DESIGN AND DEVELOPMENT OF SMART SECURITY SYSTEM

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A Project Submitted in Partial Fulfillment of the Requirements for the Degree of Bachelor of Science in Information and Communication Engineering/Electronics and Telecommunication Engineering to the Department of ECE at the

East West University
Aftabnagar, Dhaka, Bangladesh

DECLARATION

We hereby declare that we carried out the work reported in this project in the Department of Electronics and Communications Engineering, East West University, under the supervision of Dr. Md. Habibur Rahman. We solemnly declare that to the best of our knowledge, no part of this report has been submitted elsewhere for award of a degree. All sources of knowledge used have been duly acknowledged.

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Letter of Acceptance

We hereby declare that the major project entitled "Smart Security System" being submitted by Sadia Afrose Jui and Borson Sarkar of Electronics and Communications Engineering Department, East West University, Dhaka in partial fulfillment for the award of the degree of Bachelor of Science in Electronics and Telecommunication Engineering, is a record of major project carried out by them. They have worked under my supervision and guidance and have fulfilled the requirements which to my knowledge have reached the requisite standard for submission of this dissertation.

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ACKNOWLEDGEMENT

ABSTRACT

Now a days we are upgrading our life day by day using modern technologies. But where the topic "technology" arises, we have to talk about a lot of electronic devices that we have got by the blessings of science. We are using these technologies for several purposes. This project is also an implementation of modern technology. We have designed and developed an arduino based smart security system, using alarm and SMS based security. The LASER (Light Amplification by stimulated emission of radiation) security is the initial and major security and CAMERA and GSM is the secondary security we have implemented. Here a particular place or area will be laser secured. If the laser is interrupted by any reason then alarm will turn on and camera will capture the interrupter and GSM will confirm you by sending a SMS that, security is interrupted. Here we have used a photo sensor to detect the laser light and used 5V relay to turn on the camera to capture the interrupter and used SIM 808 GSM device for SMS confirmation. Here by reflecting the laser light with mirror, a particular space has been secured by laser, A program has been developed and burnt into the microcontroller of the Arduino module. This system is constructed and tested and found to work satisfactory. The developed system can be used for any security purposes. Example: Bank Vault Security (to secure the bank vault room), Museum (where a lot of ancient and precious things are preserved), Offices (where unauthorized entry is prohibited) and so on. Finally our security system can be more upgradable with some modification.

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DESIGN AND DEVELOPMENT
OF
SMART SECURITY SYSTEM

Chapter-01

Introduction

In this modern world, Analog Electronics devices are becoming less popular and digital electronics components are becoming more advanced and popular day by day. Smart security system is also an example of modernized digital world. The basic concepts of this project is to ensure the security system of homes, bank volts, offices. Laser and GSM modules are used to give the highest security system. People are using cellular mobile phone network to communicate each other. GSM modules are basic elements of these phone networks. GSM stand for global system of mobile communication. It is also used in many electronics projects among engineering students and also very popular in industry.

Motivation of our Project

Security is a most important factor today. Technology develops day by day in the world. The crime gang also improves their technology toper form their operation. So technology of security should be modern with time to protect the crime works. We decide to make a security project as our project. In this project we have used laser light to cover a large area. We know laser light goes through long distance without scattering effect. It's also visible only at source and incident point, otherwise invisible. These two properties help us to build up a modern security system, which may name as "laser security". When any person or object crossover the laser line the security alarm will ringing and also the focus light will "on" to focus the entrance of unauthorized person. We can make a security boundary of single laser light by using mirror at every corner for reflection. Our project provides complete information on the topic "Laser Security Alarm System" and maximum efforts have been taken to make the project more comprehensive and lucid to understand. Our project covers a variety of sub topics like its working, setup, uses in life and different aspects of Laser Security Alarm System

Literature Survey

New opportunities from new technology are the biggest reasons why many people feel the need of greater security. Redesigning different processes and products to support the modern technology smart security system is established

In the literature, there are few contributions proposed in recent years in machine-to-machine, mobile-to-machine, or machine–to-mobile communication. These include: laser security protection, CCTV camera protection and GSM Network protection.

The basic sensor component of a modern laser security system is an infrared motion detector. An infrared motion detector works by using beams of infrared light to detect changes in heat. When a person moves into the beam of light, the sensor is alerted by the body heat given off by the individual. If infrared sensors are placed well, the beams of light will make it impossible for an intruder to come into the area without the sensor being alerted. The sensor which is connected to the basic alarm unit through a wireless connection, then triggers the basic unit to alert the monitoring service through which the customer purchased the security plan. The monitoring service will contact the home and, if no response is received, will contact the police. In most models, the basic unit also sounds a loud alarm. CCTV (Closed Circuit TV) systems have become extremely popular over the last few decades as the technology has improved and become more affordable. Here CCTV uses to transmit video and sometimes audio images to a monitor. The main advantage of GSM alarm over the general fixed phone alarm is that the owner can always obtain information about the current state of the place protected, even when he is in another city or country, by calling or sending SMS query to the number of SIM card.

OBJECTIVE:

The objective of this project is to develop a modern security system, in which the laser security uses to ON the buzzer in the case of entry intruders during the absence of the owner. The security camera is used for recording video and GSM send massages to the owner in any insecure condition. Laser door alarm is based on the interruption of Laser beam. The laser pointer is used as the source of light beam. If somebody tries to break the laser path, then an alarm will be generated in a few seconds. Normally laser door alarm circuit will have two sections. Laser transmitter is a laser pointer readily available. This is powered with 5 volt DC supply and fixed on one side of the door frame.

Chapter-2

2.1 Microcontroller ARDUINO:

The Arduino microcontroller is an easy to use yet powerful single board computer that has gained considerable traction in the hobby and professional market. The Arduino is open source, which means hardware is reasonably priced and development software is free. This guide is for students in ME 2011, or students anywhere who are confronting the Arduino for the first time. For advanced Arduino users, prowl the web; there are lots of resources. The Arduino project was started in Italy to develop low cost hardware for interaction design.

Figure: Microcontroller Arduino

2.2History of Arduino-UNO

The Arduino is developed in 2005. The Arduino microcontroller was initially created as an educational platform for a class project at the Interaction Design Institute Ivrea in Milan (Italy) in 2005. It derived from a previous work of the Wiring microcontroller designed by Hernando Barragan in 2004. From the beginning, the Arduino board was developed to attract artists and designers. The Wiring microcontroller was created by Hernando Barragan to be used for parsing • data to electronic devices. His aim was that it could be used by non-technical people who only had basic experience with using computers. He first of all wanted it to be used as a prototyping tool. Since he needed help to create an easy software tool to programmed the board he engaged Casey Reas and Massimo Banzi as his assistants. Reas created the visual programming language for the prototyping tool.

