

Automatic Water Level Controller

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Abstract: *An automatic water level controller system is defined as a device by which we can control the water level of any water tank or a similar water storage system. In this paper, we have introduced a automatic water level controller system by using ATmega 8a microcontroller chip. The circuit that has been designed for detects the water level and control the water level in the water storage system. this system is reduces the wastage of the water from any reservoir. We are control the level of water by controlling the power supply of the Submersible pump or motor. While filling the overhead tank. It indicates the level of water and when it is at the lowest level. Then the sensors will detect the level and give the signal to the device. Then this system controls the supply of submersible pump. Then the pump is operating automatically to refill the tank. When the tank is filled to its maximum capacity, the pump will automatically turn off. The aim of this project to overcome the water wastage problem. And improve the accuracy.*

Keywords: water storage system

I. INTRODUCTION

Water is the basic need for all living beings and it is one of the most important necessities of the human's life. Hence, it is very important to reduce the water wastage problems. In many industrial and domestic applications, there is unnecessary wastage of water due to the overflow of water storage system. That's why to overcome the water wastage problem; we are making the automatic water level controller system.

The automatic water level controller system is use to detect or control the water level of the water storage tank. This system using the ATmega 8A microcontroller to monitor the level of water in the water storage tank. By using this system water level are controls by controlling the input supply of the pump. While the level of the water is at the lowest level of the tank, then the pumps is automatically turned on and fill the water tank. In this system, for identifying the level of water sensors is use. When water is fill up to maximum capacity of the tank, then the pump are automatically turn off.

In this system the sensors are placed at different levels of the overhead water tank to identify the levels of water. In that system there are the components are used, like center tapped step down transformer, relays, ATmega 8A IC, bridge rectifier, diodes, and sensors.

This system is useful for industrial as well as domestic and commercial purposes. To automatically control the flow of water and wastage of water flow.

The filling of water tanks have been done through electrical pumps in the recent. However, untimely turning off the motor pumps lead to less filled tanks or over flown water from the tanks causing wastage. In order to avoid such situations we can have an electronic water level controller which can monitor the water level and switch the motor pump accordingly. This device has two level indicators which work in harmony of a power switching relay. This relay is the one which connects the water pump to the mains power supply. If the system indicates that water level in the tank is Low, then the system turns on the power supply for the water pump. The pump remains till the system indicates the water level is low. Once the system indicates the water level as high and not low, the power to the water pump is switched off. It remains switched off till the water level is not again to the low level in the tank. Conductivity of water is what makes the level sensing work. With a reference level at the bottom we attach the rest two of the high and low level sensing wire terminals at their respective positions. At the time when water isn't the high level the circuit triggers the low level LED and also the relay to turn ON the water pump. Once the water level catches up the high level, the high-level indicator is turned ON and the relay is switched to turn OFF the water pump till the next low level trigger.

II. LITERATURE REVIEW

There are many proposed methods for the water level controlling system in literature.

Automatic water level controller we can use in Hotels, Factories, Homes Apartments, Commercial Complexes, Drainage, etc. Automatic water level controller will automatically “START ON” the pump set as soon as the water level falls below the predetermined level and shall “SWITCH OFF” the pump set as soon as tank is full. It can be used to sense water level indicator in the huge containers in the companies. Fuel level indicator in vehicles.[1]

Detector is a device that responds to a physical stimulus (as temperature, sound, pressure, magnetism, or a particular motion) and transmits a resulting impulse (as for measurement or operating a control). Sensor is essential for taking input from the environment to the microcontroller. The particular input could be light, temperature, motion, moisture, pressure, or any one of a great number of other environmental phenomena. The output is generally a signal that is converted to readable display at the sensor/detector at a position or transmitted electronically over a network for reading or further processing. In our project, we have used ‘Reed switch’ as a sensor.[2]

A switch acts as drawbridge in an electric circuit. When the switch is closed, the "bridge" is up and no current flows. So the purpose of a switch is to ON or OFF a circuit at a time of our choosing [3].

