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Sensor Networks for Monitoring and Control of Water Quality

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Abstract

This paper presents a smart water pipeline monitoring system to control the water leakages occurring in it. In day by day life, usage of water is increasing with This paper presents a smart water pipeline monitoring proportional to increase in wastage of water. So, to overcome from this, a smart monitoring system with the help of Internet of things(IOT) is designed and proposed. In this modern era, usages and advantages of IOT are immeasurable. There are a lot of sensors are available in the market to measure the water flow. In this system ,to monitor the water quality ,we are using a pH sensor.ESP32 sensor is used in this system. The main purpose of this microcontroller used is because of its interrupt pins. the values measured by the remaining sensors are stored in the server. with the measured the moisture sensor, urbidity sensor are displayed on the LCD

Keywords: Turbidity, PHsensor,DHT11, ESP32,LCD

INTRODUCTION

Due the impact of polluted water globally tremendous changes are taking place towards development of a re-configurable smart sensor interface device for water quality monitoring system in an IOT environment. Water quality monitoring system measures the water level parameters are collected by the sensors. The sensors are sending to the micro-controller board. We are using sensors like Turbidity, temperature, pH sensor, water leakage sensors and turbidity sensors. This sensor controls the whole operation and monitored by Cloud based wireless communication devices. The micro-controller system can be seen as a system that reads from the input perform processing and writes to output. For his Water monitoring system output will be in digital form. In this output of these sensors directly goes to the micro-controller. Whenever outputs of the other sensors are in analog form**.** Then we need to convert the analog values to digital **v**alues before connecting to the controller. In this paper water quality is pure as sensors play a major role for water quality monitoring system, the time and costs in detecting water quality of a reservoir as part of the environment**.**

2. LITERATURE SURVEY

A Zig bee Based Wireless Sensor Network is used to Monitor Water Quality the application of a wireless sensor network (WSN) for water quality monitoring is composed of many sensor nodes with a networking capability that can be deployed for ad HOC or continuous monitoring purposes. GSM-based self-monitoring system for water quality: The Autonomous Live Response Monitor (ALARM) toxicity Biosensor was used to create this device, which was designed to be placed in the stream for continuous monitoring ZigBee Smart Sensors for Real-Time Water Quality Monitoring: The system is skilled to measure the physicochemical parameters of water quality, such as flow, temperature, pH, and conduction. Water contaminants in rivers, lakes, and other bodies of water are identified using these Physiochemical criteria.Design of water management system: Three wireless sensor sub-systems make up the system. All communicate with each other wirelessly and send information to a gateway connected to a computer that hosts the GUI. Data delivery is not always guaranteed due to wireless data transmission. There are chances of loss of data Zig bee Based Wireless Sensor Network is used to Monitor Water Quality the application of a wireless sensor network (WSN) for water quality monitoring is composed of many sensor nodes with a networking capability that can be deployed for ad HOC or continuous monitoring purposes. GSM-based self-monitoring system for water quality: The Autonomous Live Response Monitor (ALARM) toxicity Biosensor was used to create this device, which was designed to be placed in the stream for continuous monitoring ZigBee Smart Sensors for Real-Time Water Quality Monitoring: The system is skilled to measure the physicochemical parameters of water quality, such as flow, temperature,

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.3. PROPOSED METHODOLOGY

The effective and efficient system of water quality monitoring (WQM) are critical implementation for the issue of polluted water globally, with increasing in the development of Wireless Sensor Network (WSN) technology in the Internet of Things (IOT) environment, real time water quality monitoring is remotely monitored by means of real-time data acquisition, transmission and processing. This paper presents a reconfigurable smart sensor interface device for water quality monitoring system in an IOT environment. The proposed WQM system collects the 4 parameters of water data such as water leakage, turbidity, Temperature &Ph of water and water temperature in parallel and in real time basis with high speed from multiple different sensor nodes.

3.1 Block Diagram

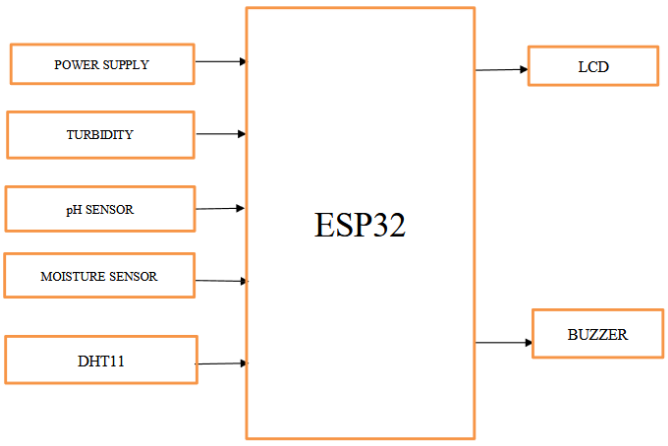


Figure 1: Block Diagram

pH SENSOR :

PH Sensor is one of the most essential tools that's typically used for water measurements. This type of sensor is able to measure the amount of alkalinity and acidity in water and other solutions

TURBIDITY SENSOR :

