Electronic Eye controlled Security System

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Abstract: Electronic eye controlled security system is also called magic eye. As the automation is emerging technology these days, just imagine a door bell that automatically rings when a person visit your home. This also provides security when any person is trying to enter into your home without your permission. Electronic eye controlled security system is the electronic device that continuously watches if anyone is visiting your home. This circuit can be divided into two parts. One is the power supply and the other is logic circuit. In the power supply 9V supply is converted to the 5V .The logic circuit operates the buzzer when any shadow falls on it. The main principle of the circuit is to ring the doorbell when there is any person at the entrance. Light on the Light Dependent Resistor (LDR) determines whether a person is present or not. When there is any object at the entrance, LDR is in dark and buzzer starts ringing and the LED starts glowing.

Security is primary concern with day to day life and properties in our environment. This paper describes effective security alarm system that can monitor image capture system with the help of VB application. As soon as door opens sensor gets activated with image captured with help of Web camera in PC captured image gets saved within VB application. It also serves function of sensing and detecting false intrusion (using input sensory device and gives early warning devices alarm and remotely controlled security system). The term false intrusion here is used to mean any form of attempt to gain entry without proper pre design protocols.

Robbery has become common in our day to day life. Countering it, Security systems with Web cameras are commercially available. These systems are powered entire time and they capture videos, images throughout the day and hence consuming large amount of electricity. In most the places remote surveillance is needed. These system captured image as door opens alarm gets on with transferring data through microcontroller control unit with image can be seen on PC or Laptop with VB application software.

Keywords : regulator IC 7805, diode 1N4007, Capacitor IC 555, Light Dependent Resistor (LDR), buzzer, LED

Objectives

The main concept of this project is to design an Electronic Eye Security Controlled System for where the security is needed like homes, malls, banks, etc. The proposed system uses a light dependent resistor (LDR) to detect the light intensity and generates an alarm sound for thefts, and also turns ON the lights.

This system is placed inside lockers and cash boxes in such a way that if a person or theft tries to open the door lock and uses a torch light to treasure the valuable things. The light falls on the electronic eye and immediately gives a command to the buzzer.

This project can be designed to secure lockers and cash boxes where security is needed like homes, banks, etc. This system uses a 14-stage-ripple-binary counter to detect the light intensity through the LDR (light dependent resistor). The relay driver is attached to the binary counter to switch various loads. The buzzer is connected to the circuit with the help of a transistor to give a sign to the users.

When an intensity of light drops on the LDR then the LDR resistance will drop, and thus, the ripple counter activates the transistors to make the buzzer ON and load connected to the relay to specify a theft.

Introduction

Security is primary concern with day to day life and properties in our environment. This paper describes effective security alarm system that can monitor image capture system with the help of VB application. As soon as door opens sensor gets activated with image captured with help of Web camera in PC captured image gets saved within VB application. It also serves function of sensing and detecting false intrusion (using input sensory device and gives early warning devices alarm and remotely controlled security system). The term false intrusion here is used to mean any form of attempt to gain entry without proper pre design protocols. Robbery has become common in our day to day life. Countering it, Security systems with Web cameras are commercially available. These systems are powered entire time and they capture videos, images throughout the day and hence consuming large amount of electricity. In most the places remote surveillance is needed. These system captured image as door opens alarm gets on with transferring data through microcontroller control unit with image can be seen on PC or Laptop with VB application software.

Security system has been concern of worldwide. As technology is emerging every second, abundant home based or office based or industries based security systems have been developed and implemented to keep welfare security safe. Home security system is an essential mean of protecting homes from illegal invasion and false intrusion. A general home security system consists of CCTV, Web

cameras, Buzzer alarm. Web camera or CCTV capture image in 24 hours to identify what goes around the house and in the house around the door which holds evidences if there is false intrusion in house breaking around the door of captured areas. The power consumption is also considerably large as camera is always on to keep recording nonstop and for capturing images. The power consumption is considered as concern of installing a security system.

Security is alarming every individual to safe guard their belongings and properties[1]. Reducing the risk of accident or protecting against deliberate attack in our social environment is a function of the degree of safety. The theft chances are increasing with the advancement of technology. Security persons are also unable to curtail the theft chances due to human mistakes. An electronic eye can curtail the theft attempt by triggering the buzzer automatically and also sending the message quickly to the concerned persons to make them alert. The communication part can be achieved with the support of Arduino. The automation of the security monitoring system using electronics assembly is enabling to develop a mechanism to reduce the theft chances at any desired points. Robbery has become common and it is increasing day by day.To counter it, high resolution security cameras are available for commercial purpose. These systems are powered entire time and they record the movements of the person throughout the day. A camera based security system requires the presence of a human or a security personnel at all time. This system is really effective only when someone is monitoring the image captured by the camera. The personnel needs to be alert all the time and ready to take necessary action.

