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IR WIRELESS UNDERWATER COMMUNICATION SYSTEM

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Abstract: Underwater wireless communications system comprising first and second communications modules which transmit and receive data utilizing infrared radiation. Each module has a transmitter/receiver which converts each received data. The infrared light detecting unit then provides a logic zero at its output when it receives a pulsed burst of infrared radiation for time period of approximately six hundred microseconds and a logic one when the unit fails to detect a pulsed burst of infrared radiation for a time period of six hundred microseconds. Wireless infrared (IR) communication system is meant to use free space propagation of light waves as a transmission medium in near infrared band. Message communication is implemented by using IR as a source that is established a light communication (link to transmit and receive data via infrared light). The outcome of this proposed work is to design and implementation an optical wireless system to transmit data over a certain distance. This system has many advantages such as is an inexpensive and the transmitter or receiver can be showed to another location with least distraction. This system is used for easy communication with transmitter and receiver in underground water. if they need any help means the transmit the signal using IR transmitter remote the signal transfer to IR receiver circuit. So thus, why they can easily identify the information.

Keywords- Underwater communication, wireless optical communication, scuba diving, heart beat sensor

I. INTRODUCTION

Wireless communication allows information to be transmitted between two devices without using wire or cable. The data is being transmitted and received using electromagnetic radiation, the electromagnetic spectrum orders electromagnetic energy according to wavelength or frequency, the electromagnetic spectrum ranged from energy waves having Extremely Low Frequency (ELF) to energy waves having much higher frequency, e.g. x-rays. Infrared is an electromagnetic radiation has a wavelength longer than that of visible light but shorter than radio waves and has wavelength between (750 nm-1mm) Infrared LEDS are classified into Near Infrared (NIR) and Far Infrared (FIR). In this project (NIR) is our interest, it is divided into two bands the long wave and short wave (NIR), So the used part of the infrared spectrum in laser communication system is divided into various bands based on the type of the light sources, transmitting\absorbing materials (fibres) and detectors. IR communication system consists of three main parts transmitter circuit, medium propagation (IR) and receiver circuit. In this project, short distance transmission of signal is realized by the design and achievement of infrared communication link.

II. RELATED WORK

Although since recent several decades, artificial scattering agents are conditioned to recreate underwater optical communication channels under different water quality conditions, but the similarity between experimental water and natural water isn't reliable, like the similarity in frequency domain characteristics. An acoustic communication has been developed for the underwater wireless sensor network because of its relatively low attenuation, but the bandwidth of the underwater acoustic channel is restricted, Underwater sensors cannot share data with those ashore, as both use different wireless signals that only labour in their respective mediums.

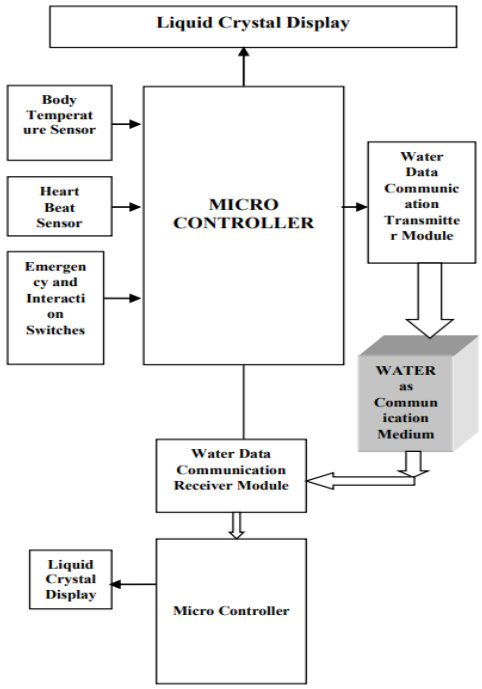
III. EXISTING SYSTEM

Various authors have proposed and discussed much advancement in educational field using technology that has helped in improving educational field **Arnone, S. Underwater optical wireless communication network.** Many underwater communication deployments use acoustic or low frequency technologies, which is why the number of works in higher frequencies is very scarce. We have found some papers showing comparative studies regarding the transmission characteristics of the acoustic, optical and electromagnetic signals in underwater environments. There is a huge variety of articles describing the propagation of acoustic waves. An example of a path loss analysis given by the reflection and refraction of the waves is provided in. Moreover, we can see in the effects of depth and temperature in this type of wave. We can also find a variety of studies about the propagation and losses in optical communications. **Wells, I.; Davies, A.; Che, X.; Kear, P.; Dickers, G.; Gong, X.; Rhodes, M. Node pattern simulation of an undersea sensor network using RF electromagnetic communications.** In RF communications, researchers work with Very Low Frequency (VLF), decreasing the frequency in order to have a more effective range of communication. Concretely, some researchers of the Swansea Metropolitan University, U.K

IV. PROPOSED SYSTEM

Almost no other systems to watch the health conditions of sea navigator while navigating the sea. While there is a wearable device for monitoring his/her pulse for himself/herself. But an individual within the ground cannot find about the health conditions of person underwater. So, he does not realize the health conditions of the person underwater. Fig 1: A Scuba Diver Diving equipment is equipment employed by underwater divers to form diving activities possible, easier, safer and comfortable. This might be equipment chiefly intended for this purpose, or equipment intended for other purposes which is found to be suitable for diving use. The fundamental item of diving equipment is an underwater breathing device, and surface supplied diving equipment. But there are no other important pieces of kit that make diving safer, more convenient or more efficient. Diving equipment employed by recreational scuba divers is usually personal equipment carried by the diver, but professional divers, particularly when functioning within the surface supplied or saturation mode, uses a good deal of support equipment not carried by the diver.

