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RFID BASED TRACKING SYSTEM FOR INDICISIVENESS AREA (MINING SECURITY)

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Abstract: This paper depicts the design of a radio frequency identification system for mining security that named as the mining RFID Tracking System (MRTS). It is designed to track the miner's in indecisiveness area. The MRTS consists of RFID active tags and RF module, the active tag made up of a single electronic chip with the intention of provider and unique identity for each miner's. Then RF module which having both characteristics of transmission and reception. This is known as the transceiver also called as a reader. The reader continuously reads the tag simultaneously and transmits that data to next RF module and so on. Finally the readied data from the tag that would be accessible through the readers to visual basic software, it analyzes and process the received data. The database that saved all the readings and user interface and enables access to the data on the server side of the system. Communication between the active tags and the server done through the RF Transmitter & RF Receiver.

KEYWORD – RFID Transmitter and Receiver module (TX/Rx), Arduino UNO, Active Tag, Visual Basic.

1. INTRODUCTION

In the modern world, Radio Frequency Identification Systems (RFID) have gained a great interest in industry and the academic world. This interest has lead to the use of RFID technology in a variety of applications such as industry automations, smart parking, object tracking information systems, library management systems and airline baggage identification. An RFID term for technologies that are used for auto -identification of people or object using radio waves. A Mining security system is proposed by radio frequency identification active tag, it's known as MRTS. This system would enable the identification of each miner and track the real-time location of the miners in the uncovering age area. This method used three essential parts, radio transceiver module (reader), RFID active tag and data monitoring station. Each mining labors are provided to the unique identity of active tag that has made up of a single electronic integrated chip. The electronic chip internally bringing together to a power supply. The radio transmitter/receiver module unyielding to the particular orbit. The reader has sensible to the miners with the help of active tags. The reader transmits its sensed data's to the another reader. Due to this, the reader doing both transmitting and receiving operations. The catch information is

loaded on the data monitoring station. Mining is considerably one because of our country's economic growth based on that..

2. HARDWARE

2.1 RF MODULE:

The RF module operating at radio frequency. It also the combination of the RF transmitter and RF receiver.The transceiver (Tx/Rx) operate at a frequency of 433.91MHZ.This is also called as a reader. And this allows around 40 meters of transmitting distance for indoor and around 100 meters for outside. In general, the wireless scheme must operate over a definite distance and transfer the amount of information within the range. The RF module in which has small in dimension and also wide range of operating voltages 3V – 5V. Predominantly the transmitter draws no power during transmitting zero carrier is low while transmitting one the carrier is high about 4.5mV with 3V power supply.

A. Features of RF module:

- Transmitter range of frequency 433.92MHz
- Transmitting supply voltage 3V~5V
- Transmitter output voltage 4V~12V
- Receiver supply current 3.5m
- Receiver Frequency 433MHz
- Receiver operating voltage 5

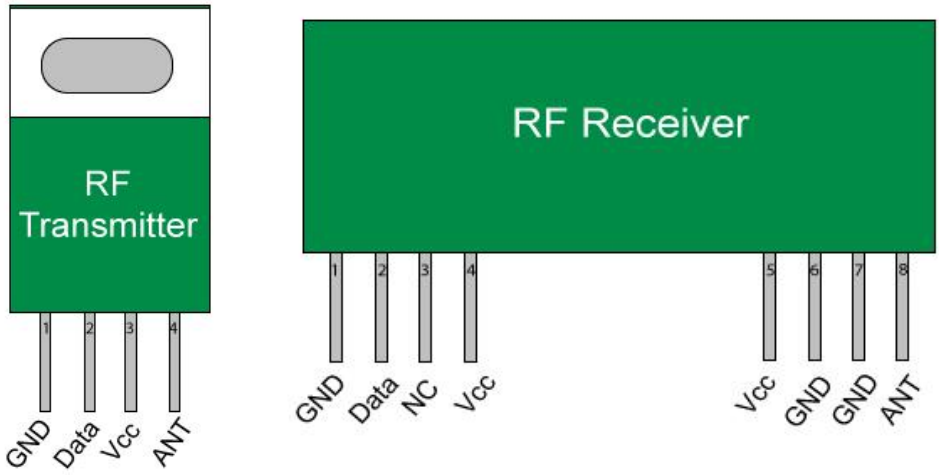

Fig:1. Pin diagram of RF Module(TX/RX)

B.Pin Description

RF transmitter has four pins the second pin is data which used to transfer the data.

The third pin usually connected to the supply, VCC, and the First pin is connected to ground finally the last pin for an antenna.In RF receiver, it has eight pins first set of four pins are GND, DATA, NC and VCC the next four is VCC,2 –GND and antenna. The data pin2 used to receive the transmitted data from the RF Tx.

2.2 ACTIVE TAG :

Motivation for an active tag is, the passive tag can be scan when the object is close related to the reader. Also it used only for sign in and sign out entries. On the other hand active tag does not need close to reader where ever it can be transmit the data.The RFIDtag is a single electronic the chip which has stored the unique identification (ID) for each miner.The chip is made up of an integrated circuit on a silicon chip. That chip programmed with miners profile and are worn by the miners. The secret code which has a serial number stored in that electronic chip. RFID tags can different sizes and shapes depending on Purpose and the surroundings at which it will be used.The RFID tags are classified in three Active tags, Passive tag and semi-passive. An active tag has an internal battery on board and it can start transmission itself. Passive and semi-passive tags were not powered itself due to this lifetime of its battery is low compared to active tag. Semi-passive tags also have batteries on board but, they use only onboard computations. Low-frequency tags (125-135kHz) can read up to 30cm away, High-frequency tags (13.56MHz) can be read up to 1meter away and the ultra high-frequency tag(868-915MHz) can be read up to 7 meters away. Alternatively, active tags can be read more than 100 meters away.

