PROJECT TOPIC

IOT-based Smart Water Level Monitoring in a Tank with remote Water-Pump control

TEAM MEMBERS

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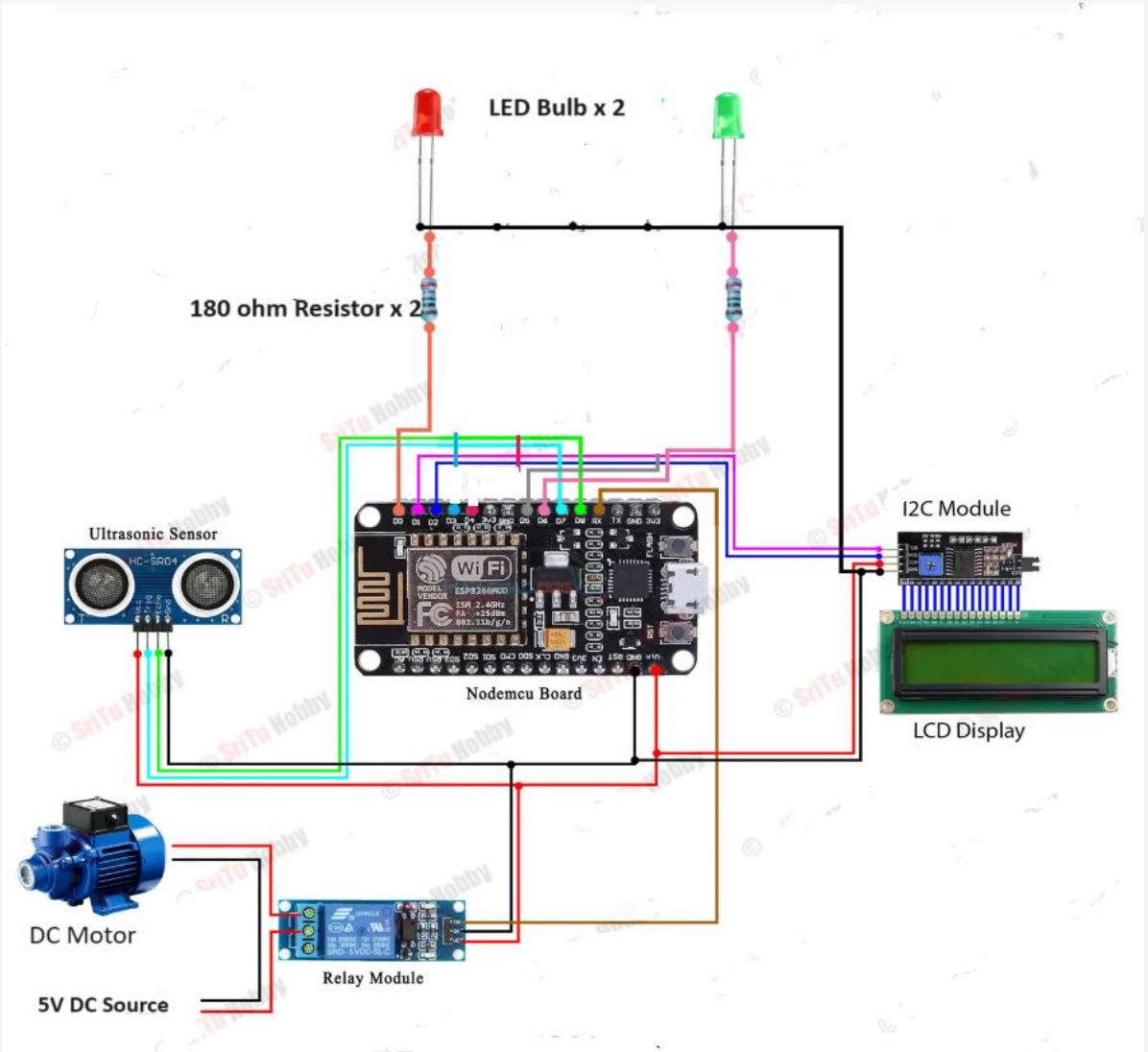
HARDWARE INTEGRATION :-

To design the IoT device following components are required –

- Ultrasonic sensor
- NodeMCU esp8266
- LCD display
- I2C Module
- Water pump (Motor)
- Relay Module
- 180 ohm Resistor
- LED
- 5V DC Source



Hardware Simulation link:

https://www.tinkercad.com/things/4wLP2LeXM4r-symbiot-project

Ultrasonic Sensor for Water Level Monitoring

1

Sensor Placement

The ultrasonic sensor is strategically mounted on the edge of the water tank, facing the surface of the water.

2

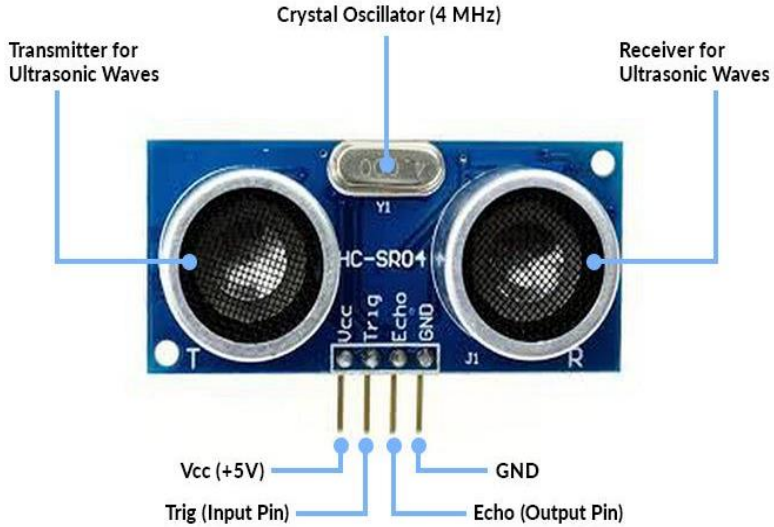
Measurement Principle

The sensor emits high-frequency sound waves that bounce off the water surface and are detected, allowing the device to calculate the water level.

