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# Arduino Based Water Level Indicator

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**Abstract:** *We live in a world which is moving at such a fast pace that everything if automated will help us to keep our lives going. The project on water level Indicator will help us to know when the water in our tanks is either full or empty and automatically switch on and off the pump as and when necessary. By using the basic principle of ultrasonic sensors, i.e. the ECHO method, we calculate the time of the ultrasonic waves travelling to and for and after a few calculations the answer obtained will be the water level in the tank. By using the concept, the water pump is switched on or off automatically when the water level falls below a certain level.*

**Keywords:** Indicator, Arduino water level

## I. INTRODUCTION

In relation with the current framework with so much work and too less time to spare, it is very difficult to keep in touch with the water level in the tanks. Water is essential in every hour of our lives. Hardly anyone keeps in track of the level of water in the overhead tanks. The objective of the project is to measure the level of water in the tank and notify the user about the water level through an SMS alert. This not only helps to keep the tank full but also making it more convenient for our day-to-day chores and also avoiding water wastage. In this project, the water is being measured by using ultrasonic sensors. Initially, the tank is considered to be empty. When the sound waves are transmitted in the environment, they are reflected back as ECHO. This same concept is applied this project. Waves generated by the ultrasonic sensors is sent to the water tank and their time of travelling and coming back is noted and after few calculations we can estimate the level of water in the tank. The motor pump is automatically turned ON when the water level becomes low and turned OFF when the tank is full. These alerts are sent as notifications in our phones through the GSM Module.

## II. LITERATURE SURVEY

This paper has an implemented Automatic water level control system consisted of Arduino to automate the process of water pumping in a tank and has the ability to detect the level of water in a tank and switches ON or OFF the pump accordingly and displays the status on the LCD screen. The system also monitors the level of water in the sump tank (source tank). If the level inside the sump tank is low, the pump will not be switched ON and this protects the motor from dry running. A beep sound is generated when the level in the sump tank is low or if there is any fault with the sensors. This paper has developed a system which initially tests the availability of water in the tank with the help of a level detector and then adjusts the state of the water pump according to the information collected through the level detector. This design makes use of seven segment display and a motor pump. The proposed system consists of water level sensor and a digital logic processor circuit. The proposed system eliminates manually controlling of water requirements in home and agricultural fields. This paper introduced a system which proposes a simple water level monitoring system with different levels indicated. It also signifies when the water level is below and above than the requirement. This method helped us to understand the use of Bluetooth modules and how it can be made as a portable device. This paper introduced a system which measures water level by using ultrasonic sensors. The system makes use of water level indicator, water level sensor, water pump controlling system and microcontroller. Ultrasonic sensor gets water level reading and it will send a signal to microcontroller and starts to echo the pulses .The system used microcontroller to automate the process of water pumping in an over-head tank storage system and has the ability to detect the level of water in a tank, switch on/off the pump accordingly, and display the status on an LCD screen. This

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research has successfully provided an improvement on the existing water level controllers by its use of calibrated circuit to indicate the water level and use of DC instead of AC power thereby eliminating risk of electrocution.

**Objective**

The following objectives are likely to be focused and achieved at the end of the project.

1) To make the most commercial and reliable water level controller using as less resources as possible.
2) To study the controller model and observe its characteristics.
3) To compare the controller with the conventional controllers available in market
4) To propose any ideas or improvements that can lead to future development of the controller.