2.3Development

The computer, commonly defined as a tool for processing, storing, and displaying information, arose from a long line of analog devices used for effective counting and calculation, ranging from the simple abacus (first invented in Sumeria around 2300 BC), to Napier's Bones (conceived in 1617, and the precursor to the slide rule), to BlaisePascal's gear-based mechanical calculator (1645).The development of the computer accelerated during the 1940's, spurred on largely by the highly industrialized nature of military production in World War II.The 1960's marked a significant evolutionary leap for computing, due to the development of solid state computers (such as the IBM 1401), which used transistors for processing operations, and magnetic core memory for storage. The invention of integrated circuits in 1959 by Jack Kilby, which enabled transistors and circuits to be fused onto small chips of semiconducting materials (such as silicon), allowed further miniaturization of computer components. Another important development during this decade was the advent of high-level computer programming languages that were written in symbolic language, making computer code somewhat easier to read and learn than previous machine languages. COBOL and FORTRAN were the main languages introduced during this period. The microprocessor was introduced in 1970. The microprocessor essentially miniaturized all hardware components of a computers central processing unit to fit onto a single, tiny integrated circuit, now more popularly known as a microchip. The microchip also became the main driving component of microcontrollers (such as the Arduino), which generally consist of a microchip, memory storage hardware, and input/ output hardware for sensors. The 1970's and 1 9 8 0 s also saw the development of a new generation of more powerful programming languages (such as C, C++, and later Java) for applications in business and science.

2.4Arduino Pins and Jacks:

Power -USB / Barrel Jack:

Arduino board needs a way to be connected to a power source. The Arduino UNO can be powered from a USB cable coming from your computer or a wall power supply that is terminated in a barrel jack. In the picture above the USB connection is labeled and the barrel jack is labeled .The USB connection is also how you will load code onto your Arduino board.

Pins (5V, 3.3V, GND, Analog, Digital, PWM, AREF):

The pins of Arduino are the places where connect wires to construct a circuit. The Arduino has several different kinds of pins, each of which is labeled on the board and used for different functions.

- **5V:** The 5V pin supplies 5 volts of power. Most of the simple components used with the Arduino run happily off of 5 or 3.3 volts.
- **GND:** Full name is Ground. There are several GND pins on the Arduino, any of which can be used to ground circuit.
- **Analog**: The area of pins under the 'Analog In' label (AO through A5 on the UNO) is Analog In pins. These pins can read the signal from an analog sensor and convert it into a digital value that we can read.
- **Digital:** Across from the analog pins are the digital pins (0 through 13 on the UNO). These pins can be used for both digital input and digital output (like powering an LED).
- **PWM:** The digital pins (3, 5, 6, 9, 10, and 11) on the UNO are the PWM(—) pins. These pins act as normal digital pins, but can also be used for something called Pulse-Width Modulation (PWM).
- **AREF:** Stands for Analog Reference. It is sometimes used to set an external reference voltage (between 0 and 5 Volts) as the upper limit for the analog input pins.

Power LED Indicator

Just beneath and to the right of the word "UNO" on circuit board, there's a tiny LED next to the word 'ON'. This LED should light up whenever plug Arduino into a power source. If this light doesn't turn on, there's a good chance something is wrong.

Reset Button

The Arduino has a reset button. Pushing it will temporarily connect the reset in toground and restart any code that is loaded on the Arduino. This can be very useful if code doesn't repeat, but we want to test it multiple times. Unlike the original Nintendo however, blowin on the Arduino doesn't usually fix any problems.

TX RX LEDs

TX is short for transmit, RX is short for receive. In our case, there are two places on the Arduino UNO where TX and RX appear once by digital pins 0 and 1, and a second time next to the TX and RX indicator LEDs. These LEDs will give us some nice visual indications whenever Arduino is receiving or transmitting data.

Main IC

The black thing with all the metal legs is an IC, or Integrated Circuit. The main IC on the Arduino is slightly different from board type to board type, but is usually from the AT mega line of IC's from the ATMEL Company. This can be important, as may need to know the IC type before loading up a new program from the Arduino software. This information can usually be found in writing on the top side of the IC.

Voltage Regulator:

The voltage regulator is not actually something interacting with on the Arduino. But it is potentially useful to know that it is there and what it's for. It controls the amount of voltage that is let into the Arduino board. It will turn away an extra voltage that might harm the circuit.

Getting started with Arduino Software

First download and install the Arduino for Mac, Linux or Windows from arduino.cc. Windows users also need to install a driver. Connect your board via USB, launch the Arduin application and select Arduino-Uno from the tools to board menu. Open the sketch File. Open Examples: 01. Basics: Blink. Click the toolbar button to upload it to your board.

The Integrated Development Environment (IDE)

Every microcontroller needs software to be programmed. The Arduino board is not a case apart. It has its own integrated development environment (IDE),It is free and everyone can download from its official website using either the Windows, Mac OS X or Linux platform. That allows Arduino Board to gain more users and it also helps it to grow.

2.5 IDE Parts

- **Compile:** Before program "code" can be sent to the board, it needs to be converted into instructions that the board understands. This process is called Compiling.
- **Stop**: This stops the compilation process.
- **Create new Sketch:** This opens a new window to create news ketch.
- **Open Existing Sketch:** This loads a sketch from a file on our computer.
- **Save Sketch:** This saves the changes to the sketch.
- **Upload to Board:** This compiles and then transmits over the USB cable to our board.
- **Serial Monitor:** Until this point when our programs (sketches) didn't work, we just pulled out our hair and tried harder. • Tab Button: This lets you create multiple files in your sketch. This is for more advanced programming than we will do in this class.
- **Sketch Editor:** This is where write or edit sketches • Text Console: This shows you what the IDE is currently doing and is also where error messages display if make a mistake in typing program.

Line Number: This shows what line number your cursor is on.

Software Design: Design is divided into two parts. First we write the Arduino program in Arduino so"' Then we compile it to the Arduino hardware. This Arduino command is control the _cfrii. arn: hardware and other circuit connection. For making connection between Arduino and andro wino mobile we need to install Arduino Bluetooth controller software on our mobile phone.

Installing Arduino, runs on Windows. Go to the Arduino software web site at Arduino warduino.cc/en/Main/Software and download the version of the software compatible with WA-tem We use Arduino 1.0.5 version. Our System. Verifying the Hardware Now that we

have the Arduino IDE software installed, let's connect the computer to the mc hoard, load a small program, and verify that all components are working together. First, need to connect the USB cable to our mc board and then plug the other end of the USB cable into our computer.

