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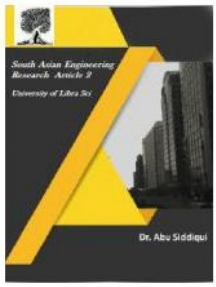

DESIGN AND IMPLEMENTATION OF SMART IRRIGATION SYSTEM USING WIRELESS SENSOR NETWORK BASED ON IOT

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Abstract: This paper presents an automation of farm irrigation system using a wireless sensor network (WSN). The system provides a web interface to the user so that the user can control and monitor the system remotely. In this paper, Raspberry Pi is used as an embedded Linux board which is designed based on the arm controller architecture. Embedded Linux board makes the communication with all distributed sensor nodes placed in the farm through protocol and itself act as a coordinated node in the wireless sensor network. The goal of coordinator node is to collect the parameters like soil moisture and soil temperature wirelessly. Each sensor node consists of soil moisture and soil temperature sensor and. Raspberry Pi stores collected data in the database and analyzes the stored data. The system will work according to the algorithm developed for watering the crop. The board has an Ethernet interface and runs the simple data web server.. User can make the irrigation system ON or OFF remotely. The system will reduce the water consumption and giving uniform water to the crop results in increasing yield.

Key words: ARM7, Moisture sensor, LM35 sensor, Motor.

1. Introduction

In our nation Agriculture is real wellspring of sustenance creation to the developing interest of human populace. In agribusiness, water system is a basic procedure that impacts trim generation. For the most part ranchers visit their agribusiness fields intermittently to check
soil dampness level and in view of necessity water is pumped by engines to flood individual fields. Agriculturist need to sit tight for certain period before turning off engine so water is permitted to stream in adequate amount in individual fields. This water system strategy takes parcel of time and exertion especially when a rancher need to flood various agribusiness fields dispersed in various topographical zones. Generally agriculturists will show in their fields to do water system process. In any case, these days ranchers need to deal with their horticultural movement alongside different occupations. Computerization in water system framework makes rancher work considerably simpler. Sensor based mechanized water system framework gives promising answer for agriculturists where nearness of rancher in field isn't obligatory. A little processor customized for control an

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electromagnetic valve and further more contrast with electromagnetic valve work engine to begin watering. Extremely INDIAN agriculturists require shabby and straightforward UI for controlling sensor based mechanized water system framework. Presently multi day's web is generally utilized. Utilizing web rancher thinks about the agribusiness field water system status. This causes agriculturists to know the status of homestead field watering bearing through a message whether the rancher is far from field know the status of water engine is ON or OFF and heading of watering. Today water has turned out to be a standout amongst the most valuable asset on the Earth and a standout amongst the most imperative factors in horticulture is water accessibility. Water accessibility is additionally a basic variable for essentially every other financial movement, including industry, the vitality area, and open utilize. As of late, water accessibility has turned into an issue. The motivation behind this work is to create self-governing water system frameworks that utilization consistently atmosphere standard to adjust day by day water system profundities to plant needs. Criteria, for example, temperature, add up to radiation and aggregate breeze can be estimated straightforwardly by PLCs which at that point adjust the water system timetable to the watched conditions, prompting a sensible sparing in the measure of water system water. Along these lines, this work expects to build up a financially savvy water system controller that is versatile to day by day atmosphere conditions, without the requirement for costly sensors and exorbitant climate stations. It should likewise be dependable and effortlessly deployable keeping in mind the end goal to work under cruel open air conditions without the requirement for supervision or standard observing

2.Existing Method:

In the present, a large portion of the nations don't have adequate talented labor in rural division and it influences the development of creating nations. So it's important to robotize the segment to beat this issue. In India there are 70% individuals subject to agribusiness. Apply autonomy is the part of innovation that arrangements with the outline, development, task, and utilization of robots, and also PC frameworks for their control, tangible criticism, and data handling. The outline of a meanderer will frequently join agrarian endeavors; however it may not look much like a person or capacity in a human like way. These sorts of smart frameworks having strong and practical model with various coordinated functionalities is the interest of future in each field of innovation, for the improvement of the general public.

Created horticulture needs to discover better approaches to enhance productivity. One methodology is to use accessible data advances as more clever machines to decrease and target vitality contributions to more successful routes than in the past. The sensors gather the parameters and send to a ARM7 controller, the controller gathers the parameters and organizes in particular arrangement and checks for the qualities if

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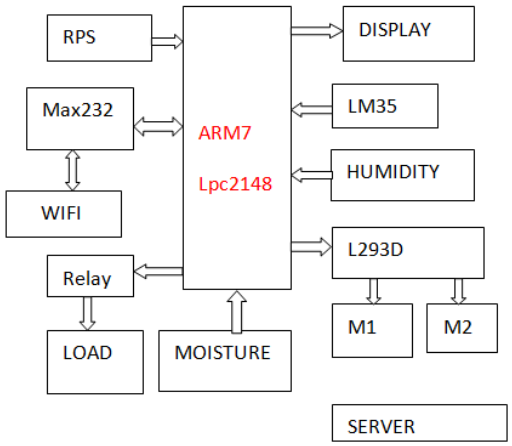
present inside as far as possible and all the while advances the data to the android portable through either Bluetooth module.

3. Proposed System:

In an expansive territory of homestead field there is utilize a vast number of pipes for watering plants in various ways from the attachment of engine. This is changed by the rancher to inundate a specific course of the field. Be that as it may, utilization of electromagnetic esteem the pipe framework are constantly associated and electromagnetic valve consequently alter the course of the water required region of the field and the valve is controlled by the Arm7.

