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Table of Content:

Project Title :

Water Level Indicator

Problem Statement:

Water is one of the natural resources on earth which is important for the living things especially for human in their activities in daily life. An intelligent monitoring and controlling water level system can help human to manage the usage water more efficient and systematically which can lead to the proper life.

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 LED will glow indicating that there is water within the tank. As the water level continues to rise and reaches half the tank, LED will glow.

Components:

- Arduino UNO R3……x 1

Fig.1

- Breadboard……..….. x 1

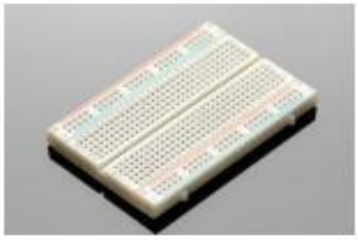

Fig. 2

- Float sensors……. x 2

Fig.3

- Light-emitting diode (LED's)……..…… x 2

Fig.4

Total Cost : 2500 Rs/-

Circuit Working :

The proposed water level controller circuit using a float switch is basically a semi-automatic system where the pump is started manually by press of a button, once the water level reaches the brim of the tank, the operation is switched of automatically by means of a float switch.

Referring to the diagram shown below, the various stages and functions may be understood with the help of the following points:

The left side of the image a shows the tank half filled with water along with the associated float and switch mechanism.

The float mechanism basically consists of a smooth cylindrical water sealed plastic pipe, clamped erect inside the water tank inner base.

A plastic water-tight float surrounds this pipe and is able to slide up/down freely in response to the water level inside the tank.

The float being made up of plastic floats at the water surface and is consequently pushed upwards or downwards across the plastic pipe depending upon whether the water is being filled or consumed from the tank.

The float also has an embedded permanent magnet at its upper surface.

The plastic pipe has an in-built reed switch assembly at the top located just near brim of the tank.

The above two counterparts are intended to interact with each other when the water reaches the upper edge of the tank.

When this happens, the magnet inside the float reaches at a close proximity to the reed switch, closing its contacts and thereby causing the wire terminals to get shorted across these contacts.

The right hand side of the diagram is a transistorized latch circuit.

When the tank is empty and is required to be filed, the push button is pressed manually.

Pressing the push button latches the base of T3 and activates the relay which switches ON the motor and holds it in that position until the water in the tank is filled upto the tank brim wherein the float switch triggers the reed relay. The reed switch shorts the connection between the base and ground of T3, rendering the latch inactive which breaks the whole operation.

The relay and the pump motor are thus switched OFF until the push button is pressed yet again for the next cycle.

C2, C3 make sure that the circuit does not get activated by false or spurious electrical disturbances.

Situations:

1. The water level is full – Nothing happens.
2. Water level drops to the reference probe.
3. Fill start is triggered automatically turning on the water to fill the tank
4. Once the water is full, fill stop is triggered and the system automatically stops the pump.
5. The system resets and waits for water levels to drop again.

Schematic Diagrams:

