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Project Title

SY B.Tech. Minor Project Report

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SCHOOL OF ELECTRICAL ENGINEERING

MIT ACADEMY OF ENGINEERING, ALANDI (D), PUNE-412105

MAHARASHTRA (INDIA)

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SY B.Tech. Minor Project Report

submitted in partial fulfilment of the
requirements for the award of the degree
of

Bachelor of Technology

In

ELECTRONICS & TELECOMMUNICATION

BY

Amit Tayade, Vivek Bawanthade, Mangesh Dushman, Shivam matale

SCHOOL OF ELECTRICAL ENGINEERING

MIT ACADEMY OF ENGINEERING, ALANDI (D), PUNE-412105

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CERTIFICATE

It is hereby certified that the work which is being presented in the SY B.Tech. Minor Project Report entitled **"*Smart Plant Watering System*",** in partial fulfilment of the requirements for the award of the **Bachelor of Technology in Electronics & telecommunication Engineering** and submitted to the **school of Electrical Engineering of MIT Academy of Engineering, Alandi(D), Pune, affiliated to Savitribai Phule Pune University (SPPU), Pune** is an authentic record of work carried out during an Academic Year 2021-2022, under the supervision of Mr**. Amit V. Nagarale, School of Electrical Engineering.**

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ABSTRACT

Smart solution for the problem of watering the plants at particular time on regular basis. People who are working professional faces this problem. Smart plant watering system will help the people facing this problem effectively. Our project consists of RTC (real time clock) which sets the time as per user requirements for watering the plants. User can set the time as per his/her convenience and RTC will fix that time for watering the plant in the system. Moisture sensor in the project is acting as an interrupt. At the set time Arduino will give the signal to relay to start the motor but at the same time moisture sensor will detect the moisture from the soil. If the soil is already wet then the motor will not start at that set time & if the soil is dry then the motor will start at that set time.

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1. Introduction

The RTC (real time clock) in this project's "smart plant watering system" sets the timing for watering the plants according to the user's preferences. The user can adjust the time to suit his or her needs, and RTC will water the plants in the system at that time. Arduino, Relay, and LCD are the main components of our project. The project's moisture sensor acts as an interrupt. The Arduino will send a signal to the relay to start the motor at the predetermined time, but the moisture sensor will detect moisture in the soil at the same time. If the soil is already wet, the engine will not start at the specified time; if the soil is dry, the motor will begin at the specified time.

2. Motivation

1. Common people generally forget to water the plants on a daily basis due to hectic routine.
2. Not giving the water to plants in a fixed timing.
3. There are some other approaches like using moisture sensor plants that are automatically watered but due to the corrosive nature of the moisture sensor system required some maintenance, so in the proposed system the plant watering system is designed by using RTC.

3. Problem statement

To Design and Implement RTC based Smart plant watering system

4. Objectives

1. To make the watering system automated as per requirement.
2. To ensure proper moisture essential for plant growth.
3. To nourish a plant by watering it from time to time.
4. To reduce human involvement.

5. Literature Survey

<u>Automatic Plant watering System Using Arduino Work and Result</u>

● Author- Khin Thandar Tun ● Published On- 8/27/2019 ● Institute: Technological University (Meiktila), Burma

The soil moisture sensor continuously monitors the volumetric moisture content in the soil and sends that information to the Arduino with values lying in the range 0 to 1023. Then the sensor obtains the data from the soil and display on the LCD screen. If the soil moisture content goes above a certain point, which is decided by the threshold value given in the Arduino code, the servo motor and the DC motor to start the watering mechanism.

Common Drawbacks from their projects:

1. They used the soil moisture sensor in the experiments.
2. Soil moisture sensors might get corroded after a long time due to excess exposure to air and water.
3. In the rainy season soil remains wet almost a whole day, so the moisture sensor gives indications very frequently. Due to this the motor will start to water the plants even if it is not needed. So, there might be loss of some water.
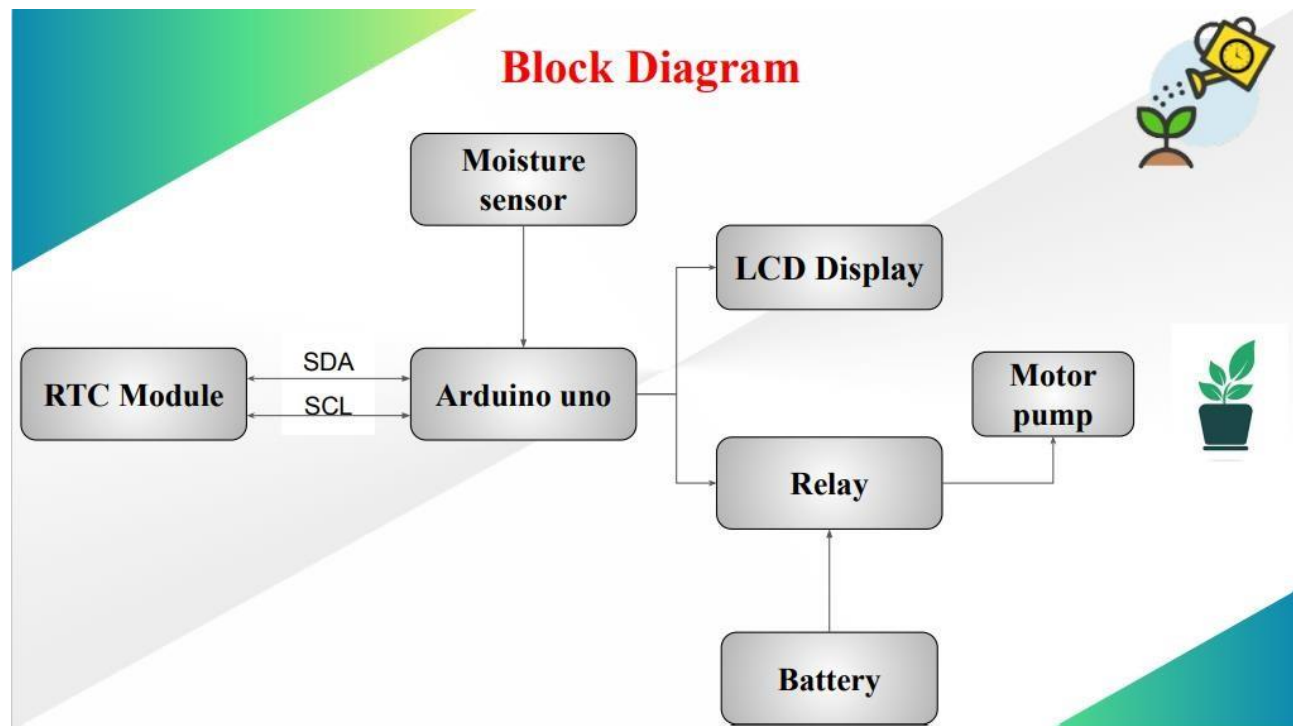
6. Block Diagram

Figure 6.1 Interfacing Block Diagram

7. Hardware and Software Requirements

Hardware	Software
Arduino Uno R3	Arduino IDE
RTC	Proteus
Motor Pump	
LCD Display	
Jumper Wires	
Pipe	
Water Canister	

USB Cable	
Breadboard	
Moisture Sensor	
Switch	
9V Battery	
Relay	

Table 7.1

8. Methodology

1. Desired time will set by user with the help of RTC when he wants to water the plants daily.
2. At that particular time the moisture sensor will detect the availability of moisture in the soil.
3. If the soil has much amount of moisture, then it will act as an interrupt and doesn't start the motor.
4. If the moisture is not there then motor will start for some time to give the water.
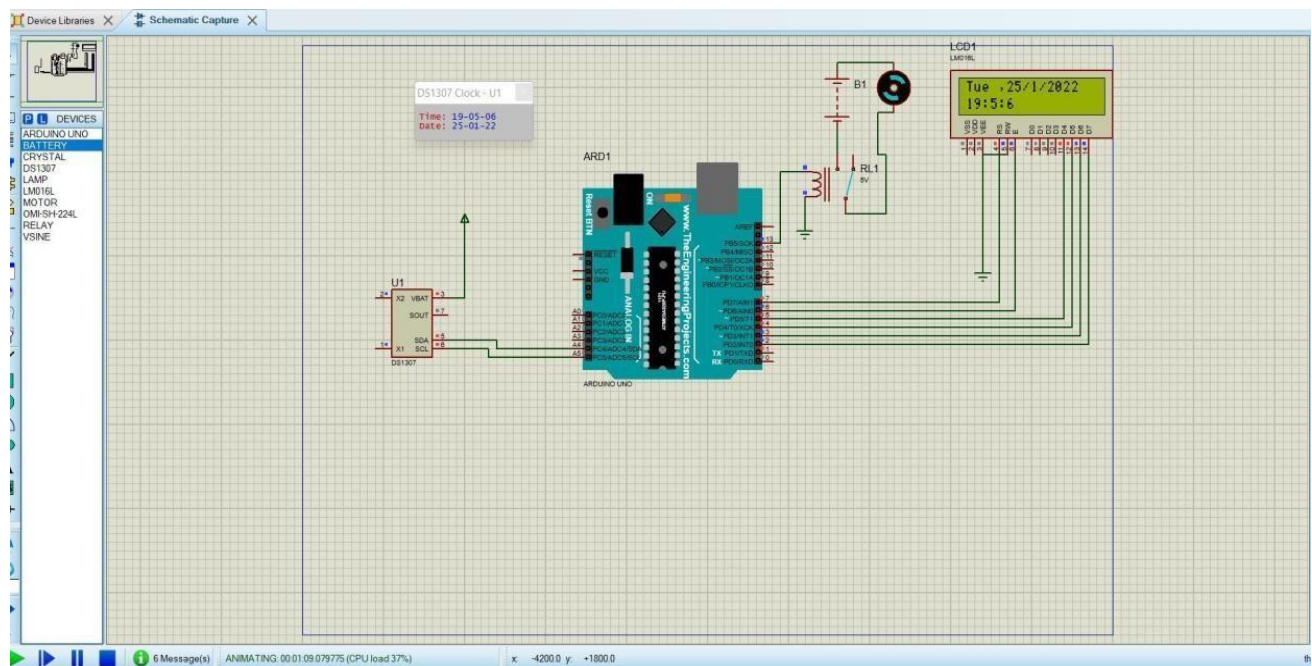
9. Software Implementation

