J Component Final Report

Measurement and Instrumentation (EEE2002) Mini Project

Project title: **Electronic Eye Security System**

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Abstract:

Electronic eye describes the design and implementation of Door keeping using Microcontroller based security system for home and offices. It provides the user with efficient and reliable security system for Door watcher for home, offices and industries that supports the use of a sensor at the door to send the signals to control unit of electronic eye with buzzer alarm for security purpose. As soon as any intruder comes into the restricted area the alarm buzz and a security notification message will be sent to the desired person.

Keywords: Microcontroller unit, Electronic eye, Security System, Control Unit, PIR Sensor, Arduino, GSM module, AT commands.

Introduction:

Security is primary concern with day to day life and properties in our surrounding. Electronic eye is an emerging technology applies now a day in electronic security system. Using this we the tension of most of the people who generally afraid of leaving home alone get decreased since they'll be getting the time to time alerts.

Objective:

To implement this concept in vast range for security in maximum places since we all needs the security of our belongings.

Motivation:

Security concern is major problem of the present. Govt. and private agency spend millions of dollar in security. There is a great demand of electronic security systems which can be reliable, cheaper and affordable.

Project Description:

ELECTRONIC EYE is the electronic device that continuously watches if anyone is visiting our home. This project is about the circuit of electronic eye controlled security system.

Doorbell automatically start ringing & LED start flashing when any person is trying to enter into your home without your permission. And you will get a text notification on your mobile phone.

Components Used:

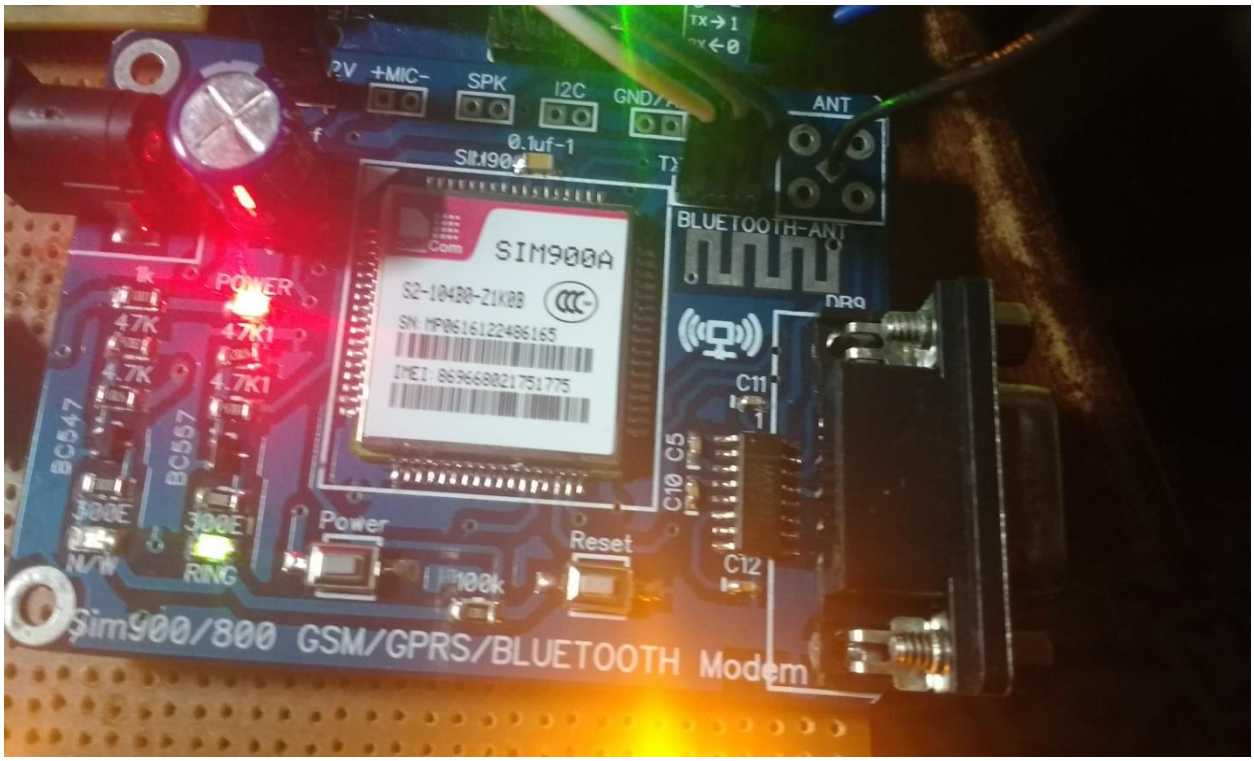
Passive Infrared (PIR) Sensor

Arduino UNO (microcontroller):

