Smart Door Lock System

User Manual

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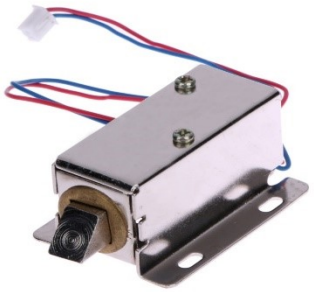
01. Hardware Components

1.1 Specifications

1.1.1 RFID module

- current: 13 - 26mA/ DC 3.3V
- Working Idle current: 10-13mA/ DC 3.3V
- Sleep current: <80 uA
- Peak current : 30mA
- Working frequency : 13.56MHz
- operating temperature: -20 - 80 degrees Celsius
- storage temperature: -40 - 85 degrees Celsius
- Supported Card type: Mifare1 S50 Mifare1, support S70, Mifare UltraLight, Mifare Pro, Mifare Desfire
- Relative humidity: 5% - 95%
- Data transmission speed: 10M bit/s at Maximum.

1.1.2 Solenoid Door Lock

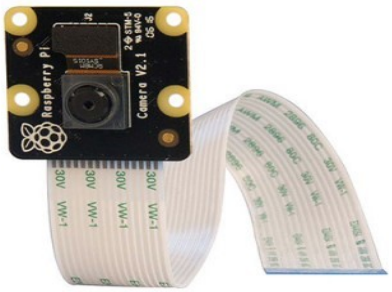


- Lock size: 54 x 41 x 30 mm
- Material: Steel frame and copper coil
- Voltage: DC 12V
- Working Current: 0.80A Max (at DC12V 20C)
- Power: 9.6 W
- DC Resistance: 14 ohm±10%
- Plug pin route length: 10 mm
- Stroke and force: 10 mm-- >=250gf
- Unlock time: 1s, max power on/time < 30S.
- Operation temperature : -5C --+55C

1.1.3 Finger Print Sensor module

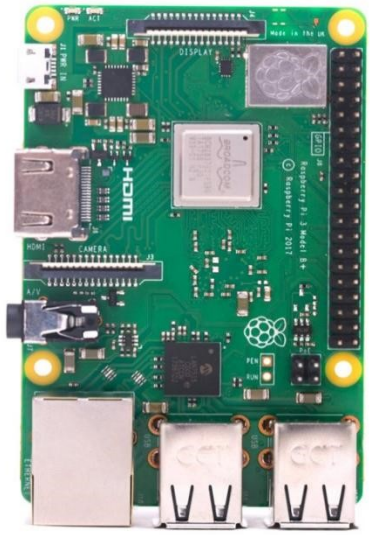
- Supply voltage: DC 4.2 ~ 6.0V
- Supply current: Working current: 50mA (typical) Peak current: 80mA
- Fingerprint image input time: <0.3 seconds
- Window area: 14x18 mm
- Matching method: Comparison method (1: 1)
- Search method (1: N)
- Characteristic file: 256 bytes
- Template file: 512 bytes
- Storage capacity: 1000 pieces
- Security Level: Five (from low to high: 1,2,3,4,5)
- Fake rate (FAR): <0.001%
- Refusal rate (FRR): <1.0%
- Search time: <1.0 seconds (1: 1000 hours, mean value)
- Host interface: UART \ USB1.1
- Communication baud rate (UART): (9600xN) bps Where N = 1 ~ 12 (default N = 6, ie 57600bps)
- Working environment: Temperature: -20 ℃ - +40 ℃ Relative humidity: 40% RH-85% RH (no condensation)
- Storage environment: Temperature: -40 ℃ - +85 ℃ Relative humidity: <85% H (no condensation)

1.1.4 Camera module



- Sensor resolution : 2592 x 1944 pixels
- Sensor image area : 3.76 x 2.74 mm
- Pixel size : 1.4 um x 1.4 um
- Temperature range
    - Operating: -30° to 70°
    - Stable image: 0° to 50°
- Shutter speed : 6 seconds

