

# Real Time Automatic Irrigation System

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**Abstract:** Real Time Automatic Irrigation System project is about the real time automatic irrigation system. The report consists of introduction, block diagram, interfaces, soil moisture sensor, solenoid valve, relays. The continuous increasing demand of food requires the rapid improvement in food production technology. In a country like India, where the economy is mainly based on agriculture and the climatic conditions are isotropic, still we are not able to make full use of agricultural resources. The main reason is the lack of rains & scarcity of land reservoir water.

The continuous extraction of water from earth is reducing the water level due to which lot of land is coming slowly in the zones of un-irrigated land. Another very important reason of this is due to unplanned use of water due to which a significant amount of water goes to waste. Agriculture is the oldest occupation in the world. We are unable to make full use of agricultural resources. The main reason is the lack of rains and scarcity of land reservoir water. This project helps in time saving and removal of human error in adjusting available soil moisture levels. The goal of this project is to automate the irrigation system with the help of wireless communication. Before having an automatic irrigation system installed, land owners usually are advised to conceptualize and map out a landscape design plan. This map or blueprint will determine the amount of water each lawn section will need.

The report explained the Real Time Automatic Irrigation System through block diagram. Under interface the sensor, relay and microcontroller is defined very clearly and pictorial way. Irrigation is the artificial application of water to the soil usually for assisting in growing crops. In crop production it is mainly used in dry areas and in periods of rainfall shortfalls, but also to protect plants against frost.

**Keywords:** Automatic irrigation, Moisture content, GSM, Timing technique, Microcontroller, LCD display.

## 1. Introduction

An automatic irrigation system presents the most efficient convenient and cost effective way to irrigate the landscape and stimulate lush greenery all around. Proper designing and maintaining both the irrigation system and irrigation valves is important as more than 60% of wasted water due to poorly designed installed and operated sprinkler systems. The main reason is the lack of rains and scarcity of land reservoir water. The continuous extraction of water from earth is reducing the water level due to which lot of land is coming slowly in the zones of unirrigated land. Another very important reason of this is due to unplanned use of water due to which a significant amount of water goes to waste. This problem can be rectified if we use.

## 2. Working

The moisture of the soil is identified by using the soil moisture sensor. The temperature of the soil is displayed in the LCD display. It consumes less power. Initially the temperature is zero. The part requires 12v power and the microcontroller requires only 5v so the power can be step down with the help of register. The information related to the temperature is send to the users mobile through GSM modem. The user can give the message as "start motor for 60 minutes". When user give message like this, then the motor will run automatically for 60 minutes with certain period of time. Basing On time setting, the motor will run fastly or slowly. When we turn on the motor the water will automatically go to the plants root. It will take around one minute. This time can also reduce with the help of program.

## 3. Description of Components

Following are the major components used from which microcontroller based automated irrigation system has been fabricated.

- Soil moisture sensor
- Microcontroller
- Relay
- GSM Modem
- Liquid Crystal Display
- Dc motor driver

### 1) Soil Moisture Sensor:

The moisture sensor is buried in the ground at required depth. The working of the moisture sensor is simple and straightforward. The moisture sensor just senses the moisture of the soil. The change in moisture is proportional to the amount of current flowing through the soil.

### 2) LCD

A liquid crystal display is a special thin flat panel that can let light go through it, or can block the light. The panel is made up of several blocks, and each block can be in any shape. Each block is filled with liquid crystals that can be made clear or solid by changing the electric current to that block liquid crystals are used in battery powered devices [6]-[8].

### 3) Relay

A relay is a device designed to trip a circuit breaker when a fault is detected. The first protective relays were electromagnetic devices relying on coils operating on the moving parts to provide detection of abnormal operating conditions such as over current, over voltage, reverse power

flow [9]-[11].

#### 4) GSM

A GSM modem [12-17] is a specialized type of modem which accepts a SIM card and operates over a subscription to a mobile operator just like a mobile phone. From the mobile operator perspective, a GSM modem looks just like a mobile phone. While these GSM modems are most frequently used to provide mobile internet connectivity, many of them also used for sending and receiving SMS messages.

#### 4. Conclusion

The Microcontroller based irrigation system proves to be a real time feedback control system which monitors and controls all the activities of drip irrigation system efficiently. The present proposal is a model to modernize the agriculture

industries on a small scale with optimum expenditure. Using this system, one can save manpower, water to improve production and ultimately profit.

#### References

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