



American International University- Bangladesh (AIUB)
Faculty of Engineering
Engineering SHOP

Course Name	Engineering Shop	Course Code	EEE 3110	Semester	Summer 2020-21	Section	H
Faculty	SUSMITA AFROZ						
Assignment	Lab Project Report				Group No	07	

Project Title: Water Level Indicator Using 555 Timer

SL No.	Student Name	ID	Dept
1.	Khan, Nishat Tasnim	18-37044-1	CSE
2.	Modak, Gourango (Leader)	18-37102-1	CSE
3.	Boosra, S.M. Tamanna	18-37107-1	EEE
4.	Bari, SK. Tasnim	18-37201-1	CSE
5.	Rahaman, Md. Mashiur	18-37227-1	CSE

Marking Rubrics (to be filled by Faculty)

PI	Not Satisfactory (1-2)	Good (3-4)	Excellent (5)	Mark Obtained
Demonstrate Individual Skills <u>P.09.3.A5</u>	Demonstrates very little or almost no individual skills in project implementation.	Moderately demonstrates individual skills in achieving project goal.	Effectively and actively demonstrates individual skills in achieving project goal.	
Demonstrate effectiveness as a member/leader of the team <u>P.09.3.A5</u>	Works towards group goal only when prompted or with occasional prompting.	Works towards group goal without occasional prompting; accepts and fulfills individual role within group.	Consistently and actively works toward group goal; willingly accepts and fulfills individual role within group.	
			Total Marks (Out of 10)	
Manage project effectively as a member/leader <u>P.11.2.P4</u>	Failed to meet most of the individual responsibilities within given deadline.	Failed to meet a few of the individual responsibilities within given deadline.	Works willingly and effectively towards completion of project and met all individual deadlines and responsibilities.	
Demonstrate effectiveness in managing project finance as a member/leader <u>P.11.2.P4</u>	Almost no or very little contribution in project budget preparation and management.	Moderately contributes in project budget preparation and management.	Effectively and willingly contributes in project budget preparation and management.	
Comments				Total Marks (out of 10)

Water Level Indicator Using 555 Timer

Khan, Nishat Tasnim
Department of CSE
American International University -
Bangladesh
Dhaka, Bangladesh
nishat122@gmail.com

Modak, Gourango
Department of CSE
American International University -
Bangladesh
Dhaka, Bangladesh
modak678@gmail.com

Boosra, S.M. Tamanna
Department of EEE
American International University -
Bangladesh
Dhaka, Bangladesh
tamanna66@gmail.com

Bari, SK. Tasnim
Department of CSE
American International University -
Bangladesh
Dhaka, Bangladesh
tasnim33@gmail.com

Rahaman, Md. Mashiur
Department of CSE
American International University -
Bangladesh
Dhaka, Bangladesh
mashiur99@gmail.com

Abstract— This is a simple circuit project for water level indicator with alarm. This circuit help us measure the water level as it is cross the danger level. The 555 timer use as an oscillation purpose. For how much frequency it generate. When the water level rises to the height of the probes, then the 555 circuit will get enabled and the output of the 555 timer produces a square wave output with a frequency of about 62 Hz. This output is given to the buzzer.

Keywords- NE555Timer, Resistor, Capacitor, Buzzer.

I. INTRODUCTION

A Water Level Indicator is defined as a system by which we can get the information of any water reservoir. Water level indicator system is quite useful to reduce the wastage of water from any reservoir, while filling such reservoir. Water is most essential thing on earth. Safe drinking water is essential to human and other life forms even though it provides no calories or organic nutrients.

This project of ours is used as water level indicator. We can use this water level indicator to find out the amount of water in tank of the house, different places and the river side area. Advantages of the proposed water level controller are, very less maintenance, very low cost, very simple construction and the circuit involved is also relatively simpler. It can be easily made at home.

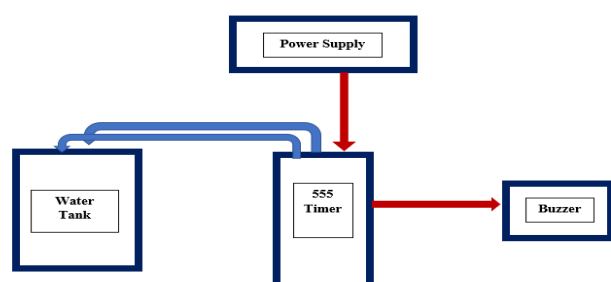


Fig. 1: Block diagram of Water Level Indicator Using 555 Timer.

II. THEORY AND METHODOLOGY :

The circuit is designed using NE555 Timer, four Resistor, Capacitor and Buzzer. The output can be seen by beep at the buzzer.