1.1.5 Raspberry Pi 3 Model B

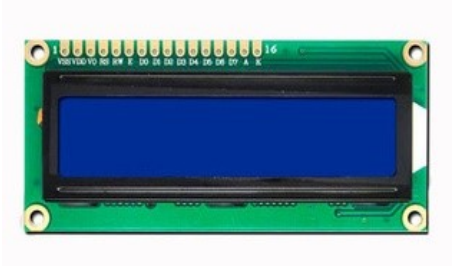


- Upgraded switched Micro USB power source up to 2.5A
- Includes a 16GB Micro SD card with NOOBS preloaded
- Upgraded switched Micro USB power source
- Broadcom BCM2837 64bit Quad Core Processor powered Single Board Computer running at 1.2GHz 1GB RAM
- BCM43438 WiFi on board
- Current : 750mA

1.1.6 IR sensors

- Voltage: 3.3V - 5VDC
- Detection distance: 2m--60m(adjustable)
- Detection Angle:35°
- the comparator using LM393
- Screw holes: 3mm
- Size of board: 31mm(length)*15mm(width)
- Size of cable: 21.3mm(including the port)
- Pitch ： 2.54mm
- also can drive a 5v relay directly; Connection mode: VCC - VCC; GND - GND; OUT - IO

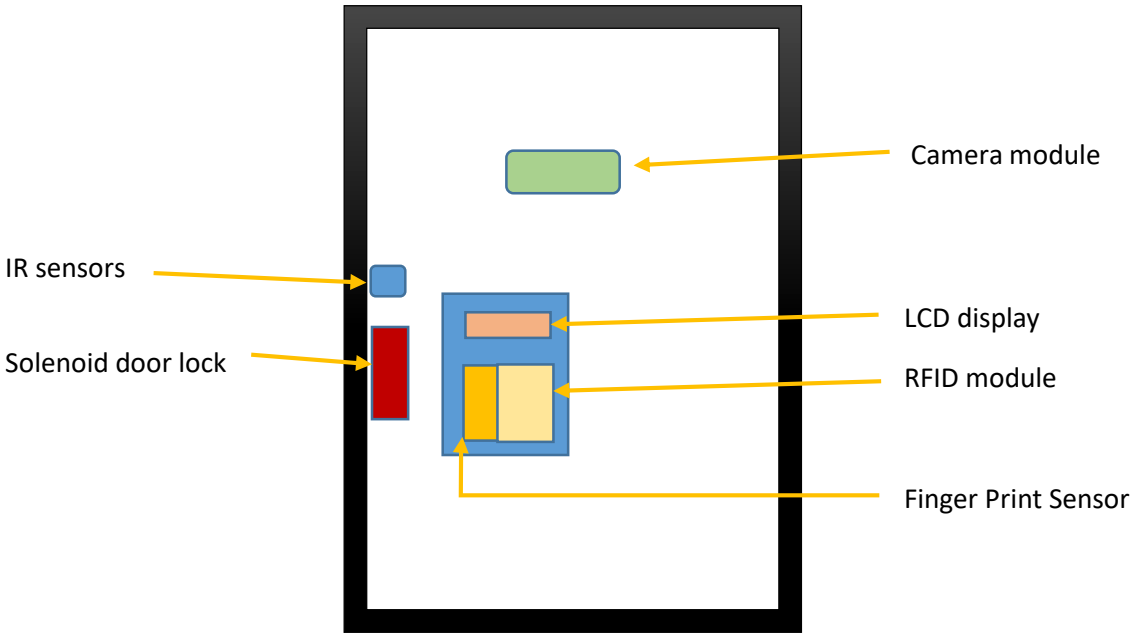
1.1.7 LCD Display



- Operating Voltage is 4.7V to 5.3V
- Current consumption is 1mA without backlight
- Alphanumeric LCD display module, meaning can display alphabets and numbers
- Consists of two rows and each row can print 16 characters.
- Each character is build by a 5×8 pixel box
- Can work on both 8-bit and 4-bit mode
- It can also display any custom generated characters

1.2.0 Identification of product

1.2.1 Structure of the door



1.3.0 How to Use

1.3.1 Register Users

In order to register an user, administrator should fill the form provided in the website with uniquely provided userid. Here, the corresponding userid is registered for one specific person.

1.3.2 Access Given

First contact the RFID card/tag to the RFID reader. Then place the finger on the fingerprint sensor and look at the camera to capture a photo of the user. Then the access will be granted if all there steps are correctly passed by that person. LCD display will display the information whether access has been given or not. All the accesses will be recorded on the website.

1.3.3 Unauthorized Access

If any unauthorized access is detected i.e. using an unregistered card/tag or trying to access more than one person into the room using one card/tag, access will not be granted and the buzzer will make a loud sound. LCD display will display the information whether access has been given or not. These accesses will be recorded on the website.

