A Proposed Model on Real Time Water Quality Measurement using GSM Module

Akshay Kumar, Manas Singhal, Abhishek Saxena,
Deep Manu, Bhupendra Singh Chauhan
Department of Electronics & Communication Engineering
Moradabad Institute of Technology, Moradabad
kingkumar241996@gmail.com
manas.singhal.ec@gmail.com
abhi12418@gmail.com
bhupendrachauhan78639@gmail.com
deepmausaxena502@gmail.com

ABSTRACT

The objective of this project is to make a real time water quality check. Few years back we used method of testing Turbidity, PH & Temperature is to collect samples from different places and then send them to laboratory for analysis and get the report of the water. This process is time consuming. Having a box of Monitoring of Turbidity, PH & Temperature of Water quality has been developed. The system made up of Turbidity, PH & Temperature sensor for water quality testing, single-chip microcontroller data acquisition module, information transmission module, monitoring center and other accessories. Turbidity, PH & Temperature of water are automatically detected under the microcontroller chip simultaneously. The chip gets the data, and then processes and analyzes them. After that, the data are instantaneously sent to monitoring center by GSM network in the form of SMS. If the quality of water is not suitable to drink and use, the message will be sent to the controlling authority . It is convenient for the controlling authority to take corresponding measures timely and be able to detect real-time situation of water quality remotely. It is characterized by advantages of shortcut, accuracy and using manpower and material resources sparingly.

KEYWORDS: *GSM, pH, SMS, Turbidity, Temperature, etc.*

I. INTRODUCTION

As we are living in 21st century we are having many type of problems but the main problem is water problem which cannot be notice by us in day to day life as we focus on other thing here we discuss about the problem regarding this water so here we make a real time water quality measurement using gsm module. Here in this system we monitored the parameters of water quality with the help of temperature, pH, turbidity, conductivity and different type of sensors. Previously we basically used a common method to collect the water from different sources and then send to laboratory to check the quality of water. This is very much time consuming method takes too much man power and material resource, and has the limitations of the samples collecting the aging of experiment equipment and other issues. We can solve this problem by using different sensors. It has many special advantages such as good selectivity, high sensitivity, fast response speed and so on. According to these characteristics and advantages of sensors, Monitoring of Turbidity, PH & Temperature of Water is designed and developed. It bases on SMS (Short Messaging Service) in the GSM (Global System for Mobile Communications) network to instantaneously transfer the collected data to the controlling authority. With the help of these sensors we can block the supply of impure water instantly.

II. METHODOLOGY

The main aspect of the project is depends on monitoring the quality of water in real time. In this monitoring we are going to monitor the quality of water and also block the supply of impure water.

For this purpose the actual propose system of our project is shown below:-
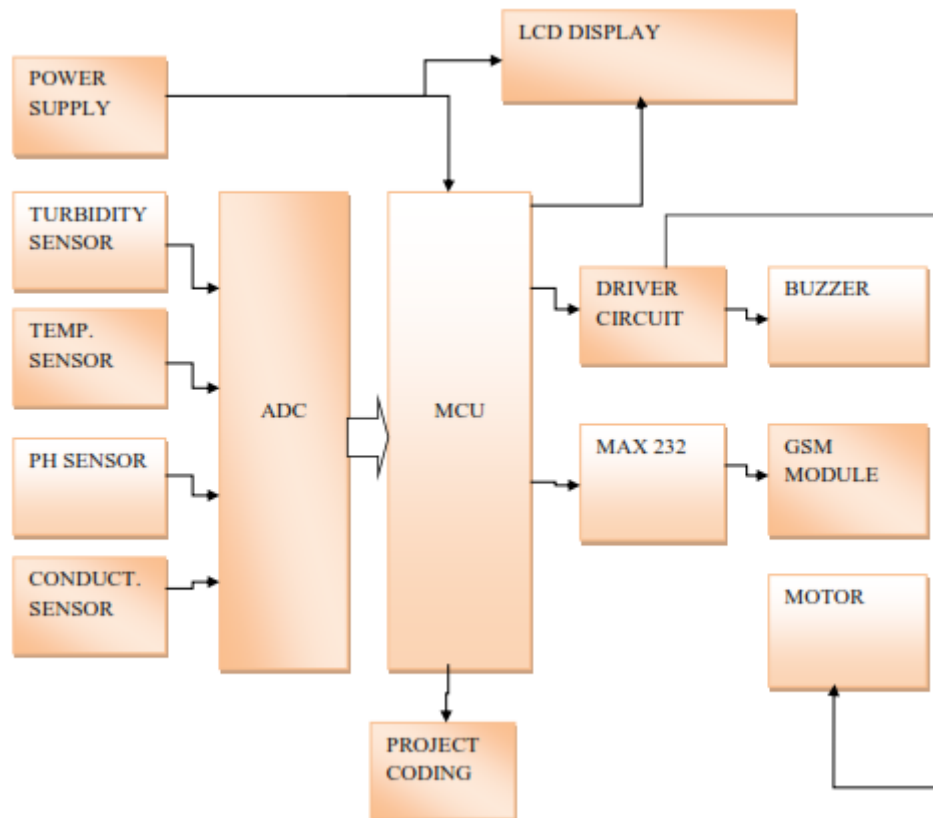
Fig 1: Block Diagram

