

# IOT BASED WATER QUALITY MONITORING AND CONTROLLING SYSTEM USING BIOLOGICAL SENSOR

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## Abstract

*Water is a crystal clear, testless, fragrance-free and almost neutral element, which makes primary constituent of earth's hydrosphere and the fluids of most dwelling creatures. Clean ingesting water is a essential source, critical to fitness and all humans. Any imbalance water great effect the health condition of humans. This undertaking offers a water fine tracking trouble for consuming water distribution systems in addition to for end user sites. The pipe monitoring execute the real time observations and evaluation of water nice at the flutter can be sensed by the low fee sensor nodes. The result of the water quality monitoring to provides the light weight implementation and reliable long time operation. Turbidity (TU), Oxidation Reduction potential (ORP), Electrical Conductivity (EC) and pH are parameter of chemical and organic thesaurus which have an effect of water. It is possible to detect and adjustment in such parameters. These sensor values processed by Arduino and the sensed records visible on the cloud computing.*

**Keywords:** - *Unsafe Drinking Water, Water Distribution systems, Chemical and Organic Contaminants, Cloud Computation, Sensors, Arduino*

## INTRODUCTION

Physical, chemical and organic traits are decides the water quality. Assessment of the best of a water frame, whether or not floor water or ground water, can help us answer questions about whether or not the water is appropriate for drinking, bathing or irrigation to call some applications. Determines outstanding water cause for the measurement and assessment of specific characteristics which encompass such parameters as temperature, dissolved mineral content, bacteria.

The frequency of water notable sampling is based upon in large part upon the objectives of the sampling applications and the water body of interest. Aquifers, on one hand regularly respond slowly to water-splendid inputs and therefore gathering discrete samples on a month-to-month or seasonal sampling frequency is adequate. Reverse as an alternative or problem to rapidly converting flows due to rain or snowmelt which in turn will have a dramatic impact on water-first-class paramaters in a rely of days ,hours, or may be minutes. Biological and chemical parameters often show off diurnal responses associated with sunlight, photosynthesis, and respiration. Temperature sensors are normally built round a thermistor with resistor properties which is probably sensitive to changes in temperature. The resistance is converted to temperature using an set of policies constructed into the sensor are proposed firmware and is said either in degrees Celsius or Fahrenheit depending on man or women preference.

Turbidity is the trade mark of the readability of water and is measured by using shining mild into the water and measuring the quantity of scatter of the mild because of debris suspended inside the water sample.

Depth is usually measured along with other water-great parameters to offer an information of the way ones parameters vary for the duration of the water column. At the bottom station, Wireless Personal Area Network(WPAN) or Low Power Wide Area Network(LPWAN) provided by the WSN. In realtime, network monitoring process can be performed slightly with minimum human involvement.

## EXISTING SYSTEM

Cloud computing, RFIP, wireless era and ubiquitous computing related to embedded technologies. Habitual methods to performs the gathering of water samples at diverse places and at various times observed by laboratory systematic techniques. Although, the modern-day approach used a chemical and biological retailers.

Numerous drawbacks are a) enable essential selections for public fitness safety b) negative spatiotemporal coverage c) it's far labor extensive and has relatively excessive value. The system developed is anticipated as a part of water sensor network that costs low to offer water pleasant information to the user device, water agencies and authorities. The spatiotemporal information furnished by means of those network can hold on critical selections pertaining to the high-quality of ingesting water. The detection of the unsafe marketers which may cause raising awareness and encourage the water dealing with the management.

Analog to digital convertor access the measured values through the center controller. Arduino UNO Board is a core controller with the Wi-Fi and the Bluetooth compatibility which is of high speed. Python software helps to get entry to terminals of the sensors with a purpose for reading and technique that senses values in automatic. Arduino comes with various equipment for the purpose of interfacing. It is not possible to connect with every drivers when the device starts, because it would boom the time that boots considerably and use a sufficient amount of gadget assets for unnecessary process. The lot module of the gateway in which the parameter waters are monitored by the sensors.