3.1 block diagram



3.2 Overview Block Diagram

i) Power Supply: This section is meant for supplying Power to all the sections mentioned above. It basically consists of a Transformer to step down the 230V ac to 9V ac followed by diodes. Here diodes are used to rectify the ac to dc. After rectification the obtained rippled dc is filtered using a capacitor Filter. A positive voltage regulator is used to regulate the obtained dc voltage.

ii) ARM7: ARM is the abbreviation of Advanced RISC Machines, it is the name of a class of processors, and is the name of a kind technology too. The RISC instruction set, and related decode mechanism are much simpler than those of Complex Instruction Set Computer (CISC) designs.

Fig:3.2.1 ARM7 controller

iii)LCD Display:

This section is basically meant to show up the status of the project. This project makes use of Liquid Crystal Display to display / prompt for necessary information.

iv)Temperature sensor:

Thermistors are a temperature sensing devise. It is used to sense the temperature. In this project by depends on the value of temperature the exhaust fan will run

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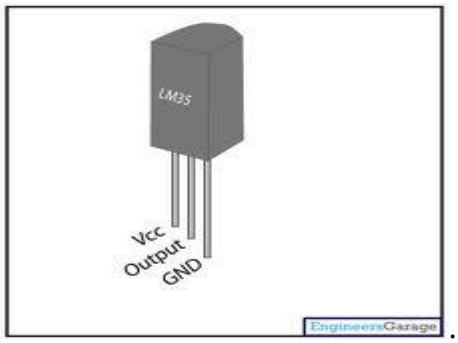

Fig 3.2.2: LM35 Sensor

v) **Moisture sensor**: YL 69 moisture sensing probe is used to sense the moisture here. It is simply a fork-shaped PCB with tracks running on both sides of the legs. Just plug this probe into the soil where you want to sense the moisture. Image of the YL 69 sensing probe is given below.

Fig 3.2.3: Moisture sensor

YL 38 comparator module is used in this project. It is a single channel op amp comparator based on L393 IC. This module just compares the output voltage of the sensing probe with a reference voltage and switches its voltage appropriately for the microcontroller to read.

VI) DC Motors: A DC motor is mechanically commutated electric motor powered from direct current (DC). Generally used in DIY projects, agriculture Battery operated toys, Radio controlled vehicles, Robotic projects etc. this is used for to sprinkle the water

4. Description:

In this framework we have planned which comprises of an ARM7 controller interfaced with soil dampness sensor, a LCD, Bluetooth. To execute the assignment of soil dampness observing, soil dampness sensor is utilized. The crude information from sensor is gathered by a processor. The information is prepared and after that showed on an LCD show. This venture can record information that is troublesome for people to assemble. They are utilized broadly by mainstream researchers to think about the dirt proficiency by estimating soil dampness utilizing soil dampness sensor. The hardware requirements used in the system. At the point when the estimation of soil dampness is zero there will be no association between the terminals and a vast impedance will happens between the two cathodes. This makes transfer is ON express the controller send output'1' to the engine circuit. Hence it will bring about turning ON the engine.

5. **Result:**

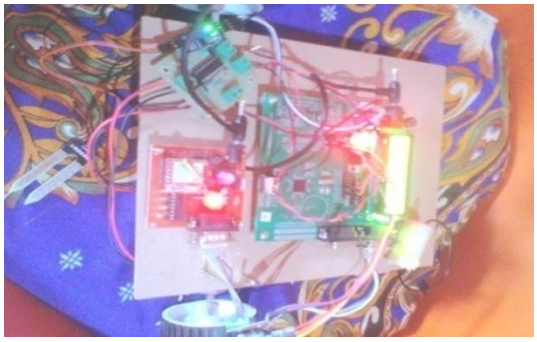

Fig 5.1: Hardware Implementation

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FIG 5.2: OUTPUT VALUES

6.CONCLUSION AND ENHANCEMENT

In this paper we present a model for programmed controlling a water system framework. Here models incorporates sensor hub and control hub. The sensor hub is conveyed in water system field for detecting soil dampness esteem and the detected information is sent to controller node. On accepting sensor esteem the controller hub checks it with required soil dampness esteem. At the point when soil dampness in water system field isn't up to the required level then the engine is changed on to flood related horticulture field and ready message is send to enlisted cell phone.

The exploratory outcomes demonstrate that the model is able for programmed controlling the trial results demonstrate that the model is able for programmed controlling of water system engine in light of the criticism of soil dampness sensor. This framework is utilized in a remote zone and there are different advantages for the ranchers. By utilizing the programmed water system framework it streamlines the utilization of water by decreasing wastage and diminish the human intercession for ranchers. It spares vitality likewise as it programmed controlling the framework. So there are the framework is OFF when the field is wet and naturally begin when the field id dry. It is executed in all kind of water system framework (channel, sprinkler, dribble). What's more, we present likewise less number of sensor hubs to use in an expansive region of field so the expense of the framework additionally diminish. Furthermore, control utilization of the remote system gadgets are additionally less and the framework play out quite a while

The working of undertaking is fundamentally reliant on the yield of sensors. At whatever point there is need of overabundance water in the coveted field then it should receive the DTMF innovation. By utilizing this we will have the capacity to water the coveted field and in wanted sum. By utilizing sun powered boards we can give control supply to the sensor circuit and afterward we can screen the water level amid control cut moreover. Empowering the Bluetooth Technology for better programmed working.

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