

GSM Based E-Notice Board

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ABSTRACT

The concept of a wireless digital notice board using GSM technology has been introduced in this suggested system. Therefore, cutting down on time and paperwork is our primary goal. In order to show messages sent to the GSM module on the notice board by authorized users, we are attempting to implement our system in this article. To put it briefly, the GSM module at the digital notice board receives the message from the authorized user and displays it on the notice board at a remote location. At the same time, the message is delivered to various user mobile numbers that are saved in the microcontroller memory. Therefore, essential messages or notices will be sent to the appropriate mobile numbers in a very short amount of time. This indicates that a user or registered individual can send a message from any location, and the message will be shown on an LCD display.

Keywords: GSM, E-Notice Board, Digital Notice Board

I. INTRODUCTION

The Campus Display System (CDS), also known as a GSM-based e-notice board, is designed to help colleges and universities show daily information either continuously or at regular intervals throughout business hours. Compared to the programmable system, the GSM-based system provides the ability to broadcast flash news or announcements more quickly. Schools, hospitals, train stations, gardens, and other public spaces can also use GSM-based campus display systems without negatively impacting the environment..

The CDS is primarily composed of a display toolkit that can be programmed from an approved mobile phone and a GSM receiver. After receiving the SMS and verifying the sender Mobile Identification Number (MIN), it converts the code as needed and displays the desired data. It can act as an electronic notice board, preventing latency by instantly displaying the most critical notifications. Due to its wireless nature, the GSM-based CDS is easily expandable, enabling the user to add more display units whenever and wherever the institute needs them on campus.

II. LITERATURE SURVEY

The Global System for Mobile Communications is referred to as GSM. These days, a lot of individuals are quite interested in learning more about GSM-related topics. Therefore, we have compiled a list of numerous GSM-based project ideas that are in high demand and fascinating to read about. A greater understanding of GSM technology in practice can be gained from the following initiatives based on the technology that we surveyed.2.1.4 The Typical Hearing Process

III. SYSTEM DESIGN

As mentioned in the introduction, the main problem that the following project's thesis addresses is the full potential of display boards and wireless media in information conveyance.

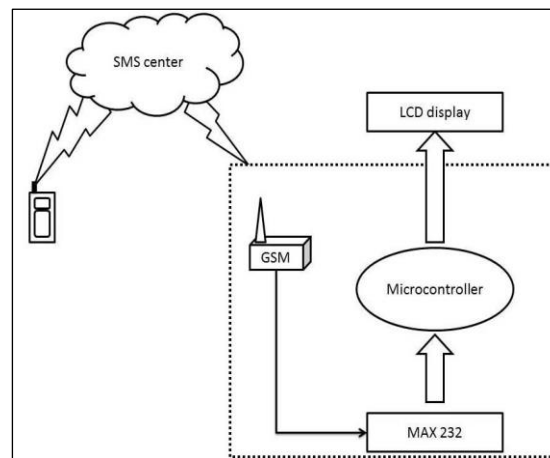


Fig 1: System Overview

As seen in the above diagram, there are a minimum of three interfacing circuits: MAX-232 with GSM MODEM, LCD display including microprocessor, and MAX-232 with microcontroller. It is commonly known that a MODEM may be easily interfaced with a regular PC by using the AT instructions that are sent to it from the Hyper Terminal window. The MODEM, nevertheless, necessitates a wired connection at one end and a wireless connection at the additional end. Dedicated general-purpose computers at each display board location would make the process much easier, but they are too costly to be a viable option. We therefore use an Atmel 89S52 microcontroller that has 64 Kb of EEROM storage memory.

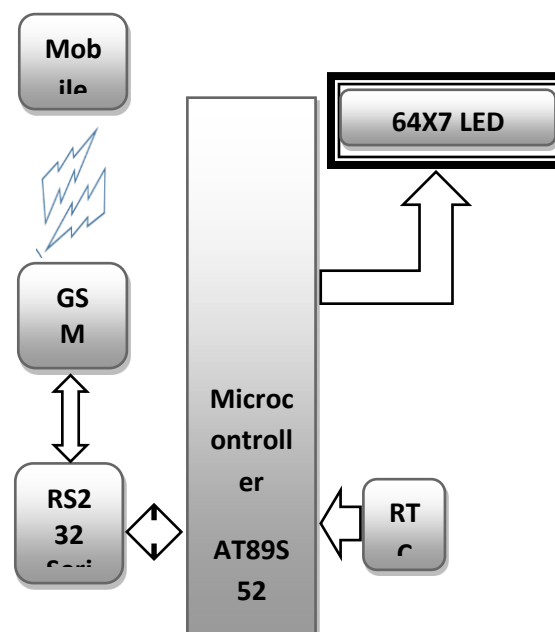


Fig 2: Block diagram

Since the module is a specialized embedded system rather than a general-purpose computer, the coding complexity significantly increases, but once designed, it operates at its most reliable level. Finding and assembling all necessary hardware as well as making sure that every component interfaces safely with every other component are all part of the design process. The coding procedure comes next, which must address the latency between two consecutive transmissions and—above all—the sender's number validation. There may be more than one valid mobile number. The RAM is the limiting factor. The following blocks make up a GSM-based digital notice board.

