IJEAST

INTERNATIONAL JOURNAL
OF ENGINEERING APPLIED SCIENCE
AND TECHNOLOGY

VOLUME : 5 ISSUE : 3 Print / Issue Publication Date: 15-Sep-2020

ISSN : 2455-2143

DOI : 10.33564/IJEAST.2020.v05i03.034

Indexed In

Google SCHOLAR OPEN ACCESS doi Crossref

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International Journal of Engineering Applied Sciences and Technology, 2020
Vol. 5, Issue 3, ISSN No. 2455-2143, Pages 228-230
Published Online July 2020 in IJEAST (http://www.ijeast.com)

A LITERATURE SURVEY ON "MINIATURE WATER PURIFIER BASED ON IOT"

Vasudev Updhya KS, Vignesh Kumar V, Tejas P, Praveen Tulasidas Naik
Dept of ECE, KSIT Bangalore

Mr. Praveen A
Asst. prof, Dept. of ECE, KSIT Bangalore

Abstract-Water pollution and contamination of water is major problem across the globe .The water bodies are polluted by human activities. The solution for contamination of water is to purify the water and montering the purity of the water. TDS (total dissolved solids) sensor is used in the water purifier to measure the TDS value of the water, to reflect the purity of the water. TDSvalue continuously measuredif the value goes below the predefined value,then the message will be sent to the user to alert him about the lesspurity in the water using the IOTtechnology. Temperature sensor is used in this purifier to measure the temperature of purified water. The ppm value obtained from TDS sensor will change if there is huge change in temperature and water flow sensor which will sensethe rate of flow of water and quantity of the water purified. The information regarding temperature ppm value and rate and flow of the water purified will be shown on the LCD display and the information is also sent to the user through mobile applications.

Keywords-**TDS, PPM**

I. INTRODUCTION

The water resources in the world are polluted by the human activities. These human activities involves dumping chemical waste from the industries to the river and lakes. Many factors like increase in population, dumping of industrial waste, oil leakage, are responsible for pollution of the water. The earth water resources are oceans, seas, rivers, ground water, ice caps, glacier etc. Water pollution means contamination of water bodies. The contaminants such as fertilizer, pesticides used by the farmers to protect the crops by the insects and bacteria's pollutes the ground water. Water purification is the process of removal of undesirable chemicals, biological contaminants, suspended solids and gases from water. Oil leakage by accident is huge threat to the oceans and marine life. Drinking tap water or impure water causes cholera, dysentery, typhoid, diarrhea and polio. The presence of pollutants in the water causes diseases like arsenicosis due to arsenic and fluorides components in the water. The process of removal of suspended particles, microbes, undesirable chemicals is called water purification. The Major process of water purification involves sediment filter which removes suspended particles and sand particles from the water . carbon filter is used to remove bad odour and colouring substance from the water. The next stage is UF filtration which purifies smaller impurities, bacteria and colloidalmatters. The process is similar toreverse osmosis, but large pores are used isthe membrane. No electricity is required forUF filtration, it can work on normal water pressureUltrafiltration (UF) remove most of the contamination and microbes from the water.

This system consists of Temperature sensor, water flow sensor and TDS module. TDS sensor continuously measure the TDS value of the water and sends the message to the user using ESP32 Wi-Fi module. Temperature sensor is used in the system to measure the temperature of the water because as the temperature varies the ppm value obtained by the TDS sensor also varies. This system contains a water flow sensor which helps to determine the amount of water purified.

II. LITERATURE SURVEY

Nikhil kediaentitled "Water quality monitoring for rural areas– A sensor cloud based economical project." published in 2015. The paper depicts the supervision of water quality based on many technique such as, sensors operation, embedded design, and information dissipation procedure regarding the monitoring control and role played by the government in monitoring the water quality, network operation and conveying correct information to the villagers. Systematic use of technology and economic practices is necessary to enhance purity of water and consciousness among the people [1].

