UNIVERSITY OF NIGERIA, NSUKKA

FACULTY OF ENIGENEERING

DEPARTMENT OF ELECTRONIC ENIGINEERING

A PROPOSAL WRITING IN PARTIAL FULFILMENT OFNTHE REQUIREMENT IN TECHNICAL REPORT WRITING

(ECE 494)

TOPIC

WEB-BASED CHAT APPLICATION USING NODEJS

BY

UGWU TOCHUKWU MARCEL

2017/247659

LECTURER

PROF. O.N ILOANUSI

SEPTEMBER, 2021

TITLE

AUTOMATIC WATER PUMP SWITCHER

ABSTRACT

A city water authority supplies the clean water and pumps it into massive ground-level storage tanks in countries like Nigeria. The water is then pumped to a water tank on top of the house by a resident's water pump. The pump siphons air and shuts off when the water level in the ground-level storage tank drops too low, forcing a householder to manually prime the water pump to get it running again. Residents struggle to keep check of the water levels in the tanks and keep the pump working. To fix the challenges, the Automatic Water Pump Controller (AWPC) system monitors water levels and controls the pump as needed to prevent pump failure and maximize water storage without overfilling the rooftop tank and wasting water. Additionally, the "automated switch for water pump" is designed to control the switching of water pumps and to minimize water and electricity waste.

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INTRODUCTION

The Water Level Controller System is an electronic device that, when connected to the starter of any pump-set motor, controls the pump-operation set's based on the water level in the Source and Destination Storage Tanks. It turns on the pump when the water level in the Overhead Tank falls below a pre-set level, turns off the pump when the water level in the Overhead Tank fills up, turns off the pump when the water level in the tank is low, and turns on the pump when there is enough water in the tank.

Automatic water level controller is an engineering project. It may turn on and off the household water pump set based on the water level in the tank. This motor driver circuit can be built at home or at college with less expensive components. The key benefit of this water level controller circuit is that it controls the water pump automatically and without the need for human involvement. The automatic pump controller eliminates the need for manual pump switching while water is being pumped from a reservoir to an above tank. When the water level in the tank goes below a specified low level and the water level in the reservoir is above a given level, it automatically turns on the pump, As the water level in the tank increased to an upper level (M), the pump was automatically turned off. Only when the water level in the tank falls below the level in the tank, and the level in the reservoir is above R, is the pump turned back on. This automatic process is done repeatedly. [1]

BACKGROUND OF STUDY

The "automatic water level control with an automatic pump control system" project is intended to keep track of the liquid level in the tank. The system is equipped with an automatic pumping mechanism that fills the tank when the liquid reaches the lower threshold and turns off the pump when the liquid reaches the upper threshold. In many ways, the availability of available water resources is currently a major challenge. Poor water allocation, inefficient consumption, and a lack of competent and integrated water management are all related to this problem. Water is widely used in agriculture, industry, and household use. As a result, for a home or office water management system, efficient use and water monitoring are potential constraints. Furthermore, the most typical way of level control for home appliances is to simply start the feed pump at a low level and let it run until the water level in the water tank rises to a higher level. This water level control monitors and maintains the water level in the overhead tank, ensuring a continuous flow of water around the clock without the hassle of turning on or off the pump, saving time, energy, and water, and preventing the pump from overworking. Liquid level control systems are also commonly used to monitor liquid levels in reservoirs and silos. To ensure that water sustainability is attained with disbursement linked to sensing and automation, a programmed strategy involving microcontroller-based automated water level sensing and regulating is recommended.

SIGNIFICANCE OF STUDY

The project was design to automatically control the pump, ensuring that the reservoir has a consistent supply of water. The design was kept clean and simple in order to avoid adding unneeded complications and making it uncomfortable in general. The system does not have a sophisticated peripheral device attached, which is impossible for detailed printing information but has been left out for cost reasons. To achieve this goal, a low-cost, low-accuracy automatic water pump was used instead of a well-built automatic water pump. The automatic water level controller detects and controls the water in the tank.

Aim and Objective of Research

The goal or objectives of the designed device are to create an automatic water level control system with an automatic control system. In this project, sensors are installed at different levels of the tank, and the microcontroller uses these sensors to monitor the liquid level at any given time. Some of the objectives are:

1. to construct an automatic water monitoring system
2. to include a means for interaction between the end user and the machine
3. to avoid overworking the pumping mechanism and causing it to break down
4. to reduce water wastage
5. Because there is such a high demand for electricity, automatic water level control saves energy.
6. To Prevent over labor of the pumping machine (dry running).

