
DESIGN AND IMPLEMENTATION OF LASER SECURITY SYSTEM

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ABSTRACT

Technology develops day by day in the world. Now days the crime gang also improves their technology to carry out their operation. So technology of security should be modern with time to protect the world from crime. We decide to make a security issue as our project. In this project we have used laser beam to cover a large area. We know laser light goes to long distance without scattering effect. It's additionally obvious just at source and occurrence point, in any case invisible. These two properties help us to develop a modern security system, which may name as "Laser Security System." When any person or object crossover the laser light, automatically the buzzer starts ringing. Laser beam goes through long distance without scattering effect and the ray is almost invisible. The project involves the use of Arduino Nano, Laser light, Buzzer, ESP32 Cam, RFID Module and LDR. With this equipment's we can easily set up a security alarm anywhere for unwanted intruders. A Laser Security System goes about as a standalone system, which makes sound or commotion when it distinguishes any sporadic action or can be part of a much bigger security.

Keywords: Arduino Nano, Laser, LDR, ESP32 Cam, RFID Module.

I. INTRODUCTION

Security is a most important factor in day to day life. Need of security is the basic necessity of every individual. The feeling that we are safe and everything around us is all right is imperative for a peaceful living. Be that as it may, in this unsafe world, when crime, terror and dangers are on their pinnacle, how might one achieve that suspicion of safety? Here, laser security system provides us with a solution and for this reason more and more people are installing them in order to stay safe and secure. Laser Security alarm is a device used for security purposes. It has a wide application in fields of security and defense starting from the security of a simple house hold material to a very high valued material of an organization. They once used to be very expensive solutions for security needs. Owing to cost cutting and fast technological advancements, this form of security system is becoming more affordable. In this project, we have designed Laser Light Security System Using Arduino Nano with Alarm with the application of Laser Diode Module KY-008. The project idea revolves around creating a security system. Whenever any object will obstruct the LASER ray the buzzer alarm will start ringing. This project can be implemented anywhere, not only buildings or premises but many precious things like jewelry, diamonds, precious antique items in the museum, etc many other things are also secured using such an invisible LASER beam. Many people secure their home, office, shops, warehouses, etc with the LASER beam security system.

II. LITERATURE SURVEY

The earliest security system comes from the early 1990's. They were very expensive at that time and hard to monitor an intrusion. Now the technology has developed very much more than the old days. Laser security system is also known as burglar alarm systems. In most common security system laser and light dependent resistor are used. This system is easy to construct and install. Now day's lots of advance security system such as PIR based security system, temperature detecting based security system, infrared security system, etc. has come into existence. Among them this system is single and effective too.

Circumstance has shown that most criminals are usually cut off by the help of the simple existence of an alarm security system in our homes hospitals, schools, organization, and industries. Criminals usually invade far more defenseless constructions compared to those guarded by security alarm systems. The improvement of the

security alarm systems started with the creation of man. To give threatening information, human being implements a form of a signal, shout, and sound. It was then replaced with the help of the clapping of hands and with the instilling of signals to notify society or to blowout a certain message during the early periods of some African society. The earliest electronic fire, security alarm system was developed by a man named William .F. Channing. Late on an electrical electronics engineer, Mr. Moses G. Farmer invented the construction. This alarm system uses automatic indicator boxes to label the position of the outbreak fire and was first lunch in Boston, United States of America. The development of this alarm system by Dr. William was then followed by the improvement of various stylish and difficult fire and intruder security alarm system technology that is so many to deliberate. Researchers from Malaysia have developed a multilevel home security system which consists of different sensor nodes as input elements while the output elements respond to the signals received from input elements. The sensor nodes include an alarm, presence detecting circuit and a camera. Researchers from China have developed a system using WSN and GSM technology. It can detect theft, fire, leaking of gas and send message to the owner. The hardware consists of single chip C5081F310, wireless receiving and sending chip CC1100 and Simens TC35 GSM module.

III. EXISTING SYSTEM

1. Block Diagram

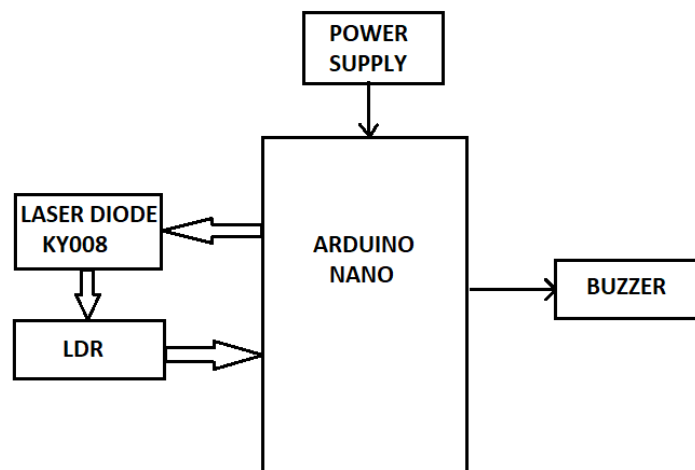


Fig 1: Block Diagram of Existing System

2. Working

In this, we present the theory on laser security system. In this proposed block diagram consist of several blocks like laser module, LDR, buzzer Alarm is connected to our controller. There are three essential components to a laser security system: a laser, a arduino and LDR module. The laser is a concentrated light source that puts out a straight line, pencil beam, of light of a single color. The LDR is sensitive to light. The LDR is connected to the Arduino NANO. When the laser beam is interrupted and can't reach the LDR, its voltage output changes, and the circuit senses the change and puts out a warning signal and then the buzzer starts alert signals. The project basically works on the principle of interruption. If by any means the laser light is interrupted the alarm will start unless it is reset with the pushbutton. The laser is a concentrated light source that puts out a straight beam of light of a single color. The LDR is sensitive to light and puts out a voltage when the laser light hits it. When the laser beam is interrupted and can't reach LDR, its voltage output changes, and eventually the alarm will ring.

