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GSM BASED ON & OFF CONTROL OF HOME APPLIANCE AND SPEED CONTROL OF FAN REGULATOR

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ABSTRACT

Mobile phones are widely used nowadays, for different application such as wireless control and monitoring due to its availability and ease of use. The implemented system is based on "Global System Mobile (GSM)" network by using "Short Message Service (SMS)". The design mainly contains a GSM modem and interfacing unit circuit with microcontrollers. This system could control up to eight different electrical devices such as light, air conditioner, washing machine and many more appliances which needed in daily life in different area (House, Office, or Factory, etc.).

There are many methods to control the speed of fan. We are implemented in this method through timer of Atmel AVR Microcontrollers.

Keywords:Appliance controller, GSM modem , PIC Microcontroller, Smart phone, SMS.

I.INTRODUCTION

There are many definitions of GSM based appliance controlling available in the literature. Fadhil T. Aula, (2005), presented a system of the PC remote Controlling with the Mobile Telephone through accessing the main PC ports; serial and parallel. Serial port for transferring data from Mobile phone to PC and parallel port for interfacing PC with real time controlling hardware. The system was implemented by using the SMS. Mohd Helmy Abd Wahab (2010), presented a GSM Based Electrical Control System for Smart Home Application.

In this paper, a GSM module was used for receiving SMS from user's mobile phone that automatically enable the controller to take any further action. The system was integrated with microcontroller and GSM network interface. It reads message from the mobile phone and responds to control the devices according to the received message. The system is designed for controlling eight electrical devices by using SMS; any device switching was achieved by relays as shown in Figure 1.

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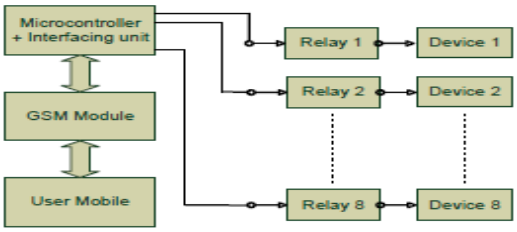

Fig 1:Block diagram of home appliance controller system

II. DESIGN AND IMPLEMENTATION

2.1 The Transmitter

A system is designed to transmit a text SMS message to control the appliances to make ON or OFF state for a in a certain places. Furthermore, the system could reads or checks the status of the eight electrical devices which are under the system control. This text message could be transmitted by one of two schemes.

2.1.1 Using traditional phone

In this scheme an SMS message is sent from the traditional cell phone to the GSM modem using one of the following cases by sending syntax as following:

Case A- 1ON 2OFF 3OFF 4ON 5ON 6OFF 7ON 8OFF

Case B- 3OFF

Case C- ALL ON

Case D- ALL OFF

Case E- Status

2.1.2 Using smart phone

Since the wide spread the smart phones and its applications, also for making SMS messages easier and faster we had developed Android-based smart phone application, to do all cases (A, B, C, D, and E) that explained in traditional phone. The application alters the ON-OFF status of Android switches according to the received feedback SMS message. The flowchart of the sending SMS message is shown in Figure 2. while flowchart of the sending status SMS message and receive feedback SMS message is shown in Figure 3.

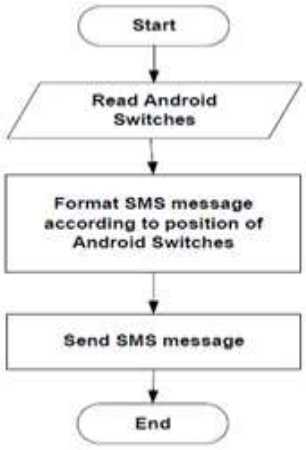

Fig 2:Flowchart of the sending SMS message

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2.2 The Receiver Circuit

The hardware of the receiver contains the two (PIC16F887) microcontrollers, GSM modem, and Interfacing unit circuit. The schematic circuit of the receiver is shown in Figure 3.

2.2.1 Microcontrollers

The first microcontroller is used to receive and read the SMS message from the GSM modem and interpret it, then interpreted message is used to control appliances (switch ON or OFF the eight devices), this microcontroller activates the relays which are connected to corresponding device through relay driver circuit. The Man/Auto function is commonly used in industry for controlling the driver through three tap selector switch (ON, OFF, or Auto position), it is essential for maintenance purposes, as shown in doted black box (driver and relay NO.1) in Figure 4.

