REVIEW ON WIRELESS NOTICE BOARD BY USING GSM TECHNOLOGY

Kamlesh Yadav[1], Kanhaiya Lal[2], Pradeep Kumar[3], Amrita Singh[4], Avanish[5], Mr. Mahesh Kumar Singh[6]

[1, 2, 3,4,5] *(E&C Deptt., BIT, GIDA, Gorakhpur, India)*

[6] *(Asst. Prof., E&C Deptt., BIT, GIDA, Gorakhpur, India)*

ABSTRACT

It is the observed that for man to control electronic appliance(s) without necessarily moving an inch. This paper explains how a convenient, reliable, low cost and an authentic wireless communication could be easily design between a mobile phone and microcontroller using GSM (Global System for Mobile Communication) MODEM. In this paper we are trying to implement our system in such a way that it can display message from authorized user sends to GSM module which is located on the notice board. So in short, the GSM module which is located at Digital notice board receives the message from authorized user and displayed on scrolling LED display notice board which is situated at remote location, at same time this message will be sent to different user's mobile numbers that are stored in microcontroller memory. So spreading of important message or notice will be takes place within very short span of time to respective mobile no's. Means user or registered person can able to send the message from anywhere and this message is displayed on scrolling LED display. This research paper discusses the design and implementation of a micro-controller-based global system for mobile communication (GSM) scrolling display system. The work uses the micro-controller (8051) as the control component in the construction of the device which makes simple, the design of the device due to the addition of the input/output port on the microcontroller. A GSM module was incorporated in the design which functions as the receiver of the message sent via short message service (SMS) on a GSM phone.

Keywords—GSM modem, LED display, transmitter, receive, Remote Location, Scrolling LED Display.

I.INTRODUCTION

Now-a-days advertisement is going digital. The big shops and the shopping centers use digital displays now. Also, in trains and buses the information like platform number, ticket information is displayed in digital boards. People are now adapted to the idea of the world at its finger-tips. The use mobile phones have increased drastically over years. Control and communication has become important in all the parts of the world. [2]

The LED Display System is aimed at the railways, hospital, colleges and universities for displaying day-to-day information continuously or at regular intervals during the working hours. Being GSM-based system, it offers flexibility to display flash news or announcements faster than the programmable system. GSM-based display system can also be used at other public places like schools, hospitals, railway stations, gardens etc. without affecting the surrounding environment. The led display system mainly consists of a GSM receiver and a display

toolkit which can be programmed from an authorized mobile phone. It receives the SMS, validates the sending Mobile Identification Number (MIN) and displays the desired information after necessary code conversion. It can serve as an electronic notice board and display the important notices instantaneously thus avoiding the latency. Being wireless, the GSM based led display is easy to expand and allows the user to add more display units at any time and at any location in the campus depending on the requirement of the institute. Now-a-days LED Message Scrolling Displays are becoming very popular .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. This is shown in fig1.
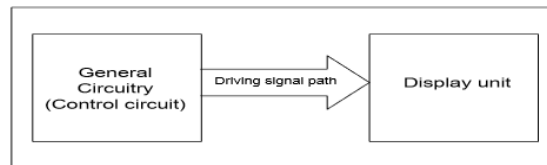

Fig1. Simplified model of scrolling LED based message display board

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 89C51RD2 belongs to microcontroller act as controller to drive the LED display board. Along with these a power supply unit and supporting hardware for microcontroller is used. There is an additional rechargeable battery back-up to compliment for power instability. The device is suitable for use at any location within the globe. The LED display system mainly consists of a GSM receiver and a display toolkit which can be programmed from an authorized mobile phone. It receives the SMS, validates the sending Mobile identification Number (MIN) and displays the desired information after necessary code conversion. The GSM-based system offers flexibility to display flash news or announcements faster than the programmable system. It can also be used at other public places like schools, gardens etc. without affecting the surrounding environment. The GSM network is inherently digital which makes it secured, relatively error-free and jamming-proof. Hospitals, banks, sports stadium, airports, railway stations, education sectors and stock markets etc find this device a useful tool to communicate electronically. It has an unparalleled advantage in drawing people's attention by prompting them to reflect many times on the scrolling lights, automatically displaying either messages of advertisement, place description or

greetings at any time of the day. It can be used for both indoor and outdoor purposes. In fact it is the most alluring, unique, captivating and attractive means of information dissemination.

II.PREVIOUS DESIGNMETHODOLOGY

It presents an SMS based notice board incorporating widely used GSM to facilitate the communication of displaying messages on notice board via user mobile phone. The message to be displayed is sent through the SMS from an authorized transmitter. The microcontroller receives the SMS validates the sending mobile identification number (MIN) and displays the desired information. The displayed board programs itself with the help of incoming SMS with proper validation. Here in advertising display system mobile is used as a transmitter which transmits SMS and from GSM Modem to LED display which is used as a receiver.

