



# International Journal of Research Publication and Reviews

Journal homepage: [www.ijrpr.com](http://www.ijrpr.com) ISSN 2582-7421

## OTP Based Locking System using IOT

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### ABSTRACT

The atrocity rate of vehicles in Asian nations is 1,65,690 (in the year 2013). OTP based Advance locking System is subordinated in fostering IOT resolution to make locking system active in vehicles which is much safer than regular locking system with common keys. Basically, this craft system is developed by microcontroller IOT mechanics. Regarding locking and unlocking system of self-propelling machines, whereas during unlocking mechanism user can press a button to unlock. Any regular locking mechanism can be replaced with this new mechanism. A unique pair of numbers are sent to the registered cell within the range of the owner of the vehicle. If the unique digits are correct the vehicles are going to be responsive with positive. The system which is used in vehicle went to unlocking the bank lockers, doors of home, gates etc.

Keywords: Arduino Uno, LCD(Liquid Crystal Display), Keypad, GSM Module.

### 1. Introduction

An Advance digital locking system is meant to make a microcontroller based mostly Digital number Code Lock that serves the goal of security. Want of safety may be achieved by creating locks which might be electrical or mechanical with one or some keys, except for lockup a giant space several locks area unit needed. As everybody is aware of quaint locks area unit significant weight and fragile additionally counting on the tools thus electronic locks area unit given additional price than those of mechanical locks. These lockup systems area unit went to management the movement of door and area unit useful while not requiring a key to lock or unlock the door. These lockup systems area unit controlled by a keyboard. The microcontroller based mostly Digital

Code Lock is associate degree access system that permits solely approved persons to access are stricted space. Security may be a prime concern in our day-to-day life. Everybody needs to be the maximum amount secure as potential. associate degree access management for doors forms a significant link in an exceedingly security chain.. The system contains of a electrical switch keyboard connected to the Arduino microcontroller. The lock can open if and as long as the entered countersign matches the countersign sent to mobile. Thus, what we wish is digital technology to construct associate degree integrated and well custom-built safety system at a worth that is cheap.

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## 2. Literature Survey

- **Design and Implementation of a Digital Code Lock:**

This paper discuss about a microcontroller established digital code locker is explained with fundamental of digital locking procedure. It also discusses about the role of global system for mobiles technology in creating the advanced locking technique with the assistance of one time password generation.

- **Low Cost Removable (Plug-In) Electronic Password - Based Door Lock:**

This paper describes the plug-in auto electronic door lock is designed to have two stages of security and it consists two sections. The first section is cell section which employed as the key. It includes a matrix keypad, LED, and a microcontroller; it can be bring around in the pocket in the period the second section, which is halted, is inducted at the door. When the mobile or cell section is sealed into the static section, the two sections have a handshake; in the absence of the internal handshake between the two microcontrollers the static section will not accept the mobile or cell section. If the valid password is entered the door lock will open the door for 15 seconds after which it will automatically close the door back.

- **Password and OTP based Door Lock System using 8051 Microcontroller :**

This paper discusses about the draw backs of conventional locking system using mechanical keys. The author discusses about many advanced way of locking with digital platform such as otp based locking ,RFID based locking. Also the methods of locking using electromagnetic door locker , solenoid.

