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INTERNET OF THINGS (IOT) BASED SMART IRRIGATION

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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 ARDUINO CONTROLLER. Then it will be transferred to the IOT (Internet Of Things) technology so farmer will monitor and management the irrigation from anyplace.

Keywords: IOT, Sensor based irrigation, GSM, GPRS, Microcontroller (AT Mega 328), zigbee, motors.

I. INTRODUCTION

India's major source of income is from agriculture sector and 70% of farmers and general people depend on the agriculture. In India most of the irrigation system are operated manually. These outmoded techniques are replaced with automated techniques. The available traditional techniques are like ditch irrigation, terraced irrigation, drip irrigation. The global irrigation scenario is categorized by increased demand for higher agricultural productivity, poor performance and decreased availability of water for agriculture. These problems can be appropriately rectified if we use automated system for irrigation.

A. Need of automatic Irrigation

- Simple and easy to install and configure.
- Saving energy and resources, so that it can be utilized in proper way and amount.
- Farmers would be able to smear the proper quantity of water at the proper time by automating farm or nursery irrigation..
- Avoiding irrigation at the wrong time of day, reduce runoff from overwatering saturated soils which will improve crop performance.
- sAutomated irrigation system uses valves to turn motor ON and OFF. Motors can be automated easily by using controllers and no need of labour to message display on liquid crystal display screen, At the end, when the gas leakage is successfully stopped then with the help of reset button the whole system reached to the initial stage.

Turn motor ON and OFF.

- It is precise method for irrigation and valuable tool for accurate soil moisture control in highly specialized greenhouse vegetable production.
- It is time saving, the human error elimination in adjusting available soil moisture levels.

LITERATURE REVIEW

India is one of the scarce water resources in 13 countries in the world, due to low utilization of the water resources our country is facing the risk of

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overheating. In order to effectively scale back the impact of inadequate water resources on India's economy from fashionable agricultural cultivation and management perspective, in line with the essential principles of web, with device technology, this text proposes exactitude agriculture irrigation systems supported the net of things (IOT) technology, and focuses on the hardware design, specification and code method management of the exactitude irrigation system. Preliminary tests showed this system is rational and practical.

We deploy the two sensor node separated from each other. Each sensor node contains humidity, moisture and pH and Zigbee. The communication with all distributed sensing element nodes placed within the farm through Zigbee protocol and itself act as a coordinated node within the wireless sensing element network. The programming on the Arduino board is such way that after every minute sensor node sends soil parameter data to coordinator node via the zigbee wireless communication protocol. The goal of coordinator node is to collect the parameters like humidity, moisture and pH wirelessly.

IOT stores collected information within the info and analyzes the hold on information. The system can work consistent with the algorithmic program developed for watering the crop. The board has Associate in Nursing LAN interface and runs the easy information internet server. thus arranger collects the info over Zigbee wireless communication protocol and permit user to watch the info from an online browser. User will create the irrigation system ON or OFF remotely. The system can cut back the water consumption and giving uniform water to the crop leads to increasing yield.

PROPOSED METHODS

Block Diagram:

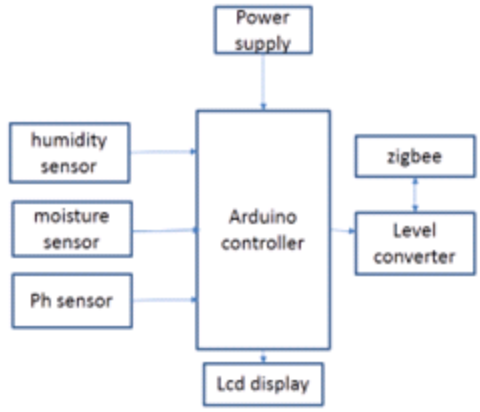

Figure1a. Transmitter node 1&2

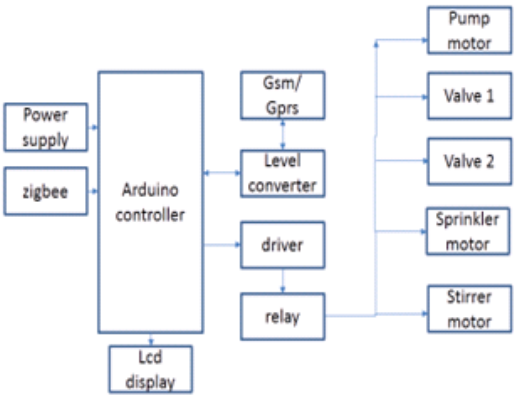

Figure1b.coordinator node

Working:

From the diagram two sensor detector node separated from one another. Every detector node contains wetness, wet and pH scale and Zigbee. The communication with all distributed detector nodes placed within the farm through Zigbee protocol and itself act as a coordinated node within the wireless detector network. The programming on the Arduino board is such means that once each minute detector node sends soil parameter knowledge to arranger node via the zigbee wireless communication protocol. The goal of arranger node is to gather the parameters like wetness, wet and pH scale wirelessly. IOT stores collected knowledge within the info and analyzes the keep knowledge. The system can work per the rule developed for watering the crop. The board has associate local area network interface and runs the easy knowledge internet server. therefore arranger collects the info over Zigbee wireless communication protocol and permit user to watch the info from an

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internet browser. User will create the irrigation system ON or OFF remotely. The system can scale back the water consumption and giving uniform water to the crop ends up in increasing yield.

