A REVIEW PAPER ON HOME SECURITY BASED ON ZIGBEE

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ABSTRACT:

Nowadays wireless technology uses for communicating and sharing information between two devices (or) users. Wireless home security is the prevention of unknown things it is low cost and less power consumption whereas it will communicate through the alarm (or) message to our connected device. This paper presents the overall design of wireless smart home security which has been built and implemented in Zigbee. It is standard-based wireless communication it will use at a low cost that anyone can use. Keywords: Sensors, Microcontrollers, GSM module, Zigbee module

I . INTRODUCTION

Our daily lives expose us to a variety of security-related problems. As a result, we had to create cutting-edge technologies to increase the security of these locations. By utilizing some of the frequently employed, inexpensive sensors that are readily available on the market, we may transform our homes into Smart Homes. These sensors will serve as the home's eyes and ears.

Zigbee is a high-level communication protocol for wireless communication that is based on the IEEE standard and suitable for building. It can send and receive data over numerous routers and endpoints. All sensors, microcontrollers, relays, and fire alarm devices will be connected through this network. The benefit of utilizing Zigbee is that it consumes little power and has a wide enough network range.

II. HOME SECURITY

Since its introduction in 2004, Zigbee technology has benefited numerous networking systems. The primary purpose of a Zigbee device is to establish a network by coupling input sensors with output electromechanical relays, motors, and alarms. The security system's fundamental architecture is depicted in This is the suggested architecture for a security system using Zigbee. In this situation, sensors are used as input devices. These inputs include a SIM 900A GSM module, infrared motion sensors, and cameras. These sensors detect when someone is trying to enter a building or a bank; if the individual is permitted, there won't be an issue, but if they are not, the system will lock the doors and bar the entrance. Some drivers are utilized in this system as output devices.
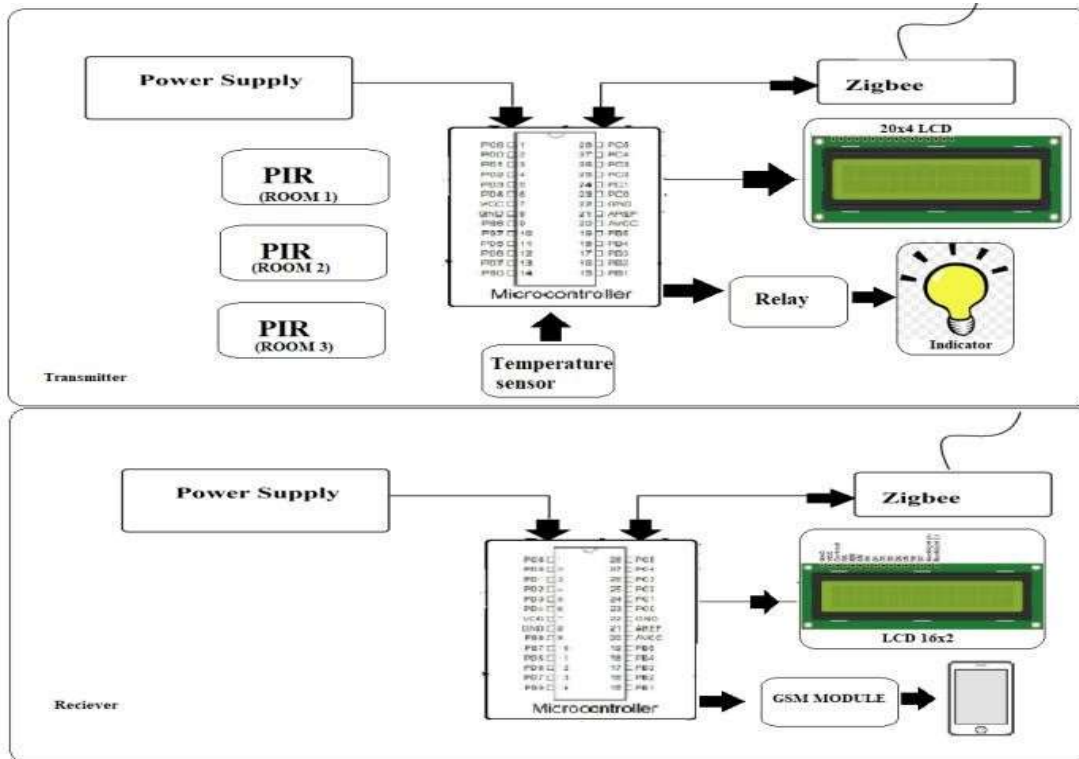
Fig(a).Zigbee Transmitter and Receiver

