

# Harmful Gases Wireless Network Monitoring System Design Using HC12 and GSM Technologies

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**Abstract-** Single network for traditional wired and monitoring systems in the wiring, coverage, scalability, compatibility and other aspects of the problem, this paper proposes to Zigbee technology-based, GSM technology, supplemented by the master-slave wireless network, this system architecture designed remote detection terminal, control master station, mobile monitoring terminal communication protocol. Remote monitoring terminal is used to detect the site environment and gas concentration. Remote sense terminals to detect scene conditions and gas concentration state. Control station is used to handle the main station to join the network of remote detection terminal data, timely alarm information sent to your phone via GSM module monitoring terminal. This system is enhanced by adding up alerting and automatic air purification system to reduce the harmful gases. In addition, through the serial port to transfer data to a computer monitor server, to achieve the status of each remote terminal data analysis and management. Experimental results show that this project designed system is capable of long-term stable and reliable operation with low power consumption, always online, covering a wide area advantages.

**Indexed Terms-** Zigbee Network, Data Collection, Database, Monitoring Platform, GSM

## I. INTRODUCTION

In Nowadays the harmful gases that are been present in the atmosphere, industries, factory can be controlled by using different technologies. Before knowing about them we have know about the previous methods that are used like wired network (or) wired technology where the detecting of harmful gases has been become

more complex and difficult in the place of the fault detection. To overcome, this we are been going into the wireless designing technology, in this the complexity will be decrease as compared with the wired and also the fault will be detected fast then the previous method (or) technology introduced as one thing is cost is more in the wireless technology and it cover wide range. About this sensing network is that It can cooperatively perceive, collect and process the information of the perceived objects in the area covered by the Network and send it to the observer. Wireless sensor network is a network system integrating monitoring, control and wireless communication. Environmental impact and energy exhaustion, the node is prone to failure; Environmental interference and node failure can easily change the network topology. In general, most sensor nodes are stationary. In addition, the energy of wireless sensor network nodes, as well as their own processing capacity, storage capacity and communication capacity are very limited.

## II. LITERATURE SURVEY

City municipal sewer is one of the city's critical infrastructure, due to it is relatively closed, environment specific, easy to produce large amounts of toxic, hazardous, flammable and explosive gases. If it is in poor management, when hazardous gas leak, there is likely to cause gas accumulation, at last, fire or explosion occurred. In recent years, Chongqing, Nanjing, Wuhan and other places have occurred such serious explosion of City municipal sewer. Sanitation workers suffered gas poisoning incidents have also occurred; It is harmful to people's personal and property safety seriously. With the development of city size and people to enhance environmental awareness, concerns and input of municipal

government and community in on-site of the environment is growing, the establishment of an effective monitoring and warning system of municipal sewer is not only an important part of the urban environment, but also imperative requirement of modernization of municipal facilities. Using GPS wireless communication technology, combined with high-performance infrared gas sensor, to design the program for the signal send back to the remote monitoring centre based on the signal processing system and wireless network sensors, the monitoring centres in different position use GPS technology to monitor the municipal sewer pipe to achieve continuous and automatic monitoring for sewer combustible gas in all-weather and alert the users.

### III. METHODOLOGY

This work will be developed in the harmful gases detecting and producing the alert signal for knowing about the gases that are been released in the industries, factories and other areas. This process is been done by using ZIGBEE (HC12) and GSM technologies.

The workflow of this proposed system will be used for security, coverage over large areas, easy altering system which is been explained in detail manner. In this process we will be having the two sensors like MQ2 sensor and MQ6 sensor for gas and smoke sensing according to the air quality. These sensors are been activated by applying external smoke by the lighter, that smoke is detected by the the sensors and given to the zigbee transceiver section where the signal is been is passed through GSM module this module will be providing the alert SMS on the mobile and also the indication on led like red, green LED'S . After getting the alert on mobile the LCD display will be showing the indication as "HARMFL GASES DETECTED" on LCD. The following figures will be explaining about the process and also the components that present like MQ2 Sensor, MQ6 Sensor, controller used is arduino Uno for interfacing of all components, which are been mentioned