Component used:

IOT:

The Internet of Things (IOT) is associate degree setting within which objects, animals or folks ar given distinctive identifiers and therefore the ability to transfer information over a network while not requiring human-to-human or human-to-computer interaction.

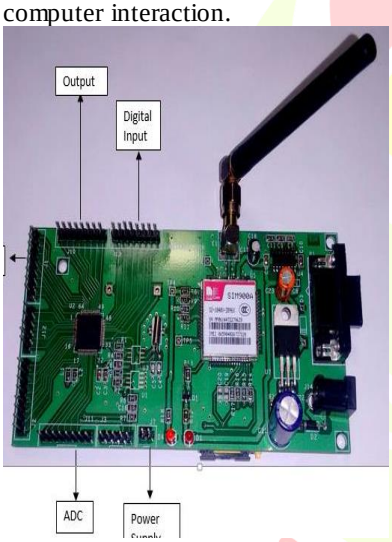

Figure 2.IOT Board

IOT board designed to fulfill a range of on-line application desires with distinct blessings that change the embedded system designer to simply, quickly and seamlessly add web property to their applications.

The module's UART update feature and webpage control make them perfect for online wireless applications such as biomedical monitoring, environmental sensors, and data from portable battery operated wireless sensor network devices. IOT board featured with SIM900 GPRS modem to activate internet connection also equipped with a controller to process all input UART data to GPRS based online data.

Input Specifications:

Power Supply: DC +12v 1Amp.
Baud Rate: 9600
ADC: 0-5V DC Analog Input

Output Specifications:

Digital Output port Pins: +5V DC

Arduino UNO

Arduino Uno could be a microcontroller board supported the ATmega328. it's fourteen digital input/output pins (of that half dozen is used as PWM outputs), half dozen analog inputs, a sixteen megacycle per second oscillator, a USB affiliation, an influence jack, associate degree ICSP header, and a button. It contains everything required to support the microcontroller; merely connect it to a pc with a USB cable or power it with associate degree AC-to-DC adapter or battery to urge started. The Uno differs from all preceding boards in this it doesn't use the FTDI USB-to-serial driver chip.

Figure 3.Arduino UNO

PH electrode:

A hydrogen ion concentration meter is associate degree musical instrument wont to live the hydrogen ion concentration (acidity or alkalinity) of a liquid (though special probes {are|ar|area unit|square live} generally wont to measure the hydrogen ion concentration of semi-solid substances). A typical hydrogen ion concentration meter consists of a special measurement probe connected to associate degree electronic meter that measures and displays the hydrogen ion concentration reading.

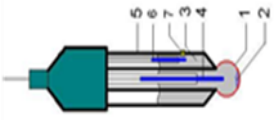

Figure 4. pH electrode

Humidity sensor:

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The DHT11 is a relatively cheap sensor for measuring temperature and humidity. The DHT11 has three lines: GND, +5V and a single line.

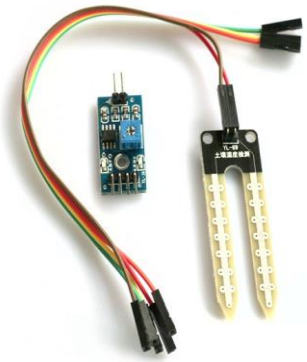

Figure5.Humidity sensor

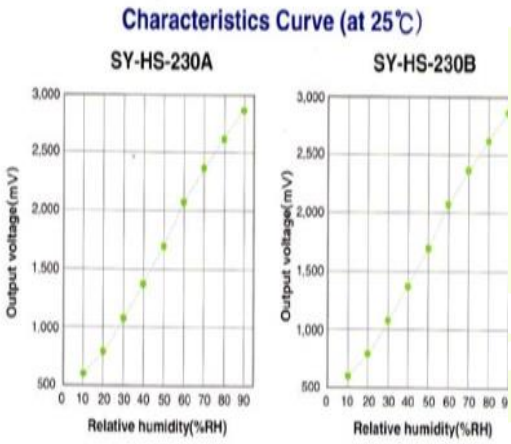

Figure6. Characteristics curve

Moisture sensor:

The moisture sensor can read the amount of moisture present in the soil surrounding. It sense the moisture level and send the values to the Arduino micro controller.

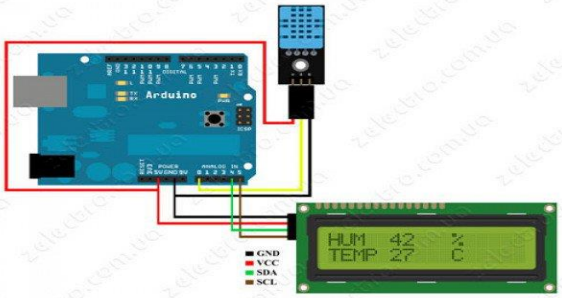

Figure7.moisture sensor

Figure8.Sample webpage

CONCLUSION

In this system we have describe a new approach for Irrigation at low cost. The humidity, moisture, temperature and PH values are measured and received by the receiver node through the zigbee protocol. Then the values are transferred to the IOT technology so that farmer can monitor and control the irrigation from anywhere.

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BIBLIOGRAPHY

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