# Remote Irrigation and Monitoring System Using GSM Technology

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*Abstract:* **The motivation for this project came from the countries where economy is based on agriculture and the climatic conditions lead to lack of rains & scarcity of water. The farmers working in the farm lands are solely dependent on the rains and bore wells for irrigation of the land. Even if the farm land has a water-pump, manual intervention by farmers is required to turn the pump on/off whenever needed. The aim of our project is to minimize this manual intervention by the farmer. Automated Irrigation system will serve the following purposes:**
**1) As there is no un-planned usage of water, a lot of water is saved from being wasted.**
**2) The irrigation is the only when there is not enough moisture in the soil and the sensors decides when the pump should be turned on/off, saves a lot time for the farmers. This also gives much needed rest to the farmers, as they don't have to go and turn the pump on/off manually.**

*Keywords:*  **DTMF Decoder IC, Cell Phone, Relay Switch, Water Pump, Sensor.**

## 1.  INTRODUCTION

Irrigation is the key to a successful garden. Long gone are the days of manual watering or relying on a friend to water when you are on vacation or away on business. The Project presented here waters your plants regularly when you are out for vacation.At the present era, the farmers have been using irrigation technique in India through the manual control in which the farmers irrigate the land at the regular intervals. The global irrigation scenario, however, is characterized by poor performance, increased demand for higher agricultural productivity, decreased availability of water for agriculture, increasing soil salinity and possible effects of global warming and climate change. This process sometimes consumes more water or sometimes the water reaches late due to which the crops get dried.The circuit comprises sensor parts built using DTMF Decoder IC CM8870. Two stiff copper wires are inserted in the soil to sense the whether the Soil is wet or dry. When Sensor Sense the dry condition then the project will switch on motor pump by sending the DTMF signal by user through cell phone and in the same way it will switch off the motor when the sensors are in wet. This project is made up of regulated 5/12 V DC power supply, DTMF decoder circuit, Tone generators to provide power supply or pump On/Off status, and output stages of relay and logics.

### A. Objective of Project

The objectives of this project are as follows;

1.   To design, implement and provide as implant economic solution for water irrigation and    monitoring system.

2.  This system should operate on5/12voltDC power supply.

3.  The system should monitor moisture in soil and should regulate water .

4.  To remove wastage of water and electricity.

5.  To remove physical effort and inconvenience.

### B. Why This Project?

If we look at current scenario of water irrigation for agriculture sector various problems are facing by the Farmers due to following reasons.

1. The increasing demand of the food supplies requires a rapid improvement in food production technology. In many countries where agriculture plays an important part in shaping up the economy and the climatic conditions are isotropic, but still we are not able to make full use of agricultural resources.

2. One of the main reasons is the lack of rains & scarcity of land reservoir water. Extraction of water at regular intervals from earth is reducing the water level as a result of which the zones of un-irrigated land are gradually increasing.

3. The unplanned use of water inadvertently results in wastage of water. In an Automated Irrigation System, the most significant advantage is that water is supplied only when the moisture in soil goes below a pre-set threshold value. This saves us a lot of water.

