



Li-fi Based Smart Data Transfer

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ABSTRACT

Visible LEDs will be used in future electric lights (light emitting diode). In the next generation of lamps, visible leds with high power output are expected to be used. The use of visible led lights in an indoor data transmission system is proposed. These devices are employed in the system not only for lighting but also for an optical wireless communication system. This approach is appropriate for private networks like consumer communication networks. However, when using visible leds as optical transmitters, it is still required to analyze their properties. It can be used for indoor optical transmission based on numerical calculations and computer simulations.

Keywords: IOT, Li-fi

Introduction

Data transfer using optical wireless has been recognized as a method that can be used for communications in sensitive situations such as airplanes and hospitals, where radio frequency (RF)-based transmissions are typically prohibited or restricted to avoid interfering with essential systems. Furthermore, at infrared and visible light frequencies, a large amount of unregulated bandwidth is available. Researchers all over the world are fine-tuning methods that employ regular lighting equipment to broadcast high-speed data streams wirelessly at a low cost, even when the equipment appears to be producing little more than typical illumination. The technologies, in general, fast and quietly change the intensity of light-emitting diodes, or LEDs, in ways that are unnoticeable to the naked eye.

Literature Survey

Scientists are currently working on VLC systems to create ultra-high-speed, high-security, biologically friendly communications networks that allow for the creation and expansion of seamless computing applications using very large bandwidth high-frequency pulsed light rather than radio waves and microwaves. Such systems primarily use Light Emitting Diodes to modulate light wavelengths emitted (and received) by a variety of suitably adapted standard sources, such as indoor and outdoor lighting, displays, illuminated signs, televisions, computer screens, digital cameras, and digital cameras on mobile phones for communication purposes (LEDs).

Methodology

In computer science, the term "message" refers to both software messages that may or may not be human-readable and human-readable communications provided by computer software for person-to-person communication. Message passing is a method of communication used in concurrent and parallel computing, object-oriented programming, and inter-process communication in which messages are sent to recipients. In object-oriented programming languages like Smalltalk or Java, a message is sent to an object, providing a request for action, in a similar sense. Computer software such as instant messaging and e-mail is meant to convey human-readable messages in prepared or unformatted text from one person to another.

Hardware Requirements

1. IC LM358 DESCRIPTION:

The LM358 is a superb dual-channel op-amp that is simple to use. Because op-amps have so many uses, we figured we should have at least one in a DIP packaging. Transducer amplifiers, DC gain blocks, and all typical op-amp circuits are among the LM358's applications. The LM358 is a good, conventional op-amp that should cover most of your needs. It can take a 3-32VDC input and output up to 20mA per channel. If you need to power two separate op-amps from a single power supply, this op-amp is ideal. It's packaged as an 8-pin DIP chip.

Features:

Two internally compensated op-amps

Internally frequency compensated for unity gain

DC voltage gain: 100 dB

Wide bandwidth (unity gain): 1 MHz (temperature compensated)

Wide power supply range:

Single supply: 3V to 32V

or dual supplies: $\pm 1.5V$ to $\pm 16V$

Conclusion

VLC has been proved to be a promising technology with a wide range of potential applications, despite the fact that most present projects are still in their early stages. VLC's ever-increasing popularity around the world is expected to lead to real-life applications in the future. It is a viable alternative to traditional solutions in particular domains of application (infrared, WLAN etc.). The transmission is based on the assumption of simplex channel conditions and direct LOS (line-of-sight) channels. To limit transmission error, encoding and decoding are utilized in the transmitter and receiver parts. Furthermore, by combining several fast-switching LEDs, the data transfer rate might be increased. If fast switching transistors were employed, the circuit's driving speed might be increased as well. It was shown that a visible light data transmission system based on blue LEDs is physically possible. The experiments were conducted in a moderately lit indoor environment. The use of LED arrays is expected to provide greater coverage. Finally, the project's ultimate goal is for wireless communication technology to be incorporated into visible light sources.

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