02.Web Application

2.1 Security of the web application

- Two factor Authentication used in logging process

    - **Email and Password Authentication**
      When an Admin registers for the web application, a valid email address must be given for the email verification. A Password will be chosen by user and he or she has the ability to change it at anytime.

    - **Phone Authentication**
      All the admins must have a common phone number and it can be predetermined by one of the three admin roles. Only that admin is authorized to change the relevant phone number and to access the website, admins must have the access to the phone number.

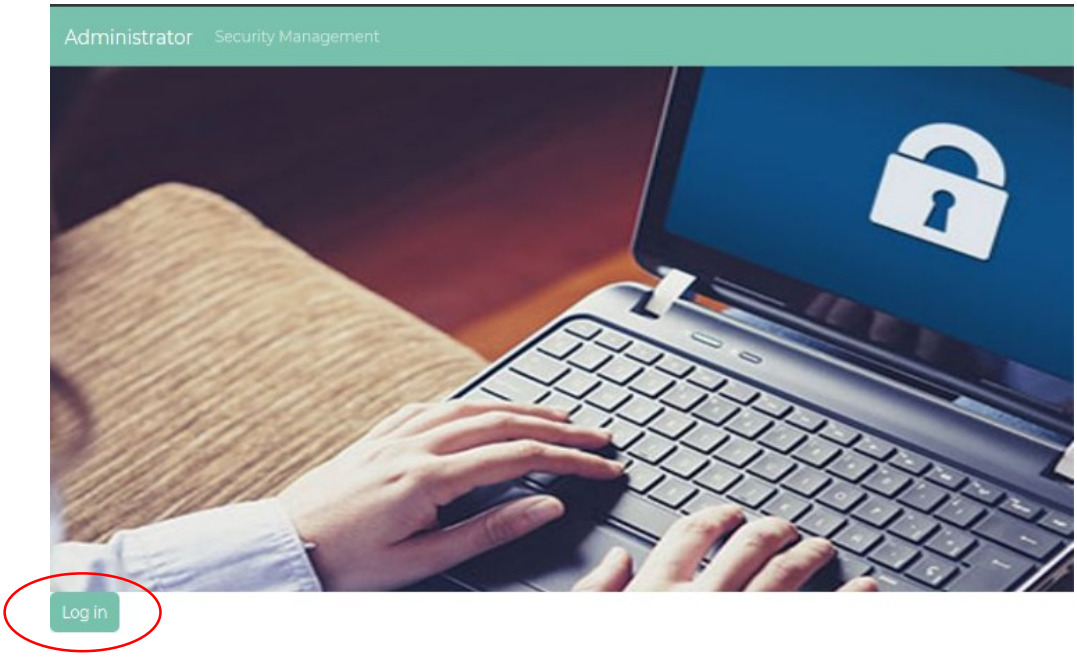
- Only the Admins have the access to the website.

- Three different admin roles have been introduced. Each admin has separate duties and all their actions are being recorded at every time they use the app. But to ensure a higher security, the records can only be viewed by one of the three admins.