## 2.    SYSTEM DEVELOPMENT

### 2.1 Block Diagram
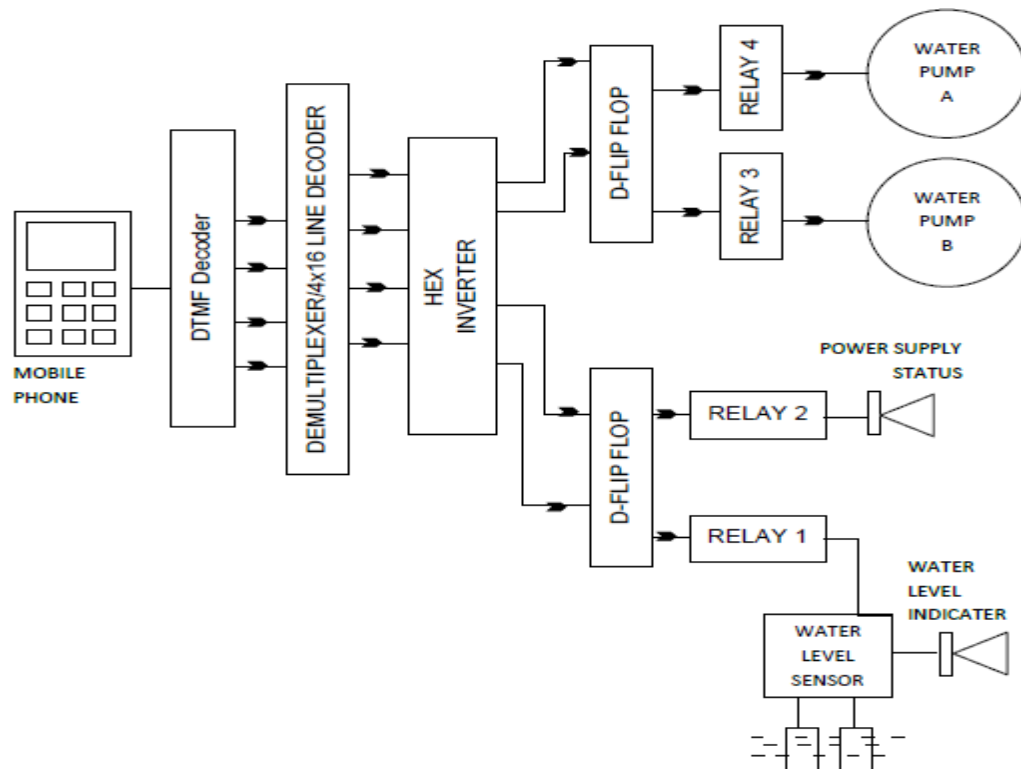


The basic block diagram of this project based irrigation system is given above. The system contain:

Cell phone, DTMF Decoder, Demultiplexer, D flip-flop, Relay, sensor, water pump etc. The function of each block is given below.

### 2.2 Cell Phone

It is the part of this system which receives DTMF (Dual Tone Multiple Frequency) and send it to the DTMF decoder IC.

### 2.3 DTMF Decoder

It decodes the DTMF signal into BCD (Binary Code Decimal) which received from the cell phone. Then this BCD number is fed to the Demultiplexer IC (which used as a decoder).

### 2.4 Demultiplexer

Here we used Demultiplexer IC as a decoder. This decoder decodes the BCD number into its decimal equivalent. This decoder IC produces active low output. Thus we use Hex inverter IC to convert this active low output into active high.

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**2.5 D Flip-flop**

D flip- flop use to trigger the relay switch.

