

Antismuggling System for Trees in Forest Using Adxl Sensor and Zigbee

LOKHANDE HARSHALI

*S.V.P.M.'s College of Engg.
Malegaon(Bk.),Baramati,Pune
harshalilokhande1005@gmail.com*

KAPADEKAR SUPRIYA

*S.V.P.M.'s College of Engg.
Malegaon(Bk.),Baramati,Pune
supriyakapadekar96@gmail.com*

KHALATE VAISHNAVI

*S.V.P.M.'s College of Engg.
Malegaon(Bk.),Baramati,Pune
khalatevaishnavi@gmail.com*

PROF. KAMBLE B.S.

*S.V.P.M.'s College of Engg.
Malegaon(Bk.),Baramati,Pune;413115*

Abstract - Many times we are reading in the newspapers about smuggling of the trees like sandal, "Sagwan" etc. These trees are very costly as well as less available in the world. These are used in the medical sciences as well as cosmetics. Because of huge amount of money involved in selling of such tree woods lots of incidents are happening of cutting of trees and their smuggling. To restrict such smuggling and to save the forests around the globe some preventive measures need to be deployed. We are developing such a system which can be used to restrict this smuggling.

In this system tree will be equipped with one small electronics unit which consists of Micro Controller, ADXL Sensor, buzzer, battery and Zigbee module. Tree cutting will be detected by ADXL sensors in tree unit. In main unit cutting tree name and area, name will be displayed on LCD simultaneously buzzer will be ON and also message will be transmitted to senior officer using GSM module. Communication between tree unit and main unit is done by zigbee module.

KEYWORDS: ADXL Sensor, GSM Module, ARM Processor, Microcontroller, Zigbee, AX232, buzzer, LCD display, Battery

I. INTRODUCTION

We are developing such a system which can be used to restrict the smuggling of the trees which would in turn stop the de-forestation and maintain the Environmental balance which would help to solve one of the issues with the Global Warming.

We are developing such a system which can be used to restrict this smuggling. Every tree will be equipped with one small electronics unit which consists of Micro Controller, ADXL Sensor and Zigbee module. Tree cutting will be detected by ADXL sensors. At main server unit cutting trees name and area will be displayed on LCD. Communication between the trees and server will be done by Zigbee modules.

The system consists of 2 stages:

1. Tree unit & 2. Main server unit.

The tree unit is primary unit for the implementation of this system. This unit consists of ADXL sensor which is a 3 axis accelerometer.

These sensors would be responsible to send the information to the micro-controller in the tree unit which would be then transmitted to the next stage i.e. Main Server Unit, for further processing.

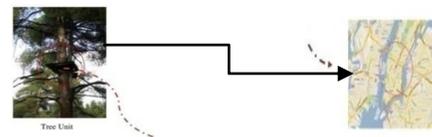


Fig: Functional Block Diagram

Smuggling and illegal logging causes enormous damage to forests, economics of producer countries and local communities. It's a very serious and comprehensive problem. Despite the economic importance of trade in timber and forest products, most of the international countries have no legal mean to stop or halt such activities because technically it's very hard to identify illegally smuggled timber and other trees.

II. LITERATURE SURVEY

First we search the old papers we find that there are three units i.e., tree unit, sub server unit and the tree unit.

In that units three controllers, zigbee modules and MAX232 are used. So the system becomes more complicated and also this system contains the flex sensor. The drawback of using such sensor is that it gives the accurate reading when it is bent.

This drawback can be avoided by using ADXL sensor which is 3-axis accelerometer. So we use this sensor and also minimize the circuit by reducing these three units into two units.

III. PROBLEM DESCRIPTION

The Antismuggling system for trees in forest is the system which detect tree's current position using ADXL sensor. This position gives the live updates of tree with their position details. It ensures the tree which has got cutted to send location details i.e, area name and tree name to main unit located at control room further that location details of tree send to senior officer as well as display it on lcd.

As per the system architecture, Antismuggling System FOR trees in forest are working same as follows. When the tree cutting will occurred, then the system will direct send the cutting alert message along with location details of the tree area name to control room it will send message to the nearby or far senior officer so that it will go to that location. By using system like this we can decrease the tree cutting rate.

