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Self-Invented Keypad Based Electronic Notice Board for Wired & Wireless Communication

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ABSTRACT:To inform vital messages to mass media, notice boards play a vital role. The events, occasions or any news, which has to be passed to the students or the members, will be written on the notice boards present in every floor of the organization. The present system is like, a person will be told the news and he has to update this news on all the notice boards present in the college or school. 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. Today's first life emphasizes to be updated for every moment. The paper proposes the notice board which provides the maintenance of the notices and articles quickly not only within the organization premises, also from elsewhere as it provides wireless communication. The technology here used is RF Technology. The RF transmitter will be present in the hand of Principal (or the person related to the issues to be displayed on the notice board). At the receiving end, the RF receiver will be fixed to the display panel. The receiver receives the data coming from the transmitter and instantly updates the notice board. Here one advantageous keypad has been used for controlling the notice board which uses push-button technology.

KEYWORDS:LCD Display, Microcontroller, Push Button Switch, RF module.

I.INTRODUCTION

Now a day's providing data security has become very prominent and it increases the quality of communication. If there are no security measures for the data then the data can be easily hacked or diverted which reduces the quality of communication.[1] We see electronic notice boards which store particular information and displays the particular information only till it is provided with new information. In this paper we will look into electronic notice boards which use wireless technology for transferring data by which the new information can be sent instantly.[2] We will see how information is transferred to different types of notice boards available.

Presently almost all electronic notice boards are designed using wired system. One of the drawbacks of the design is the system is inflexible in term of placement. The common notice board cannot be placed anywhere because of the messy wire.

Wireless electronics notice board is developed as user friendly notice board with wireless concept that offers the flexibility to control the notice board within range 25 meters. The input of the system is push button switch keypad. The keypad is connected to the electronic notice board by using RF technology.

There is huge future scope of further modification of the message display part. For example using GSM modem, android applications, using LED display panel etc.

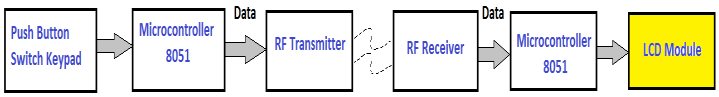

Fig. 1Block Diagram of Proposed Job

II.LITERATURE SURVEY

In the previous years a lot of researches have been done on this topic. First of all, came the wired technology. Then, as the time passed on, the technology gained momentum. Then the Wireless technology was introduced such as

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Bluetooth, RF, GSM etc. Our Project is based on wireless technology using RF. The specialty of our project is our self-invented push button switch keypad. [3]

III.PROPOSED WORK

The proposed work can be described using some steps.

The initial step is to design the push button switch which will be used as the input of the message to be displayed. Next is to design the programmed microcontroller unit with LCD interfacing. Finally the RF module assembly to transmit and receive the message.

A. Push Button Switch Design:

Here 6x6 pattern push button switches have been used as a keyboard which is connected with 8051 microcontroller. All six rows are connected with port 1 of microcontroller and other column are connected with port 3.This push button switch mainly interfaces with 8051 using hex code. All push button are indicating alphabetic Order. According row1 it will be A-Z. After completing 26 alphabets it will be 0-9 numeric order. Here Mikro c software is used for interfacing of push switch with 8051 as keyboard.

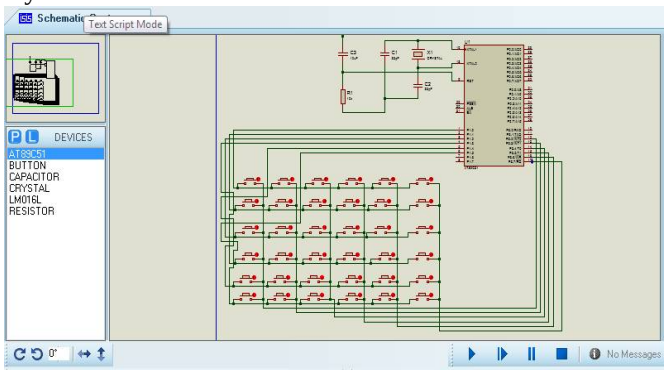

Fig. 2 Connection of push button switch

Here Fig: 2 shows as the connection of push button switch before going to the proposed design practically 8051 simulator named Proteus has been used to verify the result.