Arduino Language

The Arduino language is implemented in C/C++ and based in Wiring. When we write an Arduino sketch, we are implicitly making use of the Wiring library, which is included with the Arduino IDE. This allows us to make run able programs by using only two functions setup 0 and loop 0. As mentioned, the Wiring language is inspired by Processing, and the Arduino language structure is inherited from the Processing language, where the equivalent functions are called setup (). We need to include both functions in every Arduino program even if we don't need one of them. Let's analyze the structure of a simple Arduino sketch using again the Blink example.

Logical Diagram We have a logical diagram for this project. Here android mobile phone works as a input signal which start from beginning part. We have got output from electronic devices

Selecting the Board and Serial Port

Before we can upload our sample sketch, we need to select the correct board type and serial port that the Board is attached to on our computer. Setting the correct board can be done in the Tools

➤ Board menu

By selecting Arduino Uno or one of the other corresponding board names.

<u>2.6 Applications of Microcontrollers (ARDUINO):</u>

Microcontroller has many applications electronic equipment's

o Mobile Phones
o Auto Mobiles
o Washing Machines
o Cameras
o Security Alarms
o Traffic System

Application of Microcontroller in Day to Day Life Devices:

- Light sensing & controlling devices
- Temperature sensing and controlling devices
- Fire detection & safety devices
- Industrial instrumentation devices
- Process control devices

Application of Microcontroller in Industrial Control Devices:

- Industrial instrumentation devices
- Process control devices

Application of Microcontroller in Metering & Measurement Devices:

- Volt Meter
- Measuring revolving objects
- Current meter
- Hand-held metering systems

Chapter-03

HARDWARE & SOFTWARE

3.1 Hardware

Hardware is the physical parts or components of the system. In this project work, we've used some hardware Arduino, D400 transistor, UM3481, LDR, GSM module, Relay, Buzzer, Laser etc.

3.1.1 LDR (Light Dependent Resistor):

A light dependent resistor (LDR) or a photo resistor is a device whose resistivity is a function of the incident electromagnetic radiation. Hence, they are light sensitive devices. They are also called as photo conductors, photo conductive cells or simply photocells. They are made up of semiconductor materials having high resistance. It works on the principle of photo conductivity. Photo conductivity is an optical phenomenon in which the materials conductivity is increased when light is absorbed by the material. LDR's are light dependent devices whose resistance is decreased when light falls on them   and that is increased in the dark. When a light dependent resistor is kept in dark, its resistance is very high. This resistance is called as dark resistance.
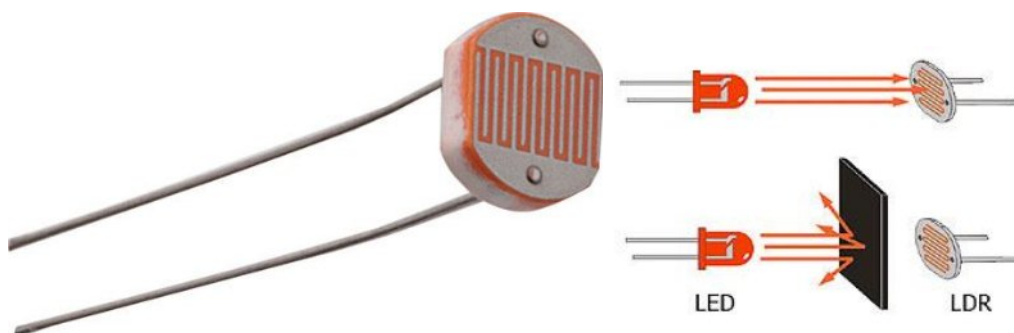

Figure 1: LDR (Light Dependent Resistor

When light falls i.e. when the photons fall on the device, the electrons in the valence band of the semiconductor material are excited to the conduction band. These photons in the incident light should have energy greater than the band gap of the semiconductor material to make the electrons jump from the valence band to the conduction band. Hence when light having enough energy strikes on the device, more and more electrons are excited to the conduction band which results in large number of charge carriers. The result of this process is more and more current starts flowing throgh the device when the circuit is closed and hence it is said that the resistance of the device has been decreased. This is the most common working principle of LDR.

3.1.2 Laser Diode (LD):

A laser diode or LD also known as injection laser diode or ILD. It is an electrically pumped semiconductor laser in which the active laser medium is formed by a p-n junction of a semiconductor diode similar to that found in a light-emitting diode. It produces coherent radiation that means the waves are all at the same frequency and phase, in the visible or infrared (IR) spectrum when current passes through it. Laser diodes are used in optical fiber systems, compact disc (CD) players, laser printers, remote-control devices, and intrusion detection systems. A laser diode cannot be used for spectacular purposes such as burning holes in metal, bringing down satellites, or blinding aircraft pilots. Nevertheless, its coherent output results in high efficiency and ease of modulation for communications and control applications. A typical laser diode measures less than one millimeter across and weighs a fraction of a gram, making it ideal for use in portable electronic equipment. Most laser diodes require only a few milliwatts of power at 3 to 12 volts DC and several milliamperes. Here we use 5volts LD.Therefore, they can operate using small battery power supplies.

*Figure 2:***Laser Diode (LD)**

3.1.3 5V RELAY:

Figure 3: Relay(5V)

Main Feature :

1. 92/8 gold silver alloy on silver palladium contact type is suitable for low level switching application.
2. Small size and light weight can provide high density P.C. Board mounting.
3. 2.54gmm Terminal Pitch.
4. Low Coil Power Consumption of GS-T Type and high Coil Power Consumption of GS-D type are available to meet user's selection.
5. Employment of suitable plastic materials to be applied to high temperature and various chemical solution.
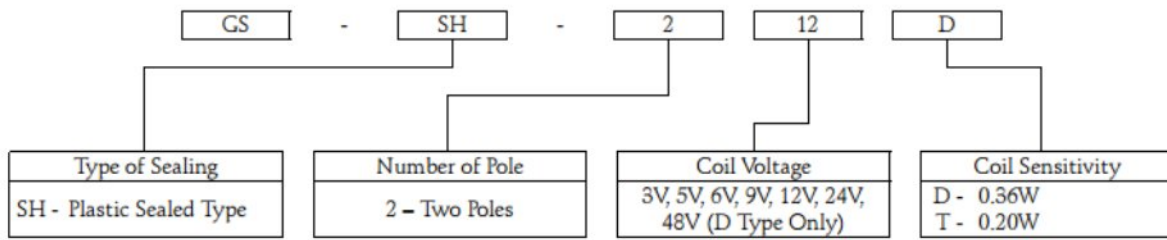6. Plastic epoxy resin sealed type for washing procedure.

