SHIP TO SHIP COMMUNICATION USING LI FI TECHNOLOGY

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ABSTRACT

The need for underwater wireless communications exists in applications such as remote control in off-shore oil industry, pollution monitoring in environmental systems, collection of scientific data recorded at ocean-bottom stations, speech transmission between divers and mapping of the ocean floor for detection of objects, as well as for the discovery of new resources. Wireless underwater communications can be established by Li-Fi technology. Underwater communications are a rapidly growing field of research and engineering as the applications, which once were exclusively military, are extending into commercial fields, the possibility to maintain signal transmission, but eliminate physical connection of tethers, enables gathering of data from submerged instruments without human intervention, and unobstructed operation of unmanned or autonomous underwater vehicles. Light signals can travel long distance without any obstruction in water, because of high speed of light, in underwater data communication is possible to increase the data rate using "Li-Fi" technology.

Keywords- LI-FI, Security, Data Communication, Ships.

I. INTRODUCTION

In our system we are going to implement system which uses the light is the communication medium between the two ships which is underwater communication. In this system one ship sends the information to the other ship also the other ship also gives the response on which the information is received from the ship. Li-Fi comprises a wide range of frequencies and wavelengths, from the infrared through visible and down to the ultraviolet spectrum. It includes sub-gigabit and gigabit-class communication speeds for short, medium and long ranges and unidirectional and bidirectional data transfer using line-of-sight or diffuse links, reflections and much more. It is not limited to LED or laser technologies or to a particular receiving technique. Li-Fi is a framework for all of these providing new capabilities to current and future services, applications and end users. The information which sent by the ship it is in encrypted form so the communication which is going to take place between the ships is more secure. In this we are sending the different messages to the other ship in difficulties. Some messages which are important for the other ship. The transmission medium used is light fidelity for transferring the data from one ship to another.

II. EXISTING SYSTEM

As for terrestrial application, the underwater wireless communication is not a straight forward process. Acoustic is the most preferred signal used as carrier by many application, owing to its low absorption characteristic for underwater communication. Using electromagnetic wave, the communication can be established at higher frequency and bandwidth. The limitation is due to high absorption/attenuation that has significant effect on the

transmitted signals. Big antenna also needed for this type of communication, thus affects design complexity and cost. Due to absorption characteristics of sea water ultrasound is not used for underwater communication. If the source or destination is moving then the Doppler effect will stretch of shrink the transmitter section. Unwanted noise signal may be present. Digital signal processing can be used for minimizing the disadvantages of ultrasound underwater communication.

III. PROPOSED SYSTEM

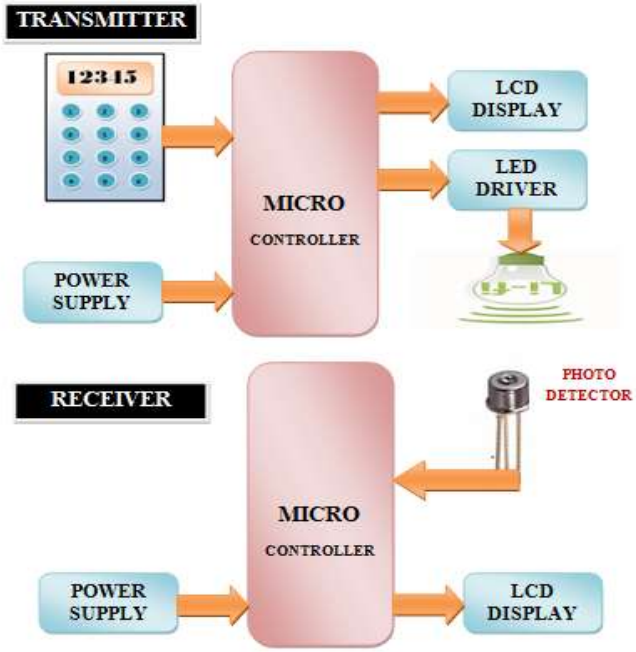

Fig 1: BLOCK DIAGRAM OF PROPOSED SYSTEM

Fig.1 Shows The Block Diagram Of The Proposed System.

