

AUTOMATION OF LIGHT AND WATER CONTROL SYSTEM

Snehal Sonawane¹, Manish Dhile², Siddhi Katta³, Prof.R.D.Komati⁴

Dept. of Electronics and Telecommunication,

MAAER's MIT College of Engineering, Pune, Maharashtra, India

ABSTRACT

There is need to monitor different water parameter due to growing pollution as well as to control water wastage because of lack of water resources, also there is need to control use of electricity due to lack of resources and growing population. This project is proposed to monitor different parameters of water using different sensors such as ph value, turbidity, water level check. Depending on level of water in tank the water motor will turn on or off. Light dependent sensor is used to check the intensity of light in home or office, on this intensity light will automatically on or off. Different water parameters sensed data is send to the Mobile user with text message.

1. INTRODUCTION

Over the previous decade, online water quality monitoring has been broadly utilized as a part of numerous nations known to have major issues identified with ecological contamination. The water is restricted and vital asset for industry, farming, and every one of the animals existing on the earth including person. Any awkwardness in water quality would seriously influence the strength of the people, creatures furthermore influence the natural adjust among species. In the 21st century there were bunches of creations, yet around then were contaminations, a worldwide temperature alteration thus on are additionally being shaped, due to this there is no sheltered drinking water for the total populace. The drinking water is all the more valuable and profitable for all the individuals so the nature of water ought to be observed continuously.

These days water quality monitoring continuously confronts challenges as a result of an unnatural weather change, restricted water assets, developing populace, and so on. Henceforth, there is a need of growing better approaches to screen the water quality parameters progressively. The WHO (world wellbeing association) assessed, in India among 77 million individuals is enduring due to not having safe water. WHO likewise gauges that 21% of maladies are identified with dangerous water in India. Additionally, more than 1600 passing's alone cause because of looseness of the bowels in India day by day. Consequently, different water quality parameters, for example, broke down oxygen (DO), conductivity, pH, turbidity and temperature ought to be checked continuously. The water quality parameter pH demonstrates water is acidic or fundamental. Immaculate water has 7 pH esteem, under 7 values show causticity and more than 7 demonstrate alkalinity. The ordinary scope of pH is 6 to 8.5. In drinking water if the ordinary scope of pH doesn't keep up it causes the bothering to the eyes,

skin and mucous layers. Likewise, it causes the skin issue. The disintegrated oxygen (DO) is demonstrated the oxygen that broke down in water. It improves the drinking water taste. The conductivity shows the capacity of water to pass an electrical ebb and flow. In water it is influenced by different broke down solids, for example, chloride, nitrate, sulphate, sodium, calcium, and so forth. Turbidity has demonstrated the degree at which the water loses its straightforwardness. It is considered as a decent measure of the nature of water. Water temperature, shows how water is hot or cool. The disintegration of water assets turns into a typical human issue.

The conventional techniques for water quality screen include the manual gathering of water test from various areas. These water tests tried in the research facility utilizing the expository innovations. Such methodologies are tedious and didn't really to be viewed as proficient. In addition, the momentum strategies incorporate investigation of different sorts of parameters of water quality, for example, physical and compound. Customary strategies for the water quality discovery have the disservices like entangled philosophy, long sitting tight time for results, low estimation accuracy and high cost. In this manner, there is a requirement for persistent checking of water quality parameters continuously. The rapid development nowadays contributes to unbalance of natural ecological system which leads to changes of earth climates and natural resources such as fresh water quality. Limitation of human resource to do real-time monitoring and data collection regarding this environmental issue will lead a major problem to fresh water supplies at coming decades. The project is used to check water parameters and control water level as well as light in home or office. The water is a one of the important natural resource and it is an important asset to save the water on the earth. This paper describes the automatic system to monitor and control water level with the help of water level sensors and wireless network system as well as it control light so that it saves electricity. The need of this project is to cut water wastage occur in home and it also check the water parameters using different sensors, electricity wastage occurs in home, office and the WSN system reduces the human efforts. Water shortages as well as electricity problems affected urban and industrial areas. This system used to manage water wastage and electricity wastage in home, office or industry.

1.1. OBJECTIVES

- a) The main objective of this project is to monitor different water parameters as well as to control the water supply automatically depending on level of water in tank. All the sensed data will send to user with text message.
- b) LDR used to check the present light intensity, on present light intensity the requirement of light in housing society is controlled.