Application:

Telecommunication, domestic appliances, office machine, audio equipment, Remote Control, etc.

Coil Specification (at 20°C)
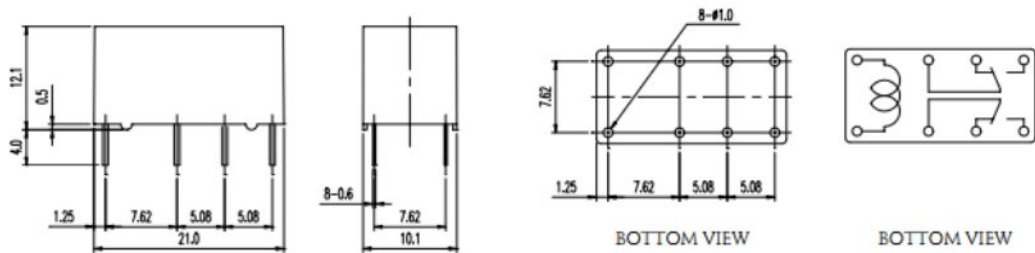
Coil Sensitivity	Nominal Voltage (VDC)	Nominal Current (mA)	Coil Resistance (Ω±10%)	Power Consumption (W)	Pull-In Voltage (VDC)	Drop-Out Voltage (VDC)	Maximum Allowable Voltage (VDC)
GS - D	3	120	25	Abt. 0.36	75% Maximum	10% Minimum	150%
	5	71.4	70				
	6	60	100				
	9	40	225				
	12	30	400				
	24	15	1,600				
	48	0.75	6,400				
GS - T	3	66.7	45	Abt. 0.20	75% Maximum	10% Minimum	150%
	5	40	125				
	6	33.3	180				
	9	22.2	405				
	12	16.7	720				
	24	8.3	2,880				

Ordering Information:

| GS | - | SH | - | 2 | 12 | D |

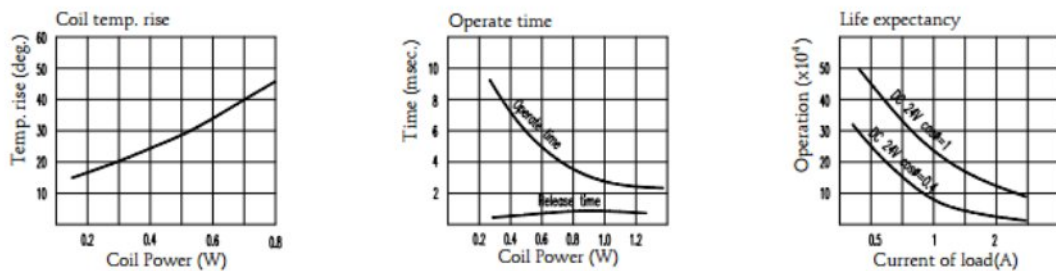| Type of Sealing	Number of Pole	Coil Voltage	Coil Sensitivity
SH - Plastic Sealed Type	2 – Two Poles	3V, 5V, 6V, 9V, 12V, 24V, 48V (D Type Only)	D - 0.36W T - 0.20W

Dimension:

GS-SH

BOTTOM VIEW   BOTTOM VIEW

Reference Data:

3.1.4 UM3481 IC:

Features:

• Powered by a 1.5V battery
• 8 beats selectable
• Low standby current
• 3 timbres - piano, organ, and mandolin
• 512-note memory, up to 16 songs
• 5 tempos available through mask setting
• 8 playing modes by user setting
• 14 tones selectable
• One built-in RC oscillator
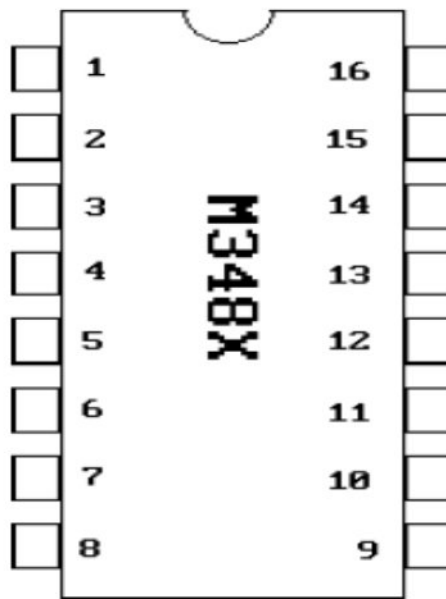
• On-chip envelope modulator and pre-amplifier

General Description

The M3481 series is a mask-ROM-programmed multi-instrument melody generator, implemented by CMOS technology. It is designed to play the melody according to the previously programmed information and is capable of generating 16 songs with 3 instrument effects: piano, organ and mandolin. The device also includes a pre-amplifier which provides a simple interface to the driver circuit. The M3481 series is intended for applications such as toys, door bells, music box, melody clock/timers and telephones.

<u>Absolute Maximum Ratings</u>

DC Supply Voltage .... -0.3V to +5.0V
Input Voltage Range .... Vss-0.3V to Vdd+0.3V
Operating Ambient Temperature .... 0°C to +70°C
Storage Temperature .... -10°C to +125°C

Pin Configuration

```
        ┌─────────∪─────────┐
    [ ]─┤ 1               16 ├─[ ]
    [ ]─┤ 2               15 ├─[ ]
    [ ]─┤ 3      M348X     14 ├─[ ]
    [ ]─┤ 4               13 ├─[ ]
    [ ]─┤ 5               12 ├─[ ]
    [ ]─┤ 6               11 ├─[ ]
    [ ]─┤ 7               10 ├─[ ]
    [ ]─┤ 8                9 ├─[ ]
        └───────────────────┘
```

Circuit Diagram For Speker:

