

## ZIGBEE and PC Controlled Scrolling LED Message Display

T. R. REVANTH KUMAR<sup>1</sup>, G. SURESH BABU<sup>2</sup>

<sup>1</sup>Assistant Professor, Dept of ECE, SVCE College, Tirupati, AP, India, E-mail: digital.revanth@gmail.com.

<sup>2</sup>Assistant Professor, Dept of ECE, SVCE College, Tirupati, AP, India, E-mail: suresh.gurapu@gmail.com.

**Abstract:** The project aims in designing a digital notice board with display on Scrolling LED display using a PC and Zigbee technology. We can implement this technology in schools, colleges, banks etc. After accessing every message it automatically resets and it displays the latest message on LED display. This project consists of an onboard computer, which consists of number of input and output ports. These onboard computers are commonly termed as micro controllers. The input and output port of the controller are interfaced with different input and output modules depending on the requirements. In other words micro controller acts as a communication medium for all the modules involved in the project. In this project we make use of a Zigbee Modem, Micro Controller and a Scrolling LED (6ft x 1ft.) display. User can send the messages to the Zigbee modem that is connected to the Microcontroller based control system. The microcontroller automatically reads the message and displays on Scrolling LED display. This process continues for every new message we send to it. The previous message will be automatically overridden by new message and buzzer alert is given for every new message.

**Keywords:** LED Display, ZIGBEE, Buzzer.

### I. INTRODUCTION

An information display is a way of providing information and/or is used as an object for promotion. It can be seen in a form of cardboard or tarpaulin at stores/shops, streamers and electronic display devices. But the advent of new technologies made the information in the form of an electronic display in the world of advertisements and promotions. The ability to display a short message can be useful application to be available for any business. A LED display board is perfect for this application. It can be used for both indoor and outdoor which makes it universal fit for any business or event. The LED display board is very efficient and cost effective way to spread messages to thousands of people, without any personal contact or door-to-door sales. LED is a solid state light source with several attractive properties for display application. It is chosen as the main component for displaying messages because, today LED is the most energy efficiency example as compared to incandescent light bulb. A LED light emit very little heat and saves a lot of energy, as 98 percent of the energy used by a traditional incandescent light can be lost as heat energy instead of light energy. A ZIGBEE based LED display board is a device for displaying messages by ZIGBEE Communication sending the through PC. A motion detector is a device that detects moving objects, particularly people. A motion detector is often integrated as a component of a system that automatically performs a task or alerts a user of motion in an area. Motion detectors form a vital component of security, automated lighting control, home control, energy efficiency, and other useful systems. This project proposes a LED display board with dual power supply such as solar and

AC power and changing the displaying message either by laptop or PC through ZIGBEE Communication. This project is also intended to incorporate a motion detector which acts as a switch in the display board.

### II. SYSTEM ARCHITECTURE

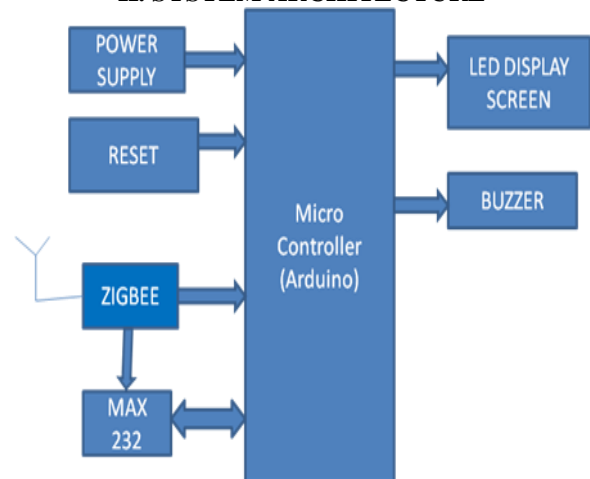


Fig.1. Block diagram.

Scrolling a message is continuously on a LED Display Screen using PC and ZIGBEE Technology. Automatically resetting Buzzer / Alert sound as shown in Fig.1.

### III. SYSTEM MODULES

**1. Microcontroller ARDUINO:** Arduino is an open source computer hardware and software company. Arduino board features are similar to Atmel ATmega328 microcontroller.

The board has 14 digital I/O pins and 6 analog input pins. Operating at 5 V with 2Kb of RAM, 32 Kb of flash memory for storing programs and 1 Kb of EEPROM for storing parameters as shown in Fig.2.