The word GSM stands for Global System for Mobile Communications. Nowadays interest regarding GSM related concepts is increasing. So, we have surveyed a list of various GSM based projects ideas which are having more demand and very interesting to learn. The projects based on GSM technology we surveyed gave us better idea about the GSM technology.

This methodology of sending messages through mobile phone and it is displayed on the LCD display. At the same time this message will be sent to different users mobile numbers that are stored in the microcontroller memory. So spreading of important message or notice will be takes place within a span of time to respective mobile numbers. [1]

Fig2 shows the block diagram of the microcontroller system

Fig2. Fundamental block diagram of the microcontroller system. [4]

III.PROPOSED METHODOLOGY

SMS technology is one the most stable technologies around the world [3]. Most of the students carry mobile phones with SMS facilities that can be used for teaching and learning. This project lets the student know about the topic studied earlier s it gives a review on the topic.
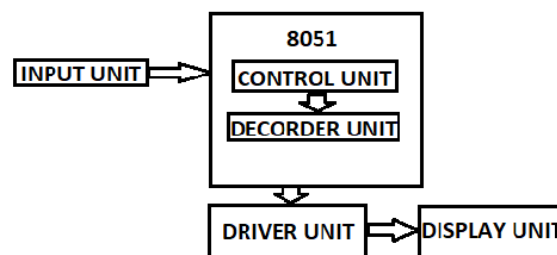

Fig3. Design of the wireless notice board system

In this paper, it is proposed to design a model where the message to be displayed is sent through a SMS from an authorized transmitter. The toolkit receives the SMS, validates the user and displays the desired information after necessary code conversion. [5]

The main components of the Fig.3 contains microcontroller 8051 which is interfaced with PC via MAX232 level convertor. MAX 232 level converter is used to convert RS232 voltage to TTL voltage levels and vice versa. A 48x 6Character LED display is attached in byte mode to port 1 of microcontroller. This display will be used to display the messages /advertisements. Microcontroller coding will be done using Embedded C and Kiel. The microcontroller displays the message in the Scrolling LED display Notice board.

3.1   Power Supply:

The power supply unit is the unit from which the maximum 5V dc. Voltage ever needed in the circuit is supplied. The unit comprises of the following components as shown in above Figure 3.

i. A transformer which steps down the ac supply voltage to suit the requirement of the solid-state electronic devices and also provides isolation from the supply line

ii. A full wave bridge rectifier which performs the transformation of the a.c. voltage into a pulsating d.c. voltage in a process known as rectification

iii. Capacitors which filter out (remove) fluctuations or pulsations (called ripples) present in the rectifier output voltage.

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3.2.   GSM Modem:

GSM/GPRS MODEM is a class of wireless MODEM devices that are designed for communication of a computer with the GSM and GPRS network. It requires a SIM (Subscriber Identity Module) card just like mobile phones to activate communication with the network. Also they have IMEI (International Mobile Equipment Identity) number similar to mobile phones for their identification. A GSM/GPRS MODEM can perform the following operations: a. Receive, send or delete SMS messages in a SIM. b. Read, add, search phonebook entries of the SIM. c. Make, Receive, or reject a voice call. The MODEM needs AT commands, for interacting with processor or controller, which are communicated through serial communication. These commands are sent by the controller/processor. The MODEM sends back a result after it receives a command. Different AT commands supported by the MODEM can be sent by the processor/controller/computer to interact with the GSM and GPRS cellular network.

3.2.1:   AT commands used by GSM:

AT commands are used to control MODEMs. AT is the abbreviation for Attention. These commands come from Hayes commands that were used by the Hayes smart modems. The Hayes commands started with AT to indicate the attention from the MODEM Following are the types of AT command:

 a) Test commands - used to check whether an command is supported or not by the MODEM. SYNTAX: AT<command name>=?

b) Read command - used to get mobile phone or MODEM settings for an operation. Fig3:GSM Module SYNTAX: AT<command name>? c) Set commands - used to modify mobile phone or MODEM settings for an operation. SYNTAX: AT<command name>=value1, value2…valueNsome values in set commands can be optional. d) Execution commands - used to carry out an operation. SYNTAX: AT<command

name>=parameter1, parameter2…parameterNsome of the AT commands are shown in the table no. 1 as follows:

