

TRACKING POLICE MAN USING RF PROXIMITY CARD

Abstract

Security is the important cause in the modern world. Now a day so many schemes have announced by the banks which very attractive and the people are saving money in banks. At this point protecting the banks is the main duty of police. Hence police are appointed securities to the banks and make them to patrol during nights. . They have to go to every banks and streets and sign the books kept in their places .But some police people forgot their duty and will sleep in a vacant place and in the morning they get up and in a hurry go to these banks and put a fake time and date and the signature .To avoid this and to provide more security our proposed system is giving solution for tracking police man using RF proximity card. A RF proximity card reader with a microcontroller will be designed and will be placed in every bank. During the patrol time, when a police man swipe the card it will read the card number and will store it with date and time. The data can be retrieved by connecting the machine to PC and giving appropriate commands.

Tracking police man using RF proximity card embedded system project explains about new method for bank officials for checking their security of the bank by implementing accurate method to control police officials. In present scenario banks are playing important role in providing security for people for saving their money, gold..Etc. So banks are taking serious steps to maintain security like hiring police officials at night time for patrolling banks, but there are chances in irregularity of police officials so this method will provide card system for every police official who should scratch his card. Data and time is stored inside system which can connect to computer and analyze details of his attendance.

Components

❖ Power Supply	:	5V/12V DC
❖ Micro controller	:	ATMEL AT89S52
❖ LCD	:	16x2 characters
❖ RS232 Converter	:	MAX3232
❖ Buzzer	:	Frequency-1 to 18 kHz (5v-12Vdc)
❖ Reader	:	RF proximity card reader
❖ Card	:	RF proximity card
❖ Memory (EEPROM)	:	AT24C04 (4Kb)
❖ Real time clock (RTC)	:	DS1307