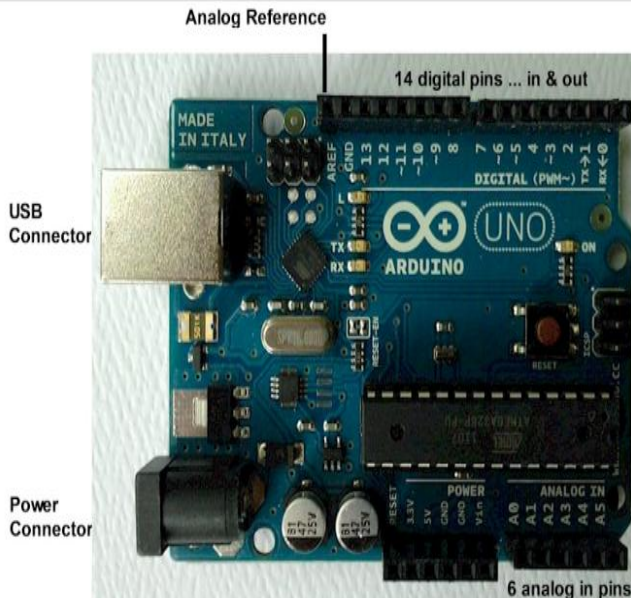


Fig. 2. ARDUINO Board.

**2. Power Supply:** The input to the circuit is applied from the regulated power supply. The a.c. input i.e., 230V from the mains supply is step down by the transformer to 5V and is fed to a rectifier. The output obtained from the rectifier is a pulsating d.c voltage. So in order to get a pure d.c voltage, the output voltage from the rectifier is fed to a filter to remove any a.c components present even after rectification. Now, this voltage is given to a voltage regulator to obtain a pure constant 5v dc voltage.

**3. Buzzer:** Early devices were based on an electromechanical system identical to an electric bell without the metal gong. Similarly, a relay may be connected to interrupt its own actuating current, causing the contacts to buzz. Often these units were anchored to a wall or ceiling to use it as a sounding board. The word "buzzer" comes from the rasping noise that electromechanical buzzers made.

**4. MAX232:** The MAX232 is an integrated circuit that converts signals from an RS-232 serial port to signals suitable for use in TTL compatible digital logic circuits. The MAX232 is a dual driver/receiver and typically converts the RX, TX, CTS and RTS signals. The drivers provide RS-232 voltage level outputs (approx.  $\pm 7.5$  V) from a single + 5 V supply via on-chip charge pumps and external capacitors. This makes it useful for implementing RS-232 in devices that otherwise do not need any voltages outside the 0 V to + 5 V range, as power supply design does not need to be made more complicated just for driving the RS-232 in this case.

**5. LED:** LED Electronic Display Screen is a large display screen system combining micro-electronic, computer and information processing technologies. LEDs light up very

quickly. LEDs can be very small and are easily populated onto printed circuit boards.

**6. ZIGBEE Technology:** ZIGBEE Technology is one of such movement in remote innovation. Remote is not another innovation as remote systems administration and remote web are now being used; yet ZIGBEE TECHNOLOGY set another angle in remote engineering. That is the reason its typically alluded as ZIGBEE Wireless Technology. Step by step headway in engineering is presenting novel and steady gadgets which are utilized to make life less demanding and ZIGBEE Technology is one of them. The ZIGBEE standard uses little low-control gadgets to join together to structure a remote control web ZIGBEE convention is enhanced for long battery life measured in months to years from reasonable, off-the-rack non-rechargeable batteries, and can control lighting, aerating and cooling and warming, smoke and blaze alerts, and other security gadgets.

ZIGBEE is a low information rate, two-route standard for home mechanization and information systems. Genuine use cases of ZIGBEE incorporates home robotization assignments, for example, turning lights on, turn up the high temperature, setting the home security framework, or beginning the VCR. With ZIGBEE all these assignments is possible from anyplace in the home at the touch of a catch. ZIGBEE additionally takes into account dial-in access through the Internet for mechanization control. ZIGBEE engineering is a low information rate, low power utilization, minimal effort, remote systems administration convention focused on towards robotization and remote control applications. IEEE 802.15.4 council began taking a shot at a low information rate standard a short while later. At that point the ZIGBEE Alliance and the IEEE chose to unite and ZIGBEE is the business name for this engineering.

#### IV. RESULTS

Results of this paper is as shown in bellow Figs.3 to 5.

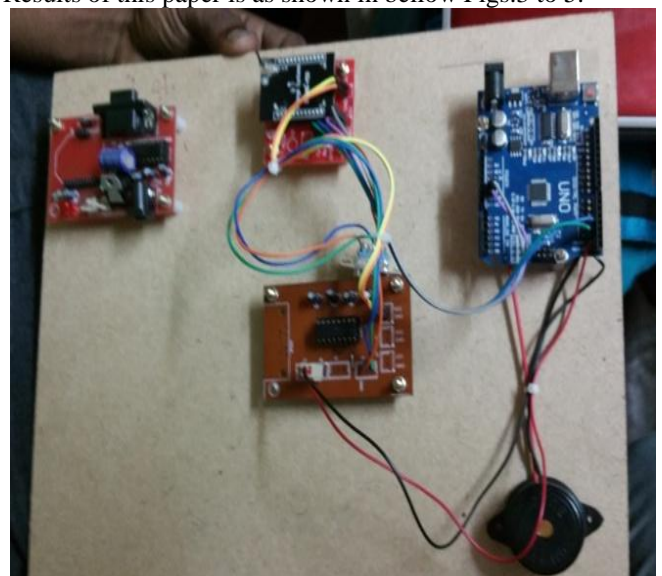


Fig. 3. ZIGBEE and ARDUINO Board.

