

MOBILE PHONE BASED ELEGANT SECURITY SYSTEM WITH ANDROID APPLICATION

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ABSTRACT

Now a day's home appliances are controlled through different wireless technologies, why because electrical appliances control with humans contact may get harmful electrical shocks, so we are developing/ implementing project like "MOBILE PHONE BASED SMART AND SECURITY SYSTEM WITH ANDROID APPLICATION". In day to day life home automation system more and more popular and comes with new technology and goes with too smart. By using this project we can control our home appliances wirelessly without human touch, and this project can be developed on ARM based controller or ARM 7 TDMI Microcontroller i.e. LPC2148 micro controller. Smart Home System could be a dwelling house incorporating communications devices like Bluetooth and GSM that connects the electrical home appliances and services allowing them to be remotely controlled, monitored or accessed. Smart Home System includes totally different approaches to attain multiple objectives vary from enhancing comfort in standard of living to facultative a lot of freelance life for old and unfit individuals. During this paper, the most fields for Smart Home System that are, home automation and remote observation, windows curtains control with remote access, as well as provides monitoring of fire and GAS accidents and security to inform authentic person monitoring is thought-about. The system style which can be developed on the Microcontroller LPC 2148 & MICRO C software; multiple passive and active sensors and conjointly a wireless GSM services that is employed in several observation and management processes of message sending applications for security and remote areas control of home appliances by message sending option .This paper presents the hardware implementation of a multiplatform control system for house automation and combines each hardware and software package technologies. The system results shows that it are often classified as a snug, secure, private, economic and safe system additionally to its nice flexibility and dependableness.

Keywords: Bluetooth Device, Sensor, Motor Control, LPC2148 Micro Controller, GSM Technology.

I. INTRODUCTION

Home automation is changing into a lot of and a lot of in style day by day owing to its various benefits. This paper aims at planning a basic home automation application on ARM7TDMI through reading the topic of Bluetooth technology. Results show the economical implementation of planned algorithmic program for home

automation. during this paper we have tendency to developing the house automation system through Bluetooth technology victimization automation application by victimization ARM7TDMI here we tend to area unit interfacing the microcontroller with Bluetooth module & GSM may also interfaced to ARM7TDMI microcontroller for the aim of dominant home appliances over remotely. The main purpose of this project is to develop an “Android based smart home system with control via Bluetooth technology”. Here we are using an lpc2148 micro controller and Bluetooth. Microcontroller is interfaced to the Bluetooth whenever the user needs to control the load which means appliances in the home like fans, lights etc.

II. LITERATURE REVIEW

To complete this “project mobile phone based smart and security system with android application “need to refer some concepts those are previously developed, the concepts will be discussed in given below“Bluetooth based home automation system using cell phone”. In recent years, electronic appliances will be monitored and controlled by embedded microprocessors and be displayed on terminals; however they're still in lack of integration. Since this home automation (HA) system isn't equipped with economic integration mechanism, it cannot totally manifest the value of those developments. So as to attain this goal of integration, several appliance makers specialize in the event of intelligent (or information) appliances to be integrated into an entire HA system for watching and dominant. Owing to the appearance of advanced pc and broadband network, the private computer-based surroundings look to be an awfully appropriate platform for system integration. The private computers will be coupled by the network and square measure capable of powerful computation and straightforward show. We are able to make the most of such skills to develop associate integration system.“Ubiquitous Smart Home System Using Android Application, “This paper presents a versatile standalone, inexpensive sensible home system that relies on the automation app communication with the micro-web server providing over the change functionalities. The LAN is employed to eliminate the utilization of a private pc (PC) keeping the price of the general system to a minimum whereas voice activation is incorporated for change functionalities. Devices like lamp switches, power plugs, temperature sensors, wetness sensors, current sensors, intrusion detection sensors, smoke/gas sensors and sirens are integrated within the system to demonstrate the practicableness and effectiveness of the projected sensible home system.

This paper principally focuses on the dominant of home appliances remotely and providing security once the user is removed from the place. The system is SMS primarily based and uses wireless technology to revolutionize the standards of living. this technique provides ideal answer to the issues visaged by home house owners in everyday life. The system is wireless thus additional adaptable and efficient. The HACS system provides security against intrusion yet as automates numerous home appliances mistreatment SMS. The system uses GSM technology therefore providing omnipresent access to the system for security and automatic appliance management.

