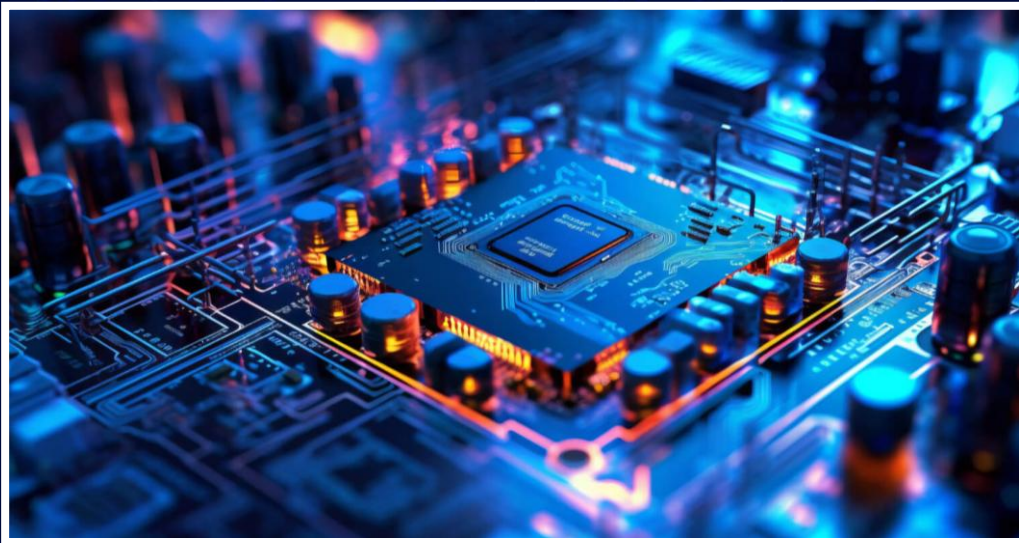


EE443: Mini Project

Topic: Implementation of a Compact Tank Water Level Measuring System



Supervised by:

- Dr. Bidhan Pramanick

Team Members:

- Hasitha Varshini Thatikayala (2104235)
- Utsav Bansal (2104236)
- Vinod Kumar (2104241)

Introduction

1.1 Project Title:

Implementation of compact tank water level measuring system

1.2 Project Statement Description:

A tank water level measuring system has already been developed and demonstrated. However, this system needs to be designed in a compact form. Students should have idea about IoT and cad design.

1.3 Our Plans:

Overview

The project aims to design and implement an automated water level measuring system comprising two primary devices: a **Water Level Sensor Device** and an **Alert & Control Device**. This system will allow users to monitor and manage water levels in a tank with enhanced convenience and automation. The project also includes a mobile app for remote control and monitoring.

System Components:

1. Water Level Sensor Device:

- **Placement:** This device will be placed inside the water tank.
- **Functionality:** The device will continuously measure the water level inside the tank using appropriate sensors (e.g., ultrasonic sensors). It will transmit the real-time water level readings wirelessly to the Alert & Control Device.

2. Alert & Control Device:

- **Functionality:**
 - **LED Indicators:** LEDs will provide a visual indication of the water level. Different colors or patterns may represent different levels (e.g., green for safe levels, red for empty).
 - **Buzzers** Audible alerts will be triggered when the water level reaches a critical point, such as when the tank is full, to prevent overflow.
 - **LCD Screen:** The current water level will be displayed on an LCD screen, providing a clear and continuous update to the user.
 - **Water Pump Control:**
 - **Manual Mode:** Users can manually turn the water pump on or off using physical buttons on the device.
 - **Automatic Mode:** The device will automatically control the water pump based on predefined water level thresholds, turning it on when the water level is low and off when the tank is full.

- **Connectivity:** The device will be capable of receiving water level data from the Water Level Sensor Device wirelessly. It will also connect to a mobile app for remote control and monitoring.

3. Mobile Application:

- **Functionality:**

- **Remote Monitoring:** Users can view the current water level and system status through the app.
- **Remote Control:** The app will allow users to control the water pump, switching between manual and automatic modes.
- **Notifications:** The app will send alerts when the tank is full or when there are significant changes in the water level.

Operation Modes:

1. Manual Mode:

- The user can manually control the water pump using either the physical buttons on the Alert & Control Device or through the mobile app.

2. Automatic Mode:

- The system will autonomously manage the water pump based on the water level, ensuring the tank is filled efficiently without overflow.

Implementation Considerations:

- **Sensor Selection:** The choice of water level sensor (e.g., ultrasonic, float, or capacitive) will be critical to ensure accurate and reliable measurements.
- **Wireless Communication:** The system will likely employ Wi-Fi, or RF modules to facilitate communication between the Water Level Sensor Device and the Alert & Control Device.
- **Power Supply:** Both devices will require a stable power supply, and backup power solutions may be considered to ensure continuous operation.
- **Mobile App Development:** The app will be developed to be user-friendly, with a focus on seamless connectivity and real-time updates.