This circuit we have implemented to amplify the alarm tone with variable tone. This circuit output is with 8 different tones.
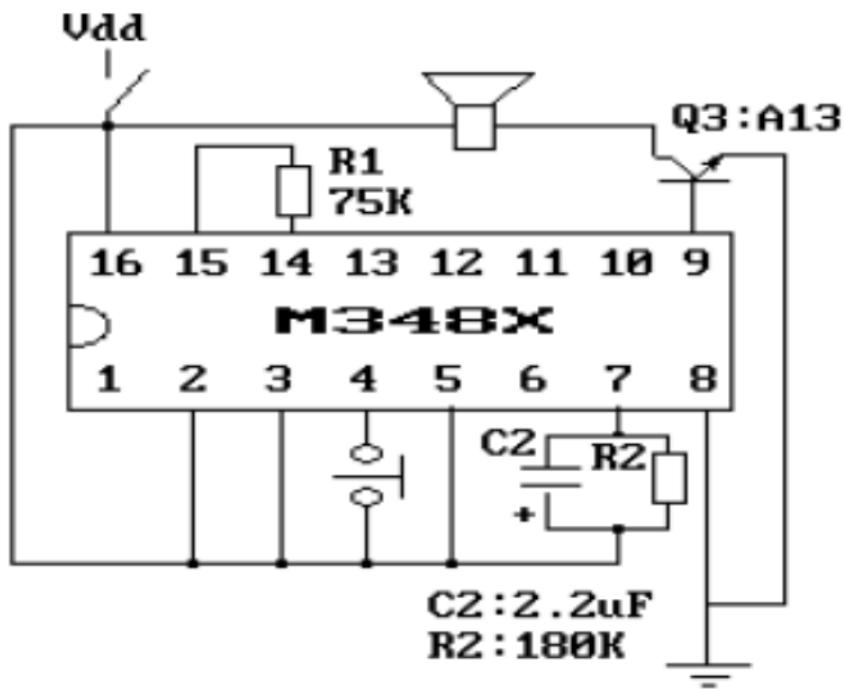
Figure 4: the alarm circuit with variable tone

3.1.5 SIM808 module:

SIM808 module is a GSM and GPS two-in-one function module. It is based on the latest GSM/GPS module SIM808 from SIMCOM, supports GSM/GPRS Quad-Band network and combines GPS technology for satellite navigation. It features ultra-low power consumption in sleep mode and integrated with charging circuit for Li-Ion batteries, that make it get a super

long standby time and convenient for projects that use rechargeable Li-Ion battery. It has high GPS receive sensitivity with 22 tracking and 66 acquisition receiver channels. Besides, it also supports A-GPS that available for indoor localization. The module is controlled by AT command via UART and supports 3.3V and 5V logical level.


Figure 5:SIM808 Module

The main features are given below:

1. Quad-band 850/900/1800/1900MHz
2. GPRS multi-slot class12 connectivity: max. 85.6kbps(down-load/up-load)
3. GPRS mobile station class B
4. Controlled by AT Command
5. Supports charging control for Li-Ion battery
6. Supports Real Time Clock
7. Supply voltage range 3.4V ~ 4.4V
8. Integrated GPS/CNSS and supports A-GPS
9. Supports 3.0V to 5.0V logic level
10. Low power consumption, 1mA in sleep mode
11. Supports GPS NMEA protocol
12. Standard SIM Card

