# Bank Locker And Jewellery Shop Security System by Using Stimulated Radar System

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## ABSTRACT

This work describes Security system for banks and jewellery shops. It is very suitable for remote monitoring of confidential area. Due to increase in bank robbery and theft day by day, security at some places is very important.So the main aim of our project is to provide high securityThe ultrasonic radar module includes a transmitter and a receiver mounted on a rotating motor. A motor is used to allow the sensor to cover 360 degree. The ultrasonic sound energy is transmitted from transmitting device into an area of interest and this further reacts to a change in the reflected energy pattern. Basically it works on the principle of echo.It has threshold value.If there is any new echo signal,it compares the signal with threshold value.This case taken as alert and SMS for this alert will send to the concerned person and the nearest police station via GSM MODEM.Then the user will monitor the footage via IP CCTV.If any immediate action needs,the person can send the command over GSM for spraying chloroform in order to prevent theft.
**Keywords :** Ultrasonic Radar,GSM module,Arduino, DC motor.

## I.  INTRODUCTION

Ultrasonic sensors work on a principle similar to sonar which evaluates distance of a target by interpreting the echoes from ultrasonic sound waves. This ultrasonic module measures the distance accurately which provides 0cm - 400cm with a gross error of 3cm. Its compact size, higher range and easy usability make it a handy sensor for distance measurement and mapping. The module can easily be interfaced to micro controllers where the triggering and measurement can be done using two pin. The sensor transmits an ultrasonic wave and produces an output pulse that corresponds to the time required for the burst echo to return to the sensor. By measuring the echo pulse width, the distance to target can easily be calculated.Here Arduino UNO is micro controller and it is used to connect external peripheral devices such as ultrasonic radar,GSM kit,Relay,Motor,Buzzer,LED.So this device ensures safety in confidential places and provides atmost security and GSM send alert and also the concerned person can take appropriate action through GSM and IP CCTV.

## II.  METHODS AND MATERIAL

### A.  Literature Survey

The existing security system consists of LASER sensor, Pyro Electric Sensor along with CCTV. In these security system, there are more disadvantages such as

i.   High cost
ii.  Synchronisation of LASER light fails at most of the times
iii. IR sensor is purely based on heat detection from the object.
iv.  High complexit

To overcome the drawbacks of these system,a new advancement technique is used in our project.In this project,IP CCTV and ultrasonic RADAR are being used in shops and banks.IP CCTV or IP camera is a digital video camera employed for surveillance.The first centralized IP camera was axis Neteye 200 in 1996.The camera is connected to an IP network using an ETHERNET connection/CAT-5 cable.They have

built in web servers so that the surveillance video they transmit,can be viewed directly from the camera over the internet using a web browser.So that,any abnormal actions in shops or banks can be viewed by the concerned person at anywhere.

The main objective of this project is to prevent theft in banks and shops.The ultrasonic radar transmits ultrasonic waves in the room and the receiver receives the reflected echo signal.If there is any abnormal value of echo signal,then the controller will send an alert to user through GSM modem. Speed=Distance Travelled /Time taken
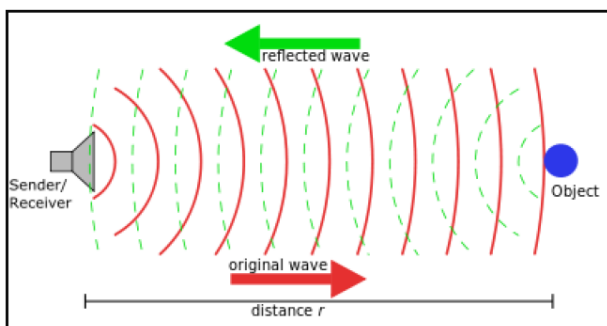


**Figure 1.** Object Detection by Echo Signal

Thus the sensor senses any object including human being. It has following features.

(a) Sensitivity: >-65dB
(b) Nominal Frequency: 40kHz
(c) Maximum Driving Voltage: 20Vrms
(d) Operating Temperature: -20oC to +70oC

### B. Hardware Requirement

The hardware requirement for this project are

1. Power Supply
2. Arduino UNO
3. Ultrasonic Radar
4. Alert Buzzer
5. LED
6. IP CCTV(Camera)
7. Spraying Motor
8. Chloroform

### C. Arduino Pin Description

The Arduino has several different kinds of pins, each of which is labeled on the board and used for different functions.
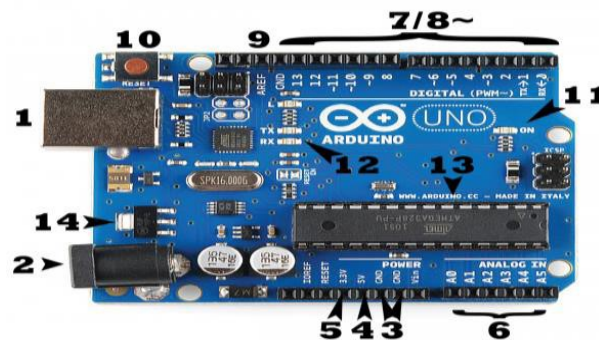


