

ABSTRACT

This Final Project conducts research on the effect of multiplexing techniques on Visible Light Communication (VLC) technology. At this time, Visible Light Communication (VLC) technology is being developed mainly indoors to meet the needs of the community namely lighting and internet connectivity by using Light Fidelity (Li-Fi) technology.

In this Final Project, the writer simulates and analyzes the effect use of multiplexing techniques in VLC systems in closed rooms measuring 5m x5m x 3m on 4-Quadrature Amplitud Modulation (4-QAM) mapper performance in DC biased Optical Orthogonal Frequency Division Multiplexing (DCO-OFDM) multiplexing techniques with receiver orientation in the VLC system. Use one Light Emitting Diode (LED) lamp positioned at 0, 0, 3 meter as a transmitter.

After simulating and analyzing this Final Project, it can be concluded that the 4-QAM modulation is effective for use in multiplexing techniques DCO-OFDM with 2 Watt sending power produces maximum communication points the distance is 2.92 m for Bit Rate 1 Gbps and 3.10 m for Bit Rate 2 Gbps and with 4 Watt sending power produces a maximum communication distance of 3.6 m for 1 Gbps Bit Rate, 3.79 m for 2 Gbps Bit Rate with a maximum Bit Error Rate limit 10^{-3} .

Keywords: VLC, QAM, DCO-OFDM, Photodiode, BER, LED.