Jayathibhatt, Jigneshpatoliya entitled "Real time water quality monitoring systems". The paper illustrate about monitoring of quality of water based on real time applications and it helps to secure the safe supply of drinking water. The design of IOT based water quality monitoring system that design of IOT based water quality monitoring system that check the quality of water continuously in real time. This system contains many sensors which measures the parameters related to the quality

of the water such as TDS value, turbidity, PH, dissolved oxygen and temperature.
This measured sensor values are sent to the microcontroller. Microcontroller process these value and transmitted remotely to raspberry pi using ZigBee protocol. Cloud computing helps to view this sensor values on the internet. [2]

Michal Lom, OndrejPribyl, Miroslav Svitek entitled "Industry 4.0 as a Part of Smart Cities". In the concept of Industry 4.0, the Internet of Things (IoT) shall be used for the development of so–called smart products. Subcomponents of the product are equipped with their own intelligence. Added intelligence is used both during the manufacturing of a product as well as during subsequent handling, up to continuous monitoring of the product lifecycle (smart processes). Other important aspects of the Industry 4.0 are Internet of Services (IoS), which includes especially intelligent transport and logistics (smart mobility, smart logistics), as well as Internet of Energy (IoE), which determines how the natural resources are used in proper way (electricity, water, oil, etc.). IoT, IoS, IoP and IoE can be considered as an element that can create a connection of the Smart City Initiative and Industry 4.0 – Industry 4.0 can be seen as a part of smart cities.[3]

ZhanweiSun,Chi Harold Li,ChatschikBisdikian,JoelW.Branch and Bo Yang entitled "QOI-Aware Energy Management in Internet-of- Things Sensory Environments". In this paper an efficient energy management frame work to provide satisfactory QOI experience in IOT sensory environments is studied. Contrary to past efforts, it is transparent and compatible to lower protocols in use, and preserving energy-efficiency in the long run without sacrificing any attained QOI levels. Specifically, the new concept of QOI-aware "sensor-to-task relevancy" to explicitly consider the sensing capabilities offered by an sensor to the IOT sensory environments, and QOI requirements required by a task. A novel concept of the "critical covering set" of any given task in selecting the sensors to service a task over time. Energy management decision is made dynamically at runtime, as the optimum for long-term traffic statistics under the constraint of the service delay. Finally, an extensive case study based on utilizing the sensor networks to perform water level monitoring is given to demonstrate the ideas and algorithms proposed in this paper, and a simulation is made to show the performance of the proposed algorithm.[4]

Sokratiskartakis, Julie A. McCann, Reza akhvan and Wieren Yu entitled "Adaptive edge analytics for distributed networked control of water systems" The paper explains the water distribution networks using the burst detection and localization scheme with the light weight compaction and spotting with graph topology. The amount of communication between the sensors and backend servers can be reduced, but can successfully constrain water flow using different arrival times detected at the sensor location by this approach. This results can save up to 90% communications compared with conventional periodical reporting situations.[5].

The filtration membranes are classified based on their size of pores in μm, UF membrane pore size ranges from 0.1 to 0.001microns. UF membrane removes higher molecular weight whose size are more the membrane pore. To separate particles of molecular weight between 1 to 300Kda and suspended particles greater than 300Kda pressure is applied greater then 1Mpa. Due to which particles of molecular weight of 1 to 300kda is passed through the membrane other particles are retained[6].
The application of UF filtration are purification of food substance, beverages and extraction of proteins from food materials and pharmaceutical industries [7], [8], [9]. UF filtration helps to remove toxic metal Concentration and harvesting of cells or liposome in biotechnology [10], [11], [12],blood dialysis, recycling ofwaste water to produce potable water [13], [14], [15].

III. RESULTS OF LITERATURE SURVEY AND DISCUSSION

In most part of the world tap water is not drinking hence there is need of smart water purification. This device will notify the user regarding the purity of the water. TDS sensor is interfaced with ESP 32 module and TDS value is sent to the user as a message. Depending on the TDS value user can check the purity of the water and cleaning of the purifier. The people cannot decide the purity of the water by looking at the water, so TDS value helps to know about purity of the water.

IV. CONCLUSION

This paper explains briefly about water purification system with smart water quality monitoring using IOT technology. Monitoring of temperature, TDS value, and rate of flow of water by using water detection sensor with advantages and applications with existing IOT technology. By using this water purification system, the user can monitor the water quality without human intervention.

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