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Approach for wireless library management system

Sumreti Gupta[1], Sidhant Sharma[2], Sameru Sharma[3], Satyam Mangotra[4], Akhil Kumar Sen[5], Rohit Manhas[6]
[1,3,4,5,6]Department of Electronics & Communication Engineering, GCET, Jammu, J&K
[2]Department of Computer Engineering, GNDU,Amritsar.
[1]Retigupta8@gmail.com, [2]sidhant47@gmail.com, [3]sameru33@gmail.com,[4]satyammagotra@gmail.com,[5]rickeyroh@gmail.com, [6]akhilsen@gmail.com

Abstract— This paper presents library management system which is used for maintaining a database of number of books to be issued and returned and recording the information of the authorized student without much intervention of manual book keeping. Whoever wants to issue a book can view the identity of that respective book from the computer that would be provided at the transmitter end, where user have to provide its information and the id of the book by viewing it from that computer, then system demand for its id ,his semester id and book index no. If any person sends the complete detail then system issue the book and display in LCD .After the book has been issued the history of the issuing person would be updated in the computer connected to the receiver side of this system. The system consists of microcontroller which is interfaced with input and output modules and a touch screen which is used to enter the information in the system.

Keywords— Microcontroller, LCD, Interface, Wireless Network, Touch Panel, Transmitter, Receiver.

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I. INTRODUCTION

The paper aims at designing completely automated books catalog system in library with the help of touch screen sensor and a LCD to control and provide a user-friendly environment of the user to register the selected book effectively through wireless. The main purpose of the library management system [1] is to maintain a proper discipline regarding the planning, managing and organizing the library tasks for making the task of library easy for librarian and the student. The library book id's will be displayed automatically on the computer and we can directly select the book with the help of touch screen[2]. Touch screens provide faster access to any and all types of digital media, with no text-bound interface getting in the way. Faster input can mean better service. All these process are automated in the library in order to avoid the manual errors taking place in the library and saving the time of both librarian and the student.

The paper is organized as follows: Section II shows the Block Diagram of the Library Book Management System. Section III explores the Circuit Diagram and Working. Section IV shows the components used in the project. Section V shows the result of this project

II. BLOCK DIAGRAM

The basic block diagram of transmitter side of the system is shown in figure 1 in which the touch screen[3] is present, from which information of the student is given and the book he is wishing for,to the microcontroller. When the information is reached to the microcontroller it performs two operation.First it display the ID of the students semester and book on the LCD display so that user gets to know that he has given correct information to the system .After that microcontroller gives it to the RF encoder for the transmission to the receiver end. Since the RF wireless transmission[4] takes place serially the RF encoder converts the parallel data coming from the microcontroller into serial data then it passes it to the RF

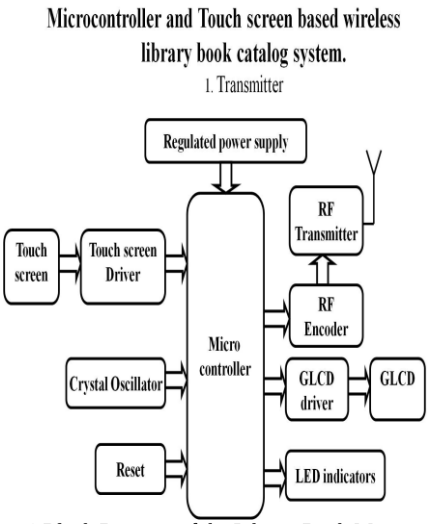

Figure 1 Block Diagram of the Library Book Management

System transmitter which transmits it to receiver side through the antenna. The data sent by the transmitter is recieved by the RF receiver . This data is then passed to the RF decoder which converts the serial data into parallel data to be processed by the microcontroller. The microcontroller is connected to the PC which has all the information about the user. When PC updates the history of the user the book gets issued to the user and it is diplayed on the LCD display through the LCD driver.

III. CIRCUIT DIAGRAM AND WORKING

This section describes the circuit diagram of transmitter and receiver section and their working.

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A. Transmitter Section

Figure 2 shows the circuit diagram of transmitter end . In this diagram it is shown that the PIC 16f877 is a 40 Pin microcontroller PORT B is a 8 pin port which is a unidirectional port that's why the 4 line output of the touch screen is connected to the port b from RB0-RB3. Then there is a PORT C which is also a 8 pin port and can act as bi directional port and through this port the 6 lines of the LCD display are connected from RC2-RC7. PORT D is also an 8 pin port which can act as a bidirectional port and that's why we have connected the encoder HT-12E to this port from RD0-RD3. For the operation of the controller the two pins of this OSC 1 and OSC 2 are connected to the crystal oscillator which is operating at a frequency of 12 MHZ. The VPP pin is connected to the 5V supply and VDD pin to the ground.

Place figure captions below the figures; place table titles above the tables. If your figure has two parts, include the labels “(a)” and “(b)” as part of the artwork. Please verify that the figures and tables you mention in the text actually exist. Use the abbreviation “Fig.” even at the beginning of a sentence. If the size of Figure or Table is more than the column size, the same may be adjusted in single column format without disturbing rest of the content.

B. Receiver Section

Figure 3 shows circuit diagram of receiver. PORT B which has 8 pins and out of which 4 pins from RB0-RB3 are used to connect the decoder which is further connected to the receiver whose function is to receive the serial data from the transmitting side.Next port is PORT C which has also 8 pins and out of which 6 pins RC0-RC7 are connected to the LCD display which is used to display weather the book is issued or not. The others of PORT D can be connected to the external computer by an interfacing and this computer can maintain the history of the user and all the other things . The two oscillator pins OSC1 and OSC2 are connected to the crystal oscillator which is providing the frequency for the operation of 12Mhz.VDD pin is grounded and VPP pin is given a 5v supply through tha dc battery which is of 12 v but we have used the voltage regulator and capacitors to bring down the voltage to 5v.