## III. BLOCK DIAGRAM

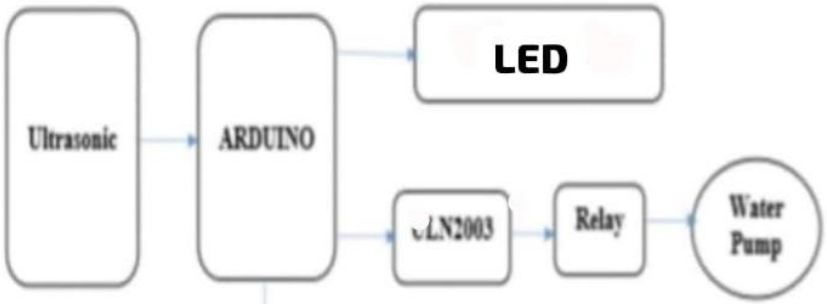
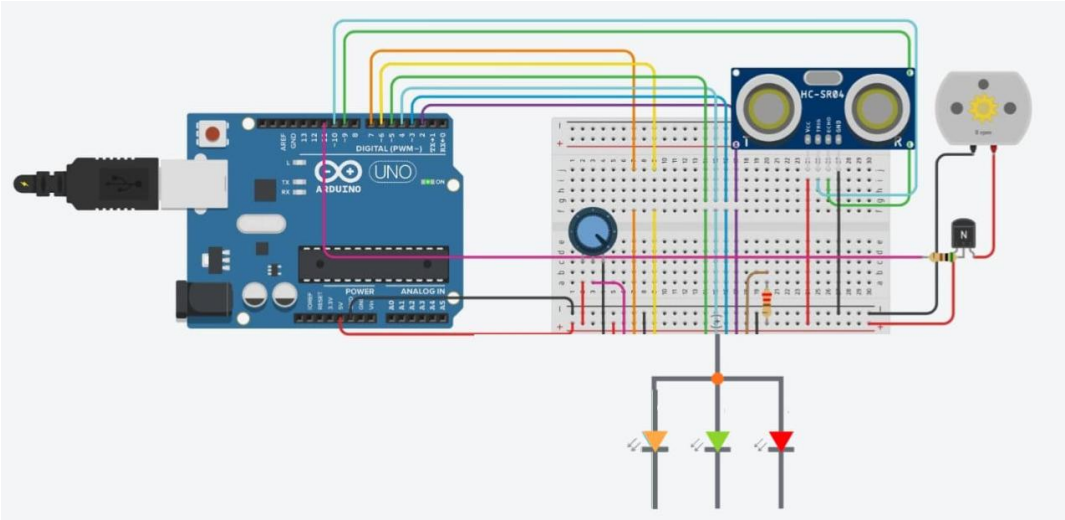



Figure: Block Diagram

Following is the schematic diagram for Water Level Indicator:

## SCHEMATIC DIAGRAM



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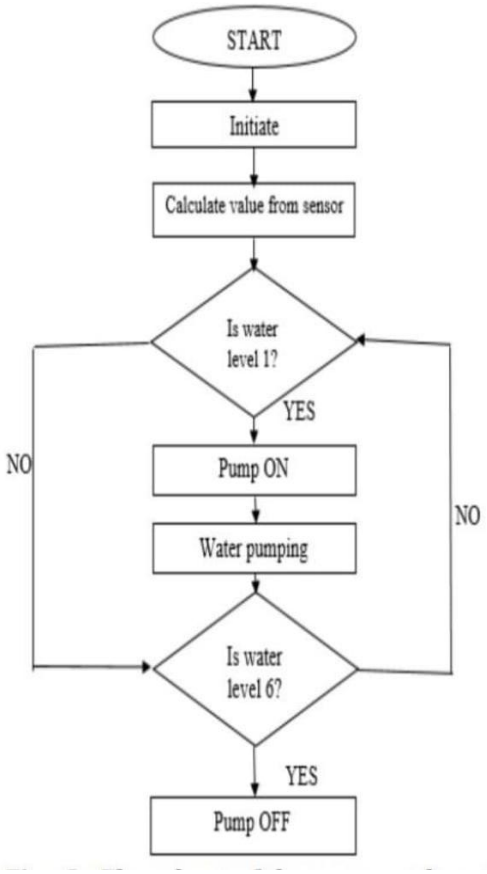
FLOWCHART:




