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Automatic System for Agriculture and Domestic Plant watering using Drip Irrigation

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Abstract - Indian agriculture is dependent on the monsoons which are not a reliable source of water, so there is a need for an automatic irrigation system in the country which can provide water to the farms according to their moisture and soil types. Modern drip Irrigation is today's need because water resources are very limited, diminishing day by day and most of them depend upon monsoons. The one and only one solution to this problem is automated Drip Irrigation system. In the field of agriculture, use of proper method of irrigation is important and it is well known that irrigation by drip is very economical and efficient.

A variety of drip irrigation methods have been proposed, but most of them have been found to be very expensive and complicated to use. In future each and every farmer, whether poor or uneducated might wake up in need of such a system, therefore the proposed applications targeting an automatic irrigation system with minimal cost, time and human-computer interaction

***Key Words*: Automation, Agriculture, PIC micro Controller, Water usage and drip irrigation**

1.INTRODUCTION

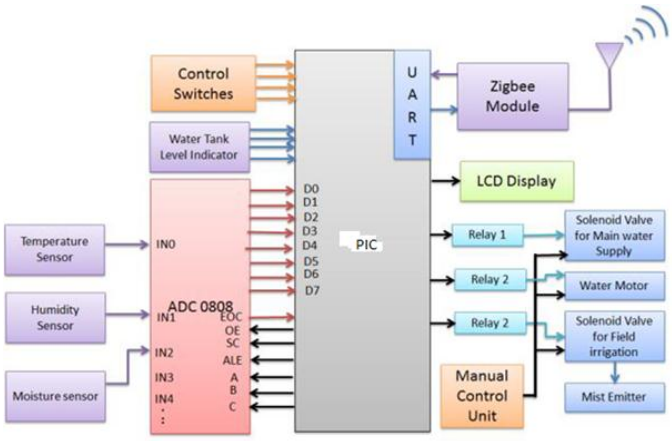
This Project contains as the smaller scale model for the auto watering structure framework, drenched state sensor, clock, and a liquid crystal display to exhibit the wetness of the dirt. Sensibly utilize to show the wetness level of soil on the liquid crystal display. The sensors are utilized to perceive the dampness at soil at the set area, clock is used to set the structure duration for watering the plant, and once it begin the water the plant when showed up distinctively in connection to the regular watering module framework that go with no microchip, it turns of the valve when the level of moistness of the dirt is achieved at the set area or field. Consequently, these segments spare water utilization while watering the plant when showed up contrastingly in connection to structure that utilization clock. Other than that, the liquid crystal display connects with the agriculturist to monitor the level of soil dampness and also it can water the plant physically by opting for manual control. This model is test to verify it's functionalities by watering the plant in the time of need and stop the flow when it accomplish the level of soddenness that customer fancied, and also compare how much water would have saved to extra when diverged from the conventional adjustment of watering framework that using clock.

2. DRIP IRRIGATION

A recently created watering framework known as trickle watering or stream watering, initially created in Israel, is getting to be prominent in territories of water lack. In this watering framework, a little measure of water is connected at regular interims as water beads through holes in plastic pipes or through tubes distributed over the dirt by restricting range only around the plant.

3. FRAMEWORK OF MODEL

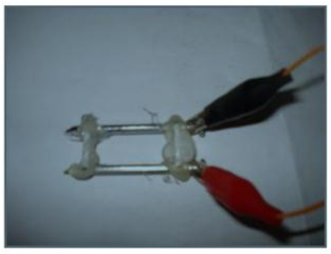
The Modeling level is a strategy to build the initial general structure which will be utilized to plot the parts and make the arrangement to figure displays of the planning of the station in which contrasting sensors is always upgraded by MC and a brief span later communicating through remote ZB handset to the base station, the base station handle these signs, redesign and exchange the choice RF signals back to the field sensor, which thusly turns the trades on/off as indicated the requirement of watering conditions.



The ZB handset module is connected to UART serial with the MC which transmits the information from the field sensors to the base station where the beneficiary ZB module gets the information, check the required watering structure conditions, show the yield and a while later resend the control signs to the field station.

4. Independent dampness sensor

Most soil soddenness sensors are proposed to gage soil volumetric water content in light of the dielectric consistent (soil mass permittivity) of the earth. The dielectric consistent can be considered as the earth's ability to transmit power. The dielectric relentless of soil relies on upon the water substance of soil. This response is a result of the way that the dielectric quality of water is much greater than the other soil parts, including air. Thusly, estimation of the dielectric relentless gives a foreseen estimation of water substance.



