

Chapter-12

Gas Leakage Tracer Using Mos Sensors by SMS Alert And Buzz

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Gas use presents major problems in both the home and the office. Liquid petroleum gas (LPG) and other flammable gases are combustible gases that are commonly utilized in homes and workplaces. Human lives and cultural heritage have been irreparably damaged as a result of the gas spill. Keeping this, we decided to develop a system that identifies gas leaks and protects workplaces by taking the necessary steps at the proper time.

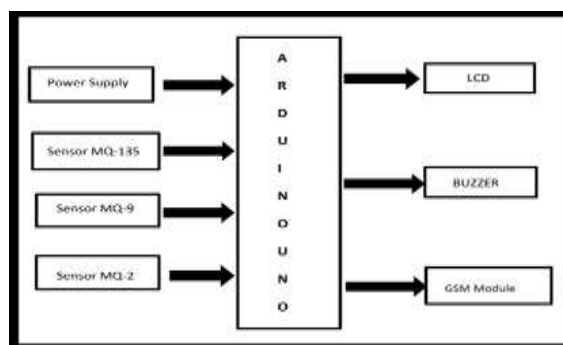


Fig.1: Block Diagram

The primary goal of a Gas Leakage Detection System, is to detect any gas leakage in the surrounding environment and inform users with a warning signal, such as a buzzer sound, as well as show the gas level on an LCD screen. The system detects gas concentrations with a gas sensor, such as the MQ series gas sensor, which is linked to an Arduino board. The gas sensor sends an analogue voltage signal to the Arduino board that is proportional to the gas concentration. The signal is then processed by the Arduino board and compared to a threshold value. If the gas concentration reaches the threshold amount, the system raises an alarm by activating a buzzer, which emits a sound to warn users of a possible gas leak. Simultaneously, the system shows the level of gas concentration on an LCD screen, providing a visual indicator of the gas level in the surrounding environment. The Gas Leakage Detection System with Arduino, LCD, and Buzzer is a simple and low-cost method for detecting gas leaks and avoiding potential hazards. It is simple to install and use, and it detects gas leaks accurately and reliably, assuring the safety of people and the surrounding environment.

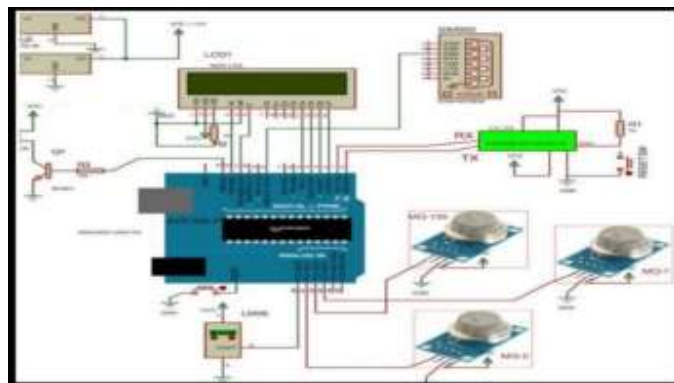


Fig 2: Schematic Diagram

1. There are various reasons why Gas Leakage Detection System should be considered:
 Safety: Gas leaks can be dangerous, triggers a fire or explosion and causing harm or even

death. A gas leak detection system can identify gas leaks early on, warns the user regarding danger and prevent hazards.

2. **Accuracy and Reliability:** Gas leakage detection systems are very accurate delivering real-time gas concentration and sends an alert when the gas exceeds a predetermined threshold level.
3. **Cost-effective:** Due to the low cost of Arduino boards and gas sensors, gas leakage detection systems are cost-effective alternatives.

Gas leakage detection systems have several applications and uses, including:

1. **Residential and commercial buildings:** This detection systems are commonly used in domestic era to detect gas leaks from gas pipelines and appliances.
2. **Industrial applications:** These are used in various industrial applications, including chemical processing plants, oil refineries, and manufacturing facilities.
3. **Laboratories:** Gas leakage detection systems are used in laboratories to detect gas leaks from various equipment, such as gas chromatographs, mass spectrometers, and other analytical instruments.

Gas leakage detection system has a lot of potential for future development and enhancements:

1. **Artificial Intelligence (AI) and Machine Learning (ML):** AI and ML algorithms can be used to analyse the gas leakage data collected by the system, enabling predictive maintenance, and alerting the users before any gas leaks occur.
2. We intend to incorporate the nearby position of the fire department automatically into the system through the Internet wherever the user takes it utilizing advanced GSM technology or a Raspberry PI. So that the device, upon detecting a new site, may automatically sync the information of the local authorities into it, perhaps making it more effective overall, it is hoped that accidents can now easily be stopped with this device wherever.



Fig 3: Hardware

The gas sensors, which delivers a signal to the Arduino UNO after detecting a gas leak, Arduino sends strong signals to other devices that are connected to the outside world, such LCDs, buzzers, and GSMs. As a result, the specified cellphone number receives an SMS from the GSM module. In actuality, the results are displayed on the LCD for the area's neighbors to see, and the buzzer's beeping sound alerts them to the danger. We can therefore draw the conclusion that the system primarily focuses on workplace and home safety. This gives us importance in the area of health as a result. Additionally, it boosts our economy because gas leaks harm both the environment and our economy by wasting gases in addition to contaminating the air. Additionally, when workers are harmed, the factory or industry's jobs cannot be maintained, which has an impact on the economy. Over the next few years, the market is anticipated to be primarily driven by the requirement to ensure worker safety. Therefore, only this detector can prevent danger and guarantee safety.