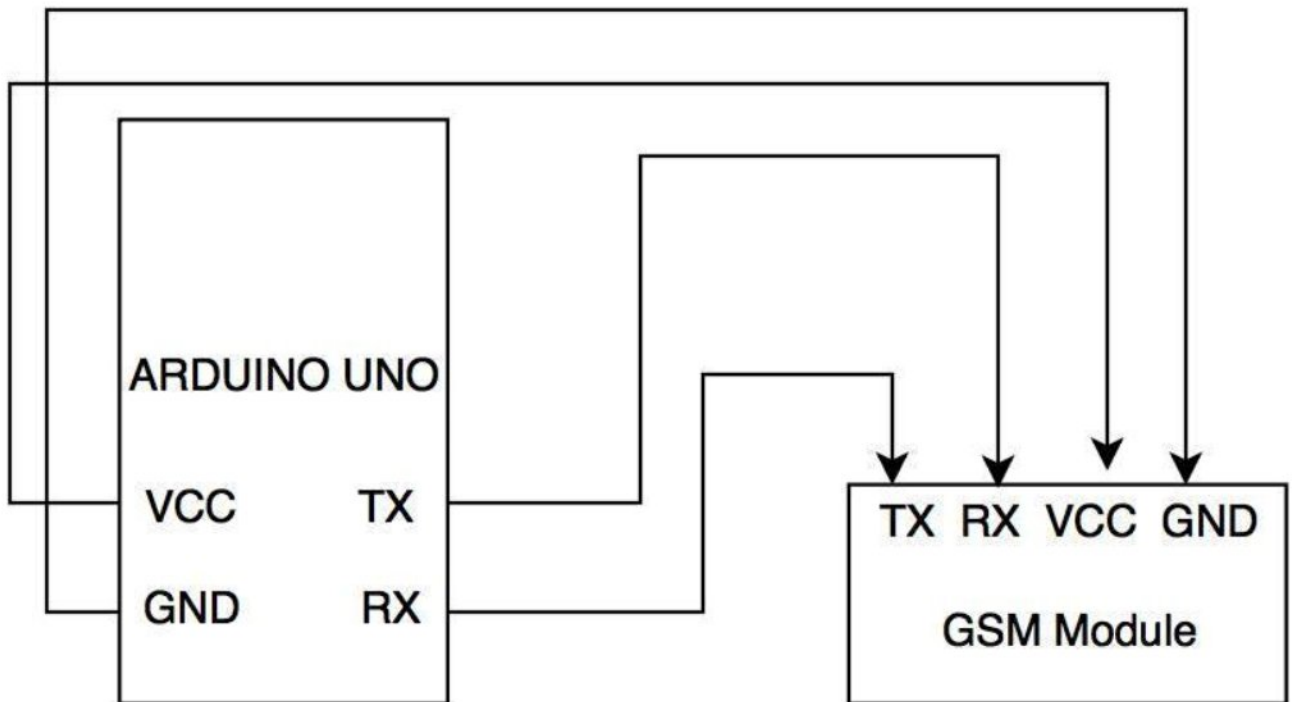# Software and development

3.2.1 Full Circuit Diagram:
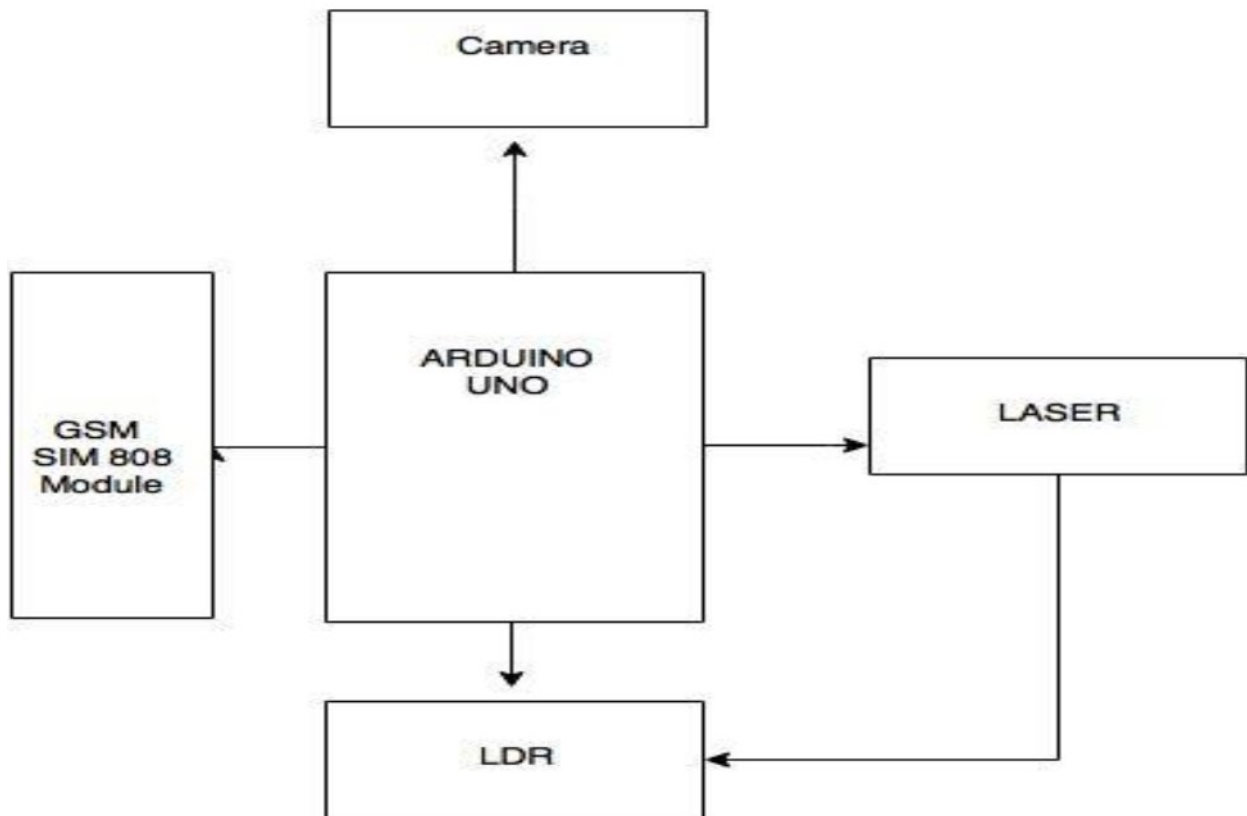
Figure 6: Full Circuit Diagram

Here is the full circuit diagram we have represented. The smart security system is fully implemented here.

3.2.2 Arduino with GSM:

Figure 7: Arduino with GSM

Here we have connected the GSM module with ARDUINO UNO. Here TX of arduino is connected with GSM RX and RX of arduino is connected with TX of GSM module. Respectively VCC and GND also connected from Arduino module.

3.2.3Arduino with 5V RELAY (for camera):

Here when alarm is activated then pin number 12 will be HIGH and relay activate the camera and camera capture the interrupter.
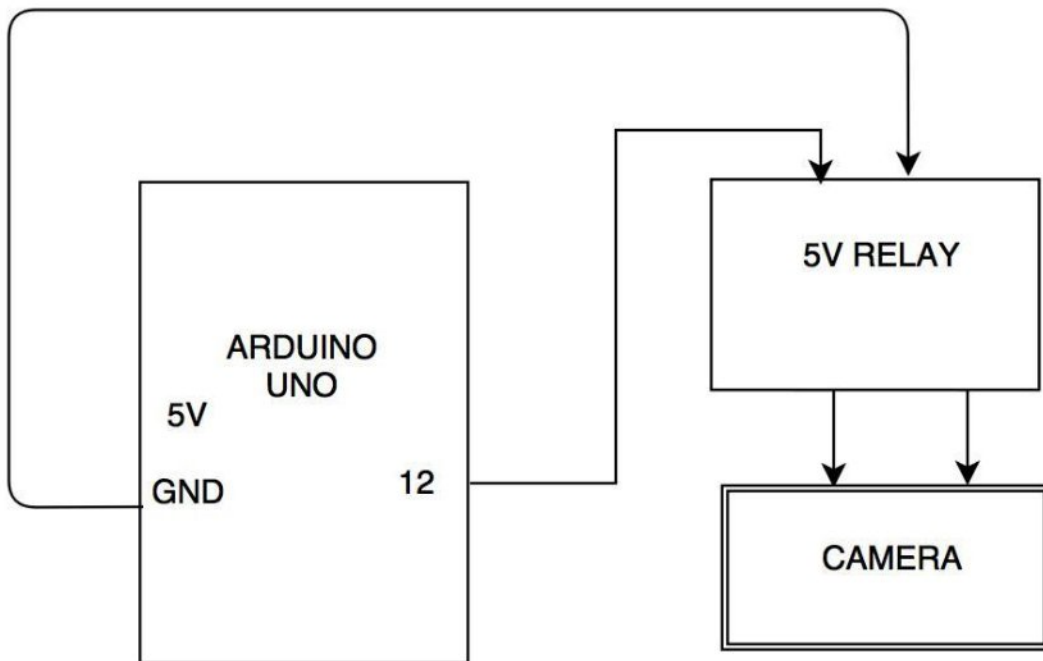
Figure 8: Arduino with 5V Relay