In most of the places remote surveillance is needed. This system after sensing the presence or any unusual movement sounds the alarm and also gets on with transferring data through microcontroller control unit to mobile phone via arduino. As we know technology is prominent every second, plentiful home based or office based security systems have been developed and implemented to keep welfare security safe. Usually a home security system consists of CCTV, Web cameras, Buzzer alarm. Web camera or CCTV captures images 24 hours a day to monitor the house. Using a preferred safety and security measures or technique depends on the absolute environment of application.

Block Diagram

Here is a smart security system for your cash box that stops the theft attempt by activating an emergency beeper. A battery is provided to supply the power to the circuit with the help of a switch. When cash box is closed LDR in dark state resets the IC CD4060 which goes low and has no impact on BC547 results Relay in off condition. When LDR in bright mode, the counter will start counting and oscillates resulting both transistors in ON condition indicating load ON and buzzer will blow. This circuit is mainly useful at Banks, Hotels, shopping malls, household appliances etc.

The block diagram of the electronic eye security control system mainly includes Battery, Slide switch, LDR, Ripple Counter IC, Transistor, Buzzer, Relay, Bulb, Diode, Transformer, Capacitor and Resistor. The main principle of this Electronic eye security control system project is to give a buzzer when there is any person at the door entrance.When the light falls on the LDR tells whether a person at the door entrance is present or not. Whenever there is any object placed at the entrance of the door, light dependent resistor is in dark and gives the buzzer and the LED starts blinking.
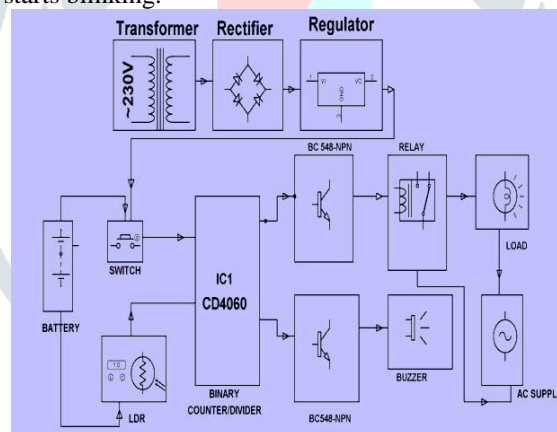

Fig I. Block Diagram of Electronic Eye Controlled Security System

Circuit Design

The main principle of the circuit is to ring the door bell when there is any person at the entrance. In order to detect a person, an LDR is used as the sensor. Light on the LDR determines whether a person is present or not. When there is any object at the entrance, LDR is in dark and buzzer starts ringing and the LED starts glowing.
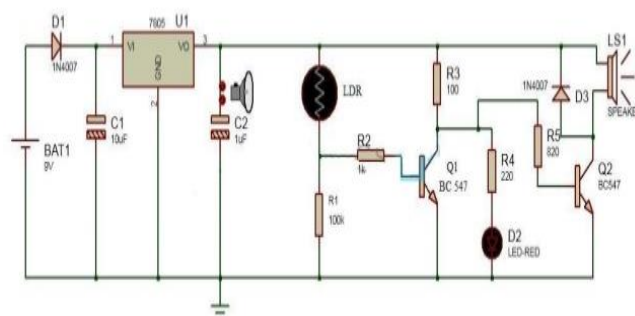

Fig II- Circuit Diagram of Electronic Eye Controlled Security System

Circuit Components

- 7805 Regulator
- Resistors – 220Ω x 2, 1KΩ x 2, 100KΩ
- 1N4007 PN Diode
- Capacitors – 1µF, 10µF
- Transistors – BC 547 x 2
- Light Dependent Resistor (LDR)
- Buzzer
- LED
- Bread board
- Connecting wires
- 9V battery

This circuit can be divided into two parts. One is the power supply and the other is the logic circuit. In the power supply circuit, a 9V supply from a battery is converted to the 5V .The logic circuit operates the buzzer and an LED when any shadow falls on the LDR.