2.2 How to use

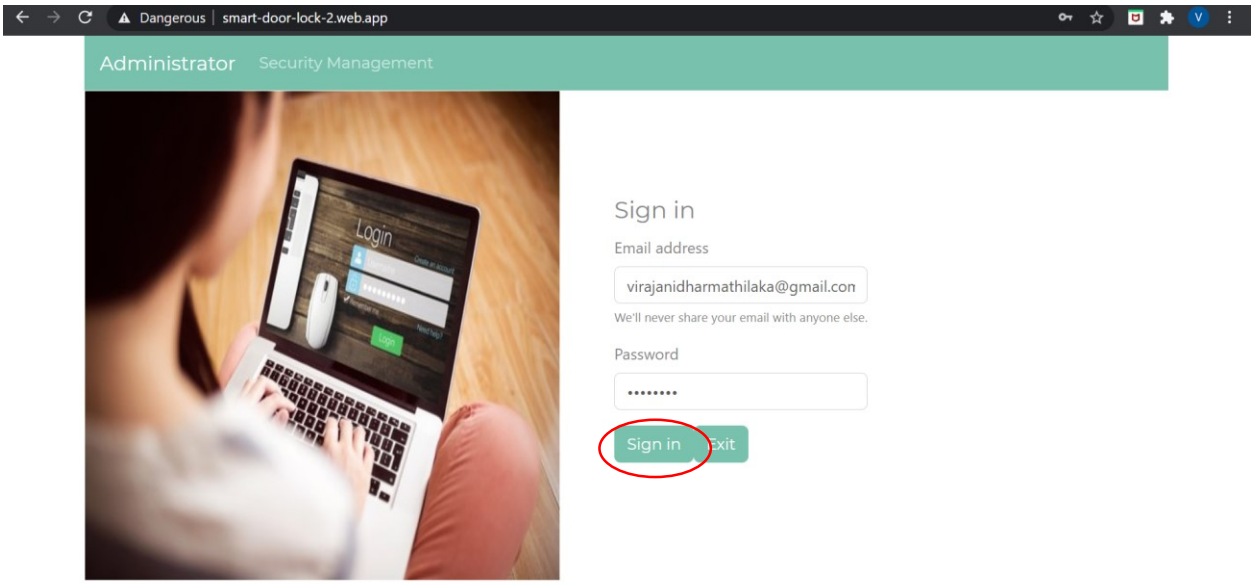
Step 1 – Log In to the website

Website link https://smart-door-lock-2.web.app

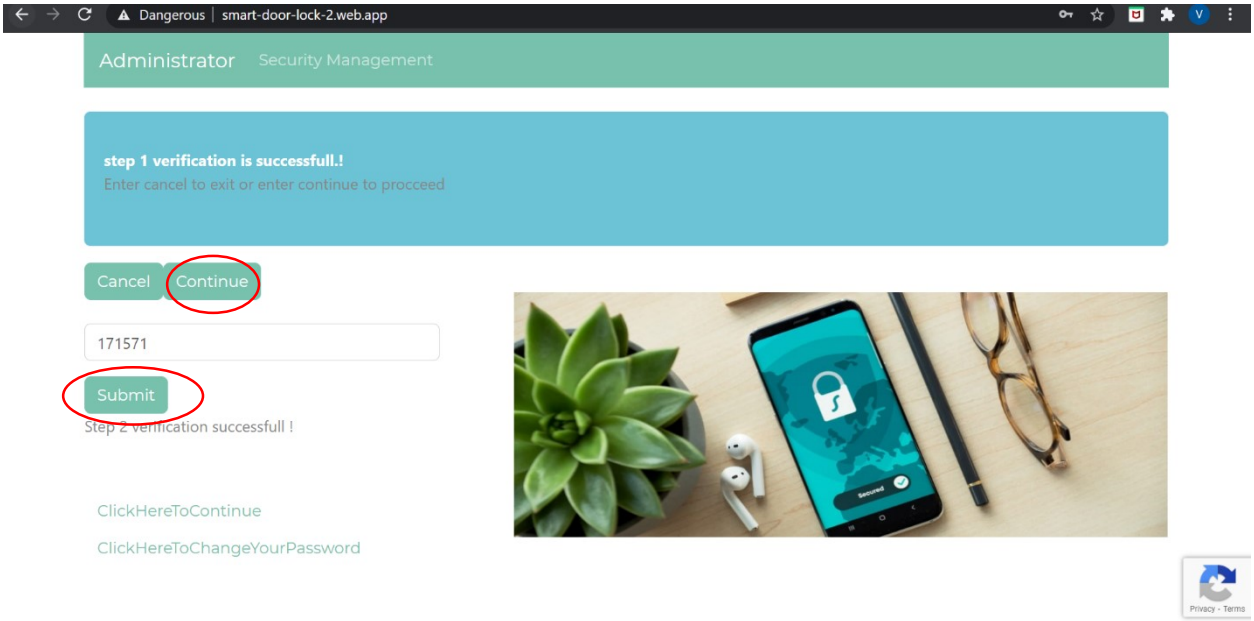


01. Click **Log in** button to start

02. After Entering your email and password **Sign In** to the website



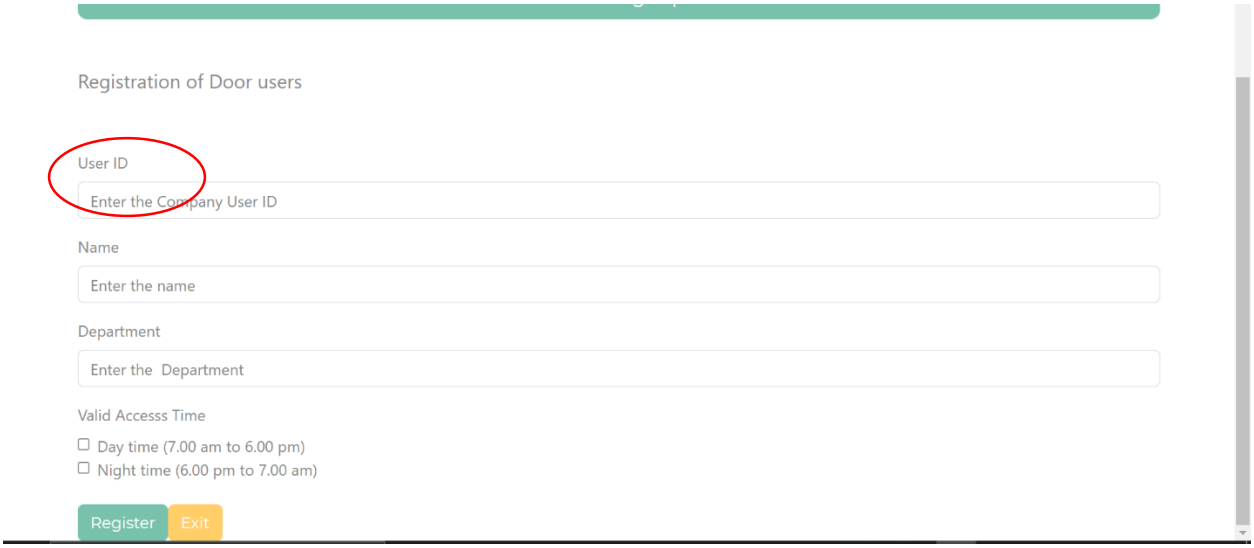
03. Click "**continue**" button to proceed then OTP will be sent to the given phone number. Then enter