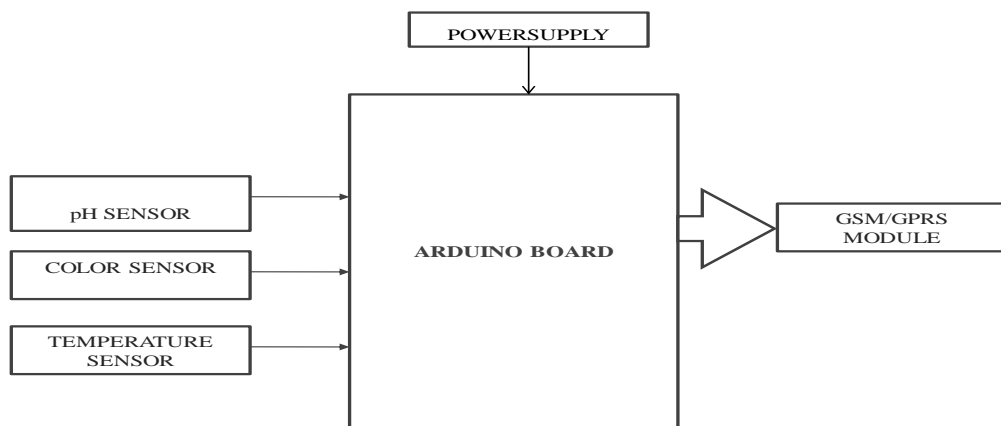


Fig.1. Existing Block Diagram

Cloud computing is an stipulate based computing technique. The computing has the far low fee technology that procedure the statistics at some stage in run time. IoT has a variety of programs in diverse fields and can clear up such a lot o everyday problems. The utility areas consist of domestic automation, smart cities, industrial automation, fitness tracking and clever environment.

### PROPOSED SYSTEM

The main objective of the proposed system to identify the biological content of water such as algae and phytoplankton. It intends contemporary monitoring prototype and proposes the scheme of tracking water introduced to consumer. It uses a low cost and power and small size of sensor. We dispute that this method can acquire extra consistent exceptional monitor caused by the high spatially allotted deployment and the opportunity of correlating the fine measurement from diverse sensor. Then instantly gives the primary steps toward this target that is intend and expansion of a squat value gadget that may be used at the premise of user device. The persistently reveal the qualitative of the embedded system has been developed that can be used in a client-slanting manner, To determine the water utilization it is need to threat at the patron level and it is based on the reaction of water parameter and fuse multi-parametric sensor in the vicinity and the consumer. Particularly the contribution concerning has the less value device to intend and improvement of slight price networked embedded system in addition to optical sensor for water satisfactory.