1.2. LITERATURE SURVEY

SMS Based Home Automation System using Arduino ATMEG328 with GSM [AmrutaPatil, PoojaPotnis, KarishmaKatkar, 2017]

Automation techniques can be applied at home to control home appliances remotely. Through engineering techniques easy drive and friendly environment can be ensured. Controllers and sensors are used for automation. Our main idea is to develop a system to provide people a living environment with security, convenience, comfort, environmental protection and intelligence. It will also be locally maintainable. We are willing to design smart home services will bring people a new living experience, and creates a smart way of living, as it can provide intelligent, individual services according to the changing of environment, emergencies, status of user's, user's preferences and user's wishes. We introduce a technology which will not only save money and time but also will prove to be beneficial and effective for the economy [1].

Fresh Water Real-Time Monitoring System Based on Wireless Sensor Network and GSM [Muhammad AzwanNasirudin, UmminurulhaizaZa'bah&O.Sidek, 2011]

This project describes an approach of Wireless Sensor Network (WSN) application to do real-time data collection at the fresh water resources such as rivers, lakes or wetlands areas to obtain proper water quality parameters measuring. The WSN system is used as a platform to monitor the fresh water quality readings, deployed at distributed location which each nodes will able to interface with various water quality sensors. The system will use a green power source via harvesting the solar day light with optimized power management to enhance the long life operation at remote rural areas. Then, the collected data from each node will go to sub-base station as the device network coordinator and to the monitoring station server via GSM network. This system powered by PIC16F886 nano-watt MCU, with RF XBEE 802.15.4, ISM 2.4 Ghz module for each node while the Coordinator device integrated with GSM/GPRS modem and monitoring LCD[2].

A Real Time Water Quality Monitoring System: A Review [Ms. ShitalPalwe, Prof. J.D. Bhosale, Mr. DharmeshDhabliya, 2017]

Drinking water shifts from place to put, dependent upon the condition of the source water from which it is drawn and the treatment it gets, be that as it may it must meet EPA heading. The customary procedure for testing Turbidity, PH and Temperature is to assemble tests physically and thereafter send them to explore office for examination. In any case, it has been not capable meet the solicitations of water quality checking today. In this paper, they present the survey of different water quality observing frameworks in a matter of seconds open with various parameters [3].

Design of Smart Sensors for Real-Time Water Quality Monitoring [Niel Andre Cloete, Reza Malekian, Lakshmi Nair, 2016]

This paper portrays work that has been done on outline and advancement of a water quality observing framework, with the target of telling the client of the constant water quality parameters. The framework can quantify the physiochemical parameters of water quality, for example, stream, temperature, pH, conductivity, and the oxidation diminishment potential. These physiochemical parameters are utilized to recognize water

contaminants. The sensors, which are outlined from first standards and actualized with flag molding circuits, are associated with a microcontroller-based estimating hub, which forms and breaks down the information. In this outline, ZigBee beneficiary and transmitter modules are utilized for correspondence between the estimating and warning hubs. The notice hub displays the perusing of the sensors and yields a sound ready when water quality parameters achieve perilous levels. Different capability tests are hurry to approve every part of the checking framework. The sensors are appeared to work inside their expected exactness ranges. The estimation hub can transmit information by ZigBee to the warning hub for sound and visual show. The outcomes exhibit that the framework is fit for perusing physiochemical parameters, and can effectively process, transmit, and show the readings [4].

Design of Online Data Measurement and Automatic Sampling System for Continuous Water Quality Monitoring [GoibWiranto, Grace A Mambu, Hiskia, I DewaPutuHermida, SlametWidodo, 2015]

To guarantee the protected supply of drinking water the quality ought to be observed continuously for that reason new approach IOT (Internet of Things) based water quality checking has been proposed. In this paper, we exhibit the outline of IOT based water quality observing framework that screen the nature of water continuously. This framework comprises a few sensors. which measure the water quality parameter, for example, pH, turbidity, conductivity, disintegrated oxygen, temperature. The deliberate esteems from the sensors are prepared by microcontroller and this handled esteems are transmitted remotely deeply controller that is raspberry pi utilizing Zigbee convention. At long last, sensors information can see on web program application utilizing distributed computing. The highlights of a "savvy gadget" that can go about as an individual from IOT arrange seem to be, gather and transmit information, module are physically set in every last water sources (lake). The water quality observing sensors accumulate information from water, and forward that information to Arduino IDE for paired to computerized change. The arduino IDE forward that information to concentrator module through Zigbee module for remote exchange of information to the lab. The information concentrator which is situated in every single lake, send that information to the cloud arranged server which is situated in the TWAD testing lab. The TWAD office representatives screen this information remotely and safely give this information to the asked for clients which is put away in the cloud. Water quality parameter information is put away in the cloud, will be safely given to asked for clients utilizing the cryptographic systems5[].

