

# WIRELESS PLACARD USING MOBILE COMMUNICATION SYSTEM

Amrit panigrahi<sup>1</sup>, Sonali Panigrahi<sup>2</sup>, Suprava Sahoo<sup>3</sup> & Sugandha Rath<sup>4</sup>

<sup>1</sup>Asst. Prof. EEE Dept. GIET, Gunupur, Odisha, India

<sup>2,3,4</sup>Btech Scholar EEE Dept. GIET, Gunupur, Odisha, India

## Abstract

*This paper carries out a detailed review of the various techniques employed in the recent years in GSM technology. It discusses the current innovations in technology, and within this context, the operation of wireless electronic placard using GSM technology / mobile communication system has been reviewed. The important techniques used in past are also tabulated. Placard or Notice board is primary thing in any institution / organization or public utility places like bus stations, railway stations and parks. But sticking various notices day to day is a difficult process. This project deals with an advanced wireless placard. We know the importance of placard in public places like railway stations, bus stations and airports. But changing notices day-to-day is a difficult task. A separate person is required to take care of this notice display. This project deals about an advanced high technology wireless notice board. This article explains you how to design a wireless electronic placard using GSM technology. The project displays the data on LCD whatever we sent from the mobile. The main objective of this project is to develop a wireless placard that displays messages sent from the user's module. When a user sends a message from his mobile phone, it is received by a SIM loaded GSM modem at the receiver unit. The GSM modem is duly interfaced through arduino uno. The message so received is thus sent to the arduino uno that further displays it on electronic notice board which is equipped with a LCD display interfaced to arduino uno duly powered by a regulated power supply from mains supply of 230 volt ac.*

**Keywords:** GSM, ARDUINO UNO, LCD, VOLTAGE REGULATOR

## 1. INTRODUCTION

Now-a-days advertisement is going digital. The big shops and the shopping centres 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 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. This gave us the idea to use mobile phones to receive message and then display it on an electronic placard. The GSM technology is used. GSM stands for Global System for Mobile Communication. Due to this international roaming capability of GSM, we can send message to receiver from any part of the world. It has the system for SMS-Short Message Service. This project is a remote notice board with a GSM modem at the receivers end. So if the user wants to display any message, he can send the information by SMS and thus update the LCD display accordingly. As engineer's main aim is to make life simple with help of technology, this is one step to simplify real time noticing.

## 2. COMPONENTS REQUIRED

- 2.1 GSM Modem
- 2.2 SIM
- 2.3 LCD
- 2.4 ARDUINO UNO
- 2.5 Voltage Regulators
- 2.6 Software
  - 2.6.1 AT Command
  - 2.6.2 Hyper Terminal

### 2.1 GSM MODEM

This GSM Modem can accept any GSM network operator SIM card and act just like a mobile phone with its own unique phone number. Advantage of using this modem will be that you can use its RS232 port to communicate and develop embedded applications. Applications like SMS Control, data transfer, remote control and logging can be developed easily. The modem can either be connected to PC serial port directly or to any microcontroller. It can be used to send and receive SMS or make/receive voice calls. It can also be used in GPRS mode to connect to internet and do many applications for data logging and control. This GSM modem is a highly flexible plug and play quad band GSM modem

for direct and easy integration to RS232 applications.

## 2.2 SIM

SIM abbreviates as Subscriber Identity Module. It is a chip-on small card consisting of user's information as well as phone book. User can alter the operator on the same handset as per convenience. At present dual SIM handsets are also available in the market where we can use two operators on the same handset. The SIM is inserted in a slot available on the GSM Modem.

## 2.3 CD

LCD-Liquid Crystal Display is an electronic device for displaying text or characters. We are using 14 pin LCD. 16\*2 represents 16 characters and 2 line display. LCD's are economical and easily programmable and can easily display special and custom character.

