

● INTRODUCTION

In today's world, securing valuable items is more important than ever. Traditional lockers that use mechanical locks or simple keys are often not enough to ensure high levels of security. To address this, we have designed a Safe Locker System using Arduino that combines both password authentication and SMS-based notification and control.

This project utilizes an Arduino microcontroller, and a GSM module (like SIM800L) for sending and receiving SMS messages. When the correct password is entered through the mobile phone, the locker unlocks. If an incorrect password is entered, the system automatically sends an SMS alert to the owner's phone, warning about a possible unauthorized access attempt. Also It will starts buzzing out giving alert to people that somebody is trying to open it in inappropriate way.

This system provides:

- Enhanced security through two-factor control (password + phone access),
- Real-time alerts for unauthorized access attempts,

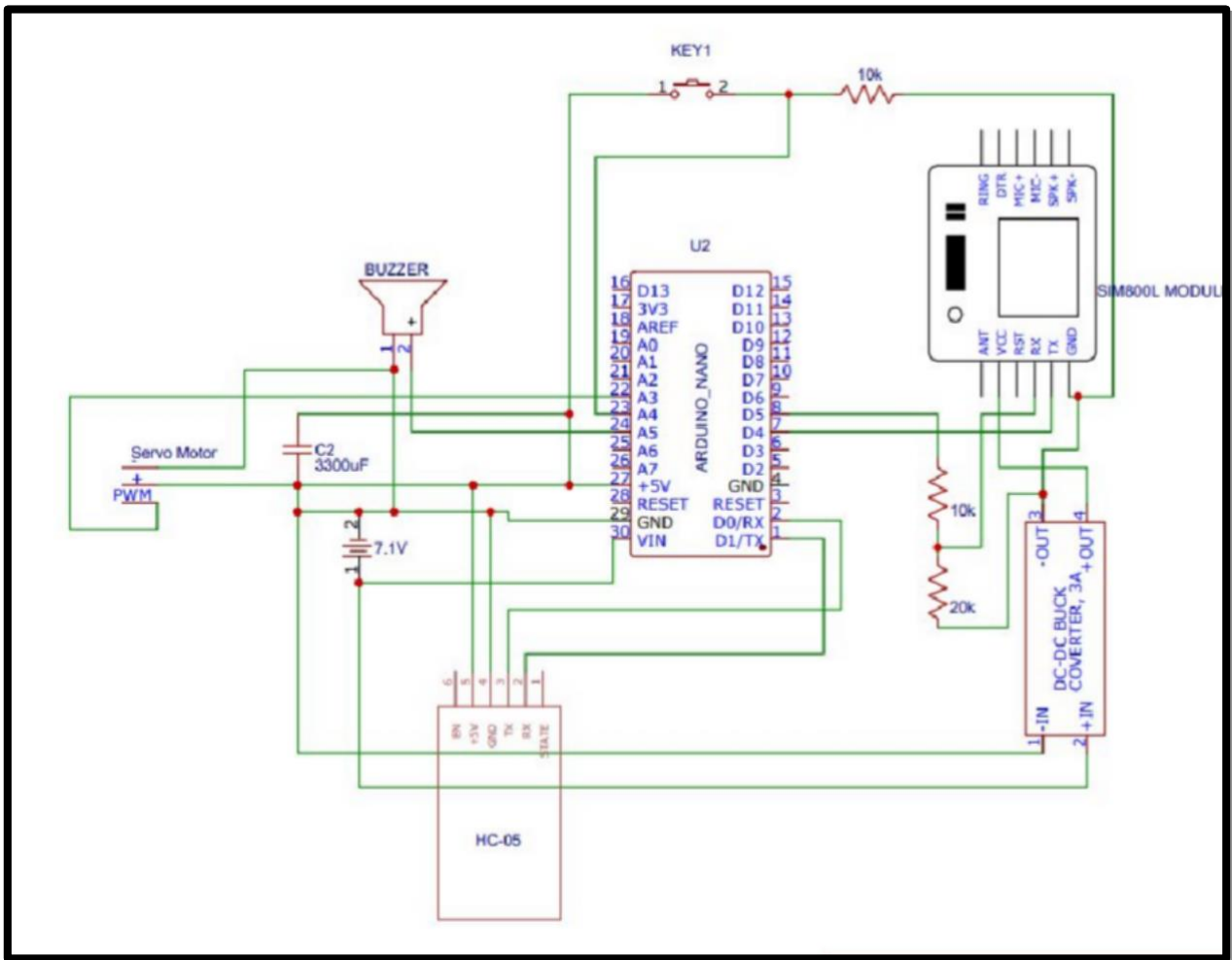
Overall, this project demonstrates how combining Arduino with GSM communication can create a smarter and safer security solution for personal or sensitive belongings.