LED’s:

Piezoelectric Buzzer:

SIM900A GSM module:



Methodology:

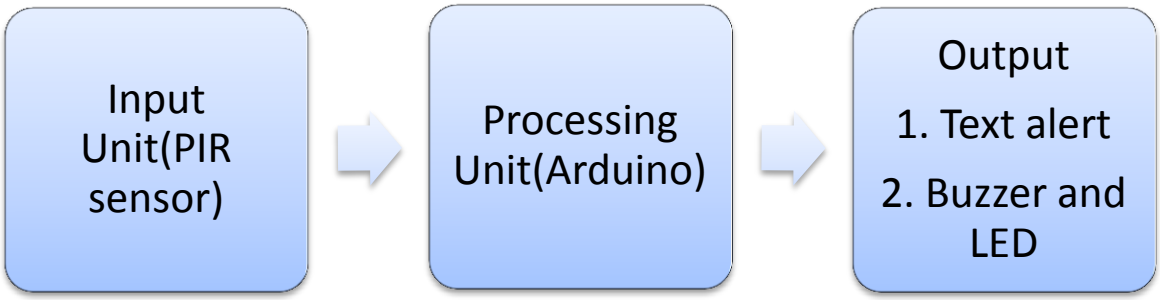
Early days with advancement of technology things are becoming simpler and easier for users. Automated systems/machines are being preferred over manual system. In this paper the basic definitions needed to understand the Project better and further defines the technical criteria to be implemented as a part of this project. Automation reduces the need of human work and also the use of control systems and information technologies reduces the need for human work in the production of goods and services. In the scope of industrialization, home automation is a step beyond mechanization. For machineries mechanization provided human operators with machinery to assist them with the muscular requirements of work, where automation greatly reduces the need for human sensory and mental requirements as well. Automation in security system plays an increasingly important role in the world economy. Automatic security systems are being preferred over manual system.

So, through this project we are going to learn the basics about the automation and we can implement the same it the future needs.

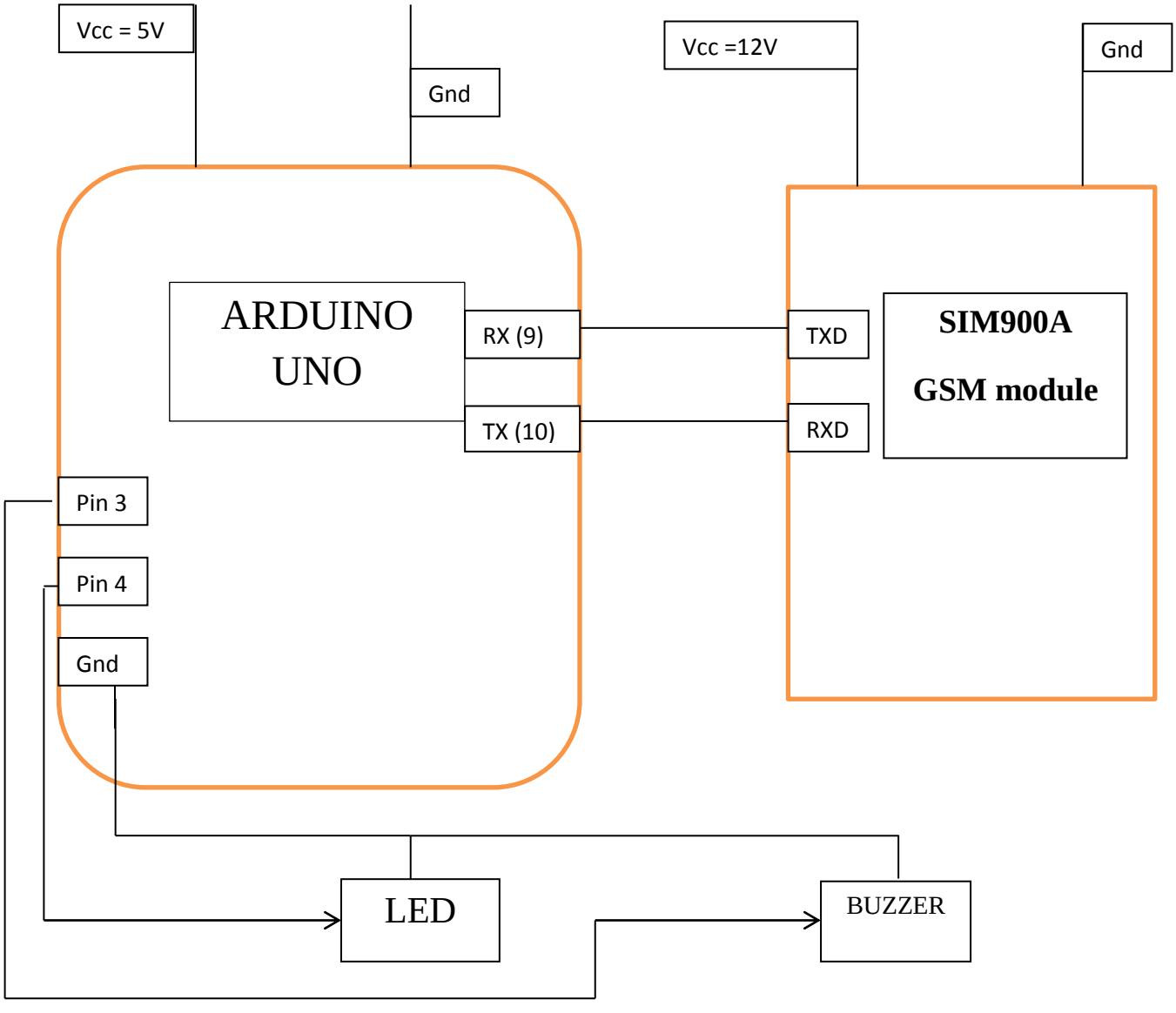
Software used:

Arduino IDE: It is an open source software and used for controlling microcontrollers ie. Arduino UNO here. It provides integrated development environment to explore the microcontrollers.

Block Diagram (Working Scheme):



Circuit Schematic:



Controlling GSM module:

We used SoftwareSerial library of Arduino to establish the Serial Communication with GSM module.

Arduino Commands:

For communication we have to use AT (attention) commands.

AT commands we used are mentioned below:

AT+CMGF=1:- AT command for text mode of GSM module

AT+CMGS=<mobile number>:- Set the mobile number to communicate with

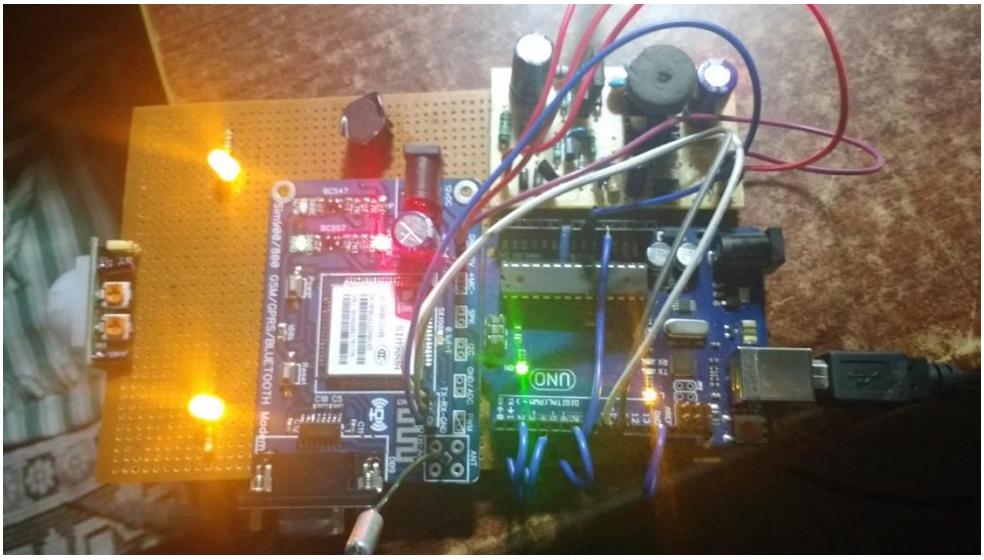
Arduino Code:

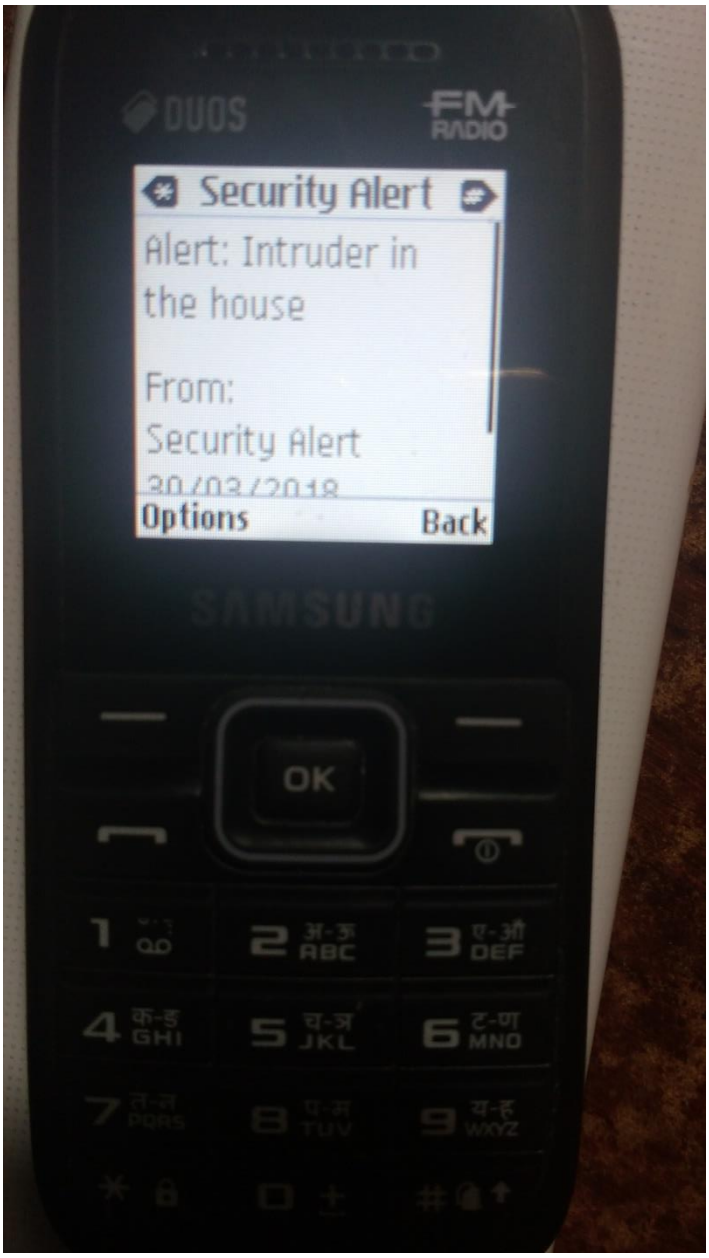
```
#include <SoftwareSerial.h>
SoftwareSerial SMS(9, 10);// rx(9) and tx(10)
                          // rx(9-arduino) connect to tx(gsm module)
                         // tx(10-arduino) connect to rx(gsm module)
int SensorInput = 7;
int led = 2;
int buzz = 4;

void setup()
{
  SMS.begin(9600);       // baud rate for gsm module
  Serial.begin(9600);    // baud rate for serial monitor
  delay(100);
pinMode(SensorInput, INPUT);
pinMode(led,OUTPUT);
pinMode(buzz,OUTPUT);
}
void loop()
```

```
{
  int x=digitalRead(SensorInput);
  Serial.println(x);
  if (x==1)
  {
    digitalWrite(led,HIGH);
    digitalWrite(buzz,HIGH);
    sendmessage();
    delay(30000);
  }
  else{
    digitalWrite(led,LOW);
    digitalWrite(buzz,LOW);
  }
   if (SMS.available()>0){// verify any bits which income through pins 9
and 10
   Serial.write(SMS.read());// write income data on serial monitor
 }

}
 void sendmessage()
{
  SMS.println("AT+CMGF=1"); //AT command for text mode of gsm module
  delay(1000);
 SMS.println("AT+CMGS=\"+919493498055\"\r"); // your mobile number
  delay(1000);
  SMS.println("Alert: Intruder in the house");// the text you want to send
  delay(100);
  SMS.println((char)26);// ASCII code of CTRL+Z
  delay(1000);
}
```

Project Outcome:

We gained the practical knowledge about the communication system, Software analysis and designing.
After assembling we found the system works properly and we are getting the desired output ie. The buzzer and the LED glow with attention text in the mobile phone.
The outcome of the project is workable, electronic eye controlled security system which can be practically implemented in our day to day life.





Advantages of using the GSM based system:

Reliable
User Friendly
Further can be used as controlling the electronic systems
Can be used for home security ie. LPG leakage sensing, or for trapping system
Can control most of the items wirelessly

Conclusion:

The electronic eye controlled security system is cost effective solution for our security need of present time. The system is cheap and can be manufactured in small size, which can be placed hidden from intruders, thus safeguarding the house, cars, and private properties.

References:

- IEEE Research paper on PHOTOSENSITIVE SECCURITY SYSTEM FOR THEFT DETECTION AND CONTROL USING GSM TECNOLOGY. https://ieeexplore.ieee.org/document/7058229/?reload=true

- Smart Home Automation: GSM Security System Design & Implementation. https://www.researchgate.net/publication/275769946_Smart_Home_Automation_GSM_Security_System_Design_Implementation