

Wireless Notice Display

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Abstract: Notice boards are common in variety of institutions and are used daily. The urgent notices are normally printed on the papers and then displayed. The proposed system can announce a notice by just typing on a computer. If there is no notice, along with temperature and humidity, time will be displayed. ZigBee module is used for wireless communication. At receiver side, matrix of LEDs will display a notice which will be controlled by microcontroller. GPS module is to interface with microcontroller for displaying real time. At transmitter side, computer is used where ZigBee module will be interfaced via USB to serial converter. An application is developed to write a notice so that when anything is written on that window it will display immediately on the board. With the help of this application notice can be transmitted from any computer if needed.

Keywords: GPS module, LED matrix board, Notice display.

I. INTRODUCTION

There is a long process involved in order to put up the notices on the notice board. Urgent notices should be displayed immediately and highlighted. In this digitalized era in the institutions the notices are still displayed in the board. Sometimes the important notices are missed. Whereas the LED displays are widely used in Public areas because of large screen, long life and flexible display. The proposed system is very useful in this area. It can announce a notice by typing on a computer. LED matrix board is used, 5×7 LEDs for one character. The board contains 24 rows and 120 columns of LEDs. Hence, three rows and in each row 20 characters can be displayed. The application window is easy to use and the authentication feature is added so that there will be no misuse. The authority can be provided to different person and the limited authority can be added. The ZigBee module is used to receive and transmit the data. ZigBee device is often used in mesh network to transmit data over longer distances for wireless communication. Additionally, the matrix board will display the temperature, humidity and the time. For the timing information GPS model is used.

II. SYSTEM ARCHITECTURE

Fig.1 shows the transmitter side of the system. The application window is to be prepared in visual studio 2010 in which the notices will be typed. When the send button is pressed the data is transmitted through ZigBee module via USB to serial converter.

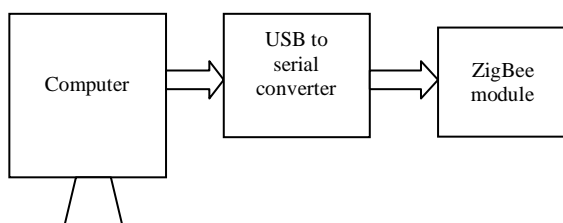


Fig. 1 Block Diagram of Transmitter side

Fig.2 shows the receiver side of the system. Temperature, Humidity sensor and GPS module are connected to microcontroller. It will receive the data from these components and after processing the data will be send to display. If any data (notice) is received by ZigBee module the notice will be displayed immediately.

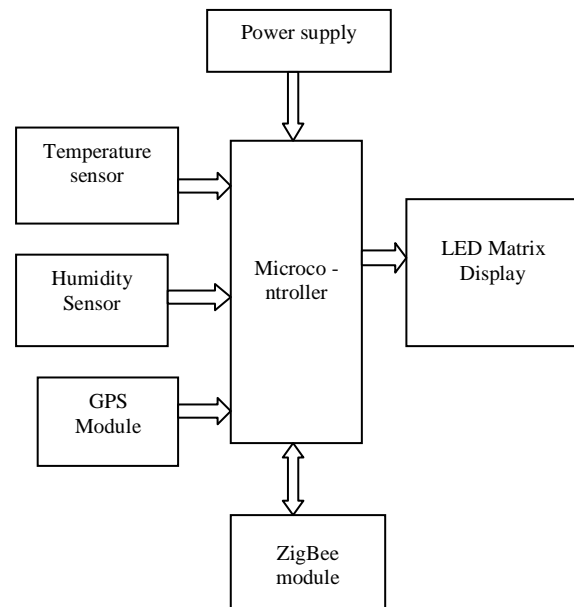


Fig. 2. Block Diagram of Receiver side

III.FLOW CHART

Fig.3 shows the flow of the transmitter side. Fig.4 shows the flow of the receiver side. First the microcontroller will check if any data is received by ZigBee module it will display it first. If not, then temperature, humidity and time will be displayed on the board. These three data will be displayed at the particular interval of time. Meanwhile the other saved notices is shown one by one.

