



INTERNATIONAL JOURNAL OF ADVANCE RESEARCH, IDEAS AND INNOVATIONS IN TECHNOLOGY

ISSN: 2454-132X

Impact Factor: 6.078

(Volume 7, Issue 3 - V7I3-1432)

Available online at: <https://www.ijariit.com>

Alarm switch for security

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ABSTRACT

The design and implementation of a switch alarm for security used in this project to prevent the number of crimes from increasing every day is presented in this document. Something must be in place to keep us safe. We're all aware of the high-end security systems available on the market, but they're not for everybody. As a result, we hope to provide a solution by constructing a cost-effective electronic device capable of detecting intruder motion and activating the alarm. The main goal of this project is to incorporate a security framework that will provide users with increased privacy, protection, and peace of mind.

Keywords: Arduino UNO, P.I.R Sensor Module, GSM Module, Programming using C language.

1. INTRODUCTION

As we all know, the function of a switch alarm is to help us protect our homes from burglars, and it can also be used for security purposes in banks and other businesses. This is a simple motion-activated alarm that detects when someone enters the room. It triggers a siren when an intruder is identified. Our bodies emit radiant heat energy, which is impossible to detect to the bare eyes. However, an electronic sensor can detect it. This type of sensor is made of piezoelectric crystalline material. The P.I.R. Motion Sensor Module is used in this project as an infrared sensor that produces an electric charge when exposed to heat and sends a signal to Arduino. Arduino shows the status and starts ringing the speaker and glowing the L.E.D. based on the amount of infrared in front of the sensor. On Arduino, a simple program monitors the sensor to see if something has changed or if a new object has been identified.

Pictorial Representation



i) Office Robbery



ii) House Theft



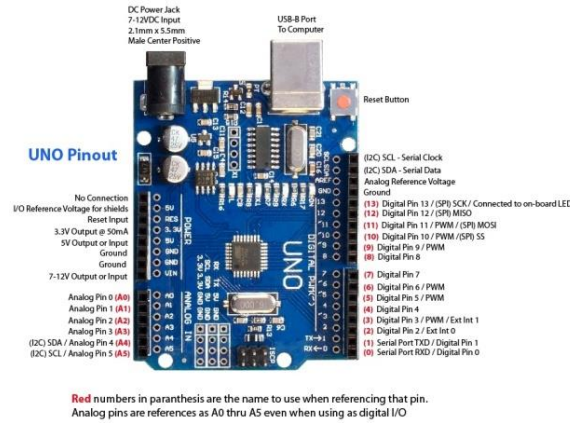
iii) Bank Robbery

2. MECHANISM

2.1. Arduino UNO

The Arduino Uno is a microcontroller board designed by Arduino and focused on the Microchip ATmega328P microcontroller. For attaching to expansion boards and other circuits, the board has both a number of optical and analog input/output pins. The

board has 14 digital I/O pins (six of which can output PWM) and 6 analogue I/O pins, and it can be programmed with the Arduino IDE (Integrated Development Environment) via a type B USB cable. It is operated by a USB cable or an external 9-volt battery and has a voltage range of 7 to 2 volts.



Arduino Uno

2.2. P.I.R Sensor Module

PIR sensors sense movement and are often used to assess whether or not an individual has reached or left the sensor's range. They're lightweight, cheap, low-power, simple to use, and they don't wear out. The PIR sensor is usually installed on a printed circuit board, which also features the electronics used to decode the sensor's signals. The entire assembly is normally housed in housing and installed in a position where the sensor can track a large area.



P.I.R. Sensor

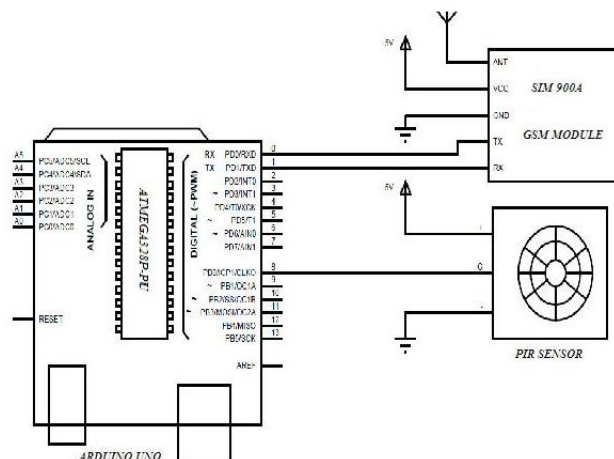
2.3. GSM Module

The GSM/GPRS module SIM 900A has an integrated RS232 interface. It has a dual-band GSM/GPRS system that operates at 900/1800MHz. The modem can be linked to a PC or a microcontroller via serial cable using RS232. This module allows you to make phone calls, send SMS messages, and access the internet. We will use the microphone and headphones built into the device to make and accept calls.