Everywhere, home security has grown to be a crucial issue. The main purpose of home security systems for people is to prevent theft. The grim truth is reflected in the rising crime rate in all cities. Many people fail to recognize, disregard, or undervalue the importance of implementing suitable home security measures. Everybody's home is more secure and gives them greater peace of mind while they sleep or are away from it thanks to home security systems. The greatest home security system improves life's comfort and safety. People will receive all updates in this system even if they are not present. Two circuits, a transmitter component, and a receiver part make up this project. The transmitter includes a proximity sensor to determine if the window is open or closed, three PIRs to detect motion in three different places, a temperature sensor to determine the current temperature, an LCD to show the parameters, and a ZigBee module. Zigbee is a wireless mesh network technology that is low cost, low power, and offers low latency communication. An LCD, a GSM module for alerts, and a Zigbee receiving module make up the receiver circuit. ZigBee Module performs the two circuits' communication. The registered user receives a notification if there is motion in any of the places or a warning when a window is opening. Additionally, there is a lamp that will illuminate if the temperature drops.

III ZIGBEE

For usage in low data rate, short to medium-range wireless networking devices like sensors and control networks, Zigbee Technology is a form of a wireless communication network that provides a set of protocols. Zigbee Technology is a low-cost, low-power, battery-operated wireless sensor network that enables sleep mode or low-power mode and does not require

continual status updates. Based on the IEEE 802.15.4 Standard, Zigbee Technology uses the 2.4 GHz ISM Band (ISM – Industrial, Scientific, and Medical). Although commercial Zigbee devices are frequently used in the 2.4 GHz band over the world, it employs a distinct set of frequency bands, including 784 MHz, 868 MHz, and 915 MHz, respectively.

IV.COMPARISION

Table 1

comparison of zigbee with related technologies

TECHNOLOGY	BLUETOOTH	WIFI	ZIGBEE
Frequency	2.4GHZ	2.4GHZ, 5GHZ	868MHZ
Modulation	FHSS	QPSK	BPSK
Error Control	CRC(16bit)	CRC(32bit)	CRC(16bit)
Range	10m	10m	10m|100m
Network Size	8	2007	64000

Table 1 explains the comparison between the wireless sensor network. The technologies like Frequency, Modulation, Error Control, Range and Network Size of respective networks.

V. GSM MODULE

SIM 900A GSM Module: The dual-band gsm engine is included in the GSM Modem RS232. SIM900A operates between 900 and 1800 MHz. The RS232interface is included with the modem. With the help of the AT command, the baud rate may be changed from 9600 to115200. To connect to the internet through GPRS, the GSM modem has an internal TCP/IP stack. It is appropriate for voice, data, and SMS transmission.

The Micro-Controller was properly interfaced with a GSM modem using the level shifter IC Max232. Upon receiving a numeric instruction by SMS from any mobile phone, the SIM card attached GSM modem sends the data to the microcontroller via serial communication. As the software runs, the GSM modem gets the instruction "STOP" to create

VI .Hardware Components
  I.ATmega328P
 II.Zigbee module
III.LCD(**Liquid crystal display**)
IV.PIR **(Passive Infrared)**
 V.Sensor (**Temperature, Proximity**)
VI.GSM module **ATMEGA328P :**

The ATmega328P is an 8-bit AVR microcontroller with excellent performance and low power consumption that can execute 131 strong instructions in a single clock cycle.

ZIGBEE MODULE:

Wireless modules based on the IEEE 802.15.4 Zigbee protocol are known as Zigbee modules. This protocol was created as a low-power mesh networking technology for wireless data transmission. It was created for IoT applications requiring low data rates.

LCD:

A type of flat panel display known as an LCD (Liquid Crystal Display) operates primarily on liquid crystals.

PIR :

All items that create heat radiate infrared, which PIR (passive infrared) sensors use to detect. Although this kind of emission is invisible to the human eye, infrared-based sensors are capable of spotting it.

