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Sea Researcher's Bio-Parameter Monitoring through Water Channel

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ABSTRACT: Water digital communication may be a potential technology to understand underwater communication. Within the development of underwater communication technique maximum care must be taken regarding the lifetime of marine animals and their communication. By having a separate Tx and Rx module within the water between the modules we will transmit the ocean researcher's biomedical conditions and interactions to the monitoring end available on the ship. A DC Binary signal is employed to represent the info as discrete values. The signal can have two possible values (one near the reference value and other near the availability voltage value). The transmitter and receiver module features a contact lead which is immersed in water for data transmission. Temperature sensor and Heart beat sensor are the sensors wont to check the bio-parameters. This communication is often applied for scuba divers to alert the receiver section if any abnormally lethal situation occurs. Data is transmitted with none interruptions thanks to the noise immunity and amplification of the signal. The diver is going to be rescued out of the water soon after the emergency switch is pressed.

KEYWORDS:DC Binary signal, Temperature Sensor, Underwater Communication.

I.INTRODUCTION

Wireless communication technology today has become a part of our lifestyle, the thought of wireless undersea communications should seem far-fetched. However, researches for wireless data transmission underwater has been active for over a decade. Human knowledge and understanding of the world's oceans, which constitute the main a part of our planet, rests on our ability to gather information from remote undersea locations.

The major discoveries of the past decades, like the remains of Titanic, or the hydro-thermal vents at heart of deep ocean, were made using cabled submersibles. Even though many similar systems remain indispensable when ultra-speed communication link exists between one remote end and thus the surface, it's natural to wonder what one could accomplish without the burden (and cost) of heavy cables.

Hence the motivation, and interest in wireless underwater communications together with various advanced technologies and wireless communications will trigger upcoming new applications ranging from environmental monitoring to gathering of oceanographic data, marine archaeology, and search, detect and rescue missions.

II.SYSTEM MODEL

This paper is all about a base idea for the real time data transmission of sea researcher's bio-parameters through water as a medium. The main components of the model are a transmitter module and a receiver module. Both the TX and RX module are controlled by a microcontroller each. The transmitter module will be fitted on the researcher's body and the receiver module will be on a ship. The microcontroller transmits, process, controls, receives the real-time bio status through water channel. The transmitter side has temperature sensor, heart beat sensor and emergency interaction switches to alert the receiver side whenever counters with an emergency situation. Both the sides have LCD displays where the temperature, heart beat rate, toxic gas are displayed. Additional features can be added and implemented after thorough research.

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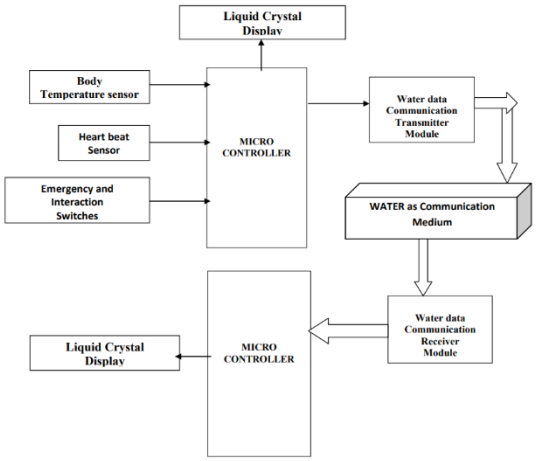
BLOCK DIAGRAM



III.TRANSMITTER AND RECIEVER

The model contains microcontroller, tx and rx module, temperature sensors, heartbeat sensors, switches, etc. By having a separate tx and rx module in the water between the modules we can transmit the sea researcher's biomedical conditions and interactions to the monitoring end available on the ship. A base concept of bio-parameter monitoring by communicating through water channel is being kept forward by us through this paper. Highly amplified Dc signal is used for the transmission and recession of status data. Since dc has no frequency it does not affect the marine life adversely.

The transmitter side has various sensors to detect the bio-parameters and a microcontroller where the detected data is controlled, processed. The controller sends the processed data to the receiving side in the form of amplified Dc signal and the datas are displayed on the LCD display. Amplified Dc signal means binary signal which have two possible values 0 and 1. The data is transmitted in discrete form. One is the reference value (zero volts) and the other value near the supply voltage. The discrete signals are amplified in order to achieve appropriate data transmission without loss.

