IOT Based Water Supply Monitoring And Controlling System

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Abstract- *Extended research on the design and development of a smart moisture, temperature sensor for monitoring concentration in surface and groundwater, are reported in this paper. The developed portable sensing system consists of moisture, temperature and associated electronics and instrumentation based analysis. This system will monitor and control the field through the IOT website. Depending on the received status from the IOT website the motor will be controlled. Water has become a crucial problem which affects the problem of water distribution, interrupted water supply, water conservation, water consumption and also the water quality . To overcome water supply related problems and make system efficient there is need of proper monitoring and controlling system. Water is the most precious and valuable because it's a basic need of all the human beings but, now a days water supply department are facing problem in real time operation this is because less amount of water in resources due to less rain fall. Water is the most precious and valuable because it's a basic need of all the human beings but, now a days water supply department are facing problem in real time operation this is because less amount of water in resources due to less rain fall.Increase in Population, urban residential areas have increased because of this reasons water has become a crucial problem which affects the problem of water distribution, interrupted water supply, water conservation, water consumption and also the water quality so, to overcome water supply related problems and make system efficient there is need of proper monitoring and controlling system. In this project, we are focusing on continuous and real time monitoring of water supply in IOT platform. Water supply with continuous monitoring makes a proper distribution so that, we can have a record of available amount of water in tanks, flow rate, abnormality in distribution line. Internet of things is nothing but the network of physical objects embedded with electronics, sensors, software, and network connectivity. Monitoring can be done from anywhere as central office.*

Keywords- Arduino uno, LCD display, IOT, Moisture sensor,Temperature sensor, Water Motor, LED

I. INTRODUCTION

The irrigated agriculture is one of the biggest consumer of fresh water with a share up to 80-90% in the developed countries. The increased demand for water and the arising climate changes are anticipating that the water resources for agriculture will be lower in the forthcoming decades. The efficient use of the water is becoming an increasingly important issue since the competition in terms of cost reduction and high crop quality is more and more tight. Now a day, water has become a big problem because of less rain fall the water resources are not able to supply sufficient water therefore, saving water is everyone's responsibility. To save the water we have to concentrate on the issues such as proper water supply, over consumption, analysis of available water, water flow rate, pressure of water flow in pipeline, quality of water. To overcome these problems we need a better technology for monitoring the supply system.

II. RELATED WORKS

Internet of Things (IoT) and Remote Sensing (RS) techniques are used in different areas of research for monitoring, collecting and analysis of data from remote locations. Water management is one of the widely used application which uses IoT to manage and monitor the water efficiently.[1] Water management involves water monitoring and controlling system for conservation .This paper focuses on various models for continuous and real time water monitoring system in IoT platform.[2]water level sensor with Arduino is used to measure the water level of sand.[3] the water level is monitored and gets stored in Arduino microcontroller. So if there is any lack of water level in the soil, the microcontroller pump the water to the desired level using motor.[4] The desired level is measured using sensors and the information about the state of the soil is send to the database thereby providing automatic motor detection.[5] And the water content of the soil is also measured thereby turning on the sprinklers automatically. It is all done using the Arduino board, sensors with Wi-Fi module.[6] Thus Arduino reads from the sensor and transmits the readings to the mobile application over the Internet.[7] Focusing on problems in traditional methods

our paper design and develop a low cost embedded system device for real time monitoring of water distribution system in IOT platform.[8] the moisture sensor and sends the status about the land and moisture. The information will be send with the help of GSM.[9] the moisture in single field and updates the information through the GSM. It can only monitor the status of the land and update the information to the user. It only monitors the land and cannot control the motor pump.

III. SYSTEM ARCHITECTURE

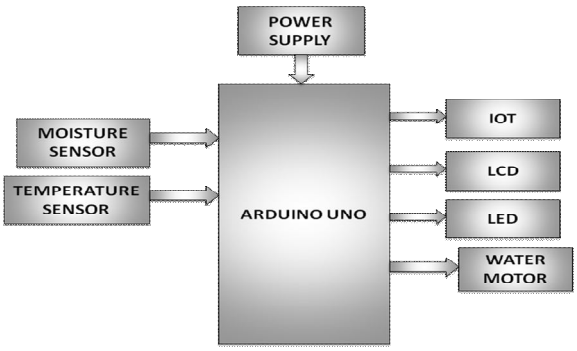

FIGURE 3.1 Architecture Diagram

Use multiple sensors such as moisture to sense the soil moisture, temperature sensor to measure soil temperature.Sensor will check the parameter and update the status to the IOT website. Monitor and control the field through the IOT website.Depending on the received status from the IOT website the motor will be controlled.The motor depends on the temperature sensor. If the temperature increase the motor will on and if it decreases the motor will turn off. Display the information through the LCD display.

