WIRELESS LIBRARY BOOK CATALOG SYSTEM

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ABSTRACT

In this project we demonstrate the idea of advance wireless library system with the help of touch panel. In this project we demonstrate the transmitter and receiver circuit. When any person wants to issue the book than system demand for student id, student semester and book index no. If any person sends the complete detail than system issue the book and display in LCD. The transmitter will be at the issuing section and the receiver will be with the operator in the library. There are LCD provided on both transmitter and the receiver to display the information provided to the operator. Touch pad will be provided to enter the data. This data includes the student ID given to the student, semester of that particular student and book ID which is to be issued. When any student wants to issue the book than system demand for student id, student semester and book index number. These details about the student will be entered with the help of touch pad by the student. If any student sends the complete detail than system issue the book and display in LCD. This information will be shown to the student and to the operator on LCD at the transmitter and receiver respectively. The operator will provide the issued book of the selected semester to the student.

Keywords: Microcontroller, Lcd, Interface, Wireless Network, Touch Panel, Transmitter, Receiver

I. INTRODUCTION

The project mainly aims in designing completely automated books catalog system in library with the help of touch screen sensor and a graphical LCD to control and provide a user-friendly environment of the user to register the selected the book effectively through wireless. The library catalog will be displayed automatically on the GLCD display and we can directly select the book with the help of touch screen.

Touch screens provide fast access to any and all types of digital media, with no text-bound interface getting in the way. Faster input can mean better service. Using a touch interface can effectively increase operator accuracy, reduce training time, and improve overall operational efficiencies, a properly designed touch interface can improve each operator's accuracy. Touch screens are practical in automation, which has become even simpler with touch screen technology. Owners familiar with the icon system appreciate touch screens that make automation systems user friendly.

The device consists of a microcontroller, which is interfaced with the input and output modules, the controller acts as an intermediate medium between both of them. So the controller can be termed as a control unit. The input module is nothing but a touch screen sensor, which takes the input from the user and provides the same to the microcontroller. The output module is the RF module. The controller also takes the responsibility to display the book catalog information on the graphical LCD. At the receiving end the selected books will be displayed on GLCD.

II. MODE OF PROJECT

2.1transmitter Mode

In this mode we select the student id, semester, book index with the help of touchpad that interface to ADC and DAC connect to microcontroller. This information send with the help of RF module with encoder system 435 MHz FSK modulation.

2.2 Receiver Mode

Inreceiver mode we receive the all information in form of frequency that decode in BCD form and given to microcontroller and issue the book and respective message display in LCD.

III. ARCHITECTURE

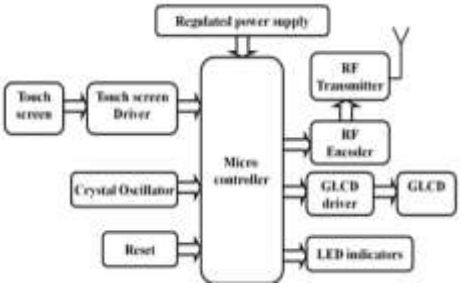


Figure 1 Transmitter

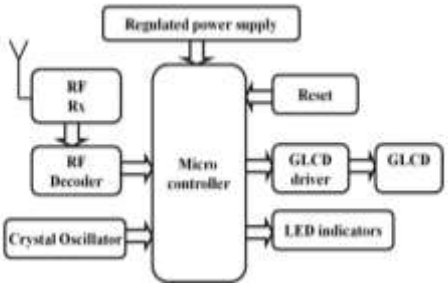


Figure 2.Receiver

IV. ELECTRICAL SYSTEM

4.1Microcontroller (AT89S52)

Here the microcontroller AT89S52 is used instead of AT89C52. Both are different in many ways. AT89S52uses In-system programming via its 6,7,8,9 pins whereas AT89C52 uses parallel programming with an external In-system programmer. The In-system programming helps to program the microcontroller after the installation. The other difference is that AT89S52 uses 4-5V voltage and AT89C52 uses 4-5V and 12V voltage. The AT89S52 works with 33MHz frequency and AT89C52 works with 24MHz frequency. So the frequency range of working of AT89S52 is far better and good than AT89C52.