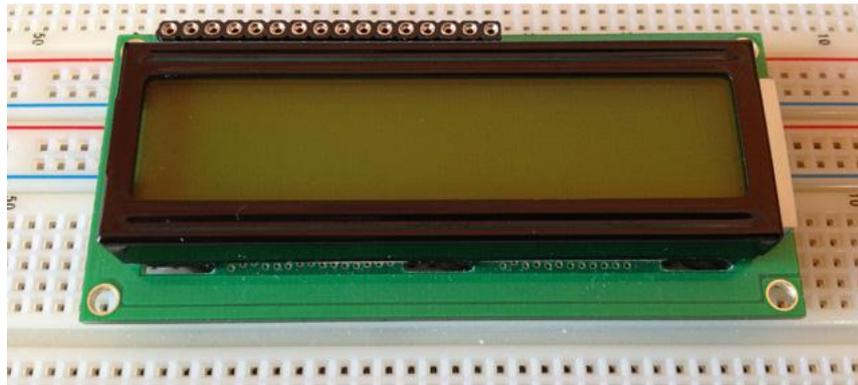


Figure 1. LCD

## 2.4 ARDUINO UNO

Arduino is an open source ,computer hardware and software company,project,space and user community that designs and manufactures microcontroller kits for building digital device and interactive objects that can sense and control objects in the physical world.The projects products are distributed as obtain source hardware and software which are licensed under the GNU lesser general public license permitting the manufacture of arduino board and software distribution by any one.Arduino boards are available commercially in pressmble for, or as do it yourself kits.Arduino board design use a variety of microprocessor and controllers.The boards are equipped with setup digital and analog input/output pins that may be interface to various version boards and other circuits.+++6



Figure 2 Arduino Uno

## 2.5 VOLTAGE REGULATOR

A Voltage regulator is a device that automatically maintains a constant voltage level. A voltage regulator generates a fixed output voltage of a preset magnitude that remains constant regardless of changes to its input voltage or load conditions. Electronic voltage regulators are found in devices such as computer power supplies where they stabilize the DC voltages used by the processor and other elements.

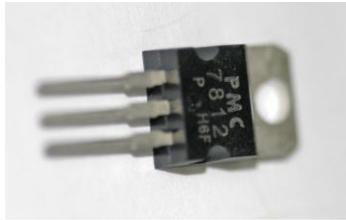


Figure 3: Voltage Regulator

## 2.6 SOFTWARE

### 2.6.1 AT Command

AT commands are instructions used to control a modem. AT is the abbreviation of ATtention. Every command line starts with "AT" or "at". That's why modem commands are called AT commands. Many of the commands that are used to control wired dial-up modems, such as ATD (Dial), ATA (Answer), ATH (Hook control) and ATO (Return to online data state), are also supported by GSM/GPRS modems and mobile phones. Besides this common AT command set, GSM which includes SMS-related commands like AT+CMGS (Send SMS message), M/GPRS modems and mobile phones support an AT command set that is specific to the GSM technology, AT+CMSS (Send SMS message from storage), AT+CMGL (List SMS messages) and AT+CMGR (Read SMS messages).

### 2.6.2 Hyper Terminal

HyperTerminal can be useful in diagnosing whether a connection problem is due to modem/line or dial-up networking issue, partly because it bypasses dial-up networking when dialing a POP. It is also capable of directing commands to the modem (ATi), thereby providing a means of collecting valuable information about the modem properties such as the chipset, BIOS and more. HyperTerminal can therefore be used instead of "More Info" or "Query Modem" on the Diagnostics tab of the Modem Properties in Windows.

## 3.CONNECTION LAYOUT

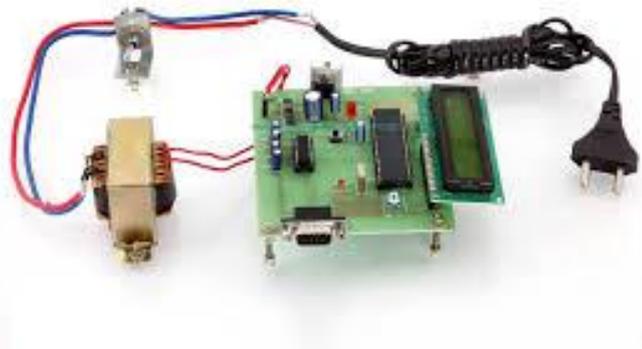


Figure 4 Connection Layout

The above figure shows the connection of the GSM modem RS232 and the LCD with the voltage regulator and microcontroller. Connected MAX232 is the IC which changes signals from RS-232 serial port to corresponding output fit for use in digital logic circuits. The MAX232 converts the RX, TX, CTS and RTS signals.

#### 4. CONNECTION AND TESTING



**Figure 5 :** Connection and Testing

First Initialize the LCD and UART protocol. Then check for the command +CMTI: "SM",3 (Location number) to know whether the new message is received or not. If you receive the command then store message location number. Now read that particular location and extract the body of the message. Then display the message on LCD.

#### 5. Conclusion

The display boards are one of the major communications medium 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.

