

GSM Modem Based Moving Message Display

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ABSTRACT –

In the last few years the technology has drastically changed and evolved. Advertising or Notification systems have attained greater importance. Earlier systems had the drawback that the Notice boards or systems that were based on Bluetooth or keyboard / PC needed proper connection for updating the information to be displayed. The idea proposed in this paper is that of using GSM technology so that the updates could be made remotely. Nowadays SMSs are very common and every ordinary mobile phone has this service. So updates to these notice boards could be made through a simple SMS. The incoming number and the message are stored in EEPROM so that no previous message is lost even after power failure. These systems could be used not only in schools or educational institutions but also for commercial purposes such as advertising or emergency notification systems.

Keywords - GSM, Interface, Message, Modem, Receiver

I. INTRODUCTION

Now-a-days LED Message Scrolling Displays are becoming very popular for advertisements. These displays are used in shopping malls, theatres, public transportation, traffic signs, highways signs, etc., The big problem with these displays is to carry a computer or special keyboard for generating and sending messages to LED moving display boards dynamically. Carrying a host computer or special keyboard every time to generate message for LED display boards is big headache and also increase cost if it go for wireless based message sending.

To make the LED scrolling display more portable, a GSM mobile phone is used instead of carrying keyboard or a host computer for generating or sending messages to LED display board. A text message is typed in the GSM mobile phone and sent it by using SMS service of the mobile phone to LED moving display boards. A GSM modem is connected to the LED display hardware is used to receive the SMS and send it to the controller circuit of the LED display. Then the controller circuit of the LED display filters the message content in SMS and changes the display text in LED display dynamically. By using this SMS service it is possible to change the text in the LED display board from anywhere in the country. The idea implemented in this project reduces the total cost that is required in the traditional LED display boards not only it makes easier to send message to the LED display boards.

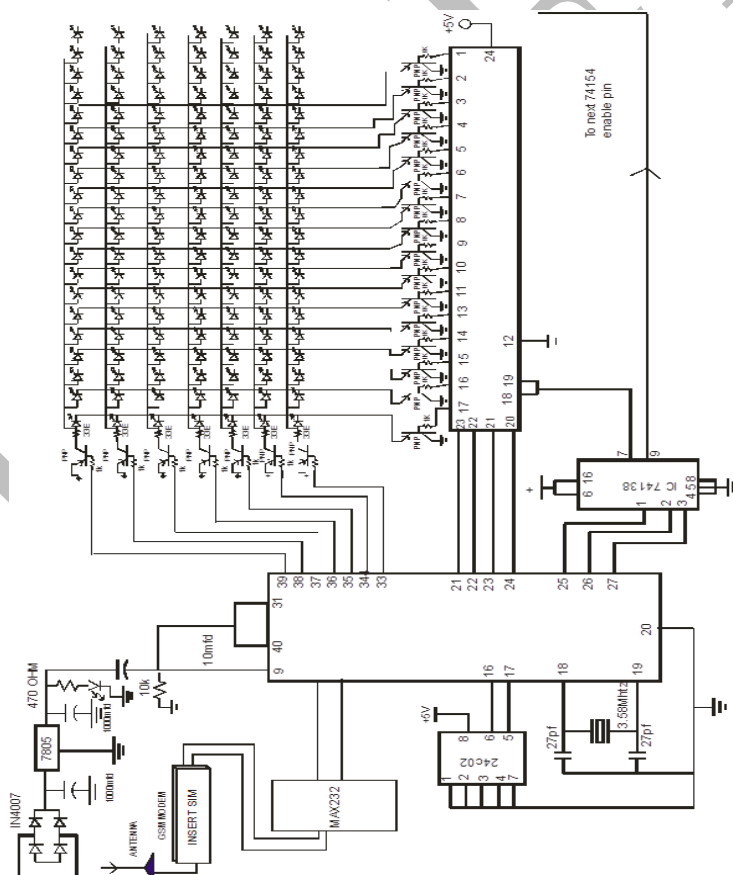
The project uses a GSM modem at the display side to receive SMS. An IC 89S51 belongs to microcontroller 8051 family act as controller to drive the LED display board. Along with these a power supply unit and supporting hardware for microcontroller is used.

II. Proposed Work

This will be a moving message display, which can be used as the digital notice board, and also a GSM modem, which is the latest technology used for communication between the mobile and the embedded devices. System will work like when the user wants to display or update the notice board, the user has to send the message from his mobile defining the message and then the password of the system to the number of the SIM which is inserted in the display system MODEM. Then the MODEM connected to the display system will receive the