2. BLOCK DIAGRAM:

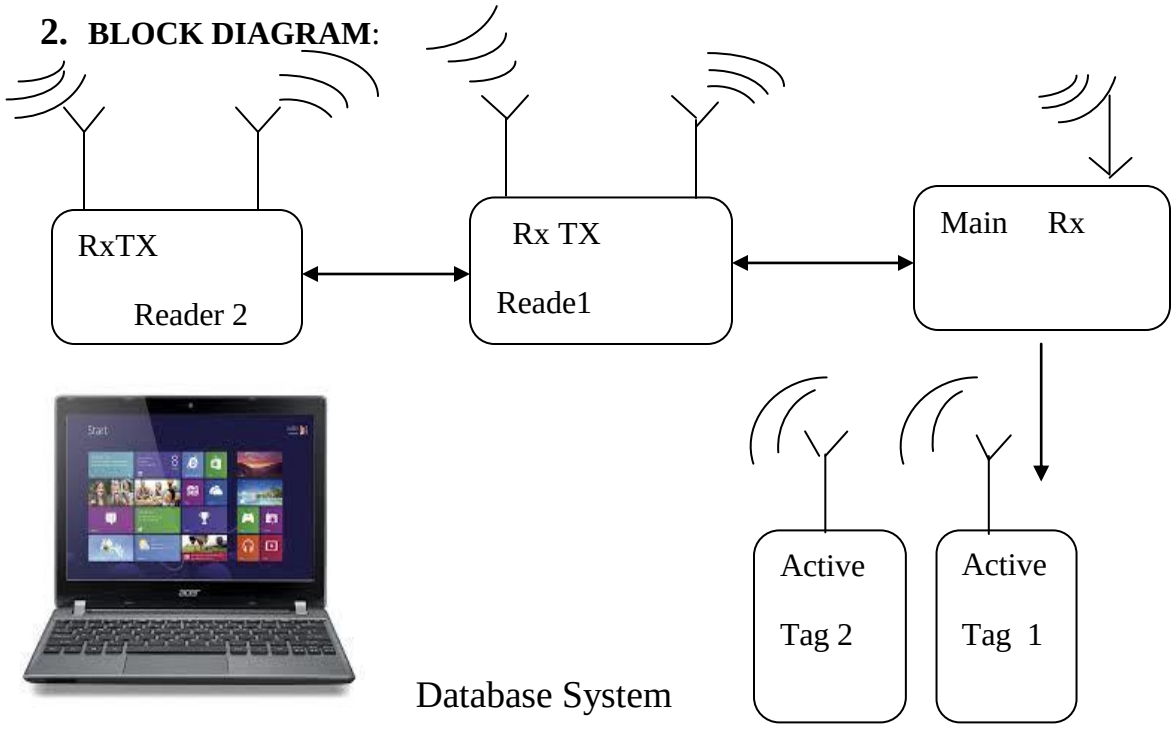

Fig:3.1 RFID based tracking system for mining security using Active Tag

3.1 FUNCTIONALITY:

The objective of this project is to design and implement the RFID –based reliable and accurately track the miner's inside the indecisiveness of the underground area such as mining area. In this mining security, each miner's has to provide active tag.The tag internally designs for the single electronic chip that chip containing an identification code programmed with miners profile using Arduino. Then the active tag internally connected to the RF transmitter, crystal oscillator, and capacitor. The crystal oscillator parallelly connected and serially connected to the capacitor in 9^{th} and 10^{th}pin of Arduino Uno. The power supply was internally provided to the active tag. It has long read range up to 10meters. Another important part of our project is the reader(RF transceiver module). This module usually a small electronic device which used to transmit and receive the radio signals between the two devices. The reader is placed inside the mining area which having the certain distance between them. The active tag continuously transmits the data and If the miner enters the area, the nearest reader will read the data from the tag and transmit it to the next RF module it receives that data and transmit to next reader. Simultaneously this process will occur and read data's are stored on the server side of the monitoring system.motivation for an active tag, the passive tag scan the bar code when the object is close related to the reader. But, the active tags not like that. The data transfer to the each reader in bidirectional. Its act as a bidirectional ring topology.Each nodes are act as the reader (transceiver).Transmitting data's are first reached to the data sever through a shortest path. Data base server designing to the web pages with the help of virtual basic this interface to the data base. From this, we have to accurately identify the real-time location of the miners in indecisiveness area.

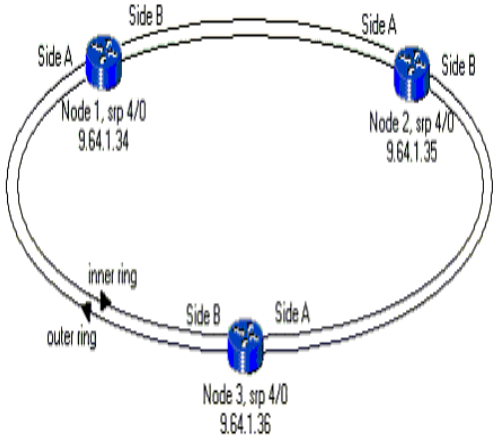

Fig: Reader transmitting and receiving signal path

4. CONCLUSION

In this paper RFID-based reliable and accurately tracking the real time location of the miner's inside the indecisiveness area was successfully implemented through the Active tag. Active tags can be deployed in a diversity of useful applications and many purposes. They can be specific tasks such as determining the location and orientation of the miners as well as enhance RFID security and privacy. This active tag method is not used for in our country. We are first implement active tag for mining security in our country. From this we conclude and hope that the RFID active Tag technology gives many benefits to several applications of tracking even in uncover age areas.

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