LASER BASED SECURITY SYSTEM FOR HOME

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Abstract: Security is a most important factor today. Technology develops day by day in the world. The crime gang also improves their technology to perform their operation. So technology of security should be modern with time to protect the crime works. We decide to make a security project as our project. In this project we have used laser light to cover a large area. We know laser light goes through long distance without scattering effect. It's also visible only at source and incident point, otherwise invisible. These two properties help us to build up a modern security system, which may name as "laser security". When any person or object crossover the laser line the security alarm will ringing and also the focus light will "on" to focus the entrance of unauthorized person.

LASER-Ray goes through long distance without scattering effect and the Ray is almost invisible. Only the radiation point and incident point is visible. So by this security project we can make an invisible boundary of a sensitive area. There is two part of the system. One is transmitter and other is receiver. The transmitter part is built with a LASER radiator, a pair of dry cell batteries, an on-off switch and a stand to hold it. The receiver side, there is a focusing LDR (Light depending Resistor) sensor to sense the LASER continuously. The LDR sensor also holds with a stand and it connected with the main driver circuit. The circuit has two parts. One is filtered the signal of discontinuity ray and others is alarm circuit. When anybody crossover the invisible ray the main circuit sense the discontinuity by sensor and turn on the alarm circuit. If once the alarm circuit is on it will still ringing until push the reset button. There is two option of ringing. One is the duration of ringing depends on preset timer and another reset manually. Any option can be set by DPDT switch. If anybody wants to bind a sensitive area with the single ray he has to use mirror at every corner to reflect it. The system has built with low cost and high performance. The power consumption of the system is very low.

***Key Words*: LASER, SECURITY SYSTEM, ATMEGA16, LDR, HOME AUTOMATION.**

1.INTRODUCTION

Security is a most important factor today. Technology develops day by day in the world. The crime gang also improves their technology to perform their operation. So technology of security should be modern with time to protect the crime works. We decide to make a security project as our project. In this project we have used laser light

to cover a large area. We know laser light goes through long distance without scattering effect. It's also visible only at source and incident point, otherwise invisible. These two properties help us to build up a modern security system, which may name as "laser security". When any person or object crossover the laser line the security alarm will ringing and also the focus light will "on" to focus the entrance of unauthorized person.

Presented here is a security system that uses an inexpensive laser torch which is usually available with a key ring. The advantage of this security lock is that you can use any laser torch or pointer that is easily available in toy shops. It employs minimal input keys and yet is very secure. It can be used as a door lock, briefcase lock or any other application related to an electronic locking system.

1.1 LASER System

The word LASER stands for Light Amplification by Stimulated Emission of Radiation. These are available in different types like semiconductor, infrared, GaAs laser diode. This has an energy wavelength of approximately 900 nanometers with a beam divergence of 3 million radians i.e. equal to a beam width small beam width. Laser technology products will calculate distance by measuring the time of flight of very short pulses of infrared light. It is different from the traditional surveying instrument method of measuring phase shifts by comparing the incoming wavelength with the phase of the outgoing light pulse.

The Laser security systems are high tech innovations that have gained popularity in home and office security systems. These are used to be expensive solutions for security needs. Depending on cost and fast technological advancements laser security systems becoming more adoptable. The features and specifications of the laser security system can be had in detail from the security system dealers who provide high end solutions based on requirement. Today, we will explore the answer to all of these questions. In addition, (in the associated activity) you will work in the computer lab in small groups to explore specific types of lasers and create presentations to share our findings with the class. With the conclusion of the presentations, you should know exactly what type of laser would be best for use in your security system design. Even further, you will know exactly why we are using a laser based security system to invisibly detect the presence of a thief.
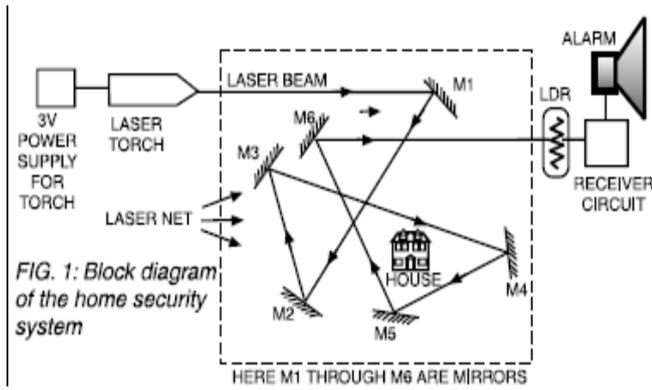
Fig 1- Laser Security System For Home

2. CIRCUIT & WORKING

Lasers play many roles in our everyday lives, from optical storage (CDs and DVDs) to metal cutting to tattoo and hair removal. Not everyone knows that laser is actually an acronym. (Take guesses from students.) Laser stands for light amplification by stimulated emission of radiation. Referring back to the particle theory of light, which has led us to today's quantum physics, we know that atoms struck by light waves (electromagnetic radiation) begin to vibrate causing their electrons to jump to higher energy levels until the atoms reach an excited state. When the atoms begin to relax, their energy is released in the form of photons, which are simply pockets of light energy. A laser is a device that controls this release of photons (pockets of light energy).

