

## Design of Smart Surveillance Security System Based on Wireless Sensor Network

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### ABSTRACT

Banks and building societies have many of their branches housed in buildings with floors above them occupied by other companies. If these other companies do not have an effective security systems and intruder deterrents then there is scope for intruders to break into these offices when empty, cut a hole in the floor and thus gain access to the bank or building society below. Thus, our system has solutions to overcome these problems and issues, which having an intruder sensor and PIR motion sensor used to detect whether a human has moved in or out of the sensors range. To monitor the safety and money lockers, we placed a vibration sensor for unauthorized access to the system, by producing suitable buzzing to siren and getting a text message to the higher authority as a notification. Sensing system has additional inputs like temperature and camera based image capturing in the monitoring end. Sensing section also has the controlling part such as door lock, chloroform release and puncher mechanism after getting intruder access. Simultaneously, the system sends the unauthorized access to the monitoring section as well.

**Keywords:** WSN, MCU, PIC, GSM, PIR.

### INTRODUCTION

Network security which was controlled by the network administrator [1] involves the authorization of access to data in a network involves that Users will assigned to an ID and password or other authenticating information that allows them access to next step. Network security used in public and private (i.e.) transactions in banks, communications, government agencies, businesses, and individuals. Networks can be private or public access. Where network security secures the network, protecting and monitoring that are being done.

Network security starts with authenticating the user commonly with a username and a password. Since this requires just one detail authenticating the user name (i.e.) the password, which is something the user 'knows' this is sometimes, misplaced and forgotten. Our system

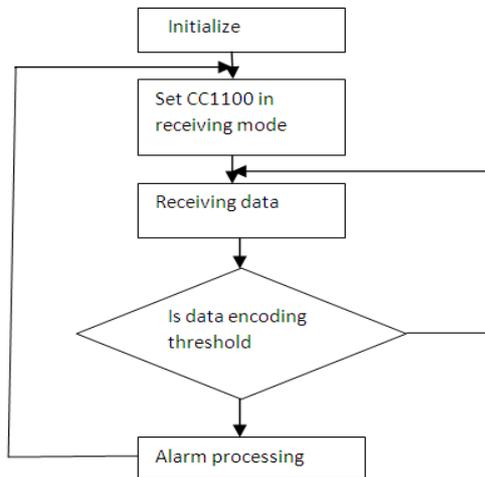
has solutions to overcome these problems and issues, which having an sensors used to detect the human. To monitor the safety and money lockers, we placed a vibration sensor for unauthorized access to the system. If it founds accessing the locker than authorized persons, we alert the system by producing suitable buzzing to siren and getting a text message to the higher authority as a notification [2]. The main aim of this paper is to provide a security to the banks and other organizations of the company, to monitor the safety and money lockers, we placed a sensor for unauthorized access to the system. Simultaneously, the system sends the unauthorized access to the monitoring section as well. Security is the great challenge at present day for banking which is fulfilled in this paper.

### SYSTEM DESIGN

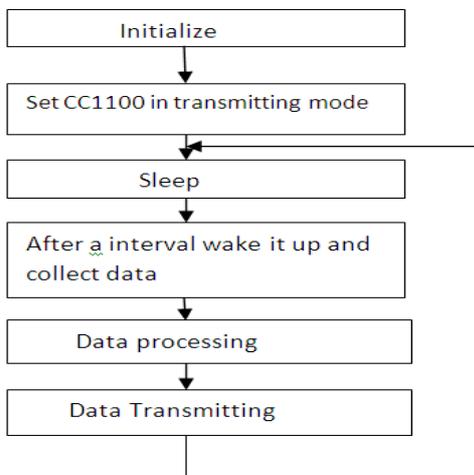
In general, WSN node consists of four unit namely Data collecting unit, Data processing

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unit, Wireless communication unit, Power management unit. Data collecting unit is composed of sensors and PIR detectors, temperature sensor, smoke detector and gas sensors are used [8]. Wireless communication unit is composed of low power consumption, short distance Radio frequency transceiver. Where the software flow module is shown in Fig1 and Fig2.

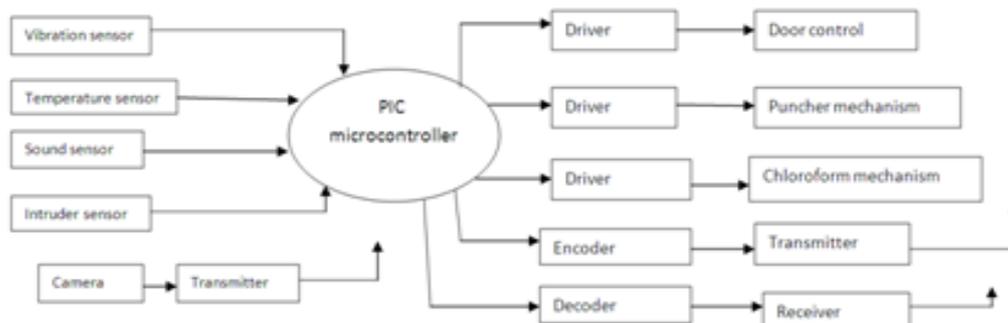


**Figure1.** Software Flow of Center Node Module



**Figure2.** Software Flow of Data Collecting Node

### Working Station Module



**Figure3.** Working Station

The former running on the slave MCU of data collecting nodes, is responsible for collecting sensor data and wireless transmitting them. Later, running on the MCU of WSN center node is responsible for wireless receiving data and judging whether it's need to start the alarming process or not [6]. If yes it will drive module to send alarm short message to user's mobile phone.

