International Research Journal of Engineering and Technology (IRJET) e-ISSN: 2395-0056
Volume: 07 Issue: 04 | Apr 2020 www.irjet.net p-ISSN: 2395-0072

Automation in Chemical Water Treatment and Control

Kale Priyanka subhash[1], Dalavi Tejaswi Suresh[2], Mohite Madhuri Bhagwan[3], Kharade R.A[4]

[1-3]Student's of Department of Electronics and Telecommunication; Dr. Daulatrao Aher College of Engineering, Karad, Tal- Karad, Dist- Satara, Maharashtra
[4]Assistant Professor of Department of Electronics and Telecommunication; Dr. Daulatrao Aher College of Engineering, Karad, Tal- Karad, Dist- Satara, Maharashtra

---

Abstract – *The main aim off all water treatment progression is to take away presented contaminants in the water, or decrease the concentration of such a contaminants so the water becomes fit for its preferred end- use. One such employ is recurring water that has been used back into the natural environment ecological impact. The chemical water treatment is automatically controlled using the microcontroller. The process control algorithmic approach is used to computerize the plant process. The system involves the controlling of temperature of the collective tank where the mixture process takes place by using embedded program using AVR, by using this control the temperature of the collection tank by regulating flow measured by LM35 using the AVR, is the temperature of the collective tank exceed, the flow of the inlet is regulated by rotating the volve of the tap using dc motor. This system presents a fully automated solution for controlling chemical water treatment plant process.*

***Key Words*: AVR microcontroller, LM35 temperature sensor, prefilter, PH sensor, sediment filter.**

1. INTRODUCTION

In the presents advances and modernized industrial world almost all the manufacturing and chemical industries have waste water with harmful chemical as its ingredients as weast . thus its becomes necessary to treat these water so as to reduce the harmful effluents from it and to make it suitable to be use for further industrial and agricultural applications .

The labour-intensive chemical water treatment plants which are used now a days are manually operated and need to be automated so as to reduce the toxicity of chemicals and also to save a large amount of time and money.

These controllers are design and simulated in real time to control the flow rate of water and temperature of the plant including boiler and cooling water. The full plant is revolutionized with reliable and tested process control strategies leading to computerization of the system and will lead to high increases in efficiency of plant. Also, the health vulnerability will be abridged and of man-power and time will be saved.

1.1 WATER TREATMENT

Sewage treatment, or domestic waste water treatment is the process of removing contaminants from waste water and house hold sewage, both effluents and domestic.it includes physical chemical and biological processes to remove physical chemical and biological contaminants. If its objective is to produced and environmentally safe fluid waste stream and solid waste suitable for disposal or reuse. Chemical treatment is still an essential component in many water and wastewater treatment shemes. The general purposes of the chemical treatment are; removal of suspended solid (turbidity) from the water; PH adjustment, removal dissolve material in the water, improve water quality.

The basic of chemical treatment

- PH adjustment and control
- Coagulation flocculation
- Precipitation
- Clarification

1.2 WATER TREATMENT CHEMICAL

For the chemical treatment of water great variety of chemicals can be applied below, the different type of water treatment chemicals are such as Algaecide, Antifoams Biocides, Boiler water chemicals, caugulants, corrosion inhibitors, disinfectants, flocculants, neutralizing agents, oxidant, scale inhibitors and pH conditioners

1.3 THE NEED FOR WATER TREATMENT

Water treatment is the process that water goes through so that can be of better quality to be used. It is made to be safer for humans to drink and for industries use to with a small to none environment problem. The water treatment method will vary greatly. This article will inform you of to the major kinds of water treatment. They are water purification and treatment of swage. The water treatment is used of safe human of drink water.

2. PROPOSED SYSTEM

The chemical water treatment is automatically controlled using the microcontroller. The process control algorithmic approach is used to computerize the plant system. This system involve the controlling of temperature of the collective tank where the mixture process takes place by using embedded program using AVR by using this control the temperature of the collection tank by regulating the flow control of the tank .The temperature of the collective tank is

measured by using the AVR if the temperature of the collective tank exceed, the flow of the inlet is regulated by rotating the valve of the tap using dc motor. The flow of effluent tank is controlled tank is using move (motor open valve) irature of the varying the supply voltage of the motor then that the speed of the motor is varied.

The temperature of the tank is also maintained by regulating the flow of the effluent and flow of the wastewater.

The system present a fully automated solution controlling chemical water treatment plant process.

2.1. pH SENSOR

pH sensor measures the difference in electrical potential between a pHelectrode and reference electrode, and so the pH sensor is sometimes referred to as "potentiometric pHsensor"difsolution

Figure NO.1- pH SENSOR

pH Sensor measures the voltage produced by the solution compare it with the voltage of a known solution. In other word when a liquid inside an enclosed made of glass is placed inside a solution other than that liquid, there exists a electrochemical potential between the liquid.

2.2. LCD DISPLAY

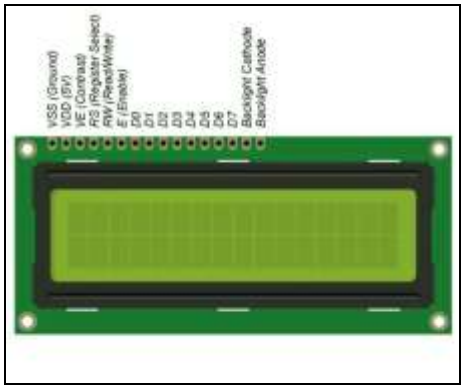

Figure No.2 LCD DISPLAY

A Liquid Crystal Display (LCD) is a flat-panel display or other electronically modulated optical device that use the light modulating properties of liquid crystals. Liquid crystals do not emit light directly, instead using a backlight or reflector to produce images in color or monochrome. LCDs are available to display arbitrary images(as in a general purpose computer display) or fixed images with low information content, which can be displayed or hidden, such as preset words, digits, and seven-segment displays, as in a digital clock.

They use the same basic technology, excepts that arbitrary images are made up of many small pixels, while other displays have larger elements. LCDs can either be normal on (positive) or off (negative), depending on the polarizer arrangement.

For example, a character positive LCD with a backlight will have black lettering on a background that is the color of the backlight, and a character negative LCD will have a black background with the letters being of the same color as the backlight.

3. CONCLUSION

The chemical water treatment plant was completely controlled automatically, by using the AVRmicrocontroller. In that process, the flow of the effluent is diverse due to the variation of the temperature in the mixing tank, the flow of the effluent is varied by using the motor open valve. And the temperature of the mixing tank is also maintained in the corresponding temperature by using the temperature sensor LM35 using the AVR controller.

The total automatic process is restricted by using the embedded programming used in the AVR. And also problem present in the system is abolished.

4. ACKNOLEGEMENT

The authors can acknowledge any person/authorities in this section. This is not mandatory

5. REFERENCES

1. V. Bagyaveereshwaran, Akshay Vijayan, M. Manimozhi and R. Anitha "Automation and On Line Moinitoring of Effluent Treatment" ISSN 0972-768X.
2. ATMEL Corporation. "AVR Enhanced RISC Microcontrollers Data Book. May 1996.
3. P. Alexander M.E. "Automation of chemical water treatment and control" ISSN:2278
4. ATMEL Corporation. AVR Enhanced RISC Microcontrollers Data Book. May 1996.
5. Master's thesis, Colorado State University, Fort Collin CO, June.
6. Metcalf & Eddy, Inc. (1972). Wastewater Engineering.
7. McGraw-Hill Book