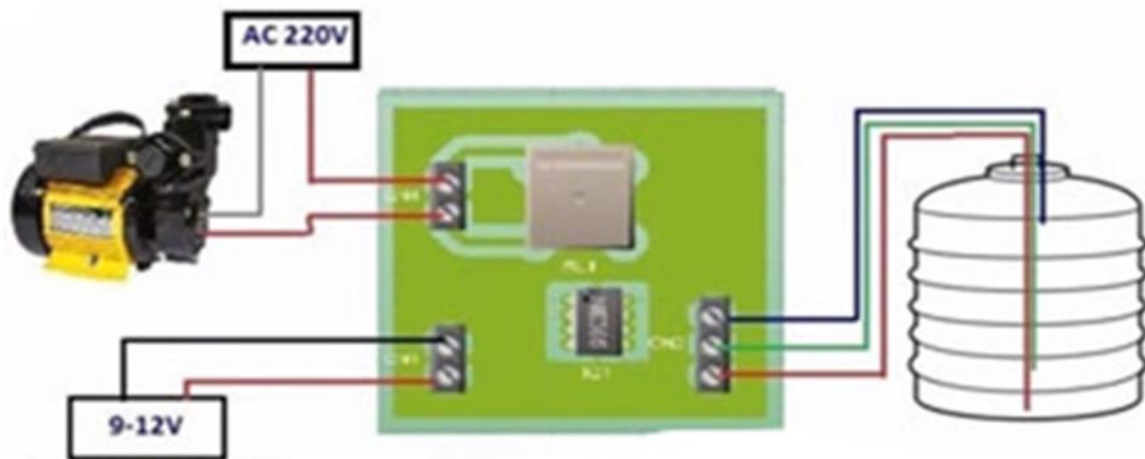




**COMSATS UNIVERSITY ISLAMABAD**  
**ATTOCK CAMPUS**



# Water Pump Controller

PROJECT SUMMARY

*Academic Year 2022*

Department: Computer Engineering

Subject: Digital Logic Design

Subject Teacher : Sir Dr. Zohaib

Lab Teacher; Sir Abbas Ali Shah

Name of Students: Syed Yousaf Shah

&

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## **Project selection;**

We choose this project because Water level controller is a device that manages water levels on a variety of systems such as water tanks, pumps and swimming pools. The basic function of a water level controller is to regulate water flow and optimize system performance. It can save time and energy. Not just electrical energy but also reduce human efforts .

## **Logic Required & Choosing Components;**

We put our logic in truth table in which two levels of over head tank are considered as an input and on the basis of their status we will decide whether the pump will be ON or OFF.

High	Low	Pump
0	0	1
0	1	1
1	0	invalid
1	1	0

- By looking at the truth table we were required to use flip-flop circuit , so ne555 timer ic in bistable mode works as a flip-flop circuit.
- To control high voltage pump to turn ON or OFF we choose relay that can switch ON/OFF the water pump on the basis of electrical signal it gets.
- Transistor was required to work as an electronic switch to create magnetic effect

of coil inside the relay.

- Capacitor was choosen at the Ctrl pin to remove noise and neglect RAW input
- Resistors were choosen to obtained desired voltage
- LED were choosen as an indicators

1. Ne555 timer ic
2. Bc 547 transistor
3. Resistors
4. 2 leds
5. 12 v relay
6. 0.1micro farad capacitor
7. Breadboard
8. Connecting wires

## **Working;**

In NE555 Timer the output will increase when the power of the second pin (trigger pin) is not more than  $\frac{1}{3}$  V DC. We can also reset the IC using low voltage to 4th pinout (reset pins).For this particular project you will find 3 wires attached to a water tank. We will specify two levels – Low (Low) and High (High) Water Levels. One of the anchors for the investigation or for Vcc.

The Lower level is connected to NE555 trigger pin 2. Therefore, the Voltage across the second pin is Vcc while in the water. As the water level decreases, a second probe is drawn from the water force, and the trigger pin will becomes below the Vcc. Then the output of 555 goes up.

Pin 6 (Highlevel)	Pin 2 (low level)	R	S	Q'	(Q')'	pump
low	low	low	high	low	high	on
low	high	low	low	low	high	on
high	high	high	low	high	low	off
high	low	high	high	invalid	invalid	invalid

The output of 555 is connected on a BC547 transistor, activating the transmission coil and water pump will be turned on. When the water level rises, a high-level probe is placed in the water and the transistor shuts down. The collecting power is  $V_{CE}(\text{sat}) = 0.2$ . Low power in 4th pinout resets IC. Therefore, the output of 555 turns 0V. So the Motor is turned off..

(Truth table of how circuit works)

## **Problems Faced;**

These were some of the major problems faced while making this project .Faulty components initially we designed a proper circuit but due to faulty Components it was not working and Understanding connectivity and Working of ne555 IC and relays .

