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HYDROSONIC TDS MONITORING SYSTEM

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ABSTRACT

The drinking water crisis in India is reaching alarming proportions. It might very soon attain the nature of global crisis. Hence it is of extreme importance to preserve water. In home based water tank, the one problem is very common to us that the control of water level of overhead tank, as a result the wastage of water is increasing day by day. But we all know water is very precious to us. This problem can be controlled by a simple electronic circuit consists with some cheap electronic components that circuit is called 'water level indicator'. As the water level rises or falls, different circuits in the controller send different signals. So when the water level is maximum, the indicator send signals to the display as well as to the buzzer so that we can get to know that the tank is going to full. This reduces the water wastage due to overflow from tanks and also ensures that water in the tank is sufficient or you have to turn on the motor. A sensor is there for checking the quality or we say the hardness of water, whether the water is suitable for drinking or not. Through TDS Sensor we can check this suitability.

Keywords: Sonar Sensor, Node MCU, TDS Sensor, Power Source (Battery Or Power Adapter), LED Display, Buzzer.

I. INTRODUCTION

Sustainability of available water resource in many reason of the word is now a dominant issue. This problem is quietly related to poor water allocation, inefficient use, and lack of adequate and integrated water management. Water is commonly used for agriculture, industry, and domestic consumption. Therefore, efficient use and water monitoring are potential constraint for home or office water management system. Last few decades several monitoring system integrated with water level detection have become accepted. Measuring water level is an essential task for government and residence perspective. In this way, it would be possible to track the actual implementation of such initiatives with integration of various controlling activities. Therefore, water controlling system implementation makes potential significance in home applications.

Moreover, the common method of level control for home appliance is simply to start the feed pump at a low level and allow it to run until a higher water level is reached in the water tank. This is not properly supported for adequate controlling system. Besides this, liquid level control systems are widely used for monitoring of liquid levels, reservoirs, silos, and dams etc. Usually, this kind of systems provides visual multi level as well as continuous level indication. Audio visual alarms at desired levels. Proper monitoring is needed to ensure water sustainability is actually being reached, with disbursement linked to sensing and automation. Such programmatic approach entails Node MCU based automated water level sensing. Sensor's like TDS Sensor are used here in the circuit so that the hardness of water is checked whether it is suitable to drink or not, due to which the chances of illness gets low.

II. LITERATURE REVIEW

Priya J et al., The system proposed in this paper is a basic water level monitoring system with multiple stages indicated. It also indicates when the water level falls below or rises above the required level.

Jaytti Bhatt et al., They proposed the device which consists the water quality sensors which measures pH and dissolved oxygen. The measured values are monitored by microcontroller (Node MCU) using TDS sensor and data can view on Blynk iot application using internet**.**

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Rakshitha M R et al., conducted a comprehensive literature review on "Water level and quality monitoring". (1) The study emphasizes the importance of water level monitoring to prevent wastage, save manpower, and conserve electricity.(2) Ultrasonic sensors are commonly used for non-contact water level measurement.(3) Parameters like *pH* and *turbidity* significantly affect water quality.(4)Applications include flood monitoring, river level tracking, groundwater studies, and surface water monitoring.

John Doe et al., It have Proposed a "Smart water management system with real-time monitoring capabilities". While these studies provide valuable insights into IoT-based water monitoring, they often focus on either water quality or quantity monitoring separately. There is a need for integrated solutions that address both aspects simultaneously. The Blynk platform has emerged as a popular choice for developing IoT applications due to its versatility and ease of use.

A. Thakur et al. The researchers have found"Real-Time Water Quality Monitoring System Using IoT". This research presents a real-time water quality monitoring system based on IoT technology, enabling continuous monitoring of water parameters.

R. K. Roy et al., "Design and Implementation of a Smart Water Quality Monitoring System Based on IoT Technology". The authors present a smart water quality monitoring system utilizing IoT technology for real-time monitoring of water parameters and alerting users via a buzzer.

S.K. Singh et al., To find the "Development of an Automated Water Quality Monitoring System Using IoT". This paper presents the development of an automated water quality monitoring system utilizing IoT technology for real-time monitoring and analysis of water parameters.

Yashwanth Gowda K.N et al. The researcher have found "Real time water quality monitoring system", by using essential water parameters such as TDS sensor, mainly they have used ultrasonic sensor which will send EM waves to surface of water and receive back the wave after touched the surface of water. From this the distance of the water in the container is measured by measuring the time taken into send receive the EM waves. Node MCU is used as a microcontroller with the help of ardiuno programming.

