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SMART WATER MANAGEMENT

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Abstract - Water pollution is one of the biggest problems in our environment and it causes a lot of problems in our society. In order to maintain the safe supply of water the quality needs to be monitored in real time. In this project we represent a design and development of a low cost system for real time monitoring of water quality in IOT(Internet of things). The system consist of several sensors which is used to measure water PH level, TDS content, temperature ,flow of the water is measured. This sensors are used to measure physical and chemical parameters of water. The measure values are processed by the controller. The atmega328p is used as controller. Finally the each sensors data is collected and viewed in the system. The user can get the information without going to the location. This helps to save the time. The average current consumed by the sensors is 28mA with a supply voltage of each sensor is 5V.The total power consumed by sensors is146.25mW.For the flow meter that requires continuous power supply adapter is used. For the water quality check, the sensors are powered by lithium ion battery(2000mAh).

***Key Words*: Lithium ion battery , IOT(Internet of things), PH level , Atmega328p , TDS content .**

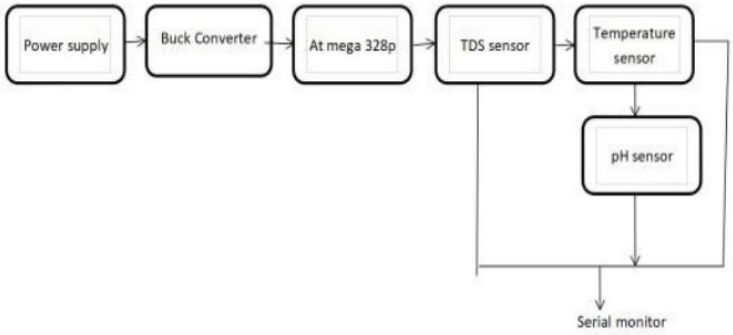
1.INTRODUCTION

Many inventions have been made in the twenty-first century, resulting in increased water contamination and global warming. Water contamination is one of the main concerns for green globalization, as a result of which the world's population lacks access to safe drinking water. Water quality monitoring has become a problem for us in recent years as a result of population growth, global warming, and dwindling water supplies, among other factors. This necessitates the creation of effective methodologies for monitoring water quality in real time. More comprehensive attempts to classify pollutants related to impaired water safety, as well as better quantification of substances with elevated biological activity, are among the concerns that will be tackled in future water sampling. Sampling techniques optimized for individual exposure conditions, effect-based identification, and safety targets are all needed to enhance bioactive compound detection. In addition, to allow for the existence of mixtures of substances and their cumulative effects, evaluation perspectives that rely on specific compounds must be updated. Toxic chemical exposure can harm freshwater marine life and contribute to changes in the structure of freshwater ecosystems due to the extinction of vulnerable organisms. Toxic strain, on the other hand, isn't the only thing that can affect the well being of marine biota. Such non□chemical considerations, such as hydrological conditions or general water quality criteria, may have a significant effect on aquatic ecology, potentially making diagnostic attempts more difficult. Overflowing water tanks in homes, schools, and universities, as well as municipal overhead tanks and hospitals, may all lead to significant water waste. We will conserve a lot of water if we can keep this under hand. Traditional water tanks are unable to track or regulate the amount of water in the tank. Currently, the water volume must be manually tested and refilled in accordance with the specifications. The concentration of h+ ions is calculated by the water quality parameters, such as PH. The presence of h+ ions indicates whether the water is acidic or alkaline. The pH value of pure water is 7. Water is known as basic or alkaline if it has a pH greater than 7. Water is acidic in nature if it is less. The pH scale ranges from 0 to 14. The standard drinking water pH range should be between 6.5 and 8.5.

1.1 WHAT IS TDS ?

TDS is a measurement of the total amount of dissolved salts in water that are not apparent to the naked eye. The higher the TDS value, the greater the risk of disease. When the water is clear, the TDS is lower. The temperature sensor decides whether the water is cold or hot, as well as improving the accuracy of the TDS sensor, as TDS value is influenced by temperature. The flow meter/sensor monitors the flow of water, allowing you to find out how much water you've used in a given period of time. Water samples are collected from various sources as part of the water quality assessment.

2. BLOCK DIAGRAM



2.1 HARDWARE REQUIREMENTS

- PH Sensor
- TDS Sensor
- Water flow meter
- Controller (ATMEGA 328P)
- Temperature Sensor

2.2 METHODOLOGY

1)The smart water management system is implemented in two stages: • Processing the data from the sensor node (tank) and gathering the requisite data • Making the data visualizable.

2) The proposed system constitutes sensors, ATMEGA328p as microcontroller, local databases. The data is presented on serial monitor.

3) A processing unit is installed on every overhead tank. The pH sensor, TDS sensor, and flow meter are all attached to an ATMEGA328p microcontroller in this unit (controller).

4) Data collection: The water flow rate from the tank surface is measured in litres per hour by sensors installed in each overhead tank. The sensors in each overhead tank are set up to collect data from sensors and save it in CSV format. The data is published in the following format: ”pH” ,”ppm” ,”C”.

Table -1: TDS value table

3. ADVANTAGES PH DETECTION

- Helps to find the accurate PH value of water .
- Helps in finding the whether the water is acidic or basic .
- Low cost.
- Portability.

4. APPLICATIONS

- Smart water management is a reasonable and sustainable usage of water resources this is done through usage of innovate techniques such as control technologies monitoring of system and use of sensor.
- This will help in reducing the loss of water and improve the quality of water usage
- This system will help urban as well as rural people and water quality checks can be done on daily basis .
- By using this system we largely reduce the diseases spread using harmful water .

5. CONCLUSIONS

The aim if this study was to develop a compact and easily configurable most importantly modular to help us to solve the problem of unhygienic water .

The system is designed in such a way that it’s a small system and lot of power

Water level control scheme used in this system falls under the umbrella of IOT (internet of things) , our key purpose was to build a smart device that could estimate water in a tank and also monitor the quality of water .

The result of the experiment showed distinct and accurate values with all the parameter according to sensor used .

6. REFERENCES

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