Home Automation using SMS

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ABSTRACT

Various electronic equipment available for remote operation of grid control. However, the main disadvantage of is these systems that they can be operated only short ranges and also less reliable. Thus, to overcome the from above drawbacks, we are using one of the wireless communication techniques i.e., GSM (Global System for Mobile communications) is a digital cellular communications system which has rapidly gained acceptance and market share.world wide. The development of GSM is the first step towards a true personal communication system that will allow us to communicate anywhere, anytime and with anyone. GSM (Global Systems for Mobile Communication) is vastly used because of its simplicity in both transmitter and receiver design, can operate at 900 or 1800 MHZ band, faster, more reliable and globally network.

Keywords: LPC2148 controller, GSM, LCD, Triac.

1.INTRODUCTION

Home management System is a project used to control any devices in home or in office or in other places can switch on or off. The goal of a smart home system on enabling those who live in them to control a large number of electronic devices easily and remotely. A simple smart home system might, for instance, turn on the lights, turn off the alarm when the garage door opener activates and turn on the motor when the water level is low. Smart homes typically have many more complicated systems, but they all operate via the same principles. Smart homes work via fairly simple systems: Arduino Uno, SIM 900 and SMS. Normal home devices such as lights, entertainment systems, heaters, air conditioners, computers, security systems and radios are equipped with receivers. This SIM 900 receives a certain signal initiated by the code SMS, which can be housed in a control device such as a light switch or, most commonly, a remote control. In order to design the remote control smart home system in this work, this system can be controlled by using Short Message Service (SMS). Nowadays, Short Message Service (SMS) is widely used as a form of data communication .It has about 2.4 billion active users which equals 74% of mobile phone subscribers sending and receiving text messages on their phones. SMS is a communication application in the Global System for Mobile communication (GSM) system. It allows interchange of short text messages between mobile telephone devices using standardized communication protocols. The system in this paper is designed to receive the SMS from any mobile device to the GSM modem that is connected to Arduino.

In order to prevent any occurrence of SMS likelihood control words, the sending SMS that contain control words should come between the specified codes that protocol between a far mobile phone and the GSM modem that is connected to the micro controller. After the GSM modem which connected to the micro controller receives the sent message, it sends this message to the micro controller in Arduino.

LITERATURE SURVEY

(ANDROID BASED HOME AUTOMATION) Remote operation is achieved by any smart-Phone/ Tablet etc., with Android OS, upon a GUI (Graphical User Interface) based touch screen operation. This project is based on the android application sends command through Bluetooth. In this project we have an electrical load i.e fan and light that can be operated through triac using microcontroller. A DC motor is also connected through H-bridge this is to access the room door/ locker door from a distant place. In extension to the project in some Industries we have different types of loads at different locations. We can control all loads at a time from one place (control room) without connecting any physical wire between loads and control room. In this project we are using Bluetooth module for communication Android phone as our remote, controller, and some discrete components.

The Bluetooth module is used here. Bluetooth is wireless technology standard for exchanging data over short distances (using short-wavelength radio waves in the ISM band from 2.4 to 2.485 GHz) from fixed and mobile devices, building personal area networks (PANs).

A. TOUCH SCREEN BASED HOME AUTOMATION SYSTEM

The most common thing that he needs to do are switching ON/ OFF the loads without much human involvement wherever they are required by using wireless devices to control different appliances.The theme of this project is to control different loads. One such implementation is home Automation using touch screen. By touching digits in it, various appliances can be controlled automatically. A touch screen is used control different loads. The project is built around the AT89S52 micro controller. A Traic Driver is used to drive the AC loads. By using a combination of MOC (OptoCoupler) 3021 and TRIAC (BT136) is used for Load driving.

B. RADIO FREQUENCY BASED REMOTE INDUSTRIAL APPLIANCES CONTROL SYSTEM

In this project 433 MHz RF transmitter and receiver modules are used. These are ideal for remote control applications with low cost. The transmitter operates from a1.5-12V supply, making it ideal for battery powered applications. The transmitter employs a SAW-stabilized oscillator, ensuring accurate frequency control for best range performance. The manufacturing-friendly SIP style package and low-cost make the STT-433 suitable for high volume applications.