1. 555 Timer

The 555 timer is an integrated circuit that can be used to make timers, pulse generators, and oscillators. The 555 can be used as a timer, oscillator, and flip-flop element. In this project the circuit uses a 555 timer in astable mode.



Fig. 2: NE555 Timer (IC)

2. Resistor

A resistor is an electronic component that resists the flow of electrons in a circuit. A resistor restricts current flow in one of three ways: first, by employing a less conductive material, second, by making the conductive material thinner, and third, by making the conductive material longer. In this project, the circuit uses three values with different values. They are, R1, R4- 1k Ω , R2- 22k Ω and R3- 570 Ω .



Fig. 3: Resistor

3. Capacitor

A capacitor is an electrical component that absorbs and stores energy from a battery. The terminals are connected to two metal plates on the inside, which are separated by a non-conducting material. When a capacitor is engaged, it swiftly releases electricity in a fraction of a second. In this project, the circuit uses $1\mu\text{F}$.



Fig.4: Capacitor

4. Buzzer

The buzzer's current causes the ceramic disk to compress or expand, causing the surrounding disc to vibrate. That's the sound we hear from a circuit. The speed of the vibrations changes as the frequency of the buzzer changes, changing the pitch of the resulting sound. In this project, circuit uses a buzzer and the output can be seen by beep at the buzzer.



Fig. 5: Buzzer

III. WORKING PRINCIPLE

The two probes which are shown in the circuit should be kept at the high level for the water. The distance between the probes should be less than a few centimeters to ensure that the conduction between the probes will take place when water is touched to these probes.

When the water level rises to the height of the probes, then the 555 circuit will get enabled and the output of the 555 timer produces a square wave output with a frequency of about 62 Hz. This output is given to the buzzer. The logic Implemented in this circuit is, 555 timer is enabled when its reset pin is connected to logic high. But initially it is connected to ground. When the water level is maximum this pin is enabled and this drives the 555 timer into a stable mode.

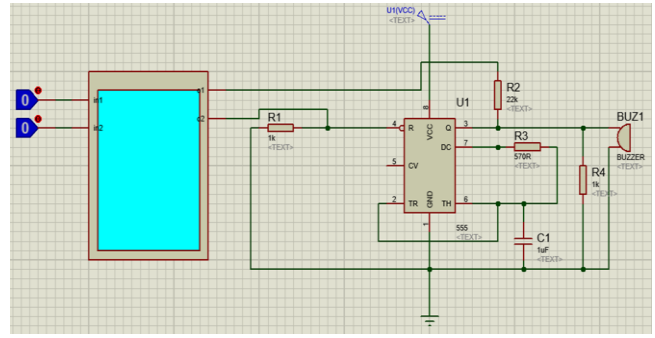


Fig. 6: Schematic Diagram

In Fig. 6, 555 timer pin 1 is connected to the ground. Pin 2 and Pin 6 are shorted and connected to pin 7 through 570 Ohm resistor. An electrolytic capacitor of $1\mu\text{F}$ is connected to pin 6 and Ground. Pin 3 is connected to the buzzer's positive terminal, and the buzzer's negative terminal is connected to the ground. Pin 4 is grounded through a 1K Ohm resistor and also another connection goes second probe in the water tank. VCC (supply voltage) is connected to pin 7 through a 22K Ohm resistor and also it is connected with the highest probe in the water tank. Pin 8 is connected to VCC.

IV. RESULT ANALYSIS

The automatic water level controller has been successfully designed and developed. The buzzer will be triggered according to the water levels. Compared to other conventional methods, the automatic water level controller shows excellent performance with its reliable technology and it is cheaper and durable. The automatic water level controller is a promising controller in terms of system response in water level control with respect to the non-linearity introduced by pumps and sensors. The experimental model was made according to the circuit diagram and the results were as expected. When the water level rises to the height of the probes, then the 555 circuit will get enabled and the output of the 555 timer produces a square wave output with a frequency of about 62 Hz. This output is given to the buzzer. The result is shown in Fig. 8. On the other hand, when the water level doesn't rise to the height of the probes, in that case the buzzer won't be triggered as a result there will be no output voltage in buzzer which is shown in Fig. 7.

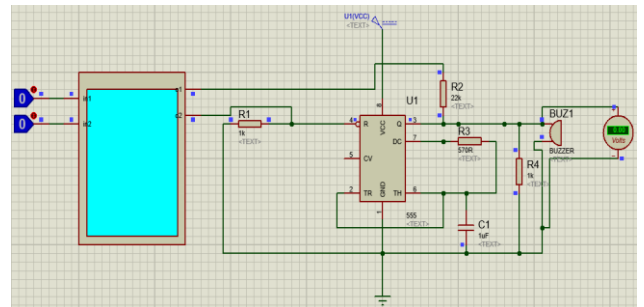


Fig. 7: Initial state when the water level doesn't rise to the height of the probes.

