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Accredited 'A' Grade by NAAC



# **“WIRELESS WATER LEVEL CONTROLLING AND MANGEMENT SYSTEM”**

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# Introduction :-

- Wireless Water level controlling and management system introduces an IoT enabled **gadget** which helps in administering and monitoring the consumption of water in multiple buildings simultaneously.
- This module can be effortlessly fixed onto desired water containers and carry on for long run.
- The Ultrasonic sensor is placed on the top of tank which continuously keeps track of the water level in real time, which will inform the users about the level of liquid and automatically turn on/off the water pump as per the defined functions.
- This figure will be regularly revised on the website, so that the user can analyze the amount of water usage and thus, control the wastage.
- According to the level of water in the tank, the motor functioning is automatically controlled.
- When the surface level drops below the threshold measure, the motor will be again switched on impulsively.

# Objectives :-

The main aim of this system is to monitor the water level at rural areas so that they help in detecting the wastage of water and measures can be taken to avoid unnecessary overflowing of water in the areas where monitoring is a difficult task.

1. To study interfacing sensor NodeMCU.
2. To implement a Wi-Fi module.
3. To achieve greater flexibility by using Wi-fi technology.

# COMPONENTS:-

- Ultrasonic sensor
- LCD 16\*2
- Electric Motor Pump
- Relay
- Jumper wires
- NodeMCU
- I2C module

# SPECIFICATIONS ----

## 1.SYSTEM SPECIFICATONS

Input voltage to system : 230 V

Input frequency to system : 50 Hz

Operating range of the ultrasonic sensor : 20cm 3.2.2 INPUT OUTPUT SPECIFICATIONS I

Input specifications : Power supply 5V to 12V

Output specifications: The wireless water level system can control the following

1. It indicates the level of water in both tanks using ultrasonic sensor.
2. LCD displays the exact level of water and motor turning on/off.
3. Use of IOT based app for controlling the motor.
4. NodeMCU connected to the app/cloud via Wi-Fi for controlling the relay.

# HARDWARE SPECIFICATIONS

## **1. NODEMCU :**

NodeMCU is an open source firmware for which open source prototyping board designs are available.

The name "NodeMCU" combines "node" and "MCU" (micro-controller unit).

The term "NodeMCU" strictly speaking refers to the firmware rather than the associate.

Both firmware and prototyping board designs open source .

