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Water Quality Monitoring System Based on IoT

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Abstract: *Water quality is a crucial factor in public health, agriculture, and industry, and it has become increasingly important to monitor and maintain it effectively. Traditional water quality testing methods are often time-consuming, require manual sampling, and can involve complex equipment and processes, which may not be suitable for continuous monitoring. This project, titled "IoT- Based Water Quality Monitoring System," aims to create a real-time, automated solution that continuously monitors essential water quality parameters, namely pH, Total Dissolved Solids (TDS), and turbidity, using IoT technology. The system utilizes a suite of sensors connected to an ESP32 microcontroller to capture data for each of these parameters. The pH sensor monitors acidity or alkalinity, the TDS sensor measures the total amount of dissolved solids to determine purity, and the turbidity sensor assesses the clarity of water, detecting particulate matter that may indicate contamination.The gathered data is displayed locally on a 16x2 LCD screen, providing instant access to real-time readings. Additionally, the ESP32 microcontroller is connected to the Blynk cloud platform, where data is transmitted and stored, enabling remote access and monitoring of water quality. Users can access the data from any location via the Blynk mobile application, making it highly versatile and accessible. By using the Blynk cloud, the system provides valuable flexibility for applications in remote or unattended environments, where it may not be practical to monitor water quality manually.The IoT-based water quality monitoring system holds significant potential for application across a range of sectors. In drinking water supply systems, it allows for continuous monitoring, which helps maintain safety standards by identifying variations in water quality immediately. For agricultural irrigation, the system ensures that crops receive water that meets quality standards, contributing to better crop health and yield. Industrial applications, where specific water standards are often required for processes, can also benefit from the system's ability to detect deviations in water quality.In conclusion, this IoT-enabled water quality monitoring system provides an efficient, real-time, and remotely accessible solution for monitoring water parameters. With the integration of IoT, it presents a cost-effective approach to water management, enhancing responsiveness to quality changes and contributing to health and environmental sustainability. This system not only reduces the reliance on periodic manual testing but also enables proactive water quality management, thus supporting the sustainability of natural resources in a variety of applications.*

Keywords: pH sensor, Turbidity sensor, Temperature sensor, Esp32WI-FI module