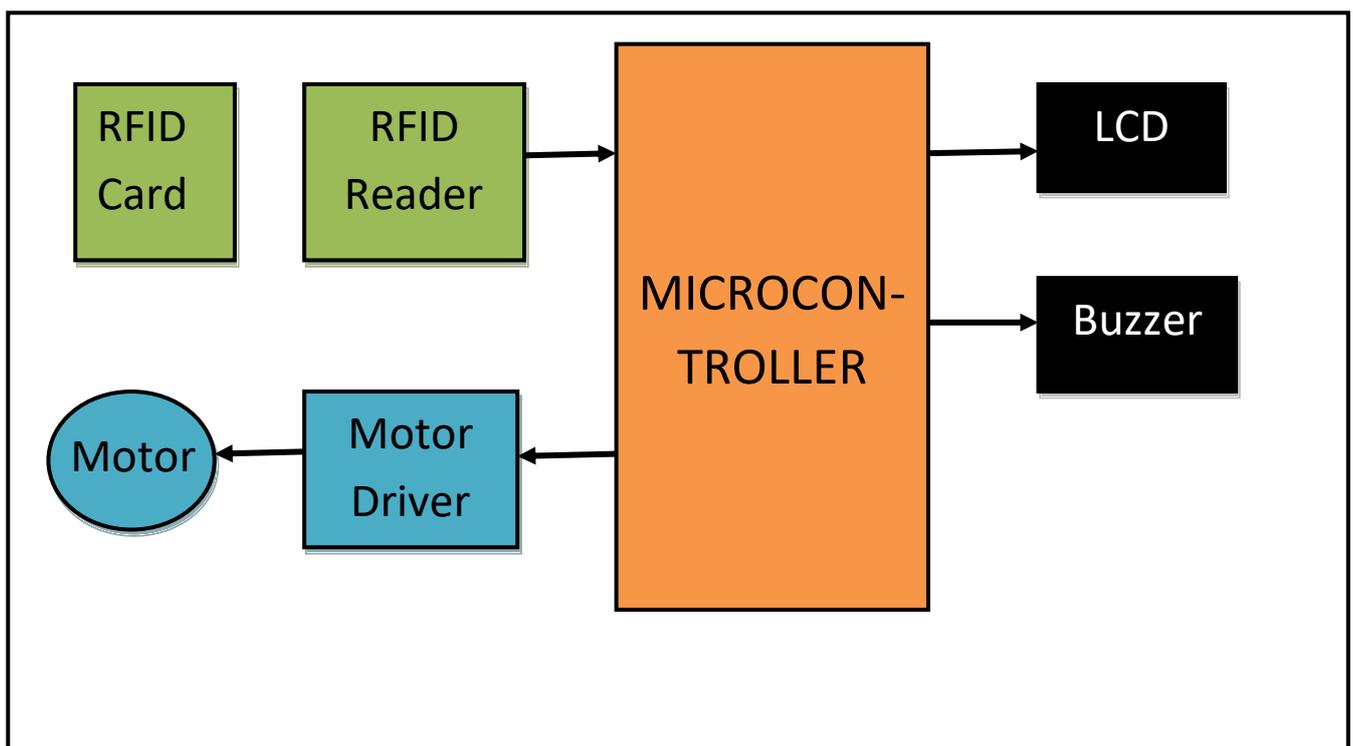# RFID Based Door Access Control

Abstract

The security system is basically an embedded one. Embedded stands for hardware controlled by software. Here, the software using a Microcontroller controls all the hardware components. The microcontroller plays an important role in the system. The main objective of the system is to uniquely identify and to make security for a person. This requires a unique product, which has the capability of distinguishing different person. This is possible by the new emerging technology RFID (Radio Frequency Identification). The main parts of an RFID system are RFID tag (with unique ID number) and RFID reader (for reading the RFID tag). In this system, RFID tag and RFID reader used are operating at 125 KHz. The microcontroller internal memory is used for storing the details. This report provides a clear picture of hardware and software used in the system. It also provides an overall view with detailed discussion of the operation of the system.

INTRODUCTION

Most educational institutions' administrators are concerned about student security. The conventional method allowing access to students inside a college/educational campus is by showing photo i-cards to security guard is very time consuming and insecure, hence inefficient. Radio Frequency Identification (RFID) based security system is one of the solutions to address this problem. This system can be used to allow access for student in school, college, and

university. It also can be used to take attendance for workers in working places. Its ability to uniquely identify each person based on their RFID tag type of ID card make the process of allowing security access easier, faster and secure as compared to conventional method. Students or workers only need to place their ID card on the reader and they will be allowed to enter the campus. And if any invalid card is shown then the buzzer is turned on.

Block diagram

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┌─────────────────────────────────────────────────────────────┐
│                                                              │
│  ┌──────┐   ┌──────┐      ┌──────────┐      ┌──────┐          │
│  │ RFID │   │ RFID │────▶ │          │────▶ │ LCD  │          │
│  │ Card │   │Reader│      │          │      └──────┘          │
│  └──────┘   └──────┘      │ MICROCON-│                        │
│                           │  TROLLER │      ┌──────┐          │
│  ┌──────┐  ┌──────┐       │          │────▶ │Buzzer│          │
│  │Motor │◀─│Motor │◀──────│          │      └──────┘          │
│  └──────┘  │Driver│       └──────────┘                        │
│            └──────┘                                           │
│                                                              │
└─────────────────────────────────────────────────────────────┘
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Component

1. RFID Reader: It reads the unique RFID number from the RFID cards or RFID tag and sends it to microcontroller
2. Microcontroller: This is the CPU (central processing unit) of our project. The various functions of microcontroller are like I. Reading the digital input from RFID reader II. Turn on the buzzer for invalid card. III. Turn on the motor or relay if the card is valid.
3. LCD: We have used 16×2 alphanumeric Liquid Crystal Display (LCD) It can display alphabets along with numbers on 2 lines each containing 16 characters.
4. Motor: For valid card a motor is turned on to indicate the door latch opening

Application

1. RFID based Security Access System is designed in this project. As the system uses RFID Technology based identification, it can be used to access secured areas like research centres, defence sites etc.
2. It is a low power system and also the RFID Cards or Tags used are of passive type.