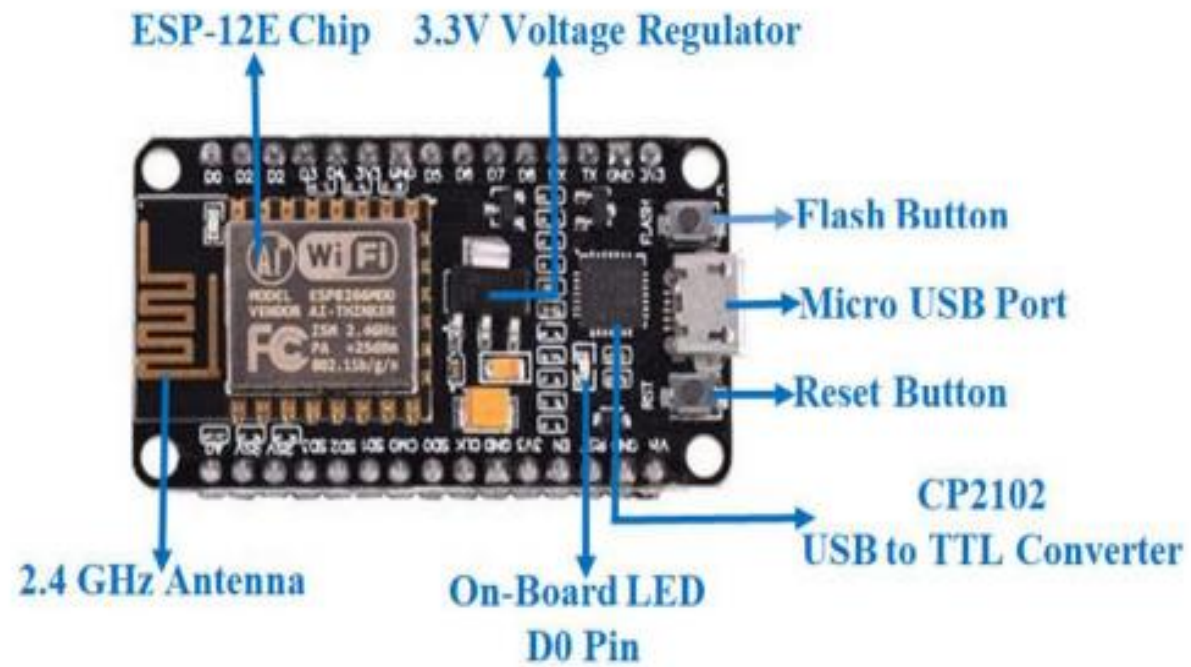


Fig. (1) NodeMCU

## **NodeMCU ESP8266 Specifications & Features:**

Microcontroller: Tensilica 32-bit RISC CPU Xtensa LX106

Operating Voltage: 3.3V

Input Voltage: 7-12V

Digital I/O Pins (DIO): 16

Analog Input Pins (ADC): 1

UARTs: 1

SPIs: 1

I2Cs: 1

Flash Memory: 4 MB

SRAM: 64 KB

Clock Speed: 80 MHz

USB-TTL based on CP2102 is included onboard, Enabling Plug n Play

PCB Antenna

Small Sized module to fit smartly inside your IoT project.



## 2. RELAY :

- A power relay module is an electrical switch that is operated by an electromagnet. The electromagnet is activated by a separate low-power signal from a micro controller.
- When activated, the electromagnet pulls to either open or close an electrical circuit.

Fig. (2)

Single-Channel Relay Module Specifications:

Supply voltage – 3.75V to 6V

Quiescent current: 2mA

Current when the relay is active: ~70mA

Relay maximum contact voltage – 250VAC or 30V DC

Relay maximum current – 10A.

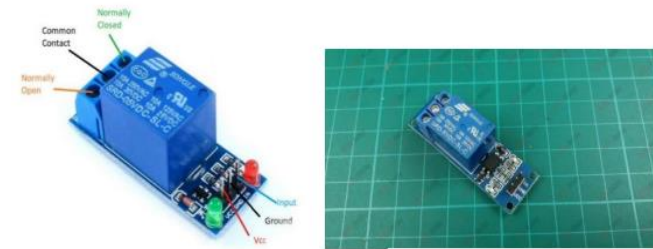


Fig. (2) Relay

### **3. ULTRASONIC SENSOR :**

- An ultrasonic sensor is an instrument that measures the distance to an object using ultrasonic sound waves.
- An ultrasonic sensor uses a transducer to send and receive ultrasonic pulses that relay back information about an object's proximity.
- High-frequency sound waves reflect from boundaries to produce distinct echo pattern.
- The HC-SR04 ultrasonic sensor uses sonar to determine the distance to an object. This sensor reads from 2cm to 400cm (0.8inch to 157inch) with an accuracy of 0.3cm (0.1inches), which is good for most hobbyist projects. In addition, this particular module comes with ultrasonic transmitter and receiver modules.

