BORDER SECURITY SYSTEM

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Abstract: ***The main purpose of the project is to enhance the border security electronically with automation and with that to reduce the work load and responsibility of the soldiers that continuously take a look on border 24x7. This project will not fully remove the responsibility of soldiers but shares the maximum responsibility and will reduce human efforts on the border. A special type of human sensor is PIR (passive infrared) used to detects the human being. If anyone tries to cross the border means the sensor detects and it sends a signal to the microcontroller and it transmit the signals. It can be used at a place where any person is not able to go, if someone wants to know what is inside the room or other place , it can easily be use. It can operate from a long distance of approx 20 feet. The microcontroller activates the relay driver automatically and control the functioning of projector alarms and display devices.***

Keyword: Detection Border Surveillance, Arduino UNO, Remote Monitor, IR transmitter, IR receiver, Microcontroller, Display, Alarm. PIR sensor, MQ2 Gas Sensor.

I. INTRODUCTION

There is a lot of requirement to automate the security systems to ensure the security of the boarders at low cost. In our project we are going to develop an embedded security system which will detect the others not to intrude our border. The security system will use Bluetooth interface to inform the authorized person. The project provides the security to the militaries border. Border Surveillance System (BSS) provides real-time regional surveillance, early warning, targeting and border-patrol mission management. The BSS also improves terrestrial and maritime security, regional control and border protection, enabling complete real-time connectivity across the entire border-security array. These solutions enable optimum coordination of ISR efforts throughout all operational zones and along the country's borders, supporting stationary control centers, deployed command posts and tactical patrol agents. Border security has become a high-priority issue in many countries. In addition to the physical fences built for stopping illegal immigrants, drug dealers, and terrorists from crossing the border, smart fencing has been proposed to extend the eyes and ears of the Border Patrol. The same approach could be used to secure nuclear power plants, chemical plants, military installations, and other critical infrastructure[1]. A passive infrared sensor used to detect the human beings for about the distance of 20feet these sensor uses the concept of black body radiation. The microcontroller activates the relay driver automatically and control the functioning of projector alarms and display devices.

Block diagram and concept of project :-

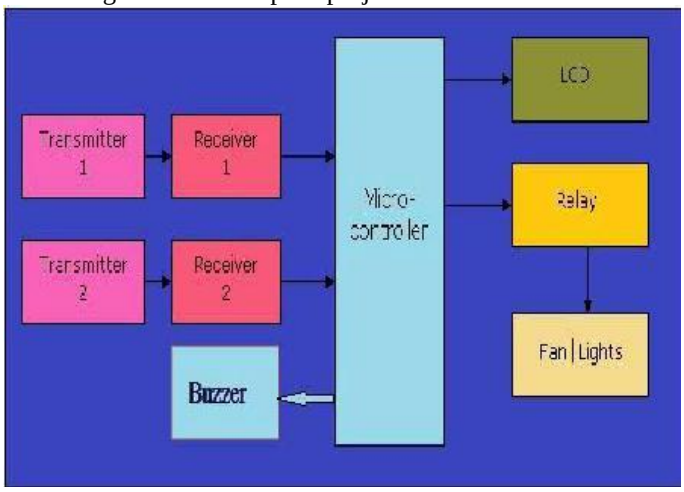
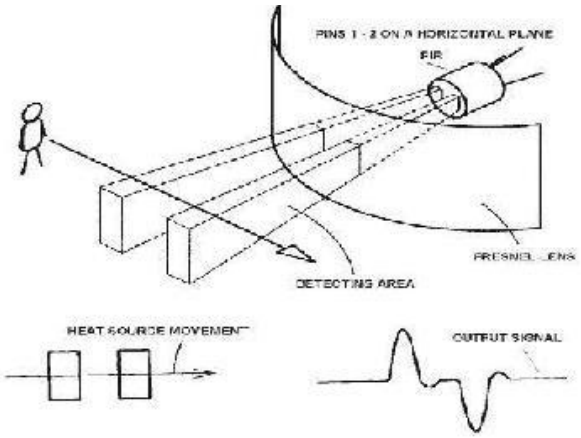


Fig. Block diagram

Concept : In our proposed method, there are two units, one is transmitter/remote unit which is placed at the border(unmanned area) and the second one is receiver/control section is at the control room.

Transmitter unit consists of PIR (pyro electric IR) detector, which is nothing but a sensor which sense IR which is emitted from the human body. once it receives a human body IR signal it provides a high output in its output pin, which is an input to the microcontroller. Once the controller receives this particular input it transmits an alarm signal to the control room via RF transmitter and drives a relay such a way that it activates the cc tv camera. Once this signal received at the receiver, the controller takes the received information as input and a voice bank unit also get enabled and it activate a warning of "Alert an enemy is detected" also its switch on a tv where the cc tv camera output is connected with the tv so that a person at the control room can take a vision of what actually going on the border. Once the vigilance person who is control room finds any unauthorized entry of adjacent country terrorist or militant he can activate a gun which is located at the border side from the room itself. Which is done by pressing a command key which is nothing but a input from control unit to the remote unit. All these transmission are taken over by a RF transmitter and a receiver which are placed at both the ends.The RF units is a 433MHZ transmitter receiver units.

