

Android Based E-Notice Board

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ABSTRACT

The proposed system based on electronics notice board using ARM-7LPC 2148 controller. Many companies are manufacturing the CCTV.PA system in audio and video nature but this all system complicated and hardwired. So by creative ideas we have developed wireless communication between android phones and LED display. Generally this model used for displays notices in college campus on electronic LED notice board. By sending message from one authorized person from his android phones through either Android application or GSM based messages. In electronic system number of displays are present, only single notice can be sent to all the notice board respective of their places. The hardware contains real time clock to maintain the track of time. Also the ARM microcontroller used for the assembly language. He operate the noticeboard, his coding done by Embedded C and Keil u vision used for debugging the programme. GSM range over the 900KHZ, 1200KHZ, 1800KHZ.

Keyword : - Android phone, GSM, ARM LPC2148, Speaker, LED Display, UART, Android Apps.

1. INTRODUCTION

This is an Electronic based project. This electronic system is the combination of software and hardware. In this paper, to design a model where the messages to be displayed is send through a SMS from an authorized transmitter then message transmit to the microcontroller it read message then send to LED display. This automated system can be reduces the manual work. We can use more display to keep all places. It is widely used to display new information anywhere such as faculty, shop, mosque, railway station, public place and so on. In this model wireless communication using GSM modem.

1.1 OBJECTIVES OF PROJECT

The objective of these is to design an electronic notice board for school and college purpose. The notice can be send to required department and respective staff wireless within second. This creative technique used to the faculty in order to display latest information. The contents of notice can be change whenever required.

2. HARDWARE OVERVIEW

The concept of this project will be to design a SMS driven automatic display board which can replaced the current used programmable electronic display. It is proposed to design receiver cum display board which should be programmed from an authorized mobile phone. The message to be displayed is sent through a SMS from an authorized transmitter. The microcontroller receive the SMS, validate the sending Mobile Identification Number (MIN) and displays the desired information. Started as an instantaneous News display unit, we have improved upon it and tried to take advantages of the computing capabilities of microcontrollers. Looking into current trend of information transfer in the campus. It is seen that important notice takes time to be displayed in the notice board. This latency is not expected in most of the cases and must be avoided. It is proposes to implement this project at the institute level. It is proposed to place display board in major access points. The electronics displays which are currently used are programmable display which needs to be reprogrammed each time. This makes it inefficient for immediate information transfer, and thus the display board loses its importance. The display board programs itself with the help of the incoming SMS with proper validation. Such a system proves that it helpful for immediate information transfer. The system required for the purpose is a Microcontroller based SMS box. The main components of the kit include microcontroller, GSM modem. These components are integrated with

the display board and thus incorporate the wireless features. The GSM modem receives the SMS. The AT-commands are serially transferred to the modem through Rx-Tx connection. In return the modem transmits the stored message through the COM-port. The ARM7 microcontroller validates the SMS and then displays the message in the LED display board. Various time division multiplexing techniques have been suggested to make the display board functionally efficient. The microcontroller used in this case is Arm 7. GSM 900 module is used as the GSM modem. In the prototype model, LED display is used for simulation purpose. While implementation this can be replaced by actual display board. The data will be displayed only after entering unique pass key .In addition to that address matching is done and data can be received only by the dedicated receiver and this data is displayed on LED. The main focus of the thesis is on displaying information to a dedicated LED by the any part of world using GSM network, which facilitate to control any message board globally from any location.

2.1 Block Diagram

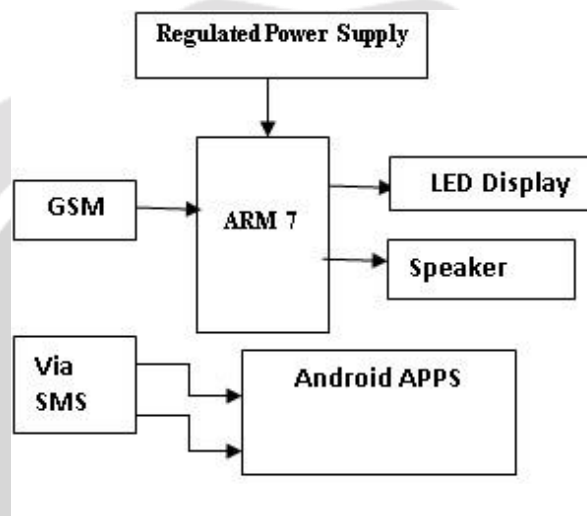


Fig1.1: Block Diagram of e-Notice Board

2.2 Block Diagram Description:

Above block diagram can be divided into two parts first one is master and second is slave.

A. GSM Modem



Fig1.2: GSM Module

A GSM Modem is the special types of Modem which accepts the Subscriber Identity Module (SIM) card. It just like mobile phone. It also provide mobile internet connectivity. We used SIM900.It cover the frequency range up to 900MHZ, 1200 MHZ, 1600 MHZ, 800 MHZ GSM Modem is used for sending and receiving the SMS and MMS. It is a wireless just like Dial-Up Modem which work with wireless network. But the difference between wireless network and Dial-Up Modem is the wireless network send and receive data through radio waves and Dial-Up Modem sends and receives data through fixed telephone network. The GSM Modem is connecting to the microcontroller through serial port using DB9 connector. The AT commands defined in the GSM standard.

