

SMART DRIP IRRIGATION SYSTEM WITH INTELLIGENT NUTRITION MANAGEMENT SYSTEM

CM.Swetha¹, V.A.Sankar Ponnappalli², B.Sreenivasu³

ABSTRACT

Drip irrigation is artificial technique of providing water to the roots of the plant. It is also called micro irrigation. Drip irrigation system is based on remote monitoring as well as controlling. In proposed system both mobile and computer are monitor and control the drip devices. In Intelligent Drip Irrigation system, an android mobile sends commands to computer to control drip irrigation system, here different sensors like humidity, temperature. will use for detection purpose. These sensors send the real time values to micro-controller and micro-controller send these values to computer (Cloud server). According to sensor values the user can switch on or off drip devices. Through modular design, the system builds hierarchical management structure to meet different applications requirements. It can monitor the changes in soil humidity, air temperature, humidity and feedback the sensor signals by wireless sensor network. Farmer can control as well as monitor the drip devices from anywhere. Proposed system removes drawbacks of previous systems like distance problem, range problem. Due to the automatic mode, drip devices can be controlled automatically by hardware. This approach is very beneficial for increasing crop production. Accurate and appropriate moisture of soil is required for the proper growth of crop. The maximum amount of water is used in agriculture in form of irrigation. The plants should be irrigated only when they need water, unwanted application of water increases the chances of weed production and incidence of disease. This paper presents a system that can help the farmers to get proper information about the amount of water required for irrigation as well as the temperature and humidity of atmosphere. The data is send to remote location using Zigbee based Wireless sensor network.

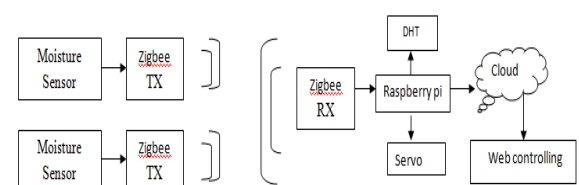
Keywords: Soil moisture sensor, Temperature sensor.

1. INTRODUCTION

In our nation Agriculture is real wellspring of sustenance generation to the developing interest of human populace. In farming, water system is a fundamental procedure that impacts trim creation. For the most part ranchers visit their farming fields occasionally to check soil dampness level and in light of necessity water is pumped by engines to flood particular fields. Agriculturist need to sit tight for certain period before turning off engine with the goal that water is permitted to stream in adequate amount in particular fields. This water system technique takes parcel of time and exertion especially when a rancher need to flood numerous horticulture fields dispersed in various topographical regions.

Generally ranchers will introduce in their fields to do water system process. In any case, these days' ranchers need to deal

with their horticultural action alongside different occupations. Mechanization in water system framework influences agriculturist to work considerably less demanding. Sensor based robotized water system framework gives promising answer for agriculturists where nearness of rancher in field is not necessary. A little processor modified for control an electromagnetic valve and furthermore contrasts with electromagnetic valve work engine to begin watering. Truly INDIAN agriculturists require shabby



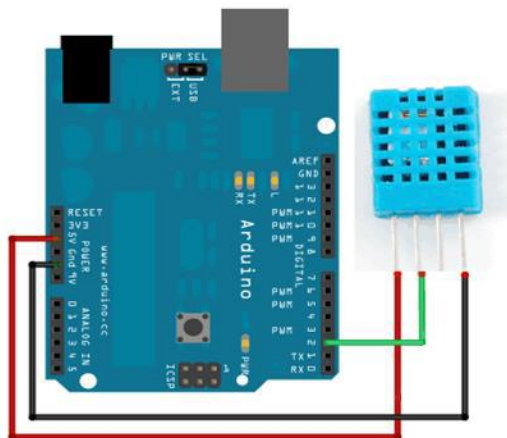
Figure(1) Block Diagram

and OFF. Moreover, ranchers utilizing mechanization hardware can lessen keep running off from over watering soaked soils, abstain from inundating at the wrong time of day, which will enhance

edit execution by guaranteeing satisfactory water and supplements when required. Programmed Drip Irrigation is a

