ABSTRACT

Sleep apnea is a condition where there is a cessation of airflow in the respiratory tract for about 10 seconds to 45 seconds during sleep. Sleep apnea has a serious impact on patients, especially it can cause heart problems (hypertension, coronary artery disease, and arrhythmias) so it is necessary to design a tool to monitor sleep apnea conditions in order to minimize the impact of more serious diseases. The purpose of this study was to design a sleep apnea monitoring device by analyzing the distance and speed of delivery of respiration rate and oxygen saturation using HC-12. The design of this tool uses a finger sensor to detect the patient's oxygen saturation signal. Data processing is carried out by Arduino Mega then the results of the data processing will be sent to the PC via HC-12. The result of the largest oxygen saturation error value is 0.8%, the tool can detect apnea and provide good notifications, and the ability to transmit data with distance testing without obstructions. The tool can send data properly and smoothly to the display (receiver) from a distance of 20 to 180 meters. . As well as for testing the distance to the barrier, the results of the farthest distance are 60 meters. For data transmission, the maximum distance can be sent at a distance of 180 meters with a correlation value of 1 with a baud rate of 4800 and a baud rate of 9800, for a baud rate of 115200, a maximum distance of 100 meters, a correlation value of 1. The results of these tests indicate that this module can monitor the value of each parameter. and can send and receive data properly.

Keywords: Monitoring, Sleep Apnea, SpO_2, Wireless, HC-12