# DTMF BASED SMART AGRICULURE

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## ABSTRACT

The project works on the principle of DTMF tone command so received from any phone to remotely switch any electrical load such as agricultural pump, domestic and industrial loads etc. In industries, the loads are spread over a large area and thus, operating these loads is a very tiresome and difficult task. In agricultural fields also, pumps and other loads are connected over a large area and hence it is difficult for the farmer to operate all the loads and similarly for house hold loads. Keeping these problems in mind, the proposed system has been designed which uses DTMF technology to control the loads remotely.

## INTRODUCTION

Now days, water shortage is becoming one of the biggest problem in the world. Many different methods are developed for conservation of water. We need water in each and every field. In our day to day life also water is essential. Water is considered to be basic need of human. Water is needed for everyone human beings, animals, plants, etc . Agriculture is one of the fields where water is required in tremendous quantity. Wastage of water major problem in agriculture . . Every time excess of water is given to the fields. There are many techniques to save or to control wastage of water from agriculture.

The micro-controller based automated Irrigation system will supply the following:  As there is no unexpected usage of water, a lot of water is saved

A cell phone is interfaced to a DTMF decoder in the system from its audio output socket for receiving tone commands. The receiving cell phone codes are converted into digital commands by using a DTMF Decoder which will identify the frequency of the key and convert that frequency to its equivalent digital code which is then fed to a microcontroller (8051 family). As per the commands sent from the sender's mobile, the microcontroller will send signals through a buffer to actuate the respective loads by turning the relays ON/OFF. These relays are actuated by a relay driver IC interfaced to the microcontroller.

from being wasted. The irrigation system is use only when there is not sufficient moisture in the soil and the microcontroller decides when should the pump be turned on/off, saves a lot time and water for the farmers.

As there is no unanticipated usage of water, a lot of water is saved from creature wasted. This also gives much wanted rest to the farmers, as they don't have to go and revolve the pump on/off automatically. The constant increasing command of the food provisions requires a rapid improvement in food production technology. In a lot of countries like India where agriculture and the climatic conditions are isotropic, at a standstill we are not able to make full use of agricultural possessions. The main reasons is the not have of rains & insufficiency of land lake water. Hence the project

"DTMF BASED SMART AGRICULTURE" is specially designed to reduce the water wastage, to give the quality product without taking more effort. It reduces manpower also. It helps to increase the product and financial profit drastically. It is more easy to control agricultural application like motor by cell phone.

This system uses the cell phone as main controlling or operating device from which the various applications in the field or farm will be controlled.

## LITERATURSURVEY

Literature review is an inevitable part of research since it gives a concrete knowledge of an area of research where someone intends to carry out and to learn more about this subject. Literature review was carried out to identify research bottlenecks and helps
one to come out with a refined research topic; this is achieved by learning from previous works done by other researchers in the same field.

Agriculture sector has important role in growth of India. Technological advancement in the agricultural sector in India has been seen in India in last two decades which also results in the health and safety issues of agricultural workers.

## EXISTING SYSTEM

Existing systems used for the agriculture were manual, computer based , time based, open loop systems, real time feedback system, volume based systems, closed loop systems.

Time based system makes use of controllers to gauge the amount of water to be applied in an irrigation system open loop system makes use of a schedule which described it as a timing of irrigation process for a period of time which either uses volume of water or time for control function.

## PROBLEM STATEMENT

Computer based irrigation control system is interface of hardware and software section which acts as the intelligent part of the system whose

We can also know the current temperature, humidity and light intensity at the field.

DTMF decoder convert the analog commands given from the cell phone to equivalent digital attaching it a code. As per the commands send from the sender's mobile, the controller will send signal to actuate the respective loads by turning ON/OFF the relays. The major advantage of this system is the person can able to control these applications from the long distance away from farm or field

function is to monitor changes in the irrigation system via a computer and can alert the user if there is a problem in the system. Real time feedback system is determined by plant requirement and specific parameters set which describes sensors as a means of providing feedback to the controller to enable it to effect operation. Volume based system uses a predetermined volume of water which can be applied to the field once , this obtained by using valves with meters which enables control and lastly a closed loop system makes use of a feedback from either a single sensor or several sensors which provides the irrigation decisions to be carried out based on the data obtained.

The use of manual irrigation consumes a lot of time apart from being labour intensive , it needs monitoring frequently but automatic systems can be programmed to turn ON and OFF the system depending on the parameter to be controlled .irrigation control methods used in Kenya are mostly manual and a lot of water is wasted during irrigation. This project seeks to help to minimize on water usage hence enhancing conservation.

