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FEASIBILITY STUDY AND IMPLEMENTATION OF SEA RESEARCHER'S BIO- PARAMETERS MONITORING BY WATER CHANNEL

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Abstract - *Automobiles and IOT technologies are creating a new level of security services in vehicles. Modern vehicle tracking uses active vehicle tracking and GPS technology. The growing popularity of big data and Internet of Things (IoT) applications brings new challenges to the wireless communication community. Big data analysis is very important to support rescue activities when natural disaster happens, through understanding various situations such as power/water outage regions. And Near Field Communication (NFC) is rapidly becoming one of the most common proximity communication technologies. As a part of this endeavour this paper presents an analysis of the path loss in the underwater acoustic channel while comparing it with the free space loss and tries to study the complex nature of the environment offered by the underwater medium. One of the main problems in underwater communications is the low data rate available due to the use of low frequencies. Moreover, there are many problems inherent to the medium such as reflections, refraction, energy dispersion, etc., that greatly degrade communication between devices. In some cases, wireless sensors must be placed quite close to each other in order to take more accurate measurements from the water while having high communication bandwidth.*

Key Words: Near Field Communication, underwater acoustic channel, underwater medium.

1.INTRODUCTION

The research carried out describes the electronics motion control and sensor system for the environmental monitoring ofunderwater water vehicles. The first diving communication began with knowledge going through humans safely and was studied by the design and way of use in order to improve the efficiency of diving communication instead of the actual sensor. This research focuses on underwater connectivity.

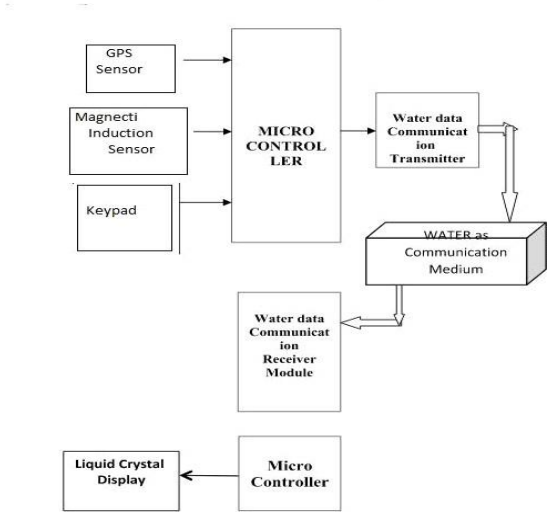
2. RELATED WORK

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. There is very little literature published about EM waves because this technology is not used in underwater communications. There is not too much documentation about high frequency in underwater communications because most of the works are designed for low frequencies in order to achieve large communication distances, preventing the power losses generated in high frequencies. Chakraborty et al. presented a detailed description of the relationship between several propagation parameters of electromagnetic waves [6]. They studied skin depth, propagation velocity, total path loss, wavelength and frequency for different values of distance and conductivity of the water medium for underwater communication. They confirmed that EM wave propagation is characterized mainly by four parameters: permeability, permittivity, conductivity and volume charge density. 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., performed their simulations at 3 KHz and distances between nodes of about 40 meters . In [6], Frater et al. compared RF and acoustic communications. They measured the maximum distances for RF. The paper shows the maximum distances for several frequencies (approximately 6 m at 100 kHz, 16 m at 10 kHz, and 22 m at 1 kHz). They concluded that RF communication offers higher performance than acoustic communication in certain ranges. except for the last paper presented in this section, which is our paper, we have not found any other papers in the related literature showing the

performance of underwater communication tests at 2.4 GHz. Ali, Mohammad & Jayakody, Dushantha Nalin & Perera, Tharindu & Sharma, Abhishek & Srinivasan, Kathiravan & Krikidis, Ioannis presented an overview of the key projects and up-to-date contributions from UWC, i.e. underwater wireless optical, acoustic and electromagnetic communication In addition, they outlined new UWC innovations, future research directions and guidelines using fifth generation (5G) communication techniques..

3.ALGORITHM

Pattern matching is checking and locating of specific sequences of data of some pattern among raw data or a sequence of tokens. It is one of the most fundamental and important paradigms in several programming languages. **Parallel algorithm** is an algorithm that can execute several instructions simultaneously on different processing devices and then combine all the individual outputs to produce the final result. The problem is divided into sub-problems and are executed in parallel to get individual outputs. Later on, these individual outputs are combined together to get the final desired output.