Methodology

There are numerous approaches to developing an automatic water level control using switching mechanism, but all of them involves human intervention. In this project, electronic control is used to construct an automatic water level control for both overhead and underground tanks with switching device to replace the 3456water without human intervention. When the water level in the tank drops below a specific level, the system automatically shuts down the water pump by turning off the electric pump. When the tank is full, the system automatically shuts down the water pump by turning off the electric pump. The modular design method was applied in this project. Function block diagrams were used to break down the overall design. In the diagram, each block represents a section of the circuit that performs a certain function. As indicated in the block diagram, the system was built utilizing functional blocks. In this method, three sensors are used to monitor the intake of water into the tank, and the circuit is built to display three separate levels. However, depending on the amount of resolution necessary, these displays can be increased or decreased. Increase or decrease the number of level detectors and associated components to achieve this.

The final design schematic circuit diagram of the method is shown below in the figure[4]

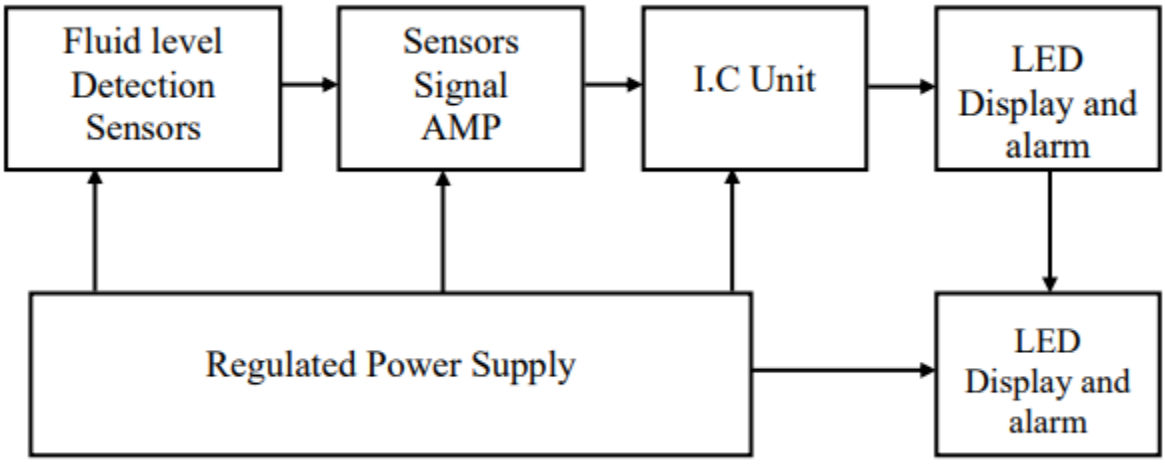

Figure 1:Project block Diagram

Budget

Costs of the Project

The costs related with this project are listed in the table below. Invoices will be sent on the dates listed below, and payment will be made by wire transfer. Payment date within 30 days.

Name	Price
Automatic water pump	₦130,000
Water tank sensors	₦40,000
Implementation	₦70,000
Transportation	₦5000
Total	**₦245,000**

Reference

1. Adil, A. & Engineering, E. Flexible Automatic Water Level Controller and Indicator. **3**, Angeles, L., Advocacy, S., Location, O. (2002). (2018).

2. Preethi, D., Anusha, J., Sravani, M. V., Puviarasi, R. & Sindhu Bala, M. Automatic water level controller. *Int. J. Appl. Eng. Res.* **10**, 26581–26587 (2015).

3. Ismail. مـــسبد ا الله نمحرـلا ميحرـلا Sudan university of Science and Technology College of Graduate Studies. 1–88 (2015).

4. Esiobi, U. E. Microcontroller-Based Automatic Water Pump Controller with Real-Time Pumping Schedule and Time Display. **4**, 178–182 (2021).

5. R.C. Dorf and R.H. Bishop. Prentice-Hall, Upper Saddle River, NJ, 2005, 10th edition of Modern Control Systems.

6. K. Ogata, K. Ogata, K. Ogata, K. Ogata, K. Ogata, K. Ogata, K. Ogata, K. Ogata, K. Ogata, K. Ogata, K. Ogata, K. Ogata, K. R.L. Wells, J.K. Schueller, and J. Tlusty. 3. Wells, R.L., J.K. Schueller, and J. Tlusty. FlexibleRobotics Arm Feedforward and Feedback Control IEEE Control Systems, vol. 10, no. 1, 1990, pp. 9-15

7. Water Level Sensor (anonymous). On the 15th of May 2009, I accessed the website

http://www.siliconchip.com.au/cms/A 30607/article.html.

8. Logic Gate Based Automatic Water Level Controller, Md. Moyeed Abrar and Rajendra.R. Patil, International Journal of Research in Engineering and Technology, eISSN: 2319-1163, pISSN: 2321-7308. http://www.ijret.org

9. Temcoindustrialpower.com, 'Float Switch Selection Guide,' 2015. [Online].

Available www.temcoindustrialpower.com/product selection.html?p=float switch selection gu \side. [Accessed: \shttp:// on October 17, 2015].