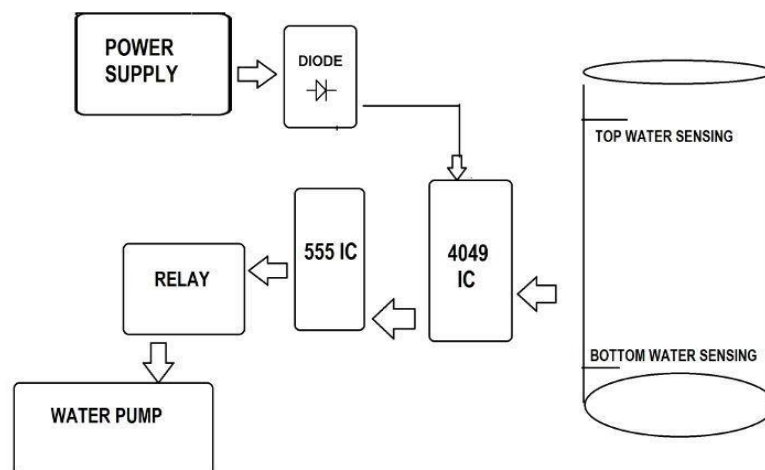
III. PROPOSED SYSTEM

In automatic water level controller system, there are two modes operation

Mode: In this mode, the system functions as a non-automatic system. The operation of the pump is manually controlled using start and stop switches. To start the pump, the user presses the start switch, which initiates the pumping process, causing water to flow into the tank. When the stop switch is activated, the pump is turned off, halting the water flow. This mode provides users with full manual control over the system's operations, making it suitable for scenarios where automation is not required or desired.

AUTO: In this mode, the system operates automatically with the help of an integrated control circuit. The pump's operation is managed entirely by the circuit based on water level sensors. When the water level in the tank reaches its lowest point, the sensor detects this condition and automatically activates the pump to fill the tank. As the water level rises and reaches the tank's highest point, the sensor identifies this state and turns the pump off automatically. This ensures efficient and hands-free operation, conserving energy and preventing water overflow. By offering these two modes of operation, the automatic water level controller system provides both flexibility and convenience, catering to a wide range of user needs and application scenarios.

Block Diagram:



Hardware Specifications

- ICs 4049
- IC 555

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DOI: 10.48175/568

- Relay
- Transistor
- Resistors
- Capacitor
- LEDs
- Connectors

IV. CONCLUSION

This project has achieved the main objectives. The automatic water level controller system is a big boon for the industrial sectors as well as agricultural and domestic purpose. This system is operated that's why the time of operation is reduced.

The system employs the use of advance sensing technology detect the water level. This system is very beneficial in urban as well as rural areas. It helps in the efficient utilization of available water sources. If the automatic water level controlling system is used on a large scale, it can provide a major role in the water conservation for the future generations.

This project has successfully achieved its primary objectives, presenting a significant advancement in the development of automatic water level control systems. These systems prove to be an indispensable asset for various sectors, including industrial, agricultural, and domestic applications. By automating the process of water level monitoring and control, the system not only reduces manual intervention but also significantly minimizes the operational time and effort involved.

The implementation of advanced sensing technologies enables precise and reliable detection of water levels. This technological innovation ensures optimal management of water resources, which is a critical requirement in both urban and rural settings. In urban areas, the system helps manage water distribution efficiently, while in rural areas, it supports agricultural activities by ensuring timely irrigation and reducing water wastage.

REFERENCES

- [1] S. M. Khaled Reza, Shah Ahsanuzzaman Md. Tariq, S.M. Mohsin Reza, "Microcontroller Based Automated Water Level Sensing and Controlling: Design and Implementation Issue", 0, San Francisco, USA.
- [2] Deepiga, A.Sivasankari-Smart water monitoring system using wireless sensor network, Journal in Engineering & Technology Science (IRJET), Volume: 02 Issue: 04 , pp 1305-1314, July-2015.
- [3] S. Maqbool and N. Chandra, "Real Time Wireless Monitoring and Control of Water Systems Using Zigbee 802.15.4," 5th International Conference and Computational Intelligence and Communication Networks, 2013, 1-7.
- [4] Praseed Kumar, Shamim S Pathan, BipinMashilkar, Liquid Level Control using PID Controller Based on Labview&Matlab Software , International Journal of Engineering Research & Technology (IJERT).
- [5] S.Jatmiko, A B.Mutiara, Indriati Prototype of water level detection system with wireless Journal in Theoretical and Applied Information Technology Vol. 37 pp 52-59, 2012.
- [6] S. M. Khaled Reza, Shah Ahsanuzzaman Md. Tariq, S.M. Mohsin Reza, Microcontroller Based Automated Water Level Sensing and Controlling: Design and Implementation Issue, Proceedings of the World Congress on Engineering and Computer Science 2010, Vol I October 20-22, 2010.
- [7] Vardaan Mittal, Automatic Water Level Controller, International Journal of Science and Research (IJSR), Volume: 6, Issue: 5, pp 136-138, May 2017.
- [8] Teetla Asha, VidadalaSrija, DESIGN AND IMPLEMNTATION OF WIRELESS BASED WATER LEVEL MONITORING USING ARDUINO AND BLUETOOTH, International Research Journal of Engineering and Technology (IJERT), Volume: 07, Issue: 01| Jan 2020
- [9] Laith Abed Sabri, Hussein Ahmed AL-Msha, Implementation of Fuzzy and PID Controller to Water Level System using LabView, International Journal of Computer Applications, Volume 116 No. 11, April 2015