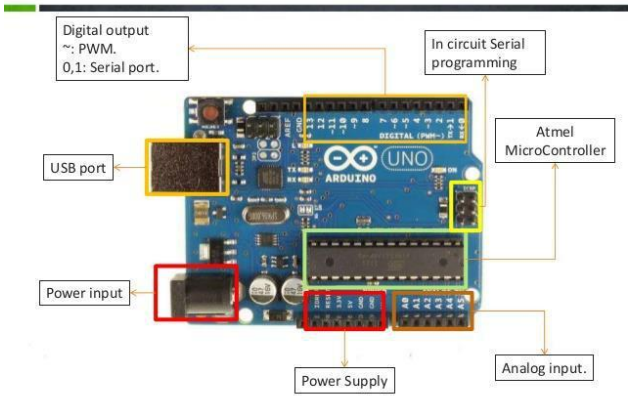
THEORY OF OPERATION:



Pyro electric devices, such as the PIR sensor or MQ2 Gas sensor, have elements made of a crystalline material that generates an electric charge when exposed to IR radiation. The changes in the amount of IR striking the element change the voltages generated, which are measured by an on-board amplifier. The device contains a special filter called a Fresnel lens, which focuses the infrared signal on to the element. the ambient infrared signal changes rapidly, the on-board amplifier trips the output to indicate motion[2].

Review of Component :
Component Descriptions:-
Arduino
Arduino is an open-source electronics circuit based on easy-to-use hardware and software. It is microcontroller which is used to give the signal to the sensor or receive the signal form the sensor and according to the program rebooted on the microcontroller IC it will perform accordingly and gives the system appropriate output. If anyone, the sensor will get interrupted or senses something then microcontroller will collect that data and send back to control room or display. Overall all the sensor is connect with single microcontroller to perform its desire function.

Arduino UNO:



II. WHY ARDUINO ?

There are many other microcontrollers and microcontroller platforms available for physical computing. Parallax Basic Stamp, Net media's BX-24, Phidgets, MIT's Handy board, and many others offer similar functionality. All of these tools take the messy details of microcontroller programming and wrap it up in an easy-to-use package. Arduino also simplifies the process of working with microcontrollers, but it offers some advantage for teachers, students, and interested amateurs over other systems:

- Inexpensive - Arduino boards are relatively inexpensive compared to other microcontroller platforms.
- Cross-platform - The Arduino Software (IDE) runs on Windows, Macintosh OSX, and Linux operating systems. Most microcontroller systems are limited to Windows.
- Simple, clear programming environment - The Arduino Software (IDE) is easy-to-use for beginners, yet flexible enough for advanced users to take advantage of as well. For teachers, it's conveniently based on the Processing programming environment, so students learning to program in that environment will be familiar with how the Arduino IDE works.
- Open source and extensible software - The Arduino software is published as open source tools, available for extension by experienced programmers. The language can be expanded through C++ libraries, and people wanting to understand the technical details can make the leap from Arduino to the AVR C programming language on which it's based. Similarly, you can add AVR-C code directly into your Arduino programs if you want to.
- Open source and extensible hardware - The plans of the Arduino boards are published under a Creative Commons license, so experienced circuit designers can make their own version of the module, extending it and improving it. Even relatively inexperienced users can build the breadboard version of the module in order to understand how it works and save money[3].

PIR Sensor :-
PIR-based motion detector is used to sense movement of people, animals, or other objects. It work as a motion detector in the system it will only observe the motion across the border if any found then it will give the signal to microcontroller. It radiate some heat energy which is not observe by naked eyes. The heat energy sense the motion of the object.

IR Transmitter :-
Implemented the Person counter module using 2 transmitters and 2 receivers and use of Infra-Red transmitters. Reason behind choosing IR LED is, infrared beams are not visible to human eyes and they are not easily triggered by other sources in the environment. Transmitters used are IR LEDs.

IR Receiver :-
Use of IR sensor as an Infrared receiver. It is an active low device, which means it gives low output when it receives the Infrared rays. So when the IR rays are interrupted by any person then Microcontroller will receive a high pulse from

the IR receiver[4].

Gas Sensor :-
Gas sensors (also known as gas detectors) are electronic devices that detect and identify different types of gasses. They are commonly used to detect toxic or explosive gasses and measure gas concentration[5].

III. RESULT

The project is very advance and automated it will help in reducing the illegal activities like drug smuggling, illegal migration of peoples and reduce the terrorist activities. When any one enters in the border, IR sensor will get interrupted by the object. One of the basic requirements for the project is Accuracy. The Project is required because till today, border is protected by Iron Spike wires, and a watch tower containing a soldiers continuously flashing the light over the border area day and night. Those soldiers are fully responsible for any intrusion. Because of our automatic system we can attain more efficient and accurate security system.

IV. CONCLUSION

Soldier efforts to count the number of terrorists is eliminated. Since this project does the automatic terrorists counting with our system Real heroes of the any country are their Soldiers. The project also aims at providing peace at the borders and reduces the tensions between the two countries. The Proposed system prevents the entries of intruders or antisocial persons, in trying to cross the border without prior permission of military with some bad intension. Hence this system will reduces the cause of rioting as well as helps to prevent terrorist activities. So the given proposed system also provides safe and calm environment for the residents living near to military base and helps to create mutual harmony between military officers and civilians. Also as the system is fully automated it will help to reduce the number of deaths of soldiers on the border in case of ceasefire violation.

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