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Monitor Soil Moisture and Controlling Motors Using IoT

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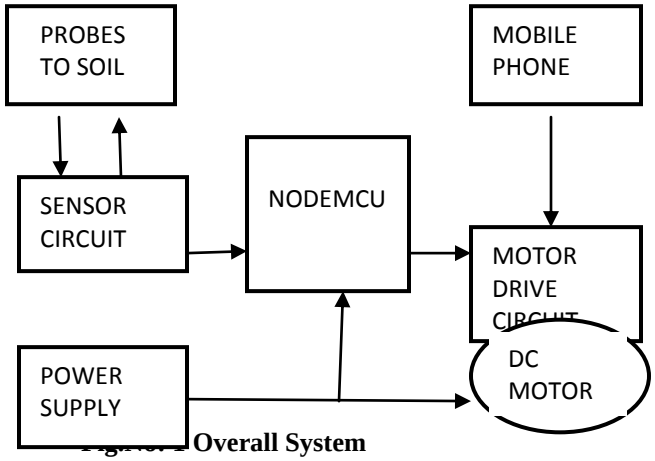
***Abstract*-----India's population is increasing day by day then once 25-30 years there'll be significant issue of food, therefore the development of agriculture is important. Today, the farmers area unit full of the shortage of rains and inadequacy of water. The most objective of this paper is to produce AN automatic irrigation system thereby saving time, cash and power of the farmer. The standard farm-land irrigation techniques need manual intervention. With the machine-controlled technology of irrigation the human intervention will be reduced. Whenever there's a modification in temperature, humidity, wetness and pH level of the environment these sensors senses the changes and offers an interrupt signal to the monitor and management the irrigation from anyplace.**

Keywords: Weather detecting, signals send to Nodemcu, Nodemcu send alert to the user, user control motor.

I. INTRODUCTION

Soil moisture sensors measure the volumetric water content in soil. [1] Since the direct gravimetric measurement of free soil moisture requires removing, drying, and weighting of a sample, soil moisture sensors measure the volumetric water content indirectly by using some other property of the soil, such as electrical resistance, dielectric constant, or interaction with neutrons, as a proxy for the moisture content. Reflected microwave radiation is affected by the soil moisture and is used for remote sensing in hydrology and agriculture. Portable probe instruments can be used by farmers or gardeners. Soil moisture sensors typically refer to sensors that estimate volumetric water content. Another class of sensors measure another property of moisture in soils called water potential; these sensors are usually referred to as soil water potential sensors and include tensio meters and gypsum blocks. Measuring soil moisture is important for agricultural applications to help farmers manage their irrigation systems more efficiently. Knowing the exact soil moisture conditions on their fields, not only are farmers able to generally use less water to grow a crop, they are also able to increase yields and the quality of the crop by improved management of soil moisture during critical plant growth stages. Soil moisture sensors are used in numerous research applications, e.g. in agricultural science and horticulture including irrigation planning, climate research, or environmental science including solute transport studies and as auxiliary sensors for soil respiration measurements. Acclaim SCX Soil Moisture Sensor and irrigation override controller. Conserve water with precision irrigation, upgrade your controller with the power of Digital TDT® moisture sensors. The SCX works with your existing electric valve irrigation timer, incorporating cutting edge moisture sensing technology to prevent over watering. A timer or clock has traditionally governed automated irrigation control systems. Day in and day out, rain or shine, these clocks faithfully water our landscapes. The weatherproof cabinet is suitable for outdoor installation. The SCX overcomes the problem of chronic over watering through use of the Acclima Digital Soil Moisture Sensor. The sensor measures soil moisture content every 10 minutes and will only allow a water cycle when the moisture drops below a "turn on" threshold that you have set, suspending water cycles until your turf needs it. During the hottest part of the year, soil moisture is depleted more rapidly and the system will water more frequently. Then when the temperature cools, or if you get a big rainstorm, the system will inhibit watering until the moisture level in the ground falls below the "turn on" threshold. The SCX provides a history of the last seven irrigation attempts. The proposed hardware of this system includes 8 bit AVR, Blue tooth module, and soil moisture sensors. The system is low cost & low power consuming so that anybody can afford it. The data monitored is collected at the server. It can be used in precision farming. The system should be designed in such a way that even illiterate villagers can operate it. They themselves can check different parameters of the soil like salinity, acidity, moisture etc. from time to time. During irrigation period, they

have to monitor their distant pump house throughout the night as the electricity supply is not consistent. The system can be installed at the pump house located remotely from the village, it is interfaced with the pump starter & sensors are plugged at different location in the field for data acquisition. Using this system, they can switch on their pump from their home whenever they want.