Turbidity Sensor is an analytical sensor that measures turbidity. They are highly useful and effective instruments to identify the clarity and particle content in a solution, like water. Turbidity sensors are used to reduce waste, improve yields, and analyze water quality in a wide range of industries

MOISTURE SENSOR :

Moisture sensors measure or estimate the amount of water in the soil. These sensors can be stationary or portables such as handheld probes. Stationary sensors are placed at the predetermined locations and depths in the field, whereas portable soil moisture probes can measure soil moisture at several locations

DHT11:

The DHT11 is a commonly used Temperature and humidity sensor. The sensor comes with a dedicated NTC to measure temperature and an 8-bit microcontroller to output the values of temperature and humidity as serial data

POWER SUPPLY:

Some Arduino boards like UNO, MEGA and DUE, come with an AC socket that can be used to power the boards and to supply additional voltage if needed.

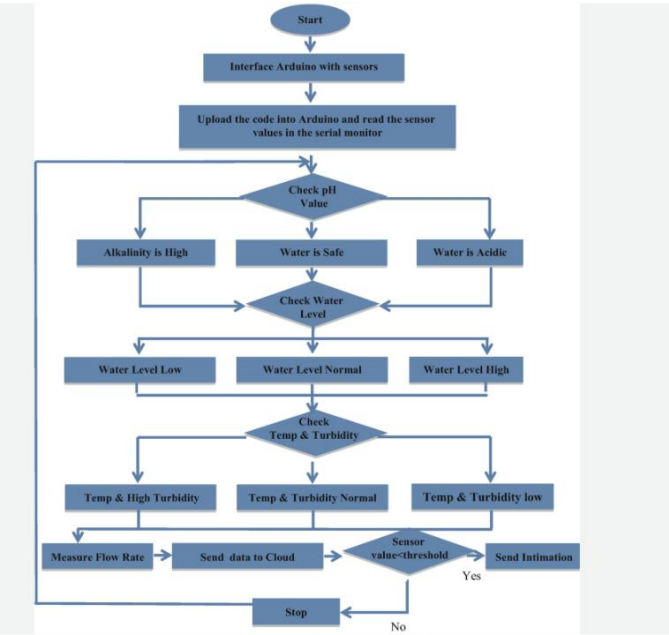
LCD(LIQUID CRYSTAL DISPLAY):

To display any character on LCD micro controller has to send its ASCII value to the data bus of LCD.

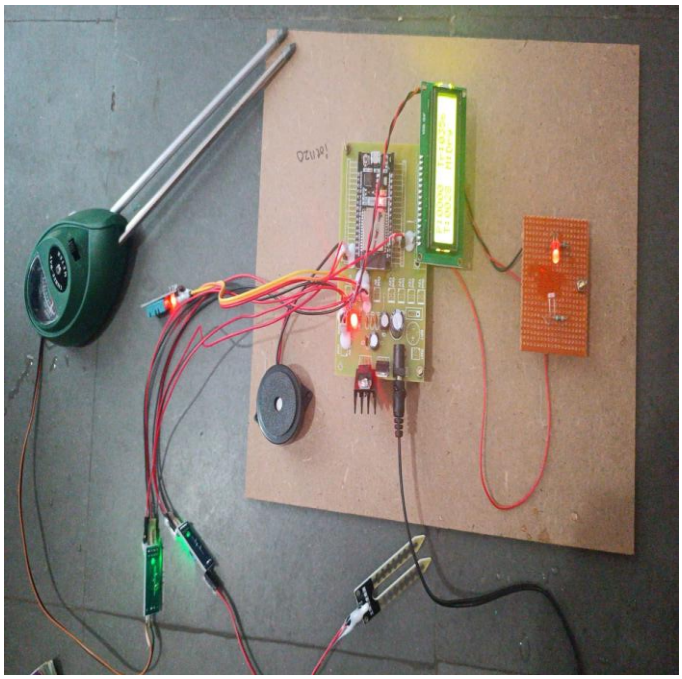
BUZZER :

Buzzer is used for emitting sounds in various electronic devices, work by converting electrical energy into audible sound waves using either piezoelectric materials or electromagnetic principles.

Architecture



3.3 Hardware Implementation



4. RESULTS

In our proposed system four sensors are connected (Temperature, pH, Leakage and Turbidity) are connected to the Mc. These four sensors measure of Water level, Conductivity, TDS and Turbidity parameters of the water when they dipped in water.

5. CONCLUSION

Real-time monitoring of water quality by using IOT integrated Big Data Analytics will immensely help people to become conscious against using contaminated water as well as to stop polluting the water. The research is conducted focusing on monitoring river water quality in real-time. Therefore, IOT integrated big data analytics is appeared to be a better solution as reliability, scalability, speed, and persistence can be provided. During the project development phase an intense comparative analysis of real-time analytics technologies.

6. FUTURE SCOPE

In Future, IOT based Water Quality monitoring system can be extended not just for Storage tank but also for deciding on Ponds, rivers and water pipes too. The same work can be extended by looking into other water parameters rather than just PH and TDS and accordingly control the flow of water based on water quality. Lastly the data security and integrity of data need to be secured while transmitting for analysis towards prediction and actuating the valve of water tank and storage area too.

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