ABSTRACT

Heart failure is a disease with the highest mortality rate. Heart failure is also the disease that most often requires re-hospitalization. Lung dysfunction in heart failure patients also affects the decrease in oxygen saturation which results in shortness of breath. The most important vital signs in the human body are heart rate and oxygen saturation. In normal humans the heart rate is between 60-90 beats per minute. Meanwhile, the normal oxygen saturation is > 95%. Therefore, a medical device is needed that can calculate heart rate and oxygen saturation in humans. This study uses one sensor, namely the MAX30100 sensor which is connected to the ESP32 microcontroller. Display to display the results of the data that is on the LCD and also some device likes martphone, PC, or laptop whose data results are displayed on platform Antares sent by the LoRa communication module. The analysis of this study is regarding the accuracy of MAX30100 sensor readings and the use of LoRa communication module technology. Based on the research results, the accuracy results were obtained heart rate and SpO2 under resting conditions of 97,20% and 98,67%, then the accuracy heart rate and SpO2 in the condition after exercising at 95,72% and 98,05%, then value error heart rate and SpO2 under resting condition of 2,80% and 1,33%, and also values error heart rate and SpO2 in the condition after exercise of 4,28% and 1,95%. The result of the LoRa communication module is RSSI (Received Signal Strength Indicator) with an average of -115,17, anddelay of 0,00886 s.

***Keywords**: Accuracy, Heart Rate, LoRa, MAX30100, Oxygen Saturation.*