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Implementation of the Atm Security System by Using ZIGBEE

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Abstract

The Implementation of the ATM Security System by Using Zigbee is developed into the security application. The main objective of this system is to develop an embedded system, which is used for ATM security applications. The embedded ATM authentication system is based on sensors & communication technology. In this paper when any disturbance takes place for the ATM machine then information is send through Zigbee and door is automatically closed then it will send the machine, by alerting the surrounding area using buzzer. This concept is not only a single ATM center, we can consider this ATM center as node1 (like node1, node2, node3……. Etc) are connected to PC through Zigbee. So that if there is any disturbance or any fire accident in any node we can get the area information through Zigbee to the PC along with buzzer.

Keywords: Zigbee Technology, Wireless Sensing Network, ATM terminal,ARM9

Introduction

As we know that over the past three decades, consumers have been largely depending on and trust Automatic Teller Machine, known as ATM machine to conveniently meet there banking needs. Using an ATM, customers can access their bank accounts in order to make cash withdrawals, debit card cash advances, and check their account balances as well as purchase prepaid cell phone credit. Most ATMs are connected to interbank networks, enabling people to withdraw and deposit money from machines not belonging to bank where they have their accounts or in the countries where their account are held. Despite the numerous advantages of AT M system, ATM fraud has recently become more widespread. Fraud technique such as card skimming, shoulders surfing etc have been observed recently. In order to increase the level of security of the ATM networks use of biometric technique for verification along with existing PIN has been thought of a solution to decrease the increasing number of frauds. Also in rural areas people are not educated enough to use the ATM machines so, use of only biometric verification can help those people access the ATMs in an easier manner and hence increase its popularity among rural masses.

A WSN (wireless sensor network) generally consists of base station (or) gateway that can communicate with a number of wireless sensors via a radio link. power unit produces the power. Data Processing unit have the micro- controller, which is the fully responsible to get sensed data and transmit over the another network. The microcontroller performs tasks, processes data and controls the functionality of other components in the sensor node. Sensing unit has the sensors and analog to digital converter (ADC) to convert analog sensed signal to digital signal. The ideal WSN is networked and scalable, consumes very little power, is smart and software programmable, capable of fast data acquisition ,reliable and accurate over the long term, costs little to purchase and install, and requires no real maintenance. Selecting the optimum sensors and wireless communication slink requires knowledge of the application and problem definition.

Related Work

ZIGBEE TECHNOLOGY

The ZigBee standard operates on the IEEE 802.15.4physical radio specification and operates in unlicensed bands including 2.4 GHz, 900MHz and 868 MHz's

The ZigBee which is one of the representative wireless sensor network which has low-power, low-cost and convenience to use, is standardized the higher protocol and application based on the PHY/MAC layer by IEEE 802.15.4 subcommittee in 2003[1].

The complete Zigbee technology[4] agreement made up by Application layer, Network layer, Data link layer and Physical layer, it can transport more than 10m, the frequency band are 2.4GHz and 900MHz, they are all free. The transmission rate is 1 0- 250kb/s, network architecture has Master/Slave characteristic and it can

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worked as Two-way communication for public use. Zigbee technology depends on its simple architecture, low price and low power consumption to prolong the life Although Zigbee technology transfer rate is not high, but for use in sensing and control, Zigbee

ZigBee can realize the local communication and ubiquitous computing, and can transfer the date with 250kbps within 100m radius range, and connect about 65000 units in single wireless network by utilizing mesh network organization. The key characteristics of ZigBee/IEEE 802.15.4 is low power consumption. The end devices of ZigBee network are able to use 2 to 3 years maximum with installation of a battery and can be use more period under the condition with lower communication[3].

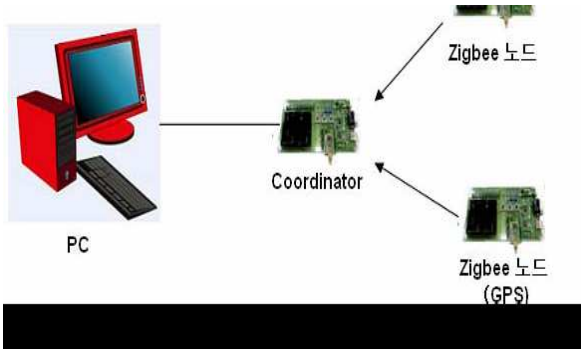

Figure1.ZigBeeNetworkOrganization [2]

ZigBee protocol features includeSupport for multiple network topologies such as point-to-point point-to-multipoint and mesh networks. Low duty cycle – provides long battery life. Low latency. Direct Sequence Spread Spectrum (DSSS).