B.Interfacing LCD with 8051:

LCD display is an inevitable part in almost all embedded projects and this article is about interfacing 16×2 LCD with 8051 microcontroller.16×2 LCD module is a very common type of LCD module that is used in 8051 based embedded projects. It consists of 16 rows and 2 columns of 5×7 or 5×8 LCD dot matrices. It is available in a 16 pin package with back light, contrast adjustment function and each dot matrix has 5×8 dot resolution.[4]

Interfacing 16×2 LCD module to 8051:-

The circuit diagram given in Fig: 3 shows how to interface a 16×2 LCD module with AT89C51 microcontroller. Capacitor C3, resistor R3 and push button switch S1 forms the reset circuitry. Ceramic capacitors C1, C2 and crystal X1 is related to the clock circuitry which produces the system clock frequency. P1.0 to P1.7 pins of the microcontroller is connected to the DB0 to DB7 pins of the module respectively and through this route the data goes to the LCD module. P3.3, P3.4 and P3.5 are connected to the E, R/W, RS pins of the microcontroller and through this route the control signals are transferred to the LCD module. Resistor R1 limits the current through the back light LED and so do the back light intensity. POT R2 is used for adjusting the contrast of the display.

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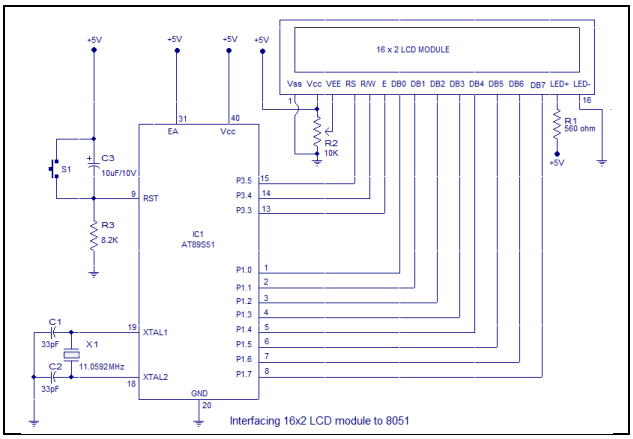

Fig. 3 Interfacing of LCD with 8051

C. Microcontroller Coding:

The coding of both microcontrollers has been done using the Mikro C Pro compiler for the transmitter and the receiver part. For encoding the alphanumeric data into the hex code and send the data via RF transmitter, transmission part needs the coding. For receiving the data through RF receiver and displaying the data in the LCD, receiver part needs the coding.

D.RF Module:

An RF module (radio frequency module) is a (usually) small electronic device used to transmit and/or receive radio signals between two devices. For many applications the medium of choice is RF since it does not require line of sight. RF modules are widely used in electronic design owing to the difficulty of designing radio circuitry. RF modules are most often used in medium and low volume products for consumer applications such as garage door openers, wireless alarm systems, industrial remote controls, smart sensor applications, and wireless home automation systems. Several carrier frequencies are commonly used in commercially-available RF modules, including those in the industrial, scientific and medical (ISM) radio bands such as 433.92 MHz, 915 MHz, and 2400 MHz. These frequencies are used because of national and international regulations governing the use of radio for communication. Short Range Devices may also use frequencies available for unlicensed such as 315 MHz and 868 MHz.[5]

The message to be displayed is typed on the push button switch. Then the microcontroller sends this message to the RF transmitter where the message (ASCII codes) is encoded serially into binary and then RF transmitter sends it in a particular frequency band (here, 433 MHz band is used) to the RF receiver.

At the receiver end, RF receiver, connected to the microcontroller, fetches the serially sent binary data, decodes the data into ASCII codes and sends it to the microcontroller where again the decoding is done from ASCII code into the alphanumeric data. Then finally the message is displayed in the LCD unit.

IV.SIMULATION & RESULT

Software Used:

Here Proteus software has been used to simulate the entire Project. Proteus 8 is a single application with many service modules offering different functionalities (schematic capture, PCB layout, etc.). The wrapper that enables all of the various tools to communicate with each other consists of three main parts. Proteus 8 consists of a single application (PDS.EXE). This is the framework or container which hosts all of the functionality of Proteus. ISIS, ARES, 3DV all open as tabbed windows within this framework and therefore all have access to the common database.

