

Multipurpose Remote Switch using Embedded System & GSM Technique

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Abstract—Agriculture is the backbone of Indian economy. The Indian Peasants are not making full use, of resources available in the country, for agriculture purpose. There are various reasons, for this but the uneven rainfall & scarcity of water is too. Also the misuse & wastage, of water, is another reason. Presently peasants, irrigate the land manually after regular intervals. This consumes, more water or sometimes water is reached late, when the moisture of the land is evaporated. For this reason, a system is design using micro controller for drip irrigation. In this water, will be utilized by roots of plants as & when needed, wastage of it will be saved and devices, can be control, from remote distances as well as from the station. SMS (Short Message Service) is used to control, from the remote station, the speed of motor, solenoid, humidity & temperature of the plants.

Keywords—Irrigation, GSM, SMS, Embedded-system.

I. INTRODUCTION

From ancient times, in India ground water table is used for irrigation. Irrigation was considered, as a catalyst, to have better improved and quality agriculture product. During the British rule, the development and improvement of irrigation began.

There is variation, in the rainfall throughout India, which is unequal, with respect to the normal season, due to geographical conditions and global warming. The annual rainfall is about 2500 mm per year, even less than 150 mm per year in some parts of the peninsular. About 329 million hectares, of the geographical area, in India, has huge number of rivers.

Water availability, is a big problem for crops. Load shading, of electricity from electric department, is now days manmade disaster. No time bound, for load shading, it may be during night, or sometimes in a day, at least 9 to 12 hours load shading, is done nowadays. Therefore to irrigate, the land which is under cultivation, we have designed and developed the system.

In the developed system, to control entirely it is necessary, to operate remotely, every electrode value, which requires simultaneously control information and

power. A single wire is used to control information and power which is the cheapest way.

II. CIRCUIT DIAGRAM OF THE SYSTEM

Main aim of this paper is to control devices from remote distances as well as from station control system using SMS. Figure 1 shows complete circuit diagram of system.

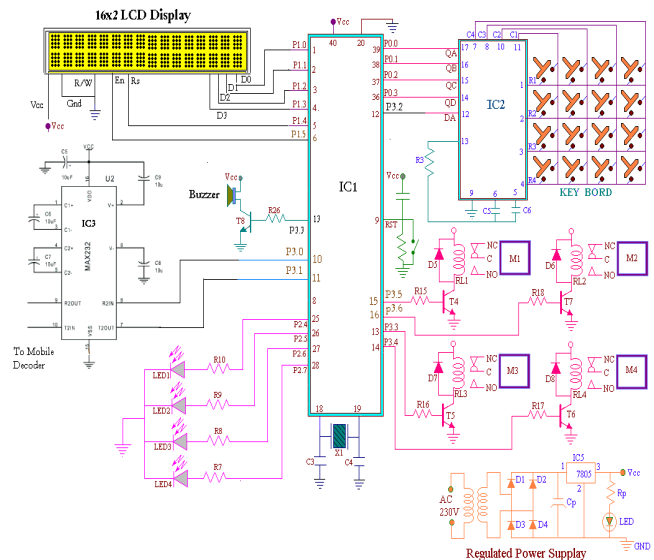


Fig. 1. Circuit Diagram of the System

This GSM network work on 0.9GHz frequency and there is no limitation of range i.e. project is work anywhere in global where mobile range is covered. In this project we can built two section, first is operate devices from remote location through SMS and other system is to control devices through key board by entering store secrete code through keyboard store in program of IC 89s8252.

One can control this system by radio frequency remote control but main limitation for it is distances, also there is lot of noise introduced in R.F. signal, Other method is controlling such a devices from telephone line, But for this purpose telephone line is required for that system, so we develop such a system which does not required any types of

cable as well as distance is limited for that purpose we select a GSM technology used in mobile phone.

Press key value is display on LCD which is connected to port pin. This display has 8 data line and 3-control line R/W, En, Rs through this pin micro controller can control and shows character on display.

At port P3 using driving transistor T4, T5, T6, T7 connect relay RL1, RL2, RL3 & RL4. Through biasing resistors to R15, R16, R17, R18. This relay is 'ON' and 'OFF' only when number feed thro' keyboard is equal to number store in program of 89s8252 is equal

- RL1 ON code no. Is - 786 RL1OFF code no. Is - 456
- RL2 ON code no. Is - 445 RL2 OFF code no. Is - 235
- RL3 ON code no. Is - 984 RL3 OFF code no. Is - 220
- RL4 ON code no. Is - 070 RL4 OFF code no. Is - 333

Above all codes number are store in IC 89s8252 this are fix and only know supervisor if illegal person comes and try to operate machine he enter number through keyboard and number is not match a buzzer is turn ON and display shows "sorry wrong password" which indicates illegal person using machine.

Buzzer is connect at pin P3.3 using transistor T8 and resistance R26 When number is enter on keyboard micro controller read number using interrupt detection and at same time display it. When one presses enter key store number can compare with fix number if both numbers are equal then and then only corresponding relay is ON otherwise buzzer is turn ON.

By means of one of the various services offered by network operators they can be converted to faxes, e-mails, and even voice calls spoken by a synthetic voice. Many cellular phones serial port can be connected to the given circuit. It helps in providing an input and an output port such that it can be easily and remotely controlled by using any mobile.

Controlling is done with the help of SMS (Short text Messages Service). When the SMS is received as "Activate burglar alarm" or "Start backup pump", it terms as command and is detected by the circuit to provide output respectively. Besides switching the port on or off, the user can pulse it for a short period (e.g. "Reboot remote server").

The cell phones can read directly the message or SMS received or typed, which is quite short, easy for the user. Incoming messages are completed with the time of reception, and stored automatically in the mobile's memory. As an additional benefit, SMS are fairly priced since they don't require precious real-time bandwidth.