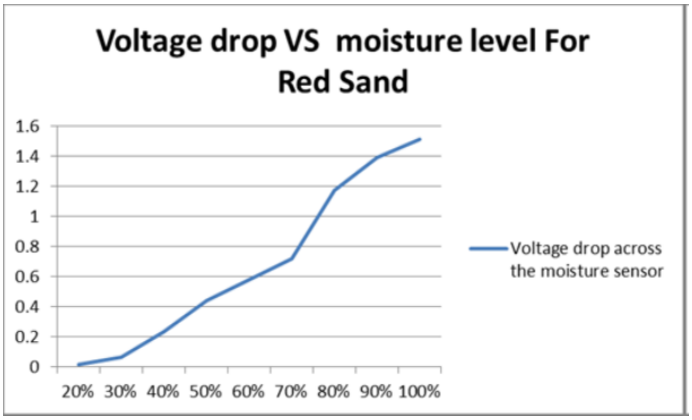
Moisture Sensor

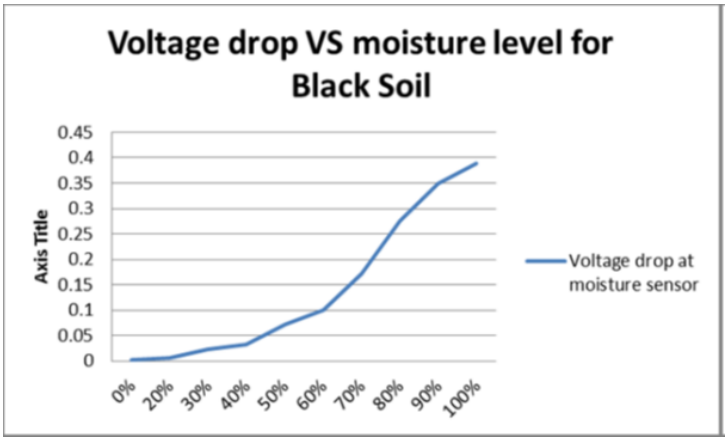
4.1. Results Obtained from Moisture Sensors

Precisely when the wetness sensor endeavored in various soils, it will have specific examining, as there is change in resistance, in this way the stickiness sensor should have been fit in with suit with various sort of soil 2. This soaked quality sensor analyzing was endeavored just with clamminess at the surface; along these lines it is just sensible with plant that acclimatizes water at first look.
The effect of voltage v/s dirt dampness for,

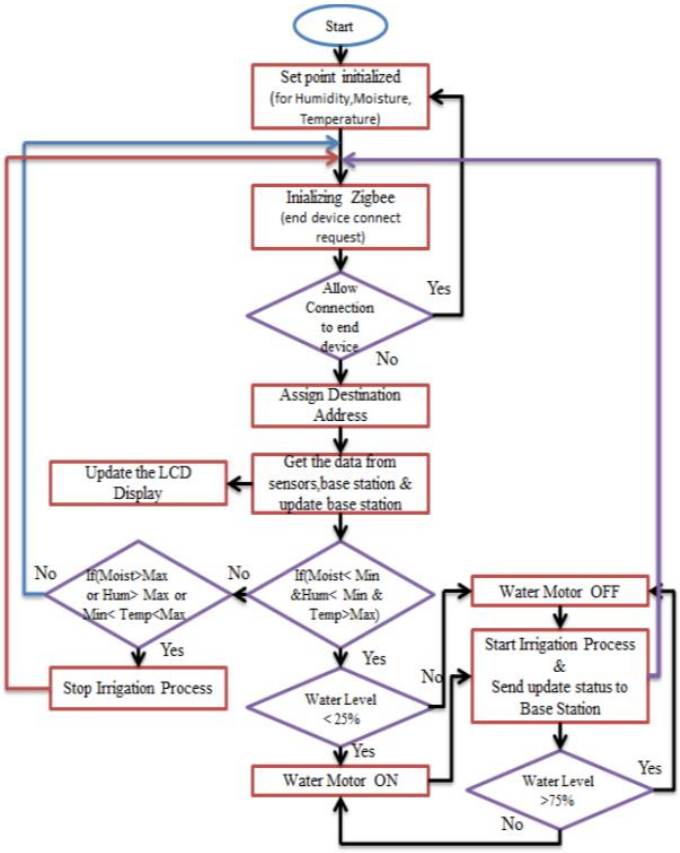
Red soil	
Moisture Level (%)	Voltage Drop (V)
0	0.01222
20	0.01489
30	0.06743
40	0.2343
50	0.4431
60	0.5808
70	0.72
80	1.17
90	1.39
100	1.509

Black soil	
Moisture Level (%)	Voltage Drop (V)
0	0.00315
20	0.00655
30	0.02247
40	0.03238
50	0.07277
60	0.10122
70	0.17177
80	0.27477
90	0.35
100	0.3887





The flow chart of functioning of the Automated Smart Irrigation module,



5. WORKING OF THE MECHANIZED WATERING MODULE FRAMEWORK IS AS PER THE FOLLOWING,

1. The Moisture sensors are covered inside the dirt in required zone of watering module. The sensors utilized are remote sensors. These sensors transmitted the simple information caught from the independent Moisture sensors by measuring the dielectric quality.

