

ABSTRACT

Cigarette smoke contains gases that are harmful to the body. Therefore we need a system that can detect concentrations of cigarette smoke. To facilitate the process of observation, an integrated system that can observe some of the coverage areas simultaneously is designed.

WSN (Wireless Sensor Network) is a system consists of three main components including the target, the sensor nodes and sensor gateway. Wireless sensor network is a wireless network, using sensors to monitor environmental conditions. Each *sensor node* placed at various location will send data to the gateway. There are scenarios to observe some important parameters such as temperature, humidity, concentration of cigarette smoke, the sensor output voltage, and sensor resistance.

The results of the clean air sensor resistance is compatible with the datasheet which is between 10 k Ω – 90 k Ω . The results of cigarette smoke detection in the test room with two smokers in the initial conditions measured 8 ppm with $R_s = 24.67$ k Ω and $V_{out} = 219$ mV, while the maximum detected concentrations of cigarette smoke is 23 ppm then $R_s = 12.65$ k Ω and V_{out} increases to = 410 mV. Maximum detection range for sensor 1 is ± 3 meters, and for sensor 2 and sensor 3 is ± 4 meters. For measurement in the building without smokes, the detected concentration is less than equal to 5 ppm, the concentration is still considered normal. Temperature and humidity measured by each sensor node in the building depends on the location of the sensor nodes. Temperature and humidity outside the building is 30 $^{\circ}$ C and 67 % while the temperature and humidity within the building is 28 $^{\circ}$ C and 73 %. Maximum transmit distance between sensor node and sensor gateway is ± 120 meter. When smoke gets thicker, the humidity will be decreasing but in the other hand the temperature will be increasing

Keywords: wireless sensor networks, sensors, sensor nodes, sensor gateway, concentration, temperature, humidity