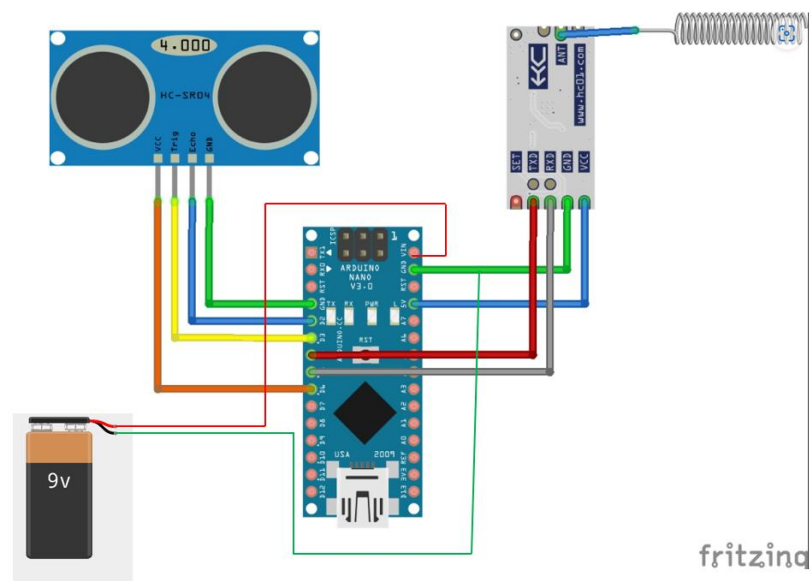
This system is designed to provide a comprehensive solution for automated water management, reducing manual intervention and preventing water wastage through efficient monitoring and control.

1.4 Components Required:

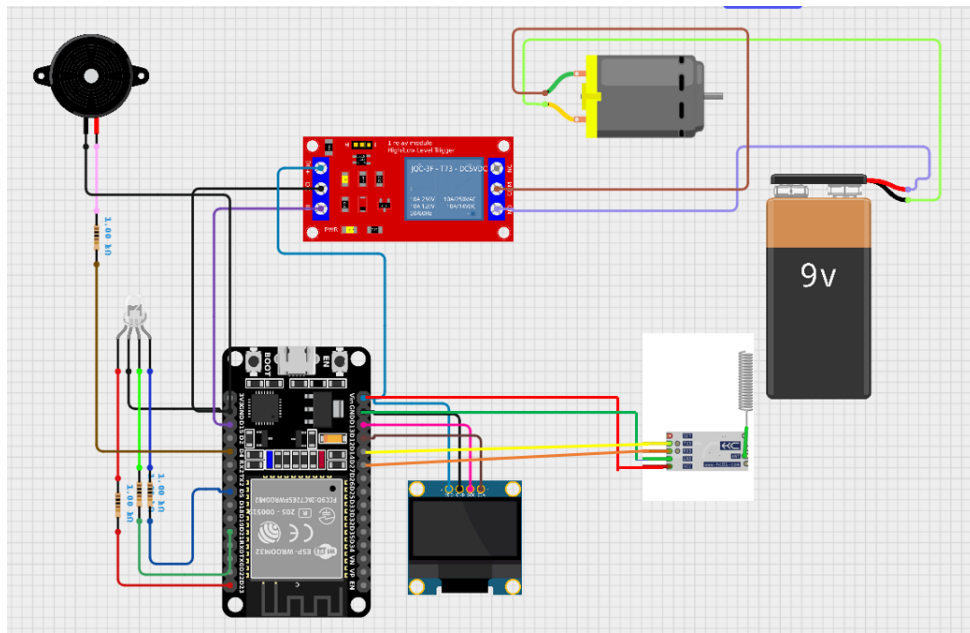
Components List					
S. No.	Device Name	Quantity	Description	Status	Buy Link (if any)
1	ESP-32 Module	1	Use in Alert Device	Available	
2	Arduino Neno	1	Use in Tank Device	Required	Link
3	UltraSonic Sensor	1	For measuring the water level	Available	
4	HC-12 Wireless Communication Module	2	For the communication between both the devices	Required	Link
5	Battery (9 V)	1	For powering the Tank Device	Required	Link
6	Battery Holder (9 V)	1	For holding the battery	Required	Link
7	RGB LED	2	For showing status in Alert Device	Required	Link
8	OLED Display	1	For showing status on display	Required	Link
9	Buzzer	1	For nofication when tank gets full	Available	
10	2-Channel Relay	1	For swithing ON/OFF pump	Available	
11	Pump	1	For filling the water in the tank	Available	
12	5V DC 1Amp Power Supply Circuit Board	1	For converting AC to DC	Required	Link
13	Li-ion Rechargeable Battery (3.7 V)	1	For powering the Alert Device	Required	Link
14	TP4056	1	For charging the battery	Required	Link
15	XL6009 Boost Module	1	For converting 3.7 V to 5 V	Required	Link
16	Resistors	-		Required	
17	Capacitors	-		Required	
18	Board	2		Required	
19	Wires	-		Required	
20	Plug	1		Required	
21	Push Buttons	3		Required	

1.5 Circuit Diagram:

1. Water Level Sensor Device:



2. Alert & Control Device:



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THANK YOU