

E-Notice Board with Handmade LED Board

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Abstract

Now a day the 'technology in embedded system' is rapidly change with advance feature which makes human life very convenient. Then system is developed using PIC18f2550 with LED handmade board which display notice on board by using hypertext terminal with cost effective method of advertising and convenient to display notice. One of most obvious is the drastic effect of LED display to capture attention to cause impulse reaction. Which gives good impression in front of people and crowd. Applications are developed with their real time application along with domestic application such as smart phones, smart televisions, smart refrigerators, so why not displays smart boards for advertisements and notices. So this project is developed with PIC18f2550 micro-controller. The micro-controller provides all the functionality to display notices. The display of led matrix is design using zero PCB on which 8x8 matrix is developed. A text message from a PC or keyboard is sent via serial cable to the micro-controller which is at receiving end. The message which is stored in EEPROM is than displayed on the LED dot matrix display board. This hardware uses 5V, 500mA power supply.

Keywords- Embedded systems, PIC18f2550, LED matrix, Serial Cable

I. INTRODUCTION

In this paper explains how a reliable and an authentic wired communication could be developed between a Personal Computer and microcontroller. This project is designed to develop a PC controlled scrolling message display for notice board. It can also be used to display latest information anywhere such as colleges, shops, railway stations and other places. The information is transmitted using PC. Traditionally notice board is all about sticking information, but sticking various notices day-to-day is a difficult process. A person is required separately to take care of this notice board. This system displays notices through a PC on notice boards.

This system can be implemented in many important places where latest information can be displayed. For example, if implemented in colleges all information for students can be displayed. It is very convenient for students and college management to display any information. This system can also be implemented in railway stations and airports to display information regarding the train and flight timings. This system reduces the wastage of papers. The information is sent through a PC, which is interfaced to a PIC18f2550 family microcontroller through MAX232 interface IC. And no need of external memory connected to the microcontroller to stores the information. PIC18f2550 provide EEPROM memory. An LED is connected to the microcontroller to display the message in a continuous scrolling manner. It gets into the micro-controller and is stored in the memory. This project can be divided into two parts. One is the keyboard connectivity and second is the moving display board.

Here we are taking input from using PC via keyboard using window software and send it to micro-controller using serial port and further it well storing to memory(EPROM).

Data will further process and output will be provided to a LED driver to LED display and it will control each segment of data by using programming.

II. LITERATURE SURVEY

A. Survey 1

In the paper by Adamu Murtala Zungeru¹, Gbenga Daniel Obikoya², Ochi Fortuna-tus Uche³, Taidi Eli⁴, they implemented a system in which they developed a GSM based scrolling Message display board in which they used two AT89C52 micro-controllers from Atmel. The controller provides all the functionality for message display board and wireless communication. The wireless communication is done using GSM in which an authorized number can change the message by just sending a SMS on the GSM board number. The system eliminates the task of manual reprogramming the controller again and again every time there is new message. [1]

B. Survey 2

In the paper by Prachee U. Ketkar¹, Kunal P. Tayade², Akash P. Kulkarni³, RajkishorM.Tugnayat⁴, they implemented a GSM based scrolling message system in which they used AT89c51 micro-controller which provide all the functionality for wireless communication. It uses a GSM modem to which a SMS is send from an authorized user it verifies the password first and then display the message on the board after verifying the password. The system also shows the method of displaying the alphabet on LED dot matrix. [2]

C. Survey 3

In the paper by 1. Anuradha Mujumdar, 2. Vaishali Niranjane, 3. Deepika Sagne, they implemented a wireless transmission system in which they used RF based transmission for sending the message to be displayed. The system also provides an idea of how to make the connection between the LED while connecting in matrix, the system uses 5x7 LED dot matrix to display a single character on the board. It uses 8051 micro-controllers in which the memory capacity is less so it requires an external EEPROM for storing the code and message. It papers also gives an idea of character coding. [3]

D. Survey 4

In the paper by Gowrishankar Kasilingam, Mritha Ramalingam and Chandra Sekar, they proposed a system in which the introduced a concept of dual option of changing the message one by using GSM and second by using PC or Laptop. It also came up with a concept of dual power supply one through AC power and second through solar power. Such collaborative powers and method of changing message had not been developed in a single device, and this paper marks the beginning of the new technology of combining two separate technologies under one roof. [4]

