

ABSTRACT

Visible Light Communication (VLC) is a communication system uses visible light in data transmission. The use of visible light makes VLC system minimize the adverse effects on health, compared to the technology of Radio Frequency (RF) which has electromagnetic radiation. In analyzing the performance of the VLC system, many components have roles to consider, such as optical concentrator on photodetector. Optical concentrator has the task of concentrating and gathering light entering the receiver, so that the more power is received within the broad communication range, the better the value of Bit Error Rate (BER), the better VLC performance.

This study evaluates the performance of the VLC system by making BER the main parameter in the simulation. There are two scenarios carried out in this Final Project. Scenario I compares the performance of the VLC system using two modulations, namely, On Off Keying - Non Return to Zero (OOK-NRZ) and On Off Keying - Return to Zero (OOK-RZ), without adding optical concentrator. Scenario II compares the performance of the VLC system with the addition of a optical concentrator.

From the simulation that has been done, it can be evaluated that the addition of the concentrator on photodetector causes a significant increase in the coverage area of communication on the VLC system. OOK-NRZ has increased communication coverage of 17.3%, while OOK-RZ is 54.9%, with the OOK-NRZ coverage area wider than OOK-RZ.

Keywords: VLC, modulation, optical concentrator, BER