AT89S52 has a Watch Dog Timer and AT89C52 don't have one. The Watch Dog Timer checks for the malfunctions in the microcontroller. After a fixed time period the timer restart the system and make the corrections. The system sends a signal to reset the timer and postpone the restart. A multistage Watch Dog Timer is a known timer used in computers. It has many stages and with a transection from one stage to other stage it checks for the malfunction and makes a correction. AT89S52 has 8K bytes of Flash memory and a RAM of 256 Bytes. It supports both, the parallel programming and the In-system Programming. Its processing time is less and it makes it fast in comparison to AT89C52.

4.2. Liquid Crystal Display

LCD's typically have 14 data pins and 2 for the LED backlight. Character LCDs use a standard 14-pin interface and those with backlights have 16 pins. There may also be a single backlight pin, with the other connection via Ground or VCC pin. The two backlight pins may precede the pin 1.The nominal backlight voltage is around 4.2V at 25˚C using a VDD 5V capable model. Character LCDs can operate in 4-bit or 8-bit mode. In 4 bit mode,

pins 7 through 10 are unused and the entire byte is sent to the screen using pins 11 through 14 by sending 4-bits at a time.

4.3. Radio Frequency Transmitter

This wireless data is the easiest to use, lowest cost RF link. Use these components to transmit position data, temperature data, and even current program register values wirelessly to the receiver. These modules have up to 500 Ft. range in open space. The transmitter operates from 2-12V.

4.4. Radio Frequency Receiver

This receiver type is good for data rates up to 4800bps and will only work with the 434MHz to 315 MHz transmitter. Multiple 434MHz or 315MHz receivers can listen to one 434MHz transmitter or 315 MHz transmitter. The receiver is operated at 5V.

4.5 RF Module

The TWS-434 and RWS-434 are extremely small, and are excellent for applications requiring short-range RF remote controls. The transmitter module is only 1/3 the size of a standard postage stamp, and can easily be placed inside a small plastic enclosure.

4.5.1 Encoder

The transmitter output is up to 8mW at 433.92MHz with a range of approximately 400 foot (open area) outdoors. Indoors, the range is approximately 200 foot, and will go through most walls. The TWS-434 transmitter accepts both linear and digital inputcan operate from 1.5 to 12 Volts-DC and makes building a miniature hand-held RF transmitter very easy. The TWS-434 is approximately the size of a standard postage stamp.

4.5.2 Decoder

The receiver also operates at 433.92MHz and has a sensitivity of 3uV. The RWS-434 receiver operates from 4.5 to 5.5 volts-DC and has both linear and digital outputs. The RWS-434 is approximately the size of a standard postage stamp.

4.6 Power Supply

This project works on the two voltages as its requirement, 5V and 12V. To have these voltage levels the following circuit is used as the regulated power supply. There is a rectifier first which converts the 220V to the pulsating DC of 12V. Transformer and diodes are used in the rectifier. As this DC voltage is in pulsating form, we have to convert it in pure DC without any fluctuations. We used an IC 7805. This converts the 12V to 5V DC. To reduce the fluctuations we used the electrolyte capacitors. The LED is used to indicate the 5V at the output.

