



International Journal of Intellectual Advancements and Research in Engineering Computations

Wireless scrolling led message display with zigbee communications

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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.

Index Terms: Zigbee, Wireless notice board, Scrolling led

INTRODUCTION

The wireless technology has been making tremendous progress. The ever increasing use wireless network serves as an indicator of the progress in the area of wireless networks. The technology defined by the ZigBee specification is intended to be simpler and less expensive than other wireless personal area networks (WPANs), such as Bluetooth or Wi-Fi. Applications include wireless light switches, electrical meters with in-home-displays, traffic management systems, and other consumer and industrial equipment that require short-range low-rate wireless data transfer. Notice boards play a vital role mostly in educational institutions. The time table or the schedule of the exams has to be given to the students. This will be done by writing the details on the notice boards. But this process consumes a lot time to update the news on all the notice boards and there may be chances that the person responsible may commit some mistakes or he

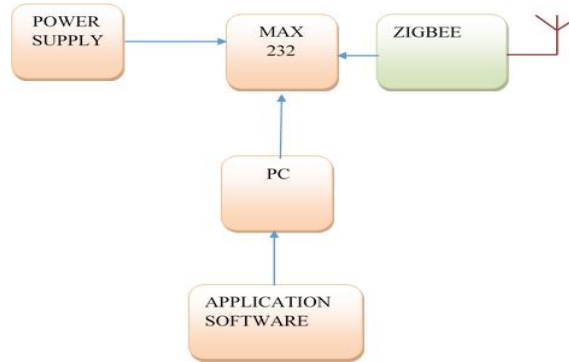
may be absent sometimes. This project uses the wireless communication, Zigbee. The Zigbee transmitter will be present at the Principal or the person related to the issues to be displayed on the notice board. PC keyboard is used as the input device here in this project. Whenever the user wants to send the news updated to the notice board, he types that particular message using keyboard and the same data will be transmitted through Zigbee transmitter. The receiver receives the data coming from the transmitter and the same data will be received by the microcontroller at the receiver end. The microcontroller sends this data to the display unit and thus the message given by the user at the transmitter end will be displayed on the notice board. Wireless Notice Board has been designed which completely eliminates manual work. The system is divided into two parts; one is hardware and second is software. The LED scrolling board will shows the notice on it using the software part. [1]

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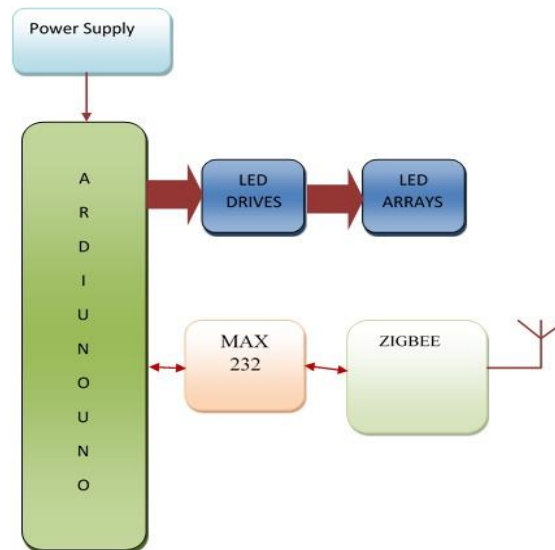
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METHODOLOGY

Transmitter



Receiver



Microcontroller

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. [2]

Zigbee

CC2500 Transceiver work on ISM band (2.4 ghz) reserved internationally that do not require any license. These Wireless RF CC2500 Transceiver also support multiple frequencies

within same band rate that helps in avoiding data collision with no requirement of complex wireless connection software for connecting to serial devices. Further, these wireless CC2500 Transceiver do not require external antenna and work on 5-9v DC supply with standard uart interface. Suitable for transmitting and receiving data at multiple baud rates, the module is direct line in replacement for serial communication and finds applications for wireless sensor network, wireless device control, wireless data transfer, wireless energy metering, robotics, wireless data logger and others. [3]