IV. HARDWARE MODULE

1. Microcontroller 89C52
2. 20 X 4 LCD Display Normal & Jumbo
3. Buzzer Driver
4. Buzzer
5. Power Supply
6. Level Converter MAX 232
7. GSM MODEM

V. MICRO-CONTROLLER BOARD

A CMOS 8-bit microcomputer with 8K bytes of Flash Programmable and Erasable Read Only Memory (PEROM) is a low-power, high-performance device. The device is compatible with the MCS-52TM instruction set and pin out and is made with Atmel's high-density nonvolatile memory technology. The program memory can be rewritten in-system or using a traditional nonvolatile memory programmer thanks to the on-chip Flash. The Atmel micro-controller is a potent microcomputer that offers a very flexible and affordable solution for numerous embedded control applications by fusing a flexible 8-bit CPU with Flash on a monolithic chip.

20 X 4 LCD

Normal & Jumbo: The notification is shown on a 20 x 4 LCD. A standard LCD is adequate for display. However, we can also connect a JUMBO LCD..

BUZZER DRIVER

Since the microcontroller 89C51's output signal is feeble, we must enhance it. The signal used to drive the buzzer is amplified by the buzzer driver block, also known as the amplifier block. The BC 547 transistor is used for amplification.

BUZZER

Buzzers are used as output devices in this project. The buzzer briefly comes on when an SMS is received. Once more, the buzzer turns on for a while after the SMS is read. Once more, the buzzer turns on for a while after the SMS is removed.

POWER SUPPLY

We need a supply of +5 and +12 volts for our project. The LCD display and microcontroller board receive +5 volts. **LEVEL CONVERTER MAX 232 RS-232 INTERFACE**

Logic 0 ranges from +3 to +15 volts, while logic 1 ranges from -3 to -15 volts for GSM modems that operate on RS-232 voltage levels. Since the microcontroller operates on TTL logic levels, logic 0 is equal to 0 volts and logic 1 is equal to +5 volts. Therefore, a Maxim MAX 232 driver IC is used to interface the two.

VI. GSM MODEM GSM MODEM

A wireless modem that is compatible with a GSM wireless network is called a GSM modem. A dial-up modem functions similarly to a wireless modem. The primary distinction between the two is that a wireless modem transmits and receives data via radio waves, whereas a dial-up modem transmits and receives data over a fixed telephone line. A GSM modem needs a SIM card from a wireless carrier to function, just like a GSM cell phone. A PCMCIA card, often known as a PC Card, or an external device can serve as a GSM modem. An external GSM modem can be linked to a PC by Bluetooth, USB, serial, or infrared. Similar to a GSM cell phone, a GSM modem needs a wireless carrier SIM card to function. PCs operate GSM modems using AT instructions. As

with a Hayes compliant modem, you can utilize a GSM modem. A wider range of AT instructions are supported by GSM modems. The GSM specifications contain definitions for these enhanced AT commands.

VII. AT COMMAND

A modem can be controlled via AT commands. AT tension is shortened to AT. "AT" or "at" appears at the beginning of every command line. For this reason, modem commands are referred to as AT commands. Mobile phones and GSM/GPRS modems accept many of the same commands used to operate wired dial-up modems, including ATD (Dial), ATA (Answer), ATH (Hook control), and ATO (Return to online data state). The AT command set specific to GSM technology is supported by GSM/GPRS modems and mobile phones in addition to the common AT command set. This AT command set includes commands related to SMS, such as AT+CMGS (Send SMS message), AT+CMSS (Send SMS message from storage), AT+CMGL (List SMS messages), and AT+CMGR (Read SMS messages).

VIII. MICROCONTROLLER

Additional peripherals like read-only memory (ROM), read-write memory (RAM), and other components are required to complete a microcomputer system. A complete microcomputer system consists of decoders, drivers, latches, and a number of input/output devices. A microcomputer system's functionality, performance, and flexibility can also be increased by adding special purpose devices such interrupt controllers, programmable timers, programmable I/O devices, DMA controllers, USART/UART, and programmable keyboard/display drivers. Furthermore, a complex power supply setup and battery backup are necessary. But the main advantage of computer systems based on microcontrollers is that they may be designed with a lot of flexibility. By adding or deleting the appropriate peripherals, a system can be configured to be either large or small. Conversely, the micro controller integrates all feature present in micro controllers. It does, however, include extra characteristics that enable it to function as a standalone microcomputer system. As a result, micro controllers are occasionally referred to as single-chip microcomputers. ROM, RAM, parallel and serial I/O, counters, interrupts, and a clock oscillator circuit are all integrated within the micro controller.