In this architecture diagram, GPS sensor, Magnetic Induction sensor and Keypad are connected a Micro controller (ATmege328) this is water data transmitter module which use the wateras Communication Medium. Similarly,

Water data

Communication Receiver Module as the Micro controller (ATmega328) and the Liquid

Crystal Display.

4. EXISTING SYSTEM

- Designing more bio-friendly modems to function in delicate fauna regions and stricter environmental controls.
- Research on optimal error correction coding with a consistent combination of multi-path signal resources, output and channel power usage could be further improved.
- Battery power is limited and usually batteries cannot be recharged, also because solar energy cannot be exploited.
- Mischance in arriving rate.

4.1 DISADVANTAGES

- Existing system genert e-waste thts affects the sea creatures.
- Bandwith
- Non corrosion resistant
- Not trust worth
- Comm. Can be easily disturbed

5.PROPOSED SYSTEM

- Near Field Communication (NFC) is becoming increasingly one of the most common communications technologies for proximity.
- While most wireless systems are worthless when submerged due to signal loss, the 13.56MHz NFC can reach a very short range of connectivity, allowing contact less data transmission.
- It is used for the processing of clean water and unclean water in science and daily life to improve the aquatic environment.
- Useful in opening the way for the use of NFCs in a number of application scenarios, particularly when dealing with marine monitoring operations.

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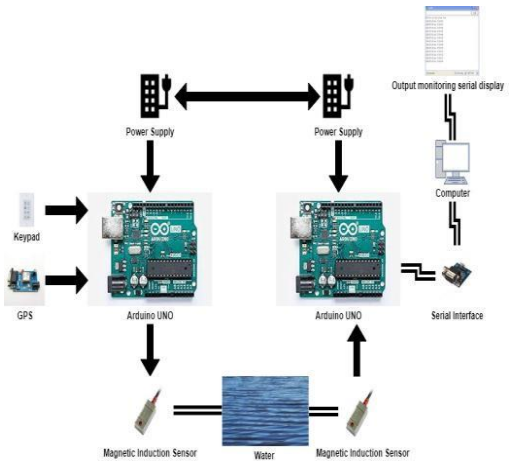
6. BLOCK DIAGRAM



ARDUINO UNO

The Arduino microcontroller is an easy to use yet powerful single board computer that has gained considerable traction in the hobby and professional market.

MAGNETIC INDUCTION SENSOR

Magnetic Induction Sensors is composed of the magnetic substance that moves in the conversion circuit, the first winding coil, the second winding coil, and the coil.

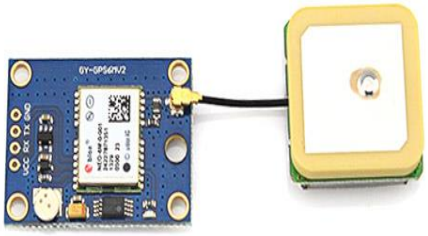
The exchange magnetic field is generated by exciting the first winding coil by the first exchange signal that becomes a standard.

Magnetic Induction sensor:-Non-contact detection,Usable in severe environment,High precision,Short response timeLong life,Only metal detection,Short sensing range

GPS

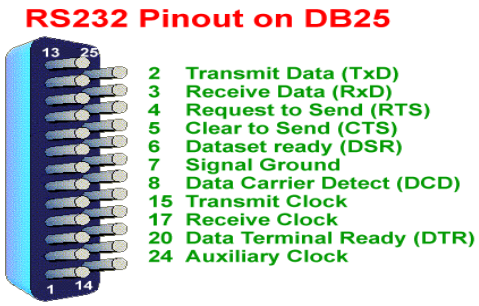
The GPS or Global Positioning System is a satellite navigation system that provides the user with location and time information in all weather conditions.

GPS:-Real-Time Tracking,Trip History,Alerts Anytime Anywhere Access,Geo-Fencing,Historical Reports and Dashboard Summary,Easy to Use, User-Friendly Interface,Access Control and User Management,Analytic,Easy Installation



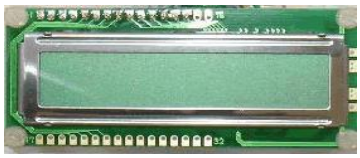
SERIAL INTERFACE

RS-232 is used for asynchronous data transfer as well as synchronous links such as SDLC, HDLC, Frame Relay and X.25.



LCD

LCDs are optically passive displays (they do not produce light). As a result, LCDs require all most no power to operate.



