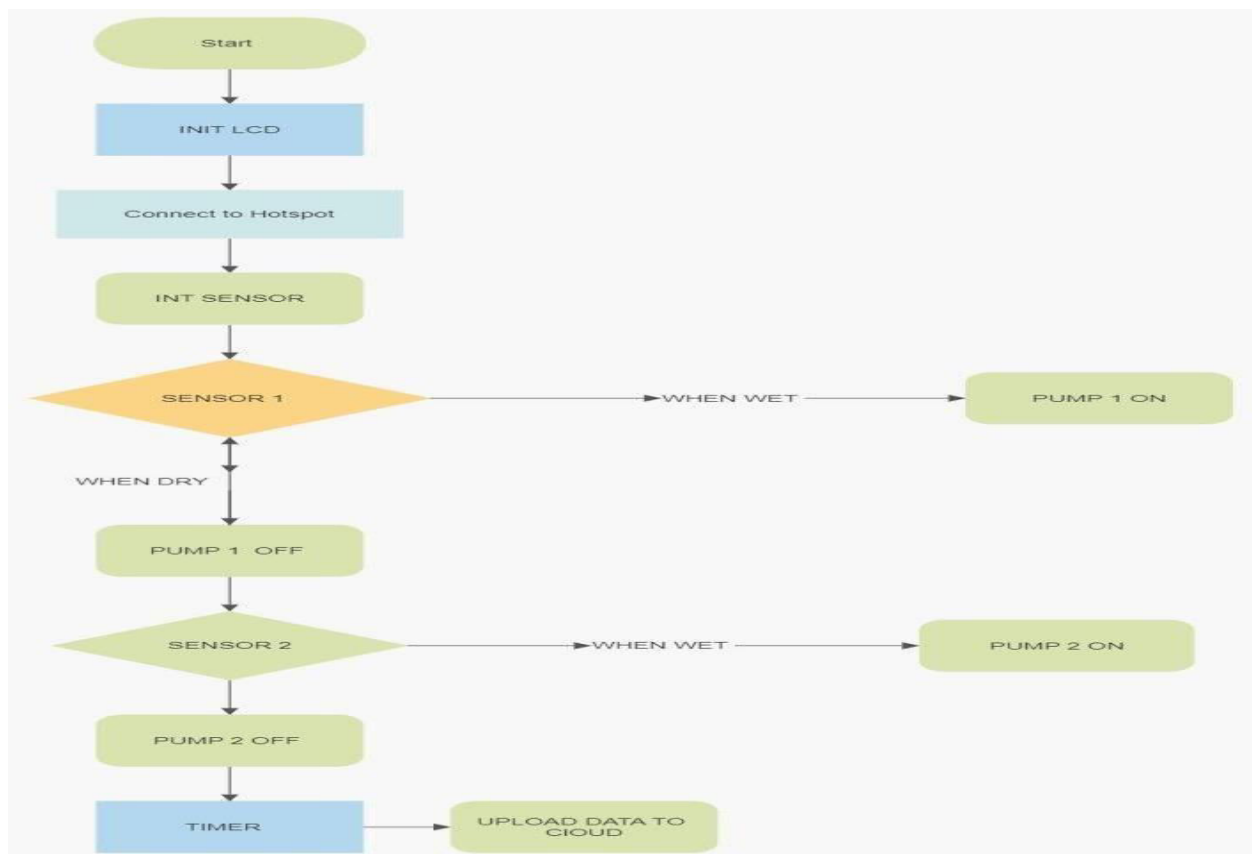


Fig.1 Flow Chart

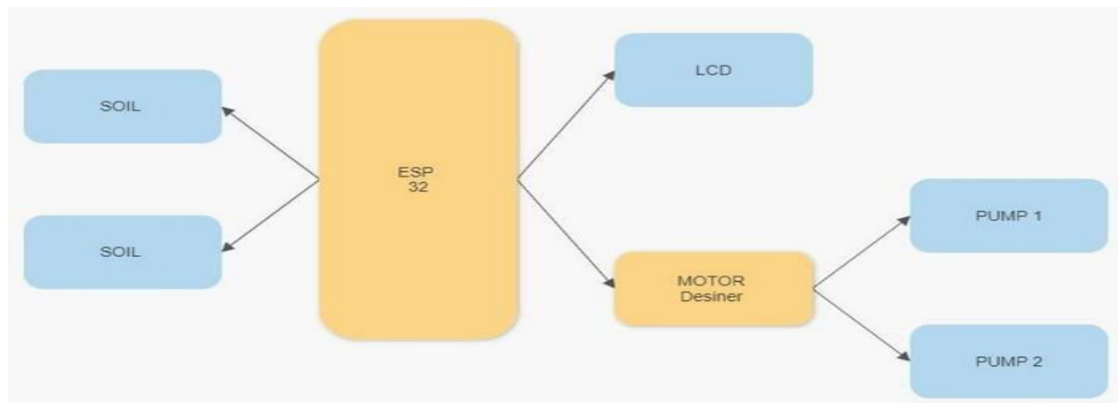


Fig.2 Sensor Flow

#### IV.HARDWARE DETAILS

##### SOIL MOISTURE SENSOR:

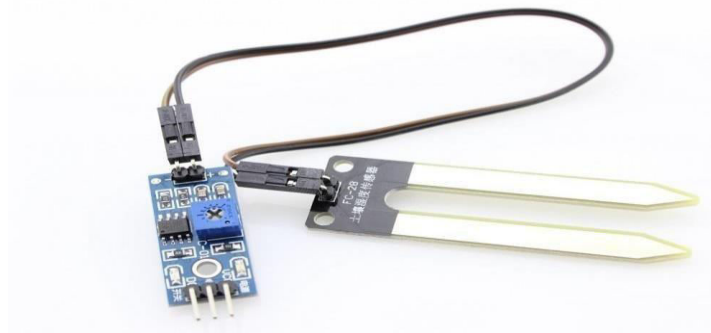


Fig.3 Soil Moisture Sensor

The soil moisture sensor (SMS) is a sensor connected to an irrigation system controller that measures soil moisture content in the active root zone before each scheduled irrigation event and bypasses the cycle if soil moisture is above a user- defined set point. Function of soil moisture sensor. Soil moisture sensors measure the water content in the soil and can be used to estimate the amount of stored water in the soil horizon.

##### MICRO CONTROLLER ESP 32:



Fig.4 ESP 32

ESP32 can perform as a complete standalone system or as a slave device to a host MCU, reducing communication stack overhead on the main application processor. ESP32 can interface with other systems to provide Wi-Fi and Bluetooth functionality through its SPI / SDIO or I2C / UART interfaces. ESP32-S3 has a complete Wi-Fi



subsystem and a Bluetooth LE subsystem, State-of-the-art power and RF performance. S3 provides a rich set of peripheral interfaces, and supports ultra-low-power applications. Different security features allow the device to meet stringent security requirements.

#### 12C LCD:



Fig.5 12C LCD

The I2C 16x2 Arduino LCD Screen is using an I2C communication interface. It is able to display 16x2 characters on 2 lines, white characters on blue background. This display overcomes the drawback of LCD 1602 Parallel LCD Display in which you'll waste about 8 Pins on your Arduino for the display to get working.