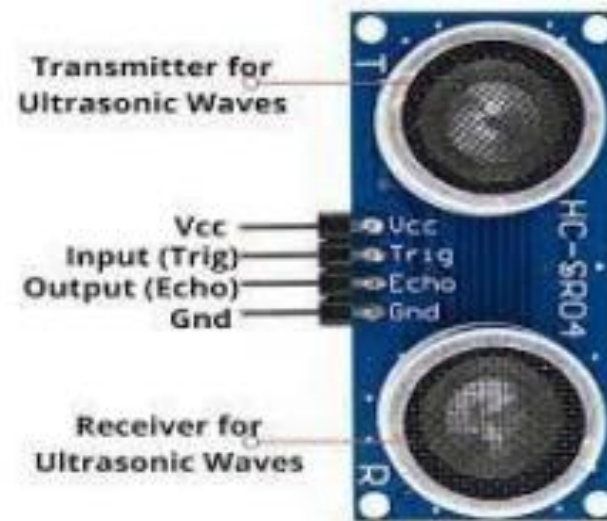
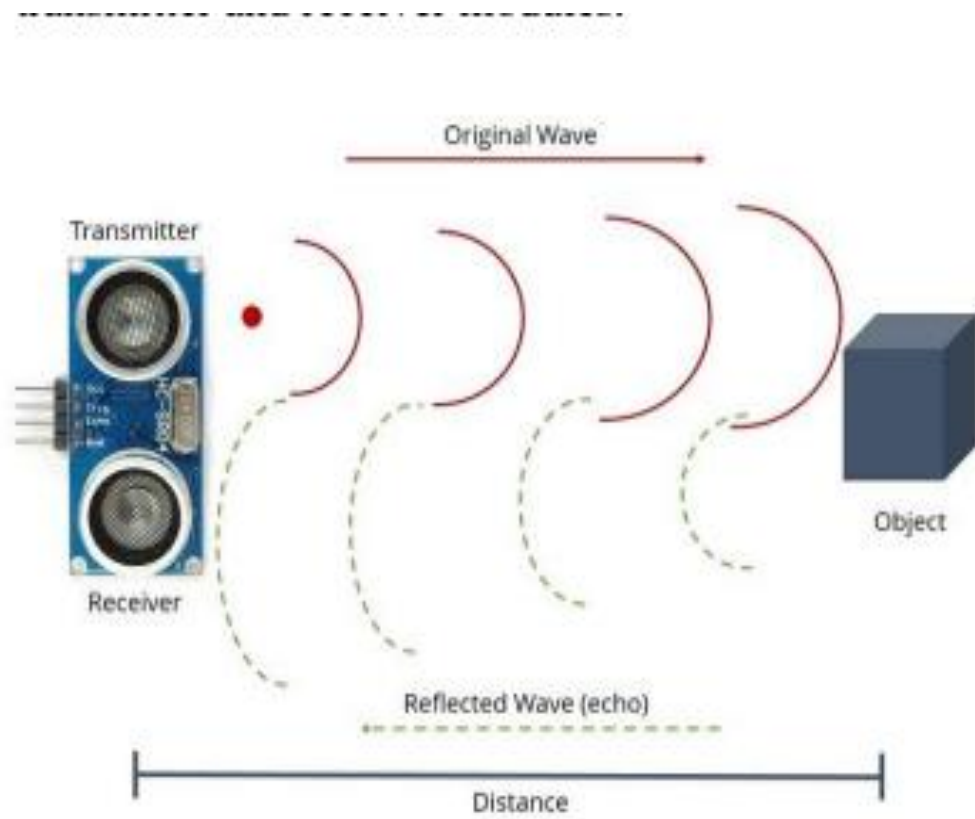


Fig. (3) Ultrasonic sensor

## Specifications:

1. Power Supply: DC 5V
2. Working Current: 15mA
3. Working Frequency: 40Hz
4. Ranging Distance: 2cm – 400cm/4m
1. Resolution: 0.3 cm
6. Measuring Angle: 15 degree
7. Trigger Input Pulse width: 10uS
8. Echo output signal: TTL pulse proportional to the distance range
9. Dimension: 45mm x 20mm x 15mm

## 4. LCD DISPLAY :

❓ The term LCD stands for liquid crystal display. It is one kind of electronic display module used in an extensive range of applications like various circuits & devices like mobile phones, calculators, computers, TV sets, etc.

❓ These displays are mainly preferred for multi-segment light-emitting diodes and seven segments. The main benefits of using this module are inexpensive; simply programmable, animations, and there are no limitations for displaying custom characters, special and even animations, etc .



Fig. (4) LCD Display

## 5. DC MOTOR :

- A DC motor is any of a class of rotary electrical motors that converts direct current electrical energy into mechanical energy.
- The most common types rely on the forces produced by magnetic fields. Nearly all types of DC motors have some internal mechanism, either electromechanical or electronic, to periodically change the direction of current in part of the motor.
- The term 'DC motor' is used to refer from small motors in toys and appliances to large mechanisms that power vehicles, pull elevators and hoists, and drive steel rolling mills.
- DC motors include two key components: a stator and an armature. The stator is the stationary part of a motor, while the armature rotates. In a DC motor, the stator provides a rotating magnetic field that drives the armature to rotate .



