



## DOOR ACCESS CONTROL SYSTEM – RFID

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### ABSTRACT

In this RFID based digital door locking system project, the door is open for those people who register will be able to enter using their card. It uses a motor that operates with the help of Microcontroller. The Arduino Uno microcontroller board runs with complete programming that is stored inside it. By using this gadget, we can restrict the entry for the specific people in. It is also very secure. RFID Module, LCD Display Red and Green and Yellow LED Light and Buzzer have also been used in this door lock system. When the door is locked, the yellow LED will be on and when the door lock is open, the green led light will turn on. The Red LED work will alert you that your card is wrong. At the same time the buzzer will get on to alert the invalid card.

### INTRODUCTION

This gadget is designed with the help of an Arduino using a servo motor that pushes the gear forward and back. When we scan our register card, there is a loop start of store programming in which the dc motor rotates 90 degrees, then the gear mechanism in it works, which locks and opens the lock. In simple language, when a card is scanned, the condition given in the programming matches, then the command given in that condition becomes active, such that when the correct card is scanned, the open condition will match, in which the servo motor will rotate 90 degrees and The green light will be on and

the buzzer will beep for 500 microseconds and the door lock will be open but when an unregistered card is scanned then it will indicates with RED LED and a BUZZER.

RFID, Radio Frequency Identification is a fundamental and inexpensive technology that enables wireless data transmission. This technology has not been very often used in industry due to lack of standardization among the manufacturing companies earlier. RFID technologies are efficient and secure compare to other network. With RFID, wireless automatic identification takes a very specific form: the object, location, or individual is marked with a unique identifier code contained with an RFID tag, which is



in some way attached to or embedded in the target. RFID is not a single product but a comprehensive system, a typical RFID system include three basic elements: RFID tag (transponder), reader (transceiver) and back-end application system (or database), which demands the support of the computer network. The software is used for management, controlling, transaction, operation and maintaining record of the various users. A digital door locking system is also implemented and governed by RFID reader which authenticate and validate the user and open the door automatically. It also keeps the record of check-in and check-out of the user. It's very important to authenticate the user before entering into a secure space and RFID provide this solution. The system enables user to check-in and check-out under fast, secure and convenient conditions. The system include door locking system which open when the user put their tag in contact with reader and the user information matched with the information already stored in database. The RFID controls the opening and closing of the door. In this study we utilize RFID technology to provide solution for secure access of a space while keeping record of the user. We used

passive type of RFID here. The passive types of rfid are battery-less and they obtain power to operate from reader. The major advantages of passive RFID are its cost effective and small in size. Due to above advantages, it is widely use by inventory tracking technology. Current antenna technology makes it possible to smaller in size.

## LITERATURE SURVEY

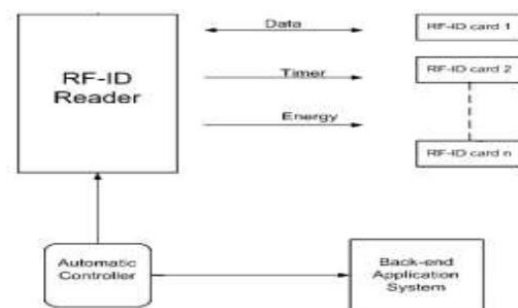
By using Arduino automatic RFID-based access control system was designed this system represents a combination of RFID system and order no to achieve a particular task. RF reader detects an RFID tag then the system captures the UID that is a unique identifier. It also captures the user's image which then scans and compares with the database for matching. If card UID matches with capture image then access is granted or access is denied and the system gives an alert alarm for security a non-contact technique applied in industries for personal access control, asset and people tracking, and many more actuator and real-time images. Umar et al suggested and developed an are more proficient and more secure as compare to other fundamental and cheapest technology to enables wireless data