#### DC PUMP:

#### RELAY MODULES:



Fig.6 DC Pump

DC motor pump is used for pumping the water

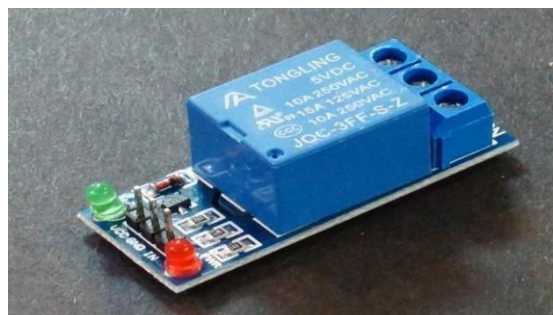


Fig.7 Relay Modules

A power relay module is an electrical switch that is operated by an electromagnet. The electromagnet is activated by a separate low-power signal from a micro controller. When activated, the electromagnet pulls to either open or close an electrical circuit.

## TRANSFORMER:



Fig.8 Transformer

A transformer is a device that transfers electric energy from one alternating-current circuit to one or more other circuits, either increasing (stepping up) or reducing (stepping down) the voltage.

## L293D Motor Driver Module:



Fig.9 L239D Motor Driver Module

L293d is a basic motor driver integrated chip (ic) that enables us to drive a dc motor in either direction and also control the speed of the motor.

## V.EXPERIMENTAL RESULTS

Controlling the module using thingspeak.com:

ThingSpeak is an IoT analytics platform service that allows you to aggregate, visualize, and analyse live data streams in the cloud. You can send data to ThingSpeak from your devices, create instant visualization of live data, and send alerts. we will see the all water flow discharge from pump . this flow chart show the water flow and real time and date show in this chart we see the left side vertical line show moisture content number and horizontal line show date and time.

