DESIGN OF RECONFIGURABLE WATER QUALITY MONITORING SYSTEM USING IOT

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I. ABSTRACT

The monitoring the Water pollution is one of the biggest fears for the green globalization. In order to ensure the safe supply of the drinking water the quality needs to be monitor in real time. In this paper we present a design and development of a low cost system for real time monitoring of the water quality. The system consist of several sensors is used to measuring physical and chemical parameters of the water. The parameters such as temperature, water level, co sensor, flow of the water can be measured. The measured values from the sensors can be processed by the core controller. Finally, the sensor data can be viewed on PC using ZIGBEE system also we can monitor the parameters with the help of Web server using GPRS technology. Water is an essential need for human survival and therefore there must be mechanisms put in place to vigorously test the quality of water that made available for drinking in town and city articulated supplies and as well as the rivers, creeks and shoreline that surround our towns and cities. The availability of good quality water is paramount in preventing outbreaks of water-borne diseases as well as improving the quality of life. The information is collected and the water pollution can be enquired, by a strict mechanism.

Keywords: microcontroller, temperature sensor, water level sensor, co sensor, zigbee transmitter.

II. INTRODUCTION

The application of wireless sensor network (WSN) for a water quality monitoring is composed of a number of sensor nodes with a networking capability that can be deployed for an ad hoc or continuous monitoring purpose. Nowadays, water quality monitoring in real time faces challenges because of global warming limited water resources, growing population, etc. Hence there is need of developing better methodologies to monitor the water quality parameters in real time. Temperature sensor measures how the water is, hot or cold. The traditional methods of water quality monitor involves the manual collection of water samples from different locations. One of the reasons for this happening is the unawareness of public and
administration and the lack of water quality monitoring system which creates serious health issues. Also natural phenomena such as volcanoes, algae tints, rainstorms, and earthquakes also change the quality and ecological status of water. As water is the most important factor for all living organisms it is very important to protect it. And water quality monitoring is one of the first steps required in the rational development and management of water resources. The whole water environment monitoring system presents useful characteristics as large network capacity, flexible disposition, low power consumption, low cost, and minor influence on the natural environment.

EXISTING SYSTEM:

In olden days usually water is contaminated by several reasons. There are no specific ways to check the quality of drinking water. Years after that some techniques are introduced to check the quality of water and there by purifying the water.

PROPOSED SYSTEM:

Now a days water is contaminated more because of the pollution. So with the advancement of technology we are using many techniques to check quality of water. The proposed system collects the five parameters of water data such as water level, temperature, carbon dioxide (CO2) zigbee on the surface of water and water temperature in parallel and in real time basis with high speed from multiple different sensor nodes.

III. BLOCK DIAGRAM

![System block diagram](image)

**Fig (3.1) System block diagram**

**Fig (3.2). Block Diagram of Monitoring Section**

IV. SYSTEM OVERVIEW

Power Supply:

This section is meant for supplying Power to all the sections mentioned above. It basically consists of a Transformer to step down the 230V ac to 9V ac followed by diodes. Here diodes are used to rectify the ac to dc. After rectification the obtained rippled dc is filtered using a capacitor Filter. A positive voltage regulator is used to regulate the obtained dc voltage.
Microcontroller:

This section forms the control unit of the whole project. This section basically consists of a Microcontroller with its associated circuitry like Crystal with capacitors, Reset circuitry, Pull up resistors (if needed) and so on. The Microcontroller forms the heart of the project because it controls the devices being interfaced and communicates with the devices according to the program being written.

Temperature sensor:

Thermistors are a temperature sensing devise. It is used to sense the temperature. In this project by depends on the value of temperature the exhaust fan will run.

LCD Display:

This section is basically meant to show up the status of the project. This project makes use of Liquid Crystal Display to display / prompt for necessary information.

ZIGBEE:

Zigbee is new wireless technology guided by IEEE 802.15.4 Personal Area Network standard. It is primarily designed for the wide ranging controlling applications and to replace the existing non-standard technologies. It currently operates in 868MHz band at a data rate of 20Kbps in Europe, 914MHz band at 40kbps in USA, and the 2.4GHz ISM bands Worldwide at a maximum data-rate of 250kbps.

Water level sensor:

The sensor used for measurement of fluid levels is called a level sensor. The sensing probe element consists of a special wire cable which is capable of accurately sensing the surface level of nearly any fluid, including water, saltwater, and oils.

CO SENSOR:

They are used in gas leakage detecting equipments in family and industry, are suitable for detecting of LPG, i-butane, propane, methane, alcohol, Hydrogen, smoke.

Turbidity Sensor:

The IR LED is used as the IR transmitter, which is connected by using the resistor logic as shown in the schematic. The IR receiver is connected by using the transistor logic whose collector is connected to the base of the transistor. The base of the transistor is connected to the photo diode through the resistor.

GPRS:

This section consists of a GPRS modem. The modem will communicate with microcontroller using serial communication. The modem is interfaced to microcontroller using MAX 232, a serial driver. The Global
Packet Radio Service is a TDMA based digital wireless network technology that is used for connecting directly to internet. GPRS module will help us to post data in the web page directly.

V. RESULT

Fig(5.1) Proposed System

Fig(5.2) Parameters on Web server

Fig(5.3) Parameters on PC send by Zigbee

VI. CONCLUSION

The system can monitor water quality automatically, and it is low in cost and does not require people on duty. So the water quality testing is likely to be more economical, convenient and fast. The system has good flexibility. Only by replacing the corresponding sensors and changing the relevant software programs, this system can be used to monitor other water quality parameters.

VII. REFERENCES