Vibration Sensor (MEM'S SENSOR)

Micro electromechanical systems are free scale's enabling technology for acceleration &the pressure sensors. Mem's based sensor products provide an interface that can sense process and/or control the surrounding environment. Mem's based sensors are a class of devices that builds very small electrical & mechanical components on a single chip mem's based sensors are a crucial component in automotive electronics, medical equipment, hard disk drives computer peripherals, wireless devices & smart portable electronics such as cell phones &PDA's

Smoke Sensor

The smoke sensor we are using any fire accidents will accrued in any area are place it can detected and alert that place. Resistance value of MQ-2 is difference to various kinds and various concentration gases. So, When using this components, sensitivity adjustment is very necessary. They are used in gas leakage detecting equipments in family and industry, are suitable for detecting of LPG, i-butane, propane, methane ,alcohol, Hydrogen, smoke. Features of the smoke sensor is Wide detecting scope, Fast response and High sensitivity, Stable and long life, Simple drive circuit[4].

System Implementation

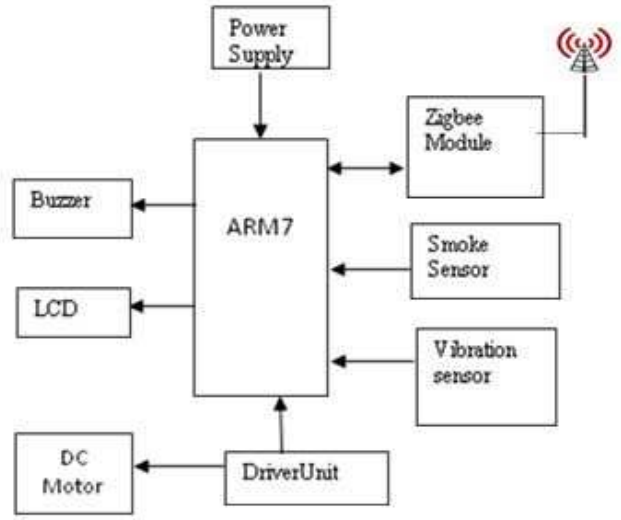

Figure: 2 Block Diagram of Transmitter section

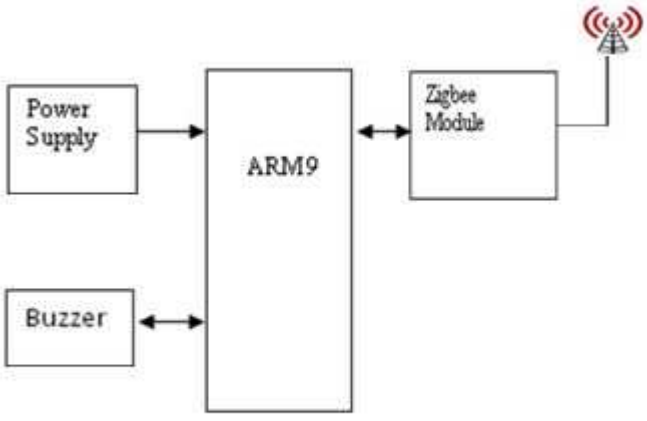

Figure: 3 Block Diagram of Receiver section

The transmitter section shown in Fig.2 when any disturbance occur the ATM section , sensors in any node of the town will be activate and sends the information to the receiver section[4].

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The receiver section shown in Fig.3 the received information is sent to the controller, when which node is disturbing in to the town the Zigbee receiver receives the information and the ARM9 controller will display the message which node is disturbing and audio alarm will be ON and Door will automatically LOCK[5].

ALGORITHM

Step1: Initializing the process
Step2: If any obstacle occurs to the ATM Machine, the vibration sensor gets activated
Step3: Automatically Door will be closed
Step4: Immediately Alarm will be ON
Step5: Through Zigbee information is sent to PC
Step6: If any short circuit occurs in the ATM section, the Smoke sensor gets activated
Step7: Immediately Alarm will be ON
Step8: Through Zigbee information is sent to PC
Step9: The details of the ATM time, area will displayed on screen
Step10: Immediately Audio Alarm will be activate

Result Analysis

Figure:3 Outputs of receiver section.

The result shown in the figures was received from the vibration sensor and smoke sensor which were connected to the coordinator nodes and consequently the coordinator node was connected to the ARM9 controller displaying the message which node is disturbing and audio alarm will be on.

Conclusion

The ATM device which is always exposed to the crime is gradually increased every year, and in this trend, the crime for the ATM is increased accordingly.
The Implementation of ATM security by using sensors (vibration& smoke)and Zigbee technology is using in to the one town. Additional, the system also contains the all the ATM systems into the town we consider that node1, node2, node3.The security features were enhanced largely for the stability and reliability of owner recognition. The whole system was built on the technology of embedded system which makes the system more safe, reliable and easy to use[5].

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