

FAKHRUDIN AMIN, 22.240.0122

RANCANG BANGUN SISTEM DETEKSI KEBOCORAN GAS LPG BERBASIS INTERNET OF THINGS TERINTEGRASI APLIKASI MOBILE DI PANGKALAN LPG MUTASLIMAH MITRA PT WAHYU PATRA TUMURUN

Di bawah bimbingan Widiyono, ST., M.Kom, and Arief Soma Darmawan ST., M.Kom.
80 halaman + xii / 25 gambar / 13 tabel / 45 daftar pustaka.

ABSTRAK

Kebocoran gas Liquefied Petroleum Gas (LPG) merupakan risiko keselamatan yang krusial di lingkungan penyimpanan gas, termasuk di Pangkalan Gas LPG Mutaslimah, Kabupaten Pekalongan, sehingga memerlukan sistem pemantauan yang mampu memberikan respons cepat terhadap anomali konsentrasi gas. Penelitian ini merancang sistem pendeteksi kebocoran gas LPG berbasis Internet of Things (IoT) menggunakan mikrokontroler ESP32, sensor MQ-2, Aktuator Buzzer, dan aplikasi mobile yang terintegrasi dengan Firebase Realtime Database untuk meningkatkan standar keselamatan operasional di pangkalan tersebut. Melalui metode Research and Development (R&D), sistem dikembangkan untuk melakukan pemantauan konsentrasi gas secara real-time serta mengirimkan notifikasi peringatan otomatis melalui aplikasi mobile kepada pengguna. Hasil pengujian menunjukkan bahwa integrasi antara perangkat keras, cloud database, dan aplikasi mobile bekerja secara efektif, menghasilkan sistem pengawasan yang akurat dan responsif dalam memberikan informasi, sehingga risiko bahaya kebocoran dapat diminimalisir secara signifikan.

Kata Kunci : *Sistem Monitoring Deteksi Gas, Internet of Things (IoT), Aplikasi Berbasis Mobile, ESP32, Firebase, Sistem Monitoring, LPG, Keamanan.*

FAKHRUDIN AMIN, 22.240.0122

**DESIGN AND DEVELOPMENT OF AN INTERNET OF THINGS BASED
LPG LEAK DETECTION SYSTEM INTEGRATED WITH A MOBILE
APPLICATION AT PANGKALAN LPG MUTASLIMAH, A PARTNER OF
PT WAHYU PATRA TUMURUN**

Under guidance of Widiyono, ST., M.Kom, and Arief Soma Darmawan ST., M.Kom.

80 pages + xii / 25 figures / 13 tables / 45 bibliography.

ABSTRACT

Liquefied Petroleum Gas (LPG) leaks pose a critical safety risk in gas storage environments, including at Pangkalan LPG Mutaslimah, Pekalongan Regency, thereby requiring a monitoring system capable of providing a rapid response to anomalies in gas concentration. This research designs an Internet of Things (IoT) based LPG leak detection system using an ESP32 microcontroller, an MQ-2 sensor, a buzzer actuator, and a mobile application integrated with the Firebase Realtime Database to improve operational safety standards at the aforementioned distribution point. Using the Research and Development (R&D) method, the system was developed to monitor gas concentration in real time and automatically send warning notifications to users through the mobile application. The test results show that the integration of the hardware, cloud database, and mobile application works effectively, producing an accurate and responsive monitoring system in delivering information, thereby significantly minimizing the risk of leakage hazards.

Keywords : *Gas Detection Monitoring System, Internet of Things (IoT), Mobile Based Application, ESP32, Firebase, Monitoring System, LPG, Safety.*