

Electronic Eye Controlled Security System

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Abstract: Here is a smart security circuit for your cash box that towards the theft attempt by activating an emergency beeper. A battery is provided to supply the power to the circuit with the help of 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 counter will start counting and oscillates results both transistors in ON condition indicating load ON and buzzer will blow. This circuit is mainly useful at Banks, Hostel, Shopping malls, Household appliances ...etc.

Keywords: Resistors, ID-CD4060, LDR, Battery, Transistors, Buzzer, 7805 IC voltage Regulator, IN4007PN Diode, Capacitor, LED, Push button switch, Breadboard, Connecting wires.

1. Introduction

In this project, we will see a simple home security application called Electronic Eye Controlled Security System using LDR as the main sensor and a few other components. Electronic eye is also called magic eye. As the emerging technology these days. The main aim of this project is used to provided security system cash boxes, lockers in malls, jeweler shops, homes and banks. Now a day's automation is a developing technology. Just imaging a doorbell 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 is the electronic device that continuously watches if anyone is visiting your home.

2. Circuit diagram of electronic eye controlled security system

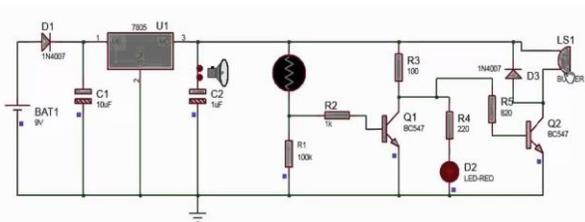


Fig. 1. Circuit diagram

A. Circuit components used

1) Resistors

Resistors is a passive to –terminal electrical component that implements electrical resistance as a circuit element. The ratio of the voltage applied across a resistors terminal to the intensity

of current through the circuit is called as resistance. The relation is represented by ohms' law: $V=IR$.

2) IC-CD4060

IC-CD4060 is a ripple binary counter /divider. It consists of an oscillator section and 14 ripple carry binary counter stages. The oscillator configuration allows design of either RC or crystal oscillator circuit. A RESET input is provided which reset the counter the all 0'S state and disables the oscillator. All

counter stages are master slave flit-flops. All inputs and outputs are fully buffered. Schmitt trigger action on the input pulse line permits unlimited input pulse rise and fall times.

Features

- High voltage type (20v rating)
- Common Reset
- 12 MHz Clock Rate at 15V
- Fully Static Operation
- Buffered inputs and outputs
- Schmitt Triggers input pulse lines.

3) LDR

A photo resistor or light dependent resistor (LDR) is a resistor whose resistance decreases with increasing incident light intensity .it can also be referred to as photo conductor. If light falling on the device, the photons absorbed by the semiconductor give bound electrons enough energy to jump into the conduction band. The resulting free electron (and its hole partner) conduct electricity, thereby lowering resistance.

4) Battery

An electrical battery is a combination of one or more electrochemical cells, used to convert stored chemical energy into electrical energy. The battery has become a common power source for many household, robotics and industrial application. Large batteries provide stand by power for telephone exchange or computer data centers.

5) Transistor

The BC548 transistor is an NPN Epitaxial silicon transistor. The BC548 transistor is a general –purpose transistor in small plastic packages. It is used in general –purpose switching and amplification BC848/BC548 series 45 volt, 100 MA NPN general- purpose transistor. Whenever base is high then current start flowing through base and emitter and after that only current will pass from collector to emitter.

6) *Buzzer*

This buzzer is a piezo type audio signaling device, which has a piezo element and an oscillating circuit inside which oscillates the piezo brass base plate, which when given voltage difference produces sound of a predefined frequency.

Features

- These high reliability piezo buzzers are applicable to general electronics equipment.
- Compact, pin terminal type piezo buzzer with 4 KHz output.
- Pin type terminal construction enables direct mounting on to printed circuit boards.

7) *7805 IC voltage regulator*

The ac power supply gets converted into constant dc by this circuit. By the help of voltage regulator dc, unregulated output will be fixed to a constant voltage. The circuit is made up of linear voltage 7805 along with capacitor and resistor with bridge rectifier made up from diodes. ICs regulator is mainly used in the circuit to maintain the exact voltage which is followed by the power supply. A regulator is mainly employed with the capacitor connected in parallel to the terminal and the output terminal of the IC regulator

8) *IN4007 PN Diode*

A diode is device which allows current flow through only one direction. That is the current should always flow from the anode to cathode. For IN4007 diode, the maximum current carry capacity is 1 ampere it withstand peaks up to 30 ampere. Hence we can use this in the circuits that are designed for less than 1 ampere. The reverse current is 5 micro ampere which is negligible. The power dissipation of this diode is 3W.

