



Smart Bluetooth Lock

N.S.V Jashwanth¹, Namith R²

^{1,2} 6th Sem ECE dept. KSIT,India

ABSTRACT

Nowadays the home security system is very poor. In this paper we propose a secured lock known as smart Bluetooth door lock system. In this proposed paper we have developed a solution to improve the home safety system using Arduino IDE software. In this method we develop an app & key activation data is controlled by Bluetooth android. This proposed system is very strong and is highly secured.

Keywords: : Android, Door Automation, Bluetooth, Smart phone , Microcontroller, ESP 32 CAM microcontroller

1. Introduction

Bluetooth is a wireless technology standard for exchanging data over short distance communication and communication in Bluetooth is established using short-wavelength UHF radio waves in the ISM band from 2.4 to 2.485 GHz. Using Bluetooth device communication can be established both for fixed devices and also mobile devices. This is also used for building personal area networks (PANs). Bluetooth communication technology was invented by telecom vendor Ericsson in 1994, it was originally conceived as a wireless alternative to RS-232 data cables. Bluetooth can connect to many devices, overcoming problems of synchronization. It exists in many products, such as phones, tablets, music players, robotics, laptops and gaming console equipment, and some high definition headsets and modems. The technology is suitable for transferring information between two or more devices that are near each other in low bandwidth situations.

2. Literature Survey

1.This paper "Design and Implementation of smart door lock control system using Bluetooth Controller of Smart phone" they used ATMEGA 32 microcontroller along with HC-05 bluetooth module which may cause trouble while designing the circuit.

2. "Smart Home Security System", In this paper they have used ESP 32 cam for face recognition purposes along with BLYNK mobile application. The problem arises when we deal with the camera of ESP 32 because it is very delicate and the Blynk application is free only for a limited amount of time so we cannot use it as a general purpose lock.

3."Car Remote Locking Via Bluetooth Using ANDROID", In this paper, They have used a Rabbit core module along with dynamic C implementation. This module can operate up to 3.3 V only so it isn't suitable for solenoid locks (generally which are in the range 5V-12V).

4."Smart Door Locking System using IoT",In this paper they have used Arduino Nano along with HC-05 Bluetooth Module and Servo motor to control the lock .Here, The servo motor requires tuning to stabilize the feedback and it becomes unpredictable if something breaks inside the servo motor.

[1]Corresponding author.

E-mail address: rithvikprabhakar@gmail.com

3. Proposed Work

The main objective for the proposed work are

1. To design password GUI in an android phone
2. Develop mobile phone applications that can be installed in any android operated phone.
3. To design a hardware Bluetooth locking system
4. To interface the Android phone to the hardware locking system by writing a C program.

4. Working

- First we upload the program to ESP32 Cam using FTDI.
- Next, we pair the bluetooth of ESP32 cam with our smartphone using Bluetooth Serial Terminal app
- The locking and unlocking is done by the relay which receives the signal from Esp32 Cam in the form of clock pulses.
- A message will be displayed on our phone to enter the required password via Bluetooth Serial Terminal App
- Once the correct password is entered, the lock will open if closed and will close if opened.
- We have overcome the drawback of a general purpose locking system which is misplacing/duplicating/loosing of keys.

