

ELECTRONIC APPLIANCE CONTROL USING ANDROID

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ABSTRACT

Nowadays, the remote Home Automation turns out to be more and more significant and appealing. It improves the value of our lives by automating various electrical appliances or instruments. This paper describes GSM (Global System Messaging) based secured device control system using Android app. The main control system implements wireless Android technology to provide remote access from smart phone. The design replaces the existing electrical switches and provides more safety control on the switches with low voltage activating method. The switches status is synchronized in all the control system whereby every user interface indicates the real time existing switches status. The system intended to control electrical appliances and devices in house with relatively low cost design, user-friendly interface and ease of installation.

Keywords: Gsm, Home Automation, Android App, Mobile Phone, Short Messaging Service (Sms).

I. INTRODUCTION

This paper presents GSM based Device Control System mobile application developed using the App for Android smart phones targeting its vast market which will be beneficial for the masses. According to the International Data Corporation (IDC) Worldwide Quarterly Mobile Phone Tracker, Android has maintained its leadership position on highest peak in global market share [2]. The Global System for Mobile Communication (GSM) network is almost everywhere. The preface of the Global System for Mobile Communication (GSM) and mainly the use of cellular phones got the novelty of distance communication at remote location.

Rising standards of people in our country gave rise to the advancement of technology. Now days everything is going smart: SMART TV'S, SMART PHONES so why not SMART HOMES! So in order to attain this objective of SMART homes we are planning on-to automate the electronic appliances present in the home using wireless remote control. Moreover the project also helps in conservation of electrical energy.

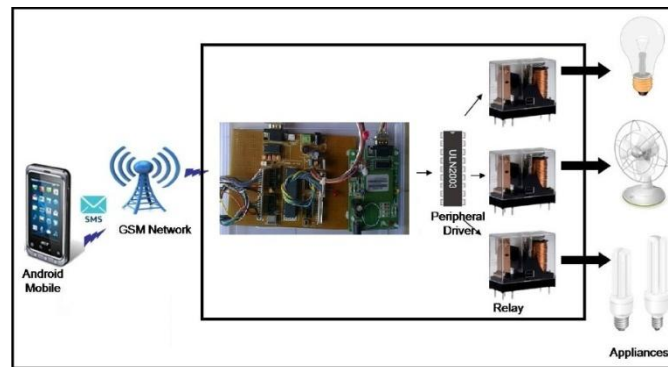


Figure 1: Interfacing

This paper presents the overall design of Home Appliance System (HAS) with low cost and wireless remote control. This system is designed to assist and provide support in order to fulfill the needs of elderly and disabled in home. Also, the smart home concept in the system improves the standard of living. The main control system implements wireless Android technology to provide remote access from smart phone. The design replaces the existing electrical switches and provides more safety control on the switches with low voltage activation method. The switch's status is synchronized in all the control system whereby every user interface indicates the real time existing switches status. The system intends to control electrical appliances and devices in house with relatively low cost design, user-friendly interface and ease of installation. The system also gives us voice acknowledgement of the appliance status Paper makes use of this ability for remote control of instruments and appliances; take a look at this example, a person on a drive within his car all of a sudden memorizes that he left the FAN, ON actually it should be OFF. The usual circumstance is to drive back and switch OFF. But with the Android mobile phone in the hand equipped with GHAS (GSM Home Automation System) Application, one looks on how the same could be used to result control at any point, anywhere and time without worrying geographical locations.

II. DEVELOPMENT PLATFORMS

This section describes the technologies used for developing the Android based mobile phone application for Home Appliance Control in GSM Network environment which are: Arduino and GSM. Android is a platform developing and deploying android based applications on mobile devices supporting it. GSM has its own benchmark as a wireless communication technology for permanent and itinerant devices. Combining the power of SMS service, the best known and used wireless technology for mobile communication provide a facility to create Android based mobile applications using the GSM Wireless Technology.

2.1 Arduino IDE

The open-source Arduino environment makes it easy to write code and upload it to the I/O board. It runs on Windows, Mac OS X, and Linux. The environment is written in Java and it is based on Processing, avr-gcc, and other open source software. The Arduino development environment contains a text editor for writing code, message area, text console, and toolbar with buttons for common functions, and a series of menus. It connects to the Arduino hardware to upload programs and communicate with them. Arduino programs are written in C or C++. Arduino IDE with features such as syntax highlighting, brace matching, and automatic indentation, and it

is also capable of compiling and uploading programs to the Board with a single click. As the Arduino platform uses Atmel microcontrollers, Atmel's development environment, AVR Studio or the newer Atmel Studio, may also be used to develop software for the Arduino.

2.2 GSM

GSM (Global System for Mobile Communications, originally Group Special Mobile), is a standard developed by the European Telecommunications Standards Institute (ETSI) to describe protocols for second generation (2G) digital cellular networks used by mobile phones. It is the de facto global standard for mobile communications with over 90% market share, and is available in over 219 countries and territories. The GSM standard was developed as a replacement for first generation (1G) analog cellular networks, and originally described a digital, circuit-switched network optimized for full duplex voice telephony.

III. BLOCK DIAGRAM

3.1 Interfacing of Android Mobile with GSM Module and Relay Circuit

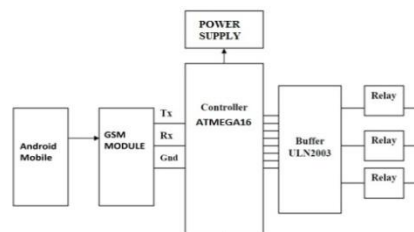


Figure 2

In figure 2, the block diagram is shown in which the embedded system consisting the main elements are:

1. Android Phone: For processing the video frames.
2. Arduino: For sending commands to the hardware system.
3. GSM Module: For receiving SMS and forwarding the commands.
4. Appliances: To see the output.

3.2 Methodology

Assuming that the control unit is powered and operating properly, the process of controlling a device connected to the interface will proceed through the following steps;

- 1) The remote user sends text messages including commands to the receiver.
- 2) GSM receiver receives messages sent from the user cell phone.
- 3) GSM receiver decodes the sent message and sends the commands to the microcontroller.
- 4) ATMEGA16 issues commands to the appliances and the devices connected will switch ON/OFF.

IV. RESULT & CONCLUSION

Design and implementation of the GSM Home Appliance System (GHAS) using the App for Android mobile phone has been discussed. The purpose of the GHAS is to use mobile phone's inbuilt SMS facility and GSM Modem for automation of Home Appliances. Different hardware and software unit of the GHAS is described.

The complete application software has been designed using Eclipse IDE and java Language. The GHAS application program is tested on various Android mobile phones which are quite satisfactory and responses received from the community in general are encouraging. The GHAS furnishes a good paradigm for any Automation System based on Android Mobile Phone and GSM.

V. FUTURE WORK

- We can implement other related modules like fire sensor etc.
- The system can be expanded with further security measures and app can be used as a monitoring system with improved sensitivity.

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