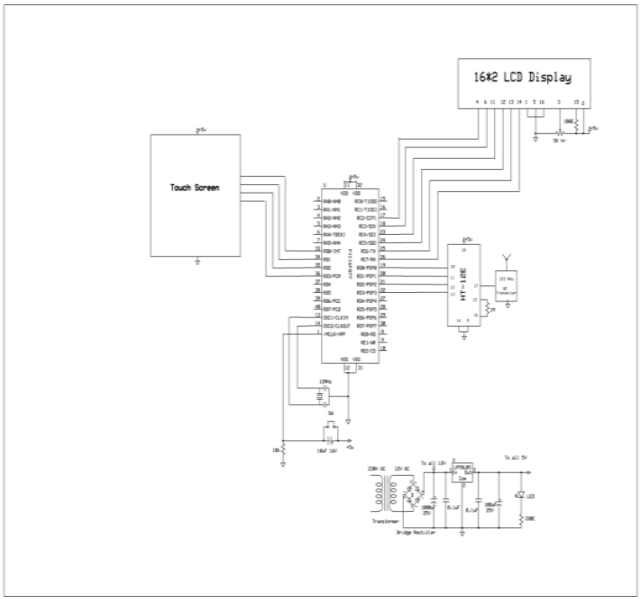

Figure 2. Circuit Diagram of transmitter section.

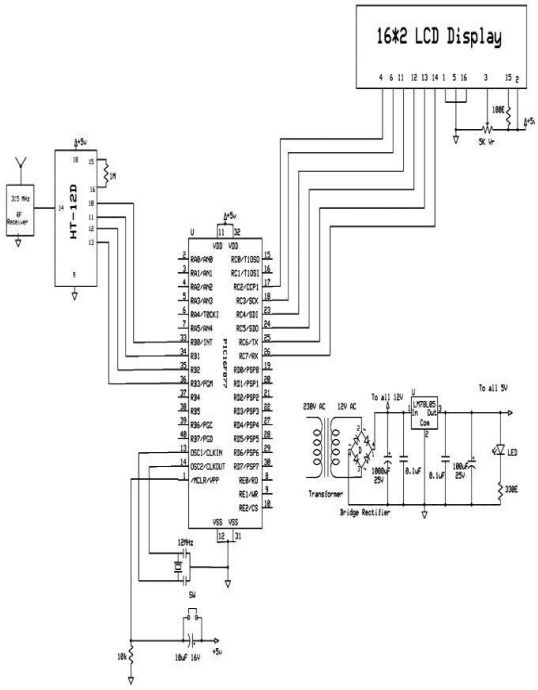

Figure 3. Circuit diagram of receiver section

C. Working

Working can be explained by a simple Flow Chart as shown in figure 4. In the flow chart given below the basic working of the system is given. According to the flow chart process gets started by entering the student ID then it is send to the transmitter after it asks for the semester ID and after sending the semester ID to the transmitter the student looks for the ID of the book he wants to issue from the computer at the transmitting end which has all the ID number of the books.

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When the correct id number is given to receiver side's microcontroller the PC connected to the receiver side microcontroller checks for the students history and if he had issued the books less than the number of books one can issue and book he wants to issue is available in the library then book is issued to the student which appears on the receiver LCD indicating the user the book has been issued to him.

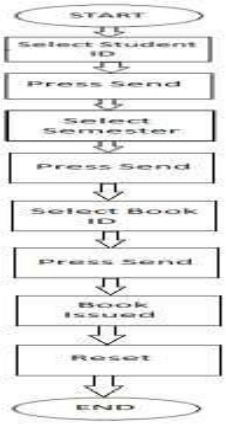

Figure 4. Fowchart of working.

IV. COMPONENTS USED

1. Regulated power supply.
2. Touch screen sensor with driver.
3. Graphical LCD with driver.
4. Microcontrollers.
5. RF Transmitter.
6. RF Receiver.
7. RESET
8. Crystal oscillator.
9. LED indicators

Hardware Used:

- PIC 16F877A
- Resister
- Capacitor
- Diodes
- Crystal
- Buzzer
- RF module
- LCD
- Touch screen

Software Used:

- PIC-C compiler for embedded C programming.
- PIC kit to programmer for dumping code into micro-controller
- Proteus for hardware simulation.
- RF Technology

V. RESULTS

Library Management System is a unique system to be implemented in libraries to manage the books automatically and efficiently. Time saving, fast accessing of books and eliminating manual errors is the main benefits of management system in Library. The books received in the library are entered in the books entry from and the new student is entered in the student entry form. When the student wants to get the desired book the same is issued on the availability basis to the student.. The library book id will be displayed automatically on the PC at transmitter end and book can directly be selected with the help of touch screen.

VI. CONCLUSION

Wireless Library Management in the library speeds up book borrowing, monitoring, books searching processes and thus frees staff to do more user-service tasks. Therefore the main idea of this work is to create a manually operated system which is easily accessible by the teacher and therefore whole process of finding the book from the racks and issue of the book to a student by viewing its previous record and then updating its record after giving the book becomes less time consuming and simple for the librarian as he/she does not have to maintain any history of the students in the registers because it will automatically updated in the computer which would be connected with the receiving side microcontroller of this system Librarian has to just watch that student is not a defaulter and when all is good then the book is issued to the student and it lessens the burden of the librarian and it also will help to reduce the waiting time of users in queue for issuing and returning of books in the library These applications can lead to significant savings in labor costs, enhance customer service, lower book theft and provide a constant record update of new collections of books. Therefore the main idea of this work is to create a manually operated system which is easily accessible by the student.

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