SENSORS:

Smart Devices like lightbulbs, sockets, plugs, smart locks, motion sensors, and door sensors may interact with one another using the wireless Zigbee protocol via a "PAN" (Personal Area Network)

We use two types of main sensors in home security using Zigbee

1)TEMPERATURE SENSOR

2)PROXIMITY SENSOR

TEMPERATURE SENSOR:

Devices called temperature sensors are employed to gauge the temperature of gases, liquids, and solids. They have several more commercial uses in addition to being employed in industrial applications.

PROXIMITY SENSOR:

A proximity sensor is a device that can sense the presence or approach of adjacent objects without making direct contact with them. Different types of proximity sensors exist.

GSM MODULE:

Global System for Mobile Communications, or GSM. GSM is a cellular technology that is open and digital and is used for mobile communication. It utilizes the 850 MHz, 900 MHz, 1800 MHz, and 1900 MHz frequency ranges over 4 distinct bands. It makes use of FDMA and TDMA in conjunction.
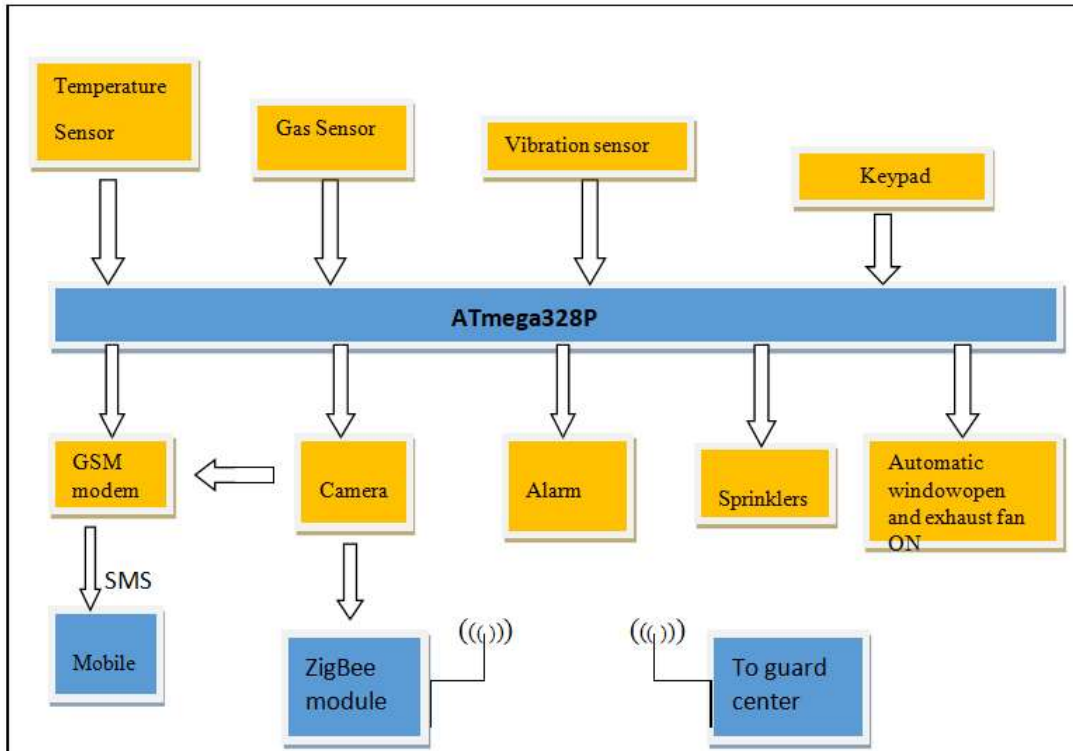
ADVANTAGES OF HOME SECURITY USING ZIGBEE:

1)Setting up the network is very simple and easy

2)It does not have central controller and loads are distributed evenly across the network

3)It is easy to monitor and control home appliances from remote

4)It will take the place of existing infrared technology based devices this will save cost of battery

DISADVANTAGES OF HOME SECURITY USING ZIGBEE:

1)It requires knowledge of the system of owner to operate Zigbee systems

2)It is not secured like wifi based secured system

3)Replacement cost will be high any problem occurs in zigbee complaint home appliances

4)Like other wireless systems zigbee based communication is prone to attack attack from unauthorized people

CONCLUSION:

Built and put into use is a Zigbee-based smart home security system. The system aims to secure homes, banks, businesses, and other facilities. Today, everyone is concerned about the protection of their lives and their possessions, so if we can develop a system that will take care of this, it will be a more intelligent use of technology in everyone's life. The suggested technique is dependable, economical, and efficient.

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