

## ABSTRACT

Nowadays, communication technology has developed rapidly. But, communication is not something easy for submarines under the sea. Optical technology that is being developed currently is the technology Visible Light Communication (VLC) with the ability to use light as a carrier of information. VLC technology that will be implemented under the sea was conceived with the aim of meeting the needs of wireless communication for radio waves and the light used for humans or marine biota compilation under the sea. In this Final Task, an analysis of visible light communication under the sea in terms of the range of distances with depth that can be used when in the type of sea water is pure ocean water. Several simulation scenarios were performed, first evaluate performance the resulted BER with modulation OOK-RZ to distance and SNR. The second, evaluate performance the resulted BER with modulation OOK-NRZ to distance and SNR.

Based on the simulation results, the best modulation is RZ with better performance results at the initial specified distance compared to the NRZ modulation format. RZ modulation at a minimum distance is 1 m and a maximum distance is 10 m with depths are 5 m, 10 m and 15 m respectively produces BER of  $2.906 \times 10^{-15}$ ,  $1.715 \times 10^{-8}$ ,  $3.467 \times 10^{-7}$ ,  $3.545 \times 10^{-2}$ ,  $2.391 \times 10^{-3}$ , and  $2.198 \times 10^{-1}$ . Produces SNR of 20.86 dB, 17.85 dB, 16.93 dB, 8.145 dB, 12.02 dB, and 0.7742 dB. Also produces power receiver of  $2.347 \times 10^{-8}$  W,  $1.658 \times 10^{-8}$  W,  $1.492 \times 10^{-8}$  W,  $5.428 \times 10^{-9}$  W,  $8.48 \times 10^{-9}$  W, and  $2.323 \times 10^{-9}$  W.

**Kata Kunci :** *Visible Light Communication, SNR, OOK-NRZ, OOK-RZ.*