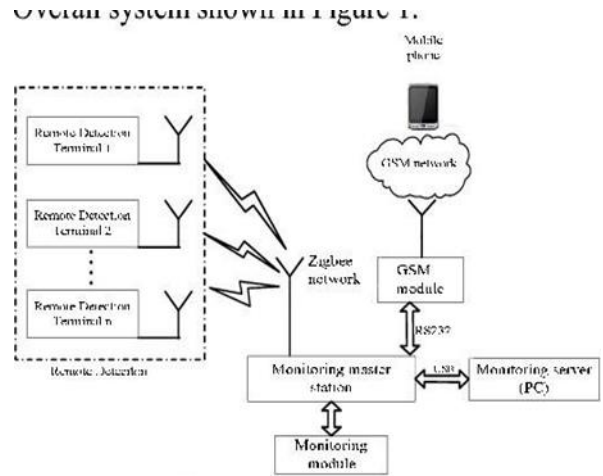


Figure 1. System structure

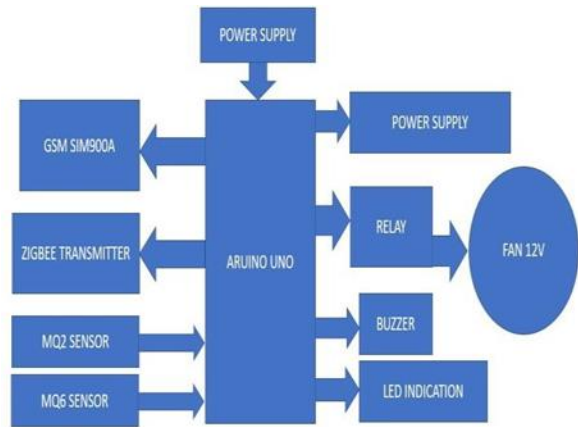


Figure 2. Block diagram of transmitter section

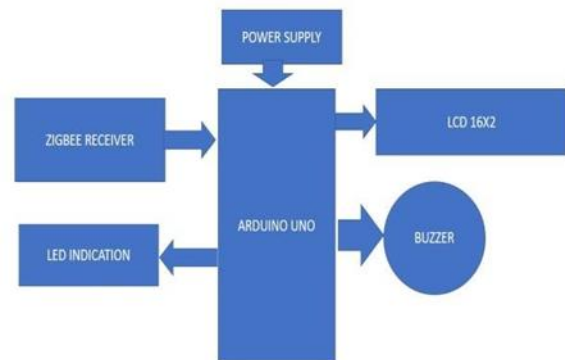


Figure 3. Block diagram of receiver section

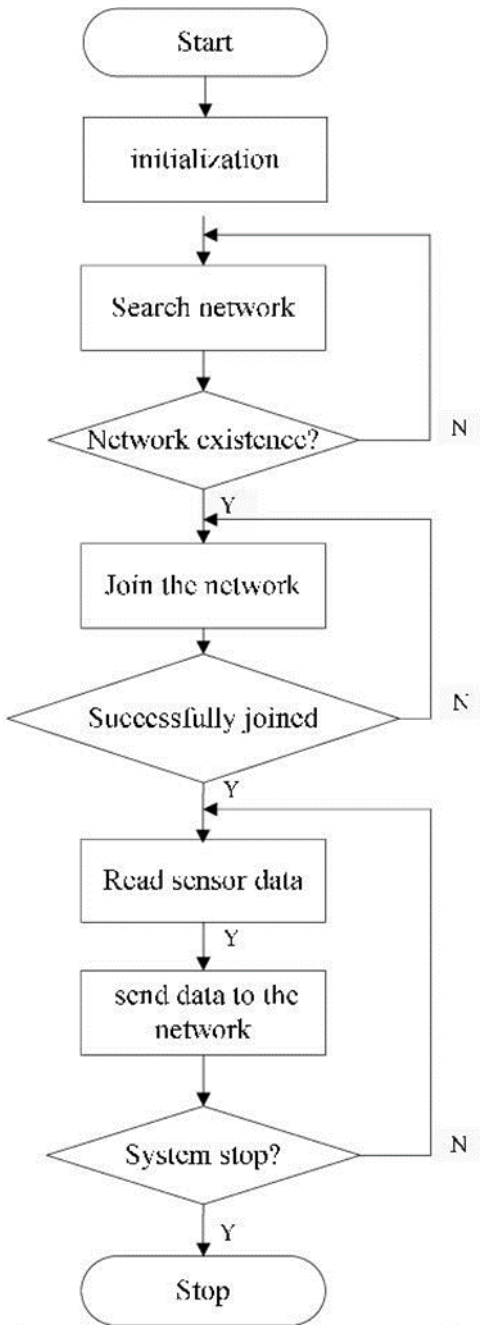


Figure 3. Flowchart of ZIGBEE remote terminal

#### IV. RESULT

In the result you will be observing how the block diagrams operators (or) works in transmitter and receiver section. As the signals will be transmitted from the transmitter section and this signals are been received at the receiver section and the output will be observed

on the mobile via SMS and also indication on LCD display. This process is mainly seen in the industries, factories, and other places where different types of harmful gases are released at that time can use this technique (or) technologies like ZIGBEE, GSM. Hence, by using this we can alert the harmful gases that are released.