3.PROPOSED SYSTEM

This project is designed for seven power grids. Microcontroller is the heart of the project. A GSM modem is interfaced to a microcontroller. This modem receives the messages from control mobile and sends as input to MCU. The MCU verify for authentication of the number and, if the number is authorized, grid control will be taken place, EEPROM is interfaced to this controller to save the grid position at every instant. This grid position information will not be deleted even in power failure conditions. 3X4 keypad is interfaced to change the mobile number at any time. 16X2 LCD is interfaced to display user-required information. In this project TRAIC is used as load controller (as a switch), MOC3021 used as a Triac driver. GSM network operators have roaming facilities, user can often continue to use their mobile phones when they travel to other countries etc…. This project uses regulated 3.3v, 750mA power supply. 7805 and 7812 three terminal voltage regulators are used for voltage regulation. Bridge type full wave rectifier is used to rectify the ac output of secondary of 230/12v step down transformer.

D.BLOCK DIAGRAM:

The art of designing SMS based home automation system is discussed in this article. SMS based control of appliances is a very popular application and the one with very much utility for different domains. Sometimes it becomes difficult to imagine and believe that mobile phone can act as a remote for the commonly used home appliances and always connect to home through mobile phone no matter in which part of the world. SMS service can be used to control different appliances of the home and for that it is quite obvious that there must be an intelligent system installed at home which will receive the SMS, read its content and finally will be able to perform the desired action for switching on/off the appliances. This type of intelligent system can be easily designed using micro controller, GSM modem and some electro-mechanical relays. Uni development platform.

III. SYSTEM DESCRIPTION

The system has two parts, namely; hardware and software. The hardware architecture consists of a stand-alone embedded system that is based on Microcontroller (Arduino Uno), SIM 900 GSM Modem and a driver circuit. The GSM modem provides the communication media between the homeowner andthe system by means of SMS messages. The SMSmessage consists of commands to be executed. format of the message is predefined. The SMS message is sent to the GSM modem via the GSM public networks as a text message with a definite predefined format. Once the GSM modem receives the message, the commands sent will be extracted and executed by the GSM handset. The system will interpret the commands and turn the appliances ON/OFF accordingly via the switching module.
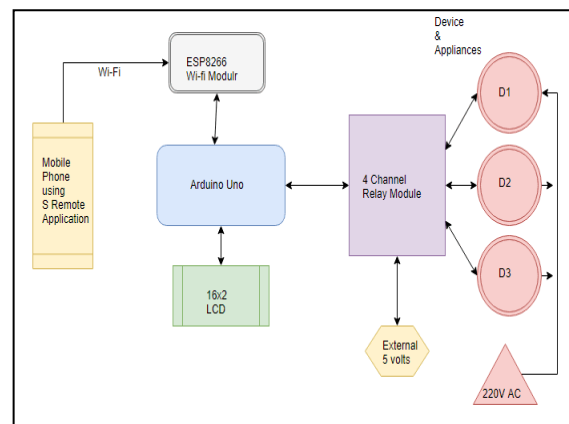
A. USER GSM MOBILE HANDSET

Cellular phone containing SIM (Subscriber's Identifying Module) card has a specific number through which communication takes place with GSM via radio waves. The mode of communication is wireless and mechanism works on the GSM (Global System for Mobile communication) technology. Here, the user transmits instructions to the system to control the appliance in the form of SMS.

B. SIM 900 GSM MODEM

This SIM 900 GSM Modem is used to receive the SMS sent by the user and then to transmit an acknowledgement or status to the user's mobile. The MODEM has to be equipped with an AT Modem and a valid SIM card.This MODEM is attached with the micro controller (Arduino Uno) used to control the appliance.

C. ARDINO UNO

Arduino Uno is the board we used in this project. The Uno is the most used and documented board of the whole Arduino family. The Uno is a micro controller board based on the ATmega328P. It has 14 digital input/output pins, 6 analog inputs, a 16 MHz quartz crystal, a USB connection, a power jack, an ICSP header and a reset button. It contains everything needed to support the micro controller, simply connect it to a computer with a USB cable or power it with a AC-to-DC adapter or battery to get started. Arduino Uno can be used without worrying too much about doing something wrong.

