

Automated Flow Measurement & Addition of Solvents with Database Management

V.A.Patil, Prachi Jadhav, Priyanka Kadam,
E&TC department, Shivaji University from ADCET, Ashta
Maharashtra, India
jadhavprachi45@gmail.com
kadampiya119@gmail.com

Abstract: Effective flow management begins with timing and regulating in chemical application in a way that will satisfy the need of the liquid consumption. This involves supplying liquid according with requirements of quantity. So measuring of liquid in chemical industry is essential step. There are many processes in chemical industry like sugar factories, distilled water plant, petroleum industry we need to calculate liquid flow as well as need to add some other chemical product for final process outcome. The aim of this project to calculate water flow and add purification chemical into water for boiler system. In this project we are going to design and manage liquid flow as well as addition of other chemical product which is required in process. Here flow meters are used to measure the flow of liquid and valve is used to add other chemical product in it. The calculated output of flow meter and added quantity of product is sent to customer's mobile and PC via GSM system. The system reduces human efforts, time and we can check the output easily on mobile.

INTRODUCTION

In chemical plants there are many critical process likely to measure flow of liquid and addition of another product to get final output of liquid product. There are many mistakes can happen by human intervention. So this kind of design requires more precise automation. Here proposed system is required by RO purification plant for measurement of water flow and addition of solvent for purification purpose. We are adding facility that have create database of all these process. Water solvent adding using flow sensor intends to add the solvent as per industrial requirement in to water.

This project is specially designed as per the industrial requirement, this is the sponsored project. In purifier industry within water solvent is required to add for making its TDS count low, but when this process completed by manually there will be mistakes. In purifier industry in 1000ml water they need to add 50ml solvent. For getting accurate output we proposed this project.

In this project we are going to use the flow sensor using that flow sensor we will measure actual flow

and add the 50 ml solvent in to the water after measurement there are two valves are used one is for water and one is for solvent, relays are used for controlling these two valves, as well as here gsm module is used which gives the information after the solvent get added into the water through the sms to operator. Controlling of the whole process will done using microcontroller 89S52. Here all record of the whole process will be stored in computer, for that design we use the visual basic software.

LITERATURE SURVEY

We have gone through past researched work on these types of projects; also we have searched IEEE papers related to our project these are as follows. According to Journal of Artificial Intelligence 2012 ISSN 1994-5450 / DOI: 10.3923/jai.2012 2012 Asian Network for Scientific Information paper for the project Automatic Agriculture Process Using PLC & ZigBee published by Dhivya J. Infanta and K. Chakrapani School of Computing SATARA University, Thanjavur, Tamil Nadu, India.

Here three processes can be implemented. Main objective is even a professional can work in the agricultural field. These manual cultivation for one acre of a land requires money of around Rs. 15000 – 17000 but due to this technique we reduces the cost and is nearly Rs.9000-10000 only and also the yield is high when compared to normal one.

ISSN: 2319-5967 ISO 9001:2008 Certified International Journal of Engineering Science and Innovative Technology (IJESIT) Volume 2, Issue 3, May 2013 229 for the poject WSN Based Closed Loop Automatic Irrigation System published by DeeptiBansal, S.R.N Reddy Department of Electronics and Communication IGIT, IP University, Delhi, India.

In last few years, remotely monitored embedded system for irrigation purposes have become a new necessity for farmer to save his energy, time and money. This paper is proposing a complete agricultural solution for the farmer based on Wireless

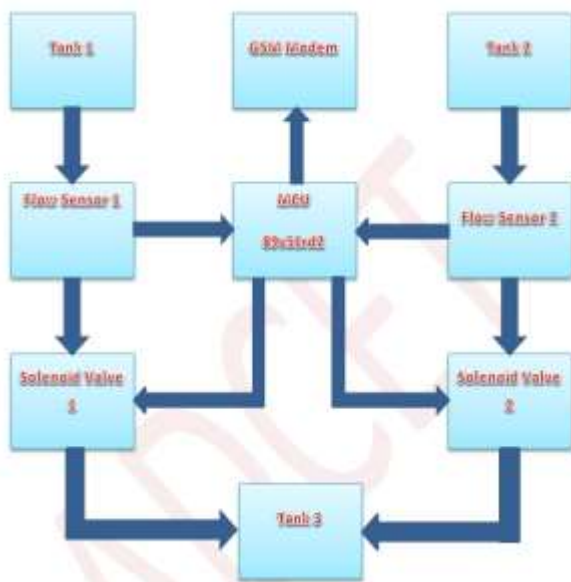
Sensor Networks and GSM technology. The data acquired about environmental factors of the field is transmitted to the farmer enabling him to control the actuators in the field. Zigbee based low power devices are employed to enable cost saving and the valves and sprinklers are employed to save the water usage for irrigation. The technology used is simple and easy to implement and the parameters recorded helps a great way to farmer to enable the “Smart farms” theory work for him. The microcontroller is the heart of the idea which controls all the devices and activates it and runs them in synchronization. So real time processing of the information is done and the required action is taken to increase the productivity of the field.