#### References

- [1] E. Ferro and F. Potorti, Bluetooth and Wi-Fi wireless protocols a survey and comparison ,Wireless Communications, IEEE, vol. 12, no. 1, pp.12-26, February 2005.
- [2] Nivetha S. R., Puritha R., Preethi Selvaraj and Yashvanthini S. M., (2013) SMS based wireless notice board with monitoring system, International Journal of Advanced Electrical and Electronics Engineering, (IJAEED), ISSN (Print): 2278-8948, Volume 2, Issue 3, pp 58-62.
- [3] Vijay Kumar Garg, Joseph EWilkes, Principle and Application of GSM, Upper Saddle River, NJ [u.a.] Prentice Hall PTR, pp. 177-192, 1999.
- [4] GSM Based e-notice board: Wireless communication International journal of soft computing and engineering (IJSCE). ISSN: 2231-2301, vol-2, issue-3, July 2012.
- [5] Anuradha Mujumdar, Vaishali Niranjane & Deepika Sagne, (2014) "Scrolling LED display using wireless transmission", International Journal of Engineering Development and Research (ISSN: 2321- 9939), Volume 2, Issue 1, pp 475-478.
- [6] Muhammad Ali Mazidi, Janice Gillispie Mazidi, Rolin D. McKinely, " The 8051 Microcontroller and Embedded System using Assembly and C", second edition, Upper Saddle River, N J Pearson publication, 2006.
- [7] J. S. Lee, Y. W. Su, and C. C. Shen, "A Comparative Study of Wireless Protocols: Bluetooth, UWB, ZigBee, and Wi-Fi", Proceedings of the 33rd Annual Conference of the IEEE Industrial Electronics Society (IECON), pp. 46-51, November 2007.
- [8] Swiatkowski, M. Fac. of Microsyst. Electron. & Photonics, Wroclaw Univ. Of Technol. Wozniak, K. ; Olczyk, L. "Student Notice Board Based on LED Matrix System Controlled over TCP/IP Protocol " , July 2006, Conference Publications.
- [9] Rahul Kamboj and Pree+ti Abrol, (2013) "Design and Development of GSM based Multiple LED Display Boards", International Journal of Computer Applications (0975 – 8887), Volume 71, No.18,pp 40-46.

- [10] Mayur R. Bhojar, Suraj Chavhan and Vaidehi Jaiswal, (2014) "Secure method of updating digital notice board through SMS with PC monitoring system", IOSR Journal of Computer Science (IOSRJCE), e-ISSN: 2278-0661, p-ISSN: 2278-872, pg. 24-29.
- [11] Prachee U. Ketkar, Kunal P. Tayade, Akash P. Kulkarni & Rajkishor M. Tugnayat, (2013), "GSM mobile phone based led scrolling message display system", International Journal of Scientific Engineering and Technology (ISSN : 2277- 1581), Volume 2 Issue 3, pp 149-155.
- [12] Bhawna Saini, Rachna Devi, Shilpi Dhankhar, Mohammad-ziaul-Haque and Jagandeep Kaur, (2014) "Smart LED display boards", International Journal of Electronic and Electrical Engineering (ISSN 0974- 2174), Volume 7, Number 10, pp 1057- 1067, © International Research Publication House.
- [13] Xin-kan Mu, Yong-hong Chen, "SMS-based Remote Computer Supervisory Control System Design", in Journal of Software, Volume No. 9, Issue No. 3, March 2014, pp. 621-626
- [14] Jeff Brown, "SMS: The Short Message Service", in IEEE Computer Society, December 2007, pp.106-111.
- [15] Dr. Himani Goyal et al, "Wireless Notice Board using UWB with monitoring System" in International Journal Of Advance Research In Computer Science and Management Studies , Volume 2, Issue 11, November 2014, pp.390-395.
- [16] Shruthi K., "Smart Notice Board", in Research & Technology in the Coming Decades (CRT 2013), National Conference on Challenges, IET, 27-28 Sept. 2013, pp. 1-4

## Author



**Sonali Panigrahi** persuing B.TECH Degree in Electrical & Electronics Engineering from Gandhi Institute Of Engineering & Technology. She has illustrious career in her intermediate and matriculation exams, her hobby is cooking and surfing internet . She is currently doing an major project is WIRELESS PLACARD USING MOBILE COMMUNICATION SYSTEM (WPUMCS).



**Sugandha Rath** persuing B.TECH Degree in Electrical & Electronics Engineering from Gandhi Institute Of Engineering & Technology. She has illustrious career in her intermediate and matriculation exams, her hobby is cooking . She is currently doing an major project is WIRELESS PLACARD USING MOBILE COMMUNICATION SYSTEM (WPUMCS).



**Suprava Sahoo** persuing B.TECH Degree in Electrical & Electronics Engineering from Gandhi Institute Of Engineering & Technology. She has illustrious career in her intermediate and matriculation exams, her hobby is cooking and painting. She is currently doing an major project is WIRELESS PLACARD USING MOBILE COMMUNICATION SYSTEM (WPUMCS).



**Amrit Kumar Panigrahi** has completed his B.TECH & M.TECH in the year 2011 & 2013 respectively from KIIT University. He is currently employed as an Assistant professor in Gandhi Institute of Engineering & Technology, Gunupur, Odisha. He has published no. of papers in reputed journals and guided many graduate and post graduate students. His area of expertise and research is VLSI & Embedded system design.