

## WIRELESS SIGNAL TRANSMISSION THROUGH VISIBLE LIGHT SPECTRUM

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### ABSTRACT

This article presents a wireless visible light communication system with a maximum bandwidth of 5 MHz (80 Mbps approximately) and 15 centimeters of distance. The system allows audio & video signals to be transmitted wirelessly with a conventional LED (white light). The light emitted by the diode is within the visible light spectrum (400-700 nm.). In this spectral range, it is possible to reach a potential bandwidth of approximately 322 THz., which is much higher than a transmission through radiofrequency electromagnetic waves (5 MHz for 3G Technology). We installed the electronic components on a circuit board inside a frame for a simpler and easier use. The system works with symmetric +9, -9 volts power. The final design consists of a transmitter and a receiver for audio & video. The system allows varying the LED intensity, so as to increase or decrease the maximum transmission distance, and to regulate the gain in both the transmitter and receiver. To enable effective video transmission quality, a final addition and subtraction stage is applied in the transmitter and receiver, respectively. The cost of the developed system is 80% lower compared to commercial systems based on visible light communication.

**Keywords:** Visible Light Communication, Electromagnetic Spectrum, Radiofrequency, LED, Bandwidth.