Figure 9.1 Software Implementation

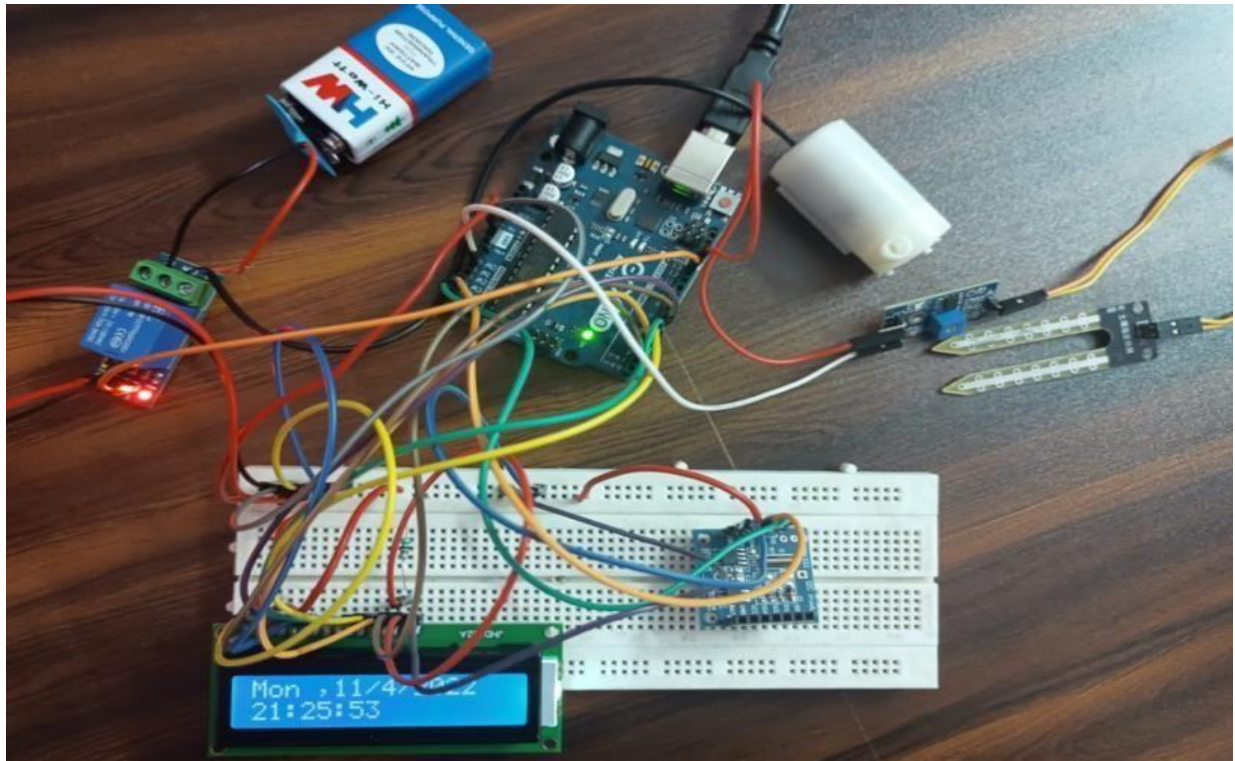# 10. Hardware Implementation

Figure 10.1 Hardware Implementation

Figure 10.2 Hardware Implementation

11. Final Product

Figure 11.1 Final Prototype

Figure 11.2 Working Prototype

12. Cost Analysis

Serial Number	Components	Prices (Rs)
1.	Arduino Kit	1200
2.	Moisture Sensor	150
3.	Battery	25
4.	Relay	60
5.	RTC Module	200
6.	Motor	170
7.	Switch	10
	Total	**1815**

Table 12.1

12. Limitations

1. Moisture sensor can get corroded after a long time of use.
2. Users can't use this for long distances as the WIFI module is not used in our project.

13. Future Scope

1. Using the GSM /WIFI module we can connect our project with the internet so that users can use it remotely.
2. To change the time manually switch buttons can be added.
3. We can make the project work two times a day as per user requirement.

14. Conclusions

Manually time is set using RTC for ON/OFF the pump at that desired time only. At that particular time a moisture sensor will detect the moisture of the soil and depending upon that the pump will start & it will act as an interrupt. Automatic plant watering system by using Arduino was successfully established and tested. The automatic plant watering system has a user-friendly design so it is used by the household users as well as the commercial user. The best benefit is that it

reduces the wastage of water during irrigation and helps in saving the precious water resource. Others are saving time, optimal water supply to plant or crop, automatic operation and protection against adverse weather conditions.

15. REFERENCES

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