

DESIGNING AND DEVELOPING AN EARLY DETECTION SYSTEM FOR LPG GAS LEAKAGE BASED ON IoT

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ABSTRACT

The use of liquefied petroleum gas (LPG) as a household and industrial fuel carries the risk of leakage, which can trigger fires or explosions. This study aims to design and develop an Internet of Things (IoT)-based system for detecting and handling LPG gas leaks and fire incidents using an ESP32 microcontroller. The system is equipped with an MQ-2 sensor to detect gas, a flow sensor to monitor gas flow, and a flame sensor to detect fire presence. System outputs include a buzzer for sound alarms, an exhaust fan for automatic leak response, and real-time notifications via the Telegram application. Testing was conducted under various conditions to evaluate system performance. The results show that the system can detect gas leaks at concentrations above 500 ppm, detect gas flow without flame as an indication of leakage, and accurately and rapidly issue alerts and trigger automated responses. This system has proven effective in enhancing user safety through early detection and automatic handling of LPG-related hazards.

Keywords: IoT, MQ-2 sensor, flame sensor, flow sensor, Telegram.