III. SYSTEM DEVELOPMENT

A. Block Diagram

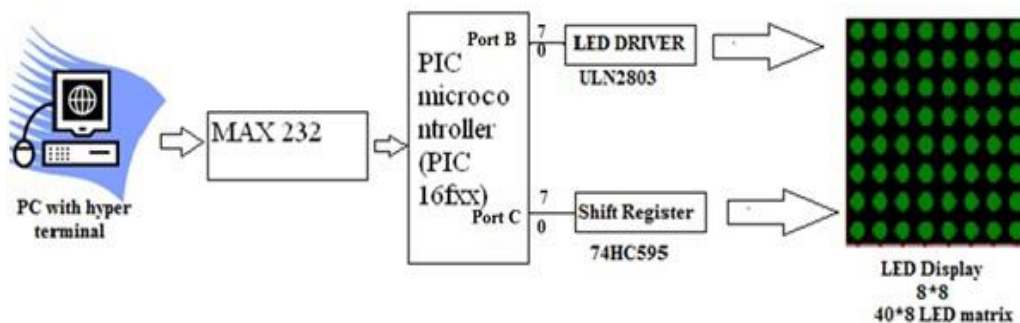


Fig. 1: Block Diagram

Here we send the data or message from computer to serial data cable. This cable passes the data to the microcontroller for further operation. So the methodology used in railway platforms for displaying train details is applied in our project. In general operation when the led display board is scrolling a message its task is to read data from the EEPROM, clock out a pulse to the column selector IC's, which drive the columns, then spit out data at the rows. This is all done very, very fast as you would imagine. All of the magic is in the software. During programming of the message into the display via the Windows based software, the micro-controllers' main role is to read the serial data and organize it into the EEPROM. Programming the message involves pressing the program button of the unit so that the Micro-controller is ready to receive serial data from the windows based software. This data is then transferred into a serial cable, EEPROM for later recall. After successful programming the display will scroll from right to left the message that you just programmed in. The scroll speed can be set via Windows based software and you can set the number of times the message repeats. In data terms, what's actually stored on the EEPROM is the row data that is broken down from the

characters that you program. The project dot matrix led display circuit which is a scrolling message device is interfaced with computer by using serial port. After all we have to only type the messages into the message box of the software setup of java Application. And after we reset the switch the message appears on to the screen.

The whole system will be an embedded system, so it will be able to display or scroll the message wherever there is an outlet. It will have a control through PC for users. Messages can be Created and saved on the display's microcomputer by using of a terminal program or java application on a PC. The PC and microcomputer will communicate via serial port. After the message is created and saved, the display can be detached from the PC and then plugged in elsewhere to scroll the message. The array of LED's will be configured together on a single board called a module. The circuit board is designed in such a manner that only the display and reset button are on the front side and all the other component are placed on the backside of the circuit board. Your message is hard coded into memory within the microcontroller.

IV. LED BOARD

Here LED Board is made up of including numbers of LED. Here in this project we are using Monochromic Red LED to developed LED Matrix.

Here in this project we are using 5 set of 8*8 LED matrix set. Zero PCB is used here to made LED set of Matrix. Zero PCB is preferable to made board as it is user friendly to soldering the series of anode and cathode as a bridge soldering.

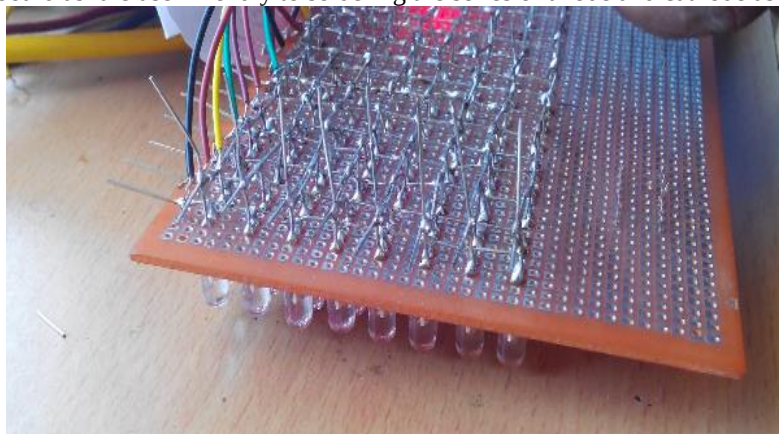


Fig. 2: Bridge type soldering

Likewise, we made 5 set of LED Matrix in zero PCB and take out proper connection to connect shift resistor and current driver.