III. HARDWARE DESIGN

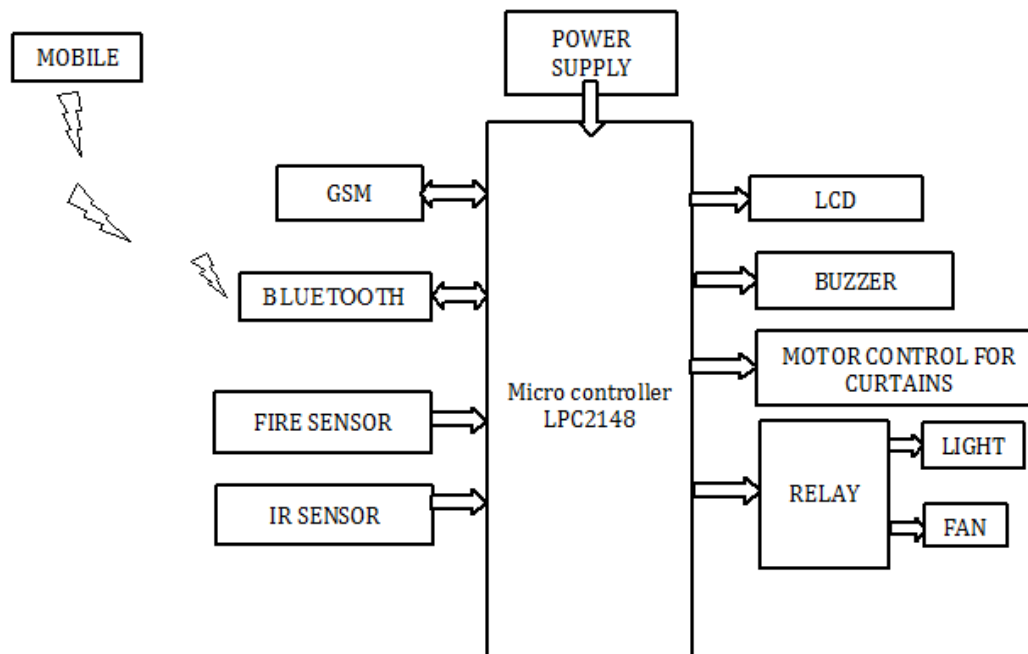


Fig 1: Block Diagram (Transmitter & Receiver).

The blocks of the system will be showed on above, the individual blocks and hardware parts will be discussed in given below.

3.1 LPC2148 Microcontroller

ARM could be a family of instruction set designs for laptop processors supported a reduced instruction set computing British company ARM Holdings was developed (RISC) architecture.

A RISC-based laptop style approach means that ARM processors need considerably fewer transistors than typical processors in average computers. This approach reduces prices, heat and power use. These area unit fascinating traits for lightweight, portable, powered devices—including smartphones, laptops, pill and pad computers), and different embedded systems. an easier style facilitates additional economical multi-core CPUs and better core counts at lower value, providing higher process power and improved energy potency for servers and supercomputers.

The NXP (founded by Philips) LPC2148 is associate ARM7TDMI-S primarily based superior 32-bit architecture controller with 512KB on-chip read-only memory with In-System Programming (ISP) and In-Application Programming (IAP), 32KB Random access memory , the controller can provide Vectored Interrupt Controller, 2 10bit ADCs with fourteen channels, USB 2.0 Full Speed Device Controller, Two UARTs, one with full electronic equipment interface. 2 I2C serial interfaces, 2 SPI serial interfaces 2 32-bit timers, Watchdog Timer, PWM unit, Real clock with facultative battery backup, Brown out find circuit General purpose I/O pins. Hard ware log up to sixty Mc, On-chip oscillator and On-chip PLL.

