



SMS Controlled Irrigation System with Moisture Sensors

KEYWORDS

AT Commands, Cell Phone, GSM, Messages, Microcontroller, Moisture Sensors

V. H. Atodaria

Electronics Department, BVM
College of Engineering, V. V. Nagar

A. M. Tailor

Electronics Department, BVM
College of Engineering, V. V. Nagar

Z. N. Shah

Electronics Department, BVM
College of Engineering, V. V. Nagar

ABSTRACT *Wireless technology has now reached to every corner of the world. If such technology is added to the field for irrigating crops then it would be great for farmers as well as for other people too. It is a very tedious job for farmers to check the motor-pump by walking through long distances to the field to check whether any problem has occurred or not, such as burning or jamming of motor. The solution to such problem is described in our paper.*

This paper represents that how such things can be made possible with less cost and time by using Embedded and GSM technology. Farmers can control the motor pump on the field by sending messages and can also get informed if something hazardous occurs at the motor pump by getting messages. By this, the yield of crops can be more and farmer can earn more, so as the people. This system is developed using P89V51RD2 microcontroller and it is interfaced with motors, sensors and GSM. Also, Moisture sensors will help the user to know where the watering is required and will bypass the area or zone where sufficient soil moisture is indicated. The main aim of representing this paper is to deploy this project on commercial basis in market.

1. INTRODUCTION

Global system for mobile communication (GSM) is one of the most vital wireless communication systems that can be accessed and used very easily. The price of GSM module and subscription fee of its services is very low so it is very cost effective also. Embedded system interfaced with GSM module can widen the scope of embedded design and enhanced the application areas of controlling and monitoring systems to a great extent. During the past decade network services has extended beyond speech communication to many other custom specified embedded design application. "SMS CONTROLLED IRRIGATION SYSTEM WITH MOISTURE SENSORS" is particularly to be design to bring the new age of revolution in the agriculture field. This project proposes a GSM based remote controlled embedded system for irrigation. The interface and communication between user and designed system is via SMS on GSM network.

In a country like India, the agriculture plays the important role in the economy and development of the country. At the present era, the farmers have been using irrigation technique in India through manual control in which the farmers irrigate the land at the regular intervals [1]. There are many problems associated with irrigation.

- Normally agricultural lands are very far from the farmer's house so farmers have to go farm land that causes inconvenience and fuel consumption.
- Farmers are unable to know the status of electricity as the nature of supply of electricity is quite unpredictable.
- There are frequent instances of burning out of motor due to unpredictable voltage fluctuations and dry running.
- Farmers are present in farm field when pesticides are sprayed. These pesticides are very harmful for farmer's health.

All these issues are handled in this system. It will send status of power supply via SMS on GSM network to user. The system will check the water flow from the pump. If electricity is there but no water supply is available, system will send information to user via SMS on GSM network. The user sends data in the form of SMS on GSM network to start or stop the irrigation according to received information. It saves a lot of time of the farmer and work can be carried out quickly. However, sometimes the land consumes more water or sometimes less due to which the crops get dried. Therefore solution to this

problem is moisture sensors. Moisture sensor adds glory to this project as it passes only adequate amount of water to the crops and soil. Thus yield of crop gets higher.

2. RESEARCH FINDINGS

Much research has been carried out in the field of automatic irrigation system using GSM, Bluetooth and Zigbee Technology [2]. However, no such product exists in market that can be used by farmers or other people. It has been limited to its research papers only. Therefore, this paper shows the simplified idea which involves automatic irrigation system as well as moisture sensors that can be used in day-to-day life and can be manufactured easily. The advantage of this idea includes low cost, easy to handle, low maintenance, low power consumption. Furthermore, such technique can be used in other area also such as automation of home appliances such as to switch on-off the air conditioner, fans, lights, etc. The block diagram, flow chart and the photograph of the prototype of SMS CONTROLLED IRRIGATION SYSTEM WITH MOISTURE SENSORS are shown below.

3. BLOCK DIAGRAM



Fig. 1: Block Diagram

4. DESCRIPTION OF BLOCK DIAGRAM :

The most important part of the wireless irrigation system is P89V51RD2 microcontroller. AT89V51 is a low-power, high-performance CMOS 8-bit microcomputer with 64Kbytes of Flash programmable and erasable read only memory [3]. A versatile 8-bit CPU with Flash on a monolithic chip, the

AT89V51 is a powerful microcomputer which provides a highly-flexible and cost-effective solution to many embedded control applications. Various parts such as GSM modem, LCD, Motor driver are interfaced with it. Microcontroller is programmed with a code to start and stop the motor and also error message can be send on user mobile. GSM modem SIM 300S is used to describe protocols for digital cellular networks and interfaced to microcontroller to send and receive messages, which indirectly controls the entire irrigation system. The GSM model is controlled by a set of AT (Attention) commands. By LCD, the user can know the status of the field. Moisture sensor is associated with each of the zones in the farm field. Each such sensor is periodically interrogated by a pulse signal provided by the microcontroller via driver or buffer circuit [4].

5. PHOTOGRAPH OF THE PROTOTYPE SYSTEM



FIG. 2: PHOTOGRAPH OF THE PROTOTYPE SYSTEM

6. FLOW CHART OF THE SOFTWARE



FIG. 3: FLOW CHART OF THE SOFTWARE

7. CONCLUSION

Thus with the blend of embedded and GSM technology, the irrigation system can be controlled and remotely operated from any part of the world. It can ensure the user less time, cost and work. Adequate amount of water can be provided to crops to increase the production of food and especially the saving of water which is on red alarm.

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