SMS, the microcontroller inside the system is programmed in such a way that when the modem receives any message the microcontroller will read the message form serial port and verify for the password, if the pass word is correct then it will start displaying the messages in the display system. The messages are displayed on the LED display. The prototype of the GSM based display toolkit has facilities to be integrated with a display board thus making it truly mobile. The toolkit accepts the SMS, stores it, validates it and then displays it in the led module. The SMS is deleted from the SIM each time it is read, thus making room for the next SMS. The major constraints incorporated are the use of „*“ as the termination character of the SMS and the display of one SMS as a time. The limitations can be removed by the use of higher end microcontrollers and extended RAM. The prototype can be implemented using commercial display boards. The use of "Embedded System in Communication" has given rise to many interesting applications that ensures comfort and safety to human life. GSM technology is one of the new technologies in the embedded field to make the communication between microcontroller and mobile. Now every embedded system is used to communicate with other system using GSM and GPRS technology, In this system the MODEM is used to access the message sent by the user to display on notice board. This system has many important applications and can be used to update the remote notice board from far off places using GSM MODEM by sending SMS between the mobile and the embedded devices (microcontroller 89c51). This remote control of notice board is possible through embedded system. The microcontroller is interfaced with GSM Modem in mobile phone via MAX232 level convertor. The microcontroller system is designed to allow easy use of a mobile phone to update the notice board at any far location. Using a mobile phone the development of the notice board is being carried out using SMS, this will update the notice board with the help of the microcontroller modules attached to it, which provides the moving message displayed on the LED using 89c51.

Proposed System



III. Hardware Design

1. Power supply: Power Supply is an important part of a circuit. It provides required supply to different blocks of the circuit from input 230 V AC. The main blocks include transformer, rectifier circuit, filter circuit, and regulator circuit. Voltage regulator IC LM7805 is used as a voltage regulator. The microcontroller and other devices get power supply from AC to DC adapter through 7805, 5 volts regulator. The adapter output voltage will be 12V DC non-regulated. The 7805/7812 voltage regulators are used to convert 12 V to 5V/12V DC.

2. Micro controller - AT89C51:8051 based CMOS controller with dual DPTR, 32 I/O Lines, WDT, PCA, 3 Timers/Counters, 7 Interrupts/4 Priority Levels, 64K Bytes ISP FLASH EPROM, 256 Bytes on-chip RAM. Vital role of micro controller in, Remote notice board using GSM with SMS: The microcontroller inside the system is programmed in such a way that when the modem receives any message, the microcontroller will read the message from serial port and verify for the password, if the password is correct then it will start displaying the messages on the LED display system. LED is connected to microcontroller as 4 bit data mode, before displaying anything on the LED, initialization has to be done, so microcontroller will control the LED initialization and select the data register and command register according to the purpose. Memory is connected to microcontroller using two pins, it is communicating with the microcontroller through I2C Communication.

3. Buzzer: Buzzer is controlled by the microcontroller using single pin. Sometimes it can be interchanged according to the transistor used to drive the device. The buzzer subsystem produces a 2 KHz audible tone when powered. The buzzer will sound when the signal coming into the driver is high. It must be connected to a Darlington transistor or transducer driver subsystem. The buzzer is connected between the supply rail (+ V) and the input signal. This acts as load on the driver. When the input signal coming into the buzzer subsystem is low, a potential difference across the buzzer causes current to flow. It is this flow of current that causes the buzzer to sound. Buzzer is connected to microcontroller port pin, so microcontroller will give high or low to switch on/off buzzer. In this system it is used to define the arrival of the SMS in the form of sound.

4. RS232 converter (MAX 232N): Vital role of RS232 converter (Max 232n) in, GSM based LED display. RS232 converter is a chip to convert the TTL voltage levels into RS232 level and vice versa. In this system GSM modem is communicated with the microcontroller using RS232 serial data format. In order to make MODEM serial port compatible with microcontroller serial port the RS232 converter is used.

5. External EEPROM memory (2 Kbytes): These memory devices are used to store the data for off line process. The AT24C02 provides 2048 bits of serial electrically erasable and programmable read only memory (EEPROM) organized as 8192 words of 8 bits each. The device is optimized for use in many industrial and commercial applications where low power and low voltage operation are essential. EEPROM is communicating with the microcontroller using I2C communication i.e. it contains one data pin and clock pin, these devices are connected as slave to the microcontroller. The main application of memory in this system is to store the message coming from user mobile, when the microcontroller is doing the operation of writing and reading to memory.

6. GSM modem (900/1800 MHz): A GSM modem is a wireless modem that works with a GSM wireless network. A wireless modem behaves like a dial-up modem. The main difference between them is that a dial-up modem sends and receives data through a fixed telephone line while a wireless modem sends and receives data through radio waves. Like a GSM mobile phone, a GSM modem requires a SIM card from a wireless carrier in order to operate. Generally, computers use AT commands to control modems. Reading of message from the SIM card inserted into the modem is done by sending the appropriate AT command to the modem. In addition to the standard AT commands, GSM modems support an extended set of AT commands. These extended AT commands are defined in the GSM standards.

VI. CONCLUSION

By introducing the concept of wireless technology in the field of communication we can make our communication more efficient and faster, with greater effectiveness we can display the messages and with less errors and maintenance. This model can be used very efficiently in establishments like chain restaurants wherein the order and special discounts can be displayed at all branches simultaneously, in colleges wherein students and staffs can be informed concurrently in no time. It can be set up at public transport places like railways, bus station, and airport and also at roadside for traffic control and in emergency situations, it is cost efficient system and very easy to handle. Latency involved in using of papers in displaying of notices is avoided and the information can be updated only by the authorized persons.

V. REFERENCES

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