# ABSTRACT

Today WSN ( Wireless Sensor Network) is growing very rapidly, especially in the monitoring area. Nowadays, the monitoring systems still use wire as connecting objects with Personal Computer ( PC ) , and only a few objects that can be monitored simultaneously. This problem are difficult to resolved. If we monitor 100 room then we must prepare a cable that connects to the 100 such rooms.

Therefore, the monitoring process is required more than one path that is efficient and save more power. On the other hand , the quality of the network on the system is must be good so we could obtained the good data and can be processed . For that it is necessary to discuss experiments on network quality for multiple nodes and different types of topologies.

Results from the design and realization of the sensor system is the result of calculation of temperature, humidity and $CO_2$ levels wirelessly with a distance of 61.84 meters without router nodes and more than 65 meters with a router node in indoor. In addition DHT11 sensor has an error rate of 0.08%, indicating that the sensor DHT11 have good quality. While the sensor MG811 has a good quality for the ppm level testing several people breathing conditions showed stable results. Then the final result of the system can be matched with air quality standards set by the government, namely the Decree of the Minister of Health No. 1077 / Menkes / Per / V / 2011.

**Keyword** : Wireless Sensor Network , Arduino Uno , MG811 , DHT 11 , Monitoring , Xbee S2