

DESIGN AND IMPLEMENTATION OF A FIRE DETECTION SYSTEM BASED ON ESP32 MICROCONTROLLER AND TELEGRAM AS A NOTIFICATION MEANS

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ABSTRACT

Fire is a type of disaster that can occur suddenly and have a major impact on human safety and material losses. Therefore, early detection of potential fires is crucial to reduce potential risks. This research aims to design and implement an ESP32 microcontroller-based fire detection system connected to the Telegram platform for real-time remote notification. This system utilizes temperature and gas sensors (MQ-2) to monitor environmental conditions that can trigger fires. The ESP32 functions as a data processing center and as a connection to the internet network. When the temperature or gas concentration exceeds a predetermined threshold of $\geq 50^{\circ}\text{C}$, and the gas concentration threshold is set at ≥ 300 , the system will automatically send an alert via Telegram message to the user. In addition, the system is also equipped with a buzzer and LED as local indicators. Test results show that the system is able to respond to changes in temperature and gas concentration within 1 minute and send notifications via Telegram. Thus, this system can be an alternative solution for effective and economical early fire detection.

Keywords: Fire Detection, ESP32, IoT, Telegram.