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## 3. System Analysis

### 3.1 Proposed System

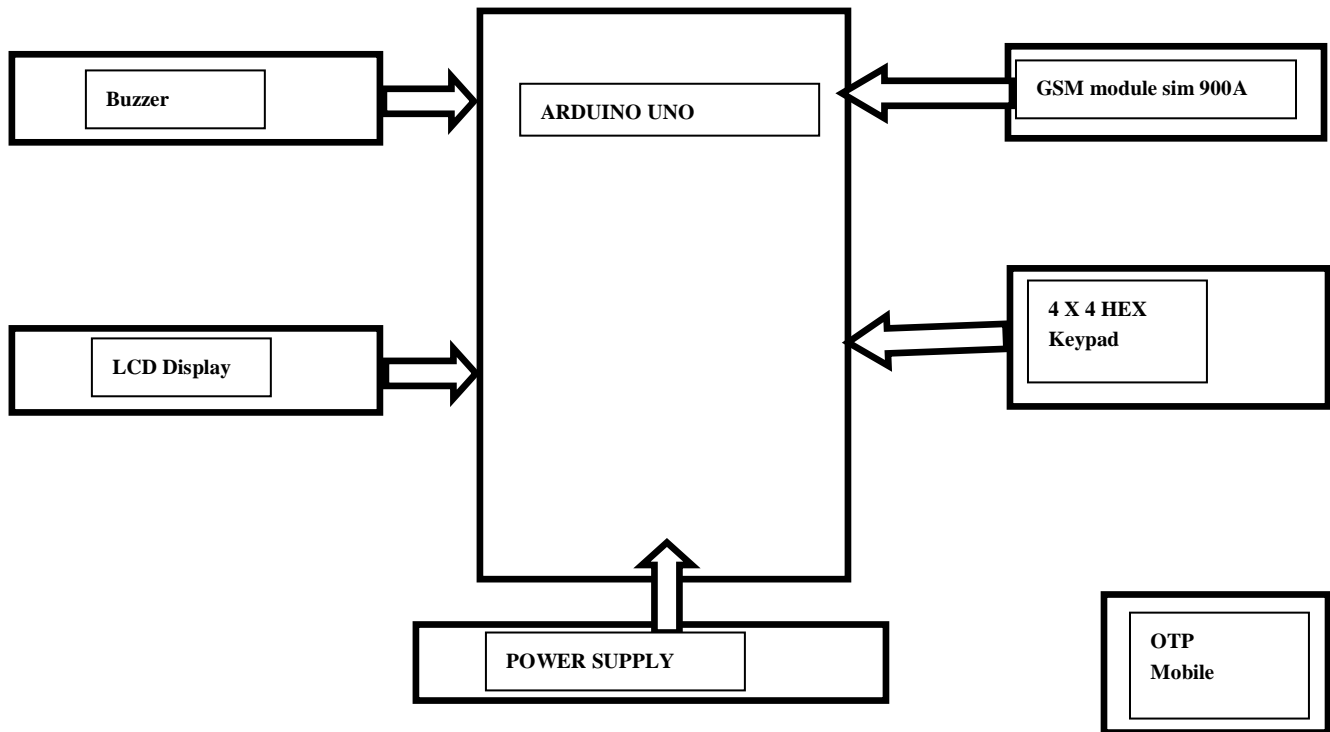
- Drawback of existed old method locking system which can easily tired jiffy
- Thus creating the system susceptible to thief attacks.
- Creates secured means of protection victimization digital platform wherever digital input device and otp is employed to unlock.
- Therefore there's no would like of mechanical keyholes which may be simply cracked.
- The model was designed victimization Arduino microcontroller, I2C liquid crystal display show, GSM module, 4X4 Keypad, magnet lock, Power provide 5V, connecting wires.
- This system is one of the only combos of microcontroller and elements.

### 3.2 Methodology

The authentication technique used here could be a four-digit numeric code generated in Arduino microcontroller and sent to the registered mobile range through GSM module and conjointly keep in Arduino microcontroller's RAM, that is then entered through the computer keyboard.

- The code entered this manner is then compared to the countersign keep in memory.
- The Arduino microcontroller endlessly monitors the computer keyboard for a match with the keep counter sign.
- As and once there's a match the output line is enabled which may then be went to run motor.
- Associate in Nursing liquid crystal {display| LCD | digital show | alphanumeric display} display is additionally wont to display whether or not the entered countersign is correct or not.
- The whole system is consisting of three elements.
- Primary half is receiving unlock command exploitation switch.
- Secondary half is generating a random OTP and causation it to the registered mobile range.
- Last half is storing the OTP and comparison the OTP and comparison the OTP entered by the user,
- If the OTP is correct then the door opens, If OTP is wrong then the liquid crystal {display| LCD | digital display| alphanumeric display} display the OTP entered is wrong
- And therefore the authentication gets unsuccessful and therefore the door can't be opened.

#### 4. System Design



**FIGURE 1: BLOCK DIAGRAM OF COMPLETE SYSTEM.**

Figure 1 represents the functionalities of this complete digital locking system. Based on the inputs from the user, this locking system can do the following operations :

- User press the unlock button
- Arduino microcontroller starts to run
- OTP is going to generate
- OTP sent to the registered mobile number
- User should enter the generated OTP
- Entered OTP matching with the stored OTP
- If the entered OTP is valid door will be open or else it remains locked.

#### 5. System Implementation

This locking technique or mechanism was implemented by using hardware parts as well as software part. In this system it includes hardware parts like Arduino microcontroller, gsm module, liquid crystal display, key pad, buzzer, solenoid lock.