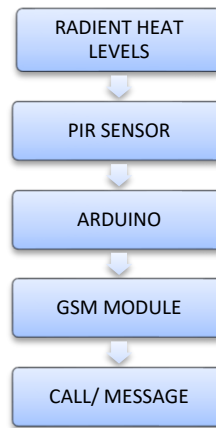


GSM Module

3. PROPOSED MODEL



4. FLOWCHART



5. ALGORITHM

STEP 1: Start

STEP 2: The PIR sensor measures motion by comparing the thermal or radiant heat levels released by objects in the vicinity

STEP 3: Then the performance of the PIR sensor is high when it senses some motion and the Arduino recognizes this.

STEP 4: The Arduino then connects to the GSM module via digital signals

STEP 5: GSM module make a call to the reorganized mobile number.

STEP 6: End

6. WORKING PRINCIPLES

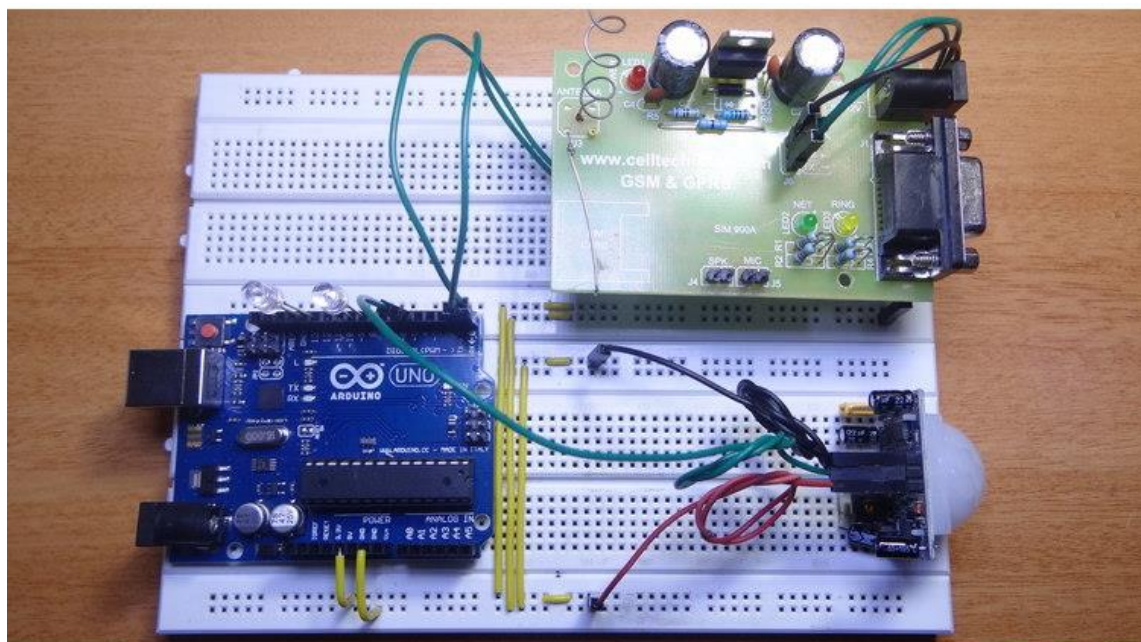
The PIR sensor measures motion by comparing the thermal or radiant heat levels released by objects in the vicinity. When the PIR sensor senses motion, the output goes high. A typical PIR sensor has a range of approximately 6 meters (30 feet).

A warm-up time of 20 to 60 seconds is needed for proper PIR sensor activity. Since the PIR sensor has a settling period during which it computes and stabilizes the ambient detector depending on the environment, this is needed. Throughout that time, there need to be very hardly any activity in front of the sensor.

The performance of the PIR sensor may not be accurate if the sensor is not given adequate calibration time. The performance of the PIR sensor is high when it senses some motion. The Arduino recognizes this. The Arduino then connects to the GSM module via digital signals to make a call to the reorganized mobile number.

PIR sensors have a high performance when they sense motion, which is something to keep in mind. When there is motion, the sensor's response fluctuates, causing the microcontroller to conclude there's really no motion. This issue must be resolved in Arduino programming by ignoring low performance signals that last less than a certain period of time. This is achieved by assuming steady motion in front of the PIR sensor.

7. EXPERIMENTAL SETUP



8. APPLICATIONS

This type of motion sensor warning device can be used to improve security in banks, workplaces, and even important establishments such as military bases. This system is simple to install for home use. The use of a protection framework improves the privacy and security of the user.

9. CONCLUSION

Finally, we produced a low-cost emergency turn alarm. We discovered that the model that was developed was in good working order after conducting this experiment. A GSM-based home security alarm system is built using Arduino, a PIR motion detector sensor, and a GSM unit. When the machine is turned on, it constantly scans for motion and makes a phone call to the owner if motion is found. This system only has an intruder warning, but it can be updated to include other security alert systems such as fire and smoke. This kind of motion sensor warning device can be used for security purposes in banks, workplaces, and even important establishments like military bases. This system is simple to set up for domestic use. The use of a protection framework improves the user's privacy and security. We're attempting to characterize better security options for customers, and then determining whether or not such things can be accomplished efficiently.

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