ELECTRONIC EYE: THE SECURITY SYSTEM

Koushik Paul, Mohit Sharma, Abhas Chandra Chakraborty, Rimpi Datta

Department of ECE, Narula Institute of Technology, Kolkata, India

ABSTRACT

This paper presents the design of the low cost Electronic Eye Security system using LDR. Security is one of the most vital concerns of our daily life and properties in our environment. Electronic Eye is also known as magic eye. It makes sure that there is a constant watch on your doors. Imagine if you are alerted each time someone is trying to enter your home or work place. This also provides security when any person is trying to enter into your home without your permission. This helps you to take precaution before the damage has occurred. It is one of the most helpful devices in today's security system. 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.[2]

Keywords: LDR, Electronic Eye, Security system.

Cite this Article: Koushik Paul, Mohit Sharma, Abhas Chandra Chakraborty, Rimpi Datta, Electronic Eye: The Security System, *International Journal of Electronics and Communication Engineering and Technology*, 10(5), 2019, pp. 5-8.

<http://iaeme.com/Home/issue/IJECEET?Volume=10&Issue=5>

1. INTRODUCTION

The circuit has two major parts. One being the power supply unit and the other is the logic unit. In the power supply unit 5 volt of power is obtained after its conversion from 9 volt. The logic unit consists of a Buzzer and Light Dependent Resistor (LDR). The logic unit works when a person is near the door. Light on the LDR determines the presence or absence of a shadow near the security system. When a shadow falls on the LDR, the sensor senses the absence of light and the buzzer goes off and the LED glows. 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.[4]

2. HARDWARE COMPONENTS REQUIRED

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

Initially we have to connect the circuit as shown in the circuit diagram on a bread board. Then have to connect the supply voltage of 9V using a battery. After that we have to Place the Light Dependent Resistor in light. You can observe no sound is produced from the buzzer. We have to also 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.

Figure 1 Circuit diagram of Electronic Eye based Security system

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.

The main purpose of the diode in this circuit is to protect the circuit from reverse polarity i.e. to protect the circuit if by any chance the battery is connected in reverse polarities. So, the P-N junction diode connected in the forward bias allows the current to flow only in one direction and thus the circuit can be protected. There is some voltage drop across the diode. A voltage of 0.7V is dropped across the diode.[6]

A regulator is used for regulating the output voltage of the circuit. The regulator IC used here is 7805. 78 represents the series and 05 represents the output voltage. Thus a voltage of 5V is produced at the output of the regulator. Two capacitors are used before and after the regulator. These two capacitors eliminate the ripples. Thus a constant voltage is produced at the output of the regulator, which is applied to the logic circuit.

Figure 2 Hardware Hardware setup of Electronic Eye based Security system

The logic circuit mainly consists of Light Dependent Resistor, transistors, a buzzer, an LED and a few passive components. A $100K\Omega$ 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.[4]

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.

3. RESULT ANALYSIS

Hardware Implementation

Our working model is tested in real time applications. With the successful development and testing of this model This mechanism is applied by us at our home to test the reliability of the product. The Light Dependant Resistor 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 door, 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.[1]

4. CONCLUSION

With the successful development and testing of this model, Crime can easily be prevented. Murder/non-negligent manslaughter o Negligent manslaughter o Robbery. The method discussed in this paper has achieved the target to meet its objectives of sensing the presence of an object when the shadow falls on the LDR sensor and this could be used for security purposes.

The study produced more favorable findings to implement this kind of security support to home and banking systems. Future works may be done by adding an arduino UNO board. That will help in communicating with the concerned owner and security team through mobile phones. This will enhance 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.[3] Image and data processing is proposed to be implemented in near future.[5]

REFERENCES

- [1] Shahriyar, R., Hoque, E., Sohan, S. M., and Naim, I, “Remote Controlling of Home Appliances using Mobile Telephony”, International Journal of Smart Home, Volume 2, Number 3, pp.37-54, 2007.
- [2] Jer-Vui Lee, Yea-Dat Chuah and Chin-Tin Chai, A Multilevel Home Security System, International Journal of Smart Home, Vol. 7, No. 2, pp. 49-60, March, 2013
- [3] Nandeesh, G.S., Srinivasalu Reddy, B. and Sunil Kumar, K.M, Intelligent security system for industries by using GPS and GSM. Int. J. Adv. Res. Comp. Sci. Technol, 2014, 2(1), pp.119-121.
- [4] Saurabh Vinayak Lawate and M. S. Al, Electronic Eye for Security System.
- [5] Alkar, A. Z., and Buhur, U, An Internet Based Wireless Home Automation System for Multifunctional Devices, IEEE Consumer Electronics, 51(4), pp. 1169-1174.
- [6] Bangali, J. and Shaligram, A Design and implementation of security systems for smart home based on GSM technology. Int. J. Smart Home. 7(6): 201-208, 2013.