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## Safe Locker With Fingerprint ID & RF ID

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### ABSTRACT

The vital factor to bother in our normal life is security. The digitized locks are a crucial part of the safety system nowadays. Biometric security systems also are playing an important role nowadays. The Biometric security contains fingerprint access and an iris ID scanner. The fingerprint ID is now implementing for each purpose like unlocking electronic gadgets like laptops, mobiles and for taking attendance for workers and tons more applications. Apart from Biometric, there are several other things that we use for security purposes like RFID, PIC based. The RFID is additionally utilized in the places like debit cards, entrance for offices, libraries, metro stations, etc., etc.

Keywords: Fingerprint scanner, Arduino UNO, RFID Scanner, electronic Clock

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### 1. Introduction

A key's a metal device that's wont to operate a lock. An electronic lock works utilizing an electrical current and is typically connected to an access system. Additionally to the pin and tumbler utilized in standard locks, electronic locks connect the bolt or cylinder to a motor within the door employing a part called an actuator. We try to use a locker to supply better security for our valuable things. The fingerprint scanner we are getting to use during this work is GT511c3, which is an optical fingerprint scanner. Because the name suggests, the Optical fingerprint, this system relies on capturing an optical image. The RFID we are getting to use is RC522. It has two components - Transponder and Transceiver. Finally, the DC electronic solenoid lock using this we are done the locking device which may be used for safe lockers, door lock, shelf lock, etc

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### 2. Literature Survey

The existing system [1] features a unique invisible internal locking mechanism fitted inside the most doors and is operated through the completion of two stage security verification. Since the system features a subkey, inside that main key approach in door lock access, it completely avoids unauthorized access, hacking, and locker breaking issues. In these systems [2] an arrangement is done to verify the registered users with respect to fingerprints and the facility for access will be provided based upon the condition. Addition and removal of users will be done for enrolment within the system. Entry to access the facility will be controlled by a centralized system. The complete system [3] is decomposed into various modules which RF identification module, display unit, communication interfaces etc..

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### 3. Proposed Work

We have seen the Fingerprint ID is employed everywhere now and also in offices and metros. The RFID tagging system is additionally using. These two are playing a crucial role in our lives nowadays. So we try to develop a locker with the assistance of those two fingerprint ID and RFID frequency ID. It works an equivalent we've to enrol our fingerprint and also we've to assign the RFID. For a registered person there's a fingerprint and an RFID. So to

access the safe the user must provide the fingerprint and an accurate RFID at a time. Then it verifies both fingerprint and RFID and if both are verified it'll unlock the lock and supply the access to us.

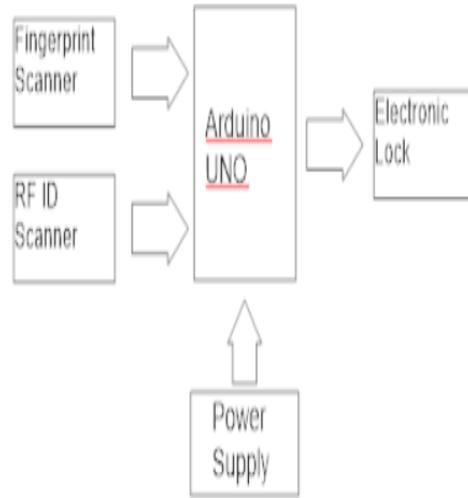


Figure 1 Proposed System

In this paper, we are using the Fingerprint ID Scanner, frequency ID Scanner for the Scanning purpose which is an input, and for the output which is nothing but the Electronic lock. Microcontroller Arduino Uno is employed for processing. For verifying or to urge the info from the user for verification we are using the Fingerprint ID and frequency ID and after scanning individually the info is shipped to the connected Arduino Uno microcontroller. After the transmission from both the scanners, the Arduino Uno verifies each of the received data and compares it both if both are correct and from the preregistered users or not.

If the user is verified then the Arduino Uno sends an influence supply to the electronic lock which it'll get from the external power supply. For the facility supply, we will use the battery or the adapters connected to the switch ports for usage. Once the facility is reached to the Electronic lock from the Microcontroller Arduino Uno the slob which the electronic lock will have is pulled into the inner side. So it provides us to open the door. If the user isn't verified either of the Fingerprint ID and frequency ID, then the microcontroller doesn't provides a power supply to lock and that we cannot access the door. Figure 2 shows the architecture of the Arduino Uno Controller.

