



Intelligent Home Appliance Status Intimation Control and System Using GSM

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Abstract— *In recent years, the home environment has project focuses on assisting the user to control as well as to know the exact status of electrical appliances in their home at that instant. It is achieved through a prominent wireless communication system called as GSM. The status of the electrical appliances is analyzed using pressure sensor. This system is designed and programmed in such a way that it can listen, reply and execute the commands only from the authorized user mobile number. The possibilities of real time constraints like distance, time and communication error are negligible. This system is quite easy to install, cost effective and zero maintenance.*

Keywords— *Home Automation, GSM, pressure Sensor, PIC Microcontroller, Short Message Service (SMS).*

I. INTRODUCTION

In recent years the introduction of network enabled devices into the home environment has proceeded at an unprecedented rate. Moreover, with the rapid expansion of the GSM, there is the potential for the remote control and monitoring of such network enabled devices. However, the new and exciting opportunities to increase the connectivity of devices within the home for the purpose of home automation remain largely unexploited.

II. GSM TECHNOLOGY

GSM (Global System for Mobile communications: Originally from Group Special Mobile) is the most popular standard for mobile phones in the world. Its promoter, the GSM Association, estimates that 82% of the global mobile market uses the standard. GSM is used by over 3 billion people across more than 212 countries and territories. Its ubiquity makes international roaming very common between mobile phone operators, enabling subscribers to use their phones in many parts of the world. GSM differs from its predecessors in that both signalling and speech channels are digital, and thus is considered a second generation (2G) mobile phone system. This has also meant that data communication was easy to build into the system. The ubiquity of the GSM standard has been an advantage to both consumers (who benefit from the ability to roam and switch carriers without switching phones) and also to network operators (who can choose equipment from any of the many vendors implementing GSM). GSM also pioneered a low-cost (to the network carrier) alternative to voice calls, the Short message service (SMS, also called "text messaging"), which is now supported on other mobile standards as well. Another advantage is that makes it easier for international travellers to connect to emergency services without knowing the local emergency number.

III. EXISTING HOME AUTOMATION TECHNOLOGIES

There are many definitions of home automation available in the literature describes home automation as the introduction of technology within the home to enhance the quality of life of its occupants, through the provision of different services such as telehealth, multimedia entertainment and energy conservation. Developed a Java based home automation system. An embedded board physically connected all the home automation devices and, through integration with a personal computer (PC) based web server, provided remote access to the system. The use of Java technology, which incorporates built-in network security features, produces a secure solution. However, the system requires an intrusive and expensive wired installation and the use of a high end PC. Introduced a Bluetooth based home automation system, consisting of a primary controller and a number of Bluetooth sub-controllers. Each home device is physically connected to a local Bluetooth sub-controller. The home devices communicate with their respective sub-controller using wired communications. From the sub-controller all communications are sent to the primary controller using Wireless communications. It is desirable for each home device to have a dedicated Bluetooth module. However, due to the fiscal expense of Bluetooth technology, a single module is shared amongst several devices. This architecture reduces the amount of physical wiring required and hence the intrusiveness of the installation, through the use of wireless technology. However, the architecture does not completely alleviate the intrusiveness of the installation due to the incorporation of some wired communications. Moreover the sharing of a single Bluetooth module between numerous devices has the disadvantage of incurring an access delay. Introduced a phone based remote controller for home and office automation.

The system differs in that all communications occur over a fixed telephone line and not over the Internet. The system can be accessed using any telephone that supports dual tone multiple frequency (DTMF). The disadvantages of this system are threefold: Users are not provided with a graphical user interface, users have to remember an access code, and they have to remember which buttons to press for the control of connected devices. Proposed a novel control network, using hand gestures. The controller uses a glove to relay hand gestures to the system. The problem with the system lies in the inaccuracy of hand gestures, with the potential for normal arm movements being inaccurately interpreted as commands. Moreover, there is the risk of user fatigue if repetitive hand gestures are required. Home gateway architecture defined a home gateway as the point of ingress between a personal area network and a public access network. They developed a web server based home gateway to interconnect with a power line based home automation system, and the Internet. To make the system more attractive to home owners, a real time AV transcoding capability was included. The system offers an insightful look into the development of a home gateway; however, the use of power lines as the communication medium limits the positioning of devices within the home to areas in close proximity to power sockets. Integrated home gateway proposed a home energy management focused home gateway, which connects the home network with the Internet. The system was installed in twenty houses in the Tokyo area. Remote user can access the system using the Internet. The remote user's communications traverse the internet until they reach the home network. They are then wirelessly transmitted to the Home Gateway using the homes Wi-Fi network. The Home Gateway is integrated with a virtual home in Zigbee based home automation system. These communications are checked and processed by the home gateway and virtual home. This checking process involves communication with the home networks coordinator, which is integrated with the home's device database and contains the status of all connected devices. Once checked the communications are sent to the real home automation system and the respective device. Additionally, a local ZigBee based remote control can be used to directly control connected devices. The disadvantages of this system are the user must come in front of the PC to send messages through internet, internet availability, booting time, power rating is high, remote area must support internet.

IV. 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 AVR GSM handset with GSM Modem and a driver circuit. The GSM modem provides the communication media between the homeowner and the system by means of SMS messages. The SMS message consists of commands to be executed. The 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 AVR. 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. RECEIVER GSM HANDSET

This receiver GSM handset is used to receive the SMS sent by the user and then to transmit an acknowledgement or status to the user's mobile. The receiver handset has to be equipped with an AT Modem and a valid SIM card. The handset has a built in AT modem with UART interface and supports most of the AT command instructions. This handset is attached with the microcontroller used to control the appliance through UART. AT Modem is a Modem which supports AT commands, also known as Hayes command.

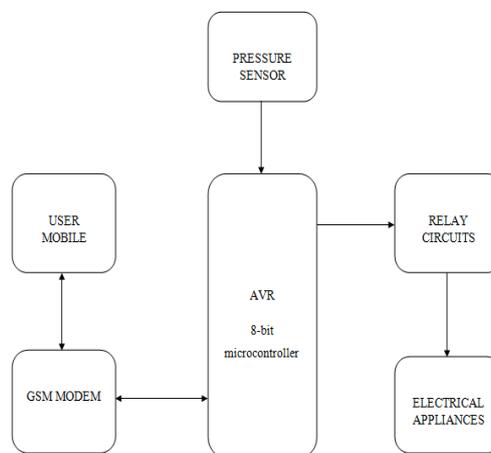


Fig. 1 Block diagram for Home appliance using GSM

The Hayes command set is a specific command language originally developed for the Hayes Smart modem. The command set consists of a series of short text strings which combine together to produce complete commands for operations such as dialing, hanging up, and changing the parameters of the connection. Most modems follow the specifications of the Hayes command set.

AT commands are instructions used to control a modem. AT is the abbreviation of Attention. Every command line starts with "AT" or "at".

V. STRENGTHS OF HOME APPLIANCES CONTROL SYSTEM

Home appliances control system has many advantages such as remote controlling of home appliances, availability and ease of users. The user can get alerts anywhere through the GSM technology thus making the system location independent. The system contains low cost components easily available which cuts down the overall system cost. The ease of deployment is due to wireless mode of communication. GSM technology provides the benefit that the system is accessible in remote areas as well. The system integration is simple and is also scalable and extensible.

VI. CONCLUSION

In this project work, we have studied and implemented a complete working model using a Microcontroller. The programming and interfacing of microcontroller has been mastered during the implementation. This work includes the study of GSM modem using sensors. GSM network operators have roaming facilities, user can often continue to use their mobile phones when they travel to other countries etc..

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