Design of Low Cost System for Real Time Monitoring of Water Quality Parameters in IOT Environment [Pavana N R, Dr. M. C. Padma, 2016]

Water is a fuel of life and no lives exist without water on this planet. The water must be observed frequently utilizing savvy advancements. There are different sanitization innovations proposed for observing of drinking water; however the dangers of various classification are blended with the drinking water which comes through industrialization, globalization, urbanization, farming and so on. Consequently, the water quality is should have

been observed at better places in a single extend to stay away from contamination in IoT condition. The 'Web of Things (IoT)' can possibly change the water business, as a greater amount of its innovation is associated with the web. Sensor based brilliant water meters are a type of IoT, a system of advancements which can screen the position of physical items, catch important information and convey that information over a remote system to a product application for investigation on a PC in the cloud. Innovations are equipped for observing items, for example, savvy water meters and other electronic gadgets, living beings or a characteristic piece of the earth, for example, a territory of ground to be estimated for dampness or concoction content. This paper tells about ease framework that checks the water quality utilizing distinctive sensors, Raspberry pi-module. In the test, the yield of the sensor will be transferred to the cloud. Further, from the cloud the information will be inspected by 'Water Monitoring Board (WMB)' to think about the tainting and furthermore to send the report. At long last, the transferred information will be put into open area; in the event that it isn't overseen appropriately by the concerned specialists. All in all, the execution of the proposed sensor based shrewd meter and other IoT systems can encourage the information on water quality which can give noteworthy data to administrative experts for deciding consistence by private, farming and different business water clients and in addition by parties in the water foundation. The information can be the reason for requirement activities so it must be solid for constant observing of water quality parameters in IoT condition through the proposed Low Cost System [6].

Water Monitoring System Based on GSM [J. Mounika, N. Siva Kumar Reddy, 2016]

The strategy to check and control water level for water system framework. The water is a one of the critical common asset and it is a critical resources for spare the water on the earth. This paper depicts the programmed framework to screen and control water level with the assistance of water level sensors and remote system framework. The need of this paper is paper is to cut water wastage happen in canel and subcanal, and the WSN framework diminishes the human endeavours [7].

2. PROPOSED SYSTEM

In this project we design the system which is useful for the home, office, industry. The ph value sensor, turbidity sensor, water level sensor should be used for testing different water parameters. All the sensors are connected to We Mos D1 mini. We Mos D1 mini is main unit used for monitoring all such sensed parameters. Two water level sensors are used

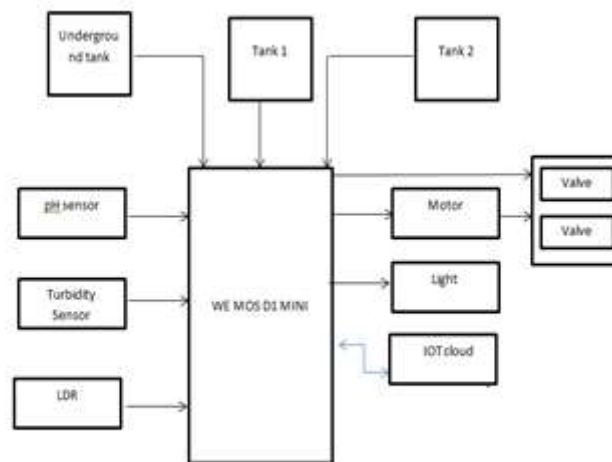


Fig 1 - Water and Light Control System

for sensing the level of water. Some threshold level of water is fixed. If water level exceed than that the threshold water level in tank, water motor will off or if water level below than that then the water motor will automatically on using relay connected to arduino. This Arduino module sends the all sensed water parameter to the mobile user in the form of text message using GSM technology. LDR is used to check light intensity. On this light intensity light controlling is automatically done. With such sensed parameter we can know the level of polluted water.

2.1. ALGORITHM

Below is the algorithm of the proposed system

- Step 1 Initialize the system
- Step 2 Gather data from all sensors
- Step 3 If value of sensors doesn't changes then go step 2.
- Step 4 If threshold is greater than sensor value then go to step 7.
- Step 5 Turn off light and/or motor if LDR and/or level are greater than threshold.
- Step 6 Go to step 8.
- Step 7 Turn on light and/or motor if respective sensor values are lesser then threshold.
- Step 8 Send change in values to user.
- Step 9 Stop.