Gyanendra and Pawan proposed a security system using a hostels at the Punjab University campus this system combines installed at the entrance and exit gate. This system can be libraries and at tollgate. RFID technology has a lack of monitoring controller and exit monitoring controller it can be networks. RFID technology is used in many areas such as passive type of RFID contains a door locking system using an public transport, industrial automation, animal identification, purposes this system plays a significant task of entrance response time can be e enhanced by using controller processes RFID is Radio Frequency Identification which is a RFID technology with biometrics. RFID-based security control system and also installed it in standardization and hence it has not been very often among the manufacturing companies earlier. RFID technologies ticketing, inventory detection, electronic immobilization, tracking, supply chain management, management of books in transmission. Radio frequency Identification i.e., RFID a non-contact technique applied in industries for personal tracking, supply chain management, management of books in libraries and at tollgate [3]. RFID

technology has a lack of standardization and hence it has not been very often among the manufacturing companies earlier [4]. RFID technologies are more proficient and more secure as compare to other networks [5]. RFID technology is used in many areas such as public transport, industrial automation, animal identification, ticketing, inventory detection, electronic immobilization, access control, asset and people tracking, and many more. Gyanendra and Pawan proposed a security system using a passive type of RFID contains a door locking system using an actuator.

## PROPOSED STRUCTURE AND DESIGN OF THE SYSTEM

In this study, we proposed a security system contains door locking system using passive type of RFID. The system is implemented in three spaces using central database system. The secure space located on same or different part of buildings as illustrate in figure.



The system used hardware as well as software. The hardware components are RFID reader, tags, USB connections and connecting cables etc. In addition we have used actuator (stepper motor for this purpose). The proposed scheme is showing in figure.

The detail of the proposed scheme is showing below:

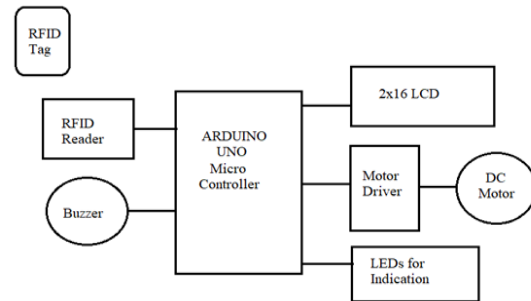
Step 1: The RFID reader retrieve the information contains by tag as it come in the range of few millimeters from reader.

Step 2: after receiving the tag information, reader send this information to database for conformation. If it holds, the information stored for further operation.

Step 3: The central server queries to database and retrieve corresponding information after receiving the query from the reader.

Step 4: The reader computes timestamp (date, time) after receiving the reply form server and create a log.

Step 5: Once the tag information verified, the system generates a control signal through parallel port which controls the opening and closing of door by means of stepper motor.



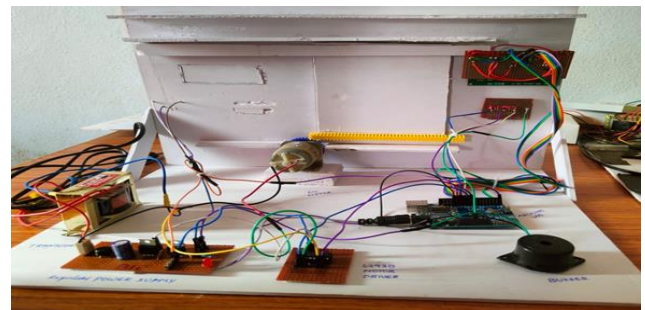
In this RFID BASED DIGITAL DOOR LOCKING SYSTEM we are using an ARDUINO UNO based micro controller, LCD, BUZZER, RFID READER and a DC MOTOR along with the MOTOR DRIVER. Here we are using the motor driver of L293D driver. Here we are taking three LEDS such as green, yellow and red for the opening, closing and for invalid card indication. The yellow led is the indication for door closing. The green led is for the indication of door opening. And finally the red led is for the indication of invalid card i.e..., if an unregistered card will be scanned by the RFID reader then the red led will glow and also the buzzer will sound for the invalid card.

