Gas Leakage Detection System using Arduino

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Abstract: *This paper presents the design and implementation of a gas leakage detection system using the SIM800L module. Gas leakage poses significant risks, including explosions, fires, and asphyxiation, which can lead to substantial property damage, environmental pollution, and loss of life. Traditional gas detectors often rely on manual inspection or localized alarms, which may not provide timely alerts, especially when the user is not present. To address these limitations, the proposed system utilizes the MQ-5 gas sensor to detect combustible gases such as Methane, Propane, and Butane. The integration of the SIM800L GSM module enables the system to send real-time SMS alerts to users, ensuring immediate notification and prompt action to prevent potential disasters. The system is designed using Arduino UNO as the microcontroller for efficient processing and control. Additionally, an LCD is used for real-time gas concentration display, and a buzzer provides audible alerts in case of leakage. The proposed design is cost-effective, user-friendly, and easily deployable in residential, industrial, and automotive environments. It significantly enhances safety by providing remote monitoring and rapid response to gas leak incidents. Gas leakage is a significant safety concern in residential, industrial, and vehicular environments due to its potential to cause explosions, fires, and health hazards. Conventional gas detection systems are often limited by range, reliability, and response time. The proposed system detects gas leakage using an MQ-5 sensor and promptly alerts users via SMS using the SIM800L module. The use of the SIM800L module ensures that alerts are sent even when the user is not on the premises, thereby enhancing safety by enabling quick response times and mitigating potential hazards. Additionally, the system is designed to be cost-effective and easily deployable in residential and industrial environments. The integration of Arduino UNO ensures efficient processing and control of the system components, making the overall system reliable and user-friendly.*

Keywords: Gas Leakage Detector, SIM800L, MQ-5 Sensor, Arduino UNO, SMS Alert, Safety System