

**“SMART SYSTEM MONITORING DAN PENANGANAN KEBOCORAN  
GAS LPG SERTA KEBAKARAN BERBASIS *INTERNET OF THINGS*  
PADA PABRIK ROTI DUA PUTRA TALUN”**

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**ABSTRAK**

Penggunaan gas LPG 3 kg sangat umum di rumah tangga Indonesia, namun kebocoran gas dan kebakaran tetap menjadi risiko serius. Penelitian ini bertujuan merancang sistem deteksi dini berbasis *Internet of Things* (IoT) untuk memantau kebocoran gas dan keberadaan api secara *real-time*. Sistem menggunakan sensor gas MQ-5 dan sensor api KY-026 yang terintegrasi dengan mikrokontroler ESP32, *buzzer*, motor servo, serta tampilan OLED. Data sensor ditampilkan melalui *dashboard* berbasis *web* dan notifikasi dikirim otomatis melalui email. Hasil pengujian menunjukkan sistem mampu mendeteksi gas secara optimal pada detik ke-2 dengan rata-rata 1159,86 ppm dan kembali stabil pada detik ke-5. Sensor api menunjukkan nilai deteksi konstan mulai detik ke-3. Sistem juga berhasil mengaktifkan *alarm*, membuka valve regulator secara otomatis, serta mengirim peringatan email kepada pengguna. Sistem ini terbukti efektif meningkatkan keselamatan rumah tangga dan industri kecil terhadap risiko kebakaran akibat kebocoran gas.

**Kata Kunci:** Gas LPG, IoT, Sensor MQ-5, KY-026, Sistem Otomatis, Notifikasi *Real-time*

**“SMART SYSTEM FOR MONITORING AND HANDLING LPG GAS LEAKS  
AND FIRE BASED ON THE INTERNET OF THINGS AT DUA PUTRA  
TALUN BREAD FACTORY”**

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**ABSTRACT**

*The use of 3 kg LPG is widespread in Indonesian households, but gas leaks and fires remain serious safety threats. This study aims to design an early detection system based on the Internet of Things (IoT) to monitor gas leaks and fire hazards in real time. The system integrates an MQ-5 gas sensor and KY-026 flame sensor with an ESP32 microcontroller; buzzer; servo motor, and OLED display. Sensor data is displayed on a web-based dashboard, and notifications are automatically sent via email. Testing results show that the system optimally detects gas in the second second with an average reading of 1159.86 ppm, stabilizing by the fifth second. The flame sensor consistently detected fire starting from the third second. The system successfully activated alarms, opened the gas valve automatically, and sent warning emails to users. This IoT-based solution proves to be effective in enhancing household and small industry safety against gas leak and fire risks.*

**Keyword:** *LPG Gas, Leakage, Fire, Internet of Things, Monitoring, Security.*