##### 5.1 Hardware components

- **Arduinouno microcontroller:**  
This one is the one of the main entity in this locking system implementation. It is a single board microcontroller and also it has a CPU as a microchip AVR which is a 8 bit. It has SRAM memory and it requires operating voltage of 5 volts and input voltage ranges from 7 to 20 volts.
- **Gsm SIM module:**  
In means of communication in this system we are using gsm module. We are using promptly available GSM/GPRS module which is called as SIM900A. Commonly these are used in lot of cell phones. This module is a twin band GSM engine and it works on frequencies like EGSM 900MHz and DCS 1800MHz.

- **Liquid crystal display:**  
Liquid crystal display which is commonly called as LCD. This is used in this system to the purpose of displaying messages and notifications which is also acts as an output device. It crates 32 characters to an outline which is tinier than that of most dual line displays.
- **Keypad:**  
The keypad which we are using in this technique is acts as an input device. This keyboard is a 4 cross 4 matrix key pad and it actually provides human user interface which is very useful component for microcontroller project. It has a very thin design and clinging backing. It has an interface of 8 pin access.
- **Solenoid lock:**  
This one is the very important component in this system because the system is called as digital locking system so for locking purpose we are using this solenoid lock. This solenoid lock is a 12v so it is an electronic lock, which is basically designed for door, locker etc. It pullout 650mA at 12v and 500mA at 9v when this lock gets activated.
- **Buzzer:**  
Buzzer is used as an alarm in this system to detect the theft activities. If someone tries to unlock it illegally this will give warning to the user.

### 5.2 Software part

To make the proper working of this system the implementation of the programming part is also important. This is done by integrating an arduinouno board. The microcontroller which we are using here in this system is a programmable circuit board. It senses and it control the parts or entity in the system. The program language which is used to programming is C++.

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## 6. Algorithm

In this project we are using our own developed algorithm by using random number generation method. The steps are as follows

- To unlock the lock user has to press button, when this button is pressed the microcontroller gets activated.
- And then the random number generation method called and it creates series of random number
- The generated number sent to the registered mobile number in the programming part.
- Then the number is stored in the microcontroller
- After that user has to enter the number which he has received.
- Then the entered the number and the stored number to be compare.
- If both are same or matched the locker will be open
- Otherwise it remains locked and after the unsuccessful attempts of 3 the alarm or buzzer will be activated.

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## 7. Conclusion

In this updating generation everything depends on our safety. Anything can be theft easily in anywhere in anytime from anyone without the knowledge of the owner or a particular person. So safety is most important in this generation. In today's days there are so many locking systems are exist. Everything is replaced by new technologies.

In our country the main goal is to digitalized everything in our daily life and this motto is fully upgrading in these days. So as we are citizens of India we thought to contribute something to our country in this new motive. At that time we got to know about the vehicles theft, theft in home and like other regions so we have to decide increase the safety in those places so we come up with the idea OTP based digital locking system.

Along with the artificial intelligence the internet of things gradually making up the things digital. So we decided to move on with internet of things basedproject. So we developed this project which is the best replacement of old method locking system. The existing digital locking system like fingerprint locker this method has advantages and as well as disadvantages also. Like the thief can tamper the finger print but in our system it can't be happen because it requires only particular randomly generated number called one time password which is sent to the particular registered cell phone. So our project will be in very good state to providing very well contribution to digitalizing motive. And the safety of our people will also be increase.

## Acknowledgement

Any accomplishment achieved does not rest entirely on individual endeavors but on the direction, inspiration, and support of intellectuals, guides, and teachers. Numerous personalities, in their own aptitudes, have helped us in carrying out this project work. We intend to take an opportunity to thank them all.

At the very outset, we owe our gratitude to our beloved Chairman, Sri Vasu V and Secretary, Sri KaveeshGowda V of VidyaVikas Institute of Engineering and Technology for their encouragement and support in all our Endeavors.

We would like to express our colossal gratitude to Dr.Ravishankar M, Principal, VidyaVikas Institution of Engineering and Technology, Mysuru, for his help and inspiration during the tenure of the course.

We also thank Dr.Madhu B.K, Professor and Head of Department of Information Science and Engineering, VidyaVikas Institute of Engineering and Technology, Mysore, for his support.

We would like to express our heartfelt gratitude to our guide Prof.Ashika V B, Asst. Professor, Department of Information Science and Engineering, VidyaVikas Institute of Engineering and Technology, Mysore, for her timely advice on the project and regular guidance throughout the project-work.

We also extend our sincere thanks to all the faculty members of Information Science and Engineering, VidyaVikas Institute of Engineering and Technology, Mysore, for their constant encouragement and backing.

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