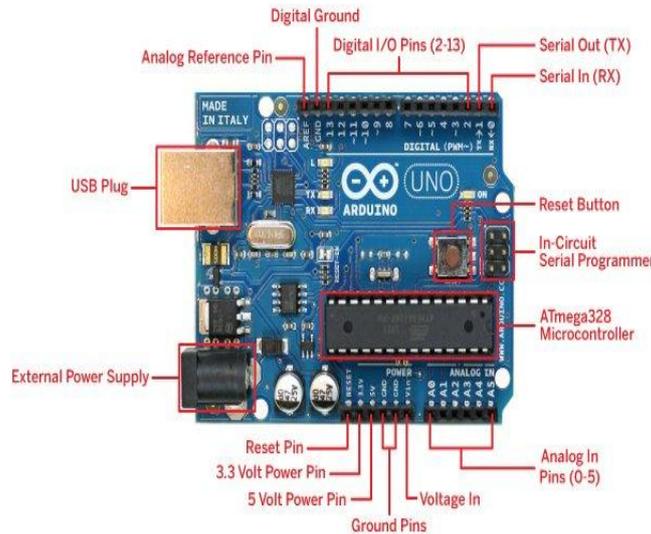


Figure 2 Structure of Arduino Uno

ATmega328p is an efficient 8-bit Reduced Instruction Set family controller which can handle powerful instructions in one clock cycle. Atmega16U2. The USB and ICSP boot loader interfaces are under the control of above processor. Figure 3 shows the structure of RC 522.

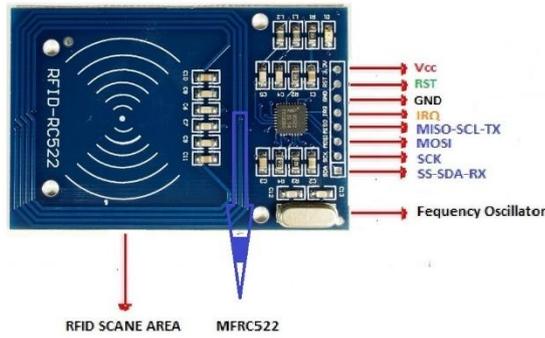


Figure 3 Structure of RC522

Table 1 Specifications of RC522

Frequency Range	13.56 MHz ISM band
Host interference	SPI/I2c/UART
Operating Supply voltage	2.5 to 3.3v
Max Operating current	13-26 mA
Min. Current(power down)	10 $\mu$ A
Logic Inputs	5V Tolerant

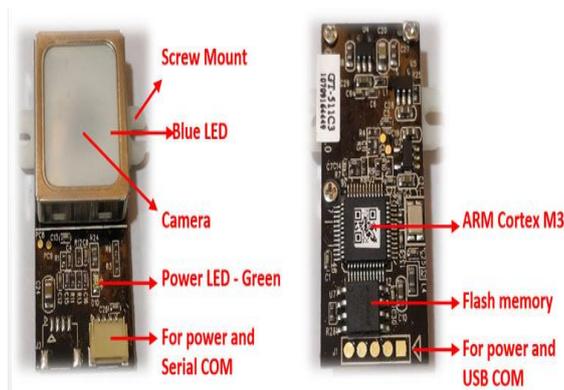
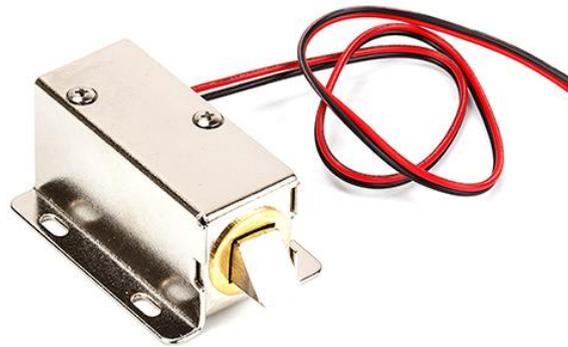


Figure 4 Structure of Fingerprint Sensor



**Figure 5 Structure of Solenoid lock**

**Table 2 Specifications of Solenoid lock**

Voltage	12DC
Current	0.8A
Size	54*41mm
Unlocking time	1s

#### 4. Results and Implementation

When both the inputs that are fingerprint and radiofrequency tag are provided and both are verified then the lock is unlocked with the help of a power supply given by the Arduino UNO.

#### 5. Conclusion

We have done the work by employing a Fingerprint Scanner and frequency Identification Scanner. Regarding for processing, we have used the microcontroller Arduino UNO and therefore the output which is a 12 V Electronic Solenoid Lock. For the external power supply, we used a 9V battery. When both the inputs that are fingerprint and radiofrequency tag are provided and both are verified then the lock is unlocked with the assistance of an influence supply given by the Arduino UNO.

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