IV. SYSTEM OPERATION

GSM module (SIM900) is interfaced with arduino using serial pins (0 and 1). AT commands are sent to GSM modem for configuring it in SMS mode and also to route the new incoming message to the serial reception pin of the arduino. The incoming message is decoded by the arduino and is compared with the predefined codes. If the match is found then the corresponding action for that code will be performed by the arduino
.
The following codes are used:

a1b1c1----------All devices on
a1b1c0----------device 3 off
a1b0c1----------device 2 off
a1b0c0----------device 2 and 3 off
a0b1c1----------device 1 off
a0b1c0----------devices 1 and 3 off
a0b0c1----------devices 1 and 2 off
a0b0c0----------all devices off

If the received message contents are a1b1c1 then relay 1, 2, and 3 will be triggered through BC547 transistor and all devices are switched on, here transistor BC547 acts as a relay driver and it drives the relay. Similarly for other codes the corresponding programmed functions are performed.
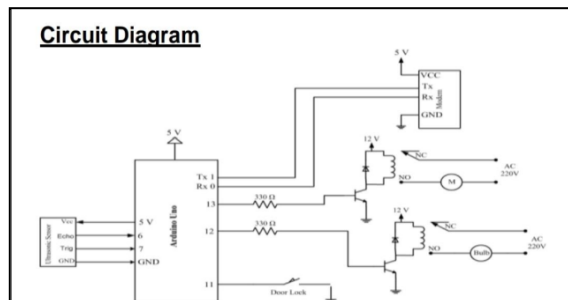
AT COMMANDS to initialize GSM modem
AT+CNMI, New Message Indications to TE

This command selects the procedure, how receiving of new messages from the network is indicated to the DTE when DTE is active.

V. PROCESS FLOW

The first step in using this system is to send the command in form of SMS to the GSM Modem connected to the micro controller, when the message is received it will now be stored in MODEM memory. The content of the message is examined to know what operation the user wants to perform; the whole process illustrated in figure.

VI. SIMULATION RESULTS

In this part there is a series of decision statements for selecting the appliance, type of operation, etc. The message body must six character, which means a user wants to perform which device is either ON or OFF operation. The first character―a‖ represents the motor to drive, the middle character ―b‖ represents the lighting control and the last character ―c‖ is for door control. The number that represent the type of operation; one is ON while zero is OFF. Each time a message is sent, it has to be sent to micro controller which will then act on

the appliance. For instance, the diagram in figure 5 is a message that will —a1b1c1‖, while that of figure 4 is for all devices are ON.

A. WORKING PROCEDURE

1)   One need to make an SMS to the mobile number of the SIM placed in the GSM modem of kit.

2)   Different loads connected to the kit can be on/off through simple SMS.

3)   Loads will be connected to the controller using Triac.

4)   This can be done from any remote place.

5)   LCD displays the information about the load.
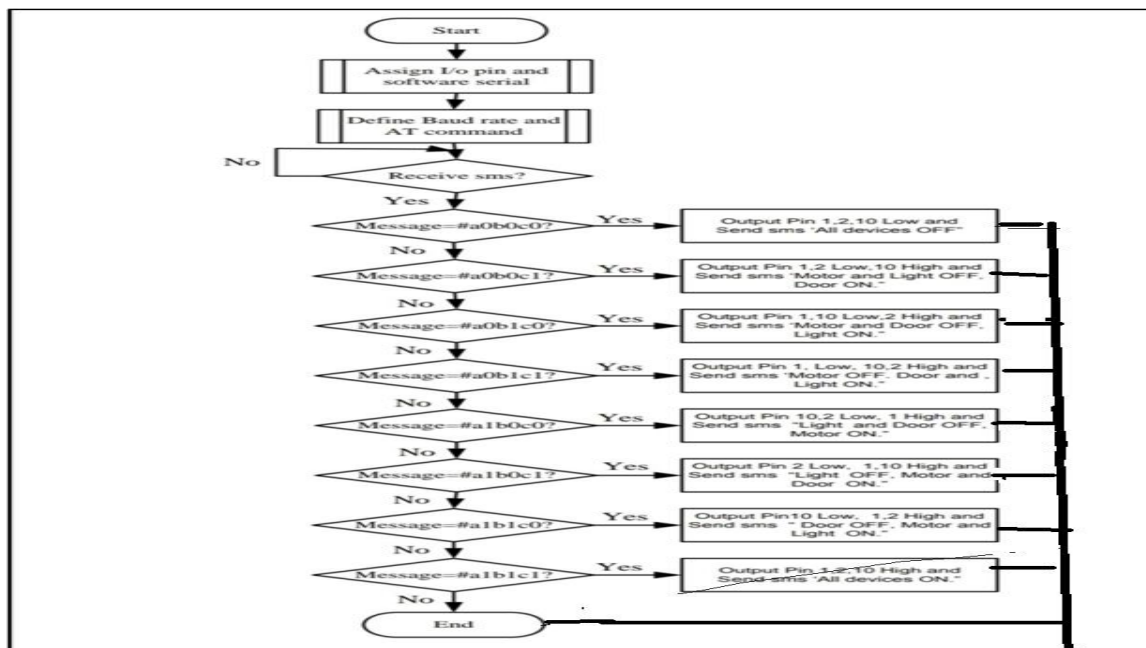