Software used

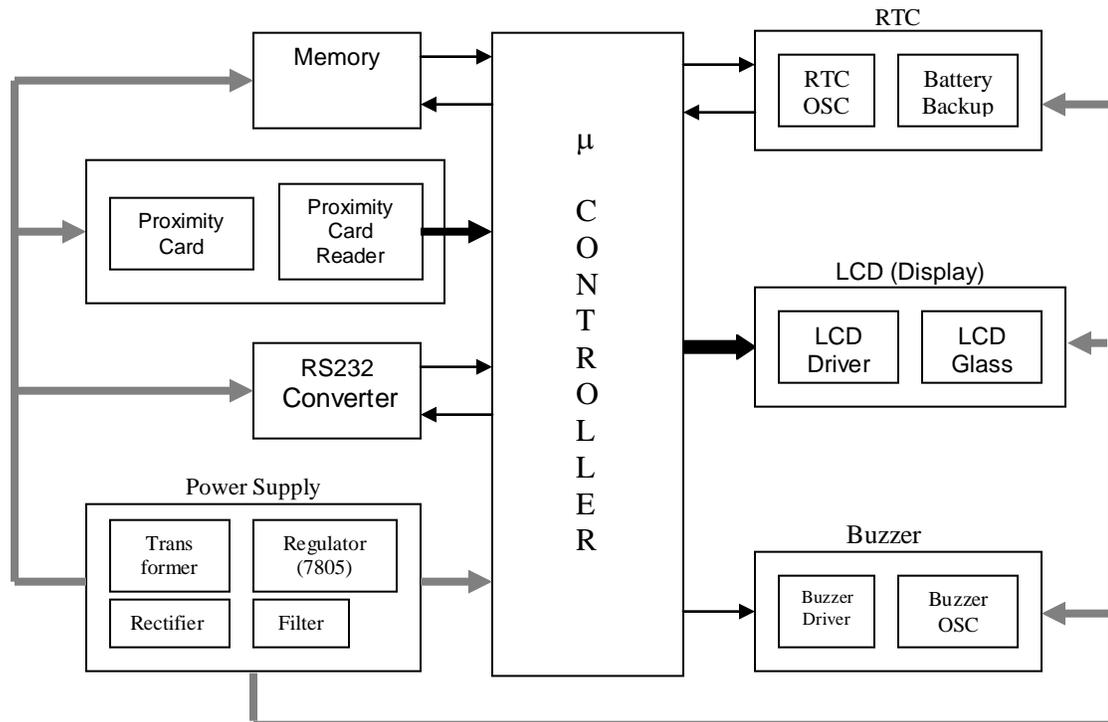
- ❖ Embedded C

❖ Pro-load

Functionality

RTC is providing the clock with date and time, and this date and time is displaying in LCD. When the police man swipe the card, RF reader will read the card and decode the card value. Decoded card value is send to microcontroller. Microcontroller is receiving the card value and the card value is stored in external EEPROM memory with the swiped date and time. Details of the card swiping are retrieved by connecting the machine to a PC. After connecting to PC through serial port, valid password is required to retrieve the data. Upon successful entry of the password data will transfer from machine to PC.

Block Diagram



Components Description

Power supply

Power supply unit contains adaptor, regulator, and filter. This will convert AC voltage into desired DC voltage. Adaptor is used for step down the voltage, regulator is used for removing AC components and filter is used to provide pure DC.



Vital role of power supply in the system

The microcontroller and other devices get power supply from AC to DC adapter through 7805 a 5 volts regulator. The adapter output voltage will be 12V DC non-regulated. The 7805 voltage regulators are used to convert 12 V to 5V DC.

Microcontroller AT89S52

The AT89S52 is a widely available in market, cost effective, low-power, high-performance CMOS 8-bit microcontroller with 8K bytes of in-system programmable Flash memory. The device is manufactured using ATMEL's high-density nonvolatile memory technology and is compatible with the industry standard 80C51 instruction set and pin out.

Features

- ❖ 8K Bytes of In-System Programmable (ISP) Flash Memory
- ❖ Endurance: 1000 Write/Erase Cycles
- ❖ 4.0V to 5.5V Operating Range
- ❖ 256 x 8-bit Internal RAM
- ❖ 32 Programmable I/O Lines
- ❖ Full Duplex UART Serial Channel
- ❖ Fully Static Operation: 0 Hz to 33 MHz

Vital role of Microcontroller-AT89S52 in this project

When ever the police man swipe the card in card reader, the uc will receive the card number and will read the current time from RTC and store the time and card number in EEPROM memory. During the same time the microcontroller will send the permission status to LCD and will activate the buzzer. During data downloading time microcontroller will receive the command through serial port and validate the command and will transfer the data to PC

Proximity card reader

Pyramid Series readers can be connected to virtually any project that conforms to Wiegand format standards. All connections between the reader and control panel are made through the reader's cable. Pyramid Series Proximity readers can communicate via Wiegand data format. Wiegand is a commonly used interface between readers and control panels used in access control, security, time and attendance, and other related industries. Pyramid Series readers follow the Wiegand standard specified by the Security Industry Association's (SIA) Access Control Standard Protocol for the 26-Bit Wiegand Reader Interface document. Manufacturers have adopted the Wiegand standard to establish a common Wiegand interface. This provides a level of compatibility and interoperability for readers and control panels that can be used by consultants, specifiers, and end users when setting product design or system installation criteria. To this end the Pyramid Series offers several approaches for implementing the Wiegand format.

Vital role of Proximity card reader in this project

This is used to read the encoded card number from RF card and send the encoded card number to microcontroller for decoded purpose.

RS 232 CONVERTER (MAX 232N)

This is the device, which is used to convert signals from TTL/RS232 vice versa.

RS-232 Protocol

RS-232 was created for one purpose, to interface between Data Terminal Equipment (DTE) and Data Communications Equipment (DCE) employing serial binary data interchange. So as stated the DTE is the terminal or computer and the DCE is the modem or other communications device.

RS-232 pin-outs for IBM compatible computers are shown below. There are two configurations that are typically used: one for a 9-pin connector and the other for a 25-pin connector.