Here we have connected 5V relay with no 12 pin of arduino module. When laser is interrupted then 12 number pin will go HIGH and relay will connect with the camera, and camera will capture the interrupter.
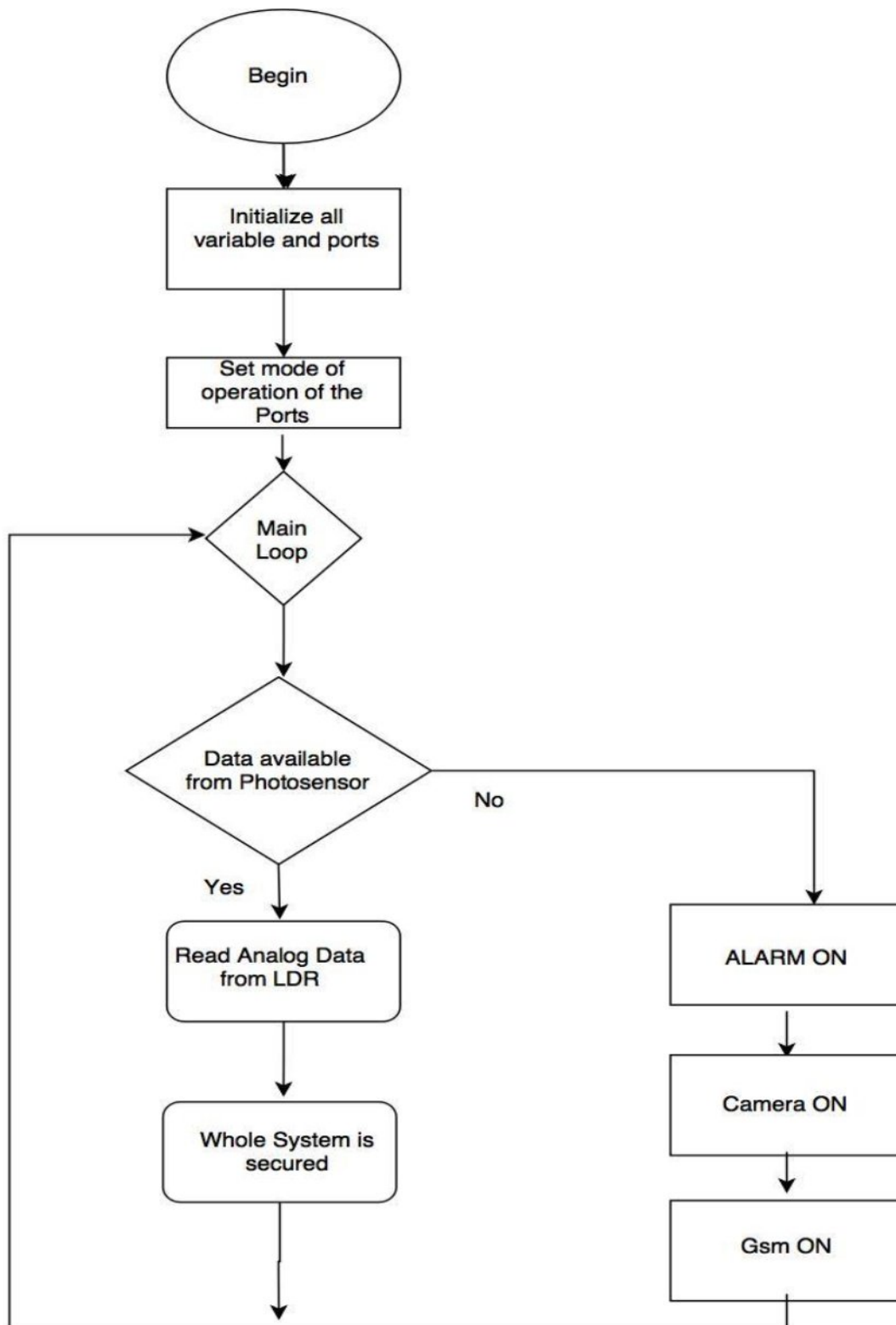
3.2.4Flowchart

Figure 9: Flow Chart

3.2.5 Code:

[code]

//When the digital pin 12 is low no SMS will be sent, when this pin is HIGH SMS will
//be sent to the number given to the variables remote Number
//Digital Pin 2 is used as RXD connected to TXD of GSM808
//Digital Pin 3 is used as TXD connected to RXD of GSM808

```
// Include the GSM library
#include <GSM.h>
#define PINNUMBER ""
// initialize the library instance
GSM gsmAccess;
GSM_SMS sms;
int dat;
void setup()
{
//  initialize serial communications and wait for port to open:
  Serial.begin(9600);
  pinMode(13, OUTPUT);
  pinMode(12, OUTPUT);
  pinMode(11, OUTPUT);
  while (!Serial) {
    ; // wait for serial port to connect. Needed for Leonardo only
  }
  Serial.println("SMS Messages Sender");
  // connection state
  boolean notConnected = true;
  // Start GSM shield
  // If your SIM has PIN, pass it as a parameter of begin() in quotes
  while (notConnected)
  {
   if (gsmAccess.begin(PINNUMBER) == GSM_READY)
    notConnected = false;
   else
   {
    Serial.println("Not connected");
    delay(1000);
   }
  }
  Serial.println("GSM initialized");
}
void loop()
{
```

```
//H Serial.print("Enter a mobile number: ");
char remoteNum[20]="01816709809";  // telephone number to send sms
//readSerial(remoteNum);

//security part


Serial.println("Waiting on the Switch");
dat=analogRead(A0);
if(dat>=300)// = digitalRead(12);
 {
   Serial.println("Secured");
   digitalWrite(13,HIGH);
   digitalWrite(12,LOW);
   digitalWrite(11,LOW);


 }
 else
{
 digitalWrite(13,LOW);
 digitalWrite(12,HIGH);
 digitalWrite(11,HIGH);
 delay(550);
 digitalWrite(11,LOW);

 char txtMsg[200]="Security Violated";
 //H readSerial(txtMsg);
 Serial.println("SENDING");
 Serial.println();
 Serial.println("Message:");
 Serial.println(txtMsg);
 // send the message
 sms.beginSMS(remoteNum);
 sms.print(txtMsg);
 sms.endSMS();
 Serial.println("\nCOMPLETE!\n");
 delay(1000);
 }
delay(1000);
 }
```
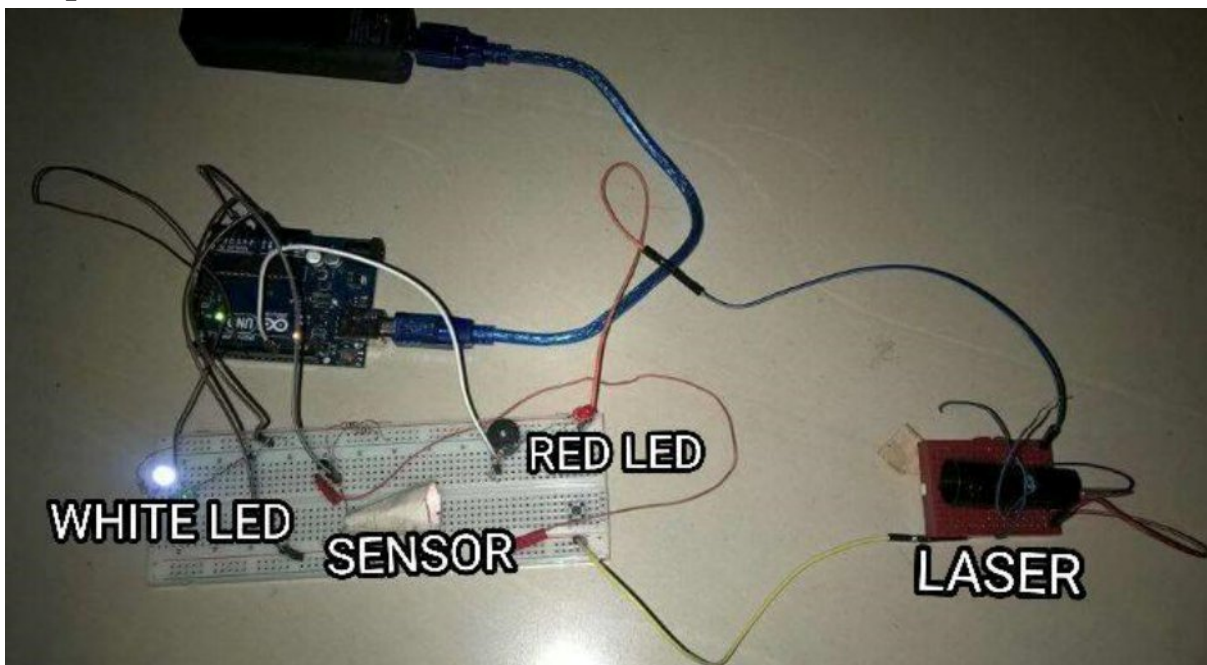
[/code]

