

## **Experimental Characterization of the Color Quality and Error Rate for an Red, Green, and Blue-Based Light Emission Diode-Fixture Used in Visible Light Communications**

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**Abstract :** An important feature of LED technology is the fast on-off commutation, which allows data transmission. Visible Light Communication (VLC) is a wireless method to transmit data with visible light. Modulation formats such as On-Off Keying (OOK) and Color Shift Keying (CSK) are used in VLC. Since CSK is based on three color bands uses red, green, and blue monochromatic LED (RGB-LED) to define a pattern of chromaticities. This type of CSK provides poor color quality in the illuminated area. This work presents the design and implementation of a VLC system using RGB-based CSK with 16, 8, and 4 color points, mixing with a steady baseline of a phosphor white-LED, to improve the color quality of the LED-Fixture. The experimental system was assessed in terms of the Color Rendering Index (CRI) and the Symbol Error Rate (SER). Good color quality performance of the LED-Fixture was obtained with an acceptable SER. The laboratory setup used to characterize and calibrate an LED-Fixture is described.

**Keywords :** VLC, indoor lighting, color quality, symbol error rate, color shift keying

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