

# Comparative Study on UltraSonics Door Unlocking System Using Arduino

Abdul Haleem Khan<sup>1</sup> and Laxmi Narayan Verma<sup>2</sup>

<sup>1</sup>Electronics & Telecommunication  
GEC Jagdalpur, INDIA.  
email:haleemk77@gmail.com, laxmiverma1104@gmail.com

(Received on: December 9, 2018)

## ABSTRACT

In our project we discuss about operations on embedded system design using 8051 microcontroller and arduino. An embedded system is a programmed controlling and operating system with a dedicated function. A small computer on a single chip containing a processor, memory, and input /output ports typically embedded inside some device that they control is called a microcontroller. Open Source electronic prototyping platform based on flexible ease to use hardware and IDE software is called arduino.

**Keywords:** 8051 microcontroller, Arduino, embedded, IDE.

## 1. INTRODUCTION

Regardless of the size of your commercial operation we have a solution for you and can provide standalone or networkable access control systems with user friendly custom made software. Our electronic door lock solutions include both electronic locking handles unitizing Mifare card credentials and Electronic key operated cylinders

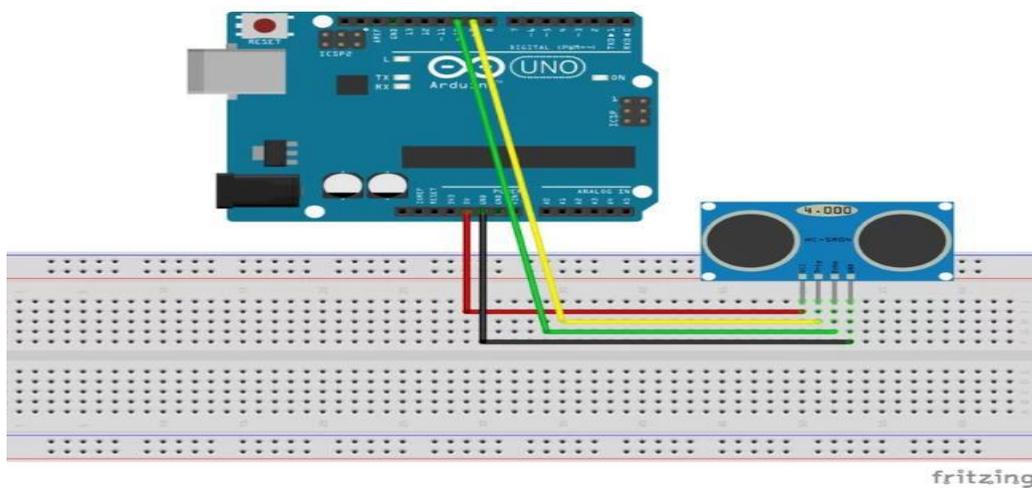
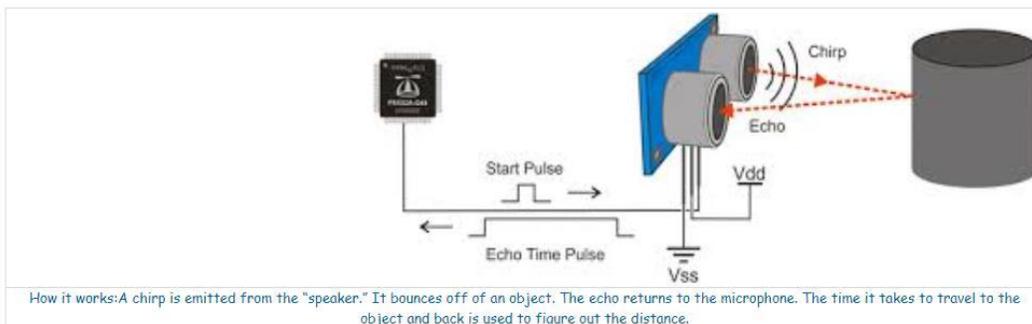
- This simple circuit can be used at residential places to ensure better safety.
- It can be used at organizations to ensure authorized access to highly secured places.
- With a slight modification this Project can be used to control the switching of loads through password

## 2. LITERATURE REVIEW

### 2.1 UltraSonic Sensor

An Ultrasonic Sensor is a device that measures distance to an object using Sound Waves.

- It works by sending out a sound wave at ultrasonic frequency and waits for it to bounce back from the object.
- Then, the time delay between transmission of sound and receiving of the sound is used to calculate the distance.
- The Ultrasonic Sensor sends out a high-frequency sound pulse and then times how long it takes for the echo of the sound to reflect back.
- The sensor has 2 openings on its front. One opening transmits ultrasonic waves, (like a tiny speaker), the other receives them (like a tiny microphone).