7.MODULES

- **7.1 Sending Text and GPS as Input:**
    - In the proposed system, Text is sent as an input through the keypad along with location through the GPS module.
    - The GPS receiver gets a signal from each GPS satellite. The satellites transmit the exact time the signals are sent.
    - By subtracting the time, the signal was transmitted from the time it was received, the GPS can tell how far it is from each satellite.
    - The GPS receiver also knows the exact position in the sky of the satellites, at the moment they sent their signals.
    - So, given the travel time of the GPS signals from three satellites and their exact position in the sky, the GPS receiver can determine your position in three dimensions - east, north and altitude.
    - The input is transmitted through water

7.2 Transmitting the data through water:

- A magnetic induction sensor is used to receive and transmit the data.
- The magnetic induction sensor develops a magnetic field when current flows through it; alternatively, a current will flow through a circuit containing an inductor when the magnetic field through it changes.
- This effect can be used to detect metallic objects that interact with a magnetic field.
- Non-metallic substances such as liquids or some kinds of dirt do not interact with the magnetic field, so an inductive sensor can operate in wet or dirty conditions.
- The magnetic induction sensors are used to send the data through water.

7.3 Receiving the transmitted data:

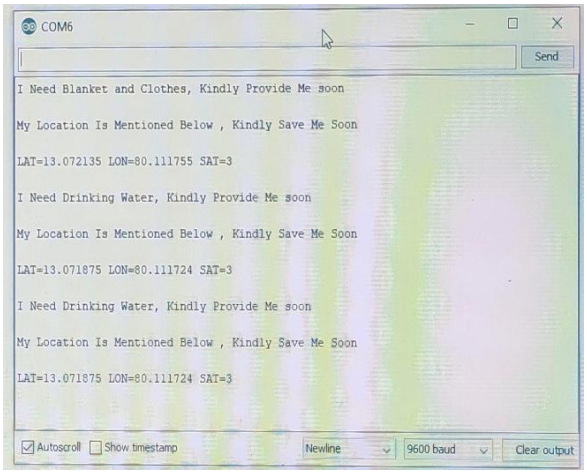
- Another magnetic induction sensor is used to receive the data that is sent through the water.
- The magnetic induction sensor senses a magnetic field surrounding the electric current.
- The field is detectable by its force or interaction on electrical charges, magnets and magnetic products.
- The strength and direction of a magnetic field can be measured and documented.
- The data is collected from the sensor with the help of a serial interface.

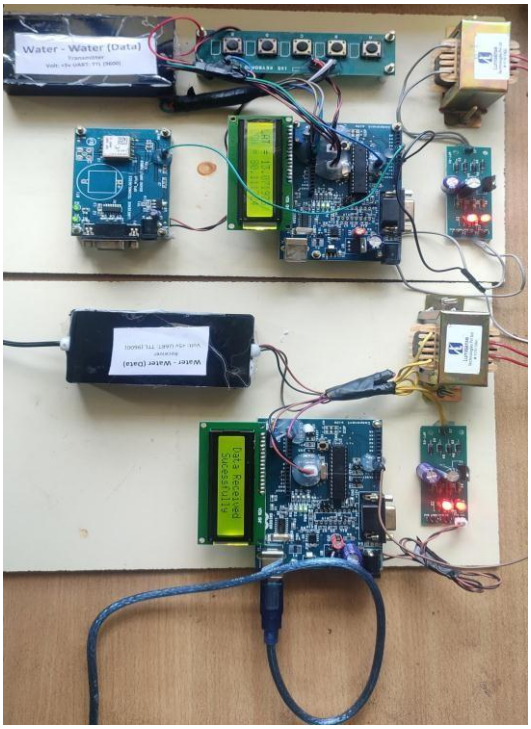
7.4 Displaying the transmitted data:

- The data that is collected from the sensor with the help of a serial interface.
- In the serial interface most of the work at the serial port is done by the UART chip.
- To transmit a byte, the serial device driver program sends a byte to the serial port's I/O address.
- From this shift register bits are taken from the byte one-by-one and sent out bit-by-bit on the serial line.
- The serial interface displays the text and the location on the system as an output.

8.RESULT

We aim to pass the message and location of the message between two systems by using water as a communication has successfully done. The screenshort of the output is displayed below. First is the IOT kits. Second is the output display in Arduino UNO.





9.CONCLUSION

The project work has shown that magnetic induction-based radio frequency technology can work underwater: experiments have been carried out both under fresh and saltwater, and data transmission has been accomplished in both situations with a small reduction in the data transmission capacity. Tests have been carried out for both the Network Initiation Modality and the Peer-to-Peer Modality: in both situations, the MIRF system has proven to be able to operate underwater. The results provided in this project may be useful in opening the way for the use of MIRFs in a few application scenarios, particularly when dealing with marine monitoring operations.

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