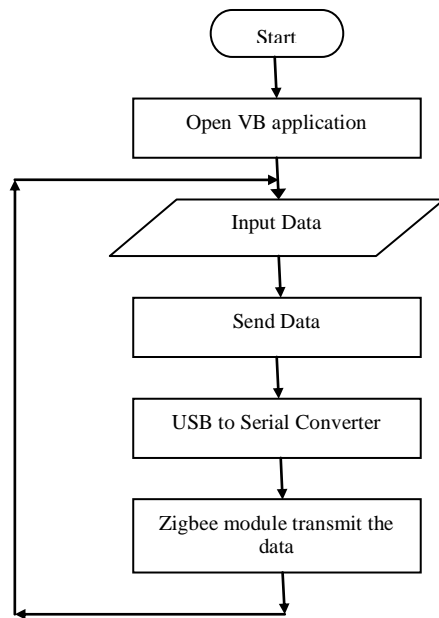


Fig. 3. Flow Chart of Transmitter side

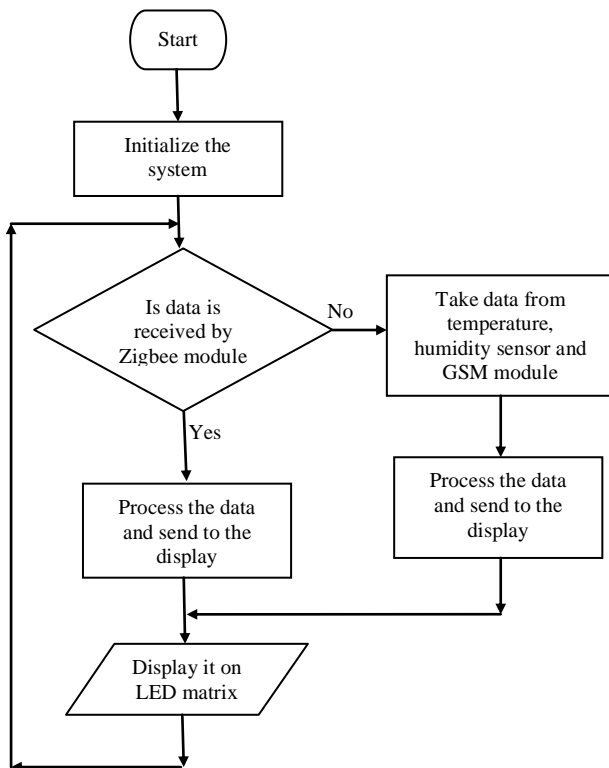


Fig. 4. Flow Chart of Receiver side

IV.SYSTEM IMPLEMENTATION

The large no of LEDs (24×120) are to be driven. It will display 3 lines of 20 characters (5×7 each). For the column the shifters are used and the rows are connected to microcontroller I/O pins via ULN2803. For the column separate driver is designed as the large no of LEDs drawn more current.

The main used components in the proposed system are as follows:

A. ATmega64

As the display panel is big, large no of pins is required for it. Also, two UARTs are needed. So, fulfilling these requirements the ATmega64 is chosen.



Fig. 5. ATmega64 Microcontroller

It has 32 x 8 general purpose working registers, 64 Kbytes of in-system reprogrammable flash program memory, write/erase cycles: 10,000 flash/100,000 EEPROM, real time counter with separate oscillator, two 8-bit PWM channels, 2 Kbytes EEPROM, 4 Kbytes Internal SRAM, 8-channel, 10-bit ADC, dual programmable serial USARTs.

B. ULN2803

To drive the LEDs the ULN2803 is used which is connected to the rows of the LED matrix. It provides 500mA collector current and high voltage output of 50V.