1. Microcontroller:-
Microcontroller is the heart of this circuit. The microcontroller used is AVR Atmega328 from Atmel Company. Here we have used one AVR microcontroller IC on the detection side of the driver drowsiness. The ATmega328A is a low power CMOS8-bit microcontroller based on the AVR enhanced RISC architecture. By executing powerful instructions in a single clock cycle, the ATmega328 achieves through puts approaching 1 mipsper MHz allowing the system designed to optimize power consumption versus processing sp

2. POWER SUPPLY:- To supply the required power in the circuit

3. TURBIDITY SENSOR:- Turbidity is a measure of the cloudiness of water. Cloudiness is caused by suspended solids (mainly soil particles) and plankton (microscopic plants and animals) that are suspended in the water column

4. PH SENSOR:-
A **pH** sensor is used to tell about the acidity or alkalinity by measuring hydrogen-ion concentration (or pH) in a solution.

5. CONDUCTIVITY SENSOR:-
The process by which the capability of water is checked by conducting electricity which is defined as the term Conductivity. Pure water always having poor conductivity.

6. GSM MODULE:-
GSM stands for Global System for Mobile Communications. It is used to send the message signal to the management so that the immediate actions take place.

7. LCD DISPLAY:-
It is used to display the real time result of project.

8. MAX 232:-
For sending alertness signal from PC to microcontroller it is used to connect PC to the microcontroller.
Features:-
➢   It can operate with single 5-V Power Supply

➢   It can operate Upto120 Kbit/s

9. Buzzer:-

Buzzer is used for indication purpose; it indicates that the driver's drowsiness condition is detected. We are going to use the SD series pin terminal electromagnetic buzzer.

10. Motor:-

It blocks the supply of impure water when it receive the impurity water signal.