Overall System

II. MODULES CLASSIFICATION

A. .Soil Moisture

Soil moisture is an important component in the Atmospheric water cycle, both on a small agricultural scale and in largescale modelling of land/atmosphere interaction.
Vegetation and crops always depend more on the moisture available at root level than on precipitation occurrence. Water budgeting for irrigation planning, as well as the actual scheduling of irrigation action, requires local soilmoisture information. Knowledge of the degree of soil wetness helps to forecastthe risk of flash floods, or the occurrence of fog. This shows Microcontroller based irrigation of water in the soil, while the soil water potential is a system proves to be a real time feedback control system expression of the soil water energy status. The relation which monitors and controls all the activities of drip between content and potential is not universal and depends irrigation system efficiently. The present proposal is a on the characteristics of the local soil, such as soil density model to modernize the agriculture industries on a small and soil texture. Scale with optimum expenditure. Using this system, one the basic technique for measuring soil water content is the can save manpower, water to improve production and gravimetric method. Because this method is based on ultimately profit. Direct measurements, it is the standard with which all other methods are compared.
They presented an incremental network programming mechanism which sends the new version of program by transmitting the difference of the two program images. Unlike previous approaches, they generated the program code difference by comparing the program code in block level without any prior knowledge of the program code structure.

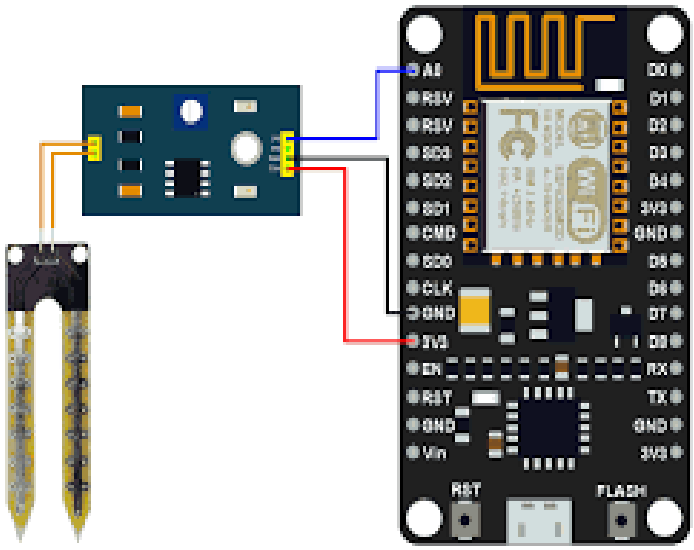


Fig.No 2 Soil Moisture Sensor With Nodemcu

B.Information Sharing:

The entire field is first divided into small good oxidation resistance, and usability for untreated sections such that each section should contain one contact surfaces such as membrane switches and contact moisture sensor. These sensors are buried in the ground at points required depth. Once the soil has reached desired moisture a soil moisture sensor can read the amount of level the sensors send a signal to the micro controller to moisture present in the soil surrounding it. It's a low tech turn on the relays, which control the motor. Sensor but ideal for monitoring an urban garden, or your .In proposed system, automated irrigation pet plant's water level. This is a must have tool for a mechanism which turns the pumping motor ON and OFF connected garden. On detecting the dampness content of the earth. In this sensor uses the two probes to pass current through domain of farming, utilization of appropriate means of the soil, and then it reads that resistance to get the irrigation is significant. The benefit of employing moisture level. More water makes the soil conduct these techniques is to decrease human interference. Electricity more easily(less resistance), while dry soil this automated irrigation project, the soil sensor senses conducts electricity poorly (more resistance). The moisture content by giving input signal to an Arduino board which h operates on ATmega328 micro-controller, is programmed to collect the input signal of

changeable dampness circumstances of the earth via dampness detecting system.

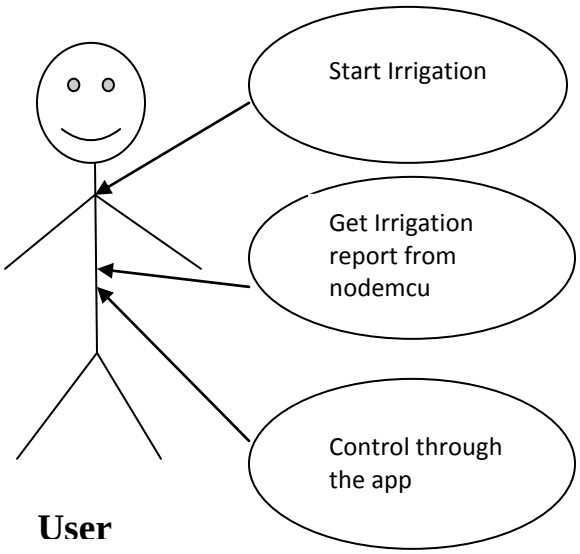
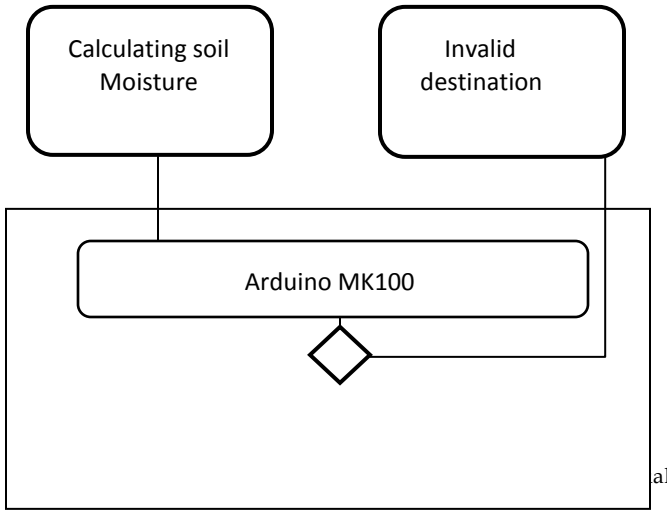