Figure 2 gives the idea of GSM based system used for controlling the devices. The signal is send to amplifier stages

so as to amplify fit & fed to A/D converters in order to get digital output form of relative input signal. The Micro-controller controls the Solenoid valves through relays.

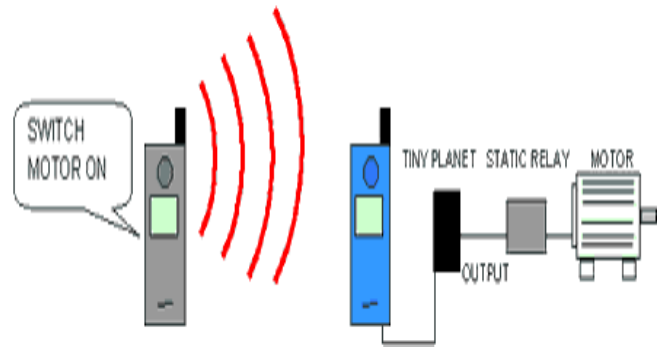


Fig. 2. Typical GSM Based System.



Fig. 3. Photograph of developed system

III. RESULT AND DISCUSSION

Nowadays we are getting very busy, so we have less time to utilize for irrigation system as most of people are involved in multi-work. It will reduce the need of extra labor for controlling the irrigation system. We can also implement the feedback SMS regarding the operation of system whether the sending SMS is received or not. The different test results are as follows:

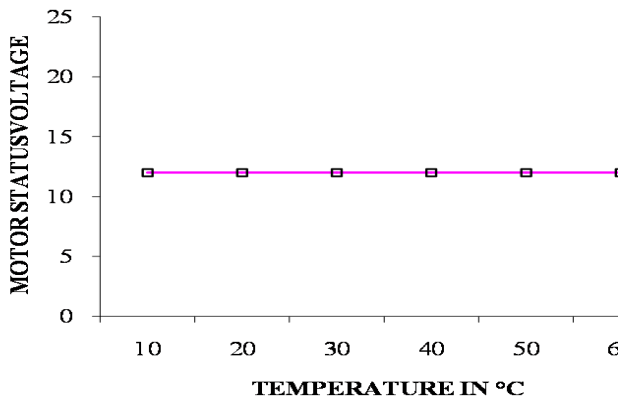
TABLE I. BUZZER TEST

Sr. No.	I/P from Keyboard	Password Status	Motor Status	Buzzer On/Off
1	786	Correct	1ON	OFF
2	445	Correct	2ON	OFF
3	984	Correct	3ON	OFF
4	070	Correct	4ON	OFF
5	456	Correct	1OFF	OFF
6	235	Correct	2OFF	OFF
7	897	Correct	3OFF	OFF
8	220	Correct	4OFF	OFF
9	333	Wrong	--	ON
10	582	Wrong	--	ON

TABLE II. TEMPERATURE TEST

Temperature in °C	Relay Status	Motor Status
10	NC	ON
20	NC	ON
30	NC	ON
40	NC	ON
50	NC	ON
60	NC	ON

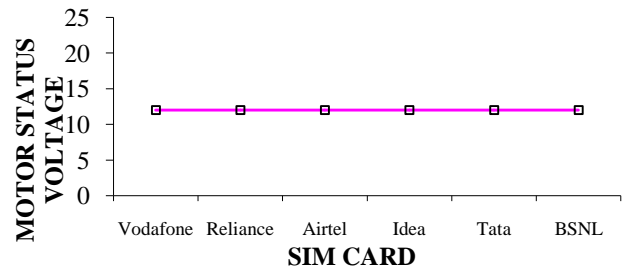
Different motors were observed at different temperature level. Testing results of motor for temperature are as shown in table. We can implement more number of controlling relays as per the application. It is Faith worthy for operation to turn ON/OFF the electric motor, controlling switches, etc.



Using any type of SIM card one can communicate with our system there is no requirement of specific company SIM Card. This system can be applicable for controlling other parameter or switch. Result of Connectivity test of signal for various cell phones are as follows:

SIM Card	Status of Relay	Status of Motor
Vodafone	NC	ON
Reliance	NC	ON
Airtel	NC	ON
Idea	NC	ON
Tata	NC	ON
BSNL	NC	ON

TABLE III. CONNECTIVITY TEST FOR VARIOUS CELL PHONES



IV. CONCLUSION

Following conclusions can be derived from above tests

The developed system, performance was tested, for the range in different, signal interference. Verification of the security, was done by entering, the different passwords. By using different SIM card & changing card one after the other, Performance and its accuracy, also results were noted. Performance of temperature, was varied from 10 to 60, and results were noted. By using GSM based Irrigation control system, we can pay special attention, as it was considered as a catalyst, for enhanced agricultural production. The development of system, gives protection against, the failure of crops.

The above mentioned system, can be used as switch, which can be controlled, from far away with the SMS, the electrical appliances can be ON/OFF. This will save the vital resource, of the energy. Also if, the person forgets, to switch OFF the home or offices, electrical connections, The system will alert him with SMS, where ever he is throughout the world, can make Switch OFF or ON. So this, is boon in the use of electronic world, which is the necessity of an hour, for us to conserve energy, and can help in sustainable use of energy.

In Future, we can develop, the **Mobile Apps using Smart cell phones**, to operate the same. It will help to; control all the switches, from remote place, with great efficiency. This paper allows, for harnessing, optimum use of the multi-switches connected to multi-relay, consequently saves the time, human resource and energy. Its application can be in various fields, in handling electrical appliances, and control them, from any part of the world, to usher into new era.

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