

LASER based Wireless Optical Video Transmission System: Study and Design

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Abstract— Video communication through the optical medium has very high speed and this mode of transmission and reception of video signals is the need of users. Optical communication work only under clear line-of-sight conditions between each unit for wireless communication. Free space LASER communications systems can be quickly deployed since they are small and do not need any radio interference. LASER based video communication systems will enable data rates of the order of Gbps and this is very helpful for HD video communication. The users are demanding very high data rates but the cost of channel will also very high for the systems so a LASER based wireless video communication system will enable users to get an economic substitute for wireless video communication. This paper presents a wireless optical video communication system model for the users of video communication.

Keywords—Data speeds, LASER, optical communication, wireless video transmission.

I. INTRODUCTION

Optical wireless communications (OWC) are very attractive from many researchers worldwide for their potential advantages and research work of communication sector over radio links. This paper is about laser based video communication system, which is one of the forms of optical communications system. It is used for inter and intra-building communication, closed circuit TV's, PC, LAN' etc. It is suitable for the study of optical communication (more specifically laser based communication) [2]. This paper helps us for the better understanding of optical communication which has become a primary means of communication in the present world and gives us the view about free optics. It enables communication unto several hundred meters and this technology can be extended in future to enable longer distance communication by using parabolic light reflector. The optical video communication is a best way of video communication where no any other medium is present for communication.

II. MODEL ARCHITECTURE

The video transmitter and receiver blocks diagrams are shown in the figure. The signal input is taken from any video source like camera and this is given to the modulator unit.

The modulator unit gives its output to the LASER drive for conversion into light form then through the LASER diode and optical antenna it is transmitted.

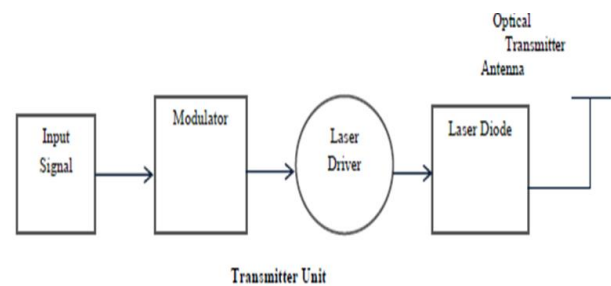


Fig.1. Block diagram of optical video transmitter unit [1].

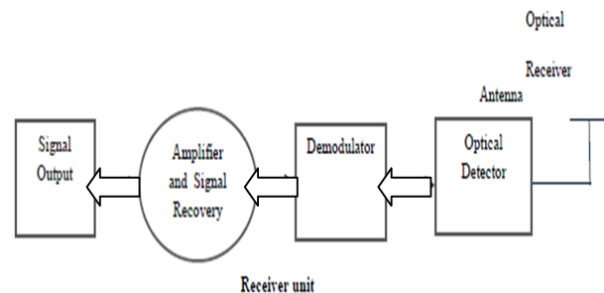


Fig.2. Block diagram of optical video receiver unit [1].

This block diagram represents the model of an optical communication system for video reception. The signal is obtained through optical receiver antenna and is given to the optical detector. This detector output is amplified and filtered from noise and then the signal output is obtained.

This model is applicable for the distances of the distances up to few hundred meters without the aid of any optical cables or optical fibers. To increase the communication range of this system the use of optical fiber cable may be taken which is a very fast communication medium for voice, data and video signals in the world across. The speed of signals in the optical media is of the order of speed of light.

III. HARDWARE



Fig.3. Hardware model of a video transmitter [1].

Above figure represents the hardware of the video communication system. The LASER light is used for transmitting the signals. According to the scope of the communication industry the demand of fast access to the internet is also increasing rapidly so to provide cost efficient and free of operator charges communication of video at very high rates this model will be very promising for the small distant users.

IV. APPLICATIONS & ADVANTAGES

Though this was a small-scale demonstration, Free Space Optics (FSO) is a very promising and high data rate

communication technology. These days the use of LASER communication is applicable for the voice, data and video communication [3]. The light beam can travel very fast as compared to that of electric signals or electromagnetic waves. So this communication model will be very helpful for the users needing a fast video communication.

V. CHALLENGES

For the video signal communication the noise and interferences' should be very low. This may be done through the use filters at the receiver end.

VI. CONCLUSION

The communication systems adopting optical communication based on optical laws will prove themselves a very fast and efficient communication system. This paper presented a LASER based optical wireless video communication system model for the users of communication industry.

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