Design of Power Supply Circuit

Power supply circuit consists of battery, diode, regulator and capacitors. Initially a 9V battery is connected to the diode. Diode used here is a simple P-N junction diode of 1N4007 series. In this circuit, 1N4007 is connected in the forward bias condition.
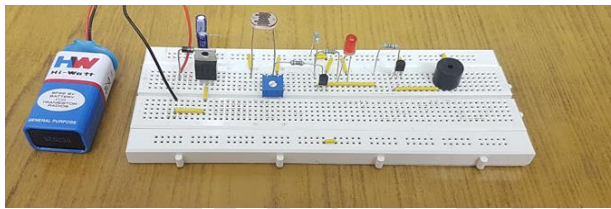

Fig III- Power supply circuit

Design of Logic Circuit

The logic circuit mainly consists of Light Dependent Resistor, transistors, a buzzer, an LED and a few passive components. A 100KΩ resistor is connected in series to the LDR in a voltage divider fashion. Light dependent resistor will have resistance in mega ohms when it is placed in the dark. This resistance value will decrease gradually when it is placed in the light. Thus, there is a variation in the series resistances.When the LDR is in dark it has high resistance and produces the logic high value at the output. When the LDR is in light, the resistance value of the LDR decreases and at the output it gives logic low voltage.

The output of the voltage divider is fed to a transistor which inverts the input from the LDR. The second transistor drives the buzzer. The diode is placed for protection.Buzzer used here is a 5V magnetic buzzer. It has two pin at the output. One pin is connected to the supply and the other pin is connected to the Collector of the second Transistor. LED is used for indication only. When the output from first transistor is high, the buzzer starts ringing. Led is also turned on.
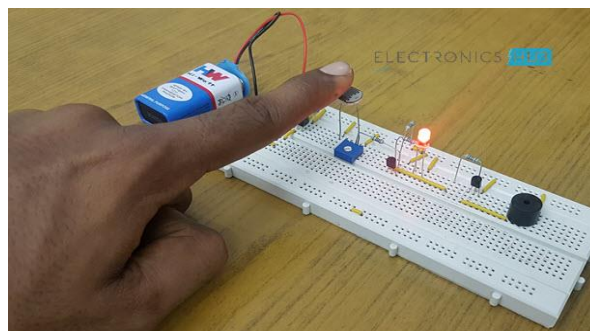

Fig IV- Logic Circuit

Operation of the Circuit

Initially, connect the circuit as shown in the circuit diagram on a bread board. Now connect the supply voltage of 9V using a battery. Place the Light Dependent Resistor in light. You can observe no sound is produced from the buzzer. Place the LDR in dark and the buzzer starts making sound. Also the LED connected to the buzzer will be turned ON. As the intensity falling on the LDR increases sound produced by the buzzer increases.
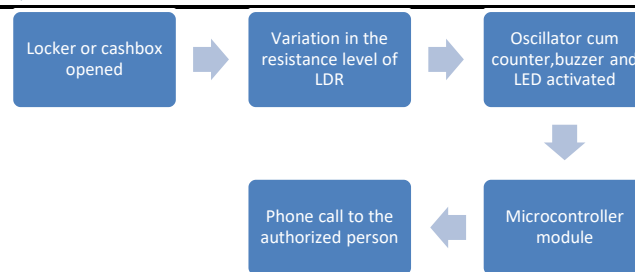
Fig V. Block Diagram Depicting the Working Of the Electronic Eye Security System

It is built around 12V-0-12V, 750mA secondary transformer (X1), 1N4007 rectifier diodes (D1 through D3), LDR (LDR1), filter capacitors C1 and C2, 5V voltage regulator 7805 (IC1), dual comparator LM393 (IC2), 12V multi-tone high-gain buzzer (PZ1), transistor TIP122 (T1) for driving PZ1, transistor BC547 (T2) for driving 12V, 1C/O relay for controlling an electrical appliance or bulb (B1), and 10-kilo-ohm potmeter VR1
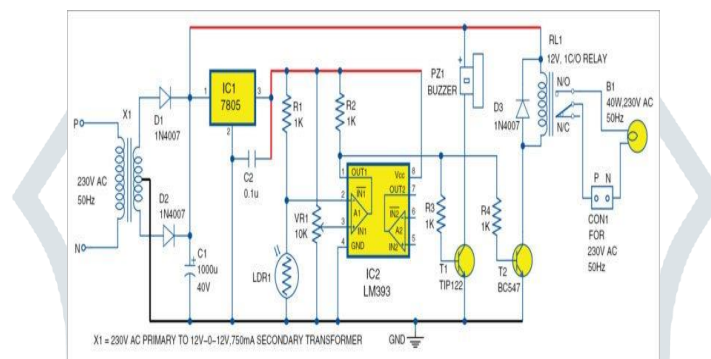