The regulated power supply is designed for the whole circuit. The supply is given to the regulated power supply board through a transformer called step down transformer. In the regulated power supply board there are 5v, 12v, ground pins are arranged. These

pins are soldered with the 1000micro farad capacitor and two one NANO farad capacitors. Also there is a bridge rectifier for the rectification purpose.

Here we are using an ARDUINO UNO based micro controller type of ATMEG328. There are 14 digital pins and 6 analog pins are in the UNO board .But we are using only the 14 digital pins for this project. The liquid crystal display called LCD is connected to the UNO board. The buzzer and the motor driver and negative terminals of the LEDES is given to the pins of UNO board. The positive terminals of the LEDES are commonly shorted with a resistor and given by the supply of 5v. And the RFID reader ground pin and the 5v pin is connected to the ground pin and 5v pin of the power supply board, and the TX(transmitter) pin in the reader is given to the RX(receiver) of the UNO board. The buzzer positive terminal is connected to the pin of uno board. And the negative terminal is for the supply board. The arduino uno drives the motor driver and the motor driver drives the dc motor in the door opening and closing times. And the operation of this project is seen in the below paper.

## RESULT





## CONCLUSION

In this study, we have implemented a digital security system contains door lock system using passive RFID.

A centralized system is being deployed for controlling and transaction operations.

The door locking system functions in real time as when the user put the tag in contact with the reader, the door open and the check-in information is stored in central server along with basic information of the user.

We utilize RFID technology to provide solution for secure access of a space while keeping record of the user.

## FUTURE SCOPE

Electronic locks are far more convenient and efficient than traditional mechanical locks. It can be unlocked easily by a simple key, which makes it more convenient. A magnetic card, a barcode, a fingerprint, or an alphanumeric code entered from the computer can all be used as the detector unlocking the electronic lock. You can accomplish a variety of accounting tasks with their assistance. Electronic locks, in addition to unlocking and locking doors, can also be used to keep track of working hours. When an employee uses an RFID tag to

unlock a door, the system receives a door open signal and records the time the employee arrived and departed the company.

### A. Attached RFID Tag Readers

You can accomplish a variety of accounting tasks with their assistance. Electronic locks, in addition to unlocking and locking doors, can also be used to keep track of working hours. When an employee uses an RFID tag to unlock a door, the system receives a door open signal and records the time the employee arrived and departed the company.

### B. Collection of Toll

There are active tags in cars and they also have serial numbers that are unique. This tag can be read so as to create an account associated with it when it crosses a toll booth to locate the serial number in the database and charged.

### C. Tagging people

If people were to wear an RFID tag, most individuals would not want to be tracked. Certain people, on the other hand, are eager to be followed. Participants in any convocation or convention, for example, may wear RFID-enabled badges to indicate their availability for discussion or to submit personal information. Other categories of individuals are seen to benefit from



monitoring or should be watched out for safety reasons. Parolees should be watched, as should Alzheimer's sufferers, and even babies can benefit from this technology. RFID-enabled baby bracelets are available at some hospitals.

#### D. Investigation of motor vehicle accidents

RFID tags can be used as eyewitnesses in road accidents, and the concept operates as given ahead. An RFID device is received by each registered vehicle which is connected to the automobile with a pre-programmed unique code that is stored in databases with the vehicle identification number. Cops may use handheld RFID scanners to capture coded information as soon as they arrive at the accident site, allowing databases to be explored for particulars such as the vehicle's owner, make, and model. The timing of the fleeing motorist can also be identified in hit-and-run accidents. It is also feasible to get vehicle locations at their first points of collision.

#### E. Mobile Commerce

RFID tags and wireless LAN, which is WLAN are required by mobile (m)-commerce applications as they need dual mode communication architecture. In any given showroom, products such as

camcorders which are digital and Televisions that come with inbuilt RFID tags, mobile computers with PDA-size might be utilized by customers to browse web pages, assess and compare the performance and features available, compare price, and make an order over WLAN. Surveillance security can be increased by adding RFID tags to these devices. As ecommerce applications grow in popularity, RFID technology will become more widely used.

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