# LiFi Integrated to Power-lines for Smart Illumination Cum Communication

K. Senthil Kumar[1], M. Venkata Sai Ajith[2], A.Sudarsan[3], T.Thalpasai[4], M.Lava Sai Anvesh[5]
Professor[1], Student [2, 3, 4, 5]
Department of Electronics & Communication Engineering
SRM Institute of Science and Technology, Ramapuram, Chennai, India

**Abstract:**
Communication plays a vital role in now a day. It is transformation of information from transmitter to receiver, the transformation of signal can be connection oriented or connection less. Information signal can be voice, audio, video signals. Channel can be wires, co axial cable, optical fiber. In wires axial cable the channel signal will be in the form of Radio frequency signal. The data rate for the Radio frequency will be in the megabits per seconds, the radio frequency signal will be operated in high frequency, due to high frequency there will be chance of health problems if more no of people associated with each other the date rate speed will decreases. Data rate is inversely proportional to the no of users used. If less no of people are used the date rate will be maximum, if more no of users are used the date rate will be minimum. Such communication will be insecure if more of users are used, rather Radio frequency signal if we use optical fiber the channel signal will be in the light. Compare to radio frequency signal the light signal will be very fastest, the date rate will be Giga bytes per second. The transmitter signal will be light signal with help of Leds as transmitter and photo detector will be Receiver. We are using digital communication technique to transmit the light signal by using binary notation."0" represents a off switch logic-0 operation which uses product of sum operation where "1" represents a on switch logic-1 operation which uses a sum of product operation. Pulse width modulation process is used to control the signal it can maintain constant duration over a transmission.

## I. INTRODUCTION

For illumination and data transmission Li-Fi technology uses VLC technology employing no of LED Li-Fi is a high rate connection for fixed as well as mobile optical communications. us. Due to limited bandwidth, high data rates and high demand of wireless communication, RF band lead to several struggles. To overcome the limitations of RF band VLC technology uses photons which are ten thousand times faster than RF waves. By overcoming all the disadvantages of RF band Li-Fi technology proved to be a prominent one for data communication. When the user is stationary the channel gain is not fluctuated in the Li-Fi technology. Li-Fi is expected to be significantly cheaper than Wi-Fi due its low reliability at short range.

## II. WHITE LEDS FOR LIFI

Li-Fi exchanges the information to an IOT stage through LED that is fixed in any method of transport wherever and at whatever point the mishap happens. To anticipate the traffic in specific zones, traffic lights passes the information to focal center point IoT stage which is prepared by VLC.Light-Fidelity is utilized to predicts environmental change by looking at the past information base. At whatever point a confusion happens this innovation gathers data from different fields and exchanges to a center point which can be gotten to by everybody. The working of VLC is amazingly simple. There is a light producer which goes about as a handset. Inside the handset the article comprises of a photodetector and furthermore an intensifier to enhance the information. The information contribution to the LED transmitter is encoded in light waves by differing the gleam rate at which the bulb's 'on' and 'off' to generate different strings of 1s and 0s. switching ON a crystal rectifier may be a logical '1', switching it OFF is a coherent '0'. By factor the speed at that the LEDs glimmer on and off, data can be encoded in the light to various mixes of 1s and 0s.In a run of the mill setup, the transmitter (LED) is associated with the information arrange (Internet through the modem) and the beneficiary (photograph identifier/light sensor) on the less than desirable end gets the information as light flag and translates the data, which is then shown on the gadget associated with the recipient. The beneficiary (photograph locator) enrolls a parallel '1' when the transmitter (LED) is ON and a paired '0' when the transmitter (LED) is OFF. In this manner, blazing the precious stone rectifier fluctuated times or abuse partner degree cluster of LEDs (maybe of various totally extraordinary hues) can in the long run give data rates inside the change of numerous Mbps. The Li-Fi working is clarified in a square chart

## III. DESCRIPTION OF THE HYBRID SYSTEM

The aim of the project is an alternative to internet connectivity with a faster access and also safer to the environment. As there is a huge issue health wise that the radiation we are having in our homes and industries are extremely harmful and tedious to deal with the after effects. The technology we are tending to introduce is the pinnacle of the future. Li-Fi is used to transmit data's and can be used as an alternative for Wi-Fi technology. In this project we have used IOT which is one of the evolving innovations now a days. Li-Fi plays a major role in health aspects which is radiation free. It also analyses and transfers data faster than any other technique. This mode of transmission is

going to provide 9 times the speed of transmission of the regular wireless modems. Therefore in this Li-Fi technology is coupled with the hierarchical structure of IOT. The objective of the system is to propose an alternative to internet connectivity. As there has always been a need for a faster connectivity with minimal loses, we look for different technologies which could fill in efficiently. As IOT is the upcoming technology to implement from our homes to the industry, We need a faster network technology which could be safe and easy to implement.
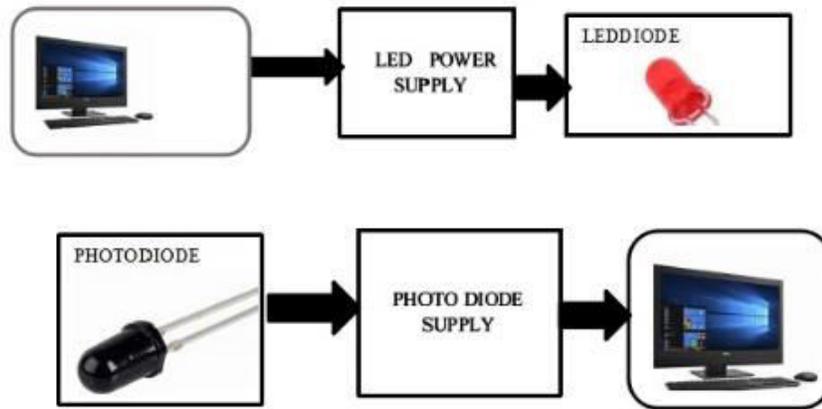


**Figure.1. shows VLC Transmitter and VLC Receiver.**

### VLC Principle

Li-Fi transfers the data to an IOT platform through LED that is fixed in any mode of transport wherever and whenever the accident occurs. To predict the traffic in certain areas, traffic lights passes the data to central hub IoT platform which is processed by VLC. Light-Fidelity is used to predicts climate change by comparing the previous data base. Whenever a misconception occurs this technology collects information from various fields and transfers to a hub which can be accessed by everyone.

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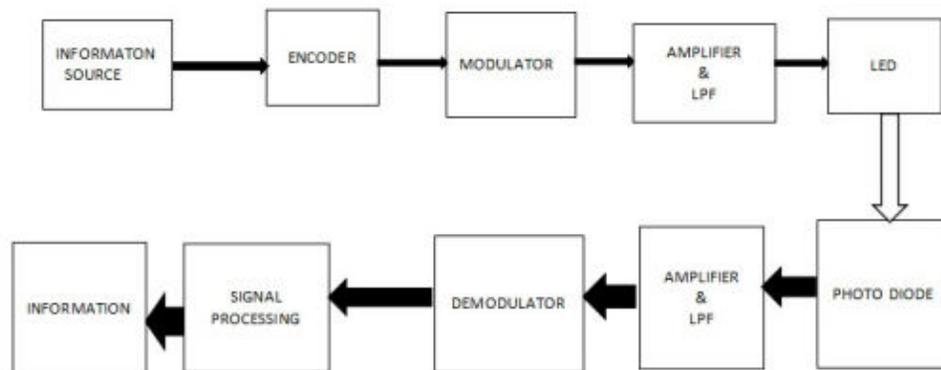
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