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RFID Security Access Control System

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Introduction

RFID is an acronym for Radio Frequency Identification. RFID is one member in the family of Automatic Identification and Data Capture (AIDC) technologies and is a fast and reliable means of identifying just about any material object. This project can be used for security purpose where it gives information about the authorized persons and unauthorized persons.

This can be applied in real time systems as such in recording the attendance, in the companies and in industries to know who are authorized. RFID is increasingly used with biometric technologies for security. Primarily, the two main components involved in a Radio Frequency Identification system are the Transponder (tags that are attached to the object) and the Interrogator (RFID reader).

Communication between the RFID reader and tags occurs wirelessly and generally doesn't require a line of sight between the devices.

Existing system

A **locker** is a small, usually narrow storage compartment. They are commonly found in dedicated cabinets, very often in large numbers, in various public places such as locker rooms, workplaces, middle and high schools, transport hub and the like.

They vary in size, purpose, construction, and security.In the present system to get access for any sort of such place is by using key to the fixed locker.

Drawback: This can be duplicated with ease.

Proposed system

In this project, the RFID module reader typically contains a module (transmitter and receiver), a control unit and a coupling element (antenna). This module is interfaced with the micro controller and when the card is brought near to the RFID module it reads the data in the card and displays on the LCD. If the data in the card is matched with the data in the program memory then it compares and displays a message that the person is authorized. If the data is not matched it displays unauthorized. For authorized message, the door gets opened and the person gets in after sometime the door gets closed. If it is an unauthorized person it alerts the others through a buzzer.

The RFID module indicates a buzzer whenever it reads the data from the RFID card.

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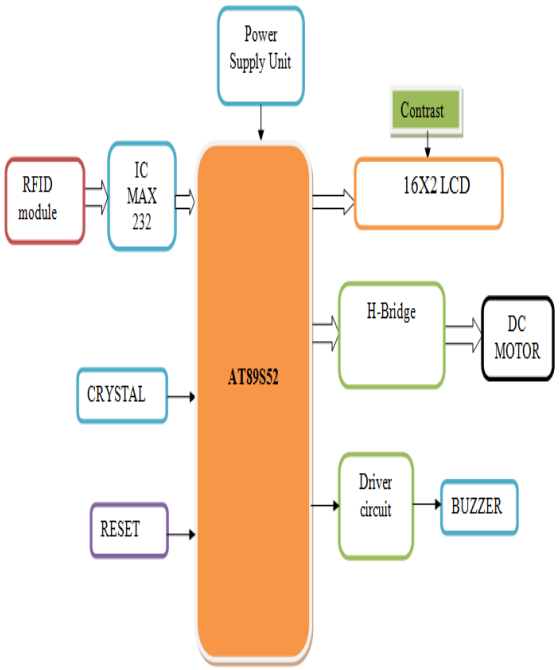
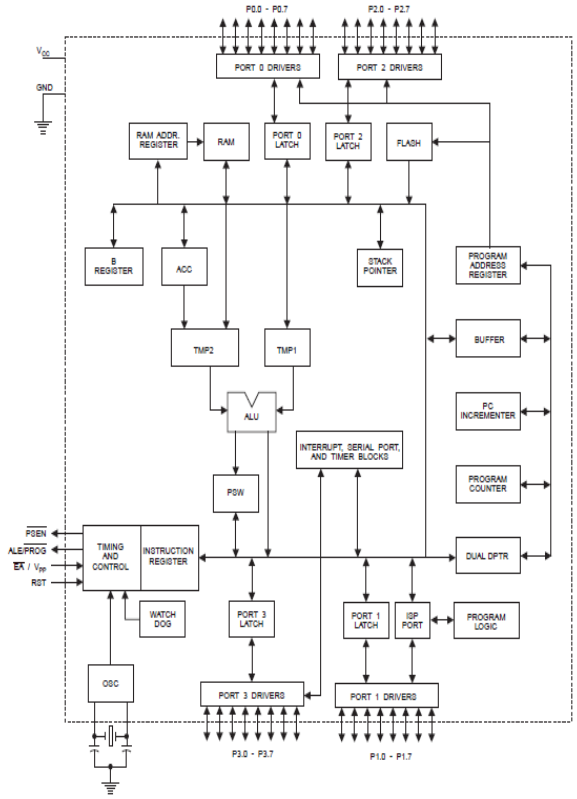
BLOCK DIAGRAM:



Block Diagram



HARDWARE MODULE USED IN THIS PROJECT

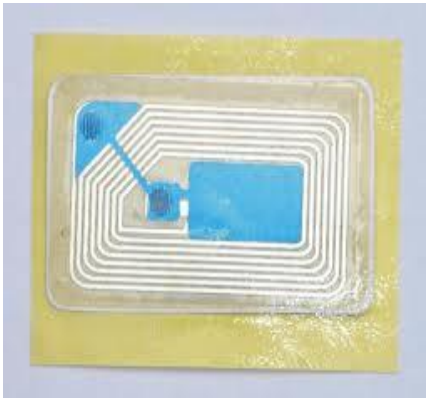
AT89S52

The AT89S52 is a low-voltage, high-performance CMOS 8-bit microcomputer with 8K bytes of Flash programmable memory. The device is manufactured using Atmel's high-density nonvolatile memory technology and is compatible with the industry-standard MCS-51 instruction set. By combining a versatile 8-bit CPU with Flash on a monolithic chip, the Atmel AT89S52 is a powerful microcomputer, which provides a highly flexible and cost-effective solution to many embedded control applications.

In addition, the AT89S52 is designed with static logic for operation down to zero frequency and supports two software selectable power saving modes. The Idle Mode stops the CPU while allowing the RAM, timer/counters, serial port and interrupt system to continue functioning. The power-down mode saves the RAM contents but freezes the oscillator disabling all other chip functions until the next hardware reset.

RFID

Radio-frequency identification (RFID) is the use of a wireless non-contact system that uses radio-frequency electromagnetic fields to transfer data from a tag attached to an object, for the purposes of automatic identification and tracking. Some tags require no battery and are powered by the electromagnetic fields used to read them. Others use a local power source and emit radio waves (electromagnetic radiation at radio frequencies).



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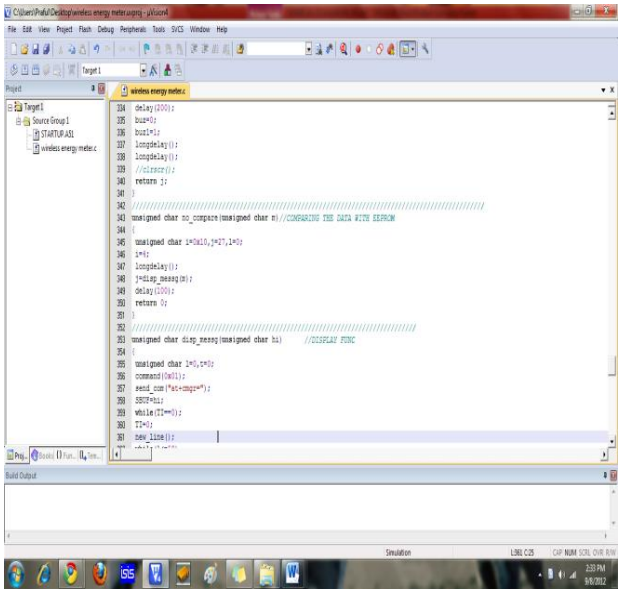
Software tools

