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FACULTY OF ENGINEERING
DEPARTMENT OF COMPUTER AND ELECTRICAL
ENGINEERING
DIPLOMA IN INDUSTRIAL ELECTRONICS AND ELECTRICAL
ENGINEERING

FINAL YEAR PROJECT REPORT
AN AUTOMATIC WATER LEVEL SWITCH

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A project report submitted to the department of computer engineering as a partial fulfilment of the requirements for the award of a diploma in industrial electronics and electrical engineering

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We acknowledge with great pleasure the department of computer and electrical engineering for the continued support towards the development of this project proposal.

Great thanks to our supervisor Mr KIGOZI JOHN for his guidance, class mates and friends for their practical help and prayers during the synthesis of the work. May the Almighty God bless you in all your endeavours.


DECLARATION

I NABIRYE DAPHYNE and my partner NANTUME MAJORINE NAMUDDU declare that this project report product of our research and findings, it has never been submitted to any university for examination to the best of our knowledge.

NAME: NABIRYE DAPHNE

Signature.....  ✓

NAME: NANTUME MAJORINE NAMUDDU

Signature..... 



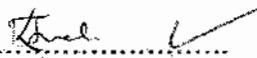
DEDICATION

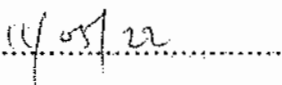
We dedicate this proposal report to our family relatives and friends most especially our parents

APPROVAL

This final year project report is being submitted for examination with the approval of our supervisor.

SUPERVISOR: Mr KIGOZI JOHN

Signature..... 

Date..... 

ABSTRACT

The main objective of this research to design and develop an automatic water level switch and preventing the wastage of water due to over pumping. This report describes the design, development, implementation, and testing of an automatic water level switch and reduce on the wastage of water. The device controls the pump depending on the water level. Two float level sensors are used to detect upper and lower water level points. When the water falls below the lower point, the pump is switched on through the relay. When the water level reaches the maximum, the pump is switched off.

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LIST OF ABBREVIATIONS

AWLS..... Automatic Water Level Switch

CHAPTER ONE INTRODUCTION

BACKGROUND

Automatic Water level controller system is designed to monitor liquid level in an overhead tank or any liquid storage system with an automatic pumping system attached to it to refill the tank once the liquid gets to the lower threshold, while switching OFF the pump once the liquid gets to the higher threshold

The Water Level Controller System is an Electronic Equipment which when electrically connected to the starter of any given pump -set motor will control the level of water thereby controlling the operation of the pump. It Switches ON the Pump-set when Water level drops below pre-set level in Overhead Tank, Switches OFF the Pump-set when Water level in Overhead Tank becomes full,

The device control the pump depending on the water level. Two float level switch sensors are used to detect upper and lower water level points. When the water level falls below the lower point, the pump is switched on through the relay. When the water level reaches the maximum, the pump is switched off.

PROBLEM STATEMENT

People forget to switch off the pump when tank is full hence water being wasted. By using this water level indicator system, we can monitor water level and consumption of water

The most obvious problem a water sensor can ward off is a water container that's too full or too empty. A water tank level sensor that shows that a tank is full can make sure that water doesn't keep filling the tank until it overflows into your home or your city.

On the other hand, a water sensor makes sure that we don't run out of water. If a container of water is getting empty, we can know that information automatically, and the system can automatically divert more water into the tank so we never run out

References

- [1] S. Pudasaini, A. Pathak, S. Dhakal, and M. Paudel, "Automatic Water Level Controller with Short Messaging Service (SMS) Notification," *Int. J. Sci. Res. Publ.*, vol. 4, no. 9, pp. 518–521, 2014.
- [2] A. A. M. Eltaieb and Z. J. Min, "Automatic Water Level Control System," *Int. J. Sci. Res.*, vol. 4, no. 12, pp. 1505–1509, 2015.
- [3] S. M. K. Reza *et al.*, "Microcontroller Based Automated Water Level Sensing and Controlling: Design and Implementation Issue," *World Congr. Eng. Computer. Sci. Vols 1 2*, vol. I, pp. 220–224, 2010.
- [4] "Ultrasonic Sensor - HC-SR04 - SEN-13959 - SparkFun Electronics."
- [5] *online*, 2014. [Online]. Available: <https://store.arduino.cc/usa/arduino-uno-rev3>. [Accessed: 22-Mar-2017].
- [6] "TAAM, Aquarium Products." [Online]. Available: http://www.riopump.net/products_pumps/Rioplus_desc.html. [Accessed: 26-Mar-2017].
- [7] "SRD-05VDC-SL-C Datasheet PDF - SRD RELAY - SONGLE." [Online].

Available: <http://www.datasheetcafe.com/srd-05vdc-sl-c- datasheet-pdf/>. [Accessed: 26-Mar-2017].

<https://oakter.com/blog/automatic-water-level-controller-tankbolt/#:~:text=They%20work%20by%20using%20sensor,water%20in%20a%20storage%20tank.&text=Fill%20start%20gets%20triggered%20automatically,the%20system%20stops%20the%20pump.>

<https://www.waterlinecontrols.com/how-does-a-float-switch-work/>

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