B. POWER SUPPLY

Power Supply is an important part of our electronic circuit. It provides required power supply to different blocks of our circuit from input 230 V AC. The blocks include transformer, rectifier circuit, and filter and regulator circuit. Voltage regulator IC LM7805 is used as a voltage regulator for to regulating power supply.

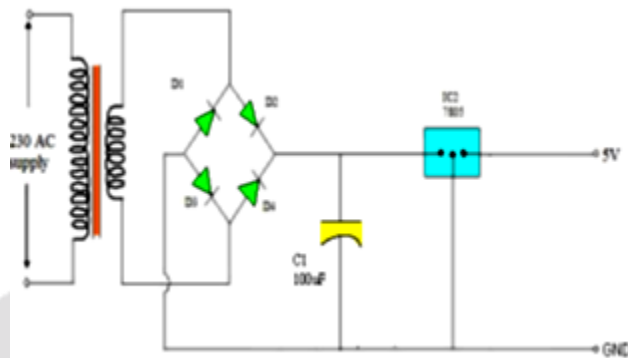


Fig1.3: Power Supply

The microcontroller and other required devices have get power supply from AC to DC adapter through 7805. The IC- 7805 is voltage regulators IC for regulating the power supply between the ranges of 5V to 12V DC. must not show any professional title (e.g. Managing Director), any academic title (e.g. Dr., Prof.) or any membership of any professional organization (e.g. Authorized IEEE member). To avoid confusion, the family name must be written as the last part of each author name (e.g. John reddy). Each affiliation must include, at the very least, the name of the company or the name of the country where the author is based (e.g. Causal Productions Pty Ltd, Australia).

C. LPC2148 ARM Controller

The LPC2148 is an advanced embedded RISC Machine. It is a 32 bit. This controller which follows Von Neumann architecture. It has 32KB RAM (Read Only Memory), necessary of Vectored Interrupt Controller, two 10bit analog to digital converters (ADC'S) with 14 channels, USB 2.0 Full Speed Device Controller. Two I2C serial interfaces, two 32-bit timers. There is a 3 way pipelining and having memory of 4GB along with two UARTs. Number of external peripherals is interfaced with ARM if required. We are referred ARM over PIC because of its rapid response i.e. it operated at speed of 60 MHz and also its interrupt priority character. It consumes less power. So we are using both the UARTs. A real-time clock which operates at 32 KHz is in-built in the controller.

D. LED Display

The size of LED display is 48*8(LEDs) 5mm dot size LEDs in Matrix form (8 LED height and 48 LED width). It is operated at 5V and it can directly connect to controller through RS232. For complete notice display there is scrolling is possible. It operates at 5V power supply and required operating current is 800 mA Peak. When all LEDs are glow up the display takes 800mA current, so there is a requirement of that much of current. If there is no LEDs are glow up the display take around 100mA current which is take very less amount of current. The baud rate is accepts as the serial input string. 9600 – 8 bit data – No parity – 1 stop bit. This system is accepts Serial input baud rate of 3-5V voltage level & directly connect to a TXD pins of UART0 of ARM processor. In this process we using only three pins to use the display, which is explain as following

1. RX-IN = Receive Input: Input serial data of 3-5V is logic level, generally connected to TXD pin of microcontroller serial input RS232.
2. +5V Power Supply = At Input: Regulated 5V supply. Current is of at least 800mA.
3. GND = Ground level of power supply must be common & ground with controller.

Volatile Memory: The display having internal memory less than 120 Characters. When displays powered is off, the memory is cleared. LED Dots: Width are 48 LEDs across Height has 8 LEDs. All LEDs are made for a moment (1sec) during power up so we can test the display Board.

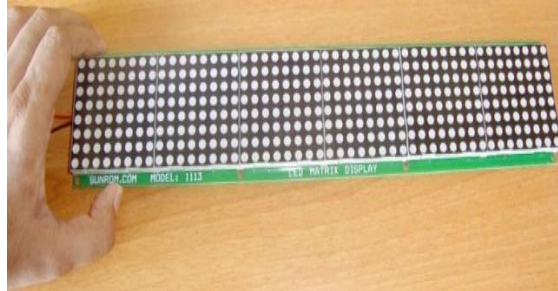


Fig1.4: LED Display

E. BUZZER

Piezo buzzer is an electronic device which is commonly used to produce sound. It is a light weight, simple construction and less price. It is compatible in various applications like car/truck reversing indicator, computers, call bells etc. Piezo buzzer is basically based on the inverse principle of piezo electricity developed in 1880 by Jacques and Pierre Curie. It is a phenomena of generating electricity when mechanical pressure is applied to certain materials. Piezo electric materials are either naturally available. Piezoceramic is class of hybrid material, which cause piezo electric effect and is widely used to make disc. When divided to an alternating electric field they stretch, in accordance with the frequency of the signal thereby producing sound.