OTP and click on "**Submit**". Once the OTP sent to you, it will notify by giving message of "OTP sent". Then "**ClickHereToContinue**" button will direct you to the page relevant to the admin role. If needed, password can be changed using "**ClickHereToChangeYourPassword**" .



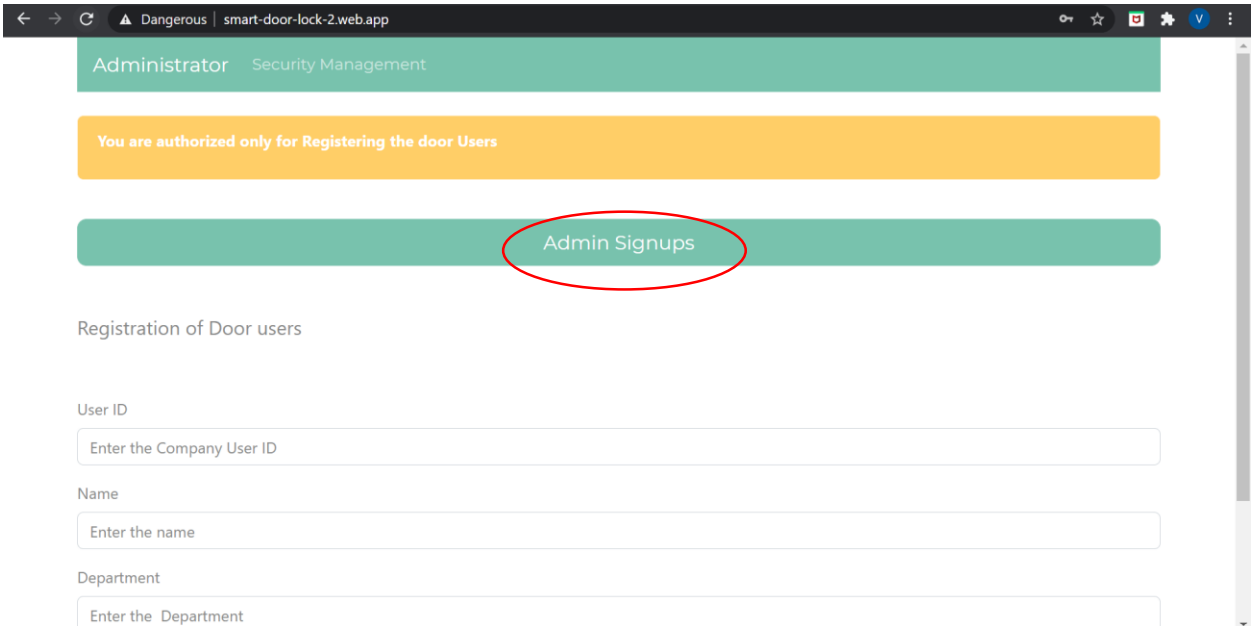
Step 02

Admin role 01 – Can register other admins who have the access to the website and the door lock users