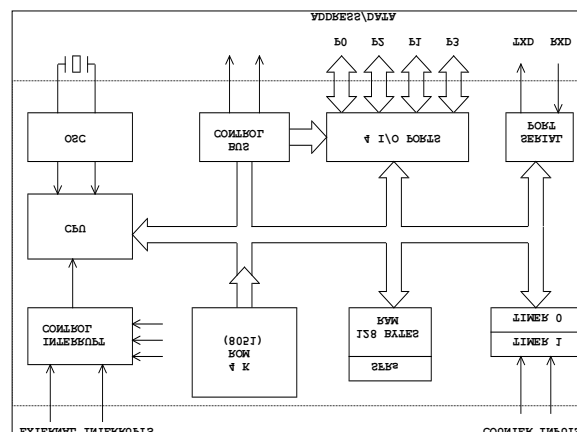


Fig 3: Block diagram of 8051 family microcontroller

IX. FEATURES OF 8051 FAMILY MICROCONTROLLER

- 8-bit Central Processing Unit.
- 4Kbytes of programmable Memory.
- Fully Static Operation: 0 Hz to 24 MHz
- 128 x 8-bit Internal RAM.
- 32 Programmable I/O Lines.
- Two 16-Bit Timer/Counters.
- Six Interrupt Sources.
- Programmable Full Duplex Serial Channel.
- On-chip Oscillator and Clock Circuit.
- Low Power Idle and Power Down Modes.

X. COMMUNICATION

To connect a computer to a GSM-GPRS system, a GSM/GPRS module is required. The majority of nations use the Global System for Mobile Communication (GSM) architecture for mobile communication. Higher data transmission rates are made possible via the Global Packet Radio Service (GPRS), an expansion of GSM. A GSM/GPRS modem, power supply circuit, and computer connection interfaces (such as USB, RS-232, etc.) make up a GSM/GPRS module.

GSM/GPRS MODULE

In order to facilitate easy interface with a computer or microprocessor/microcontroller-based system, a GSM/GPRS module assembles a GSM/GPRS modem with common communication interfaces such as RS-232 (Serial Port), USB, etc. The module also has a built-in power supply circuit that can be turned on with the right adapter.



Fig 4: GSM Module

LED DISPLAY

The display is having following specifications:

- LED Matrix: 7X64.
- Fonts: English 3 Fonts Inbuilt
- Symbols: 25 (Heart, Car, Om, Rupees Symbol, Dollar Symbol, Up Down Right Left Sign).
- Pages: 10
- Date and Time: Yes
- Char Capacity: 1500
- Single Page Char: 150
- Interface: GSM.
- Function: Special
Pause, Roll Slide,



Effect Functions like Blinking, Roll Up, Roll Down etc.

Fig 5: LED Display

SOFTWARE IMPLIMENTATION EMBEDDED C

The C Standards committee created Embedded C as a collection of language extensions for the C programming language to solve commonality problems with C extensions for various embedded devices. Historically, to implement exotic features like fixed-point arithmetic, many different memory banks, and simple I/O operations, embedded C programming has required nonstandard additions to the C language.

KEIL SOFTWARE

Every level of software developer is supported by Keil's development tools for the 8051 Microcontroller Architecture, from professional applications engineers to students just learning about embedded software development..

APPLICATIONS

- Educational institutions & organizations
- Managing traffic
- Advertisement Conference Hall
- Bus/Railway station
- Any Public utility places

ADVANTAGES

- We can transmit messages from anywhere in the world to any remote area by using a GSM mobile.
- Because it is a GSM wireless transmission system, it requires less upkeep and has relatively few mistakes.
- Uses a password to prevent unwanted access to the notice board.
- There are no fees associated with printing or photocopying; many users are permitted to edit notifications on the electronic notice board. Consequently, it saves energy, time, and the environment.

DISADVANTAGE

- ★ When there is network problem gsm doesn't work.

XI. CONCLUSION

The display boards are one of the major communication mediums for mass media. Local language can be added as a variation in this project. This can be achieved by using graphics and other decoding techniques. Also we realize that this project saves time, energy and hence environment. Cost of printing and photocopying is also reduced as information can be given to a large number of people from our fingertips. Thus we can conclude that this project is just a start, an idea to make use of GSM in communications to a next level.

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