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A Two Days National Conference on Emerging Trends in Electronic and Instrumentation Engineering (NCETEIE 19)

12th & 13th March 2k19

Organized by

Department of Electronics and Instrumentation Engineering, Adhiyamaan College of Engineering, Hosur, Tamilnadu, India

Design and Implementation of Anti-Poaching Forest Trees

M. Anbarasan[1], S. Premkumar[2], A. Pradeep[3]

Assistant Professor, Department of EIE, Adhiyamaan College of Engineering, Hosur, Tamilnadu, India[1]

UG Student, Department of EIE, Adhiyamaan College of Engineering, Hosur, Tamilnadu, India[2,3]

ABSRTACT: Poaching of economically precious trees has become a major threat to the plantation of these trees causing an environmental imbalance and risk to the natural resources. Wireless sensor network technology can help develop an energy efficient system for monitoring the poaching of trees. Routing protocols in wireless senor networks are responsible for forwarding the information within the network ensuring reliable communication.Smuggling of trees in forest, act as a serious trouble to forest capital. It causes economic damage. Animals are losing their natural environment and proposed work on a microcontroller based anti-poaching system provide work on wireless sensor network technology, which is accomplished of sensing theft by monitoring the signal produced by cutting of trees using tilt sensor which consist of mercury ball. A low power ATMEGA328p microcontroller is used along with RF modules. The wireless sensor network is widely cast off technology in monitoring and controlling for the remote application.

KEYWORDS: Thermistor, Tilt sensor, Vibrator sensor, Monitoring, GSM module.

I.INTRODUCTION

Poaching is nothing but the cutting down the valuable trees and smuggling it. The government has been taking so many steps to avoid the smuggling, they prevent as much as they can but the smuggling is still continue. In previous days the government has taken steps by increasing the guards. The guards have to monitoring the forest all the time. Guards were splits in the shift basis like day shift and night shift. But the government were not satisfied in this system because smugglings are still continuous in some other ways. [3] They implement the another method, that RFID method.Forest officer should enter the tree's information into the database. Radio frequency identification is fitted in each tree to serve as a unique id. Forest officer would be holding the tracking device, in which Radio frequency identification reader is embedded. He is walking through the forest. Once within the reader coverage area, the reader will detect the tags. Forest officer should walk through the forest all the time. Maintaining database is such a crucial process. The system cannot find tree logging before it is cut down fully.So we have a plan to avoid the smuggling by using wireless sensor network. Anti-poaching and avoid smuggling forest trees. Smuggling can be easily prevented by continuous monitoring of the valuable trees (sandal wood, Rose wood, ect) in the forest automatically. The main goal of the system is to enhance forest management efficiency and decrease tree illegal logging cases. Continuity tilt sensor, vibration sensor and also flammable detection gives robust monitoring of the trees being cutting down. And immediate alert is given to forest guard patrol. So they can take immediate actions. The transmitter kit has been placed in the tree, which is having the sensors to detect. Receiver kit will be place in control room which will be monitor by guard. This is one of the easiest way to avoid the cutting down the valuable trees. By using this system we can easily detect the forest firing and we can save the most of other region of the forest and then we can save the animals and birds also. We can take steps immediately to stop the forest from the fire. By this system we can reduce the number of guards. Each tree will be monitor 24*7.

II. PROPOSED SYSTEM

In this device we using tilt sensor which is monitoring the axis of the tree. Tilt sensor are produce an electrical signal that varies with an angular movement. These sensors are used to measure the slope and tilt within a limited range motion. The tilt sensor consist of a conductive free mass inside, such as blob of mercury or rolling ball and one end of