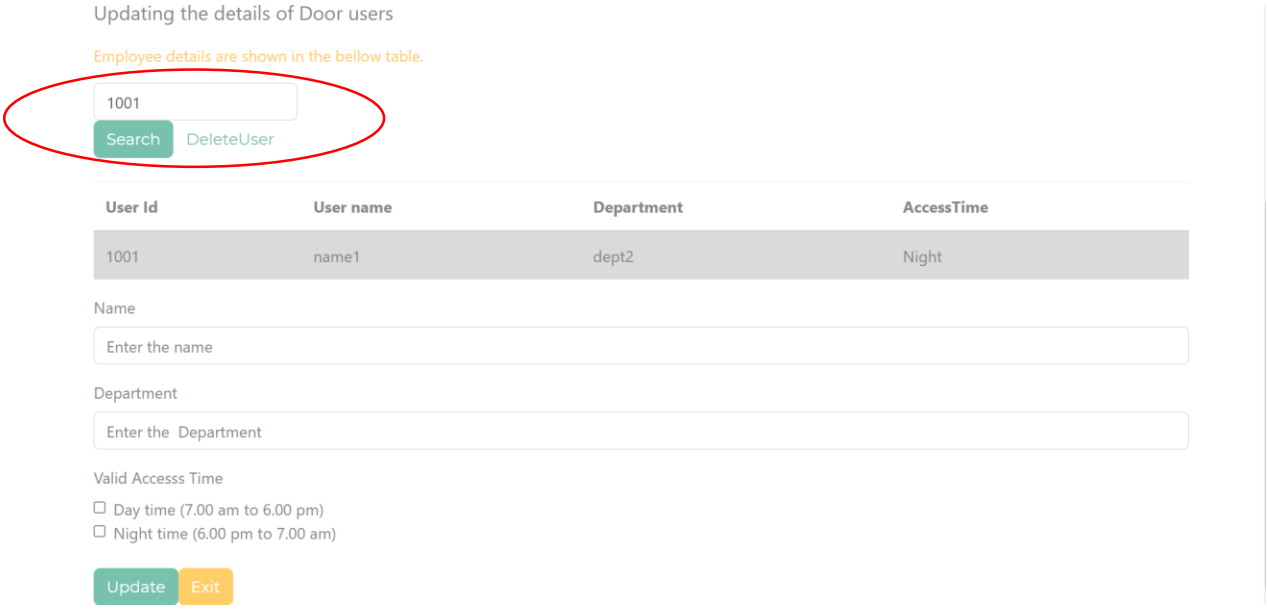
User ID must be the ID which used when configuring the sensors.