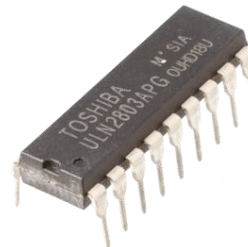


Fig. 6. ULN2803

C. LM35

To display the atmosphere temperature LM35 is used. It is rated for Full -55°C to 150°C Range. It Ensures 0.5°C Accuracy at 25°C.

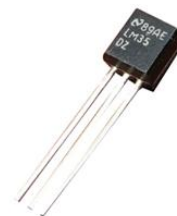


Fig. 7. LM35 Temperature Sensor

D. HC201

For the humidity HC201 is used. Its humidity measuring range is 0 to 99%RH.



Fig. 8 HC201 Humidity Sensor

E. XBee-PRO® S2 RF Modules

XBee module is used for the large range. It can transmit and receive data up to 800m. Receiver Sensitivity is -102 dBm.



Fig. 9. XBee-PRO® S2 RF Modules

F. SIM28ML GPS Module

For the current time value the GPS module is used. It has timing accuracy of 10ns. Updating rate is 1-5Hz.



Fig. 10. SIM28ML GPS Module

V. RESULT AND DISCUSSION

The application window is prepared in the Visual studio 2010. Fig. 11 shows the application window, which contains one Text box, five buttons (Send, Highlight, Show all, Delete, and Delete all) and a progress bar.

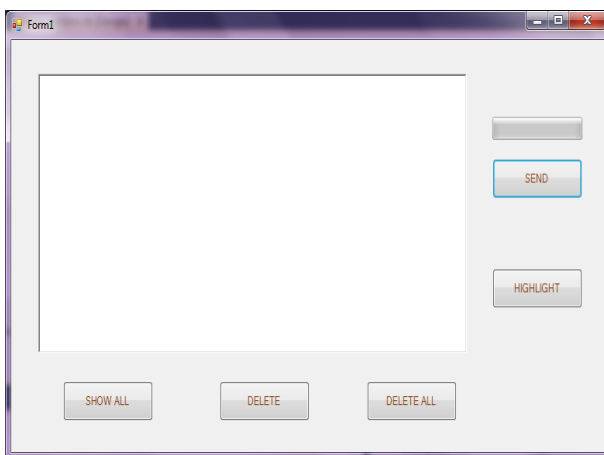


Fig. 11. The Application Window

Fig. 12 shows the notice is written in the text box and 'send' button is pressed. The 'Show all' button will display the all notices which are stored in the microcontroller. When we press 'delete' button it will delete the notice which one is ask for.

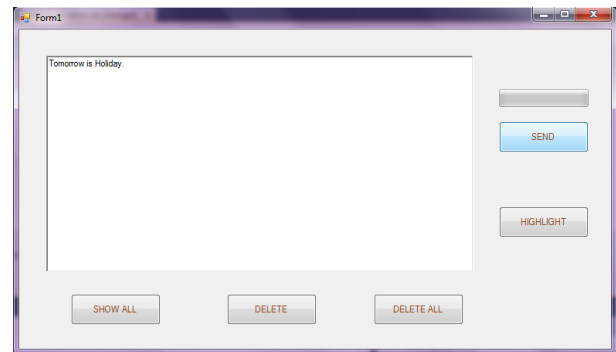


Fig. 12. The Application Window when a Notice is Send.

VI. ADVANTAGES AND APPLICATIONS

The advantages of the system are as follows:

- Display GPS clock, humidity and temperature when notice is not displayed.
- Notice changes immediately after typing on the PC.
- Provides authentication to other teachers also.
- Having storage of notices and selective notice delete system.

Where the announcement of notice is needed, the system can be implemented. It can be used for both indoor and outdoor purposes. This system can be very useful in the industries also.

VII. CONCLUSION

The proposed system will be very useful for urgent notice. The developed application window will be used to write the notice so that when anything is written on that window it will display immediately on the board. With the help of this application notice can be transmitted from any computer if needed. After the installation, it will be easy to use and notices can be changed at any time. Authentication to different authority will be provided for security purpose. This system will be very useful for urgent notice.

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