## 2.2 Program

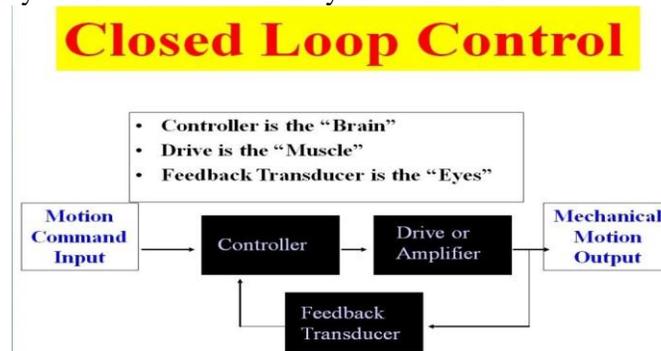
\* Ultrasonic Sensor HC-SR04 interfacing with Arduino.

```
// defining the pins
const int trigPin = 9;
const int echoPin = 10;
// defining variables
long duration;
int distance;
```

```
void setup() {  
  pinMode(trigPin, OUTPUT); // Sets the trigPin as an Output  
  pinMode(echoPin, INPUT); // Sets the echoPin as an Input  
  Serial.begin(9600); // Starts the serial communication  
}  
void loop() {  
  // Clears the trigPin  
  digitalWrite(trigPin, LOW);  
  delayMicroseconds(2);  
  // Sets the trigPin on HIGH state for 10 micro seconds  
  digitalWrite(trigPin, HIGH);  
  delayMicroseconds(10);  
  digitalWrite(trigPin, LOW);  
  // Reads the echoPin, returns the sound wave travel time in microseconds  
  duration = pulseIn(echoPin, HIGH);  
  // Calculating the distance  
  distance= duration*0.034/2;  
  // Prints the distance on the Serial Monitor  
  Serial.print("Distance: ");  
  Serial.println(distance);  
}
```

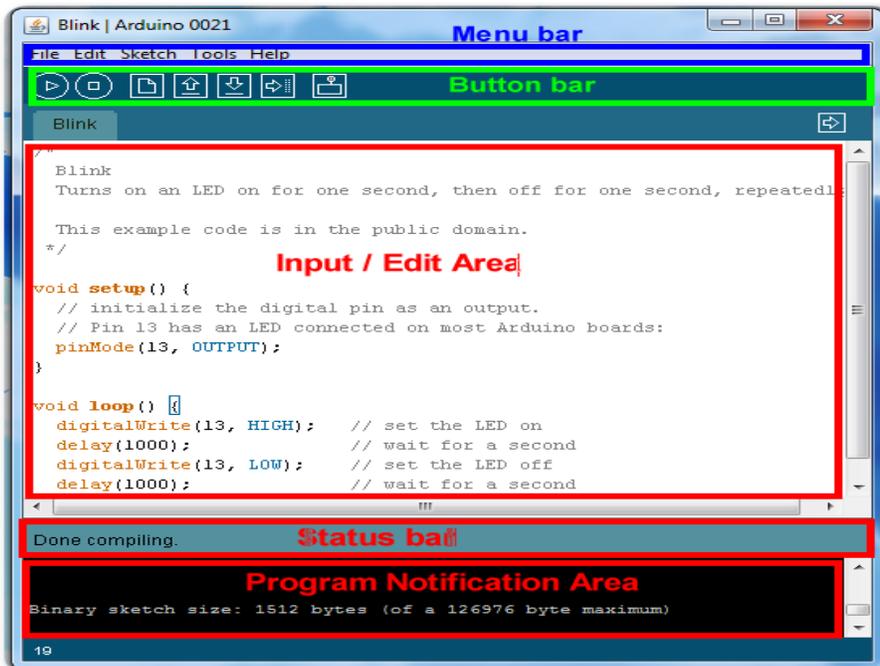
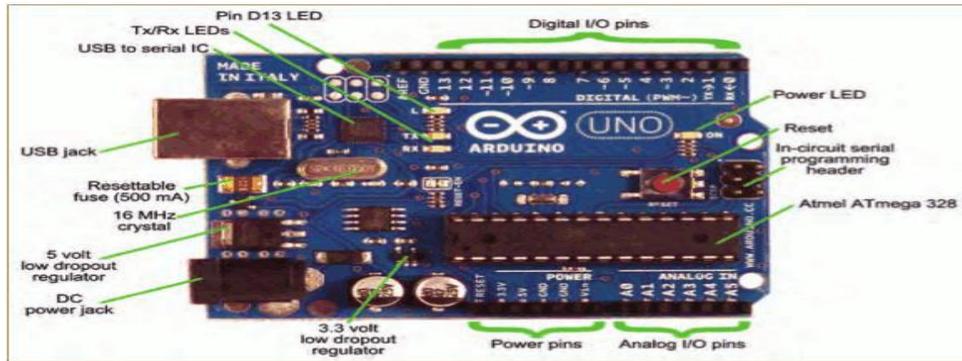
### 3. SERVO MOTOR

- Servo is mechanism based on feedback control.
- The controlled quantity is mechanical.
- Because servo motors use feedback to determine the position of the shaft, you can control that position very precisely.
- As a result, servo motors are used to control the position of objects, rotate objects, move legs, arms or hands of robots, move sensors etc. with high precision.
- Servo motors are small in size, and because they have built-in circuitry to control their movement, they can be connected directly to an Arduino.



#### 4. ARDUINO

The Arduino hardware and software is open source. The open source philosophy fosters a community that shares its knowledge generously. This is great for beginners as help is often available geographically nearby and always online, at many different skill levels, and on a bewildering array of topics. Example projects are presented not just as pictures of the finished project, but include instructions for making your own or as a starting point for incorporation into your derivative or related projects. The Arduino software, known as the Integrated Development Environment (IDE), is free. You can download it from [www.arduino.cc](http://www.arduino.cc).



Abdul Haleem Khan, *et al.*, J. Pure Appl. & Ind. Phys. Vol.8 (12), 237-241 (2018)

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SPECIAL THANKS TO (INSTRUCTABLE.COM & WIKIPEDIA)