9-pin RS-232 Pin-out

PIN	DESIGNATION
1	Data Carrier Detect
2	Receive Data
3	Transmit Data
4	Data Terminal Ready
5	Signal Ground
6	Data Set Ready
7	Request to Send
8	Clear to Send
9	Ring Indicator

Voltage range

The standard voltage range on RS-232 pins is $\pm 15V$ to $\pm 5V$. This voltage range applies to all RS-232 signal pins. The total voltage swing during signal transmission can be as large as 30V. In many cases, RS-232 ports will operate with voltages as low as $\pm 5V$ to $\pm 15V$. This wide range of voltages allows for better compatibility between different types of equipment and allows greater noise margin to avoid interference. Because the voltage swing on RS-232 lines is so large, the RS-232 signal lines generate a significant amount of electrical noise. It is important that this signal does not run close to high impedance microphone lines or audio lines in a system. In cases where you must run these types of signals nearby one another, it is important to make sure that all audio wires are properly shielded. The main role of the RS232 chip is to convert the data coming for the 12-volt logic to 5 volt logic and from 5 volt logic to 12 volt logic

Vital role of RS232 Converter (Max 232n) in this project

This device is used to download the stored details (police man database) from microcontroller to computer.

LCD (LIQUID CRYSTAL DISPLAY)

LCDs can add a lot to your application in terms of providing a useful interface for the user, debugging an application or just giving it a "professional" look. The most common type of LCD controller is the Hitachi 44780 which provides a relatively simple interface between a processor and an LCD. Using this interface is often not attempted by inexperienced designers and programmers because it is difficult to find good documentation on the interface, initializing the interface can be a problem and the displays themselves are expensive.

This LCD is Two-line (16x2 characters) display.

Vital role of LCD in this project

This device is used to display the permission status.

External EEPROM memory (4Kbytes)

These memory devices are used to store the data for off line process. This provides 4096 bits of serial electrically erasable and programmable read only memory (EEPROM) organized as 512 words of 8 bits each. The device is optimized for use in many industrial and commercial applications where low power and low voltage operation are essential. The AT24C04A is available in space saving 8-pin PDIP.

Features

- ❖ Internally Organized 512 x 8 (4K) 2-Wire Serial Interface (I2C protocol)
- ❖ High Reliability
- ❖ Endurance: 1 Million Write Cycles
- ❖ Data Retention: 100 Years
- ❖ ESD Protection: >3000V

Vital role of External EEPROM memory in this project

This device is used to store policeman attendance details for offline processing.

Real Time Clock (RTC – DS1307)

This is used to maintain the current time in off line processing. The DS1307 Serial Real-Time Clock is a low-power; full binary-coded decimal (BCD) clock/calendar plus 56 bytes of NV SRAM. Address and data are transferred serially via a 2-wire, bi-directional bus. The clock/calendar provides seconds, minutes, hours, day, date, month, and year information. The end of the month date is automatically adjusted for months with fewer than 31 days, including corrections for leap year. The clock operates in either the 24-hour or 12-hour format with AM/PM indicator. The DS1307 has a built-in power sense circuit that detects power failures and automatically switches to the battery supply.

Features

- ❖ It uses I2C protocol
- ❖ Real-time clock (RTC) counts seconds, minutes, hours, date of the month, month, and day of the week, and year with leap-year compensation valid up to 2100.
- ❖ Two-wire serial interface Consumes less than 500nA in battery backup mode with oscillator running

Vital role of Real-time clock in this project

This is used to maintain the current time for off and on line processing.

Computer

This is used to monitor the system status and controls the system devices. Here the front end application is developed by using VB software. The computer is communicating with microcontroller through serial port.

Vital role of computer in this project

The visual basic front end application is stored in computer. By using this application we can download the police man database details every 1 week or 1 month.

Buzzer

The buzzer subsystem produces a 2 KHz audible tone when powered. The buzzer will sound when the signal coming into the driver is high. It must be connected to a transistor, Darlington or transducer driver subsystem.

The buzzer is connected between the supply rail (+V) and the input signal. This acts as load on the driver. When the input signal coming into the buzzer subsystem is low, a potential difference across the buzzer causes current to flow. It is this flow of current that causes the buzzer to sound.

Vital role of Buzzer in this project

When ever the police man swipe the card, the buzzer will give beep sound. So the police man can easily identify the process status. So no need of swipe the card once again for confirmation.

Future Enhancement

By using GSM modem the policeman details can send to the server system immediately after the person swipe the card.