● Components Used

1. Sim800L Module (GSM Module)
2. Bluetooth Module (HC-05)
3. 2 X Lithium Ion Battery (3.7V)
4. Buck Convertor
5. 3 X Resistors (10Kohm each)
6. Servomotor
7. 1 X Capacitor (3300 microfarad)
8. Antenna
9. Power Switch
- 10.Connecting Wires

- **Sim800L Module (GSM Module)**- SIM800L Module enables the locker to communicate over a mobile network. It can send and receive SMS messages. In the safe locker, it is used to receive commands from the user via SMS, allowing locking and unlocking.
- **Bluetooth Module (HC-05)**- The HC-05 Bluetooth Module allows local wireless control of the locker via a smartphone. The user can unlock or lock the safe by sending Bluetooth commands from a mobile app. It works in **short range**.
- **2 X Lithium-Ion Batteries** – These are used to power the system. They are connected in parallel or series depending on the voltage requirement.
- **Buck Converter**- The Buck Converter steps down the battery voltage (7.4V or higher) to a safe 5V level suitable for the Arduino, SIM800L, and other modules.
- **3 X Resistors (10K Ω each)**-It acts as signal conditioning and protection. In safe locker, it will act as Voltage divider circuit.
- **Servomotor**-It acts as **mechanical actuator for the locking system** by acting as the physical locking and unlocking mechanism.
- **Capacitor (3300 μ F)**-It acts as power smoothing and system stability in the system by helping in to stabilize voltage fluctuations caused by the sudden high current draw of the GSM module.
- **Antenna**-It is attached to the SIM800L module to improve signal reception. It ensures reliable communication for remote control.
- **Power Switch**- It is included to manually turn the entire locker system **ON or OFF**. This is useful for saving battery life when the system is not in use.
- **Connecting Wires**-It is used to establish electrical connections between the Arduino, modules, power source, and servo motor.

• Circuit Diagram



• Code

```
#include<SoftwareSerial.h>

#include<Servo.h>

#define gateSwitch A4

#define buzzer A5

SoftwareSerial Sim800L(4,5);

String command="";

Servo gate;

unsigned long currentTime=0,previousTime=0;

bool openGate=false;

void setup()

{
```

```
gate.attach(A3);
gate.write(0);
delay(1000);
gate.detach();
pinMode(gateSwitch,INPUT);
pinMode(buzzer,OUTPUT);
digitalWrite(buzzer,LOW);
Sim800L.begin(9600);
Serial.begin(9600);
}
void loop()
{
  if(digitalRead(gateSwitch)==HIGH)
  {
    digitalWrite(buzzer,HIGH);
    sendSMS("ALert!! Someone is trying to open door lock!!");
    while(digitalRead(gateSwitch)==HIGH)
    {
      delay(10);
    }
  }
  if(openGate)
  {
    currentTime=millis();
    while(millis()-currentTime<5000)
    {
      if(digitalRead(gateSwitch)==HIGH)
      {
```

```
digitalWrite(buzzer,LOW);
gate.attach(A3);
for(int i=0;i<=90;i++)
{
    gate.write(i);
    delay(20);
}
delay(1000);
gate.detach();
openGate=false;
Serial.println("Door opened.");
sendSMS("You have unlocked the door.");
while(digitalRead(gateSwitch)==HIGH)
    break;
}
delay(10);
}
if(openGate)
{
    Serial.println("Command Cancelled");
    sendSMS("Command was received to open the door lock but unlock button
was't pressed in 5 seconds of time period");
    openGate=false;
}
}
if(Serial.available(>0)
{
    char c=Serial.read();
```

```
command=command+c;
delay(10);
if(command.length()==4)
{
    if(command=="1234")
    {openGate=true;}
    else if(command=="4321")
    {
        openGate=false;
        gate.attach(A3);
        for(int i=90;i>0;i--)
        {
            gate.write(i);
            delay(10);
        }
        delay(1000);
        gate.detach();
        Serial.println("Door Closed.");
    }
    command="";
}
}
}

void sendSMS(String sms)
{
    Serial.println(sms);
    Sim800L.println("AT");
    delay(100);
}
```

```
Sim800L.println("AT+CMGF=1");  
  
delay(100);  
  
Sim800L.println("AT+CMGS=\"+917009854143\""); //Change phone number if  
other phone no. is used.  
  
delay(100);  
  
Sim800L.print(sms);  
  
Sim800L.write(26);  
  
delay(3000);  
  
}
```

• Applications

1. Home Security Safes

- i. Used to store valuables like jewelry, important documents, and cash.
- ii. The locker can be remotely unlocked via mobile SMS or a Bluetooth app.
- iii. Provides an affordable alternative to expensive electronic safes.

2. Hotel Room Personal Safes

- i. **Guests can use a mobile app or receive an SMS OTP to unlock their room safes.**
- ii. **Adds a tech-savvy touch and improves guest security and convenience.**

3. ATM and Bank Security Systems (Prototype Level)

- i. **Early prototype models for secured ATM compartments that only open upon encrypted commands.**
- ii. **Could integrate additional features like GSM alarms or emergency SMS alerts if tampering is detected.**