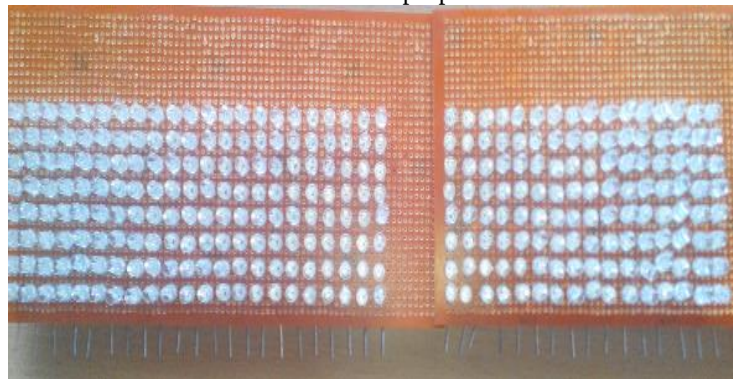


Fig. 3: Front view of LED Board

V. MAIN BOARD

Here we are using PIC18F2550 as a main board to control LED Matrix with the help of program. In main board we have 5v power supply with connector for proper connection to alternate board.

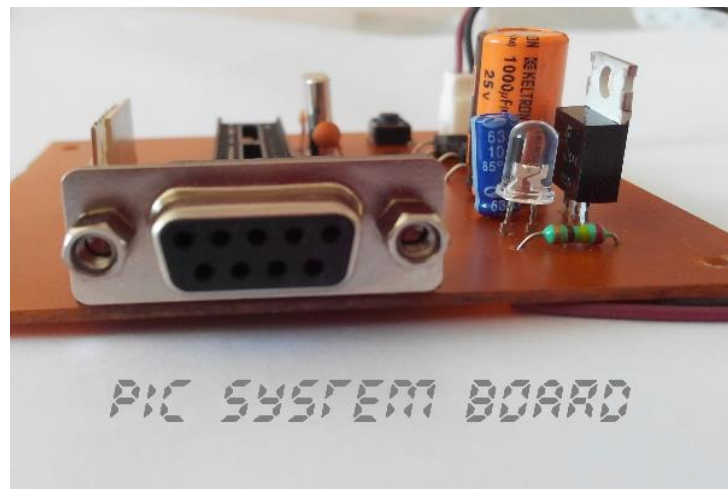
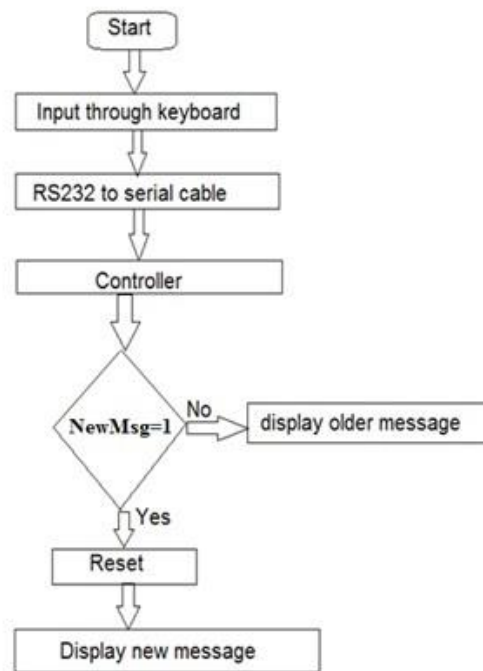


Fig. 4: Main board

It is tested board to communicate with PC through serial communication.