3

Accurate Readings

The sensor provides precise, real-time measurements of the water level, ensuring reliable data for monitoring and management.



Microcontroller Integration and Programming

Microcontroller	Firmware Programming	Smart Algorithms
The device incorporates a powerful microcontroller that processes the sensor data and manages the device's various functions.	Custom firmware is developed to integrate the sensor, control the display, and enable connectivity options for data transmission.	Advanced algorithms analyze the water level data, detect anomalies, and provide intelligent insights to users.

Water level Alert

Threshold Detection

The microcontroller continuously checks the water level against a pre-set low-level threshold and a high level threshold.

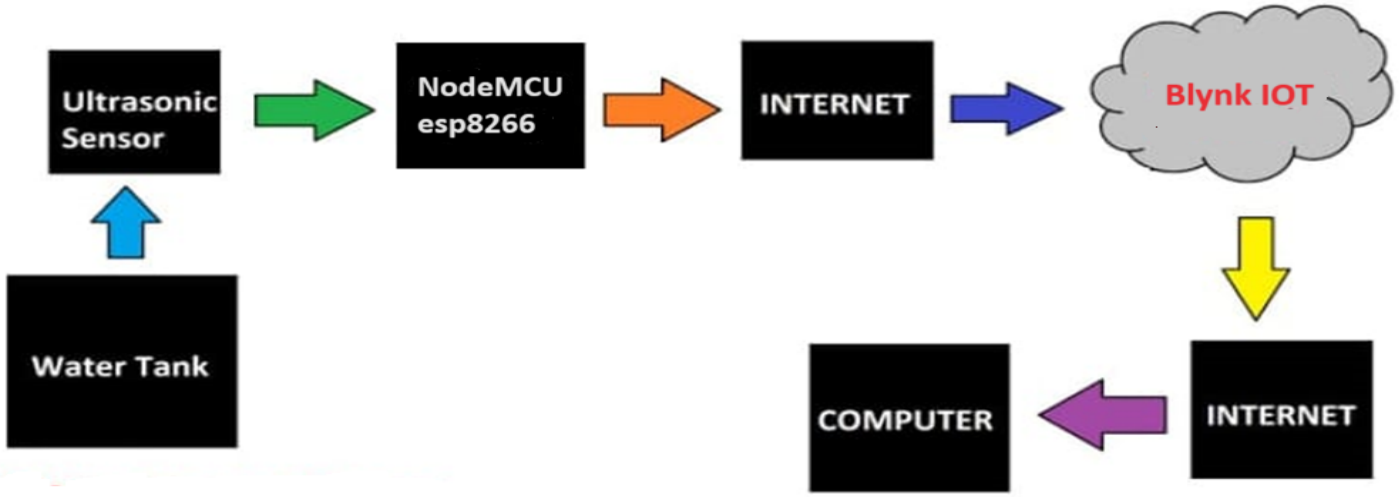
Notification in Device

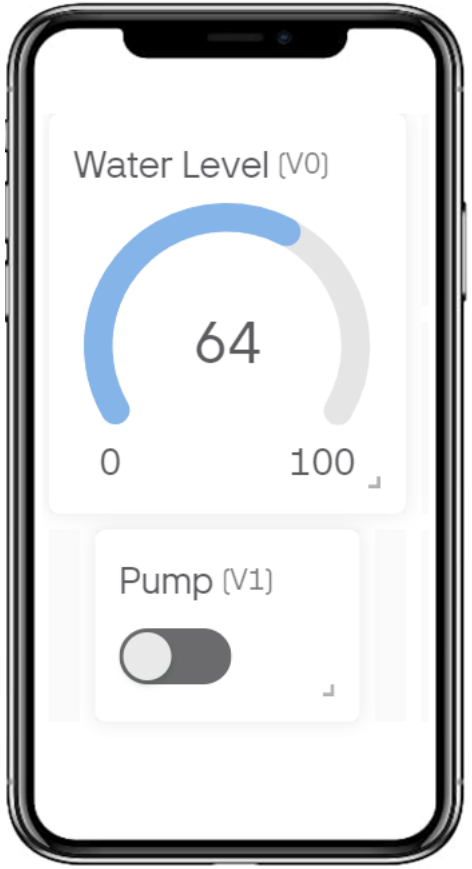
When the water level drops below the threshold or surpasses the max. limit, a notification is sent to the user indicating the need of either turning on or off the water pump.

LED Activation

The LED notifies the user that the tank needs to be refilled or the pump should be stopped, ensuring timely water management.

Remote communication using Blynk IOT





Conclusion and applications

Water Management

This IoT device helps to efficiently monitor and manage water levels, preventing waste and ensuring timely refilling.

Smart Home Integration

The device can be integrated into a smart home system, providing remote monitoring and control of the water level.

Water Conservation

By alerting users to low water levels, the device promotes sustainable water usage and conservation.

Reference

- https://iotdesignpro.com/projects/iot-based-water-level-indicator-using-ultrasonic-sensor
- https://hackster.io/sridhar-babu/iot-based-tank-water-monitoring-system-6b7658
- https://www.tinkercad.com/dashboard