III.   WORKING OF SYSTEM WITH THE HELP OF FLOW DIAGRAM
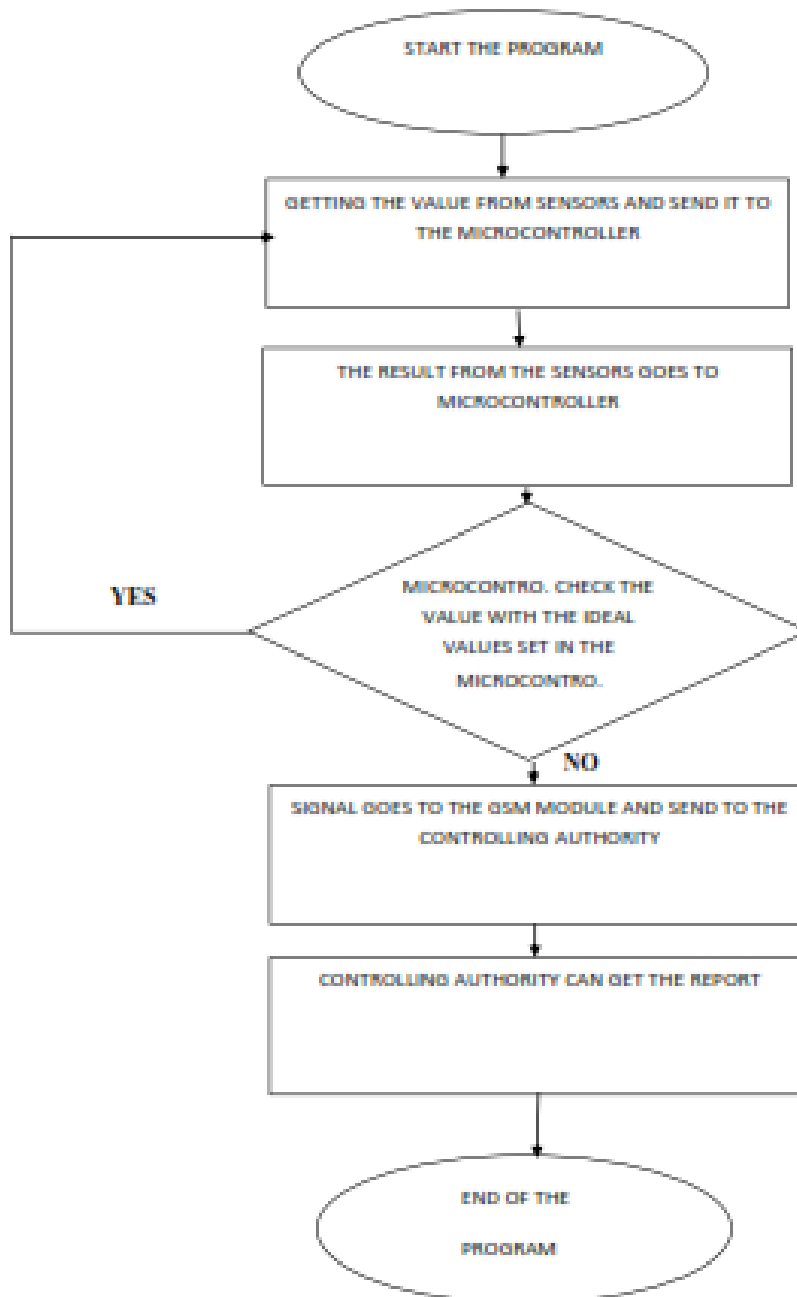

Fig 2: Flow Chart of Working Process

IV.   LITERATURE SURVEY

Nazleeni Samiha Haron, et.al., [1]: This research paper proposes an architecture for implementing a water quality monitoring system for the aquaculture industry. The system would enable monitoring of the water quality remotely via GSM. Conventional method used by aqua farms requires technical staff to visit ponds at designated time and perform manual testing on the water quality. Consequently, the technique consumes a lot of time and effort. This research project would focus on developing a prototype that can evaluate data collected through three criteria: Dissolved oxygen level, pH level, and temperature level. The system would also be able to send alert messages upon detecting degradation of water quality in the pond via SMS.

Mijović S, et.al., [2]: This paper reports on the automatic stations for monitoring river water quality in Serbia. One automatic station observing basic parameters such as temperature, pH value, dissolved oxygen concentration and electro conductivity was established on the river Kolubara, a tributary of the river Sava. Two more automatic stations were installed on the river Tisa, a tributary of the Danube, with a higher number of parameters – in addition to basic parameters there were sensors for turbidity, ammonium ion and chlorophyll. Build-up of the early warning system is in the design phase, and consists of four automatic water quality stations on the main watercourses – the rivers Sava, Danube and Tisa.

Wu Xiaoqing, et.al., [3]: This paper reports the water quality may be an advanced term to explore. The standard of water depends on such a lot of things. We've used many thought parameters in conjunction with one another to work out the water's quality. These include: pH, turbidity, conductivity, total dissolved solid and temperature. Since the standard technique of water quality measuring isn't economical thus there was a necessity to develop a system which is able to measure the standard of water in real time and also the system must be economical, correct and low price. The water quality measuring system makes use of multiple sensors, information acquisition module and data transmission module. Information acquisition module includes microcontroller 8051. Data transmission module includes GSM module. There are numerous sensors that measures temperature, turbidity, pH, conductivity and total dissolved solid present in the water. This technique conjointly uses ADC. The measured values are then transmitted to the watching centre via GSM; it's conjointly shown on LCD by the microcontroller. The system has the advantage of potency, accuracy and low price.

Akanksha Purohit, et.al., [4]: In this paper author describes the conventional technique of measuring the quality of water is to gather the samples manually and send it laboratory for analysis, but this technique is time overwhelming and not economical. Since it's not feasible to take the water sample to the laboratory after every hour for measuring it's quality. The water quality measuring system can measure the essential qualities of water in real time. The system consists of multiple sensors to measure the standard of water, microcontroller and GSM to send the information to the watching centre. It's a true time system which is able to endlessly measure the standard of water and can send the measured values to the watching centre when each predefined time. The system relies on microcontroller 8051 and GSM.

Prof.Sachin S.patil, et.al., [5]: In this paper author describes the rapid development of the economy, more and more serious problems of environment arise. Water pollution is one of these problems. Routinely monitored parameters of water quality are temperature, pH, turbidity, conductivity, dissolved oxygen (DO), chemical oxygen demand (COD), biochemical oxygen demand (BOD), ammonia nitrogen, nitrate, nitrite, phosphate, various metal ions and so on. The most common method to detect these parameters is to collect samples manually and then send them to laboratory for detecting and analyzing. This method wastes too much man power and material resource, and has the limitations of the samples collecting, long-time analyzing, the aging of experiment equipment and other issues. Sensor is an ideal detecting device to solve these problems. It can convert no power information into electrical signals. It can easily transfer process, transform and control signals, and has many special advantages such as good selectivity, high sensitivity, fast response speed and so on. According to these characteristics and advantages of sensors, Monitoring of Turbidity, PH & Temperature of Water is designed and developed. The measured values from the sensors can be processed by the core controller. Finally, the sensor data can be viewed on internet using cloud computing.