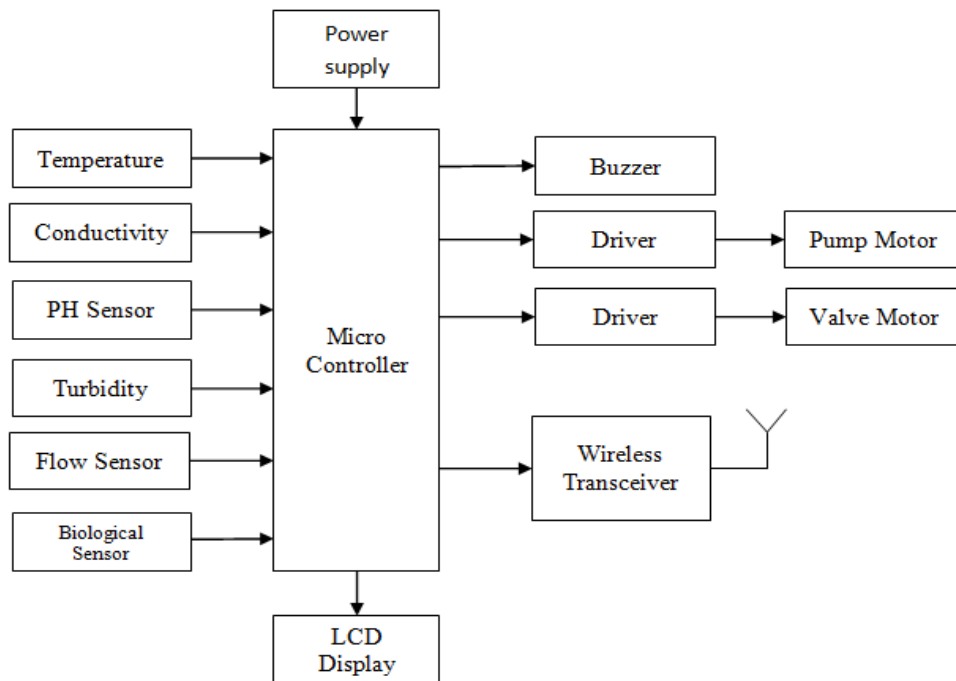


Fig.2.1 Proposed System Block diagram For Transmitter

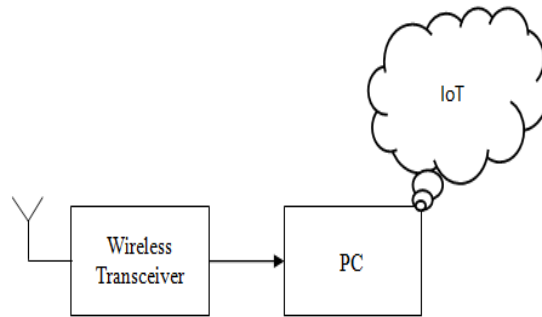


Fig 2.2 Proposed System Block Diagram For Receiver

### **Turbidity**

In turbidity, the result of floating particles and microscopic organism. The turbidity of the results can be measured through the cloudiness of the water sample. The intensity of infrared light scatters at 90° attitude to the transvering beam and it is resolute with the aid of turbidity and this can be expressed in terms of Nephelometric

### **Oxidation Reduction potential**

Reducing the power of water and oxidizing can be measured by the Oxidation Reduction and oxidation refers to chemical action in their potential, where the electrons are enter among atoms. The rust and diminution are frequently arise together. Oxidation Reduction Potential is a method to the degree of effectiveness of water disinfection santizers in actual time.

### **Temperature**

The organic and element activities are heavily inclined by the temperature of water. The temperature and accordingly temperature reimbursement mostly depend on the fine sensors. These process are done to obtained the correct results.

### **pH**

The acidity or alkalinity of the water can be measured by pH. The pH of the basic and acidic values can be explained as the poor decimal algorithm of hydrogen ion concentration activity in a water solution. such that the protability of pH variety has a certain range from 6.5–8.5. In case of alkalaline or acidic conditions, there is no more health issues results are associated with pH, until it deals with these values. Low pH allows an extra powerful disinfection provided through chlorination.

### **Electrical Conductivity**

The facility of water to perform the electrical current and it can be measured by electrical conductivity. The total dissolved solids in a water and it is concentrated by the hall mark of electrical conductance. By applying an AC voltage it can resolute by means of Conductivity. Conductivity is uttered in terms of s/cm. Drinking water conductivity has a certain ranges from 500 to 800  $\mu\text{S}/\text{cm}$  (max 1050  $\mu\text{S}/\text{cm}$ ).

## WORKING PRINCIPLE

Water flow is controlled by using solenoid valve. Middle controller which performs approaches the information and sends to the internet and connected with solenoid valve. The sensed values send to an internet browser can be processed by sending easy instructions during net solenoid whether on or off valves. The acidity or alkalinity that solution are measured by pH value. pH value is ranger from 0-14.If value is 7it is neutral point or above 7 it implies alkaline solution else beneath 7 which is an acidic solution. It performed on 5V strength deliver and it is straightforward to crossing point with arduino.

Arduino is a based on the microcontroller board AT mega 328P. It have virtual i/o pins , a 16 MHz quartz crystal,6 analog inputs, a USB connection, a power jack, a reset button and an ICSP header. Now newer versions are developed based on Arduino Software (IDE) were the reference versions of Arduino. The Uno board is the primary in a sequence of USB Arduino forums, and the reference version for the Arduino platform for an in depth listing of present, pastor out-of-date forums observe the Arduino indicator of forums.

A gateway is created on Arduino, which is accountable for examine and forward the sensed facts to server. The Gateway and Encapsulate the samples are generated by using the UDP packets facts this is to be sent to far off server.UDP packets collected by the server and shops at the base data and solenoid valves are control from everywhere inside the world using wifi network.

