

Multiple Water Tank Control Using IoT

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Abstract-

Water is the key resource for our life on earth.Clean drinking water is one of the essential need for the humans.With the increase in urbanization a threat of water scarcity is alarming. This triggers the idea for reuse and recycle of water scarcity which is alarming. There is need for waste water treatment.This waste water treatment plan works optimally only under certain parameters.Hence Sensors can be used at different level of water treatment for automation. This also presents the importance and necessity to recycle the waste water and also provides a solution for the automation of the waste water treatment plant.

Keywords :- IoT (Internet of Things), Filter (sediment,carbon), Sensors, etc.

INTRODUCTION

Water is one of the most important natural resources. Without water there is no life on earth. Up to 60% of human body is water. Therefore the quality of water we consume is very important. The world population is increasing day by day and is expected to increase from 6.8 to 9.1 billion up to coming years. According to this projection the urban areas all over the world would have tremendous increase in population growth in next few years.

It is expected that the urban population would be 4 billion in developing countries and 1 billion in developed countries. With this we can say that population growth in an urban phenomenon. Many other countries are facing problem of water scarcity. Hence it is great necessity to consider the water treatment.

Hence the water quality we consume is very important. The waste water produced by them will also be increase with growing urban population. The municipal sewage may be very harmful when mixed with untreated industrial waste. As a consequence, waste water treatment is the hour's requirement. An significant aspects of intelligent

monitoring is the internet of Things(IoT),which links people and device using wireless sensors technology. It is a fast growing field of military science, energy management, healthcare and much more. Kevin Ashton suggested the idea of the IoT to show a series of interconnected devices. IoT facilities knowledge sharing between various electronic devices embedded with modern technology. By using IoT and combining technologies such as Wireless sensor network (WSN), AI can be used to ensure the water quality in real time and alerts the users to take remedial measures.

Need For Treatment of Water

Waste Water contains a variety of organic and inorganicsubstances dissolved which also includes toxic elements such as Cadmium (Cd), Zinc (Zn), Copper (Cu),Mercury (Hg), Lead (Pb) etc. It may not be present to affect human life dense concentration, but may affect plants and animal life. Disposing the waste water directly into water sources such as rivers and oceans will affect the life of aquatic animals. The water in these water bodies are consumed by animals and also by the people living downstream. Consumption of this pollutedwater results tin long term health issues. Agriculture growth is influenced by the water in a river or Lake I.e usuallyused by farmers

for agriculture, and the presence of micro and macro species in water. The water is also to be processed before being disposed into water bodies. Also with the growth of urbanization and the increasing scarcity of drinking water, it is necessary to recycle and reuse the waste water for agricultural purposes.

Overview of Water Treatment

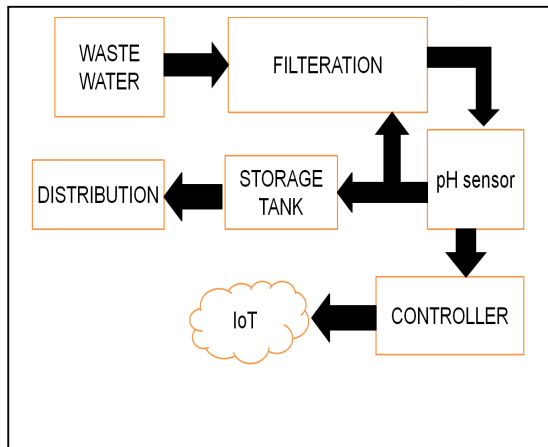


Fig-1:- Block diagram

There are 3 stages of water treatment i.e Filtration, Sedimentation, Tertiary Treatment. In filtration removes all the objects all the diameters greater than 20mm. In sedimentation removes the dust particles and solids are made settle down from waste water. In Tertiary Treatment uses biological process to further purify the water. In tertiary Treatment the oxygen levels are increased and foul odour is removed.

A. Filtration

In filtration technique the carbon filter is been placed at the entrance of water treatment. In which there will be the removals of objects of diameter larger than 20mm. This water is flown to tank for grit removal.

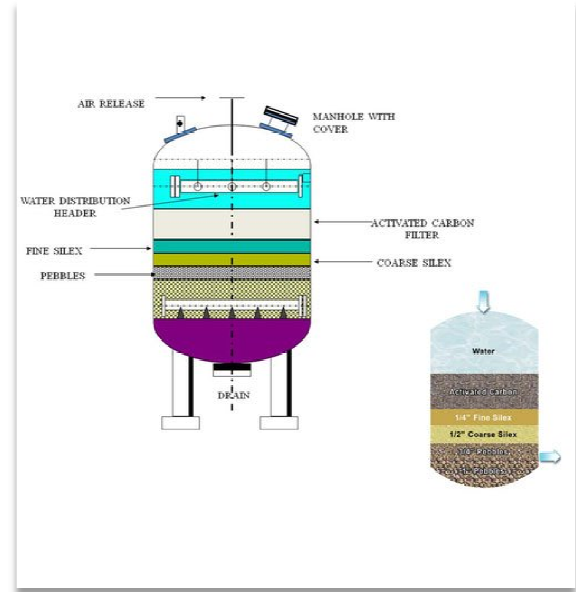


Fig-2:- Activated carbon filter

B. Sedimentation

In sedimentation technique there is removal of all dust particles and solids are made settle down in sedimentation.