3.2 GSM Module

A GSM is a device which can support message and calling services like mobile phones. The most distinction between them is that dial-up electronic equipment sends and receives information through a set phone line whereas wireless electronic equipment sends and receives information through radio waves. GSM electronic equipment may be associate degree external device or a laptop Card / PCMCIA Card. Typically, associate degree external GSM electronic equipment is connected to a pc through a serial cable or a USB cable. GSM electronic equipment within the type of a laptop Card / PCMCIA Card is meant to be used with a notebook computer. It ought to be inserted into one among the laptop Card / PCMCIA Card slots of a notebook computer. Like a GSM portable, GSM electronic equipment needs a SIM card from a wireless carrier so as to work. As mentioned in earlier sections of this SMS tutorial, computers use AT commands to regulate modems. Each GSM modems and dial-up modems support a typical set of ordinary AT commands. You'll use GSM electronic equipment a bit like dial-up electronic equipment.



Fig 2: GSM module

3.3 Fire & Gas sensor

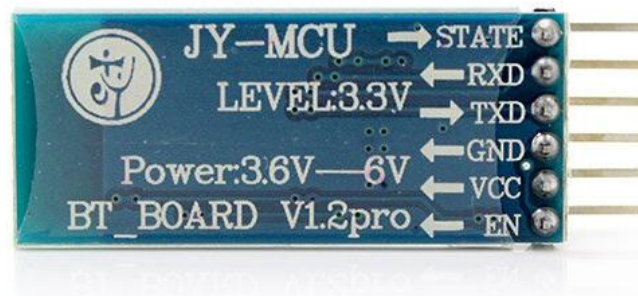
The Fire sensing element, because the name suggests, is employed as a straightforward and compact device for cover against hearth. The module makes use of IR sensing element and comparator to sight kindle to a spread of one metre. The device, deliberation regarding five grams, is often simply mounted on the device body. It offers a high output on police investigation hearth. This output will then be wont to take the requisite action. An on-board crystal rectifier is additionally provided for visual indication.

The Grove - Gas Sensor (MQ2) module is helpful for gas run detecting (in home and industry). It will discover H₂, LPG, CH₄, CO, Alcohol, Smoke, and Propane, Supported its quick reaction time. Measurements are taken as shortly as attainable. Conjointly the sensitivity is adjusted by the potentiometer.

**Fig 3: Fire and Gas sensor**

3.4 Bluetooth Module

Bluetooth could be a wireless technology customary for exchanging knowledge over short distances (using short-wavelength UHF radio waves within the belief band from two.4 to 2.485 GHz from fastened and mobile devices, and building personal space networks (PANs). Fictional by telecommunication trafficker Ericsson in 1994, it had been originally formed as a wireless different to RS-232 knowledge cables. HC-05 module is a simple to utilize Bluetooth SPP (Serial Port Protocol) module, intended for straightforward remote serial association setup. Serial port Bluetooth module is completely qualified Bluetooth V2.0+EDR (Enhanced Data Rate) 3Mbps Modulation with complete 2.4GHz radio handset and baseband. It utilizes CSR Blue core 04- External single chip Bluetooth framework with CMOS innovation and with AFH (Adaptive Frequency Hopping Feature). Having numerous Bluetooth modules with the same name can be confounding. At times it may require changing the default settings like baud rate, or ace/slave part of the module.

**Fig 4 : Bluetooth module.**

3.5 Relay

A relay is associate electrically operated switch. Several relays use associate magnet to automatically operate a switch, however alternative in operation principles are used, like solid-state relays. Relays area unit used wherever it's necessary regulate a circuit by a low-power signal (with complete electrical isolation between control and controlled circuits), or wherever many circuits should be controlled by one signal. The primary relays were employed in long distance telegraph circuits as amplifiers: they perennial the signal returning in from one circuit and re-transmitted it on another circuit. Relays were used extensively in phone exchanges and early computers to perform logical operations.



Fig 5: Relay

3.6 Light & Fan (Electrical Appliances)

A ceiling fan could be a mechanical fan, typically electrically powered, suspended from the ceiling of an area that uses hub-mounted rotating paddles to flow into air. A ceiling fan rotates rather more slowly than an electrical table fan; it cools folks effectively by introducing slow movement into the otherwise still, hot air of an area, causation physical change cooling. Fans ne'er really cool air, not like air-conditioning instrumentality, however use considerably less power.