### Channel Stats

Created: 22.days.ago  
Last entry: 10.days.ago  
Entries: 84

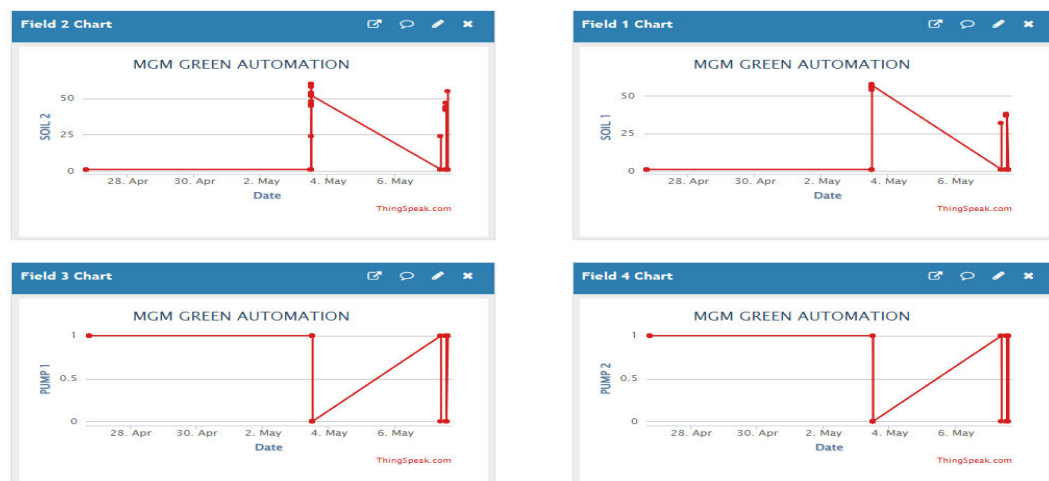


Fig.10 Observation Chart

This result we can see Irrigation becomes easy, accurate and practical with the same soil sample impossible. Because of the idea above shared and can be implemented in agricultural difficulties of accurately measuring dry soil and water fields in future to promote agriculture to next level. The Volumes, volumetric water contents are not usually output from moisture sensor and level system plays major determined directly. Role in producing the output. the smart irrigation system was tested on a garden plant, In the Arduino code, the moisture range was set as 30%-100%. Providing optimum condition for plant growth. Moreover, this system proves to be cost effective and proficient in conserving water and reducing its wastage. Shows the moisture content being displayed on the monitor, this display of moisture takes place at regular intervals depending on the delay time mentioned in the program source code represents the watering of soil when the moisture content is below the threshold value. This irrigation or water flow is controlled by the relay module which performs the switching operations ON and OFF

## VI.CONCLUSION

Automated drip irrigation is the most beneficial approach for the farmers. this system reduces the extra manpower to the farmer for his farm work like supplying water to plants, safeguard the crop from intruders. the smart irrigation system is suitable and cost effective for advance water resources for agricultural production. the system would provide feedback control system which will monitor and control all the activities of plant growth and irrigation system efficiently. iot enabled agriculture has helped implement modern technological solutions to time tested knowledge. this has helped bridge the gap between production and quality and quantity yield. data ingested by obtaining and importing information from the multiple sensors for real time use or storage in a database ensures swift action and less damage to the crops. with seamless end to end intelligent operations and improved business process execution, produce gets processed faster and the smart irrigation system is an iot based device which is capable of automating the irrigation process by analyzing the moisture of soil and the climate condition (like raining).also the data of sensors will be displayed in graphical form on think speak cloud page.

## REFERENCES

- [1] vinoth kumar, r. ramasamy, s. janarthanan, m. vasim babu "implementation of iot in smart irrigation system using arduino processor", international journal of civil engineering and technology. october 2017
- [2].gaikwad tararani1, gandule shital2, korabu sofiya3 , pawar gouri 4 ,prof.vasekar s.r. 5 1,2,3,4student, department of computer science and engineering, smsmpitr, akulj, maharashtra, india, 5assistant professor, department of computer science and engineering, smsmpitr, akulj, maharashtra, india
- [3].sensor based automated irrigation system with iot: a technical review karan kansara 1 , vishal zaveri1 , shreyans shah1 , sandip delwadkar2 , kaushal jani3 1 pg student, babu madhav institute of technology, uka tarsadia university, bardoli, gujarat, india 2 assistant professor, babu madhav institute of information technology, bardoli, gujarat, india 3 teaching assistant, babu madhav institute of information technology, bardoli, gujarat, india
- [4].smart irrigation system using iot m gayathri1 , d arun shunmugam2 , a ishwariya3 assistant professor1,3, associate professor2 department of computer science and engineering, psr engineering college.
- [5].smart irrigation system using iot \*meghana gupta arakere, avik seal and tejomurthula bhuvana teja srm institute of science andtech.
- [6]. Ban Alomar, Azmi Alazzam "A Smart Irrigation System Using iot and Fuzzy Logic Controller" in fifth HCT information technology trends (ITT 2018) Dubai, UAE , Nov. 28-29, 2018
- [7]. Ercan Avsar, Kurtulus Bulus, Mehmet Ali Saridas, Burcak Kapur "Developement of a Cloud based Automatic Irrigation System: A case study of Strawberry Cultivation" in 2018 7th International Conference on Modern circuits and systems Technologies(ICMCST)
- [8]. Hiteshkumar J. Lad, Vibhuthikumar G. Joshi " Irrigation Control System using Distributed Embedded System" in
- [9]. Meghana Gupta Arakere, Avik Seal and Tejomurthula Bhuvana Teja , "SMART IRRIGATION SYSTEM USING IOT", Asian Journal of Science and Technology, June 2019.
- [10]. Tyson Baptist Dcunha, "AUTOMATED IRRIGATION SYSTEM USING IOT", International Journal of Engineering Research and Technology (IJERT), May 2019.



**INNO SPACE**  
SJIF Scientific Journal Impact Factor  
**Impact Factor: 8.118**



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STANDARD  
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