

## **ABSTRACT**

**Asthma is a chronic respiratory disease and has become the main reason patients are always rushed to the hospital emergency department. The research was conducted by utilizing a CO<sub>2</sub> gas sensor type cozir wx-20% which reads CO<sub>2</sub> concentration in ppm value and a microcontroller as an analog to digital data processor to be displayed on the LCD. Sensor characterization was carried out to compare the side stream and mainstream methods, response time readings and the accuracy of the cozir sensor. The resulting data is taken from CO<sub>2</sub> cylinders and medical air gas in several Lpm and is connected to the Cozir sensor and Etc<sub>2</sub>, mainstream patient monitors and side stream Etc<sub>2</sub> patient monitors. The resulting CO<sub>2</sub> readings from CO<sub>2</sub> tubes and medical water on the cozir wx sensor and mainstream patient monitors get an error of 4.6%, namely at a Co<sub>2</sub> concentration of 7% or 70,000 ppm and sensor accuracy is above 95%. As for the side stream method, the reading error is 1.96% and 1.74% at a Co<sub>2</sub> concentration of 6-7%. Sensor accuracy on the sidestream method cozir module is above 95%. Response time reading Co<sub>2</sub> gas at a concentration of 1%-7% under 5 seconds.**

**INDEX TERMS: Carbon dioxide gas, medical air gas, Sensor Cozir wx, mainstream, side stream, etc<sub>2</sub> patient monitor**