

ABSTRACT

Visible light communication (VLC) is a communication system which uses visible light as information carrier. The initial background of this technological growth is started from the wide usage of LED lamp. Compared to another kinds of lamp, LED saves more power and has a very high switching speed that make it possible to be used as a short distance information transmitter. This technology grows rapidly due to the need of innovation in wireless information transmission system, since the radio wave which is widely used now has a very limited available frequency. The usage of visible light has many advantages, such as in security side, speed, and easy to apply on the current society condition.

Communication using visible light allows the transmission of various kinds of information including digital data such as text and image. In this research, analysis would be done from the design of VLC transceiver prototype to send digital data in form of text and image by using visible light transmitted from LED. Since the prototype is in form of transceiver, at least two devices are required in which of them could act both as transmitter with LED as its main component and receiver with phototransistor as its main component. Several tests will be done by sending text and image information with certain sizes from transmitter side to receiver side. After that, analysis would be done on the influences of distance, acceptance angle, and baud rate on Character Error Rate (CER) for text transmission and Bit Error Rate (BER) for image transmission.

In this research, the designed prototype is able to transmit digital information well on distance range 1 – 12 cm. The range of acceptance angle where system can run well is 0° - 75° . The design system can operate well on baud rate 4800, 9600, and 19200 bps.

Keywords: VLC, transceiver, text, image, CER, BER.