Kiran Patil, et.al., [6]: In this paper author describes monitoring of Turbidity, PH & Temperature of Water makes use of water detection sensor with unique advantage and existing GSM network. 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. The operation is simple. The system can be expanded to monitor hydrologic, air pollution, industrial and agricultural production and so on. It has widespread application and extension value.

V.   FUTURE SCOPE

With the help sensors we can detect not only the impurity but also with the help of MOTOR we block the water supply immediately so that no one can drink impure water upto when water in a tank is not clean again.

VI.   CONCLUSION

With the help of sensors we can check the water quality by use of gsm module not only check but also block the supply of impure water. Since the system is automatic therefore it is low in cost and does not require man power so time and powers both are save. So the water quality testing is likely to be more feasible in many ways. The system has good flexibility. It has widespread application and extension value.

REFERENCES

[1]. Nazleeni Samiha Haron, Mohd Khuzaimi B Mahamad, Izzatdin Abdul Aziz, Mazlina Mehat," A System Architecture for Water Quality Monitoring System Using Wired Sensors," Computer and Information Science Department, 978-1-4244-2328-6/08/$25.00 © 2008 IEEE

[2]. Mijović S. and Palmar B. (2009). "Continuous water quality monitoring on river Kolubara", 30th scientific professional meeting with international participation.

[3]. Wu Xiaoqing, Huhe Muren, "GSM module communication controlled by single-chip," Nei Mongol Science and Technology and Economic, 2010, 2:87-88. (in Chinese).

[4]. Akanksha Purohit, Ulhaskumar Gokhale "Real Time Water Quality Measurement System based on GSM" IOSR Journal of Electronics and   Communication Engineering (IOSR-JECE) e-ISSN: 2278-2834,p-ISSN: 2278-8735.Volume 9, Issue 3, Ver. V (May - Jun. 2014)

[5]. Prof. Sachin S. patil, Prof. S. J. Patil, Prof. M. M. Raste "Air Polutant   Monitring   Using   Sensor Networks" International Journal of Advanced Research in Electronics and Communication Engineering, Volume.3.Issue.8.Aug-2014,pp 829-833.

[6]. Kiran Patil1, Sachin Patil,Sanjay Patil and Vikas Patil "Monitoring of Turbidity, PH & Temperature of Water Based on GSM" International Journal for Research in Emerging Science And Technology, Volume-2, Issue-3, March-2015.

[7]. Akila. U, Elackiaselvi. R, Maheshwari. R, Shunmugavalli. K T. Prathiba, "Industrial Sewage Water Quality Monitoring System" International journal of Engineering Research and General Science Volume 3, Issue 2, March-April, 2015.

[8]. Mithila Barabde, Shruti Danve "Real Time Water Quality Monitoring System" International Journal of Innovative Research in Computer and Communication Engineering (An ISO 3297: 2007 Certified Organization) Vol. 3, Issue 6, June 2015.

[9]. Pradeep kumar M, Monisha J, Pravenisha R, Praiselin V, Suganya Devi K "The Real Time Monitoring of Water Quality in IoT Environment" International Journal of Innovative Research in Science, Engineering and Technology(An ISO 3297: 2007 Certified Organization)Vol. 5, Issue 3, March 2016.

[10]. Priyanka N. Bande, S.J.Nandedkar "Survey Of Water Quality Measurements Sensors" International Journal of research in Engineering and Technology Vol. 05, Issue 06, June 2016.

AUTHORS:

Akshay Kumar is pursuing B. Tech in Electronics & Communication Engineering from Moradabad Institute of Technology, Moradabad. A tech enthusiast Area of interest includes embedded systems (Micro-controller).
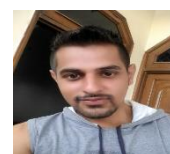
Manas Singhal received the ME degree in E&C Engineering from NITTTR, Panjab University, Chandigarh, India in 2016. He has acquired his B. .Tech. in E&C Engineering from GNIT, UPTU, Greater Noida, India in 2008.
He is currently working as an Assistant Professor in the Department of E&C Engineering, MIT, Moradabad, India. His current research and teaching interests are in Biometric Authentication, Digital Signal Processing, Digital Communication, and Digital Image Processing. He has authored till date 20 research publications out of which 15 are in Journals.

Abhishek Saxena is pursuing B. Tech in Electronics & Communication Engineering from Moradabad Institute of Technology, Moradabad. Works on embedded systems using microcontroller

Bhupendra Singh Chauhan is pursuing B. Tech in Electronics & Communication Engineering from Moradabad Institute of Technology, Moradabad. Area of interest includes working on Embedded systems