Electric strikes are generally available in two configurations—fail-secure and fail-safe. In fail-secure configuration, applying electric current to the strike causes it to open; whereas in fail-safe configuration, applying electric current to the strike causes it to lock. A fail-secure configuration.

Opening the lock. The use of switch S2, pressing and releasing of switch S1 and supplying the laser pulses at the right time are the security features of this circuit. Switch S2 should not be released during the entire operation, otherwise the counter will get reset and you will not be able to open the lock.

When switch S1 is pressed, the first in-built timer of IC2 is triggered. Its output pin 5 goes high for four seconds. LED1 glows and transistor T3 conducts. During this time, the collector of T3 becomes low, which in turn pulls the clock enable pin (pin 13) of IC1 to low state. This enables the counter (IC1) to count. During this time, five laser pulses are applied (by you) at photo sensor T1. These signal pulses go to clock pin 14. LED4 glows and T2 conducts at the fifth pulse. This triggers the in-built second timer of IC2. Its output pin 9 goes high for two seconds. The high state is indicated by the glowing of LED2. When LED2 goes off, you press switch S1 and release it. The first timer is triggered again and its output is high for four seconds. During this time, you send another

five pulses of laser beam towards the sensor. At the fifth pulse, LED3 glows and transistor T4 conducts. This action triggers IC3 and its output pin 3 goes high for ten seconds. That is, the lock opens for ten seconds.
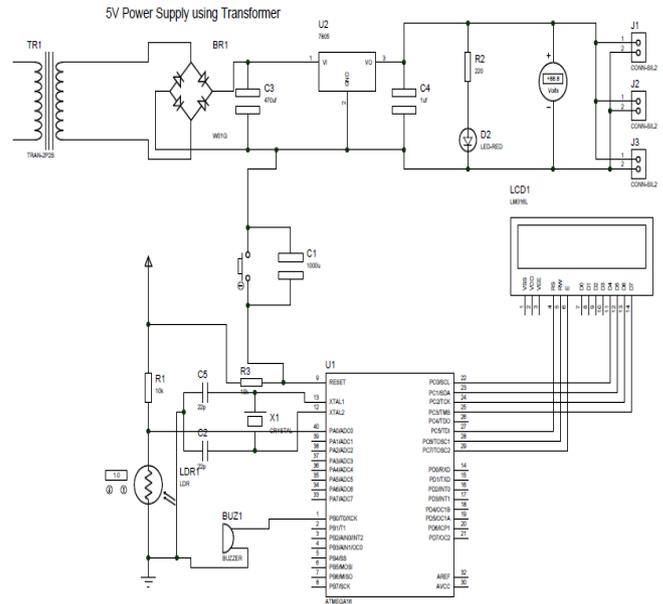

Fig 2- Circuit diagram of the laser based security lock

The lock driver circuit is connected to output pin 3 of IC3. The circuit is powered off a 5V DC supply. Normally the electric lock or electric strike works off a 12V DC. To make the circuit simple, the lock driver section is not shown here. While pressing switches S1 and S2 simultaneously, point the laser torch toward the photo transistor sensor T1 and press on/off button of the laser torch five times within four seconds. Release switch S1 while pressing switch S2. Wait for two seconds till LED2 goes off. Keeping S2 pressed, press S1 and release it, press on/off button of laser torch five times again. The lock will open for ten seconds and then close automatically. The lock can also be opened from the inside (for ten seconds) by pressing switch S3.

3. SOFTWARE DESCRIPTION

Compiler Compatibility-mikroProg™ for AVR® is supported with mikroC™, mikroBasic™ and mikroPascal™ compilers for AVR®. You may also use mikroProg™ for AVR® as a standalone programming tool.

As fast as it gets With mikroProg™ the speed is never the issue. Programming is done as fast as the microcontroller can handle it, while retaining data integrity at the highest level.

Atmel® AVR® supported Almost entire Atmel® AVR® family of microcontrollers is supported right from the start. Whatever chip you decide to use, you will never need another programmer.

Design matters Elegant minimalistic design, clean matte white plastic finish and color indicator LEDs make our programmer the first of its kind in the world.

3. CONCLUSIONS

In the end, we made the laser security in low budget. It had been protect in full security. Laser security systems are a high tech technology that used to be a part of home security only available to the wealthy. It is manually switch dependent sensors and a basic alarm unit. Laser security system a person moves in front of the motion sensor, that person's body heat triggers the system's alarm. And the alarm signals the security monitoring company and local law enforcement. The basic alarm unit will also sound a loud alarm.

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