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UNDERWATER WIRELESS COMMUNICATION SYSTEM USING IOT

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Abstract - *A approach that could be used is underwater data transfer. Several types of agents are tested in this project in order to precisely alter the coefficients of experimental water. We can broadcast the marine researcher's organic situations and interactions to the tracking give up available to them through a way of manner of the use of a separate transmitter and receiver module withinside the water the various modules. The ocean's atmospheric situation will significantly change. It motives an immoderate variety of problems for marine navigators. Following a dive, it's miles hard to hold the marine navigator's health. His heart pulse becomes uncontrollably changing even if he dives below 20 meters. As a result, even supposing his pulse step by step declines, it may bring about death. In sure circumstances, there's no manner to store the navigators. So, in this paper, we suggest a system for monitoring a marine Navigator's fitness at the same time as navigating through a manner of the method of assessing coronary heart rate, temperature, oxygen levels, and GPS coordinates.* We can study a diving navigator's health from the land and use a conversation machine even as navigate via way of means of assessing coronary heart rate, temperature, oxygen levels, and GPS coordinates. *We can tune a diving navigator's fitness from the land using a conversation system. We can communicate with the sea navigator to reach the ground if we discover his health circumstances are unstable, as determined by sensor readings. Between the ground station and the sea navigator, two-way communication is possible. We can save the lives of a large number of navigators in this way.*

Key Words: **Underwater data transfer**, **Marine Navigators**, **Two-Way Communication**, **Heart Rate, Temperature, Oxygen Levels, GPS Coordinates, Ground Station**.

1. INTRODUCTION

The military, industry, and scientific communities all benefit from underwater wireless information transmission. In order to allow all of these activities, the number of autonomous vehicles or devices deployed underwater is increasing, necessitating immoderate bandwidth and functionality for underwater statistics mobility. The popularity of the Internet of Things (IoT) for terrestrial, space and underwater communications has risen in current years, due to its capability to deliver immoderate record speeds with low power and mass requirements. The Internet of Things (IoT) can be a promising device for gaining a higher record of the ocean floor. The essential project for reliable underwater conversation is the big variety of bodily processes that arise in numerous underwater habitats, from shallow coastal water to deep seas or oceans.

Because the physical scale is limited, the underwater wireless communication experiment conducted in the laboratory differs from that conducted in the real water system. Although artificial scattering agents have been conditioned to recreate underwater wireless communication channels under various water quality conditions for numerous decades, the similarity between experimental water and herbal water, just like the similarity in frequency area characteristics, isn't always suitable. The transmission traits of underwater wi-fi communique alerts below alignment situations are tough to reap inside the seawater environment because of the trouble of synchronization due to unpredictability of the vicinity of the transceivers, bad mechanical stability, and the complexity of the waterways.

When something unusual happens at a sea, it must be reported to the sailor or divers. Our human beings can foresee what's going to manifest at seaway to technological advancements, however, it's miles tough to talk this data to sea navigators. To cope with those concerns, we've got released a sophisticated generation referred to as underwater reality reporting. This project looks at an underwater data communication system that may be used to send messages to marine navigators or scuba divers, as well as track their health. We use the Internet of Things (IoT) to ship textual content and sensor readings from the navigator to the ground, a good way to help us avoid the unfortunate deaths of our pilots at sea.

Because the temperature and pressure of subsurface water can fluctuate in any scenario, it also contrasts the navigator's body Temperature and oxygen degrees as a result, if it falls or rises throughout a massive selection, the navigator can lead to death. It additionally offers important scientific help to the character in question. It is intended for military personnel, marine drivers, and others who participate in aquatic activities. In contrast to hardwired communications, which limit you to the length of a cable, Wireless communication allows you to easily talk to your partner while diving. Underwater wireless communication is a fun and convenient way to stay in touch while diving.

2. PROBLEM IDENTIFICATION& PROBLEM SOLVING

2.1. EXISTING METHOD

However, no extra diving device is wanted to make diving safer, greater snug, or maybe greater effective. Professional divers, especially while working in the surface supplied or saturation mode, utilize a lot of support equipment that isn't carried by the diver. There are almost no other methods in place to monitor the health of a sea navigator while traversing the sea. While there is a wearable device for him/her to monitor his/her own pulse. However, a person on the ground cannot learn about the health status of someone who is underwater. As a result, he is unaware of the person's underwater health. Scuba Diver Diving Equipment is used by underwater divers to make diving sports easier, safer, and more comfortable. This could be equipment designed specifically for diving or equipment designed for other reasons but discovered to be suitable for diving.

2.2. PROPOSED METHOD

To start, there are two kinds of undersea communication systems to choose from: Hard-wired communications are carried out over a cable, whereas wireless communications are carried out over the water. Many divers love the idea of being able to dive wherever they want while still being able to communicate with their dive partner fast and efficiently. With wi-fi underwater communications, we had been capable of doing this. Wireless communications, as opposed to hardwired communications, which limit you to the length of a cable, allow you to communicate with your companion or top side with ease when diving. The benefits of this system include the ability for someone on the ground to monitor the navigator's health, the ability for sending messages to navigators from the ground, the possibility for explorers to communicate with the ground, and the ability to monitor the navigator's health from anywhere, as well as ease of deployment, data accuracy, and reliability.