A. Algorithm



VI. RESULT

In this project we are going to design digital notice board. In which we are going to provide input from personal computer to Notice board. Here basically we are doing serial communication through MAX233 which converts the signals from RS232 serial port to signal suitable for TTL compatible logic circuits. It typically converts Rx, Tx, CTS and RTS signals. In this project we used the PIC 18f2550 microcontroller. It has 2048bytes of SRAM and 256bytes of EEPROM. This controller provides good facility of serial communication. Here we design a display board which is handmade. In this board we are designing five 8*8 matrixes. In this we are at sending 256 letters at a time. Here we design scrolling display board on which message is scroll using shift register IC 78Hff. The column of each matrix is connected to shift register so that message will get shifted horizontally from left to right. We also required ULN2803 for current driving which act as a current sinker which is capable to sink 500ma current.

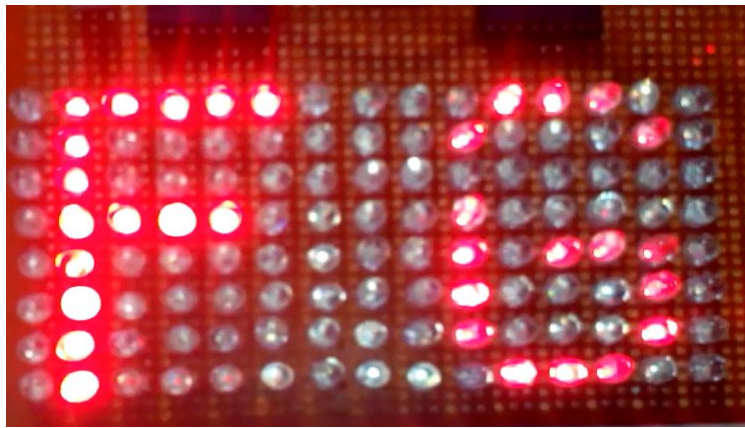


Fig. 5: Above image is of displaying alphabets on dot matrix LED Board.

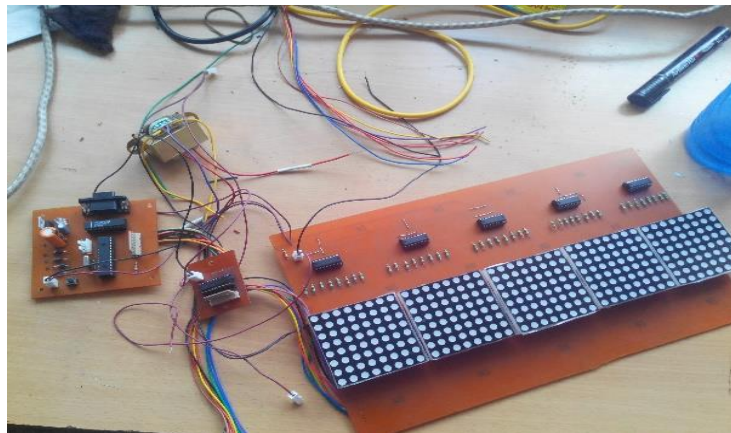


Fig. 6: Above image is of LED Dot Matrix LED.

A. Scope

This study focuses on Electronic Notice Board is one of the application where PC can be used effectively. It can also be used in Colleges, Malls and Highways for Notice and advertisement purpose. A moving display with variable speed can also be used in place of static display.

B. Advantages

- 1) Instead of using traditional static billboard we can use led billboard which is a much better way to conduct scoreboard.
- 2) Through simple reset button we can reset the whole program or message in controller.
- 3) Time efficient system.
- 4) Display's message in a quick and efficient manner.
- 5) We can easily display maximum message in less number of led.
- 6) We can identify the message from large distance also.
- 7) Message can be change according to user needs.

C. Disadvantages

- 1) High maintenance is required.
- 2) Single damage LED will disturb the whole system.
- 3) Difficult to replace a single damage LED on the board.
- 4) Scrolling program is complicated.
- 5) LED Board circuit have complex Hardware design.
- 6) Current related problems arise during driving the number of LEDs.

VII. CONCLUSION

The proposed design of LED notice board is integrated with PC and moving LED display this whole procedure is achieved with the help of wired technology. Here we use a PC and controller to display the message due to which the traditional drawbacks of the system are overcome and we can display maximum number of data using minimum led's through scrolling the data on display board.

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