Fig: Flow chart of the system

B. SCOPE

• The scope of our project "GSM Based control system" is immense.

• The future implications of the project are very great considering the amount of time and resources it saves. The project we have undertaken can be used as a reference or as a base for realizing a scheme to be implemented in other projects of greater level such as weather forecasting, temperature updates etc.

• The project itself can be modified to achieve a complete Home Automation system which will then create a platform for the user to interface between himself and the household.

C. PROTOTYPE

6.CONCLUSION

This paper describes the design and development of a system for household appliance control using cell phone through global system for mobile communication (GSM) technology. The cellular communications is a potential solution for such remote controlling activities. SMS (short message service) technology can be used to control household appliances from distance.

The proposed system makes use of wireless control hence can be effectively used in systems were unwired connections are desired. The system uses the user's mobile handset for control and therefore the system is more adaptable and cost effective and also providing ubiquitous access for appliance control.

REFERENCES

1) K. Das, M.Sanaullah, H. M. G. Sarower and M. M. Hassan, ―Development of a Cell Phone Based Remote Control System: an Effective Switching System for Controlling Home and Office Appliances,‖ International Journal of Electrical and Computer Sciences (IJECS), vol. 9, No. 10, pp. 37–43.

2) H. H. Goktas, N. Daldal, ―A Cellular Phone Based Home/Office Controller and Alarm System,‖ G. U. Journal of Science, vol. 19, pp.21– 26, 2006.

3) Ramamurthy, S. Bhargavi and R. Shashi kumar, ―Design and Implementation of GSM based Remote Monitoring and Control system for Industrial process Parameters,‖ International Journal of Computer Science and Internet Security (IJCSIS) , vol. 8, No. 5, pp. 219–225. 2010.

4) Gowthami, Dr. Adilinemacriga "Smart Home Monitoring and Con trolling System Using Android Phone" International Journal of Emerging Technology and Advanced Engineering Website: www.ijetae.com ISSN 2250-2459, ISO 9001:2008 Certified Journal, Volume 3, Issue 11, November 2013.

5) Amit Chauhan, Reecha Ranjan Singh, Sangeeta Agarwal, Saurabh Kapoor, and S. Sharma, SMS based Remote Control System, International Journal of Computer Science and Management Studies, Vol. 11, pp 19-24, Issue 02, Aug 2011

6) E. Wong, A phone-based remote controller for home and office automation, IEEE Trans Consumer Electron., vol. 40, no. 1, pp. 28-33, Feb 1995

7) R.Das, S.Dutta, K.Samanta, A.Sarkar and D.Das, Security Based Domotics, International Conference On Computational Intelligence: Modeling, Techniques and Applications (CIMTA-2013), ELSEVIER (ISSN: 2212-0173)

8) S.Dutta, R.Das and A.Sarkar, Microcontroller Based Data Acquisition System, International Journal of Engineering and Technology, July edition 2013. (Paper Code-IJERTV2IS70678 with ISSN: 2278-0181)

9) Muhammad Ali Mazidi and Janice GillispieMazidi, The 8051 Microcontroller & Embedded System, Pearson Education India

10) AdamuMurtalaZungeru , Ufaruna Victoria Edu, and Ambafi James Garba , Design and Implementation of a Short Message Service Based Remote Controller, Computer Engineering and Intelligent Systems ISSN 2222-1719 (Paper) ISSN 2222-2863 (Online) Vol 3, No.4, 2012.

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