Automatic Water Pumping and Distribution to College Campus

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Abstract - Water is basic need of human being. Automation provides optimized solution to all problems of distribution of water system. This system has features of AURDINO BOARD AND GSM system to control and monitor the water supply and in case of power failures to maintain continuity of power supply. Now-a-days water distribution system faces some problems like improper water supply and water leakage. This leakage cause reduction in a pressure of water flowing through the supply line. Due to this consumer gets less amount of water. By considering above scenario we are trying to find solution for the above problem. It reduces human efforts and improve the performance hence we have implemented ARDUINO based water distribution system. This project explores the ARDUINO and GSM technology and its use for developing automation for monitoring purpose of water distribution for an entire college campus. Earlier the monitoring of the process was done by human which caused error. To reduce this error, automation is developed by using ARDUINO and 741 operational amplifiers.

Key Words: (Arduino Uno, 741 operational amplifier, L293D Motor Driver, Liquid crystal display, DC motor)

1.INTRODUCTION

Automation plays an important role in reducing human efforts and improves the performance. The main objective behind selecting this project is to improve the performance of the water distribution system with minimum human efforts. Presently process control and monitoring was done by human which is found to be inefficient. Due to discontinuity of power supply the man has to turn ON the motors again and again. In this project we are making use of micro controller for advanced water distribution system to our college campus. All the operations will be carried out by micro controller which controls inflow and out flow. This system is primarily focused on efficient water distribution by reducing wastage of water and power. Also the same man power can be utilized to other type of works. This proposal is made by considering water distribution system advanced for college campus, hostels and PG blocks etc. It reduces human efforts and improve the performance hence we have implemented ARDUINO based water distribution system. This project explores the ARDUINO and GSM technology and its use for developing automation for monitoring purpose of water distribution for an entire college campus. Earlier the monitoring of the process was done by human which caused

error. To reduce this error, automation is developed by using ARDUINO and GSM.

1.1 PROBLEM IDENTIFICATION

The traditional water distribution had many disadvantages such as;

- The traditional water distribution system is inefficient.

- The traditional water distribution more laborious work and carried out by human operators.

- The problem of manual control is sometimes people in efficient.

- There are wastage of water resources and electric energy due to negligence of human operators.

In existing system, water is supplied to college with some manpower. The activity of opening the valve will be performed by the person who is given the charge of it. The person has to wait for a time period and again close the valve. Time consumption is very high in this system. This type of operation needs manpower. Also, if operator does not perform the proposed task perfectly then the output of the task will not be good. Also, the people may take excess water for their personal use with help of motor or some other equipment. Due to this many people will not receive sufficient water for use. They are standalone instruments and do not have any management over consumption of water. Thus, it works on open loop system.

1.2 METHODOLOGY

The below figure shows the present water distribution system to the college campus. It has Main Tank, Masjid Tank, Filter Tank, Sump and Overhead Tanks of hostel blocks. The filter tank gets the water supply from bore and well. They have used three 10 HP motor pumps to pump the water from bore and well. After filtering the water will go to the sump. There is a manually controllable valve to make the flow of water from filter tank to sump. Again, the water is distributed to main tank and masjid tank by the submersible pump which is been placed in the sump tank. The rating of suberized pump is 15 HP. To distribute the water, they will open the masjid tank valve first and close the

main tank valve and vice-versa. After that the water will be supplied to college campus and overhead tanks of hostel blocks through pressure. With the continuous economic growth, the water demand of enterprises is also increasing. The monitoring of water resource for these enterprises can prevent the occurrence of stealing water and leaking water effectively. Therefore, the monitoring system of urban water supply has aroused extensive attention in recent years. Urban water supply networks form the link between drinking water supply and drinking water consumers. These large-scale networks are vital for the survival of urban life, for maintaining a healthy level of economic development, and for the continuous operation of factories and hospitals.

Fig-1 Water distributtion system

2. BLOCK DIAGRAM

Fig-2 Block diagram

The above fig shows block diagram of water level control system. Two inputs are taken from the sensor and other two are taken from filter tank. When the water level reaches the low level sensor micro controller sends signal to motor driver to make NC operation. When the water level reaches the high level sensor micro controller sends signal to motor driver to make NO operation. Taking advantage of the