3.1 Transmitter Section

The Power supply is applied to the microcontroller generally we preferred microcontroller is AVR 328. The Keyboard is used for transmitting the message which we have to transmit to the receiver section. LCD display is used to display the message which we are going to transmit. The microcontroller generates the message and sends to the LED driver . At the LED driver we connected the LED which is useful for transmitting the message. The LED transmits the message in the format digital signals that is in the format of string of 1's and 0's form. The speed of the transmitting the string of 0's and 1's is very high it is in Gbps. Generally We can choose any type of basic LED that is Red, Blue, Green. The transmiited signal is in the encoded form so the hacker can not hack easily the signal so the privacy or security of the information obtained so the it is preferred for the underwater defense applications like Navy.

3.2 Receiver Section

At the receiver section generally we preferred the Photo detector which accepts the signals or string light signals from the LED and it process it. After the Photo detector the signals is applied to the amplification and signal processing then the we get the actual transmitted signal. At the receiver we also connected the LCD display to verify the we get the actual transmitted signal or not.

Generally We get the very high speed it is in Gbps. Also the transmitted signal is also very secured so the for the high security applications like the defense applications we can use the our system. The communication takes place between the ships is bi-directional. So the full duplex communication can be takes place and also we get the acknowledgement wheather the transmitted signal is actually received or not.

IV. FEATURES

5.1 To Trnasmit Secure Data

Our system is useful to transmit the secure data between the two or more than ships. We can use the Cryptology for the secured communication.

5.2 High Speed and Full Duplex

The system is useful for the high speed operations . As we know the speed of the LI-FI system is in the Gbps. So we get the high speed and also the communication taken in both the ship it can be done bidirectional.

5.3 Low Power Requirement

The power requirement for the system is very less. So the it is helpful for the less power applications.

5.4 Easy To Implement

The Syetem we proposed is very easy to implement and the very less cost. The Hardware is used in the system is very less cost.

VI. APPLICATIONS

6.1 For Fisherman Security

Our System is useful for the fisherman also if the fisherman finds some problem in sea or his ship then he can send the message to the other ship or central authority.

6.2 Rescue Operations in Sea

If the rescue operation taking place in the sea then the one information can be transfer from one ship to another.

6.3 Alerts for Ships

If the hurricane occurs in the sea then the alert information can be sent to the ship also if the pyrites in the sea is available then the message also sent to the ships.

6.4 For Defense Operations

The proposed system is useful in the Defense operation. While Patrolling if the Unknown Ship is find in the sea then the patrolling ship also send the information to the Central authority.

VII. FUTURE SCOPE

7.1 GPS System

By using LI-FI system we can be allocate the area for the Fisherman this effects the fisherman never crosses the sea boundary so the war between the Countries minimized.

7.2 Ship Navigation

By using the Li-Fi System We can Navigate the ships so the current activity or location of the ship can be detected and it is helpful for the preventing the ship from major accidents.

7.3 Under Water Oil Rigs

It is also helpful for the underwater oil rigs where the radio signal dangerous for the industry in that place the Li-Fi system is very good option for communication.

7.4 Use of Laser

For Long Distance communication We can use the LASER in place of LED So the communication distance can be increased.

VIII. CONCLUSIONS

We are proposed the system which are the useful for the ship to ship underwater communication at faster speed in Gbps. It can be overcomes the problem occurs in the communication also it gives the secure communication so the hacking of the system has less chance. It also be effective for the security purpose of the ships. If this system is used in the Indian Navy it can be more effective for avoids the many problems occurs in the communication between the ships. Our system is very cost effective so it can be more effective than the other systems like the Acoustic wave communication and Ultrasonic wave communication. So the our system may be replaced by existing underwater communication techniques and it is better than the existing systems.

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