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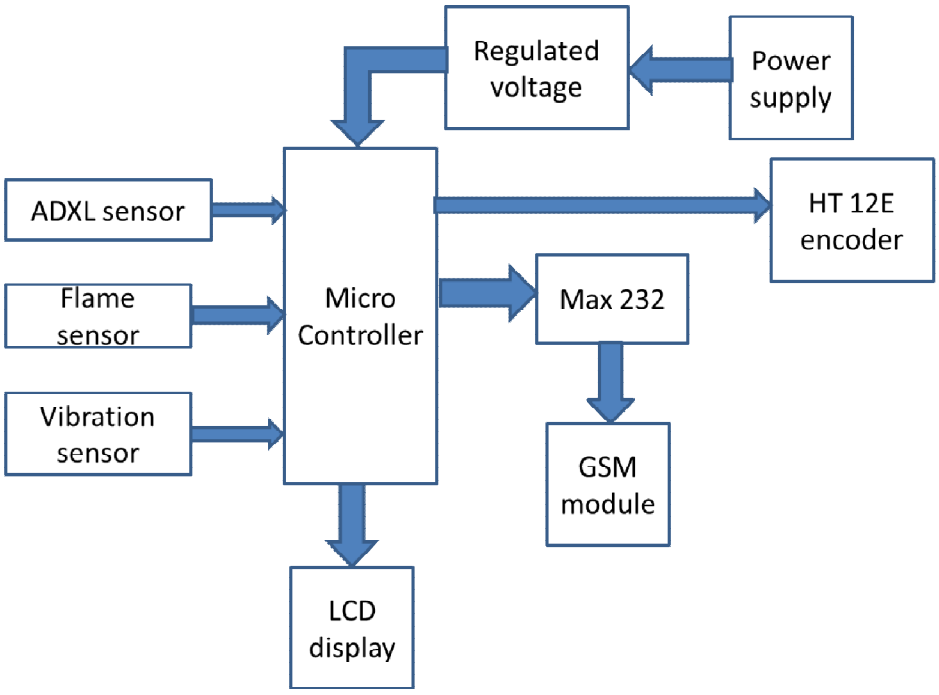
the sensor has two conductive poles. When the power is supplied, the rolling ball falls to the bottom of the sensor to form an electric connection. When the sensor is tilted the rolling ball doesn't fall to the bottom so the current flow the two end terminals of the sensor. And next sensor is temperature sensor. It is usually sensing the temperature. The thermistor works a little differently. When temperature increases, the resistance increases, and when temperature decreases, resistance decreases. It sense when the tree is getting fire, the sensor gives an alert. Buzzer is used to make the sound when the sensor is sensing. Vibration sensor is used to sensing the vibration, when they try to chop the tree. It makes some vibration that is has to be detected by vibration sensor and gives alert to the guard. GSM module 800 is a chip or circuit that will be used to establish communication between mobile device or a computing machine. SIM800 is a quad-band GSM module designed for the global market. It works on frequencies GSM 850MHz. The signal will be transmitted to that particular range guard mobile via GSM module. So they can take action immediately. ATMEGA328p microcontroller is used in both transmitter and receiver kit. The transmitter is having the HT12E encoder and receiver is having the HT12Ddecoder. Which is commonly used for radio frequency application. By using the paired HT12E encoder and HT12D decoder we can easily transmit and receive 12 bits of parallel data serially. HT12E simply converts 12 bit parallel data in to serial output which can transmit through the RF module.

