

## **ABSTRACT**

*Sikidang Crater is a natural tourist destination located in Central Java and has its own charm. However, the potential danger of toxic gas that can appear in the area threatens the safety of visitors. Therefore, a gas detection system is needed to ensure the safety of visitors. This research aims to design and implement a gas detection system that can detect CO and CO<sub>2</sub> gas with a Matrix and buzzer alarm, and is equipped with point-to-point LoRa technology to provide warning notifications and uses Boolean logic for decision making in cases of detected gas hazards. in natural tourist areas. The gas detection system designed uses the MQ-7 sensor to detect CO gas and the MQ-135 sensor to detect CO<sub>2</sub> gas. The toxic gas monitoring and detection system at the Sikidang Crater tourist attraction has succeeded in providing early warning of gas leaks with a display in the form of a dot matrix and notifications in the form of a buzzer which can work well to ensure the safety of visitors and tourism managers. The results of measuring the accuracy of the MQ7 and MQ135 sensors reached a fairly high level of accuracy, namely 96% for CO gas and 97% for CO<sub>2</sub> gas respectively. The point to point LoRa system at a distance of 273 m can transmit data well with an average delay of 69 ms, which is in the very good category and an average RSSI value of -100 dBm, which is in good condition.*

**Keywords:** *LoRa , MQ-7 sensor, MQ-135 sensor, Sikidang Crater, Toxic gas,*