V. BLOCK DIAGRAM



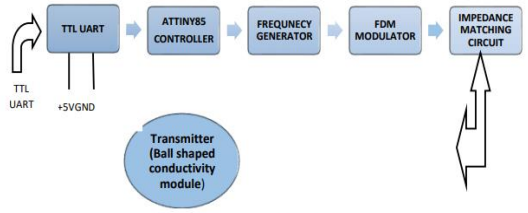


Fig 3: Transmitter Module

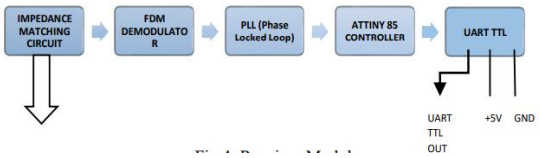


Fig: 5.2 Input Transmitter module

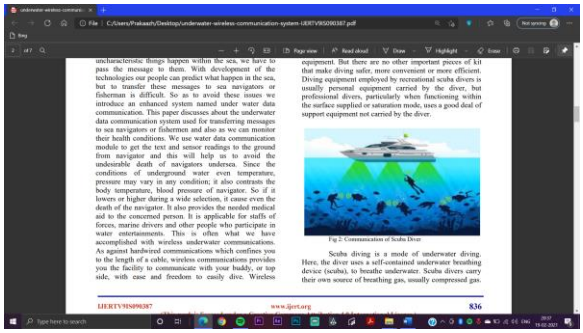


Fig 5.3 Communication between scuba drivers

Underwater sensors cannot share data with those ashore, as both use different wireless signals that only work in their corresponding mediums. Radio signals that travel through air die very quickly in water. Acoustic signals, or sonar, sent by underwater devices generally reflect off the surface without ever breaking through. This causes inefficiencies and other problems for a variety of applications, like ocean exploration and submarine-to-plane communication. To start, there are two selections of underwater communications: Hardwired- uses a cable to transfer the communications.

VI. EXPERIMENTAL RESULTS

This project is focusing on transmitting light signal (remote) from the transmitter ending to the receiver ending using the infrared light radiation equipment in underwater ,this design is called the underwater wireless communication system, The designing in this project devoted on the development of the conventional infrared radiation communicating by increasing the transmission distance and the effective signal coverage region, likewise, this system has unique advantages such as minimal effort with low cost, high speed communication and almost no limitations of bandwidth range . So, this system can be easy and fast communication with underground water.

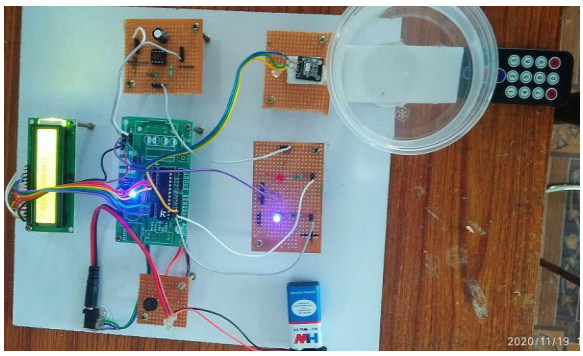


Fig 6.1 Experimental outputs

VII. CONCLUSION

An improvement in submerged correspondence framework is required because of expanded number of automated vehicles in space and submerged. Conventional submerged correspondence depends on acoustic signs and notwithstanding the generous progression in this field, acoustic correspondence is unable to give adequate data transmission low inertness. Optical submerged correspondence gives incredible potential to enlarge customary acoustic correspondence because of its high information rates, low dormancy, less force utilization and littler bundling. Likewise, this innovation can profit definitively from the advancement made in the earthly optical remote correspondence. We propose another strategy by adding heartbeats to the FDM technique which is predominantly utilized in submerged wire-less information correspondence. Rather than the regular optical remote transmission, we use information correspondence module.

With this idea we discover a steady answer for observing the wellbeing states of ocean researcher. Now a days, the air conditions are evolving hugely. It influences the ocean pilots in a difficult situation. It is hard to screen their wellbeing conditions when they are in ocean. As we probably are aware, regardless of whether they jump under 20 meters into the ocean their heart beat changes wildly and pulse lows perilously it might prompts passing. Also, this will be hard to guides/angler to continue in those conditions. So here we propose a framework to screen heath states of an ocean guide while checking the heart beat perusing during route. Utilizing an information correspondence framework, we can screen pilots heart beat even in ground. So, this will assist us with discovering the status of the pilot and can dodge the unsafe circumstances. We can likewise share ready messages to them if the atmosphere changes definitely when they are exploring. This will likewise assist them with understanding the condition and can securely return to the board

Fig 6.2: Displaying Message Alert

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