### Proposed Method

Our paper provide an effective security system, which having an intruder sensor and sound motion sensor used. To monitor the safety and money lockers, we placed a vibration sensor for unauthorized access to the system [4].

If it finds accessing the locker than authorized persons, we alert the system by producing suitable buzzing to siren and getting a text message to the higher authority as a notification. This system consists of two sections namely,

- Working Station
- Control Station

Working station has additional inputs like temperature and camera based image capturing in the monitoring end as shown in Fig. 3. It also has the controlling part such as door lock, chloroform release and puncher mechanism after getting intruder access. Simultaneously, the system sends the unauthorized access to the controlling section as well. The Control station has a personal computer to monitor those data and send the message via GSM technology [5]. The overall system has wireless transmitter and receiver through RF communication and it has encoder to convert the digitized signal into frequency and decoder act as vice versa. The controlling section has a driver to amplify the current signal to the driving level as shown in Fig. 4.

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The system has a controller which act as a main sensing and controlling unit, and we used PIC based micro controller to do that [3]. PIC has an inbuilt Analog to digital converter, which is easy to interface analogous sensors to the control unit. In the monitoring section, Lab

VIEW was loaded in the personal computer to achieve Graphical based simulation monitoring.

It is a working station module which is placed in the bank or in any organizations. This block is used to detect whether the intruder has entered into the bank or not.

### Control Station Module

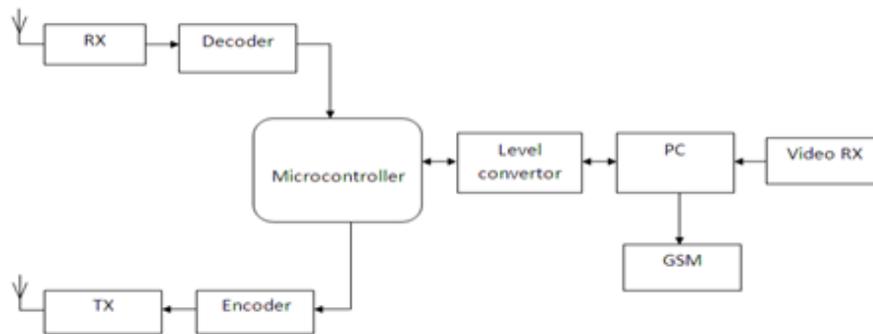


Figure4. Control Station

Output power and harmonic emissions are easy to control, making FCC and ETSI compliance easy. The transmitter is basically a negative resistance LC oscillator whose center frequency is tightly controlled by a SAW resonator. SAW resonators are fundamental frequency devices that resonate at frequencies much higher than crystals. OOK is the modulation method of choice for remote control applications where power consumption and cost are the primary factors, because OOK transmitters draw no power when they transmit a 0, they exhibit significantly better power consumption than FSK transmitters. OOK data rate is limited by the start-up time of the oscillator [10]. High-Q oscillators which have very stable center frequencies take longer to start-up than low-Q

oscillators. The start-up time of the oscillator determines the maximum data rate that the transmitter can send.

## RESULTS AND DISCUSSION

### Working Station Module

In this the working station of our paper and this station is kept in the public area for example inside the bank, which is used to protect the money or valuable things inside the bank or other private organizations. When the intruders enter into the company or bank this working station will send alarm to control station and lock the main gate of company or bank. The working station module is shown in Fig. 5.

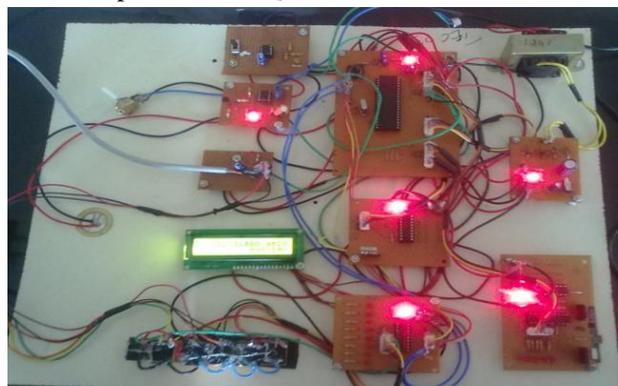
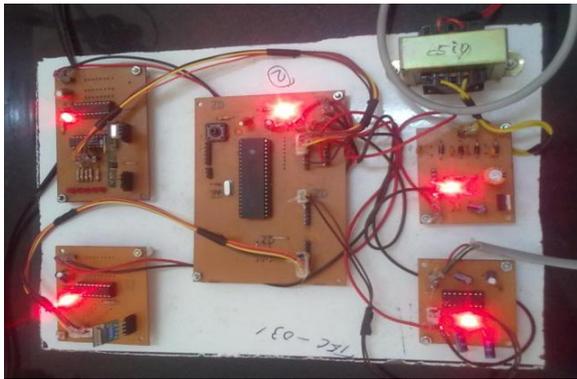


Figure5. Working Station Module

### Control Station Module

In this the control station and it is kept in the controlling side for full duplex communication through which we can send message to three

people like security, police, headquarters using night vision camera we can able to store the data and we can use it for future references. The control system module is shown in Fig. 6.



**Figure 6.** Control Station Module

### CONCLUSION

This system has low power consumption based remote security alarm system, based on WSN. It can detect the theft and send an alarm message to three people like police, security and head office. With the advantage of complement wireless, low power consumption, easy usage the system can be used in various fields. Thus, this paper provides an enormous security for banks and other organizations having more reliability and high security.

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