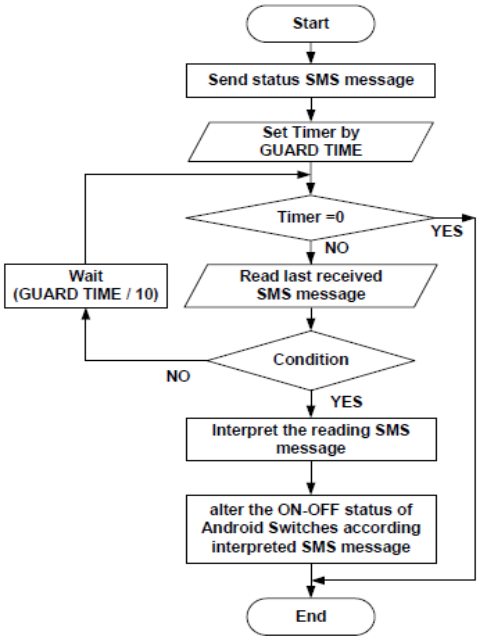

Fig 3: Flowchart of the sending status SMS message and receive feedback SMS message

2.2.2 GSM Modem

Modem encodes and decodes signals sent to and from the network servers. Modems are frequently associated with telephone systems, but wireless modems are used with computers and also with communication mediums. A GSM modem is a network device which connects to a GSM network.

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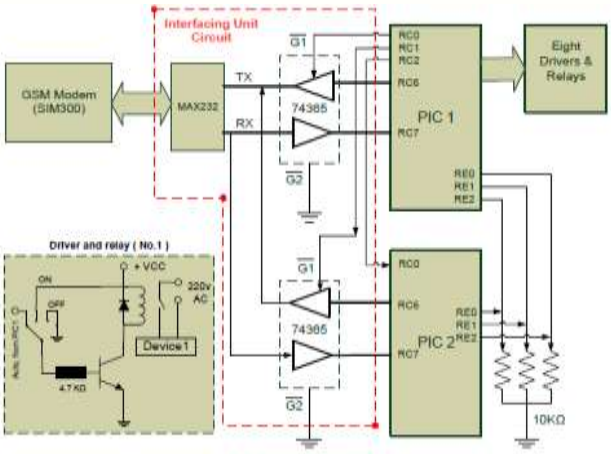


Fig 4: The schematic circuit of the receiver

2.2.3 Interfacing Unit Circuit

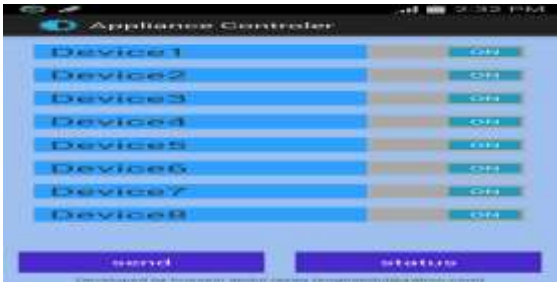
This unit is used to interconnect the PIC with the GSM modem. Also a three state buffer (74365) is used for managing data transfer between microcontrollers with (MAX232).

III.SPECIFICATIONS OF FAN

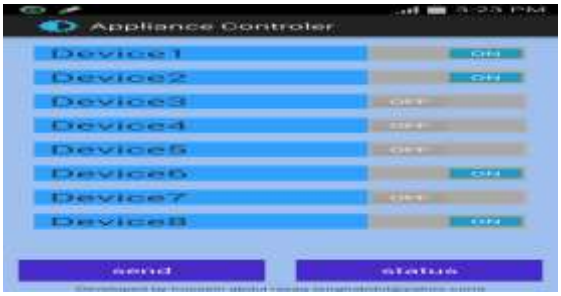
Turn on/off the Fan, Speed levels(can add more levels as much as you want), Any phone number can send the message, Reply message will be send to user about present state, Respond in 3-4 second.

IV. RESULTS

In the first case, it is selected to make all devices ON as shown in Figure.



In the second case, it is selected to make the devices (1, 2, 6, and 8) ON, and others are OFF.



V.CONCLUSION

In this paper a low-cost and simple approach to design an intelligent home system using the concept of mobile-to-machine and machine-to-mobile communication is designed. We develop a general purpose electronic circuit design that can control and monitor a variety of home appliances with interface that can be plugged into GSM modem. The system can automatically switch ON and OFF the devices using SMS. In addition, the system is very practical when the user is away from home; through it the user can control the electrical home appliances automatically as long as the mobile phone gets the coverage. Pulse Width Modulation technique have various applications in power electronics. Majority it is used to control the voltage at your desired level without any losses. Other voltage control methods involve a lot of losses but in this method only switching losses of switching devices included.

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