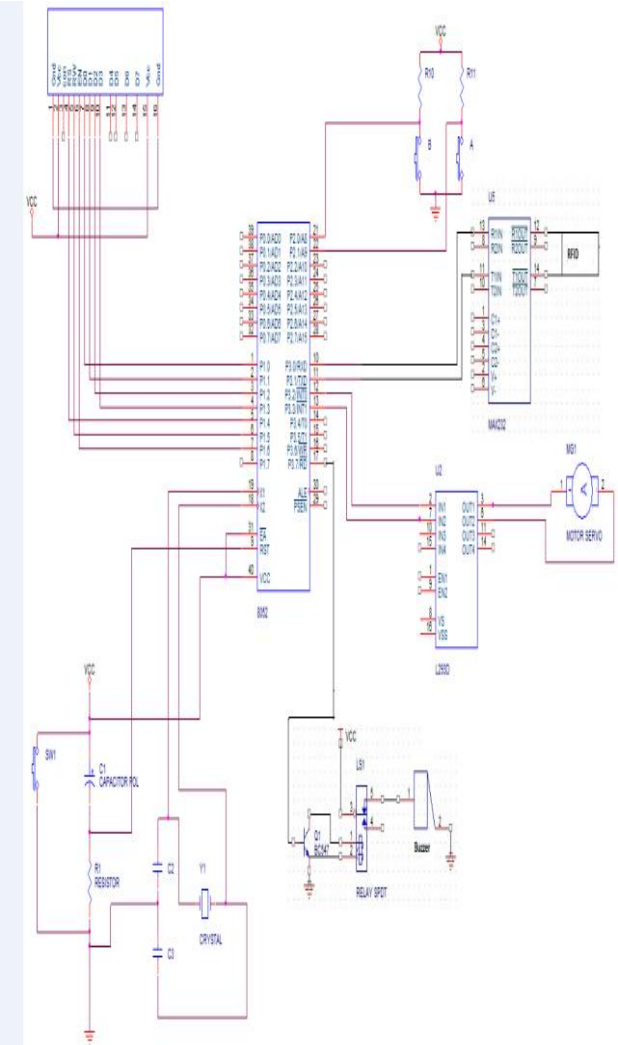
Keil compiler is a software used where the machine language code is written and compiled. After compilation, the machine source code is converted into hex code which is to be dumped into the microcontroller for further processing. Keil compiler also supports C language code.



Flash Magic

Flash Magic is a tool which is used to program hex code in EEPROM of micro-controller. It is a freeware tool. It only supports the micro-controller of Philips and NXP. It can burn a hex code into that controller which supports ISP (in system programming) feature. Flash magic supports several chips like **ARM Cortex M0, M3, M4, ARM7 and 8051.**

INTERFACING DIAGRAM



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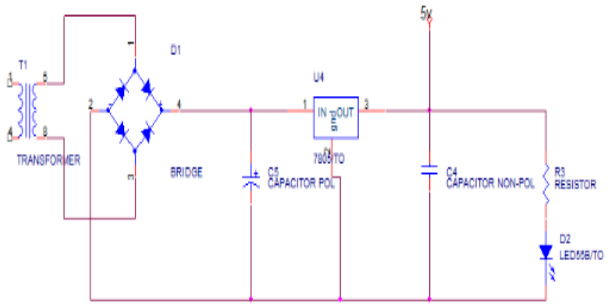

RFID frequency bands					
Band	**Regulations**	**Range**	**Data speed**	**Remarks**	**Approximate tag cost in volume (2006) US $**
120–150 kHz (LF)	Unregulated	10 cm	Low	Animal identification, factory data collection	$1 US
13.56 MHz (HF)	ISM band worldwide	1 m	Low to moderate	Smart cards	$0.50
433 MHz (UHF)	Short Range Devices	1–100 m	Moderate	Defence applications, with active tags	$5
868-870 MHz (Europe) 902-928 MHz (North America) UHF	ISM band	1–2 m	Moderate to high	EAN, various standards	$0.15 (passive tags)
2450-5800 MHz (microwave)	ISM band	1–2 m	High	802.11 WLAN, Bluetooth standards	$25 (active tags)
3.1–10 GHz (microwave)	Ultra wide band	to 200 M	High	requires semi-active or active tags	$5 projected

ADVANTAGES

The significant advantage of all types of RFID systems is the non contact, non-line-of-sight nature of the technology. Tags can be read through a variety of substances such as snow, fog, ice, paint, crusted grime, and other visually and environmentally challenging conditions, where barcodes or other optically read technologies would be useless. This project can provide security for the industries, companies, etc.

APPLICATIONS

- Banks and ATM
- Voter Identification and electoral enrollment
- Personal Computers

CONCLUSION

In this project work, we have studied and implemented a complete working model using a Microcontroller. The programming and interfacing of microcontroller has been mastered during the implementation. This work includes the study of **RFID module.**

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