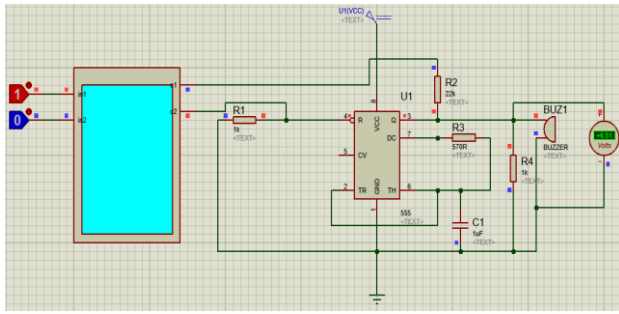


Fig. 8: Final state when the water level rises to the height of the probes.

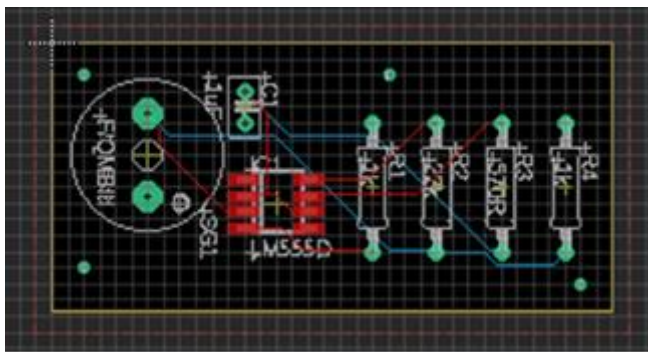


Fig. 9: PCB layout design of Water Level Indicator Using 555 Timer.

V. COST ESTIMATE:

Sl No.	Components	Approx. Unit Price (BDT)	Quantity	Total Price (BDT)
1	Resistor	0.385	4	1.532
2	LM555 Timer	25	1	25
3	Capacitor	5	1	5
4	Buzzer	15	1	15
5	Breadboard	100	1	100

VI. GANTT CHART

Progress/Task	7-13 June 2021	13-30 June 2021	1-15 July 2021	16-25 July 2021	25-31 July 2021	1-10 August 2021
Topic Selection						
Circuit Selection						
Simulation						
PCB Design						
Manufacturing Cost						
Testing						
Project Presentation						

VII. APPLICATIONS

Water level Indicator Can be used to measure underground storage of water. Water level Indicator works to maintain a constant water level. Buzzer starts ringing as soon as tank becomes full. It helps to check overflow and wastage of water by warning the person when the tank is about to brim. It can also be used to calculate incoming and outgoing water in large reservoirs. It is used to predict the arrival of floods.

VIII. FUTURE WORK

In future, we want upgrade this circuit with some sensor which can automatically stop the power supply of the driving pump or motor. As a result, the future circuit is not very cheaper the present one, but we try our best to

- Made it simple,
- Easy to use,
- Easy to install,
- To make Available for all,
- Try to smaller than the present one.
-

As a result, it can available

IX. LIMITATION

A project has its own set of limitations. This project is not an exception to the rule. As a developing project, it will have some limitations.

- Water level controls need to be replaced every 3 years.
- The rust, foul and deteriorate.
- Electronics are usually built separately.
- More difficult installation.
- Most float switches are outdated.
- No LED indicator lights.
- No Warranty or Guarantee.

X. JUSTIFICATION & CONCLUSION

Now a days Water tanks are filled through electrical pumps. 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 situation, we can have an electronic water level controller which can monitor the water level. We can check the natural disaster like flood is happening or not by monitoring the water level of River or canal. So this circuit is very simple but useful in our daily life.

XI. ACKNOWLEDGEMENT

At first, we are very grateful to our Almighty God for blessings to complete this report. We would like to express our gratefulness to our course teacher SUSMITA AFROZ, Faculty of American International University –Bangladesh for motivation and encouragement that lead me to the process of fulfilling my report.

As, we are working as a group. I would like to thank all of my group members who directly or indirectly, have given their hands to help this report.

XII. REFERENCES

- [1] "Water Level Indicator | What, How, Where, Types, Benefits," 29 May 2019. [Online]. Available: <https://waterlevelcontrols.com/water-level-indicator/>.
- [2] "Simple Water Level Indicator with Alarm (Tested Circuits)," 14 March 2017. [Online]. Available: <https://www.electronicshub.org/water-level-alarm-using-555-timer/>.
- [3] D. K. U. B. Ravi Shankar Kumar, "Automatic Water Level Controller Using 555 Timer," Assam, May, 2015.
- [4] B. B. S. D. P. B. D. P. M. S. P. Dipanjan Rakshit, "Water Level Indicator," *International Journal of Scientific & Engineering Research*, vol. 7, no. 4, pp. 7-10, April, 2016 .