

Water Quality Monitoring System using Microcontroller

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Abstract— Water quality is degrading rapidly and it is necessary to test and monitor it frequently. Contaminated water is one of the main causes of the diseases which lead to millions of deaths. This paper aims in the monitoring of the essential parameters of the water. The system contains a combination of sensors which measures the parameters of water. The parameters of the water and their values will be accurately observed by the user on LED screen which includes pH, Turbidity, TDS and the temperature of water. The pH sensor will monitor the acidic nature of water; Turbidity will be measured by the Turbidity. System provides a portable design to analyse the water parameters. By Knowing the parameters the consumption of the contaminated water can be avoided.

Keywords: pH sensor, turbidity sensor, temperature sensor, TDS sensor, water quality

I. INTRODUCTION

As rapidly growing population increases the pollution, global warming and many more, at the same time the water pollution also increases so there is no safe drinking water for the worlds pollution so it is more essential for humans to monitor the quality of water before its consumption so it should be guaranteed that the water is safe and the information regarding the parameters of water about its quality must be made available to all consumer. The design is very simple and less expensive .The elements present in the water are sensed by the sensor and the data or information is collected by controller and performs necessary action and shows the purity of water on the liquid crystal display(LCD) according to that we continuously monitor and improve the quality of water . The parameters which measures the quality of water are pH which shows the concentration of hydrogen ions, for pure water it should be 7pH value but the pH range for drinking water is 6.5-8.5, turbidity measures the invisible particles present inside the water if the turbidity is high there is the risk of diarrhoea, cholera etc. so the Turbidity should be less for clean water; Temperature sensor senses the temperature of water.

II. LITERATURE SURVEY

We know very well that the water is an invaluable resource and its benefit to the human lives from the proper management of this resource as well as the impact of its mismanagement are well known.so the awareness about quality of water is at its climax .The term quality however create a number of questions are often controversial because of major difference between the technological and individual precipitations. Technologically quality of water can be catalogued in terms of proper physical, chemical and bacterial parameters which must be quantitate, accurate and unambiguous. Natural water is chemically not pure it contains large number of constituents such as (1) minerals

consisting different type of metal ions (2) soluble organics such as alcohol, acids and sugars (3)suspended particulates(4)living organism(5)floating matter like oil.

The paper suggests a smarter way to determine quality of water. A real time monitoring of water is proposed using IoT .Different sensors are used which include pH, temperature, conductivity, turbidity. Parameters monitored by the sensors are accessed by the microcontroller which is aurdino board. The data is collected through IoT and an alert is sent to the authorised subdivision. [1].

The paper suggests a constantly monitoring of water quality using IoT. The major components used are pH sensor level sensor gas sensor to measure quality. The values measured from the sensors are transferred to the cloud through the IoT module and the data from the sensor can be viewed on a system application from any desired location. The design also includes water quality monitoring via mobile devices in the internet by an android application [2].

III. PROPOSED SYSTEM

A. Block diagram

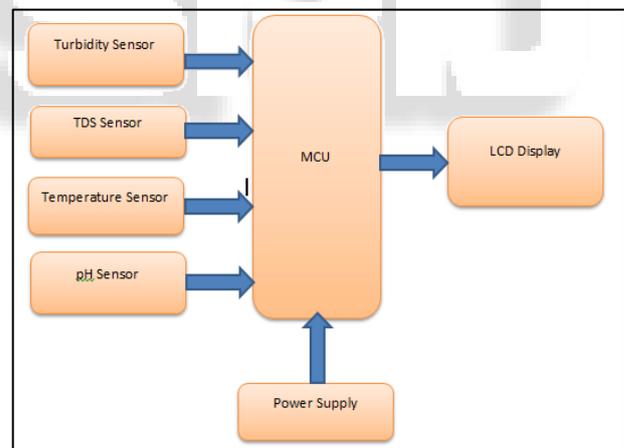


Fig. 1: Block diagram Of Water Quality monitoring System

B. Working

In this system we have used four sensors (turbidity, pH, temperature, TDS) and the Atmega 328 microcontroller and LCD. Each sensor is used to measure the parameter which is present in the water such as

- 1) pH sensor is used for measure weather water is alkali or basic.
- 2) Turbidity sensor is used for measure the invisible particles present inside the water if the turbidity is high there is the risk of diarrhoea, cholera etc.
- 3) Temperature sensor senses the temperature of water which is suitable for drinking purpose.
- 4) Total dissolved solid (TDS) are the type of sensor that indicates the total amount of mobile charged ions as

well as salts or minerals, salts, or metals dissolved in a particular volume of water it can also be expressed in units of mg per unit volume of water and PPM(parts per million).

All the above sensors are placed inside the water then each sensor take a particular reading according to their features and give it to the microcontroller where it converts these analogue data into digital form and process on it. After processing this digital data is fed to the LCD display which shows the output reading

According to the reading displayed on LCD we can obtain the purity of water.

The necessary ranges are listed in below table which shows appropriate range that is required for an ideal drinking water.

C. Sensors and their ranges

Sr.no	Parameter Name	Units	Quality Range
1	pH sensor	pH	6.5-8.5
2	Turbidity	NTU	1-4
3	TDS Sensor	Ppm	300-900
4	Temperature	°C	15-25

Table 1: Sensor and their Ranges

D. PCB Layout

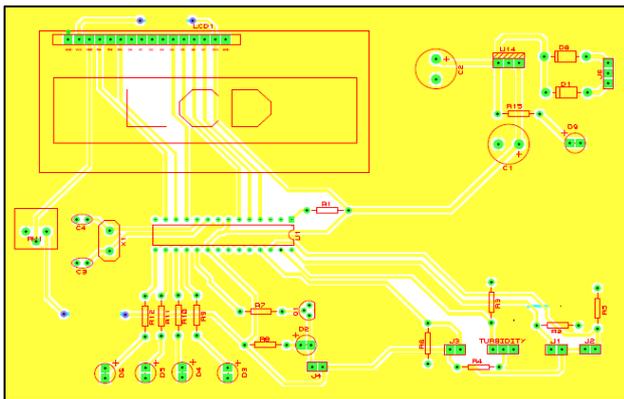


Fig. 2: PCB Layout of Water quality Monitoring System

IV. CONCLUSION

The paper suggest about the low cost water quality monitoring which is portable and more user friendly using microcontroller. Hence adaptable good water is obtained The sensors used are precise and give accurate readings from which the quality of water can be determined.

V. FUTURE SCOPE

Concept of IOT can be used. Readings obtained can be stored in cloud storage and can be accessed whenever required .Data can be obtained via Wi-Fi on smart phones. Parameters can be increased by adding more sensors

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