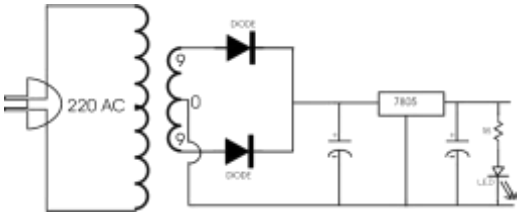


Figure 3. Circuit diagram of Power Supply

4.7. Touch Screen Technology

A touchscreen is an electronic visual display that can detect the presence and location of a touch within the display area. The term generally refers to touching the display of the device with a finger or hand. Touch screens can also sense other passive objects, such as a stylus. In other words, a touchscreen is any monitor, based either on LCD (Liquid Crystal Display) or CRT (Cathode Ray Tube) technology that accepts direct on screen input. The ability for direct onscreen input is facilitated by an external (light pen) or an internal device (touch overlay and controller) that relays the X, Y coordinates to the computer. The touchscreen has two main attributes. First, it enables one to interact directly with what is displayed, rather than indirectly with a cursor controlled by a mouse or touchpad. Secondly, it lets one do so without requiring any intermediate device that would need to be held in the hand. Touchscreen technology has the potential to replace most functions of the mouse and keyboard. The touchscreen interface is being used in a wide variety of applications to improve human computer interaction. As the technology advances, people may be able to operate computers without mice and keyboards. Because of its convenience, touch screen technology solutions has been applied more and more to industries, applications, products and services, such as Kiosks, POS (Point-of-Sale), consumer electronics, tablet PC, moderate to harsh Machine Control, Process Control, System Control/Office Automation and Car PC, etc.

4.8 Touch sensor

Touch sensors are finding their way into many applications, from mobile phones to remote controls and appliance control panels. Mechanical button and switch replacement continues to be implemented in a wide variety of applications. Touch sensors with simple linear or rotational sliders, rotary wheels and touch pads offer significant advantages for more intuitive user interfaces. They are more convenient to use without moving parts and provide increased reliability. Using touch sensors allows the designer greater freedom, while reducing overall system cost. The consumer can now enjoy a more appealing, intuitive interface often with a more contemporary look.

Free scale's touch sensors are designed to detect touch and even the presence of objects without relying on physical contact. Touch sensors can support multiple electrodes, where several different applications can be controlled by one sensor. By multiplexing the electrodes, the single sensor becomes an extension for detection at multiple points. For example, capacitive touch sensors are user interface controllers that manage multiple configurations of touch pads, sliders, rotary positions and mechanical keys. Free scale offers a broad portfolio of touch sensors as both standard products and software solutions for applications ranging from gaming controllers to occupant detection. Target markets include consumer, appliance, automotive, industrial, medical electronics and networking.

1) Features

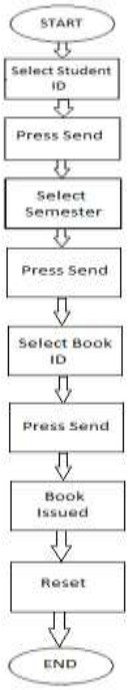
- Multiple electrode configurations
- Voltage operation range of 1.8 V–18V Analog or digital (I2C) interface.
- Minimal software integration.
- Rotary wheel, linear sliders and touch pad options.
- Temperature ranges from -40ºC to +110ºC.

2) Advantages

- Touch screen based user-friendly interfacing.
- Low power consumption.
- Registration of books in the library becomes simple.
- Long life.
- Highly sensitive.

V. WORKING

The working of the project is quite simple and convenient as per the requirement. The transmitter is fixed at the entry section of the library. The receiver is placed in the library where the operator is noting down every activity. Every student has given an ID. He has to enter the ID at the transmitter through the touch pad. After that the semester is to be selected by the student. Then the book number should be entered in order to issue the book. This information is transmitting to the receiver and the operator is reviewing them. He will note down this information and provide the book to the student.



Flow Chart

There is also a future aspect of this project. We can make the facial recognition at the side of entry. This will reduce the unauthorized attempts to issue the book. We also can initialize a locking mechanism which can be unlocked by entering the individual code given to every student. The door at the entry will only open if both the facial recognition and the code entered are good. We also can use a printer to maintain the record of each book issued. We are also thinking about the conveyer belt through which the book will move down to the student from the shelf.

VI. CONCLUSION

Test is found that this system is highly effective and it is efficient in selecting book directly from library. Touch screens provide fast access to any and all types of digital media, with no text-bound interface getting in the way. The need of an operator is reduced with this project. This project also gives attention to the concept of self service. Faster input can mean better service. The sole aim of this project is to make the process of book issuing more interesting and secure. This also facilitates the student to maintain the record as per the requirements.

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