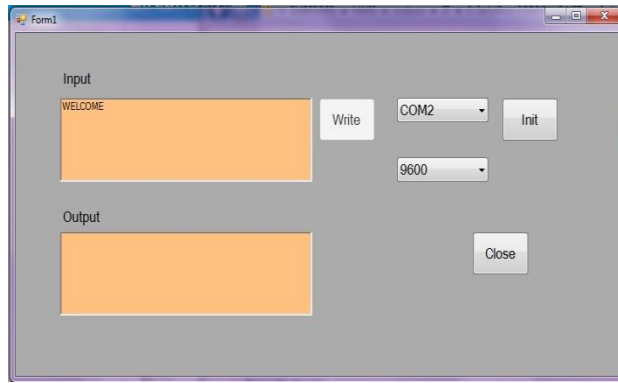


Transmitter



Transmitter Section mainly consists of serial port interfaced to Zigbee Module via MAX232. Module of XBEE Series2 of Digi Inc. Has been used. The Xbee radios are programmed using X-CTU software in API mode with the desired baud

rate. Screenshots of X-CTU are shown in Net based GUI application is developed on PC which enables the user to display message. The application authenticates user and then allows displaying message. [4]



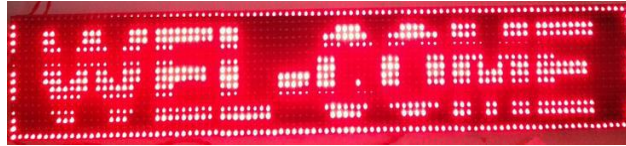
Receiver section

Zigbee module on the Receiver side is interfaced with UART (Universal Asynchronous Receiver/ Txr) of Micro -Controller Ardiuno. Micro-Controller receives the message from Zigbee module on receiver side and displays it on the LED Display. It also provides Synchronization between Transmitter and Receiver. [5]

LED matrix board or display unit

LED notice board is made up of simple red led and RGB led i.e. red, green, blue here in our system

we use the red led as it is even chipper then the RGB led. The decade counter IC, shift register IC, EPROM IC, etc. The LED notice board is arranged into in the form of 5 by 1 as it becomes more convenient to display the message on the notice board. The high intensity led light is used here as it is not harm the naked eyes anymore and it feels good to the eyes. Improper color reproduction, spreading of the light, and dimming problem, are avoided here. [6]

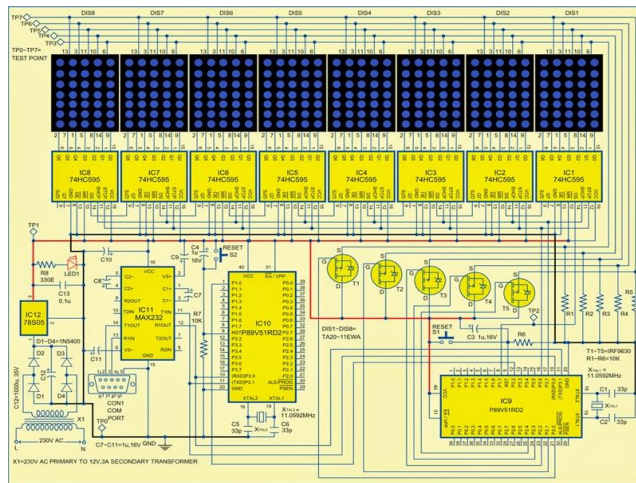


PC Interfacing

To connect to PC you can use either a simple MAX232 circuit to convert display’s TTL level of 5V to RS232 level or you can use a USB to TTLUART board. Either way you can get a serial

port on PC to connect to and send string. We recommend this Terminal software which can be used test display by sending serial data from PC side.

CIRCUIT DIAGRAM



Applications, features and the advantages and disadvantages of our proposed system

Advantages

1. Portability.
2. User-friendly interface.
3. Quick response.
4. Low power consumption.
5. Can be used by anyone who knows PC operation.

Features

1. Messages can be sent from PC over wireless.
2. Zigbee based communication is simple to operate.
3. Low power consumption.
4. Display on Scrolling LED display.
5. Alarm system when new message is displayed
6. High reliability and long lifetime.
7. Digital display

Applications

1. Hospitals
2. Shopping mall
3. Schools, Colleges
4. Public place

CONCLUSION

Wireless operations permit services, such as range communications, that are impossible or impractical to implement with the use of wires. It provides fast Transfer of information and is cheaper to install and maintain. These papers provide an efficient way of displaying messages on Notice Board and send emails using Wireless Technology. It also provides user authentication in order to avoid any misuse of proposed system. 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 zigbee in communications to a next level.

It can also be used in Malls and Highways for Advertisement purpose. A moving display with variable speed can also be used in place of static display.

FUTURE SCOPE

Electronic Notice Board is one of the applications where Zigbee can be used effectively.

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