Fig.No 3 Way Of Information Sharing

C.Irrigation

Little water is lost to deep percolation if the proper amount is applied. Drip irrigation is popular because it can Irrigation system usesvalves to turn irrigation ON and increase yields and decreaseboth waterrequirementsand OFF. These valves may beeasily automated by using labor. Controllers and solenoids. Automating farm or nursery Drip irrigation requires about half of the water needed by irrigation allows farmers to apply the right amount of sprinkler or surface irrigation.

The irrigation operation will start by the two types one via nodemcu and via mobile application



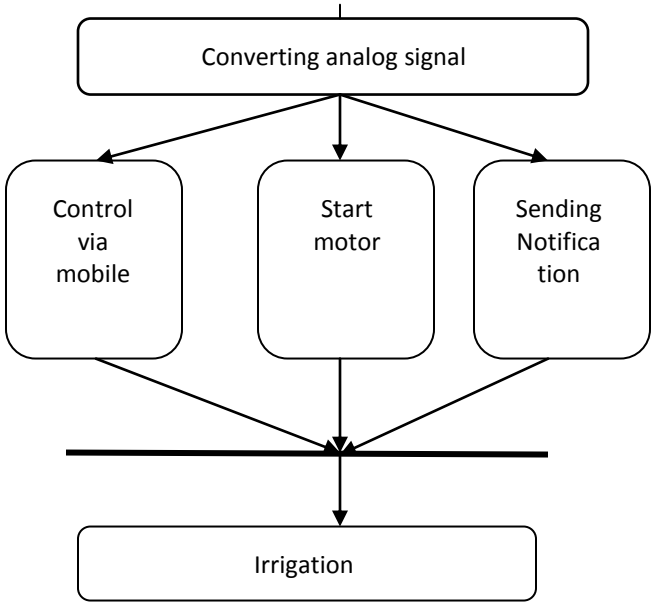


Fig.No 4 Irrigation Process.

Lower operating pressures water at the right time, regardless of the availability of and flow rates result in reduced energy costs.

D.Motor Control Via Mobile

In before architecture and systems are constructed for only alerting the moisture of soil but now we are constructing the system for also control the motor where from our place. It saves the time and cost of travel. We don't miss any other meetings for this work. This system works through the GSM in motor. So, we can send the actions to the motor through this GSM. GSM is mostly used for communication and this type of process.

A relay is an electro mechanical switch. It is used for switching high current devices that cannot be switched by transistor. Relay consists one electromagnetic coil and three terminals for switching. One among these three terminals is a common terminal that floats between other two terminals. These two terminals are Normally Close (NC) and Normally Open (NO) terminal.

In normal condition (power is not supplied to relay's coil) the Common terminal remains connected to the NC terminal. When a power is supplied to the relay's magnetic coil, it generates magnetic force. This force detaches common terminal from the NC terminal and connects the common terminal to the NO terminal. The

relay returns to its original condition as soon voltage supply stops.

Handle Features:

Features	Yes	No
User-friendly	✓	
Power Saving	✓	
Installation difficult		✗
Remote Accessing	✓	
High cost		✗

Fig.No 5 Handled Feautures

III. RESULT

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.

III. Conclusions

The primary applications for this project are for farmers and gardeners who do not have enough time to water their Crops/plants. It also covers those farmers who are wasteful of water during irrigation. The project can be extended to greenhouses where manual supervision is far and few in between. The principle can be extended to create fully automated gardens and farmlands. Combined with the principle of rain water harvesting, it could lead to huge watersavings if applied in the right manner. In agricultural lands with severe shortage of rainfall, this model can be successfully applied to achieve great results with most types of soil. Considerable progress has been made in the development of irrigation scheduling methods and there is a gradual increase in the adoption of irrigation scheduling tools by farmers. The technology level of the farm will determine the choice of the irrigation scheduling method. Industry farms and farms with high value cash crops are more likely to adopt and invest in sophisticated scheduling methods.

The support and collaboration of the expert irrigation adviser will determine the rate of success in the adoption of the irrigation scheduling technology.

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