## DISADVANTAGES

1. Manual irrigation needs more hard work and human efforts
2. Requires more hardware and software interfacing
3. Less water saving
4. Volume based systems can identify only predetermined volume
5. Systems are time consuming

6. In manual irrigation there is big possibility of

   diseases

7. Systems are more complicated

## PROPOSED SYSTEM

### AIM

The aim of this project is to critically assess the automation of an irrigation system using a moisture sensor and a microcontroller as the main brain of control. It is evident that if comparison is made with theoretical knowledge there are inherent problems associated with RF signals due to interference, and also moisture sensors give different readings in respect to the depth as well different soil samples.

The following aspects were put into consideration to achieve the design solution;

- Water utilization and saving
- Human interaction
- Power consumption
- Reliability
- Future improvement

This project is based on moisture sensor used to measure humidity content in the soil. The design portion involves mainly a global system for mobile communication and a control circuitry with a microcontroller. This project used some of the software like basic language for programming the application software to the microcontroller and visual basic for interfacing the hardware and mobile phone.

Using DTMF 8870 IC will act as an interface between the user and the system as it is a receiver which links the GSM network, the microcontroller contains the software which states the conditions of

## TECHNOLOGY

The project "DTMF based SMART AGRICLTURE" uses the controller ATMEGA8 which is the most important element of the system. IT has four I/O ports. For this project we are using

the system which can be displayed in a liquid crystal display and transmitted via mobile phone to the dual tone multiple frequency receiver which is part of the control system in the farm. New technologies help in increasing productivity with use of less manpower as well as conservation of water in the process.

## OBJECTIVES

The core objective is to manage irrigation for optimum food production that will also prompt data to a remotely on every occurrence on the field with help of a mobile phone and a DTMF. The user will be able to switch ON and OFF the irrigation system.

## MAIN OBJECTIVE

The main objective of this project was s to design, construct and test an automatic irrigation control system.

## GENERAL OBJECTIVES

1. Recognize the need for water saving in irrigation systems
2. Use mobile phone to control an irrigation system
3. Reduce the number of workforce in the farm

## FEATURES OF THE INTENDED SYSTEM

This system normally sends signals via a mobile phone to the DTMF and if there is a problem in the system the operator of the farm can be notified and action is taken to restore the system to normalcy.

this circuit in two modes i.e., automatic and manual mode. So to select the mode there is a single switch is used. LCD is connected to the port B for display the result. The display used is 16/2 display. The applications which are controlled by this system are heater, fan, water pump. There is temperature

sensor (LM35) is used to sense the current temperature, the humidity sensor is used to sense the moisture contains in the air, LDR is used to detect the light intensity. There is an reset switch is used which reset the system. The DTMF DECODER is used to convert the different frequencies of the keys of cell phone into the equivalent codes required to the controller for the proper operation of the system.

## IMPLEMENTATION OF CONTROLLER

The main aim of this work is to save the water, electricity and improve the growth of plant.

## RESULT

Existing agricultural systems were manual, computer based , time based, open loop systems, real time feedback system, volume based systems, closed loop systems. These systems are more complicated. These systems uses more hardware. Manual controlling systems needs the hard work, manpower. Proposed system is designed to make

## CONCLUSION

The system provides with several benefits and can operate with less manpower. The system supplies water only when the humidity in the soil goes below the reference. Due to the direct transfer of

## FUTURE SCOPE

This project is paradigm shift from manual irrigation to automatic irrigation. Sensors are used to monitor humidity level in the soil and the temperature which are processed by the

Considering farmer's economical conditions we have prepared a circuit which is cheap and reliable. We have used 89C52 microcontroller for low consumption, low cost, small circuit size and easy to implement. Micro controller can read the data available at o/p of A/D converter and store in memory and compare with the set point to turn ON or OFF relay If comparison is equal then operate relay. The operating relay makes the motor ONN or OFF according to humidity & temperature sensor by using the program. In this way we can convert physical quantity (i.e. temp, humidity) in to digital equivalent using DTMF DECODE

the agriculture control system automatic. These systems are less complicated. There is no more hardware is required. Due to automation in agriculture field, it reduces the manpower, human efforts. Due to automation it reduces water wastage, electricity wastage, etc. This system is time saving also.

water to the roots water conservation takes place and also helps to maintain the moisture to soil ratio at the root zone constant to some extend. Thus the system is efficient and compatible to changing environment.

microcontroller indicating ON or OFF condition of the system. This system also used for the home automation .The automation system using DTMF and cell phone can be implemented for departmental cabin also.

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