IV. PROPOSED SYSTEM

1. Block Diagram

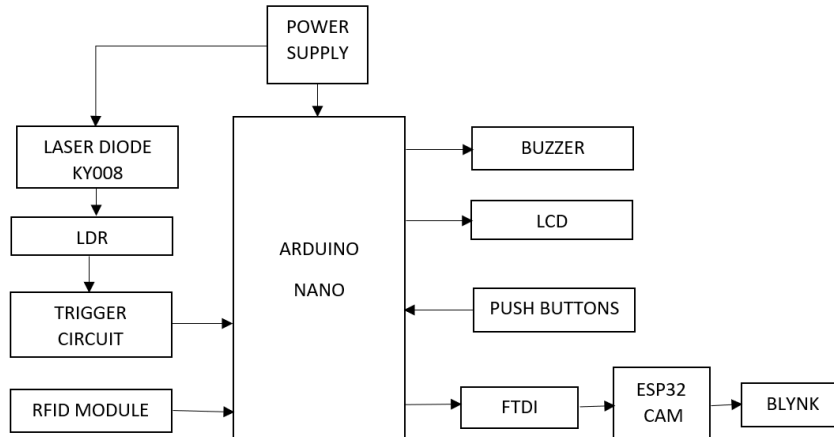


Fig 2: Block Diagram of Proposed System

2. Working

Laser Security alarm is a device used for security purposes. It has a wide application in fields of security and defense starting from the security of a simple house hold material to a very high valued material of an organization. In this project, we have designed Laser Light Security System Using Arduino Nano with Alarm with the application of Laser Diode Module KY-008. The project idea revolves around creating a security system. Whenever any object will obstruct the LASER ray the buzzer alarm will start ringing. When the user wants access to the locker, they have to scan the RFID tag and enter the password through push buttons. If and only if password entered is correct and the actual tag is scanned, the laser stops for few seconds allowing the user to have the access to the locker. Incase of entering wrong password or wrong tag is scanned, the buzzer starts ringing to alert the owner and sends alert message and live images to smart phone via Blynk app. The experimental model was made according to the circuit diagram and the results were as expected.

V. RESULTS AND DISCUSSION

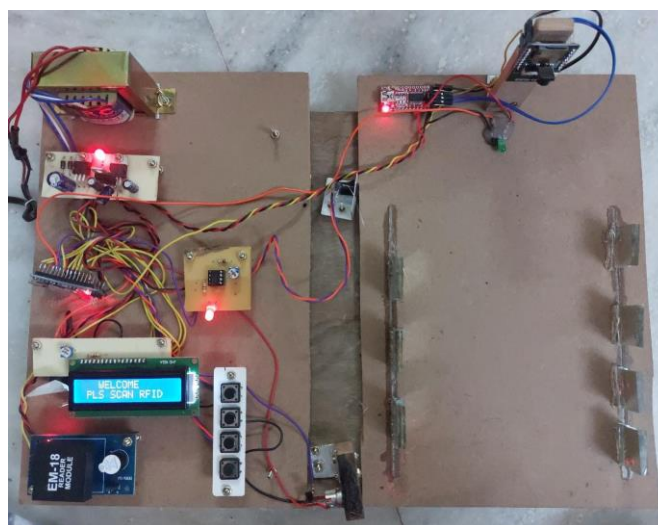


Fig 3: Laser Security System

The Laser Security System has been successfully designed and developed. The buzzer is turned on as the laser beam falling on the LDR is interrupted. When the user wants access the locker, they have to scan the RFID tag and enter the password which is set by them through push buttons. If and only if correct tag is scanned and password entered is correct, the laser stops for few seconds allowing the user to have the access to the locker. Incase of entering wrong password or wrong RFID tag is scanned, the buzzer starts ringing to alert the owner and sends alert message and live images to the smart phone via Blynk app. The experimental model was made

according to the circuit diagram and the result were as expected. The LDR has to be placed in dark place or inside a case so that the other sources of light except the laser beam doesn't affect the LDR. This helps the circuit to work faster and properly. During the operation the laser beam is allowed to reflect through mirror to mirror to create criss-cross rays of laser beams. This is beneficial for the advanced protection over a very small objects. Also using of infrared laser could make the laser net invisible to human eye. Use of microcontroller gives better result for the laser security system.

VI. CONCLUSION

Laser security system provides us the security against any crime, theft in our day to day life and so people are installing them in order to stay safe, secure and sound. Various electronic security systems can be used at home and other important working places for security and safety purposes. It is a great opportunity and source of saving man power contributing no wastage of electricity. The "Laser Security System" is an important helping system. Using this system robbery, thefts & crime can be avoided to large extend. Avoiding thieves results in the safety of our financial assets and thereby this system provides us protection against all. The Laser & LDR system is highly sensitive with a great range of working. The system senses the light emitted by the Laser falling over the LDR connected with the circuit. Whenever the beam of light is interrupted by any means, it triggers the alarm or siren. It also allows to enter password to get access for more security. This highly reactive approach has low computational requirement, therefore it is well suited to surveillance, industrial application and smart environments.

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VII. REFERENCES

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