Fig. (5) Electric Motor

**List of DC motor parameters :**

<b>PARAMETER</b>	<b>VALUE</b>	<b>UNIT</b>
Input voltage	12	V
Speed	26	Rpm
Torque	588	mNm
Weight	160	G
Power	1.1	W

Diameter	37	mm
Length	27	mm

## 6. JUMPER WIRES :

A jump wire (also known as jumper, jumper wire, jumper cable, DuPont wire or cable) is an electrical wire, or group of them in a cable, with a connector or pin at each end (or sometimes without them – simply "tinned"), which is normally used to interconnect the components of a breadboard or other prototype or test circuit, internally or with other equipment or components, without soldering. Each cable length about 20cm or 8-inch. The male ends meant for insertion into standard 0.1 inch (2.54mm) female sockets and the female ends are meant for insertion onto standard 0.1 inch (2.54mm) male headers. The cables can be separated to form an assembly containing the number of wires you require for your connection and to support non-standard odd-spaced headers.



Fig. (6) Jumper Wires



## **SOFTWARE SPECIFICATIONS :**

- ❖ Blynk App
- ❖ Embedded C Language
- ❖ Arduino IDE for coding

# BLOCK DIAGRAM :-

## METHDOLOGY

### 4.1 BLOCK DIAGRAM

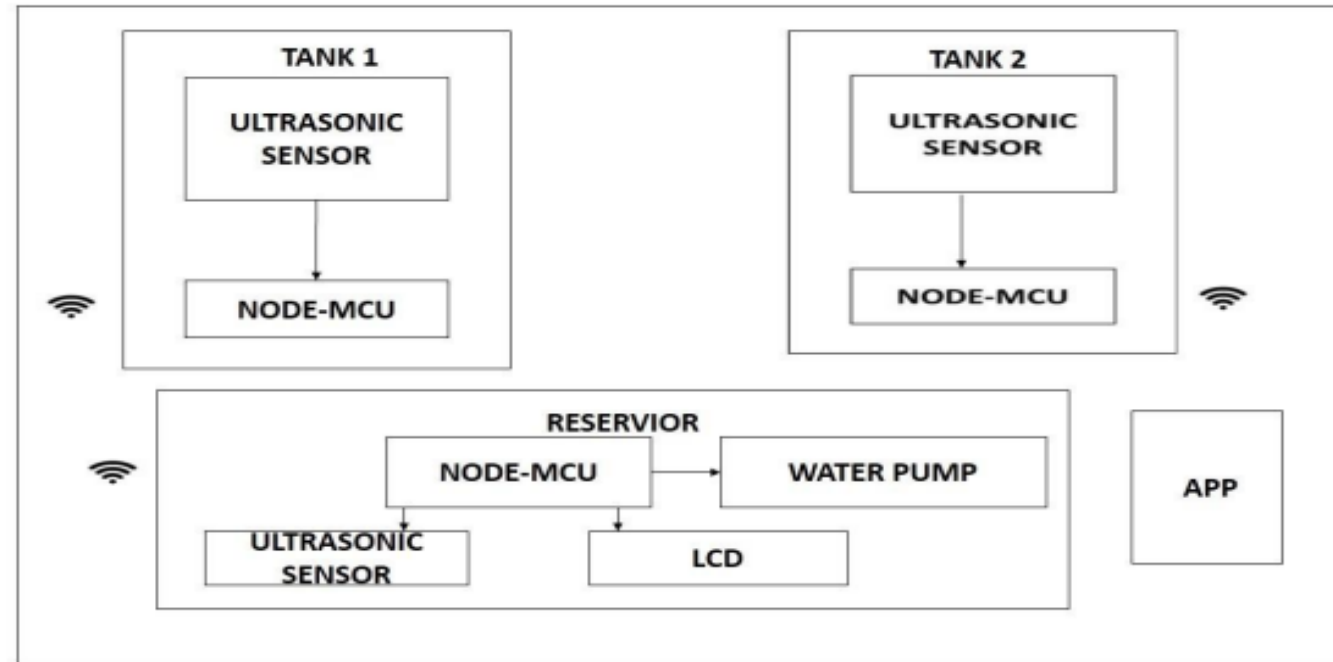


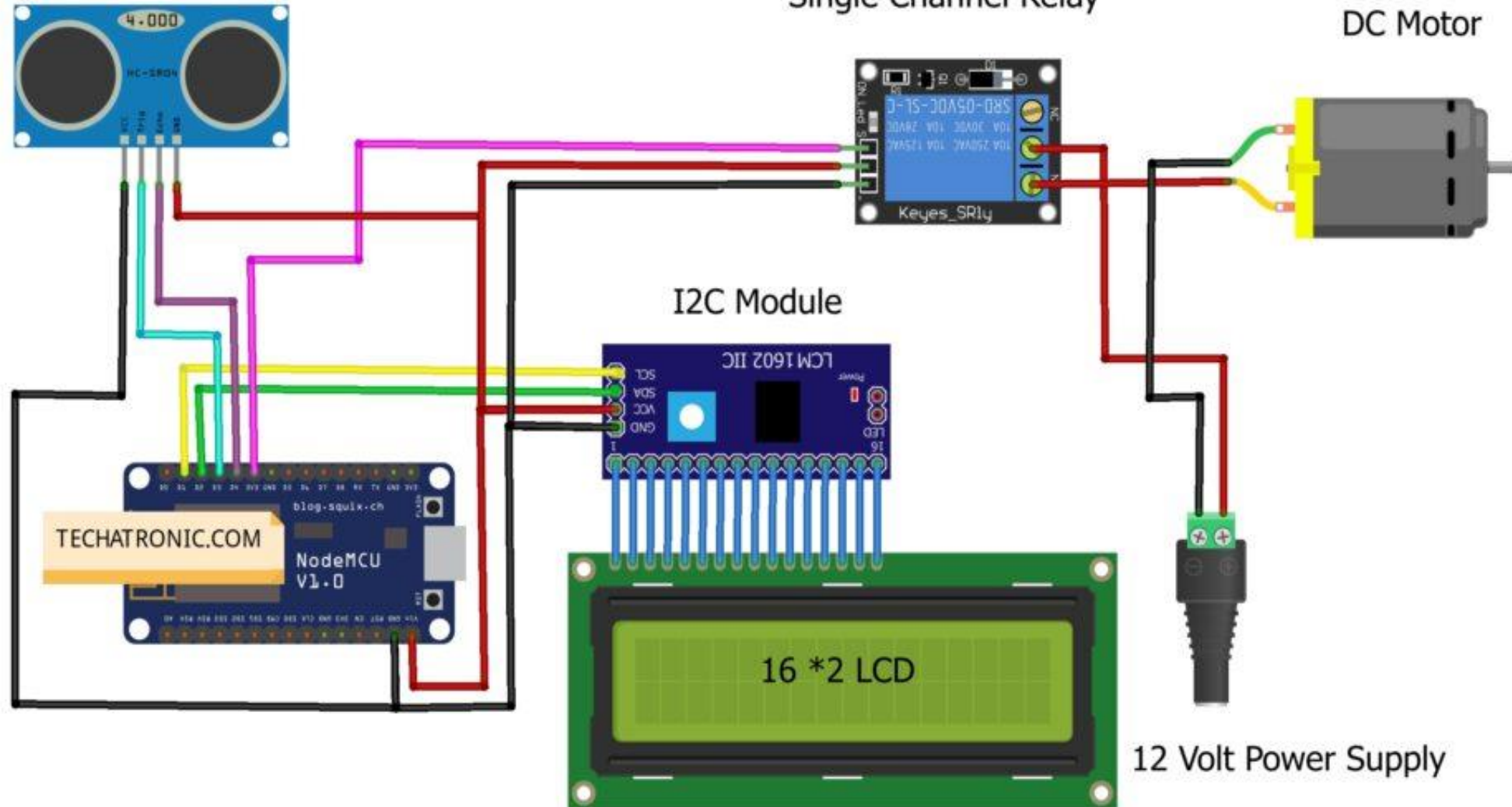
Fig. (7) System Block Diagram

# CIRCUIT DIAGRAM :-

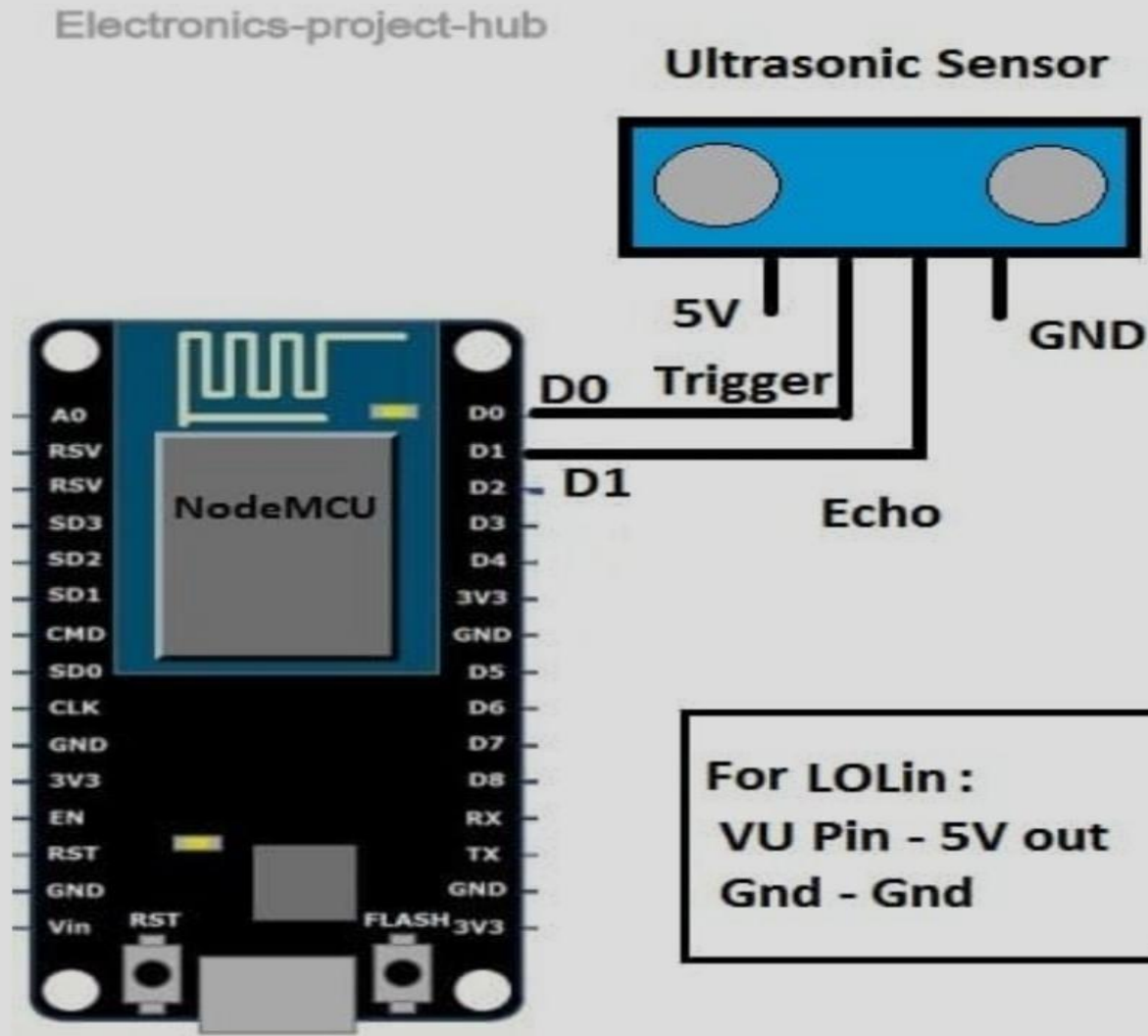
HC-SR04 Ultrasonic1

Single Channel Relay

DC Motor



## Circuit diagram:



Ultrasonic Sensor with NodeMCU

# Applications :-

- Can help avoid seepage of roofs and walls due to tanks overflowing.
- Automatic operation saves you manual labour time.
- Consumes a little energy, perfect for on-going operations.
- Detect and fix wasteful leaks with flow monitoring.
- **Smart irrigation**

# CONCLUSION :-

- The preferred execution might be usable for wide-ranging monitoring of water resource, like in considerable firms and communities.
- The system proposed in this paper is an efficient, inexpensive IoT solution for real-time water quality monitoring. The developed system having NodeMCU target board is interfaced with several sensors successfully. An efficient algorithm is developed in real-time, to track water quality.
- This paper has presented the principal intentions. Furthermore, this involved in scheming and maturing of an automatic water level controllable system exposing the fitter way of information processing architecture that interpenetrates for the interfacing scheme.
- In a nutshell, the system has proved its worth by delivering accurate and consistent data throughout the testing period and with the added feature of incorporating
- IoT platforms for real time water monitoring, this should be an excellent contender in real time water monitoring solutions

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**THANK**



**YOU**