**ALGORITHM:**

```
#include <LiquidCrystal.h>
#define ECHO 9
#define TRIGGER 10
#define TRIGGER_pulse 1
#define motor 11
int DURATION;
float DISTANCE;
float DIST;
float LED;
LiquidCrystal lcd(7, 6, 5, 4, 3, 2);
int num=1;
void setup() {
// set up the LCD's number of columns and rows:
pinMode(TRIGGER, OUTPUT);
pinMode(ECHO, INPUT);
pinMode(motor, OUTPUT);
Serial.begin(9600);
lcd.begin(16, 2);
lcd.print("LevelApprox: ");
```

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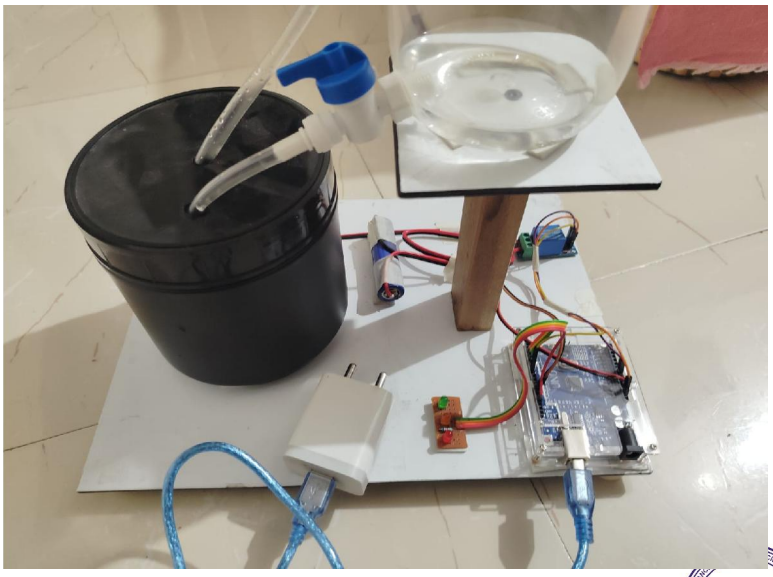
```
//lcd.setCursor(0,1);
//lcd.print(" :");
}
void loop() {
digitalWrite(TRIGGER, HIGH);
delay(TRIGGER_pulse);
digitalWrite(TRIGGER, LOW);
//see how long it takes to receive the response pulse
DURATION = pulseIn(ECHO,HIGH);
//Distance in centimeters
DISTANCE = 0.01716*DURACION;
//LED=((100-DISTANCE)/100)*255;
DIST = 1.25*DISTANCE;
Serial.println(DISTANCE);
if(DIST <= 40){
digitalWrite(11,LOW);
lcd.setCursor(0,1);
lcd.print(" ");
}
if(DIST >=100){
digitalWrite(11,HIGH);
lcd.setCursor(0,1);
lcd.print("Water Filling");
}
lcd.setCursor(12, 0);
lcd.print(int(DIST));
delay(1000);
lcd.setCursor(12,0);
lcd.print(" ");
}
```

Arrangement of project work



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## IV. 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 the present one, but we try our best to

* Make 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

## V. APPLICATION

Water level Indicator can be used in Hotels, Factories, Homes, Apartments, Commercial complexes, Drainage, etc. It can be fixed for single phase motor, three phase motors, fuel level indicator in vehicles .liquid level indicator in the huge container companies on the tank walls.

## VI. CONCLUSION

The Arduino based water level indicator using an ultrasonic sensor provides an effective and reliable solution for monitoring water levels in various applications, such as water tanks, reservoirs, or even industrial processes. By utilizing an ultrasonic sensor, the system measures the distance from the sensor to the water surface, and based on this measurement, it can accurately determine the water level. The Arduino processes this data and can trigger visual indicators (such as LEDs) or even alerts (like alarms or notifications) when the water level reaches predefined thresholds. In conclusion, this project offers a cost-effective and efficient means of real-time water level monitoring, which can prevent overflow or dry running of pumps, ensuring better management of water resources. It also highlights the versatility of Arduino and ultrasonic sensors in creating automated, scalable solutions for everyday problems. This setup can be expanded further with additional features like wireless monitoring, integration with IoT systems, or remote-control functionalities, making it a valuable addition to modern smart water management systems.