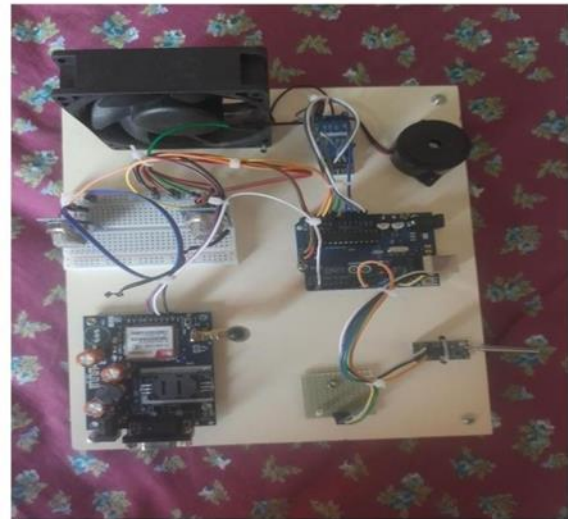


Figure 4. Connection at transmitter section

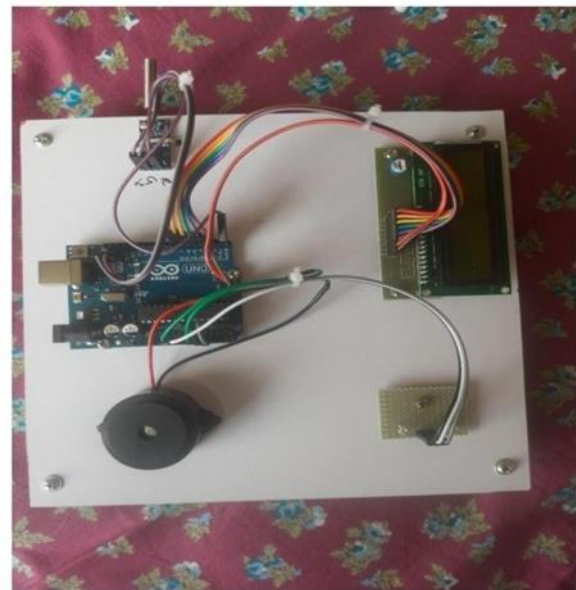


Figure 5. Connection at receiver section

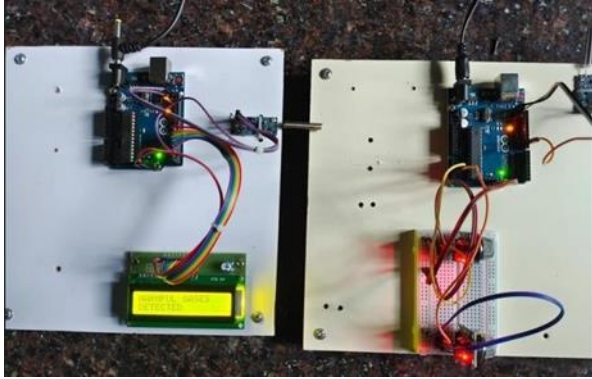


Figure 6. By using only ZIGBEE technology

### CONCLUSION

ZIGBEE technology is developed from sensor network. In view of the complicated underground environment of coal mine and the difficulty in cable layout. ZIGBEE has a strong wireless networking capability. ZIGBEE wireless communication technology is adopted to replace the traditional cable communication mode, making the monitoring range more extensive and the monitoring mode more flexible. ZIGBEE nodes are divided into RFD, FFD and PAN. It is very suitable for special environment in coal mine and monitoring the environmental parameters in coal mine. Therefore, ZigBee network-based wireless sensor network in coal mine will make safety monitoring in coal mine more automatic, networked and intelligent, and further effectively guarantee the safety of underground workers. Along with we are been using the GSM module for getting the alert message so that we control the problems that are occurring.

### FUTURE SCOPE

The proposed fresh access to adviser and ascertain the arising of LPG gas is apish a developed which detects the arising of gas in the air and if it exceeds assurance akin again it activates the buzzer and sends the SMS to the defined numbers by application GSM. Application this user gets active in the chancy and aberrant activity to yield the all important action. We can obtain the accidents acquired by gas arising with the advice of this system. In this future ideas (or) technologies you can use the IOT that is the advanced technology of ZIGBEE and GSM.

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