IV. METHADODOLOGY

This system is a prototype model of Antismuggling system for trees in forest using ADXL sensor and ZIGBEE Module working will be made in the following steps:

- The sensor detects the x y and z axis position of a tree.
- The 3 axis position of the tree is sent to main server unit
- If the position of tree changes to the out of setpoint value then message will be send to main server unit through

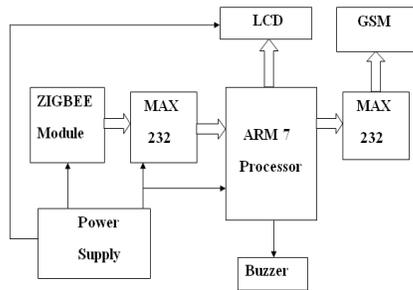


Fig 3.2 : Block diagram of main server unit

Arduino: - It is a 8 bit microcontroller, high performance and low power. It is an open source electronic prototyping platform enabling user to create interactive electronic objects .It is based on easy to use hardware and software. ARDUINO consist of both physical programmable circuit board and a piece of software or IDE that runs on computers. .We use ARDUINO to interface with ADXL sensor, MAX232, and buzzer.

ADXL sensor: - The ADXL335 is a small, thin, low power, complete 3-axis accelerometer with signal conditioned voltage outputs. The product measures acceleration with a minimum full scale range of +/-3g. It can measure the static acceleration of gravity in tilt sensing application as well as dynamic acceleration resulting from motion, shock or vibration.

GSM: - GSM/GPRS Modem-RS232 is built with Dual Band GSM/GPRS engine- SIM900A, works on frequencies 900/1800 MHz. The Modem is coming with RS232 interface,

ZIGBEE that message will be display on lcd and also message will send to main officer using GSM.

- Whenever tree is cutted the position is detected and a message has been sent to the main senior officer

V. SYSTEM BLOCK DIGRAM

This is the block diagram of antismuggling system for trees. This shows the overall view of the tree unit and main server unit circuit. The blocks connected here are LCD display, GSM, ADXL Sensor, Power supply, MAX232, zigbee module, buzzer etc.,

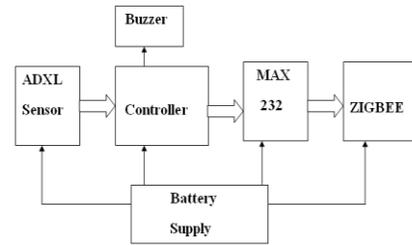


Fig. tree unit

Fig: Block diagram of Tree unit

which allows you connect PC as well as microcontroller with RS232 Chip(MAX232). The baud rate is configurable from 9600-115200 through AT command.

VI. CONCLUSION

In this way we are developing the system which is able to restrict the smuggling of trees in forest where the human being are not able to provide security.

We are developing such system in the forest where the trees are costly and their protection is important fact for us. In this area we are providing such kind of system.

REFERENCES

1. <http://timesofindia.indiatimes.com/city/lucknow/200-teak-trees-cut-timber-smuggled/articleshow/16804707.cms>
2. <http://ibnlive.in.com/news/endangered-red-sandalwood-seized-from-smugglers-in-berhampur/480595-3-234.html>.
3. <http://esl.fis.edu/learners/support/sci/text/stolenforest.htm>.
4. Yichang, China; Guangyu He ; Junli Wan —Research on Zigbee wireless communication technology Wei Wang| In Electr.Eng. & Renewable Energy Sch., China Three Gorges University.
5. Chonggang Wang, Tao Jiang, Qian Zhang —ZigBee® Network Protocols and Applications
6. ZigBee specification version 2006, ZigBee document 064112, 2006.
7. ZigBee Alliance, ZigBee Specification. Version 1.0 ZigBee Document 053474r06.
8. Jiang, Y., Cao, J., & Du, Y. —Unmanned air vehicle landing based on Zigbee and vision guidance WCICA 2006, 2, 10310 - 10314.
9. Muhammad Ali Mazidi, Roln D.Mckenley, "The 8051 Microcontroller and embedded system using assembly & C.
10. Hua Qian —API: GSM/GPRS Modem User Interfacel The University of Texas at Dallas University of Texas at Dallas, 2007.
11. Glen E. Clarke, Edward Tetz —CompTIA A+ Certification All-In-One Desk Reference For Dummies
12. Ahmed

El-Rab