2.1 DHT11 HUMIDITY SENSOR**Description:**

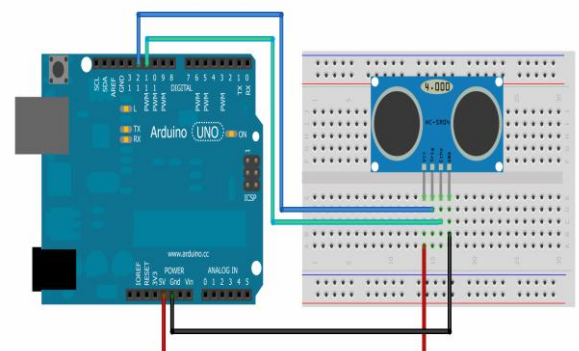
The DHT11 is an essential, ultra-minimal effort computerized temperature and stickiness sensor. It utilizes a capacitive dampness sensor and a thermistor to quantify the encompassing air, and releases a computerized motion on the information stick (no simple information pins required). It's genuinely easy to utilize, however requires watchful planning to get information. There are two sticks on to the mugginess sensor one is for ground and other for out which goes on the stick 2 on to Arduino.

**Figure 2.1 Humidity Sensor****2.2 ULTRASONIC SENSOR**

significant device for exact soil dampness control in profoundly specific creation and it is a basic, exact technique for water system. It likewise helps in efficient, evacuation of human mistake in altering accessible soil dampness levels and to expand their net benefits. The whole computerization work can be partitioned in two areas, the field station and focal station

Description :

The HC – SR04 ultrasonic sensor utilizes sonar to decide separation to a question. It offers brilliant non – contact extend discovery with high exactness and stable readings in a simple to-utilize bundle. From 2cm to 400 cm or 1" to 13 feet. Its operation is not influenced by daylight or dark material like Sharp rangefinders are (albeit acoustically delicate materials like fabric can be hard to identify). It comes finish with ultrasonic transmitter and collector module. The HC-SR04 ultrasonic sensor utilizes sonar to decide separation to a question. It offers brilliant non-contact extend discovery with high exactness and stable readings in a simple to-utilize bundle. From 2cm to 400 cm or 1" to 13 feet. Its operation is not influenced by daylight or dark material like Sharp rangefinders are (albeit acoustically delicate materials like fabric can be hard to identify). It comes finish with ultrasonic transmitter and collector module.

Figure 2.2 Ultrasonic Sensor

2.3 SG90 9 g Micro Servo

Little and lightweight with high yield control. Servo can turn roughly 180 degrees (90 toward every path), and works simply like the standard sorts however littler. You can utilize any servo code, equipment or library to control these servos. Useful for novices who need to make stuff move without building an engine controller with input and apparatus box, particularly since it will fit in little places. It accompanies a 3 horns (arms) and equipment.

2.4 ZIGBEE Module

The blast in remote innovation has seen the rise of numerous principles, particularly in the modern, logical and medicinal (ISM) radio band. There have been a large number of exclusive conventions for control applications, which bottlenecked interfacing. Requirement for a broadly acknowledged standard for correspondence between sensors in low information rate remote systems was felt. As a response to this predicament, many organizations fashioned a union to make a standard which would be acknowledged around the world. It was this Zigbee Alliance that made Zigbee. Bluetooth and Wi-Fi ought not be mistaken for Zigbee. Both Bluetooth and Wi-Fi have been produced for correspondence of expansive measure of information with complex structure like the media documents, programming and so forth. Zigbee then again has been produced investigating the requirements of correspondence of information with basic structure like the information from the sensors.



