WATER LEVEL INDICATOR

PROJECT SYNOPSIS

PROJECT – II

PROJ-CS781

BACHELOR OF TECHNOLOGY

COMPUTER SCIENCE & ENGINEERING

SUBMITTED BY

CSE_PROJ_2024_19

Group Members

Student Name	University Roll NO.	Registration No.
Moumita Podder	11900120070	201190100110021
Alik Sarkar	11900120083	201190100110008
Arindam Bhattacharjee	11900121176	211190100120002
Priti Sahani	11900120028	201190100110063

Siliguri Institute of Technology

Salbari, PO: Sukna Darjeeling: - 734009

Siliguri Institute of Technology

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Title: *Water Level Indicator*

I. Summary

In this project we will be building a water level indicator using Arduino & water sensor with three levels that consist of inside a tank with the help of 3 LED and a buzzer to indicate that the tank is full.

II. Objectives: project category

1. To learn the working of a water indicator
2. Measure the water level when the circuits indicate when the tank its half and full.
3. To learn how to build simple circuits.

III. Industry-Based Applications

The water level indicator circuits are used in factories, chemical plants, and electrical substations and in other liquid storage systems. There are many possible uses for this simple system, examples include monitoring a sump pit (to control pump activation), rainfall detection, and leakage detection. Electronic water level circuits have the capability of alerting if there is a water leak somewhere in the factory. When the water level is too high or too low or exceeds the higher limit, it can detect the water level easily by hearing an alarm sound or from different colors of a light bulb. We can also measure the fuel level in motor vehicles and the liquid level containers which are huge in the companies.

IV. Project Methodology

The circuit is designed to indicate three levels of water stored in the tank: low but not empty, half and full but not overflowing. When there is no water in the tank, all the LEDs are off as an indication that the tank is completely empty. When water level increases and touches the sensor, the Red LED will glow indicating that there is water within the tank. As the water level continues to rise and reaches half the tank, Yellow LED will glow. When the water in the tank rises to full an alarm is made by the buzzer as an indication that the tank is full.

V. Components:

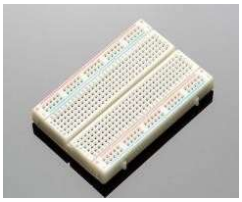
1. Arduino Uno

2. Water level sensor module

3. Light-emitting diode (LED's)

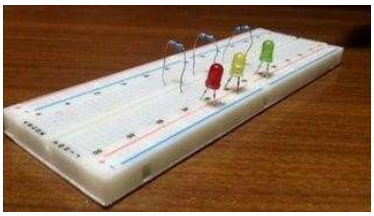
4.1-Buzzer 

5. Connecting wires

6. Breadboard 

VI. Project Procedures:

Step 1: Assemble LED on Breadboard



Red: (indicating extremely low level)

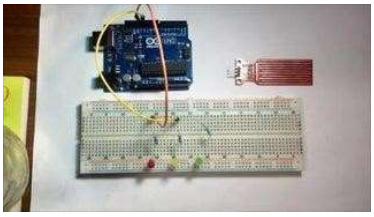
Yellow: (indicating half water level)

Green: (indicating full water level)

- Connect the cathode of each led to power rail(blue rail) on breadboard which would be the ground supply.

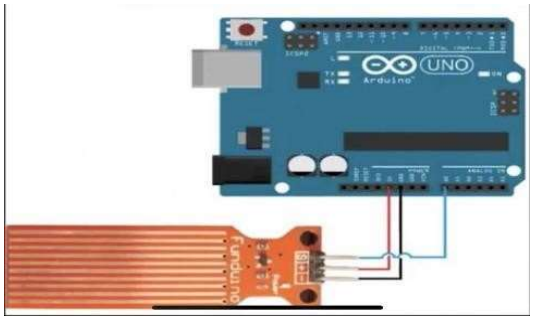
- Connect the anode of LED to different nodes.
- Connect 220 ohms resistor in series with each LED.

Step 2: Make Connections with Arduino and LED Make connections for LED with digital pins on Arduino as follows



- **Red LED** wired to Digital to pin 13
- **Yellow LED** wired to Digital to pin 12
- **Green LED** Wired to Digital to pin 11

Step 4: Connect the Water Sensor with Arduino



Connect the water level sensor to Arduino as follows:

With the Water Sensor pins you need to connect to the Arduino pins

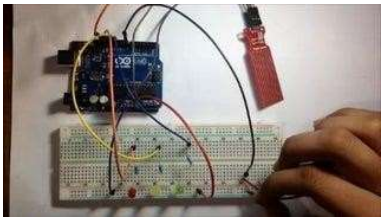
The Negative (-) pin will need connect to the GND on the Arduino

with a wire The Positive (+) pin is needed to connect to the VCC on

the Arduino

And The (S) pin needs to be connected to A0 on the Arduino with the wires provided

Step 5: Connect Buzzer



Connect the buzzer the positive to Digital pin 8 of Arduino and the negative to ground

on the board on the negative.

After putting all components on the breadboard connected to the Arduino and making sure all components are connected students will now place the water sensor in the tank empty and then pour the water slowly into tank.

VII. References

Instructables. “Water Level Indicator Using Arduino.” *Instructables*, Instructables, 29 Aug. 2017, https://www.instructables.com/id/Water-Level-Indicator-Using-Arduino-1/.

Title: *Water Level Indicator SMS Alert*

I. Summary

In this lab students will learn how to build a water Level Controller that monitors the level of the overhead tank by constructing a circuit which will notify the user via SMS if the water supply to an area / home is initiated and indicated how high the water has risen when is reach too high or too low.

II. Objectives

1. Learn the working of a water indicator.
2. Understanding of the components use and working.
3. Performing labs in putting circuits together and troubleshooting.

