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A Smart Monitoring System for Preventing Gas Risks in Indoor

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Abstract : In this paper, we propose a system for preventing gas risks through the use of wireless communication modules and intelligent gas safety appliances. Our system configuration consists of an automatic extinguishing system, detectors, a wall-pad, and a microcomputer controlled micom gas meter to monitor gas flow and pressure as well as the occurrence of earthquakes. The automatic fire extinguishing system checks for both combustible gaseous leaks and monitors the environmental temperature, while the detector array measures smoke and CO gas concentrations. Depending on detected conditions, the micom gas meter cuts off an inner valve and generates a warning, the automatic fire-extinguishing system cuts off an external valve and sprays extinguishing materials, or the sensors generate signals and take further action when smoke or CO are detected. Information on intelligent measures taken by the gas safety appliances and sensors are transmitted to the wall-pad, which in turn relays this as real time data to a server that can be monitored via an external network (BcN) connection to a web or mobile application for the management of gas safety. To validate this smart-home gas management system, we field-tested its suitability for use in Korean apartments under several scenarios.

Keywords : gas sensor, leak, gas safety, gas meter, gas risk, wireless communication
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