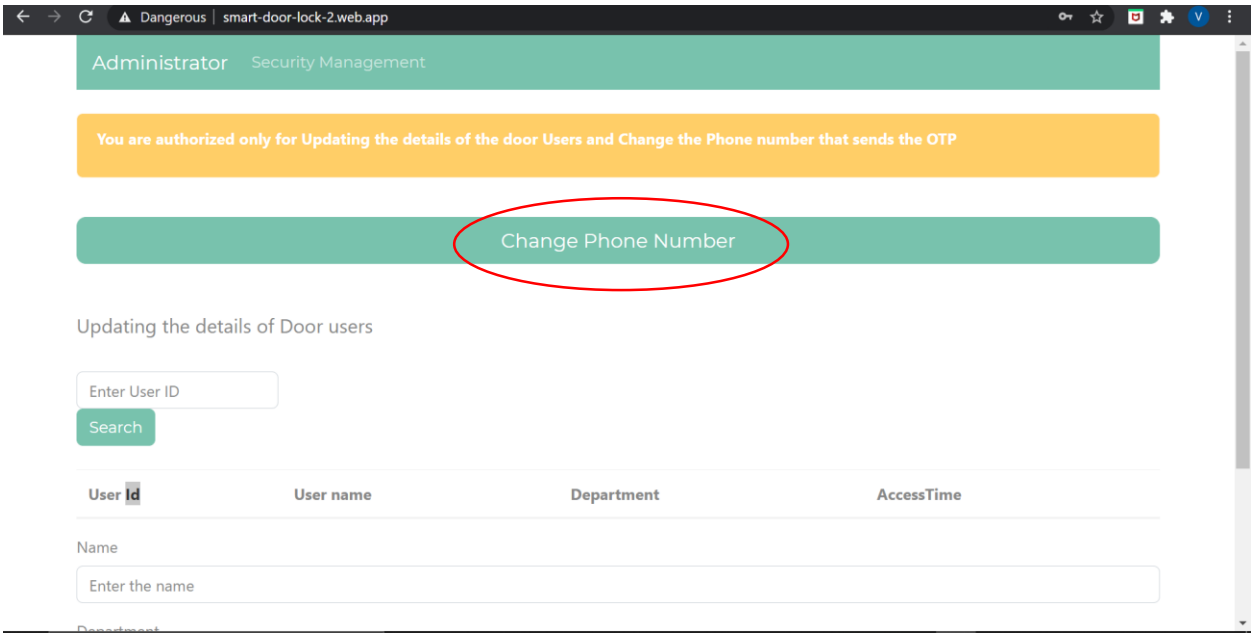
"Admin Signups" used to register admins. Their role can be defined by the admin who register.



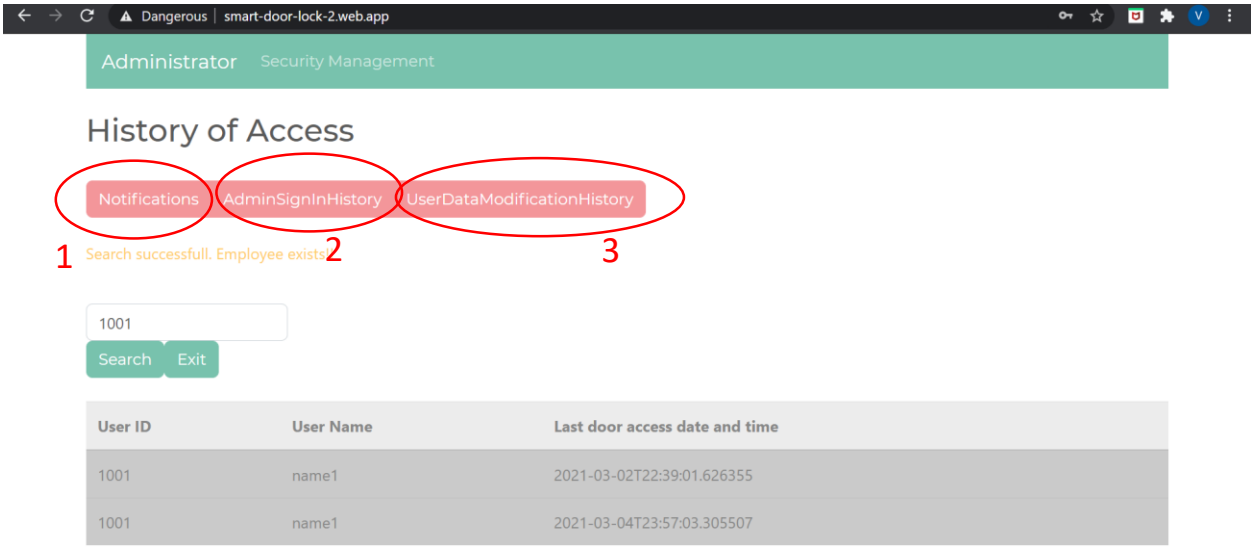
Admin role 02 – Can modify user details except their User ID and can change the phone number if necessary.



Before modifying the details, the existing details can be viewed by the Admin.



Admin role 03 – Can view the History of door lock users



History of each authorized door lock user can be viewed separately. Therefore an attendance record can be obtained easily.

1 - **Notification** will give the details about all unauthorized access which were detected by the system.

2 – **AdminSignInHistory** will give details about the admin sign history with the time to ensure the transparency of the admin roles.

3 – **UserDataModificationHistory** will give details about any user data modifications.