9) *Capacitor*

A capacitor is a passive two terminal electronic components that stores electrical energy in and electric field. In a way, a capacitor is a little like a battery. Capacitor is basically two conductor separated by a dielectric.

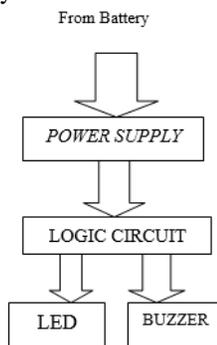


Fig. 2. Block diagram

10) *LED*

A light emitting diodes (LED) is a semiconductor light source that emits light when current flows through it. It is a p-n junction diode that emits light when activated. The two terminal (anode and cathode) of a LED when connected to a voltage source in the correct polarity, may produce lights of different

colour, as per the semiconductors substance used inside it.

11) *Push Button Switch*

We have used push button for on- off process and control device. Almost all industrial machines contain push buttons even if the facilities operation is to set to run automatically.

12) *Breadboard*

A breadboard is a solder less device for temporary photo type with electronics and test circuit designs. Most electronic components in electronic circuit can be interconnected by inserting there leads or terminals into the holes and then making connections through wires where appropriate.

13) *Connecting Wires*

A wire is single, usually cylindrical, flexible strand or rod of metal. Wires are used to bear mechanical loads or electricity and telecommunication signal.

3. Working

This circuit can be divided into two parts. One is the power supply and the other is logic circuit. In the power supply 9 volt supply is converted to 5v. The logic circuit operates the buzzer when any shadow falls on it. Power supply circuit consist of battery, diode, regulators and capacitors. Initially a 9 v battery is connected to the diode. Diode used here is a p-n junction diode of IN4007 series. In this circuit IN4007 is connected in the forward biase condition. The main purpose of the diode in this circuit is to protect the circuit from negative voltage there is a chance of connecting battery with reverse polarities which damages the circuit. So p-n junction diode connected in the forward biase 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 0.7 v is dropped across the diode 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 5 v is produced at the output of the regulator. Two capacitors are used before and after the regulator. This two capacitors eliminate the ripples. Thus a constant voltage is produced at the output of the regulator, which is applied to the logic circuit. The logic circuit mainly consists of Light Dependent Resistors, transistors, op-amp, IC and a buzzer. A 220 K Ohm resistors is connected in series to the LDR. Light Dependent Resistors will have resistance in mega ohms when it is placed in dark. This resistance value will decrease gradually when it is placed in the light. Thus there is a variation in the series resistance. When the LDR is in dark it has high resistance and produce the logic high value at the output. When the LDR is in the light, the resistance value of the LDR decreases and at the not gate it gives logic low voltage. The op-amp IC used is LM 358. This IC compares the two inputs and produces an output which is applied to the transistor. Two transistors are connected to the buzzer from this resistance. The first transistors inverts the input from the op-amp. The second transistors drives the buzzer. The diode is placed for protection. Buzzer used here is a 5v magnetic buzzer. It has two pin at the output. 1 pin is connected to the not gate

and the other pin is connected to the Light Emitting Diode. LED is used for indication only. When the output from logic gate is high buzzer starts ringing. LED also starts blinking.

4. How to operate the electronic eye controlled security system

- Initially, connect the circuit as shown in the circuit diagram on the bread board.
- Now connect the supply voltage of 9v using a battery.
- Place the light dependent resistor in light but no sound is produced from buzzer.
- Place the LDR in dark and the buzzer starts making sound. Also the LED connected to buzzer will be turned ON.
- As the intensity falling on the LDR increases sound produced by the buzzer increases.

5. Limitations

- Light is required in front of doorbell.
- If any person come in and out then the bell is ringing.

6. Applications

- This can be used in doorbell circuit.
- This can be used garage door opening circuit.
- Electronic eye can be used in security applications.

7. Conclusion

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 malls, hoses etc., that supports the use of binary counter which sense the intensity of light through LDR and activating the buzzer indicating a theft.

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