Chapter-04
Results & Discussion

4.1 Hardware Results

The model is designed in bread board and all the components are connected as per the circuit diagram. The figures below shows the hardware connection and the output obtained.

Step 1: When laser communication is established white LED is on.

Figure 10: communication is established

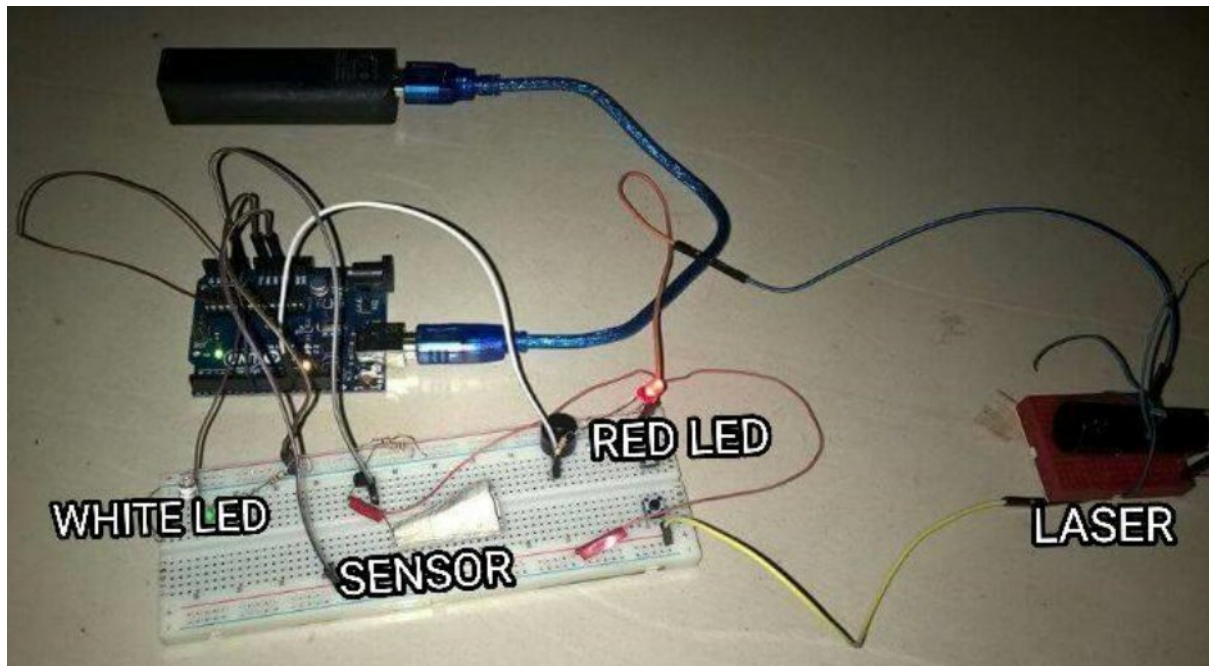**Step 2:** When laser is interrupted red LED is on

Figure 11: leisure is interrupted

Step 3: Arduino with GSM

Figure 12: Arduino to GSM module

Step4: Full hardware circuit diagram of security system

Figure 13: Total Security System

4.2Discussion

The security system is capable of controlling of the appliances from any place where GSM service is available. The combination of the hardware and software give the final design. There were some problems encountered in our project development which can be stated as under:

- Most home laser security systems are made of two parts: a basic alarm unit and an infrared motion detector. Motion detector is not used.
- With the development of operating system this type of security could be hampered.
- Unavailability of components in the local market.
- We have facing many problems for using GSM SIM808
- Coding issues also creates some problems.

Chapter-05

5.1 Conclusion:

The focus of this project is to develop a security system using the concept of Laser security and CCTV security and SMS security with GSM module. An electronic circuit is designed that start alarming when anyone interrupt the Laser and monitor a variety of home appliances with interface that can be plugged into GSM modem. The project is successfully developed and met the stated objectives. In addition, the system is very practical when the user is away from the place; through it the user get massage with the electrical device remotely as long as the mobile phone gets the coverage.

The Smart Security systems have many advantages. They are simple to install and can be used successfully inside or outside a home. Indoors, the sensors utilize normal power outlets and telephone jacks; outdoors, the sensors can be hidden beneath plants and bushes and will not harm lawns or other plants.

5.2 Future Work Scope:

We can upgrade our project by using CCTV high definition camera, Metal detector sensors for safe entry and unsafe entry , finger print sensor for controlling laser security system on/off to stop system hacking and a lots of modification we can do to upgrade this. This project has a lot of upgradable scopes.

REFERENCES

- https://www.modulight.com/applications-security/
- http://coral-home.over-blog.com/article-how-does-gsm-alarm-system-work-78700141.html
- http://circuitdigest.com/electronic-circuits/laser-security-alarm-circuit-diagram
- http://www.hkvstar.com/company-news/what-is-gsm-alarm-system.html
- http://alarmsim.com/index.html
- http://www.instructables.com/id/Protect-Your-Home-with-Laserbeams/
- http://www.asecurelife.com/reasons-to-install-home-security-system/
- http://www.rxpaper.com/
- https://en.wikipedia.org/wiki/Arduino
- https://www.arduino.cc/en/Guide/Introduction
- https://www.adafruit.com/product/2637
- http://www.hoperf.com/rf_transceiver/?gclid=CKvS95HGz84CFRcXaAod3QkNtg