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1. Introduction:

Global climate and unpredictable rain circle may cause uncertainty of water availability . Recently, a very important problem from all over the world is the management of water resources . Water is commonly used in households, agriculture, and industry . Therefore, we need technology which can increase water distribution efficiency. In practice are known that many types of water level control system that can be done . Such system includes providing flood prediction, environmental protection, water discharge, power plant system, providing water control in industry, simple water level control in the home . The most efficiency of water distribution system to every aspect can be enhanced through dam automation. For that application can be done by designing open and close automatic water gate at the dam for a drainage system. The drainage system efficiency is not more than 40% if manually operated,
through some automation, the drainage system efficiency can be enhanced to 50% .

This paper design prototype water level control system by open and close automatically the water gate use ultrasonic sensor. Open and close automatically the water gate becomes one of the means of service in an effort to control the distribution of more efficient drainage system to every aspect so as to minimalize the risk of the flood .

Objective:

A simple of water level control system. A fully automatic water tank pump controller & indicator is proposed. Water level indicator circuit or liquid level sensor displays the current level of water in any water tank reservoir. Here we use a simple real time logic circuit with AND and NOT gates with indicators. It can also be used as a water level meter or water level detector

Software design:

In this paper, the ultrasonic sensor reads the water level in the aquarium as input to the Arduino. As output, the servo would move the door aquarium, and water level conditions would be visible on LCD and led, as illustrated in the following schematic capture by Proteus (Figure 1). The open and close automatically water gate operation is illustrated in block diagram system

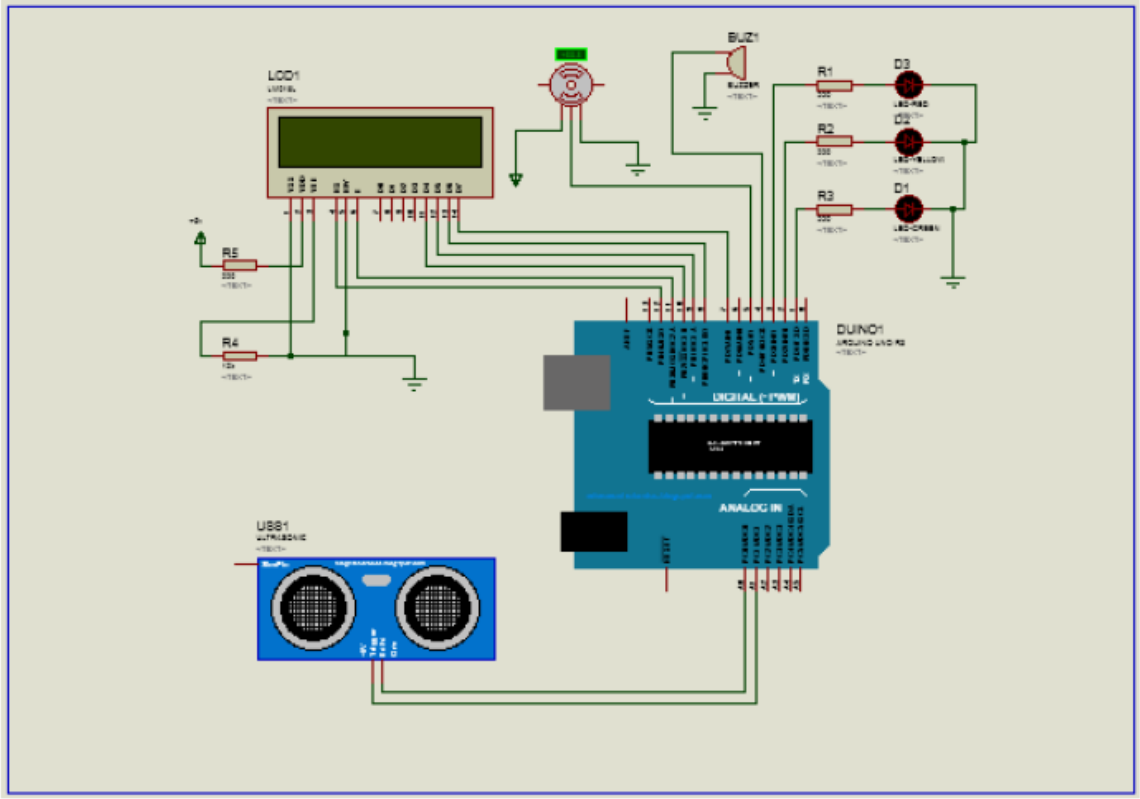

Figure 1. Schematic capture.

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2). The diagram contains several parts, that is, water level detected by the ultrasonic sensor, input data from ultrasonic sensor to Arduino, Arduino set servo motion, the servo for moving the water gate (the door aquarium), and the ultrasonic sensor for making feedback to Arduino. If the water level is low so the door would close.

Figure 2. Block diagram system.

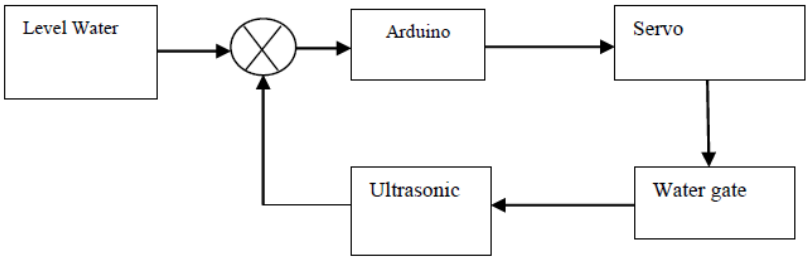

Figure 2. Block diagram system.

The flowchart of system is as follows (Figure 3).

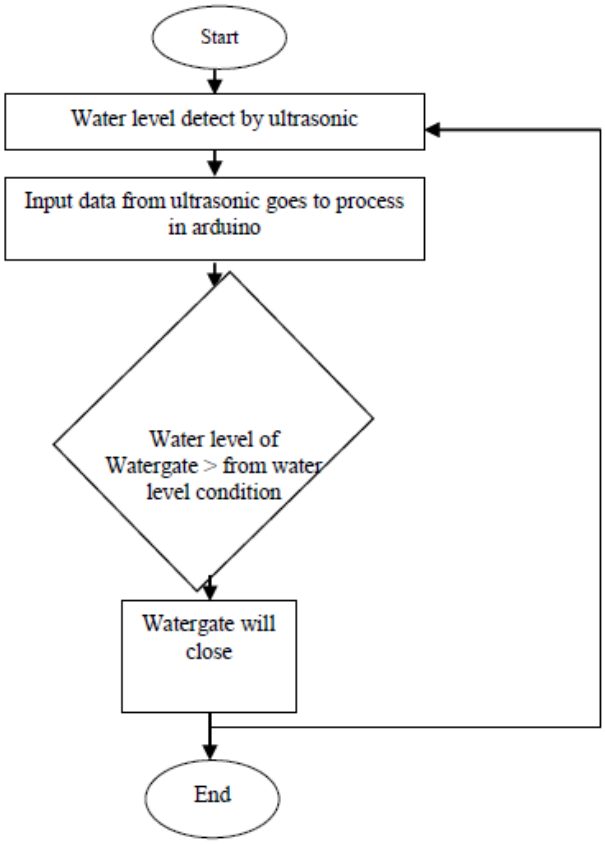

Figure 3. