Asian Journal of Convergence in Technology **Volume IV Issue III**
ISSN NO: 2350-1146 I.F-5.11

SMART DRIP IRRIGATION USING CLOUD TECHNOLOGY AND MOBILE APP

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Abstract **-- In India agriculture is the main occupation of the people. Our people completely depended on the agricultural harvesting. In dry areas or in case of inadequate rainfall, irrigation becomes difficult. so, todays our farmers are using drip irrigation to save water. In drip irrigation the farmers must switch on the drip based on timings manually on his assumption of plants moisture level. In this paper we are proposing a smart drip irrigation which is based on Controller. We are using moisture sensor to sense the moisture level of the plants. We will collect the moisture reading from sensor to "ThingSpeak" cloud, where we are calculate the average value of sensors and we will compare to the threshold value of moisture. If the value is greater than threshold value the notification will be sent to the mobile app denoting farmer to switch on the pump of that line. If farmers switch on the pump the pump will be opened in the farm by which water will flow to plants. The moisture level reduces**.

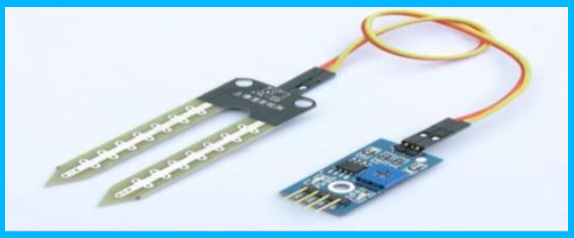
Index Terms**-- IOT, Sensor based irrigation, soil moisture sensor, drip irrigation, automation control**

INTRODUCTION

Ordinary drip irrigation: Drip irrigation is a type of micro-irrigation that has the potential to save water and nutrients by allowing water to drip slowly to the roots of plants, either from above the soil surface or buried below the surface. The goal is to place water directly into the root zone and minimize evaporation.

Smart drip irrigation: Smart irrigation systems tailor watering schedules and run times automatically to meet specific landscape needs. These controllers significantly improve outdoor water use efficiencies.

Soil Moisture Sensors: Soil moisture sensor-based smart irrigation controllers use one of several well-established technologies to measure soil moisture content. When buried in the root zone of turf, trees or shrubs, the sensors accurately determine the moisture level in the soil and transmit this reading to the controller.at Technical Work Preparation.



Soil moisture sensor

Internet of Thing (IoT): The Internet of Thing (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.

Internet of Things represents a general concept for the ability of network devices to sense and collect data from the world around us, and then share that data across the Internet where it can be processed and utilized for various interesting purposes.

IoT is defined as network of physical devices which may include things like smartphones, vehicles, home appliances, and more, that connect each other's for exchange data with computers.

Cloud Computing: cloud computing is the delivery of computing services—servers, storage, databases, networking, software, analytics and more—over the Internet ("the cloud").

Cloud computing is an information technology (IT) paradigm that enables ubiquitous access to shared pools of configurable system resources and higher-level services that can be rapidly provisioned with minimal management effort, often over the Internet.

Mobile Application Development: A mobile app is a computer program designed to run on a mobile device such as a phone/tablet or watch. Mobile applications often stand in contrast to desktop applications that run on desktop computers, and with web applications which run in mobile web browsers rather than directly on the mobile device.

Mobile application development requires use of specialized integrated development environments. Mobile apps are first tested within the development environment using emulators and later subjected to field testing. Emulators provide an inexpensive way to test applications on mobile phones to which developers may not have physical access..

II. LITERATURE SURVEY

In this system, soil dampness sensor set in root zone of plant and portal unit handles the data about sensor and convey information to the cloud. One calculation was created for measure edge estimations of soil dampness sensor that was modified into a microcontroller to control water amount. The automatic system was tried and contrasted and conventional watering framework [1].

In this system design a model of automatic irrigation system which is based on Controller and solar power was used only for source of power supply. Various sensors are placed in grapevine. Sensors sense water level regularly and give the information to farmer through cellular phone. Farmer controls the motor using cellular phone without going to field [2].

Irrigate the field automatically when it is dry. This is done using a moisture sensor. A conductive sensor is placed into the soil which senses the moisture level of the soil and sends feedback to the microcontroller if the soil is dry which eventually activates the relay and the pump to irrigate the soil. Controlling amount of water would be an advantage since it encourages energy saving and reduces the possibility of over watering a plant.[3]

It is described that IOT is the interconnection between devices and computer system. Here semantic means all the things that can be connected to IOT framework so the data of all devices should be stored on web server. IOT has become an important area for cloud vendors, as the demand for large data storage and analysis leads to significant investments into cloud infrastructure semantic.[4]

This paper is about the application and benefit of IOT in agriculture. Applications in agriculture include soil and plant monitoring, greenhouse environment monitoring and control systems. The main aim of building IOT in agriculture was to enable the farmers know different information about the farm crops diseases, method of agriculture, crop and water security, techniques tools and tips for farming. The benefit of IOT is that the farmers can access the information about

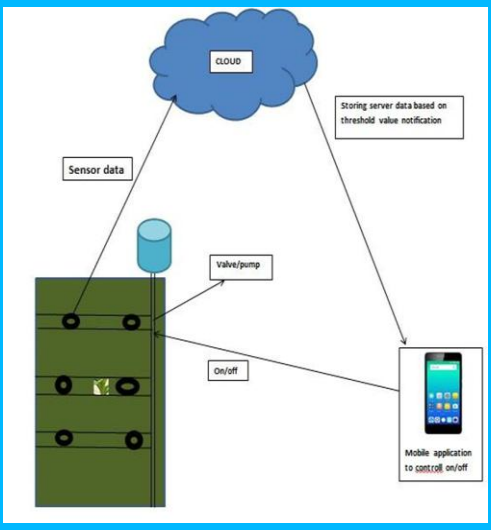
their crops diseases and all other things using mobile phone at their place. [5]

III. PROPOSED SYSTEM

The proposed framework is a microcontroller based plan which controls the water supply. Soil dampness sensor measure the volumetric water content in soil by utilizing property of soil, for example, electrical opposition, dielectric consistent, or collaboration with neutrons, as an intermediary for the dampness content. Dampness, temperature and moistness readings are ceaselessly checked and values are sent to the versatile application through Wi-Fi module. In the event that the dampness level is past predefined limit an alert will be sent to the user. On the off chance that the client needs to control the motor remotely it is conceivable by proceeding and OFF catch in the portable application. The proposed framework is intended to enhance water utilize proficiency, can also acknowledge water saving..

IV. WORKING

The automatic irrigation system was designed to continuously sense the moisture level of the soil. The system responds appropriately by watering the soil with the exact required amount of water and then shuts down the water supply when the required level of soil moisture is achieved. At first the water level is measured by the soil moisture sensor, the measured values will be sent to the database which is present in cloud. As we created an android app which will access the database where it shows the measured values, as per the value farmer will decide to switch on/off the valve.



V. IMPLEMENTATION

MPLAB IDE

The compiler is utilized for gadgets and records created by Microchip. The compiler causes you assemble your code that you have composed for the microchip gadgets. MPLAB IDE is a product program that keeps running on a PC to create application for Microchip microcontrollers. It is called an Integrated Development Environment, or IDE, since it gives a solitary coordinated environment to create code for implanted microcontrollers. The PIC micro MCU has program memory for the firmware, or coded guidelines, to run a program. It likewise has file, register memory for capacity of factors that the program will require for calculation or brief stockpiling. It additionally has various fringe gadget circuits on a similar chip. Some fringe gadgets are called I/O ports. I/O ports are sticks on the microcontroller that can be driven high or low to send signals, flicker, light, drive speakers and pretty much anything that can be sent through a wire. Frequently these pins are bidirectional and can likewise be designed as data sources enabling the program to react to an outer change, sensor or to speak with some outside device. . Different variables may incorporate the power devoured by the microcontroller and it's informing factor, that is the size and attributes of the physical bundle that must dwell on the objective plan. An advancement framework for inserted controllers is an

arrangement of projects running on a work area PC to help compose, alter, troubleshoot and program code and the insight of installed framework applications into a microcontroller. MPLAB IDE keeps running on a PC and contains every one of the segments expected to plan and send inserted frameworks applications.

SERIAL BOOTLOADER

The Serial Bootloader gives a well orders strategy to accumulate a task for the serial bootloader. This archive will likewise portray how to utilize a scrambled variant of the Serial Bootloader - The encoded bootloader. Note that there is likewise an illustration serial bootloader designed task included with the HostTestRelease. Serial bootloading is component that empowers a cc254x gadget to stack into streak an inserted programming picture from a host processor through a serial interface.

The Serial BootLoader is used to begin serial boot stacking or to hop to the downloaded picture region. This choice is made in light of the legitimacy of the downloaded picture. In the event the picture in the downloaded picture territory isn't a substantial picture, the serial bootloader begins in serial boot stacking mode and sits tight for summons from have processor. On the off chance that the picture in the downloaded picture territory is substantial, the bootloader hops to the legitimate picture segment to download, peruses back the downloaded picture zone area to confirm the composed picture was composed accurately, and approves the utilization of the picture, and so forth.

Serial boot stacking order bundles take after an indistinguishable organization from consistent system processor interface orders. Notwithstanding, they are not precisely the same as serial boot stacking. summons are acknowledged just by the serial boot loader in serial boot stacking mode and the basic transport component could be not quite the same as the one utilized by organize processor picture.

PIC18 ARCHITECTURE

In spite of the fact that microcontrollers were being produced since mid-1970's genuine blast came in mid-1990's. An organization named Microchip made its first straightforward microcontroller, which they called PIC. Initially this was created as a supporting gadget for PDP PCs to control its fringe gadgets, and consequently named as PIC, Peripheral Interface Controller. In this manner every one of the chips created by Microchip have been named as a class independent from anyone else and called PIC. Microchip itself does not utilize this term any longer to portray their microcontrollers, anyway utilize PIC as a component of item name. They call their items MCU's. A substantial number of microcontroller plans are accessible from microchip. Contingent on the engineering, memory format and handling power. They have been named low range, mid-range, high range and now computerized flag handling microcontrollers. The magnificence of these gadgets is their simple accessibility, ease and simple programming and taking care of. This has made PIC microcontrollers as the apple of specialists and understudies eyes. We should discuss mid-extend PIC microcontrollers, and utilize PIC18F452 as a model in this manual to investigate them. Information picked up by learning and investigating one microcontroller is very nearly 90% relevant on different microcontrollers of a similar family.

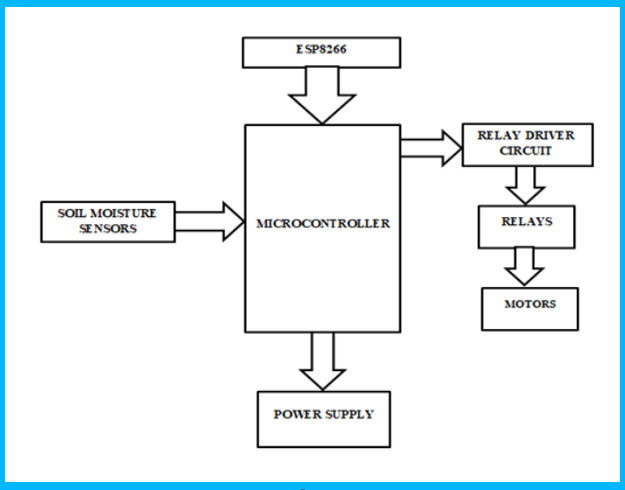


Fig::Architecture of pic18 microcontroller

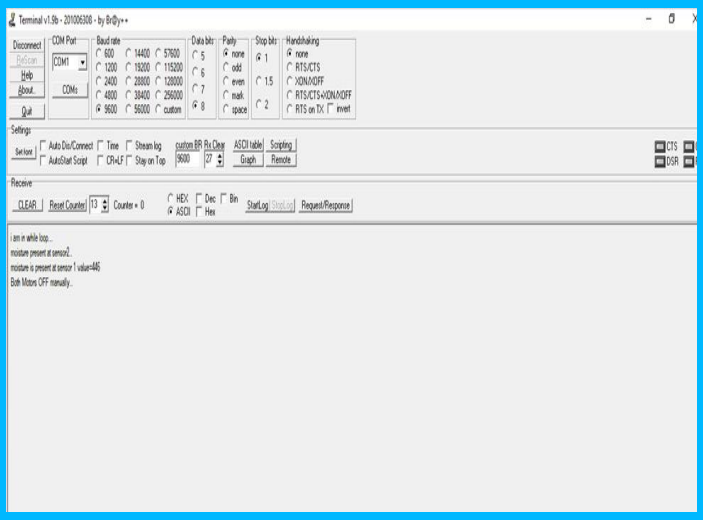


Fig: Terminal

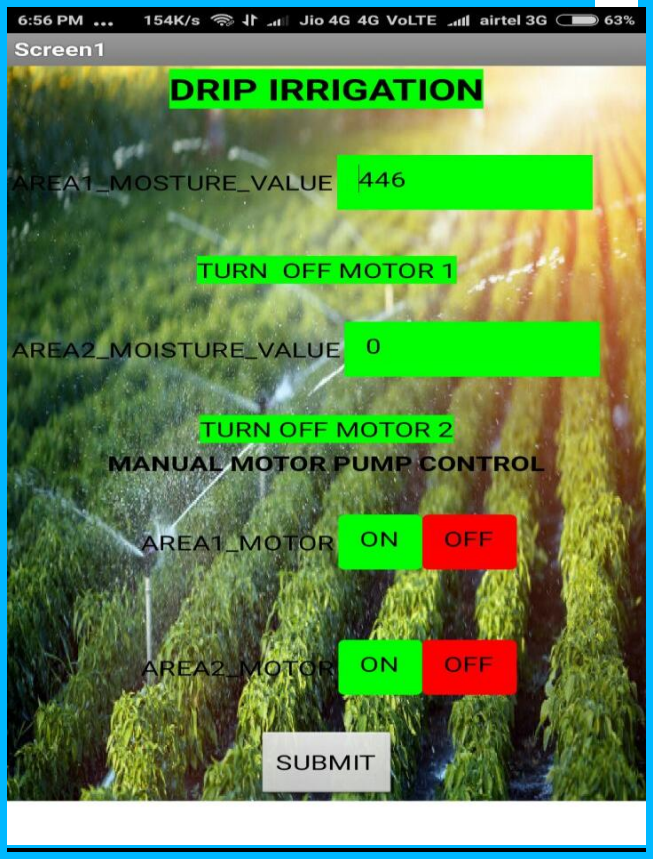


Fig: mobile application

VI. CONCLUSION

The output from moisture sensor and system plays major role in producing the output. The chosen approach is expected to yield the following results,

- Reduced labour
- Reduced monitoring
- Decrease in water input
- Low maintenance
- Low power consumption

The advantage of using this method is to reduce human intervention and to ensure proper irrigation.

- Minimizes water waste and improves plant growth.
- This system is designed to work automatically

and hence, there is no need for any human intervention.

VII. REFRENCES

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[5]Jia Uddin, S.M. Taslim Reza, Qader Newaz, Jamal Uddin, Touhidul Islam, and Jong-Myon Kim,"Automated Irrigation System Using Solar Power" ©2012 IEEEthe symbols in your equation have been defined before the equation appears or immediately following.