

ABSTRACT

Chronic obstructive pulmonary disease (COPD) is a disease whose prevalence tends to increase annually, with the World Health Organization (WHO) data predicting in 2020 the disease is the cause of the third-highest mortality worldwide. The assessment of the recurrence of COPD patients is very important, as it will accelerate the decline of lung function and health status. The purpose of this research is to design a spirometer by utilizing the MPXV7002DP sensor and equipped with a graphical display as well as lung health status on the Nextion TFT LCD. A portable Spirometer design has been done using the MPXV7002DP pressure sensor out as a transducer with a display on the Nextion TFT LCD. The design aims to determine the health of lung function by knowing the volume of lung Forced Vital Capacity (FVC), Forced Expired Volume in one second (FEV1), and Vital Capacity (VC). The working principle of this tool is to process the pressure from the results of the user blowing to the sensor through a mouthpiece which is designed based on Venturimeter law, the data will be processed by the Arduino microcontroller 2560 to be displayed on the LCD TFT and Nextion stored in SD card memory. The result of module validation data against a Spirometer 3L calibrator Benchmarking tool was obtained 1.58% VC error. The value is still below the 5% error tolerance limit so that the VC parameters in the secure module is used.

Keywords: Lung Volume, MPXV7002DP Sensor, Spirometer