5. Block Diagram

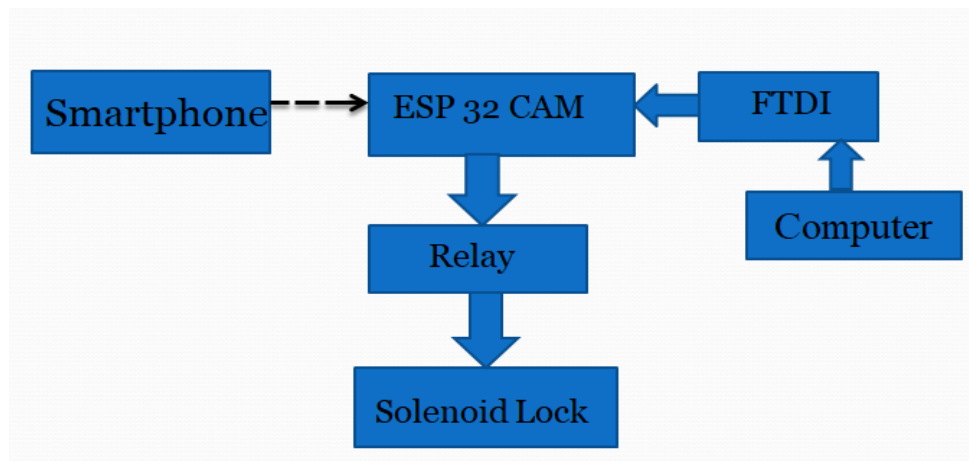
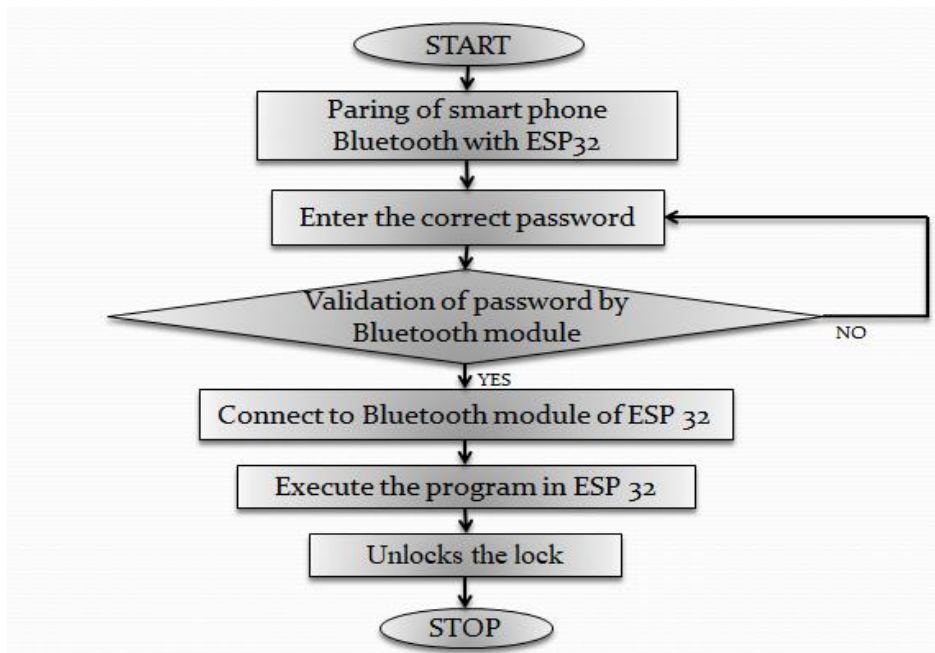


fig1:

First we should load the program into ESP 32 CAM using a computer through FTDI . Once the programme is successfully uploaded it should be removed. The Bluetooth of the smart phone must be connected to the Bluetooth of ESP 32 CAM. Then ESP 32 CAM sends the signal to the relay in the form of a clock pulse. Based on this signal the relay controls the lock.

6. Flowchart



7. Result

The program for the ESP 32 CAM was written in C language and was then compiled into an executable file using the Arduino IDE . The executable file was next imported into the Proteus Design Suite IDE, where the hardware circuit was designed and simulated. Upon successful completion of the software simulation, the system's hardware was constructed on a breadboard and programming of the ESP 32 CAM was carried out using Arduino IDE through FTDI.

8. Output

SIMULATION

- Our code has 3 parts.
- First, we include the Bluetooth Serial Library in our code. Next, we set up the password.

```

sketch_aug24c $
#include "BluetoothSerial.h"

#if !defined(CONFIG_BT_ENABLED) || !defined(CONFIG_BLUEDROID_ENABLED)
#error Bluetooth is not enabled! Please run `make menuconfig` to and enable it
#endif
String pasw="efylockL133";
String getinput="";
BluetoothSerial SerialBT;
int lockpin= 15;

```

- The 2nd part is setting the serial baud rate and defining the Bluetooth Serial.