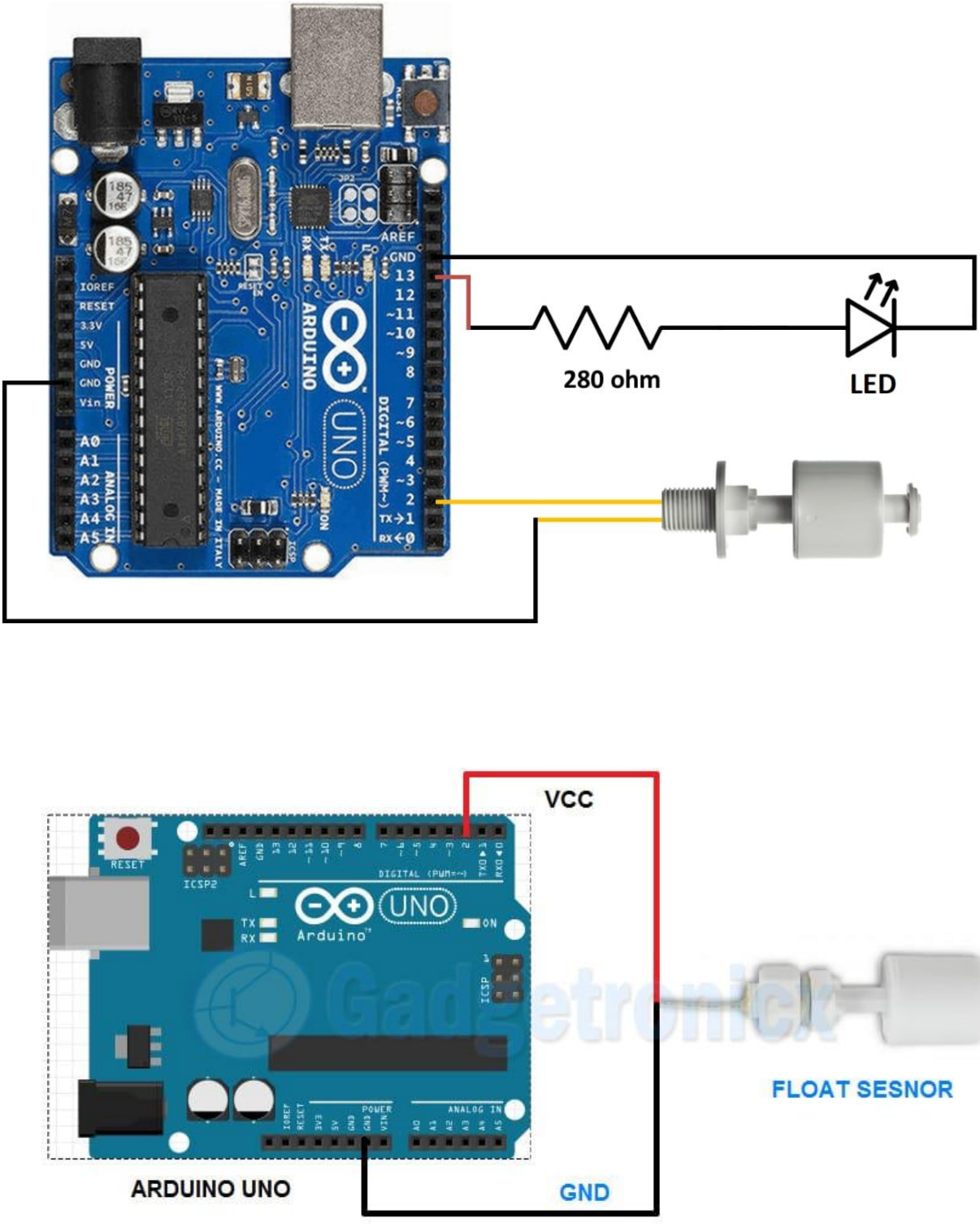

Figure 5: Circuit Diagram.

Benefits Of Water Level Indicators:

1. Easy to install.
2. Very little maintenance.
3. Compact design.
4. Automatic water level indicators ensure no overflows or running of dry pumps.
5. Saves money by using less water and electricity.
6. Can help avoid seepage of walls and roofs due to tanks overflowing.
7. Automatic save you can save manual labor time.
8. Consumes very little energy, perfect for continuous operation.
9. Shows incitation of water levels in any type of tank.

Scope:

Water level indicators are important for many different industries. For example, cooling towers use water level indicators to monitor water levels in a tank and make corrective actions based on the level of water. Without water level indicators in a water tank, People would have to manually check whether enough water is in the tank, and should your tank ever go empty, it could mean your chiller overheating. Water level indicators allow people to remotely monitor water levels and make corrective actions automatically so you can focus on more important senerios.

Arduino Code:

```
int Sensor0 = 3;

int Sensor1 = 4;

int Led0 = 12;

int Led1 = 13;

int State0 = 1; //reads pushbutton status

int State1 = 1;
```

```
void setup()
{
  Serial.begin(9600);
  pinMode(Sensor0, INPUT_PULLUP);
  pinMode(Sensor1, INPUT_PULLUP);
  pinMode (Led0, OUTPUT);
  pinMode (Led1, OUTPUT);
}
void loop()
{
  State0 = digitalRead(Sensor0);
  State1 = digitalRead(Sensor1);

  if (State0 == HIGH && State1 == HIGH) {
    Serial.println( "WATER LEVEL- HIGH");
    digitalWrite(12, HIGH);
    digitalWrite(13, HIGH);
  }
  else if (State1 == HIGH && State0 == LOW) {
    Serial.println( "WATER LEVEL- MID");
    digitalWrite(12, HIGH);
    digitalWrite(13, LOW);
  }
  else {
    Serial.println( "WATER LEVEL- LOW");
    digitalWrite(12, LOW);
    digitalWrite(13, LOW);
```

```
  }
  delay(1000);
}
```

Outcome/Result:

The purpose of a water level indicator is to gauge and manage water levels in a water tank. The control panel can also be programmed to automatically turn on a water pump once levels get too low and refill the water back to the adequate level.