TABLE NO.1

For The AT Command

Command	Description
ATA	Answer Command
ATD	Dial command
ATH	Hang up call
ATL	Monitor speaker loudness
ATM	Monitor speaker mode
ATO	Go on-line
ATP	Set pulse dial as default
ATT	Set tone dial as default
AT+CSTA	Select type of address
AT+CRC	Cellular result codes

3.3: MAX232:

It is a dual driver/receiver that includes a capacitive voltage generator to supply EIA-232 voltage levels from a single 5-V supply. Each receiver converts EIA- 232 inputs to 5-V TTL/CMOS levels. Each driver converts TTL/CMOS input levels into EIA-232 levels.

a. FEATURE

b. Meets or Exceeds TIA/EIA-232-F and ITU Recommendation V.28.

 c. Operates From a Single 5-V Power Supply With 1.0_F Charge-Pump Capacitors

d. Operates Up To 120 kbit/s.

e. Two Drivers and Two Receivers.

f. 30-V Input Levels.

g. Low Supply Current . . . 8 mA Typical.

The implementation of this work was done on the breadboard. The power supply was first derived from a bench power supply in the electronics laboratory. The implementation of the work on bread board was successful and it met the desired design aims with each stage performing as designed.

IV.APPLICATION

4.1. Educational Institution and Organization: Currently we rely on putting up papers on notice boards to inform people of events. This method can be discarded by using GSM based LED display to display information in real time. E.g. Placement news, cultural activities news, etc.

4.2. Advertisement: In shopping malls we get to hear the offers on various products from time to time. Instead we continuously display the information regarding the products and related offers on electronic display boards.

4.3. Railway Station: Instead of announcing the delay in arrival of trains we can display the information.

4.4. Hotels: To display the availability of the rooms and the room rents the type of rooms.

4.5. Nursing homes: To display the staff attendance, the availability of the doctors, the list of the specialized doctors, no of in patients etc.

V.MERITS

5.1. User friendly: Messages are only to be typed on a mobile or a computer, which in turn are displayed wirelessly on the display unit.

5.2. Eliminates use of printers: Since we don't use papers to display information, printers are also of no use in this system.

5.3. Faster means of transferring information: There is no delay in transmission of information. Messages are displayed in a matter of seconds after typing.

VI.FUTURE ENHANCEMENT

6.1. A commercial model can be able to display more than one message at a time.

6.2. In our system we are sending messages via GSM network and displaying on a LED by utilizing AT commands. The same principle can be applied to control electrical appliances at a distant location.

6.3. This technology could be further modified and more upgraded as per individual need and interest. We have discussed some basic ideas of this technology. And depending on innovative applications user can upgrade as per requirement.

VII.CONCLUSION

This paper has discussed "Design Of Wireless Notice Board By Using Gsm Technology" which can be widely used for displaying notices in colleges, advertisement in stock market, by sending messages in form of SMS. The hardware board contains PIC 16F877A microcontroller at the heart of the system. The microcontroller is interfaced with GSM Modem. It is used to convert RS232 voltage levels to TTL voltage levels and vice versa. Microcontroller coding was done using embedded C programming. Multiple users are authorized to update notices on the digital notice board provided the user has the pass code The digital scrolling light advert display was implemented using light emitting diodes (LED) matrix array. The LED matrix array was driven by a

microcontroller programmed to handle the character/ message display. The choice of the LED matrix array and the use of a microcontroller were made to ensure that the display unit does not consume much power. A GSM module which serves as the receiver of the transmitted pulses from the mobile phone was also incorporated.

REFERENCES

Conference Papers:

[1] Gao W., Zhang, G. and Jiang, X. "Study Implementation of Agricultural SMS Management System". In Proceedings of IEEE International Conference on Information Technology and Computer Science, 13-17 October 2009, Beijing, China, pp. 1-4, 2009.

Journal Papers:

[2] Priyanka A. Borkar et al, International Journal of Advanced Research in Computer Science, 4 (6) Special Issue, May 2013,191-195.

[3] Shereen, N. Z. and Rozumah, B. "Mobile Phone use Amongst Student in University in Malaysia: It correlates and relationship to Psychological Health". European Journal of Scientific Research. Vol. 37. No.2. pp. 206 – 218, 2009.

[4] Dahul K and Preeti A(2013): "Design and development of GSM- based multiple LED display boards",International Journal of Computer Applications, Volume 7, No.8, Pp. 40-46.

Books:

[5] Hehta V.K (2013): "Principles of Electronics", Second Edition, S.Chand& Company Ltd, India, Pp 23-65.

Website Link:

[6] http://www.itu.Int/ITUD/ict/publications/idi/2009/material/IDI2009_w5.pdf.

[7] http://www.itu.Int/ITUD/ict/statistics/2010/material/ graphs/2010/Global_ICT_Dev_00-10.jpg.