2. The information gathered from the Self-made dampness sensor is transmitted by the ZB transmitter to the recipient associated with the PIC MC.

3. Also the temperature and the humidity is measured and the simple information is given to the PIC controller.

4. The simple information gained is changed over into computerized information by an ADC (Analog to Digital converter).

5. The information gained from the ZB module is examined to perceive the territory with low dampness level in soil.

6. After the dampness level and other parameter is checked with the required worth and if the dampness level in soil. At that point the trickle watering module is exchanged on.

7. Before the Drip watering module is initiated, the water level in the overhead tank is checked, if the level is above 25%. In the event that the water level is under 25%, then the water pump is turned on and the tank is filled with water. After the tank is filled then the watering module is activated.

8. The drip irrigation watering module is continued till the dirt recaptures the required dampness level according to the necessity of soil and Crop.

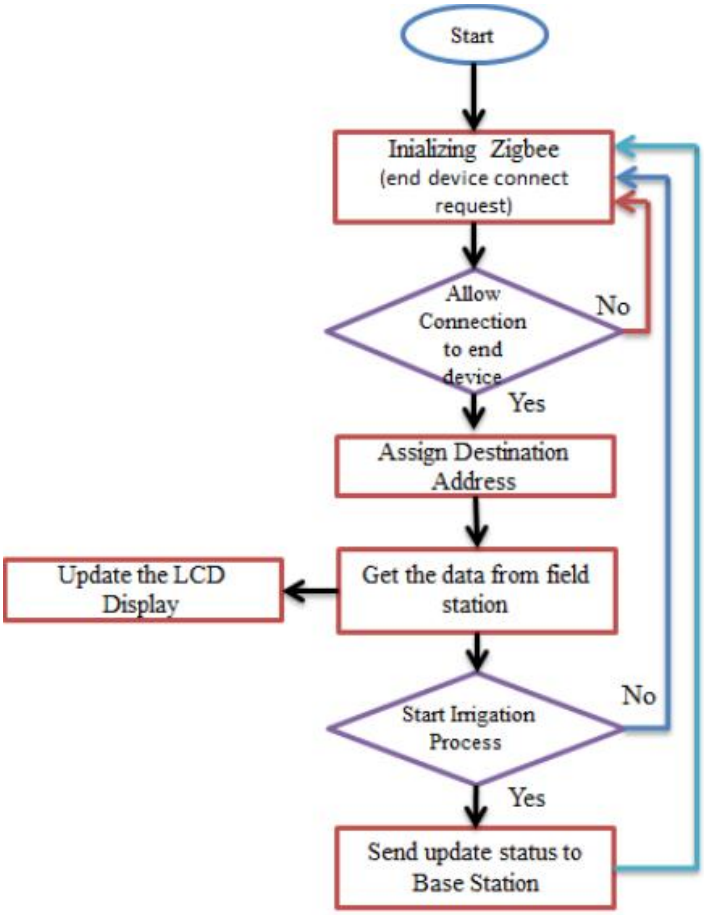
9. The framework gets exchanged off once the dampness is accomplished and the framework will just switch of if the dampness level falls underneath as far as possible, until then framework stays off.

10. This cycle rehashes consequently, at whatever point water is required at exactly that point it works. No human connection is required.

11. The framework can be additionally worked physically when required.

6. SOFTWARE DESIGN

The fundamental undertaking of this framework is brought into shaped by utilizing the presented C-programming language. The flow diagram for the structure which incorporates the noteworthy number of segments was portrayed out by utilizing the proteus ISIS 7 fit structures. The key model was made in bykeil Integrated Development Environment by utilizing the presented C programming dialect. The .c structure was changed over into .HEX file in this IDE and fumed into the system.



Base Station Software Flow-chart

7. CONCLUSION

This Smart Irrigation model was effectively worked, with breaking point, for occurrence, automatic-control and manual-control procedure for watering, when and where client arranged to set the methodology for watering structure to automatic-control and manual-control watering. Automatic-control watering will be the mode where it will water the plant as per customer specification and it will essentially water the course of action until it is sufficiently soaked.

The dampness level to be held can be set in three unique modes "Dry Soil", "Moderate Wet Soil" and "Amazingly Wet Soil", contingent on the yield or soil sort. Likewise it targets just the range where the dirt is dry or the dampness level is beneath the required worth. With the assistance of solenoid valves the water stream is focus to required zone.

This framework can be utilized to for agribusiness reason also for home plant watering. The misuse and waste of water can be decreased as this framework uses water ideally. As we are confronting a ton of lack of water India, there is no water for drinking in numerous spots in India amid summer. By utilizing this sort of framework the water use can be lessened and water can be spared.

Additionally Indian government can give this sort of framework at low costs to Indian famers by programming and set to required elements relying upon the dirt sort and harvests. They can likewise give specialized help. As this will be useful is conquering the shortage of water confronted in India both for drinking and Agriculture.

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