Images Of Projects :

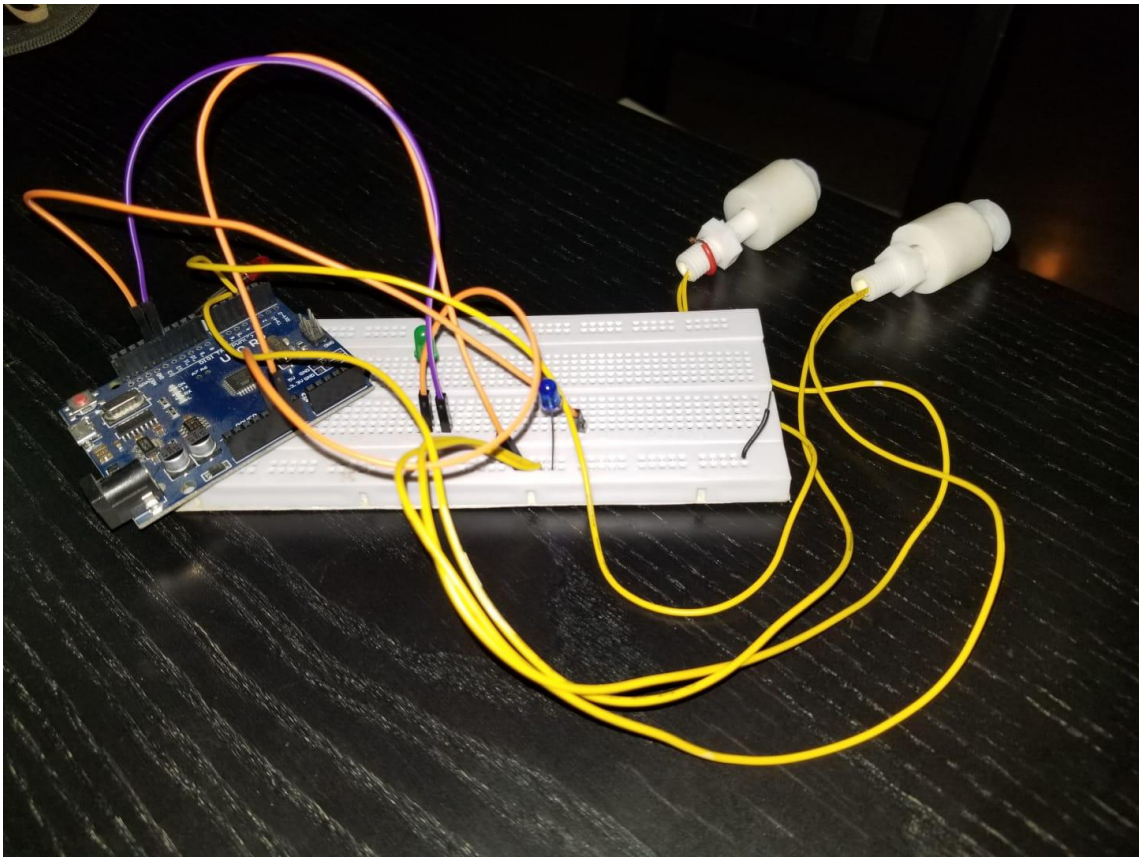

Figure 6.

Conclusion:

The main purpose of this project is to help people with the water level tank and to avoid the wastage of the water, as water is the most important element of our lives. One cannot live without it and as per the general analysis shortage of water has been increase over the past few years. This project gave us more confidence that students will be able to put in practice, also this can be useful in many places.

Future Enhancement:

Water level monitoring system has a good enhancement in future especially for the agriculture sector. There are areas where people need water level controller. It could be agricultural fields, overhead tanks. Students can make this project wireless by using NRF transmitter & receiver. It is the mostly & must needed equipment for the water tank in houses and in industries. The system can also be used to collect and study the environmental data of water source and its surrounding area by integrating other sensor to the system.