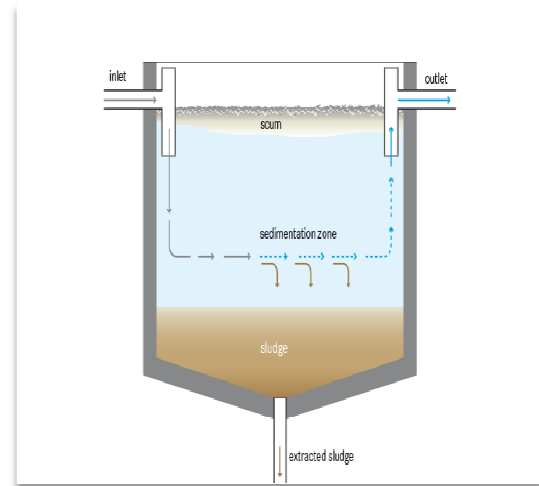


Fig-3:- Sedimentation

C. Tertiary Treatment

The water from sedimentation treatment only organic matter (Algae), Bacteria, Carbon dioxide (Co2) etc. In Tertiary Treatment the bacteria present in the water is provided by oxygen which in turn breaks the organic matter containing Carbon.

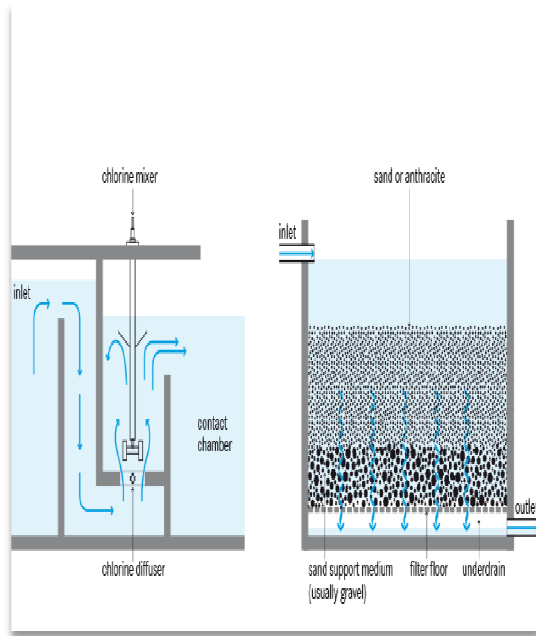


Fig-4:- Tertiary Treatment

D. pH Value

For the growth of the bacteria responsible for anaerobic digestion, the pH value is to be maintained to 7 or above.

How Working of IoT

As we know that smart homes having the appliances do our bidding automatically. The alarm sounds and the pot of coffee starts to brew. As you walk around the building, lights come on some unknown computer devices responds to our voice to read our timetable and then turns on the TV news.

In the above manner plant is going to monitored easier manner with the help of sensors placed on suitable place. It can be visible through all over the world with the help of platforms like IBM bluemix etc.

Objective of the Work

The objective of this work is to ensure the good quality of water in natural environment. Remove all the pollutants most economically and efficiently. Also to avoid or minimize other environmental impacts such as solid disposal, Odour creation, Noise generation.

The main objective of the work is to reduce or minimize the water scarcity. This can be done by recycling or reusing the waste water which is coming from our houses, building wash basins, car cleaners shop etc

After collection of this waste water there will be treatment on it and we can minimize the scarcity of water and we can save lots of drinking water which we get scarcity of it.

HardwareDescription

Hardware overview involves complete process block diagram and circuit diagram of the different electrical connection. A sensor is the system that senses the physical environment and responds to some sort of data.

The output is generally a signal that is converted to human readable display at the sensor location. There are many types of sensors in our environment. Sensors are used to sense some physical parameters such as gas, Temperature, Pressure, etc

Sensors going to use

- pH
- Float
- COD
- BOD

Main is controller which is Arduino Mega with Wi-Fi module ESP01

A. pH Sensor

The pH value of water is measured by the pH Sensor. After tertiary treatment the pH of water is measured and maintained to 7 or above.

Deploying the pH sensor can detect any deviations in pH value and report them.

B. Float Sensor

A float sensor is a device that is used to measure the liquid level inside a tank. In a pump indicator warning or other devices the switch may be used. Magnetic float sensor is an electromagnetic ON/OFF

switch. It helps to identify the amount of water present in the overhead tank or sump.

C. Arduino Mega 2560

The Arduino Mega 2560 is based on the Atmega2560 microcontroller board. It has 54 digital input/output pins (of which 14 can be used as PWM outputs), 16 analog inputs, 4 UARTs (hardware serial ports), a 16 MHz crystal oscillator, a USB interface, a power jack, an ICSP header, and a reset key. It includes everything required to support the microcontroller, simply link it to a device with a USB cable or power it to get going with an AC-to-DC adapter or battery.

RESULT

By implementing this device able to monitor the whole working system through on mobile phones, Websites Login, Message Communication, etc

We can reduce the time for frequent checking of samples and time consumption and check whenever needed.

CONCLUSIONS

Usage of recycled water for purposes like gardening, flushing toilets, watering plants and vegetables, washing cars, cleaning of house and Fire fighting. The reuse of recycled water decreases the usage of drinking water for these purposes potentially leading to water shortage reduction. The deployment of sensors in the waste waste treatment plan leads to automation of the plant which leads to efficient use of the plant. The biggest challenge of water shortage for smart cities can be overcome by smart waste water treatment.

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