

Smart Water Distribution Management System

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ABSTRACT: The urban area population is more because of this increasing population water distributed is big issue. Water distribution in different area in every house wastage of water is controlling and proper control of water distribution. People are found complaining that they don't have sufficient amount for their daily needed water, so to overcome water supply related problems and makes system efficient there is need of right management and distribution of water. The manual water distribution and management the performance of the system through various application applied through the embedded system. At the start the exact idea about automatic water distribution for different areas with its proposed system is discussed using different technologies.

KEYWORDS: Arduino, Flow sensor, Water Level Sensors, relay, Motor, Solenoid valve, GSM

I. INTRODUCTION

According to recent survey, rain fall is less so water is big issue of our country, because of increase in population many cities are facing this problem people have to suffer from this problem they don't have sufficient amount for their daily needs. Due to proper management of water is not supplied properly, some area in city get water and some area is not get water, there is a need of continuous monitoring, water supply scheduling and proper distribution another problem are excessive consumption, overflow of tanks, leakage in pipeline, interrupted water supply. Water is regular need of every person everyone has to save the water many a times with proper management, overflow of these overhead tanks can occur because of this lots of water get wasted, another thing because of overflow in the pipelines with more pressure there is possibility of pipeline damage, leakage detection is one more problem all these problems are because of lack of monitoring, manual work, less man power. Before implementing this project, I have taken a survey, after taking a survey I observe that all the work is manual and need a better technology to make proper distribution.

II. METHODOLOGY

1. Water level sensor



Fig-1: Water flow sensor.

Water level sensor is used to detect the level of substances. This type of substances include powder, liquid material. This sensor is used to measure the level of tank. So using this we know the level of the tank.

2. WATER CONTROLLING VALVE

A solenoid valve main purpose is water controlling valve; it is a simple electromagnetic device that converts electrical energy into linear mechanical motion.

A solenoid valve is the combination of a mechanical valve and basic solenoid. So a solenoid valve has two parts Namely-Electrical solenoid and a mechanical valve.



Figure-2: Water controlling valve

3. ULTRASONIC SENSOR

Ultrasonic sensor is used to measure the distance by using ultrasonic waves. The sensor emits the ultrasonic waves and it receives the waves which is coming from the reflected target.

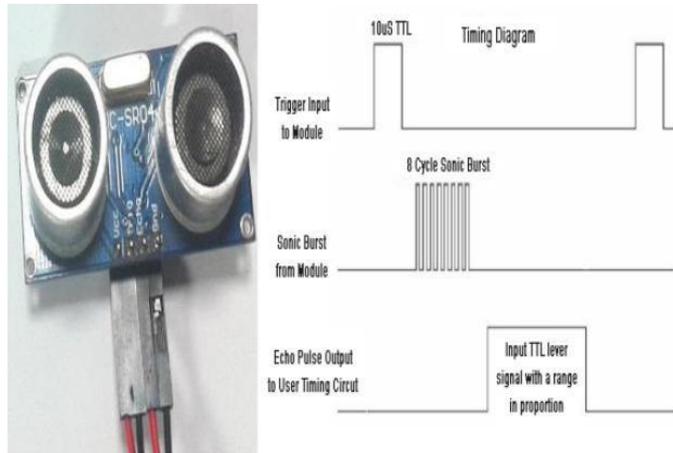


Figure.3: Ultrasonic sensor & waveform.

The distance is calculated by using formula:

$$\text{Distance } L = \frac{1}{2} * t * c$$

Where L is distance, it is time between emission and reception & c is sonic speed.