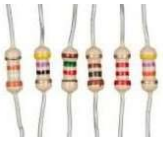
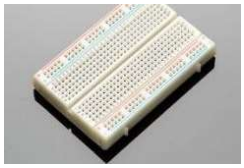
III. Industry-Based Applications

The water level alert system in industries can notify the user with an alarm when the water level reached is too high or too low; systems may be wired or wireless. They are used in factories such as electrical substations and in other liquid storage systems which have many uses like flood warning, management of water wells, and locating water. Smart Cities on the east coast of the USA deploy flood warning systems that monitor water levels using Industrial IoT sensors.

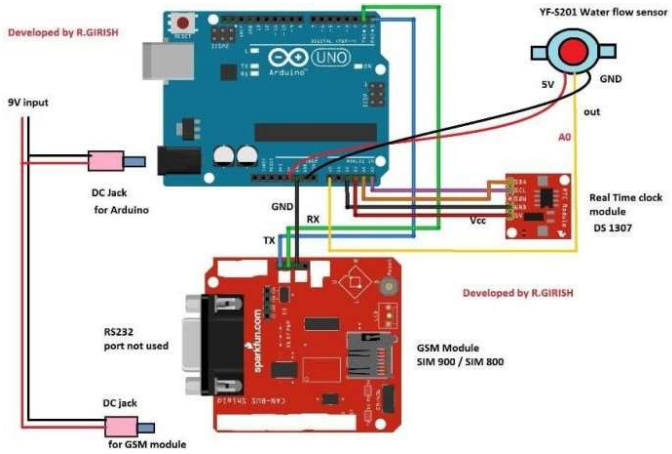
IV. Project Methodology

This group project will monitor the water levels, while it's rising it will show the time when the water is beginning to fill the tank and reach maximum volume. The average water flow speed is in liters per minute and the total water to your tank is in liters. The circuit consists of a water flow sensor known as the Hall Effect Water Flow Meter (YF-S201), an Arduino board which is the brains of the project, a Global System for Mobile Communications (GSM module), a SIM 800 or SIM 900 for receiving SMS alerts on water supply, and a real time clock module for tracking the correct time for water supply initiation and termination of water supply. Nine Volts of energy is desirable for powering the Arduino board and the GSM module, it is recommended to provide the power supply from nine-volt adapters or well-built homemade transformer based (LM 7809) supply. After a minute powering the circuit ON, you will get an SMS saying that the system is ready. When the water starts flowing through the sensor, the system will notify the user with time. After the water supply is terminated the system will send another alert and summarize the session with time, average water flow and total water delivered to your tank. The time of water arrival the water must free flow, meaning if there is any block or tap which is closed will not notify you.

V. Components:

- Resistors R1,R4-1K, R2-22k, R3-570 Ohms 
- Water flow sensor 
- Global System for Mobile Communications (GSM Module) 
- Real Time Clock module 
- Arduino Uno 
- Connecting wires 
- Breadboard 

VI. Project Procedures:



Step 1: With wires connect Arduino pin TX to RX pin in the GSM module.

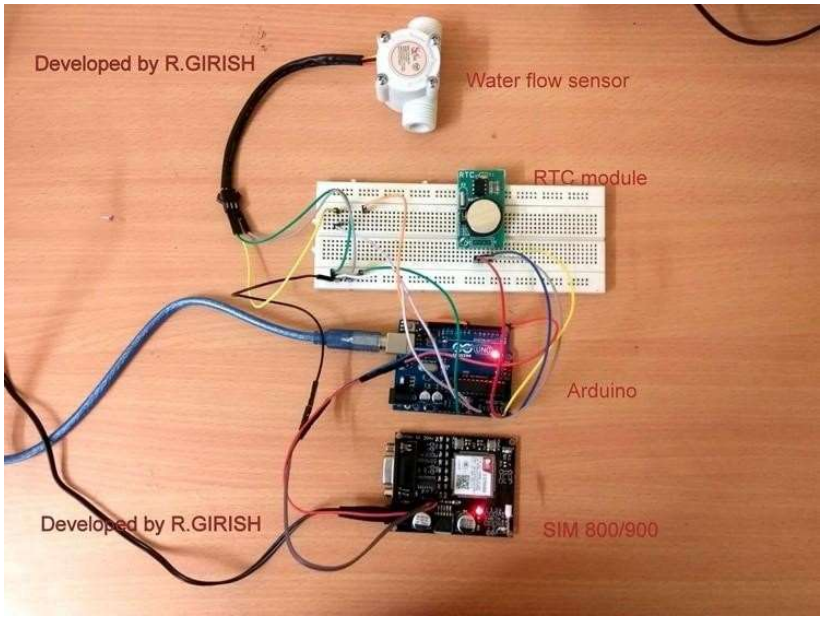
Step 2: Connect the Arduino pin RX to TX pin GSM module

Step 3: Connect the Arduino pin GND to GND pin GSM module

Do not try to power the GSM module from Arduino's 5V output pin to 5V input of GSM module.

Step 4: The Real Time Clock (RTC) module will track the time of arrival of water and termination of water supply.

For this project a board will be incorporated for the students to put the components together there be able to see how the wires are connected and the relationship between the Arduino and the circuits.



VII.References

1.Swagatam. “SMS Based Water Supply Alert System.” Homemade Circuit Projects, Swagatam, 11 Sept. 2019, www.homemade-circuits.com/sms-based-water-supply-alert-system/.

Conclusion:

This is the webpage that we have created using our Node MCU board. It contains a heading that is, Web-based Water Level Indicator, below which is printing the live data coming through the HCSR04 Ultrasonic sensor. The water level values are printed in CMs, the less the value, the less empty the container, and vice versa.