## ZIGBEE and PC Controlled Scrolling LED Message Display

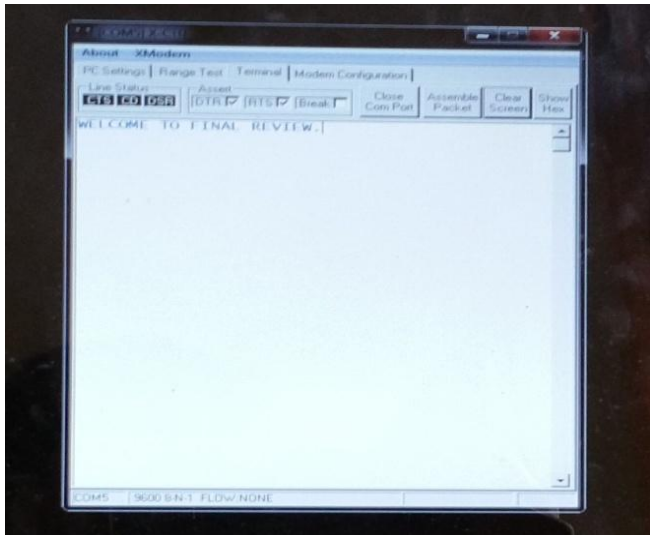


Fig.4. Input is given through PC.



Fig.5. Output is display on LED.

**Applications:** This project can be used public places as well as hospitals and private companies, schools, colleges and universities. This is user-friendly interface.

### Advantages:

- Low power consumption.
- Wireless Communication.
- Overcome the drawbacks of Bluetooth and WiFi.

## V. CONCLUSION

This Project identifies the drawbacks that have been found in every existing work. As a result, by introducing the concept of enhanced LED display board, this Project explains by integrating features of dual power supply, dual option of changing message and inbuilt motion detector in the field of communication. Such collaborative powers and method of changing message had not been developed in a single device, and this Project marks the beginning of the new technology of combining two separate technologies under one roof. Therefore, this new enhanced display system makes our communication more efficient and faster. Certainly this model may be able to work under any circumstances with greater efficiency, as it does not need any man power to switch off the system because it is an automated system. Besides, in this paper the user can display additional messages at a time. From this the user of this display board can use the board for rental out, notice board and promotion board. In a nutshell, this paper describes the new enhancement in LED display board which is highly efficient than the existing technology.

## VI. REFERENCES

- [1]Gupta H, Shukla P, Nagwekar A. GSM based LED scrolling Display Board. International journal of Students Research in Technology and Management. 2013; 1(3):278–91.
- [2]Ketkar PU, Tayade KP, Kulkarni AP, Tugnayat RM. GSM Mobile Phone Based LED Scrolling Message Display System. International Journal of Scientific Engineering and Technology. 2013; 2(3):149–55.
- [3]Sooxma Technology. Android Controlled Scrolling LED Message Display. Hyderabad, India.
- [4]Bin Zohedi FN. Wireless electronic notice board. Faculty of Electrical & Electronics Engineering, University Malaysia Pahang; 2007.
- [5]Kumar P, Bharadwaj V, Pal K, Rathor NR, Mishra A. GSM based e-Notice Board: wireless communication. International Journal of Soft Computing and Engineering. 2012; 1–2(3):601–5.
- [6]Kamboj R, Abrol P. Design and development of GSM based multiple LED display boards. International Journal of Computer Applications. 2013; 71(18):40–6.
- [7]Dalwadi DC, Trivedi N, Kasundra A. Wireless notice board our real-time solution. National Conference on Recent Trends in Engineering & Technology; 2011.
- [8]Ni X, Yan Z, Dan L, Zhou Y. The realization of led display system based on the embedded, department of computer engineering, Telkomnika. 2013; 11(5):2626–33.
- [9]Song Y, Feng Y, Ma J, Zhang X. Design of LED display control system based on AT89C52 single chip micro-computer. China, Journal of Computers. 2011; 6(4):718–24.
- [10]Wimalasena H. LED Notice Board; 2013.
- [11]Sarode A, Salunke DM, Shukla AL, Sonawadekar MM. Spin- ning LED display using radio frequency. 2012; International Journal of Computer Science and Informatics 2(4): 83–86.
- [12]Manihar SR, Dewangan KP, Dansena AK. The Design and construction of a low cost propeller LED display. Global Journal of Researches in Engineering–Electrical and Electronics Engineering. 2012; 12(4):