CIRCUIT DIAGRAM

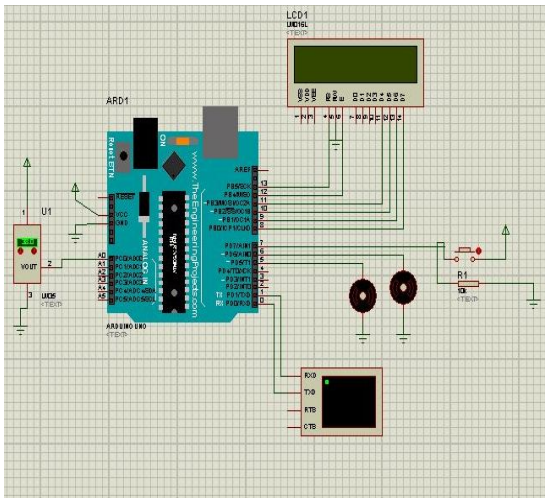

FIGURE 3.2

The above circuit diagram, if the temperature level is increased, it will detected by temperature sensor. The temperature sensor can be used for increasing the temperature level it will informed to the arduino. The arduino UNO are connected with two components, one is LCD display and another one is LED. The LCD display used to displaying if the temperature level is increased and moisture level indications. The LED is used to indicate the if the moisture level is high the LED is automatically lightining.

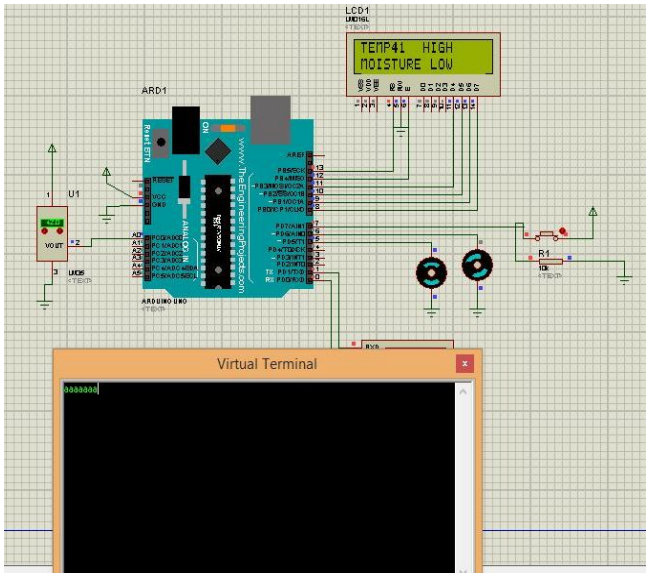

FIGURE 3.3 Circuit diagram

The above diagram explains that, if the temperature level is high it display to the LCD display and indicate to the Arduino uno. Then we can control the temperature level by use of IOT controller. 0's and 1's is used to ON/OFF the controller. Then to increase the moisure level also using the IOT.

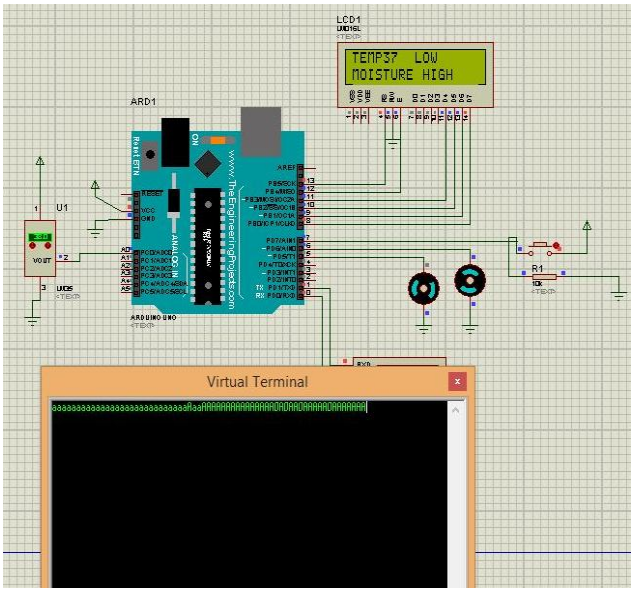

FIGURE .34 circuit diagram

Finally, The temperature level is reduced by using the IOT based technology. This techonology increase the moisure level.