A light bulb or lamp could be a device that produces light from electricity. Additionally to lighting a dark area, they'll be accustomed show a device is on, to direct traffic, for heat, and plenty of different functions. The incandescent light-weight bulb turns electricity into light-weight by causation the electrical current through a skinny wire known as a filament. Filament is created up principally of metal, a sort of metal. The resistance of the filament heats the bulb up. Eventually the filament gets therefore hot that it glows.

3.7 DC Motor

Electrical engines are all over the place around us. All the electro-mechanical developments we see around us are brought about either by an A.C. on the other hand a DC engine. Here we will be investigating this sort of engines. This is a gadget that changes over DC electrical vitality to a mechanical vitality. This DC or direct current engine chips away at the primary, when a current conveying conductor is put in an attractive field, it encounters a torque and tends to move. This is known as motoring activity. In the event that the course of current in the wire is switched, the heading of pivot additionally turns around. At the point when attractive field and electric field associate they create a mechanical drive, and in view of that the working rule of dc engine established. The bearing of pivot of a this engine is given by Fleming's left hand guideline, which expresses that if the forefinger, centre finger and thumb of your left hand are stretched out commonly opposite to one another and if the pointer speaks to the course of attractive field, centre finger demonstrates the heading of present, then the thumb speaks to the course in which compel is experienced by the pole of the dc engine. Fundamentally and development savvy an immediate current engine is precisely like a DC generator, however electrically it is the polar opposite. Here we dissimilar to a generator we supply electrical vitality to the info port and get mechanical vitality from the yield port.

IV. SOFTWARE DESIGN

To complete the project on hardware need to embedded software on to the controller used in this project for that purpose we need software's like keil u vision and flash magic those are discussed in given below

Compiler that runs on one pc however produces computer code for a distinct kind of pc. Cross compilers square measure accustomed generate computer code which will run on computers with a replacement design or on

special-purpose devices that can't host their own compilers. Cross compilers square measure very fashionable for embedded development, wherever the target in all probability could not run a compiler. Usually associate degree embedded platform has restricted RAM, no disc, and restricted I/O capability. Code are often altered and compiled on a quick host machine (such as a laptop or operating system workstation) and therefore the ensuing viable code will then be downloaded to the target to be tested. Cross compilers square measure useful whenever the host machine has a lot of resources (memory, disk, I/O etc) than the target. Kiel compiler is one such compiler that supports an enormous variety of host and target mixtures. It supports as a target to eight bit microcontrollers like Atmel and Motorola etc. Flash Magic is associate application developed by Embedded Systems Academy to permit you to simply access the options of a microcontroller device. With this program you'll be able to erase individual blocks or the whole nonvolatile storage of the microcontroller.

V. WORKING DESCRIPTION

The main purpose of this project is to develop “Android based smart home system with control via Bluetooth and GSM Technology”, here we are using an lpc2148 micro controller and Bluetooth module which is connected to Android mobile phone and the microcontroller is interfaced to the Bluetooth whenever the user needs to control the load which means appliances in the home like fans, lights etc. which are also connected to the controller then the user will send a command to Bluetooth module from mobile phone through Bluetooth communication whenever receives the particular command at controller side via Bluetooth module which assigned for the microcontroller it may do some action defined in controller with programming written in side of the controller, whatever the command sent by the user will receive the Bluetooth module and these commands to the controller to switch on/off conditions of the lights or fans etc. And another key feature of this project is detection of fire and Gas in our home if any one of them detected at home sends message to owner of the house through GSM module, here we are controlled curtains doors also through Bluetooth communication.

VI. RESULTS

We have observed the output of the project, when we sent commands to Bluetooth from mobile phone then automatically the light and the fan are switched ON/OFF. & if the person is outside of home then he controlled remotely by sending a message through GSM module. Here another application like risky action functions whenever the Fire accidents or Gas leakage occur it may give alerting signals like continuous buzzer indication; another feature of this project is we can control Curtain doors also by sending commands through Bluetooth module.



Fig 6: The System Overall Setup and Output Result

VII. CONCLUSION

With this project we have improved the home automation system controlled via Bluetooth & GSM communication. We are controlling electrical appliances like fan /light etc. And also monitor the security conditions like gas leakage conditions and fire accident conditions with the help of wireless sensor network and make a security like alertness buzzer and visual indication. Apart from that it also gives information about any unpredicted action happened at the living place. & controlled Curtain doors also.

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