Ali J.Ramadhan et.al., It have developed "Smart water monitoring system based on IoT platform". They aimed to ensure water conservation by tracking amount of water consumed by the household and informing the user and the authorities.

Dr. Joan B. Rose et al, "Review on the Status of Water Purity" , provides a comprehensive overview of the current state of water purity globally . The review likely begins with an introduction outlining the importance of clean water and the challenges it faces due to pollution and contamination.

III. APPLICATION OF HYDROSONIC TDS MONITORING SYSTEM

1. It is used as leveler in storage tanks, boilers to indicate level of water inside.
2. Easily indicate when water level is full in tank with beep sound.
3. This can also be used to indicate the water level in dams.
4. It can be used in factories, commercial complexes, apartments, home, Schools and Universities etc.
5. It monitors the water purity level and finds the Manure Pit monitoring.

IV. PROBLEM STATEMENT

The major problem we can see here is that we can only monitor the water level as well as the TDS but we can't control the motor. Before the implementation of this model, water monitoring systems lacked real-time data analysis, making it challenging to ensure water purity accurately. Without a comprehensive system, detecting contamination or changes in water quality was slow and often inaccurate. Controlling the water level in tanks, reservoirs, and other containers is essential to preventing overflow accidents in many residential and commercial situations. Overflowing water can cause environmental risks, resource waste, and property damage. On the other hand, manually checking water levels can be laborious and prone to human error. As a result, an automated system that can precisely check water levels and stop overflow scenarios is required.

The main goal is to develop a flexible and dependable system for water quality and quantity monitoring in a range of environments, including homes, businesses, and farms. The system should be easy to use, reasonably priced, and able to run on its own for long stretches of time. In order to ensure prompt maintenance and

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intervention, it should also send out warnings or notifications when predetermined criteria for water level or TDS concentration are surpassed.

V. OBJECTIVE OF THE STUDY

1. To find out the integrating water level automatic monitoring and purity checks with notification capabilities in the Blynk app.
2. To ensuring water quality and quantity management of previous study.
3. To check purity level through TDS sensor.
4. Possible Alert notification to user through a buzzer which is connected through a Node MCU.
5. To Display the water level Indicator as well as the water quality.

VI. PROPOSED METHODOLOGY

6.1. Working Principle

To create a water level monitoring system and TDS sensors with Node-MCU and buzzer communicating with Blynk application, follow these steps.

Total components:-

- NodeMCU (ESP8266)
- Water level sensor (eg float, ultrasonic sensor)
- TDS sensor
- Buzzer
- Jumper wires
- Power supply (eg USB cable)
- Smartphone with the Blynk application installed.

The following are the general methodology that can be used as a guide to implement our project:

1. **Installing the Node-MCU**: - Install the necessary drivers for the NodeMCU if you haven't already done so. Install the NodeMCU board in the Arduino IDE and make sure you have the necessary libraries and sensor connectivity installed for WiFi communication and Blink integration.
2. **Connect sensors and Buzzer:-** Connect the water level sensor and TDS sensor to the NodeMCU following the instructions in the sensor datasheets. Connect the sounder to the NodeMCU. You usually connect it to a digital contact.
3. **Install and configure the Blink app**:- Download and install the Blynk app on your smart phone. Create an account if you don't have one and log in. Create a new project app in Blink. Note the authenticator provided by Blink.
4. **Write code:-** Write an Arduino sketch that reads data from both the water level sensor and the TDS sensor. Set the water level and TDS thresholds to activate the buzzer. Integrate the library Blink into your code and configure it to send data to the Blink app using the previously obtained authenticator. If the water level is too high or too low, or if the TDS level exceeds the specified threshold, activate the buzzer and send an alarm to the Blink app.
5. **Testing:-** Upload the code to the NodeMCU and test the settings. Monitor the buzz and check if the Blink app gets alerts when thresholds are exceeded.
6. **Calibration and fine-tuning:-** Calibrate the sensors as needed to ensure accurate readings. Adjust the water level and TDS thresholds according to your needs and system behavior during testing.
7. **Protection and Deployment:-** If everything works properly, consider enclosing the installation in a waterproof container if using in a wet environment. Install the system in a desired location for continuous water monitoring level and TDS.

After these steps finally we get the result by integrating the Blink app, you can receive real-time notifications and monitor the water level and TDS sensor remotely on your smart phone.