IV.PARAMETRIC SENSOR OPERATIONS

The model consists of two sensors: temperature sensor (LM35) and heart beat sensor (TCRT1000). The LM35 is rated to work over a -55° to +150°C temperature range. The sensor consists of an excellent bright red LED and lightweight detector. The LED needs to be super bright as the maximum light must pass spread in finger and detected by detector. Now, when the guts pumps blood through the blood vessels in the body, the finger becomes slightly more opaque then less light reached the detector. With each heart pulse the detector signal varies. This variation is converted to electrical pulse.

The sensed data are processed and displayed in the LCD display. The microcontroller/microprocessor interface to HD44780 modules is 14 pins. We may find that some displays have additional pins for backlighting or other purposes, but the first 14 pins still serve as the interface. The initial three pins thus provide power to the LCD module. Pin 1 is GND and be grounded to power supply. Pin 2 is VCC and should be connected to +5V power. Pin 3 is the LCD Display Bias. By 21 adjusting the voltage or duty cycle of pin 3, the contrast of the display can be adjusted.

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V.OUTPUT FROM LCD DISPLAY

After the data transmission the receiver side receives the bio-parametric data and processed in the microcontroller, finally displayed on the LCD display. The demonstration is carried out using a water barrel in which on one side transmitter's contact lead is immersed and on other side receiver's contact lead is immersed. Using water as medium the sensed real time datas are transmitted to the receiving end and are displayed on the LCD.

VI.OUTPUT ANALYSIS

Temperature sensor: LM35 Temperature Sensor is used. Temperature sensor shows the value of body temperature in the researcher's body. In the LCD display the letter "T" denotes the Temperature Sensor Output. The Temperature sensor provides and output of T=32.

Fig. Temperature And Heart Beat Sensors

Heartbeat sensor: TCRT1000 Heart Beat Sensor is used. Heart beat sensor shows the heart beat count in Beats Per Minute (BPM). In the LCD display the letter "HB" denotes the Heart Beat Sensor Output. The Heart beat sensor provides an output of HB=73.

Push Button: Emergency button is also added in the transmitter module. It is denoted by letter "But" in the LCD display. When the push button is not pressed it shows but=0, it indicates there is no alert signal or any fatal situation encountered.

SENSORS	OUTPUT
Temperature Sensor	32
Heart Beat Sensor	73

VI. CONCLUSION

In this paper, we have discussed about a base idea of underwater communication to transmit the bio-parameters of sea researcher's. The objective of the reviewed technique is to monitor sea researcher's bio-status and by which we can act quickly when an emergency situation arises. Along with that our aim is to provide direction for future researchers. Also, we presented a vibrant view to academia by providing a base for a better solution. In this perspective, we've presented future directions which are still not yet explored during this research area. A better communication technique is often proposed by considering environmental effect during communication. In the development of underwater communication technique maximum care want to be taken regarding the lifetime of marine animals and their communication techniques. The deep digging out in the areas regarding nonlinear sound propagation of acoustic signals can be more useful for designing future communication techniques.

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REFERENCES

[1] N.-S. N. Ismail, L. A. Hussein, and S. H. S. Ariffin, - "Analyzing the performance of acoustic channel in underwater wireless sensor network(UWSN)," in Proceedings of the Asia Modelling Symposium 2010: 4th International Conference on Mathematical Modelling and Computer Simulation, AMS2010, pp. 550–555, Malaysia, May 2010.

[2] T. Cinar and M. Bulent Orencik, - "An underwater acoustic channel model using ray tracing in ns-2," in Proceedings of the 2009 2nd IFIP Wireless Days (WD 2009), pp. 1–6, Paris, December 2009.