Fig VI- Circuit diagram of the Security System

Results and Discussions

The developed working model is tested in real time applications. This mechanism is applied by us at our home to test the reliability of the product. The Light Dependant Resistor or the photoresistor sensor detected the entry of the person and the state of the sensor is communicated to the authorized person"s mobile with the support of arduino UNO board. The state of the light intensity levels in the specified room is also able to monitor with the developed model. If any unauthorized person is trying to open the personal loc- er, a switch provided to the locker cause to send the phone call to the authorized person. Alerting the security depends upon the situation. The results produced are forced to rely on the proposed methodology to be implemented for the security levels of the home and even banking systems.With the successful development and testing of this model, the following can be maximally prevented by incorporating the electronic eye security system:

   o   Crime can easily be prevented.
   o   Murder/non-negligent manslaughter
   o   Negligent manslaughter
   o   Robbery

Furthermore, this Electronic eye security control system project can be enhanced by using a microcontroller and a GSM modem. The GSM based home security system can be interfaced with the microcontroller to send & receive an SMS to the authorized person in case of robbery.

Therefore, this is all about electronic eye controlled security system using LDR, and the applications of this project mainly include door bell circuits, garage door opening circuits and security applications.

Conclusion

The method discussed in this paper has achieved the target to monitor the locker's in homes using the SMS-based system satisfying the user needs and requirements. From the convenience of a simple cell phone, a user is able to monitor virtually the lockers in the house. The study produced more favorable findings to implement this kind of security support to home and banking systems. Future works may be done on enhancing the security of this system. In future, this system can be powered with wireless spy camera system to transmit the status of the security levels to the authorized persons. Image and data processing is proposed to be implemented in near future.

Electronic Eye controlled Security System device utilizes binary counter as input. It has been successfully demonstrated that, this will serve as a device for providing security. It provides the user with efficient and reliable security system for houses, malls etc; that supports the use of a binary counter which sense the intensity of light through LDR and activating the buzzer indicating a theft.

Hence, LDR based Electronic Eye for security system, device that utilizes Sensor input as key for users' access. It has been successfully demonstrated that, this will serve as a device for securing personal wares in environments where it is deployed against intruders by setting off appropriate alarm for every door opens. Therefore, it can be said that the objectives have been met, hence conclusion is made that this is a successful undertaking design and implementation of Door image capture using LDR based security system for home and offices. It provides the user with efficient and reliable security system for Door image capture for

home, offices and industries that supports the use of an sensor at the door to send the signals to control unit of electronic eye with buzzer alarm for security purpose with image capture as soon as the door opens with image capture at the output of laptop or PC with VB application output.

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, shops, cars and private properties.

Application and Scope for Future Work

➢ Voice Integration in the security system.
➢ Image integration and processing.
➢ Biometric Solution (thumb scan, face scan).
➢ Can be used in medical for disabled and handicapped.
➢ This can be used in doorbell circuits.
➢ This can be used in garage door opening circuits.
➢ Electronic eye can be used in security applications.
➢ It can be augmented by implementing it by using a GSM modem and a microcontroller. The GSM modem can be interfaced to the microcontroller to send and receive SMS to the user in case of burglary.
➢ Android app will also develop for easily use. In Android app there will be direct buttons for on or off the system or to receive the OTP. For more security purpose camera module can also be implemented on the system. If any person attempt to enter in home with more than three time wrong password then at that time camera module will be activated. And camera module will capture the image of person who trying to attack on system.
➢ Future Enhancements Future suggestions of this project are very great considering the amount of time and resources it saves. This system can be used as reference or as a base for realizing a scheme to be implemented in other project of greater including the audiovisual camera by sending the captured images to an email instantly. The project itself can be modified to achieve a complete home automation system which will then create a motion system which will then create a platform for user to interface between himself and his household. In this system GSM shield is a very important part for communication between mobile phone and microcontroller GSM Shield required the SIM card, due to range fluctuation or busy network sometimes GSM shield will not work properly.

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