

UTILIZING TOTAL DISSOLVED SOLIDS (TDS) SENSOR FOR DISSOLVED SOLIDS MEASUREMENT IN WATER

Abstract:

Clean water quality is essential for human health and environmental sustainability, but it is increasingly threatened by urbanization, industrial activity, and poor waste management. One key indicator of water quality is the concentration of total dissolved solids (TDS), which reflects the presence of minerals, salts, and organic substances in water. High TDS levels can impact the usability and safety of water for consumption and other purposes. Monitoring TDS is crucial for identifying pollution levels and ensuring that water meets established health standards. Advancements in sensor technology have made it possible to measure TDS levels in real time with greater accuracy and lower cost. By integrating a TDS sensor with a microcontroller, water samples can be assessed efficiently, distinguishing clean from contaminated sources using a threshold value of 500 parts per million (PPM). Experimental results indicate a strong correlation between sensor readings and standard instruments, with a minimal average error of 0.008894%. This method allows for reliable and immediate classification of water quality, offering practical applications in environmental monitoring and public health protection.

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Water Quality Monitoring System Using TDS

Abstract:

Rising levels of water pollution caused by rapid urban growth and industrialization have intensified the need for real-time water quality monitoring. Total Dissolved Solids (TDS), a key parameter for assessing contamination, indicates the presence of salts, minerals, and organic matter in water. Traditional methods of testing are often time-consuming, costly, and require expert handling. In contrast, modern sensor-based approaches, integrated with microcontrollers, offer immediate and efficient evaluation of water quality. A system employing TDS, pH, and temperature sensors with an Arduino microcontroller and Wi-Fi module provides real-time water quality data both locally and via the cloud. Calibration ensures accuracy, while platforms like ThingSpeak enable remote access, visual analytics, and alert notifications when parameters exceed safe limits. This setup supports continuous monitoring in both urban and rural environments, promotes safe water usage, and enhances decision-making in public health and environmental management.

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Real Time Water Quality Monitoring and Management System

Abstract:

Poor water quality continues to impact public health, especially in areas where access to clean water is limited. Conventional lab-based water testing methods are time-consuming and inefficient for continuous use. Monitoring key parameters like pH and Total Dissolved Solids (TDS) in real time is essential to detect contamination early and ensure water is safe for consumption. Additionally, unmonitored water usage contributes to wastage, calling for better management strategies. This system combines water quality monitoring with consumption control using sensors and microcontrollers connected through Wi-Fi. It measures pH, TDS (through an in-house fabricated circuit), and water flow rate, using the data to assess quality and prevent overuse. Visual feedback is provided to users through indicators and cloud-based dashboards. The solution is compact, low-cost, and adaptable, offering real-time analysis and resource management suited for smart homes and future smart cities.

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