TRANSMITTER



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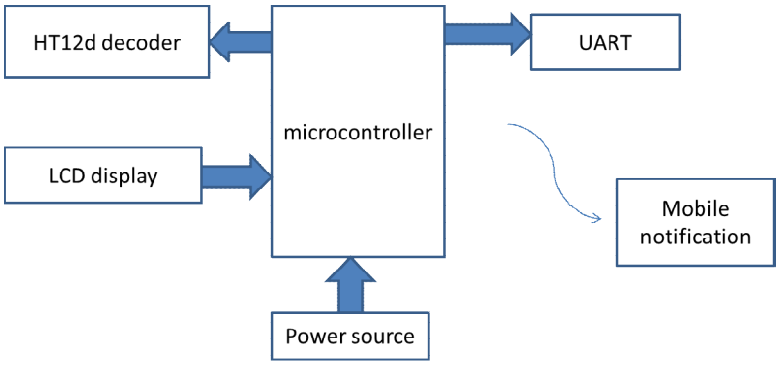
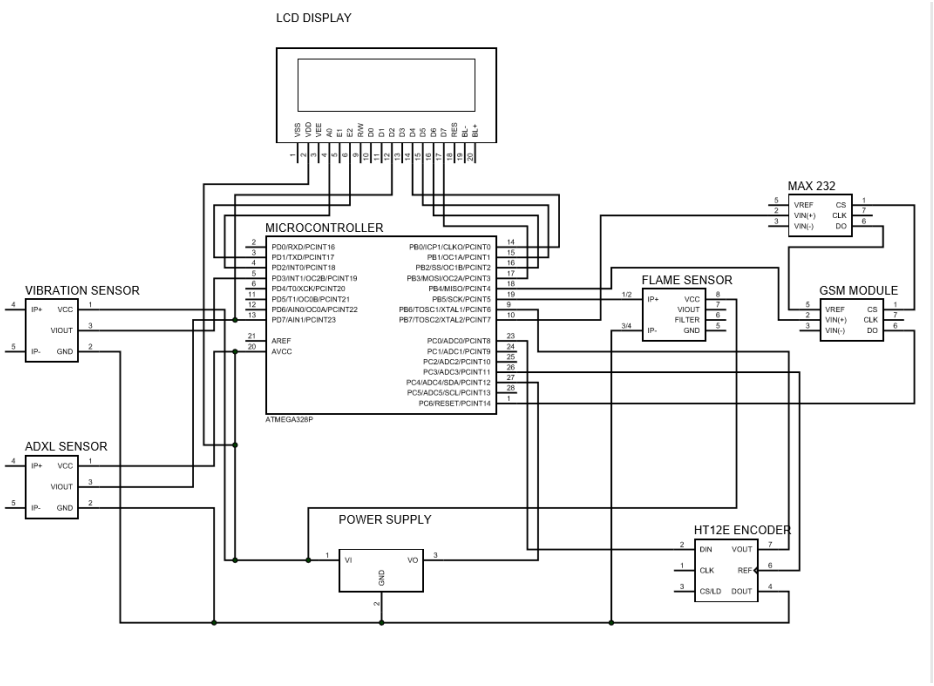
RECEIVER



III. FUNCTIONAL DISCRIPTION

In huge forest, each trees having sensors which is integrated on stem of tree. These are communicating with their main server unit. The communication between the tree unit and the main server unit taking place by using HT12E encoder and GSM module. The axis detected by the tilt sensor will allow the controller to transmit the signal to the main server via encoder and GSM module. The temperature sensor take place the surrounding temperature of the particular trees. The vibration sensor will detect the movement of the tree in which how many angles the trees are flexible and giving information to the controller.The server will be having GSM module. This unit is nothing but the authorized person mobile phone which will display the information on the mobile phone. With the help of GSM modem whenever any tree will get scratch down then we get the SMS on our registered mobile phone which contains information regarding Tree Name, temperature of the tree and movement of the trees by tilt sensor. Since the information we are able to alert and control the smuggling.

CIRCUIT DIAGRAM



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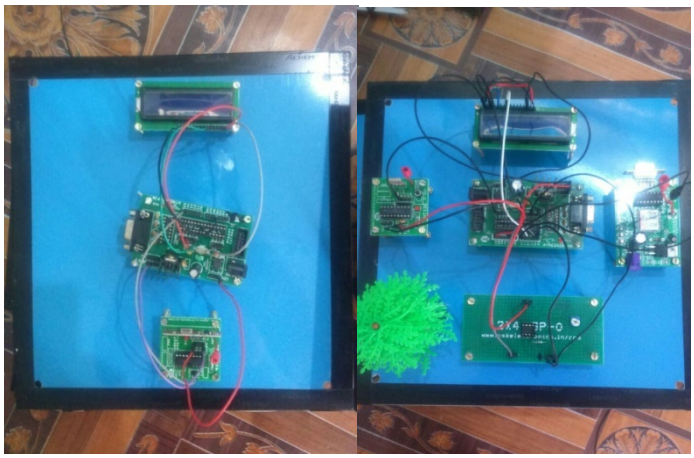
IV. RESULT AND DISCUSSIONS

The kit which is designed for the purpose of anti-poaching the valuable trees. The below figures are the kit which is used for our proposed system. The figure shows the connection of the components in the system.

RECEIVER AND TRANSMITTER KIT



V. CONCLUSION

The proposed system can be useful to save many valuable trees and animals and birds life. We have successfully designed and tested the hardware kit for the wireless sensor network based anti-poaching forest tree.It helps to avoid the economically damage for the government. And we can save the environment and the fire accidents in forest. The system can be monitoring the forest everyday with the less number of guards. Communications are too fast, so we can take the action immediately to rescue the forest.

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