**2.6 Relay**

A relay is an electrically controllable switch which allows the isolation of two separate sections of a system with two different voltage sources i.e., a small amount of voltage/current on one side can handle a large amount of voltage/current on the other side but there is no chance that these two voltages mix up.
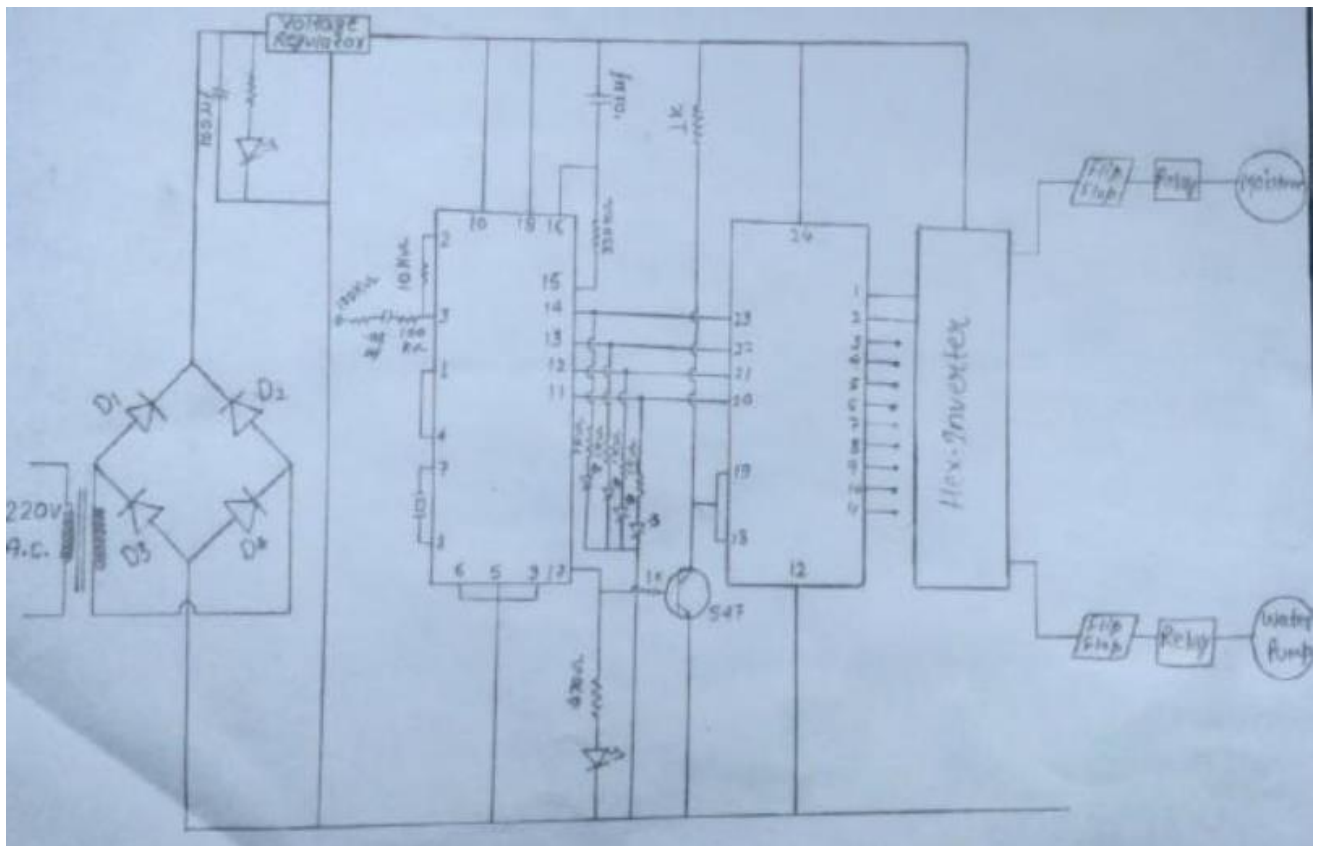
**2.7 Sensor**

It senses the moisture.

**2.8 Water Pump**

It use to provide water for irrigate the field.

**Circuit Diagram**



## 3.   CONCLUSION

Irrigation has been the backbone of human civilization since man has started agriculture. As the generation involved, man developed many methods of irrigation to supply water to the land. In the present Scenario on conservation of water is of high importance. Present work is attempts to save the natural resources available for human kind. By continuously monitoring the status of the soil, we can control the flow of water and thereby reduce the wastage. By knowing the status of moisture and temperature through GSM with the use of moisture and temperature sensors, water flow can be controlled by just sending a message from our mobile. Conservation of water and labour: Since the systems are automatic, they do not require continuous monitoring by labour. Thus, this system avoids over irrigation, under irrigation, top soil erosion and reduce the wastage of water. The main advantage is that the system's action can be changed according to the situation (crops, weather Conditions, soil etc.). By implementing this system, agricultural, horticultural lands, parks, gardens, golf courses can be irrigated. Thus, this system is cheaper and efficient when compared to other type of automation system. In large scale applications, high sensitivity sensors can be implemented for large areas of agricultural lands. A stand by battery or solar cells can be implemented which comes into use in case of power cuts. A secondary pump can be used in case of failure of the pump.

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