

AUTOMATIC INTELLIGENT PLANT WATERING SYSTEM DEPENDING ON THE SOIL MOISTURE

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ABSTRACT

With the development of technology there is also an increase in the demand of the food, plantation in the societies now days. In the same way Water which is the most important cultural practice and most labor intensive task in daily greenhouse operation. Watering systems ease the burden of getting water to plants when they need it. Knowing when and how much to water is two important aspects of watering process. To make the gardener works easily, the automatic plant watering system is created. This project uses watering sprinkler system because it can water the plants located in the pots. This project uses RPi board, which consists of ARM cortex (64 pins) . It is programmed in such a way that it will sense the moisture level of the plants and supply the water if required. This type of system is often used for general plant care, as part of caring for small and large gardens.

1. INTRODUCTION

Water is the most important cultural practice and most labor intensive task in daily greenhouse operation. Without water no plants, no life so watering system ease the burden of getting water to plants when they need it. Knowing when and how much to water is to important aspects of watering process. For these all above we are making this project so that in less water we can manage to plant and make environment green. Though this technic we can save water and when there is no water then also we can plant crops or plants. With the help of this technic farmers will also face less issues or problems regarding farming or having good yield in their farms. As the unplanned use of water inadvertently results in wastage of water. This can lead to permanent loss of aquifer capacity, water level quality will also decrease and other problems. The new technology and the other application helps to make this area with the great help as they deliver efficiency and accuracy. In the Automatic Plant watering system using RPi, the most significant advantages is the water is supplied only when the moisture in soil goes below a pre-set threshold value. This saves us a lot of water. In recent times, the farmers where using manual controls technics for the applications of farm but now with the help of new technic the farmers irrigate the land at regular intervals by turning the water-pump on/off when required. But sometimes this new technic also make deficiency of water which can be occur because of no time management or access of water to plant.

This problem can be perfectly rectified if we use Automatic Plant Watering System Depending on Soil Moisture in which the irrigation will take place only when there will be intense requirement of water, as suggested by the soil moisture.

2. LITERATURE SURVEY

Venkata Naga et al.in [1] Developed automatic irrigation system used for the plants. This system is controlled by the RPi to give the interrupt signal to the motor. Temperature sensor and humidity sensor are connected, whenever there is a change in temperature and humidity of the surrounding these sensors sense the change in the temperature and humidity and gives an interrupt signal to RPi and thus the motor is activated.

Chatali R. Fule et al.in[2] the soil moisture sensor based irrigation system which can prove to be a real time response control system which monitors and wheels all the activities of the irrigation system.

3. BLOCK DIAGRAM

The project is having two functional components those are motor/ water pump and soil moisture sensor. The function of the soil moisture sensor is to detect the moisture level or the humidity of the soil. The motor/ water pump will give the water to the plant. The motor in this which is used is of 9 volt battery, battery life can be detected by the current measurements. The RPi has a code to work that is done in python. .

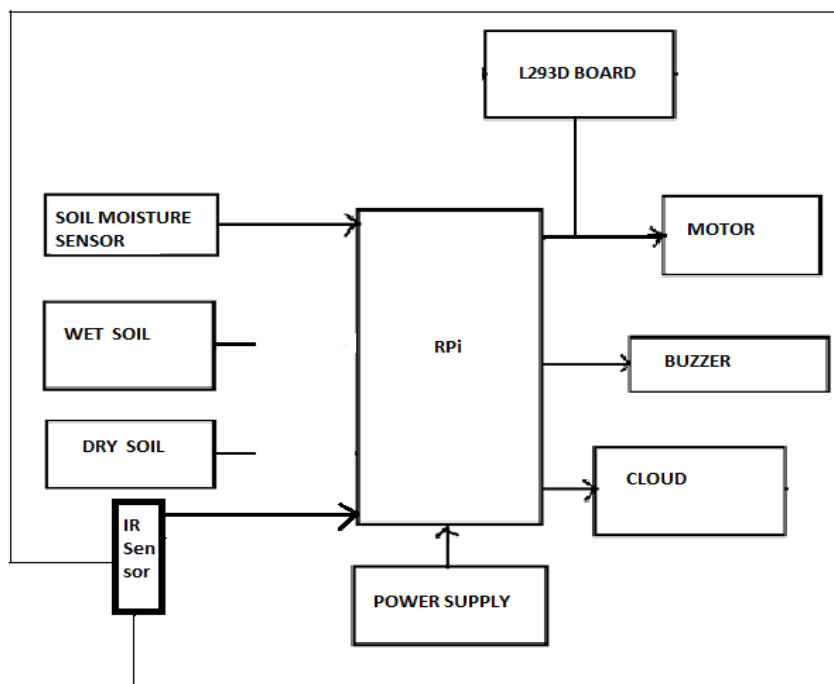


FIG - 1: Automatic Plant Watering Block Diagram

4. SYSTEM REQUIREMENT SPECIFICATION

4.1. SOFTWARE REQUIREMENTS

- Operating System: Windows 7 or higher.
- Coding Language: Java, XML.
- Python.

4.2. HARDWARE REQUIREMENTS

- Motor/ Water pump: 9 volts
- Soil moisture sensor
- Buzzer
- L293D Board
- Wet and Dry Soil boxes/containers.
- IR Sensors.

5. TECHNICAL SPECIFICATIONS

5.1 ADVANTAGES

- Saving water
- Saving Time
- Saving manpower
- Optimal water supply to plant/crop.
- Automatic Operation.
- Protection against adverse weather Conditions.

5.2 FUTURE SCOPE

- Automatic carrying of plants will be done.
- Plantation will be successful in low water quantities.
- Environment balancing like tree plantation & saving trees kind of activities will become come easy once implemented.
- It is possible to pumping the water by solar energy.
- It is possible to connect humidity sensor to sense humidity.
- By we timer (section) circuit we control the supply of pump by timer.

6. CONCLUSION

Thus the “AUTOMATIC INTELLIGENT PLANT WATERING SYSTEM DEPENDING ON THE SOIL MOISTURE” has been designed and tested successfully. It has been developed by integrated features of all the hardware components used. Presence of every module has been reasoned out and placed carefully, thus contributing to the best working of the unit. Thus, the RPi Based Automatic Plant Watering System has been designed and tested successfully. The system has been tested to function automatically. The moisture sensors measure the moisture level (water content) of the different plants. If the moisture level is found to be below the desired level, the moisture sensor sends the signal to the RPi board which triggers the Water Pump to turn ON and supply the water to respective plant using the Rotating Platform/Sprinkler. When the desired moisture level is reached, the system halts on its own and the Water Pump is turned OFF. Thus, the functionality of the entire system has been tested thoroughly and it is said to function successfully

7. REFERENCES

- Venkata Naga et al.in [1] Developed automatic irrigation system used for the plants.
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- Design and construction of automatic power changeover system, by Jonathan Gana Kolo
- The 8051 Micro controller and Embedded Systems, by Muhammad Ali Mazidi