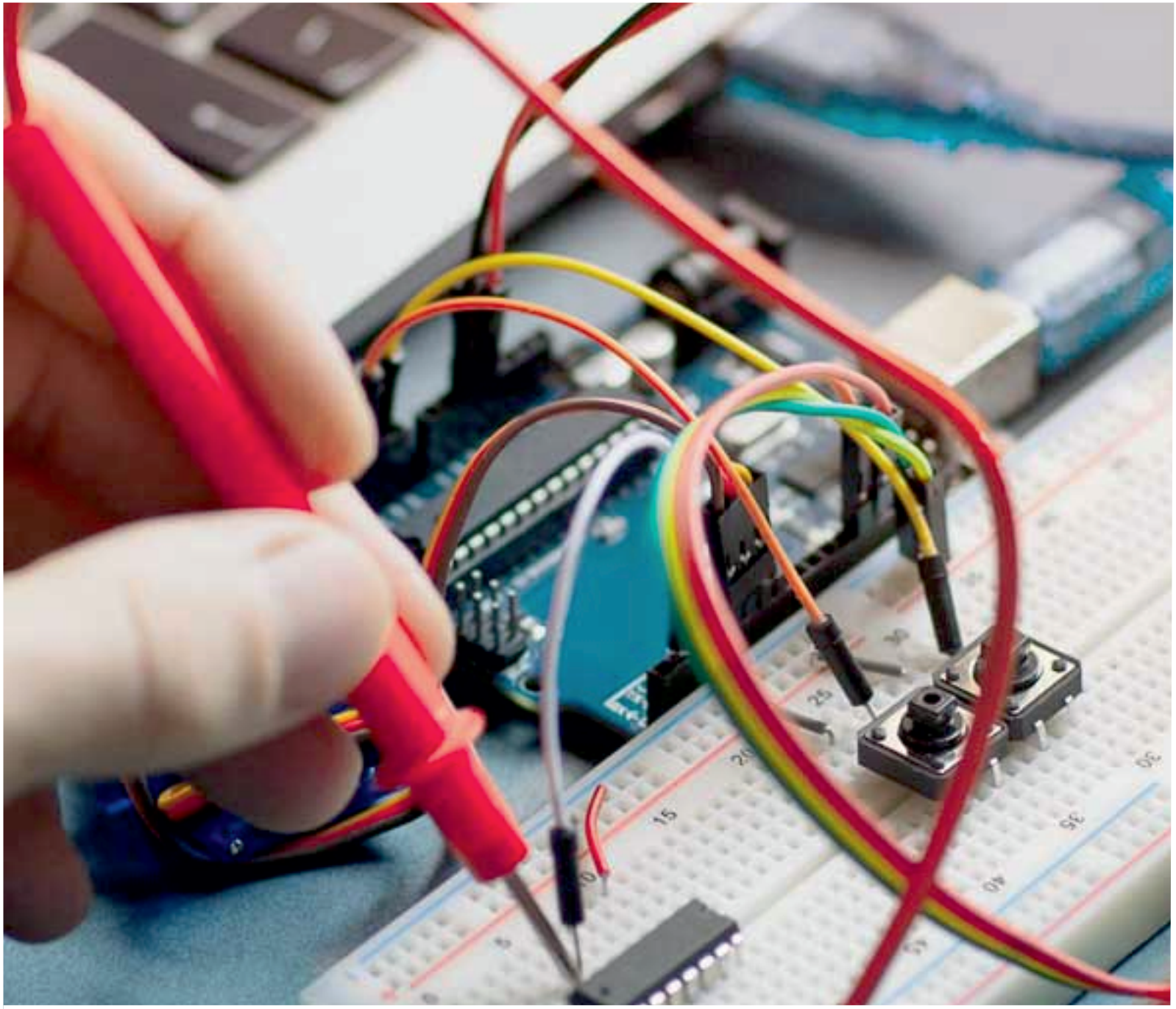
[3] J. Lloret, - "Underwater sensor nodes and networks," Sensors, vol. 13, no. 9, pp. 11782–11796, 2013.

[4] L. Liu, S. Zhou, and J. H. Cui, - "Prospects and problems of wireless communication for underwater sensor networks," Wireless Communications and Mobile Computing, vol. 8, no. 8, pp. 977–994, 2008.

[5] G. Zaibi, N. Nasri, A. Kacouri, and M. Samet, - "Survey of temperature variation effect on underwater acoustic wireless transmission," ICGST-CNIR Journal, vol. 9, 2009

[6] Y. Luo, L. Pu, M. Zuba, Z. Peng, and J.-H. Cui, - "Challenges and opportunities of underwater cognitive acoustic networks," IEEE Transactions on Emerging Topics in Computing, vol. 2, no. 2, pp. 198–211, 2014.

[7] J. Kong, M. Gerla, and S. Zhou, - Challenges: Building Scalable and Distributed Underwater Wireless Sensor Networks (UWSNs) for Aquatic Applications, 2005.



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