## RESULT

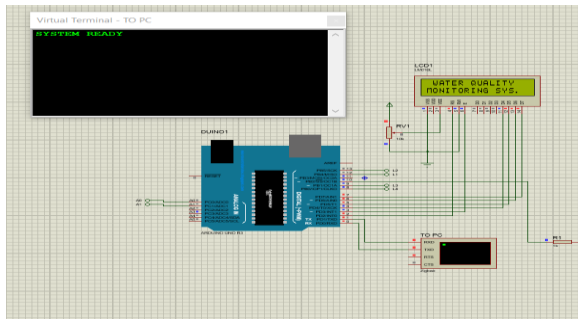


Fig 2.3 values obtained from microcontroller

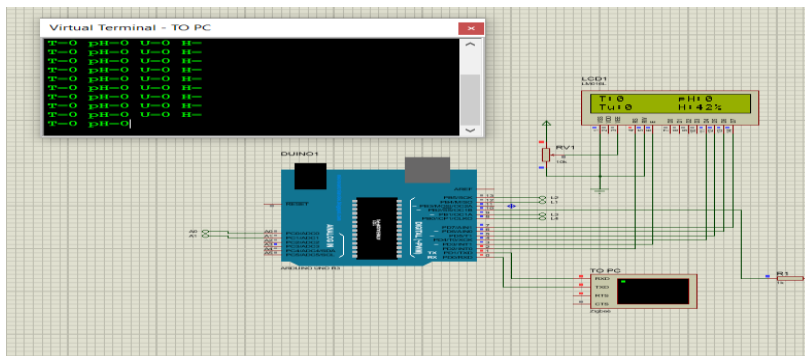


Fig 2.4 Respective datas are displayed

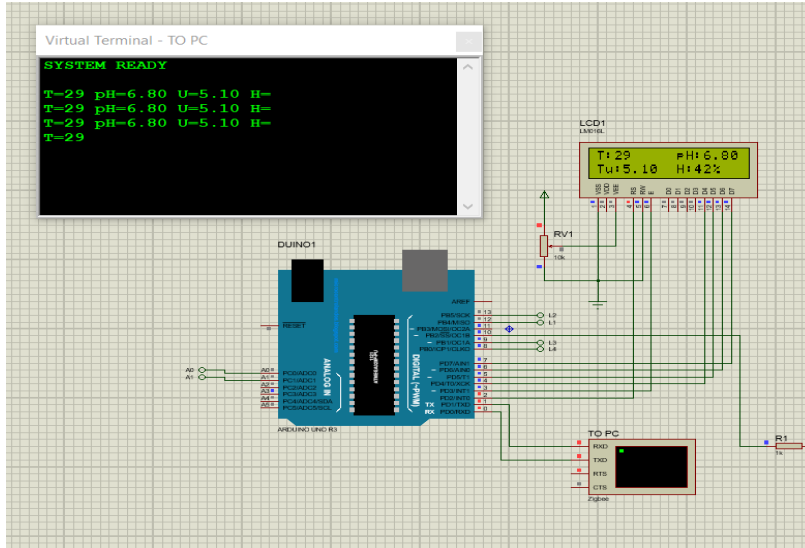


Fig 2.5 Final output

## CONCLUSION AND FUTURE WORK

In consumer sites needed the concurrent monitoring of drinking water is satisfactory. The flat measuring probe and in-pipe are connected to proposed sensor. The systems are developed by low value, low power, light weight with capable for handle the distantly current facts. Furthermore,when contamination detected by the sensor nodes are make choices and cause and alarms whistle.

This process is right for permitting a sensor network method to provides spatio temporally qualitative information to water users, water firms and rulers. The proposed gadget includes sensors for water first-class tracking and controlling the flow of water by solenoid valve. The equipments are less expensive and more flexible. Both arduino and IoT module connected to sensors and valves. At last, internet and mobile devices are control and performs the sensed data values via wi-fi. Different types of biological sensor can include in future work for better detection of contamination. Detecting the more parameters for most study purpose.

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