PROPOSED WORK

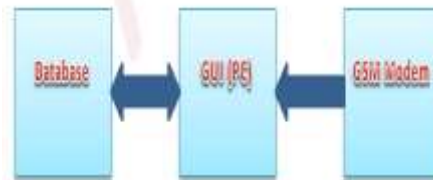
- **To Increase productivity.**
- **To Improve quality :**
As man power is involved, so there are chances of introducing errors into the work. This will affect the quality of the work. So by doing automation we are going to increase quality of the work.
- **To improve consistency.**
- **To reduce Direct human contact :**
In industry currently all work is with the help of man power. As man power is included there are chances for errors. Also time required for the work is more due to man power. Some chemicals are hazardous, so handling such chemicals by human is risky. So our aim is to reduce the direct contact, so that time required & errors should be reduced.

BLOCK DIAGRAM

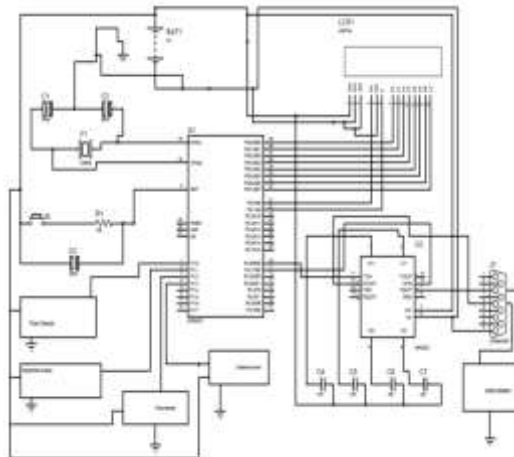
Transmitter:



Receiver:



CIRCUIT INTERFACING DIAGRAM



SCOPE

The proposed project is designed for RO purification plant. As well as we will use this project in other chemical industries and petroleum plants and for boilers in sugar factories. In many industries there is requirement of adding the some type of solvent in the water or any other mixer, when this process carried out manually there may be the chances of mistake or inaccuracy, when any at the time of solvent addition quantity may change because of this many problems may create, and inaccuracy also this may consume time. To overcome from this problem proposed system uses microcontroller to can control flow sensors, valves and GSM module is used to get reading from all process. This system can measure actual flow of water and add solvent in water automatically by the operation of valves. This can help to get actual usage of solvent and overall output of purified water. The use of controller can handle this critical event and generate database via GSM module. The project is designed in this way to add desired amount of solvent and get added into the fixed amount of water using controller programming and flow sensors and GSM module is used for the wireless message convey.

REFERENCES

- Muhammad Ali Mazidi And Janice GillispeMazidi, The 8051 Microcontroller and Embedded system, I/O Port Programming
- Industrial Automation and Process Control.-Jon Stenerson
- Luis Castañer, Vicente Jimenez, Manuel Domínguez Francisc Masana and Angel Rodriguez,(1997) “Design & fabrication of a low cost water flow meter”, IEEE International Conference on Solid-State Sensors & Actuators, Vol.5,pp. 159-162. Digital object identifier :10.1109/SENSOR.1997.613607
- Shiqian Cai and Haluk Toral, (1993) “Flow Rate Measurement in Air-Water Horizontal Pipeline by Neural networks”, International Joint Conference on Neural Networks, pp. 2013-2016.
- Young-Woo Lee, Seongbae Eun, Seung-Hyueb Oh,(2008) “Wireless Digital Water Meter with Low Power Consumption for Automatic Meter Reading ,” International Conference on Convergence & Hybrid Information Technology IEEE, pp. 639-645. DOI 10.1109/ICHIT.19 /2008.172.
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