2.2. FLOW CHART

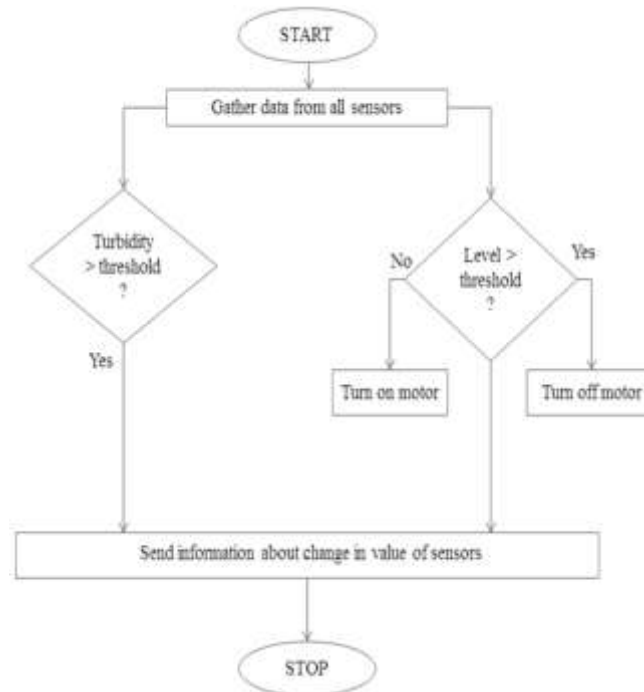


Fig 2 Flow of system operation

2. HARDWARE



Fig. 3 Hardware

```
Python 2.7.14 Shell
File Edit Shell Debug Options Window Help
>>>
614
level-1
428
level-2
498
ph
0
turbidity
49
level-3
538
light
601
level-1
428
level-2
498
ph
0
turbidity
49
level-3
538
light
601
level-1
418
level-2
428
ph
6
turbidity
49
level-1
538
light
605
level-1
428
level-2
```

The screenshot displays a web browser window with the address bar showing 'localhost/normal/manage-users.php'. The web application has a dark sidebar on the left with a menu icon and two links: 'Manage Users' and 'Recommendation'. The main content area features a green header with the text 'ADMINISTRATION OF WATER & LIGHT CONTROL'. To the right of the header is a blue box with a user profile icon, the text 'Welcome Administrator', and a dropdown arrow. Below this is a 'Home' link with a right-pointing arrow. A table with a red header and light blue body contains sensor data:

TANK-1	TANK-2	TANK-3	PH	TURBIDITY
42	49	53	6	48

At the bottom of the main content area, there is a footer that reads 'All Rights Reserved | Project Title'.

90 | Page

4. CONCLUSION

This system is used in commercial and domestic use. For health department to identify the reason of water disease. This system is also useful in industry such as food, chemical, etc for testing water before using it for further product manufacturing. It is possible to monitor the different water parameter as well as water control in tank using testing of water level. The implementation is made easier thus this system is economic. Water as well as electricity wastage has been reduced. Due to automation it will reduce the time to check the parameters. This is economically affordable for common people. Low maintenance, Prevention of water diseases.

5. REFERENCES

- [1] Patil, Amruta, Pooja Potnis, and Karishma Katkar. "SMS Based Home Automation System using Arduino ATMEG328 with GSM."
- [2] Muhammad Azwan Nasirudin, Umami Nurulhaiza Za'bah & O. Sidek, "Fresh Water Real-Time Monitoring System Based on Wireless Sensor Network and GSM", 2011 IEEE Conference on Open Systems (ICOS2011), September 25 - 28, 2011, Langkawi, Malaysia.
- [3] Ms. Shital Palwe, Prof. J.D. Bhosale, Mr. Dharmesh Dhabliya, "A Real Time Water Quality Monitoring System: A Review", International Conference on Recent Trends in Engineering Science and Technology (ICRTEST 2017) ISSN: 2321-8169 Volume: 5 Issue: 1 (Special Issue 21-22 January 2017) .
- [4] Niel Andre Cloete, Reza Malekian, Lakshmi Nair, "Design of Smart Sensors for Real-Time Water Quality Monitoring" IEEE Access Vol 4. July 2016.
- [5] Goib Wiranto, Grace A Mambu, Hiskia, I Dewa Putu Hermida, Slamet Widodo, "Design of Online Data Measurement and Automatic Sampling System for Continuous Water Quality Monitoring," Proceedings of 2015 IEEE International Conference on Mechatronics and Automation, Aug. 2-5, Beijing, China, Aug., 2015, pp. 2331-2335.
- [6] Pavana N R, Dr. M. C. Padma, "Design of Low Cost System for Real Time Monitoring of Water Quality Parameters in IOT Environment", International Journal of Advance Research in Computer Science and Management Studies, Volume 4, Issue 5, May 2016.
- [7] J. Mounika, N. Siva Kumar Reddy, "Water Monitoring System Based on GSM", International Advanced Research Journal in Science, Engineering and Technology, Vol. 3, Issue 7, July 2016.