3. IMPLEMENTATION

3.1. ABOUT THE PROJECT

This undertaking is a running prototype of a wi-fi conversation machine to be used underwater. Underwater operations can benefit from this project. It's a wearable device that's utilized by ship captains. The system first identifies a marine navigator's basic health state metrics and delivers the information to the microcontroller. The sensor values are then dispatched to the floor station through the WIFI module, that's related to the cloud. As an outcome, some other character could be capable of maintaining the ocean navigator's health. Someone else in the ground station can monitor the marine navigator's GPS position of the sea navigator in addition to the sensor values. The block diagram for the above-stated operations is shown in Fig 3.1.

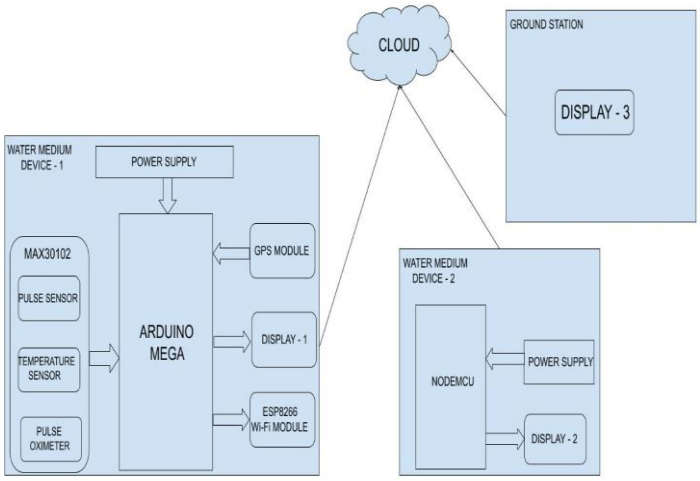

Fig 3.1 Block Diagram of Underwater Wireless Communication System Using IoT.

3.2. HARDWARE REQUIREMENTS

1. Arduino Mega.
2. MAX30102 Sensor.
3. Power Supply (12V).
4. NEO-6MV2 GPS Module.
5. ESP 8266 Wi-Fi Module.
6. LCD 16*2 Module.
7. NodeMCU.

3.3. SOFTWARE REQUIREMENTS

1. Arduino IDE.
2. Thingspeak Software.

4. RESULTS ANALYSIS

In this prototype model it is having two devices with the sea navigator one is for receiving information from the ground station and the other is to transmit the fitness situations of a sea navigator to the floor station. The prototype model of this project is shown in fig.4.1

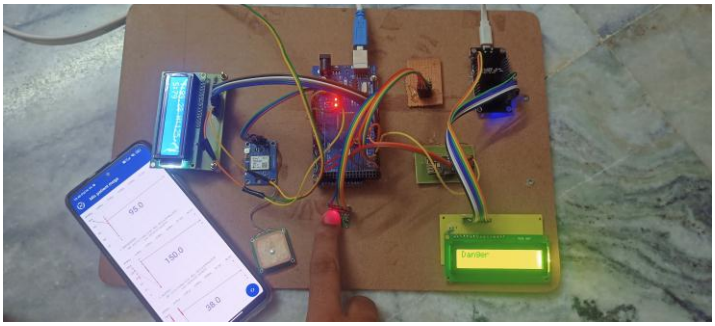

Fig 4.1 Results of Underwater Wireless Communication System Using IoT

5. CONCLUSION & FUTURE WORK

5.1 CONCLUSION

We find out a regular answer for tracking the fitness of ocean researchers the usage of this concept. The air quality is mostly converting these days. It has an impact on marine pilots who are in difficult situations. When they are in the ocean, it is difficult to monitor their health. As anyone knows, no matter whether or not, they no longer dive under 20 meters. The ocean's atmospheric conditions will drastically change into the water, their heart rate fluctuates wildly and their pulse drops dangerously low, prompting passing. In addition, it will be difficult for guides and anglers to continue in those conditions. As a result, we provide a machine for assessing an ocean guide's fitness while tracking his or her heart rate continuously during the diving. We can discover a pilot's heartbeat even on the floor with the usage of a records correspondence architecture. As a result, we will be able to learn more about the pilot's status and avoid potentially dangerous situations.

5.2 APPLICATIONS

- Health Monitoring System
- Underwater remote control
- Wireless Data Communication
- Measure temperature and humidity
- Local Weather station
- Automatic climate control
- Underwater quality monitoring
- Underwater temperature measurements

5.3 FUTURE SCOPE

This test is full-size as it develops a wireless network below the water. It has the cap capability to speak amongst devices, similarly to track and find out them underwater. It continues the self-sufficient GPS region tracker bot for destiny reference via way of means of working it withinside the IoT cloud. It additionally measures temperature, vibration, and water quality, consisting of pH, dissolved oxygen, and salinity, and sends information to the IoT cloud. It minimizes the quantity of natural trash that finally ends up at the seabed. Range expansion, a larger number of attached devices, and increasing the depth of the established network can all be improved with further optimization. We can also send them pre-recorded messages if the environment changes significantly while they are investigating. This will also aid them in comprehending the situation and allowing them to safely return to the board.

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