Figure 2.4 Zigbee

3.1 INTRODUCTION OF RASPBERRY PI

The Raspberry Pi is a Visa measured single-board PC created in the UK by the Raspberry Pi Foundation with the expectation of advancing the educating of essential software engineering in schools. Instead of a microcontroller board, the Raspberry Pi is a total PC extremely like the PCs with which you're as of now commonplace. It utilizes an alternate sort of processor, so you can't introduce Microsoft Windows on it. However, you can introduce a few variants of the Linux working framework that look and feel especially like Windows. On the off chance that you need to, you can utilize the Raspberry Pi to surf the web, send an email or compose a letter utilizing a word processor. Be that as it may, you can likewise do as such considerably more at an exceptionally shabby cost. The Raspberry Pi circuit board, with parts and attachments stuck on it is appeared in Figure 4.1. (a), (b)



Figure 3.1 Raspberry Pi

4. Sensors

4.1 Soil moisture sensor

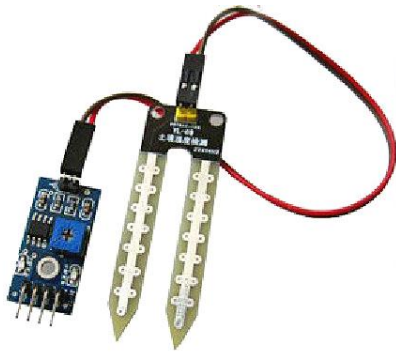


Figure 4.1 Soil moisture sensor

Soil dampness sensors measure the water content in soil. A dirt dampness test is comprised of various soil dampness sensors. Since scientific estimation of free soil dampness requires expelling a specimen and drying it to remove dampness, soil dampness sensors measure some other property,

for example, electrical resistance, dielectric steady, or cooperation with neutrons, as an intermediary for dampness content. The connection between the deliberate property and soil dampness must be adjusted and may shift contingent upon soil sort. Reflected microwave radiation is influenced by the dirt dampness and is utilized for remote detecting in hydrology and agribusiness. Convenient test instruments are utilized by agriculturists or cultivators.

4.2 Humidity Sensor

Dampness is the nearness of water in air. The measure of water vapor in air can influence human solace and also many assembling forms in ventures. The nearness of water vapor additionally impacts different physical, substance, and organic procedures. Mugginess estimation in ventures is basic since it might influence the business cost of the item and the wellbeing and security of the faculty. Subsequently, mugginess detecting is critical, particularly in the control frameworks for mechanical procedures and human solace.



Figure 4.2 Humidity sensor

In trickle water system control framework equipment and programming is intended for uniform utilization of water straightforwardly to the plant root zone to keep up soil dampness inside the range for good plant development without over the top water misfortune, disintegration, decrease in water quality, or salt aggregation. Controller ceaselessly procures information from RF 433 MHz Soil dampness sensor detects the dirt dampness and in like manner solenoid valve gets open or close when required. The controllers ended up being viable in keeping up the dirt water content in the plant according to the set purposes of the plant. The dribble water system framework has been attractively tried under perfect states of controlled water system of plant to keep up soil dampness in the scope of a model-based framework.

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Python 2.7.9 Shell
File Edit Shell Debug Options Windows Help
200 OK
None
ADC-1 = 512.0
Last valid input: 2017-08-21 11:26:11.527499
Temperature: 26.000000 C
Humidity: 45.000000 %
Dewpoint: 13 C
Moisture Node1: 527
Moisture Node2: 522.0
Distance:22.0
Inserted
200 OK
None
ADC-1 = 512.0
Last valid input: 2017-08-21 11:26:25.444438
Temperature: 26.000000 C
Humidity: 45.000000 %
Dewpoint: 13 C
Moisture Node1: 512.0
Moisture Node2: 527
Distance:22.0
Inserted
200 OK
None
ADC-2 = 524.0
Last valid input: 2017-08-21 11:26:33.279230
Temperature: 26.000000 C
Humidity: 45.000000 %
Dewpoint: 13 C
Moisture Node1: 527
Moisture Node2: 524.0
Distance:22.0
Inserted

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SUMMARY:

In our nation, water is the most imperative contribution for expanding crop creation and the spared water can be used for different yields as well. The present work intends to build up a savvy water system framework utilizing soil temperature and dampness sensor. Robotization helps in use of water for water system according to necessity of the product result in better yield of harvest contrasted with typical practices completed by agriculturists. The proposed framework empowers water system of the field just when it is required and along these lines serves to save water. Additionally, the proposed framework takes out the mediation of individual for water system purposes.

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