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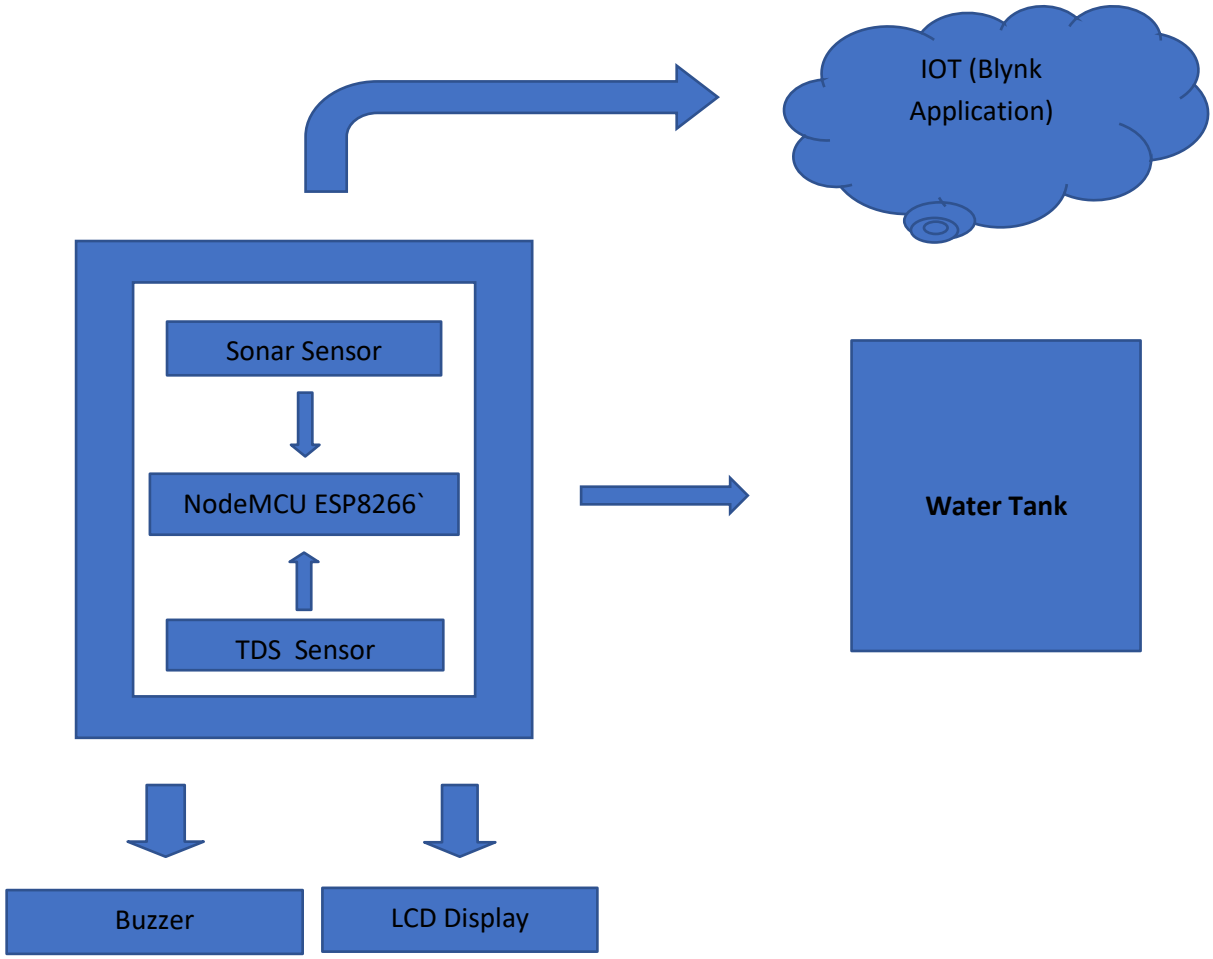
6.2 Block Diagram of Hydrosonic Tds Monitoring System



VII. CONCLUSION

This Project Create the integrating water level automatic monitoring and purity checks with notification capabilities in the Blynk app offers a comprehensive solution for ensuring water quality and quantity management. This system provides real-time updates on water levels, alerts users to any impurities detected, and empowers proactive maintenance measures. By leveraging IoT technology and mobile connectivity, it enhances convenience and efficiency in monitoring water resources, contributing to sustainable management practices and safeguarding public health.

In the future, this model will use cutting-edge AI algorithms to forecast trends in water quality, identify anomalies, and recommend remedial actions. Enhancing accessibility and efficiency is another benefit of integrating IoT technology for real-time data transmission to centralized monitoring systems. It can optimize resource allocation for water management agencies by providing insights into possible causes of contamination through machine learning. Comprehensive water quality monitoring is made possible by the model's capacity to combine a variety of sensors and devices, including displays, TDS sensors, and ultrasonic. When combined with user-friendly interfaces like the Blink app, it guarantees quick access and useful information for both individuals and authorities, encouraging proactive approaches to water management.

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