ABSTRACT

In an era of information and communication technology developments very rapidly, the demand for communication services with the level and range of services that increasingly sophisticated and increasingly complex. To meet these needs, the communication system is needed that has the capacity and the high level of reliability. Optical fiber communication system is a reliable communication system capable of handling the problem. Optical communication system is a system that uses light as signal carrier wave information from sender to receiver. Therefore, we need a component that converts the signal information into the form of light waves that can be transmitted to the destination. This component is called an optical modulator. One type of optical modulator is the Mach Zehnder modulator which is able to modulate a signal to 100 Gbps.

In this final project, a simulation of the Mach Zehnder modulator where the signal information used is the video signal was made. Signal information in the form of video signal converted into binary (bits). Furthermore, the signals are modulated by using BPSK modulation (*Binary Phase Shift Keying*), QPSK (*Quadrature Phase Shift Keying*), 8PSK (*Eight Phase Shift Keying*), and 16PSK (*Sixteen Phase Shift Keying*). This signal is a signal which is modulating the Mach Zehnder modulator. Then, the signals are combined with the light beam as signal carrier. This simulation using Matlab.

Mach Zehnder modulator is influenced by various factors. From the laser as the signal carrier, the wavelength and the power of the laser will affect the intensity and the result of the signals superposition on Mach Zehnder modulator. Meanwhile, the modulator input signal which are superimposed on a carrier, amplitude and information signal shape will also affect the intensity of the output of the Mach Zehnder modulator. From this modulation process can be seen that the intensity of light output Mach Zehnder modulators vary according to changes of the modulating signal. Mach Zehnder intensity modulator output using BPSK modulating signal where 1 mW laser output power is 0 to 0.99 mW, for QPSK modulating signal, the modulator output intensity value is 0 to 0.9988 mW, for 8PSK modulating signal, the output intensity value modulator is 0 to 0.9988 mW and for modulating signal 16PSK, modulator output intensity value is 0 to 0.9989 mW .

Keywords: Mach-Zehnder, Intensity, electro-optical, modulation