There are two types of Ultrasonic sensor

1. Proximity Detection
2. Ranging Measurement

III. BLOCK DIAGRAM

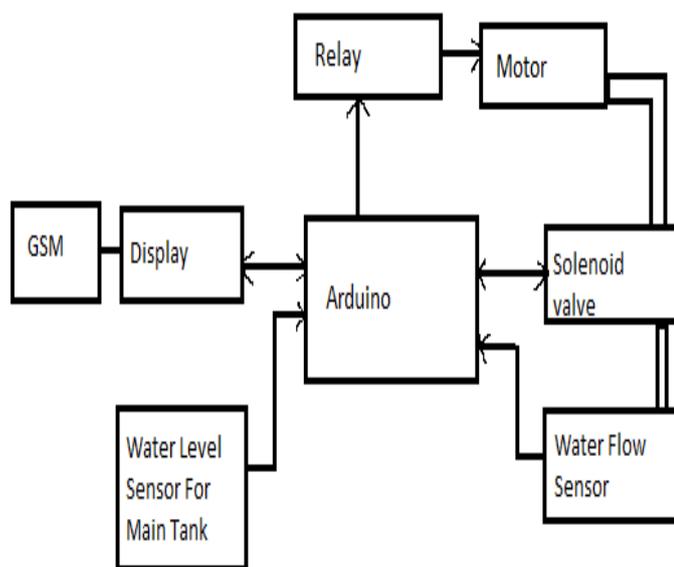


Figure-4: Block diagram

BASIC CONCEPTS

1. Water Flow sensor:

The Arduino flow meter also known as Hall Effect. Hall Effect is used in the flow meter using a small fan shaped rotor which is placed in the path of liquid flowing. The liquid thus pushes against the fans of the rotor, causing it to rotate.

2. Microcontroller:

The Arduino Uno is used as a microcontroller in this system, it has 14 digital input/output pins. Microcontrollers are used in automatically controlled products and devices, such as automobile engine control systems, implantable medical devices, remote controls.

3. Water controlling valve:

A solenoid valve main purpose is water controlling valve; it is a simple electromagnetic device that converts electrical energy into linear mechanical motion.

4. Water level sensor:

Water level sensor are quantity of water to be supplied. If the tank is empty water flow and a quality check will be on hold and if the tank is full then, water can be distributed after a quality check.

Ultrasonic sensor is used to measure distance in the range of 2cm-400cm with an accuracy of 3mm. The ultrasonic sensor module works on the natural phenomenon of ECHO of sound.

5. GSM:

GSM means Global System for Mobile communication it is a digital mobile telephony system. GSM are used in this system because transmit and receive a message.



Figure.6: GSM

IV.CONCLUSION

The final outcome of the project is a smart water distribution and management system overcome a wastage of water. It also registers the data regarding flow rate and total water flow in database. In this project a major module in Water Distribution System is successfully implemented using above technique. The project has given a proper water distribution in each area.

V. REFERENCES:

- [1] Shining Fang, An Integrated System for Regional Environmental Monitoring and Management Based on Internet of Things[J], IEEE TRANSACTIONS ON INDUSTRIAL INFORMATICS, VOL. 10, NO. 2, MAY 2014, PP:1596-1605
- [2]Xu Ling, Su Guofeng, Architecture for Monitoring Urban Infrastructure and Analysis Method for a Smart-safe City. 2014 Sixth International Conference on Measuring Technology and Mechatronics Automation.pp:151-154
- [3]V.C. Sharath, S. Suhas, B.N. Sachin Jain, S.B. Vinay Kumar, C. Prasanna Kumar, "Smart aqua meter," in Advances in Electronics, Computers and Communications (ICAECC), 2014 International Conference on, October 2014, pp. 1-5
- [4]Ayisha Sayed "Smart and Automatic Water Distribution Control System" International Research Journal of Engineering and Technology (IRJET) Volume: 05 Issue: 01 | Jan-2018
- [5]Patawala Amatulla.H "IOT Based Water Management System for Smart City "International Journal of Advance Research, Ideas and Innovations in Technology Volume3, Issue2
- [6]S.Vishal "Smart Water Supply Using Labview and Arduino "International Journal of Electronics Engineering Research. ISSN 0975-6450 Volume 9, Number 8 (2017) pp. 1237-1244