IV. REQUIREMENT SPECIFICATION

The hardware requirements we are using are Arduino Uno, Power Supply, Transformer, Bridge Rectifier, Moisture Sensor, Liquid Crystal Display(LCD), Light Emitting Diode(LED), Water Pump Motor,Relay board.The software Arduino IDE 1.8.5 is used for coding the Embedded C coding.

V. SYSTEM COMPONENTS

1. ARDUINO UNO

ARDUINO is an open-source computer hardware and software company, project and user community that designs and manufactures microcontroller-based kits for building digital devices and interactive objects that can sense and control objects in the physical world. For programming the microcontrollers, the Arduino project provides an integrated development environment (IDE) based on the Processing project, which includes support for the C and C++ programming languages.

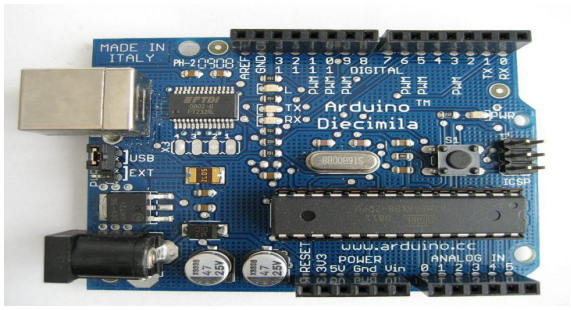

FIGURE3.5ardino uno

2. POWER SUPPLY

Power supply is a reference to a source of electrical power. A device or system that supplies electrical or other types of energy to an output load or group of loads is called a power supply unit or PSU. The term is most commonly applied to electrical energy supplies, less often to mechanical ones, and rarely to others.

POWER SUPPLY CIRCUIT

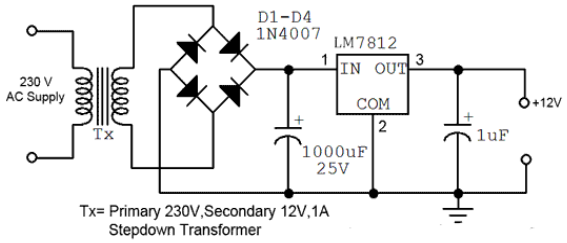

FIGURE 3.6 power supply circuit

3. BRIDGE RECTIFIER

A bridge rectifier can be made using four individual diodes, but it is also available in special packages containing the four diodes required. It is called a full-wave rectifier because it uses the entire AC wave (both positive and negative sections). 1.4V is used up in the bridge rectifier because each diode uses 0.7V when conducting and there are always two diodes conducting, as shown in the diagram below

4. INTERNET OF THINGS (IOT)

The Internet of Things may be a hot topic in the industry but it's not a new concept. In the early 2000's, Kevin Ashton was laying the groundwork for what would become the Internet of Things (IoT) at MIT's AutoID lab. Ashton was one of the pioneers who conceived this notion as he searched for ways that Proctor & Gamble could improve its business by linking RFID information to the Internet. .

5. LIGHT EMITTING DIODE(LED)

A light emitting diode (LED) is a device which converts electrical energy to light energy. LEDs are preferred light sources for short distance (local area) optical fiber network because they: are inexpensive, robust and have long life (the long life of an LED is primarily due to its being a cold device.

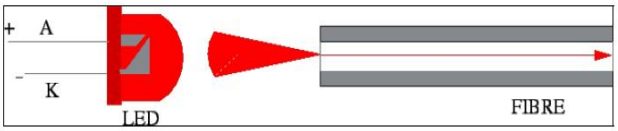

FIGURE 3.7 LED

6. WATER PUMP MOTOR

The pumping of water is a basic and practical technique, far more practical than scooping it up with one's hands or lifting it in a hand-held bucket. This is true whether the water is drawn from a fresh source, moved to a needed location, purified, or used for irrigation, washing, or sewage treatment, or for evacuating water from an undesirable location.

7. MOISTURE SENSOR

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. The relation between the measured property and soil moisture must be calibrated and may vary depending on environmental factors such as soil type, temperature, or electric conductivity. 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.

V. CONCLUSION

In this paper, the review of previous system and design of a water supply system in IOT environment using Raspberry pi is presented. Proposed system consist of different sensors, Arduino Uno, IOT module these all devices are low cost, more efficient, reliable and capable of sending, processing, analyzing data and monitoring and control can be done. We are concentrating on different parameters so that whole water supply system can be monitored. In future work we plan to implement our system and take proper results. The wastage of water is gradually reduced, it monitors and controls motor in agriculture land.

VII. ACKNOWLEDGEMENT

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