electrical conductivity property of water, we used the copper conductors as the water level sensor. When water touches the copper sensor positioned at a particular level in the tank, voltage is transferred to the copper which in turn is transferred to the comparator circuit for further processing. The L293D comparator was used to compare the inputs from the electrodes in the tank and with a pre-set resistance and output a HIGH or a LOW with respect to the result from the comparison. This HIGH or LOW was fed into the microcontroller which in turn uses this to control the water pump and display the appropriate status on an LCD screen. The programmable Atmel 89C52 microcontroller was programmed in Assembly Language and was used as the processor to control the functionalities of the entire system. A Liquid Crystal Display (LCD) served as the output unit which showed the status of the system on a screen. Motor drivers were used in building a switching unit that simply triggers the pump on or off, depending on the signal received from the microcontroller.
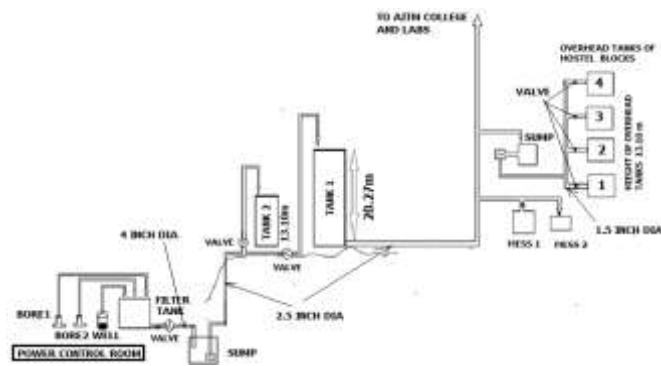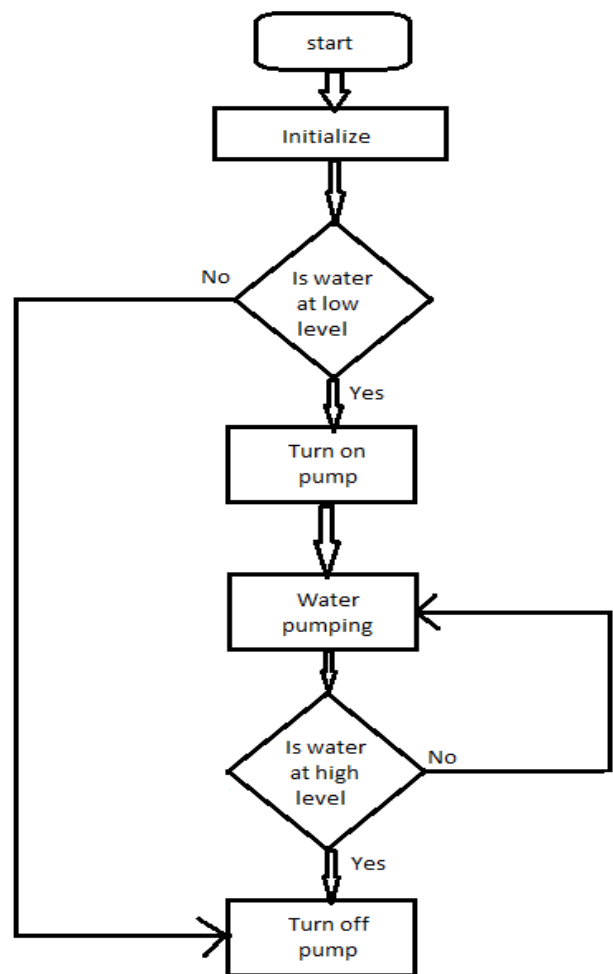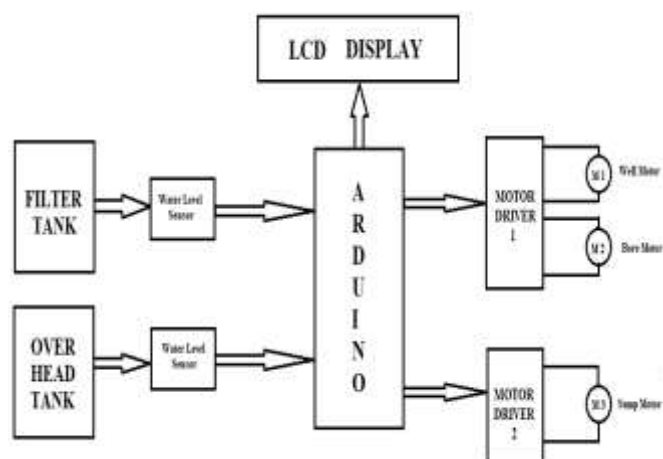
2.1 FLOW CHART

Fig-3 Flow Chart

To make water distributions more efficiently by reducing wastage of water and power. It monitors, controls and protects all the water pumps used for water distribution purpose. It monitors all the storage tanks situated and distributes the water equally to all the areas depending upon the amount of water in the tank. And mainly it reduces the man power required to operate the motors and to supervise the water distribution system which becomes economical. In this work, the microcontroller for the automatic water level monitor with feedback, having passed the necessary tests with the other components interfaced to it, is hereby presented. With this implemented system, it is possible to monitor the water level in an over-head tank, switch on the water pump when the tank is empty and switch off the same pump when the tank is full without any need for human intervention. By so doing, the incidence of water wastage is eliminated and abrupt cut-off of water supply is equally also eliminated. As already highlighted in the previous sections, the microcontroller is the heart of this project work, as all the control signals pass through and are processed by the microcontroller.

3. OBJECTIVES

1)Optimization of existing water distribution system.

2)To develop controller using Micro controller as programming.

3)Reduction of human risks.

4)To prevent over labour of the pumping Machine.

5)Reduction of the wastage of water and electric energy due to negligence of operators.

6)Designing more efficient system.

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