3. SOFTWARE OVERVIEW

A. KEIL μ vision 5.0 IDE

The Keil vision is 5.0 IDE (integrated development environment). It is the windows based on front end for the Compiler and Assembler. KEIL μ vision 4 is useful for writing embedded software C programs. It is a high level language which involves many aspects of the ANSI (American National Standard Institute) C-Programming language. The Keil μ vision IDE from Keil combines project management to make facilities, source coding, code editing, programming and debugging, for complete simulation in powerful environment. The keil μ vision development is easy to use and helps you quickly to create embedded programs that for their working. The keil μ vision editor and debugger are integrated in a single application that provides an embedded.

B. Embedded C

Embedded it is a combination of hardware and software program. There is a large and developed – international process for programmers with 'embedded' skills and knowledge, and many desktop users are starting to move into this vital area because of most embedded projects have high cost.

3.1 Android Application Buit

A. Setup Java Development Kit (JDK)

I have download the latest version of Java JDK from Oracle's Java site: [Java SE Downloads](#). I have find instructions for installing JDK in downloaded files, follow the given instructions to install and configure the setup. Finally set PATH and JAVA_HOME environment variables to refer to the directory that contains java and javac, typically java_install_dir/bin and java_install_dir respectively.

B. Setup Android SDK

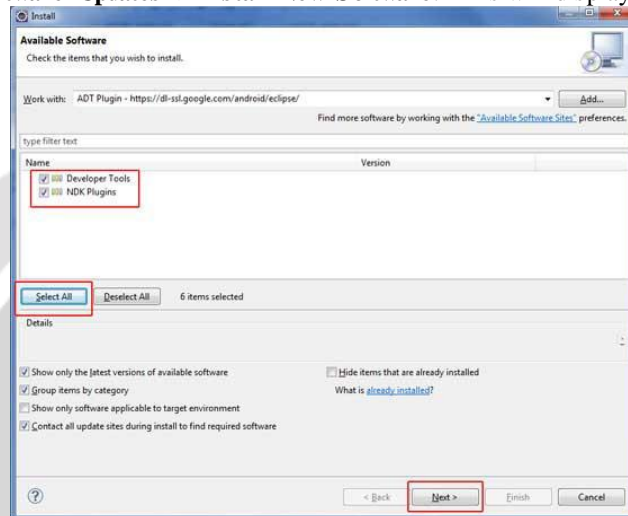
You can download the latest version of Android SDK from Android official website: Android SDK Downloads. If you are installing SDK on Windows machine, then you will find a installer_rXX-windows.exe, so just download and run this exe which will launch Android SDK Tool Setup wizard to guide you through out of the installation, so just follow the instructions carefully. Finally you will have Android SDK Tools installed on your machine. If you are installing SDK either on Mac OS or Linux, check the instructions provided along with the downloaded android-sdk_rXX-macosx.zip file for Mac OS and android-sdk_rXX-linux.tgz file for Linux. This tutorial will consider that you are going to setup your environment on Windows machine having Windows 7 operating system.

C. Eclipse (ADT) Android Development Tools:

I have been written Android app design using Eclipse IDE. We have installed Eclipse IDE, download the latest Eclipse binaries from <http://www.eclipse.org/downloads/>. Once you downloaded the installation, unpacked the binary distribution into a convenient location. For example in C:\eclipse on windows, or /usr/local/eclipse on Linux and finally set PATH variable appropriately. Eclipse can be started by executing the following commands on windows machine, or you can simply double click on eclipse.exe
%C:\eclipse\eclipse.exe

D. Setup Android Development Tools (ADT) Plugin

This step will help you in setting Android Development Tool plugin for Eclipse. Let's start with launching Eclipse and then, choose **Help > Software Updates > Install New Software**. This will display the following dialogue box



4. RESULT

The code was written in Keil u vision and then we simulating using Proteus simulator. The results satisfactory we want about with the hardware implementation part. The hardware was also implemented using a decoder board for the selecting among the LED's and the speaker part is also implemented successfully. But in order to use ARM controller in fulfilment, for our project development can be brought about such as including the monitoring system which can make use of the other UART.



5. CONCLUSION

By introducing the concept of wireless technology in the field of the communication. We can make our communication more efficient and faster, with greater efficiency. We can display the messages and with less errors and maintenance. This system can be used in college, school, offices, railway station and commercial as well as personal used. Latency involved in using of papers in displaying of notices is avoided and the information can be

updated by the authorized persons. The above technical paper explains how we can develop as well as modify Android based e-notice board.

6. Future Enhancement

A commercial model can be able to display one message at a time. In our system we are sending the messages via GSM Network through android applications and displaying on a LED by utilizing AT commands. The same principle can be applied to control the electrical appliances at a distant location. The project can be further enhance to control different electrical appliances. The message can be secured for the fixed number.

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