Border Security System

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ABSTRACT

Our project provides the security to the militarian border. Our project provides the THREE sections for the security purpose. Near the sea border which is totally controlled automated. Near the sea border and also the water bodies near the land borders (rivers) which is also automated totally. Security stations which can be operated manually. 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 Diver detection sonar which detects the activities of human beings under water and creates a powerful aqua shield. Thermal imaging system which detects the human activities at night these systems transmit the signal to the nearest security station and the receiver section receives the signal and displace the image captured on the monitor. The microcontroller activates the relay driver automatically and control the functioning of projector alarms and display devices.

Keyword: - *Detection Border Surveillance, GSM module, Remote Monitor, IR transmitter, IR receiver, Microcontroller, Display, Alarm. PIR sensor, laser security.*

1. 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 boarders. The security system will use gsm interface to inform the authorized person. The project provides the security to the militarian border. It provides the THREE sections for the security purpose. Near the sea border which is totally controlled automated. The water bodies near the land borders (rivers) which is also automated totally. Security stations which can be operated manually. 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. Laser security which has a range of several kilometers, and this laser system used as a counter too. Diver detection sonar which detects the activities of human beings under water and creates a powerful aqua shield. Thermal imaging system which detects the human activities at night this system transmits the signal to the nearest security station and the receiver section receives the signal and displace the image captured on the monitor. The microcontroller activates the relay driver automatically and control the functioning of projector alarms and display devices.

Illustrations or pictures:

2. Block diagram and concept of project :-

2.1.Block diagram:-
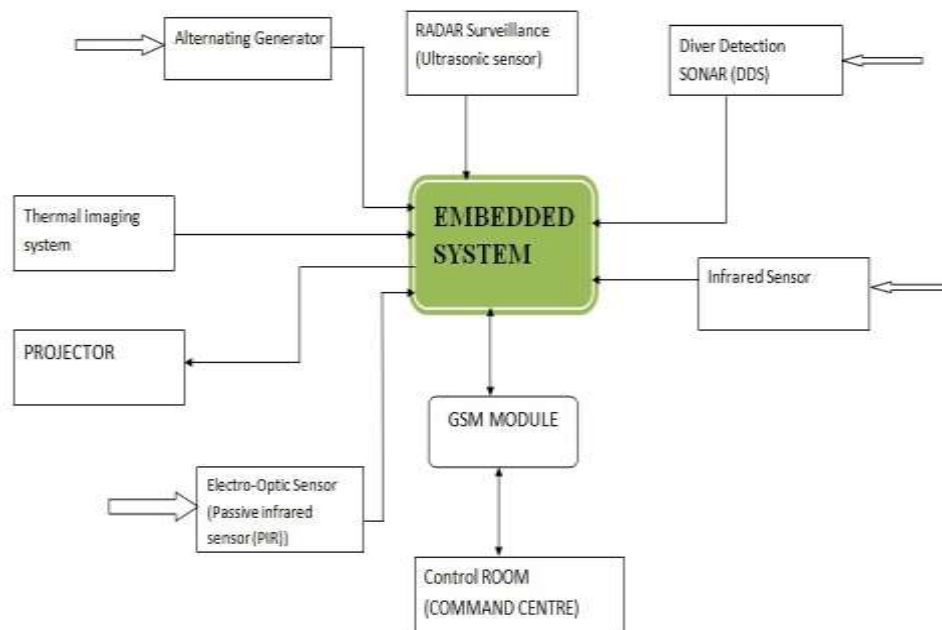
Fig. Block diagram

2.2. Concept :-

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 .Diver detection sonar which detects the activities of human beings under water and creates a powerful aqua shield. Thermal imaging system which detects the human activities at night these systems transmit the signal to the nearest security station and the receiver section receives the signal and displace the image captured on the monitor. The microcontroller activates the relay driver automatically and control the functioning of projector alarms and display devices.

Security provided by the system.