Simulation:

Before starting of the practical work, our project has been verified in 8051 simulator. Here Proteus software is used for simulation of the project. Using various types of module like push switch, AT89C51, crystal, resistor,

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capacitor also 16x2 LCD panel. In transmitter section one extra LCD has been used for testing the push switch.

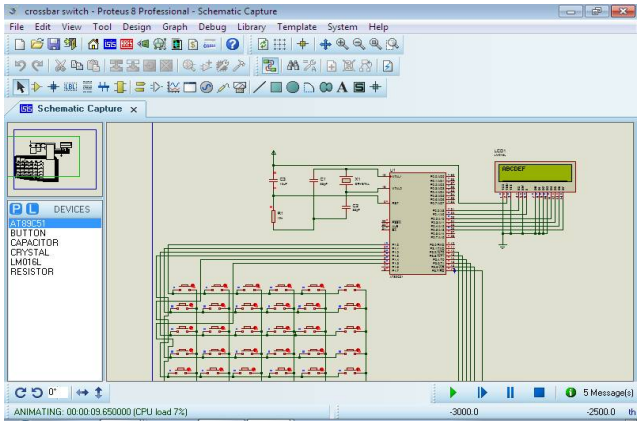

Fig. 4 Transmitter part

Fig: 4 is mainly for transmitter part. Using push switch as keyboard controller. After making proper circuit connection, hex code was written in Mikro C software. Another receiver part also simulate in proteus. Mainly proteus cannot have any RF module so a wire at transmitter port of the transmitter is connected with receiver port of receiver for checking the total circuit.

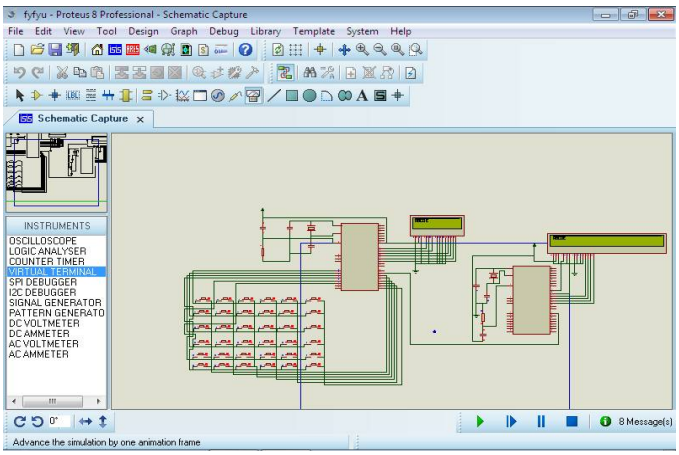

Fig. 5 Simulation of the total project

Fig 5 is mainly simulation of our total project. Using two LCD panel, our total project was verified. But practically, one 16X2 LCD is connected at the receiver part of the circuit.

Result:

After successful simulation of the project in Proteus, the implementation of the hardware is done. The input message “DSCSDEC 2016” is typed on the keypad (Fig: 6). This message is then passed onto the microcontroller and transmitted through the RF transmitter.

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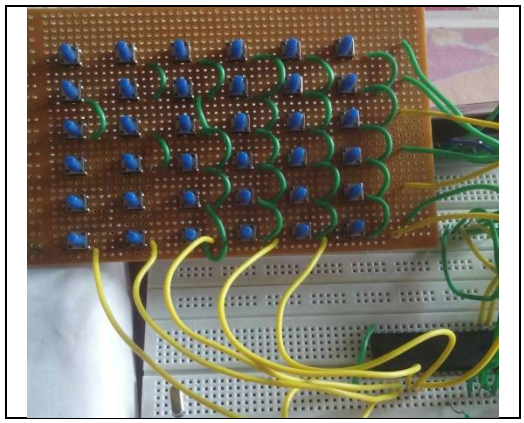

Fig. 6 Push Buton Switch Keypad

The RF receiver receives the message and passed it onto the microcontroller.

Fig. 7 LCD display

Then, in the LCD, the exact message is displayed (Fig: 7).

V. CONCLUSION

By using the above mentioned technique we can modify the data in the electronic notice board automatically by using wireless communication. The RF modules have the capability to form a mesh network by which we can send larger data over shorter distances. We can transmit the data in a secure manner. Thus we are using modern technology nowadays to replace conventional display boards and further innovative modifications like the GSM and the android app interface can make this system even more user friendly and popular.

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