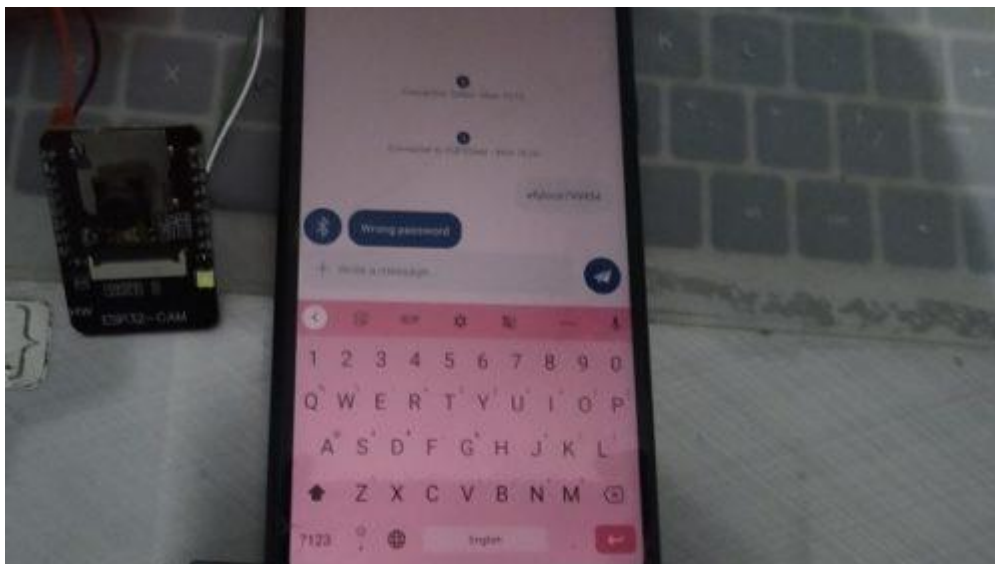
```
void setup() {
  Serial.begin(115200);
  SerialBT.begin("SmartLock"); //Bluetooth device name
  Serial.println("The device started, now you can pair it with bluetooth!");
  pinMode(15,1);
}
```

- Last part is creating the loop function for availability of bluetooth serial input. If input is available, then we will read and save it in an empty string variable named get input. An If condition will try to create a match between the entered password and the set password. Whenever found correct, it will initiate unlock otherwise nothing will happen and the lock will remain same.

```
void loop() {
  if (SerialBT.available()) {
    getinput=(SerialBT.readStringUntil('\n'));
    Serial.println(getinput);
    if(getinput ==pasw){
      Serial.println("unlocked");
      digitalWrite(15,1);
    }

    else
      digitalWrite(15,0);
  }
}
```

- After we successfully design the circuit, we need to enter the valid password.



- Once the valid password is entered, the lock will open considering the lock was closed initially.
- If the password is invalid then “Wrong Password” message will be displayed on our smart phone.

9. Conclusion and Future Scope

This proposed work can be implemented and used in various places such as home, offices and industrial areas. The Automated door lock system can provide added security to institutions or organizations that use the system. It can thus be concluded that the initial objectives were achieved .

REFERENCES:

1. Mr.Bhaktishwar Rajiwade, Shital Thakar, Payal Pokharkar, Mr.Shankar Malbhare, "Design and Implementation of smart door lock control system using Bluetooth Controller of Smart phone" Volume:03 Issue:11| Nov-2016
2. Mr.M.Venu Gopal, S.Raasi, M.Naga Sai Praveen, "Smart Home Security System", Volume 08 Issue:03| Mar-2021
3. Mrunal Sakhare, Sagar Ganer, Mona Mulchandani , "Car Remote Locking Via Bluetooth Using ANDROID", Volume: 02 Issue: 09 | Dec-2015
4. Karthik A Patil, Niteen Vittalkar, Pavan Hiremath, Manoj A Murthy, "Smart Door Locking System using IoT", Volume: 07 Issue: 05 | May-2020