**Figure 2.** Arduino Board GND (3): Short for 'Ground'.

There are several GND pins on the Arduino, any of which can be used to ground your circuit. 5V (4) & 3.3V (5): As you might guess, the 5V pin supplies 5 volts of power, and the 3.3V pin supplies 3.3 volts of power. Most of the simple components used with the Arduino run happily off of 5 or 3.3 volts. ANALOG (6): The area of pins under the 'Analog In' label (A0 through A5 on the UNO) is Analog In pins.. DIGITAL (7): Across from the analog pins are the digital pins (0 through 13 on the UNO). These pins can be used for both digital input (like telling if a button is pushed) and digital output (like powering an LED). PWM (8): These pins act as normal digital pins, but can also be used for something called Pulse-Width Modulation

Power LED Indicator

Just beneath and to the right of the word "UNO" on your circuit board, there's a tiny LED next to the word 'ON' TX is short for transmit, RX is short for receive.
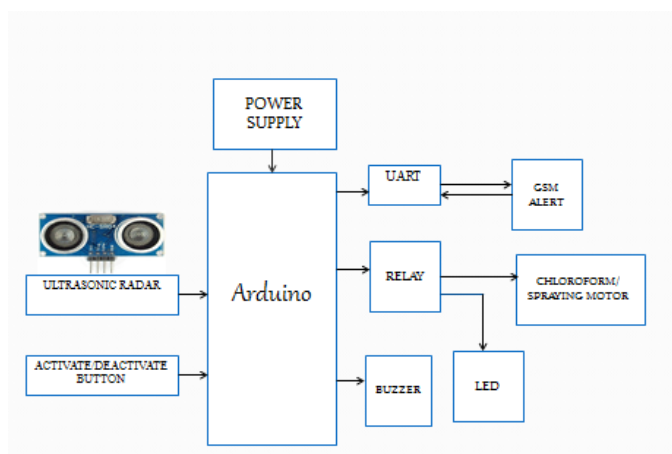


**Figure 3.** Block Diagram

## D. Ultrasonic Sensor HC-SR04 Pin Description



**Figure 4.** Ultrasonic Radar

VCC: 5V DC supply voltage is connected to this pin. Trigger: The trigger signal for starting the transmission is given to this pin. The trigger signal must be a pulse with 10uS high time. When the module receives a valid trigger signal it issues 8 pulses of 40 KHz Ultrasonic sound from the transmitter. The echo of this sound is picked by the receiver. Echo: At this pin, the module outputs a waveform with high time proportional to the distance. GND: Ground is connected to this pin. The sensor takes 2-3 seconds for detecting the object because of its 360 degree coverage. Range: Tested from 5 to 200 cm Accuracy: ±0.002 to ± 0.05%
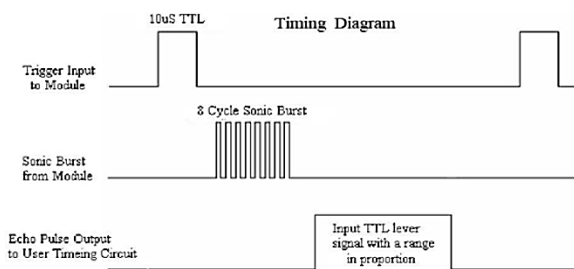


**Figure 5.** Ultrasonic Echo pulse Signal

## E. GSM Modem

GSM stands for Global System for Mobile Communication. GSM allows transmission of Short Message Service(SMS) in TEXT mode. The user receives alert over GSM Modem. The GSM modem is based upon digital mobile communication having data rates from 64 kbps to 120 mbps.
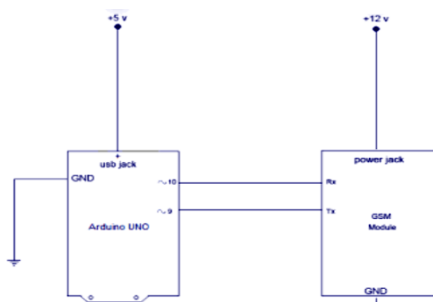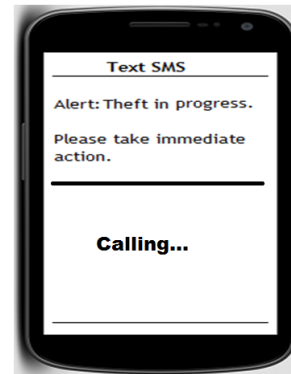


**Figure 6.** Interfacing Arduino UNO with GSM

# III. RESULTS AND DISCUSSION

## ALERT NOTIFICATION



## NOTIFICATION

This is how the user get intimation while there is theft in their shop. Further it takes the action of spraying chloroform inorder to fainting the thief.

### Application

It can be used in many applications such like they are following as below:

**1. Defense line:** It can be easily implemented in border line and when any interrupt created through across this range then it send alert to soldiers and it create protection from attackers.

**2. Detection and Tracking:** It can be used in targeting any obstacles or unknown material without creating any disturbance.

**3 .Vehicle parking system:** For the reducing the traffic on the road, this sensor can be useful on vehicle parking system.

**4 .Find the depth or level of any medium:** By the use of ultrasonic wave we can find the level of any medium it works on where sonar principle.

**5. Loop Control**

**6. Liquid Level Control**

**7. Wire Break Detection**

**8. Robotic Sensing**

**9. Vehicle Detection for Car Wash and Assembly**

## IV. CONCLUSION

We have reported the outcomes of a research and demonstration project on ultrasonic radar sensor for security system for human or object interference in confidential area. By Using a GSM and camera it makes better for any security purpose. The result in this project is genuine and is a product of sincerity and hard work. The system has been successfully implemented and the aim is achieved without any deviation. There is a lot of future scope for this project because of its security capacity. It can be used in many applications. The product can also be developed or modified according to the rising needs and demand.

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