- **Land**
- **Water**
- **Air**

Land :

In our project we are providing the security to the land through fence ,radar and thermal imaging systems. We are using an alternating generator for the fence which detect nay break on it. PIR sensor are been used for the diction of anybody with a temperature above absolute zero temperature emit head in the form of radiation. Thermal imaging system and night vision cameras are been used for any activities that have been performed in the night time and radar for the land and aerial security purpose.
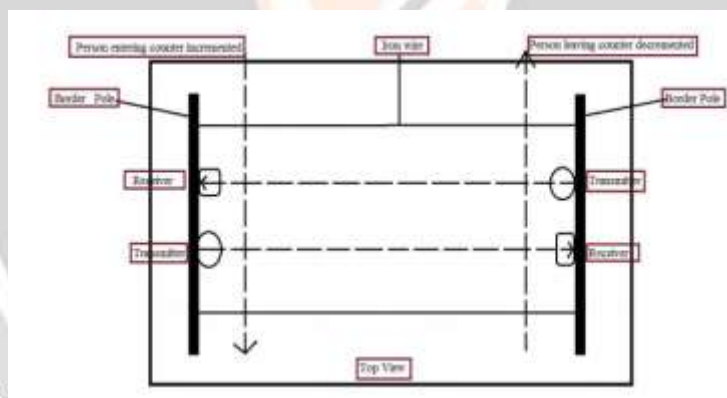

Fig.   Fence security

Water :

For water security diver detection sonar(DDS) have been used. Diver detection (DDS)system are sonar acoustic location system employed underwater for the detection of diver and submerged swimmers delivery vehicles (SDVs). The purpose of this type of sonar system is to provide detection, tracking and classification informed on underwater through that could endanger property and lives.

Fig. Diver detection sonar

Air :

The air security is a big concern nowadays. The air security can be accomplished with the help of radar. It will thus protect the advance drone attacks.
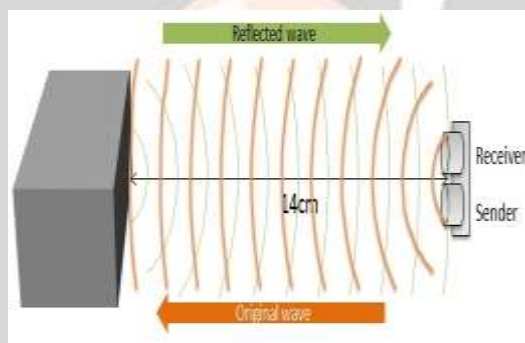

Fig. Ultrasonic Radar

2.3. Future implementation

a) In the future we are planning to extend this project for underground security for better protection
b) Implementation of arial security using automated robot drone.
c) We are also trying to provide fully automated robotic system with arms for instant action on border.
d) For sequential coordination between the devices used in the system, we are planning to implement it on PLC.

3. Review of Component :

Component Descriptions:-

i. 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.

ii. 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.

iii. 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.

iv. 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.

v. Ultrasonic sensor :-

It is used in the system like radar. It detect the object under its surveillance and sent the signal to microcontroller . An Ultrasonic sensor is a device that can measure the distance to an object by using sound waves. It measures distance by sending out a sound wave at a specific frequency and listening for that sound wave to bounce back. By recording the elapsed time between the sound wave being generated and the sound wave bouncing back, it is possible to calculate the distance between the sonar sensor and the object.

vi. GSM module :-

GSM is used as a long range wireless device to send the single to controller and also to controller room for the appropriate action. It will not only used to send the signal it can also receive the signal from the control room or controller and according to that it will perform the appropriate action when it is need. it is the intermediate for the system for long range communication. Because of this we can operated this system form anywhere .

vii. Laser :-

Laser security system used in this system. It acquired a long range for security. Laser cannot visible by naked eyes. In this using a Laser count is made so that how many intruders are entering through the border easily counted.

4. 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.

5. 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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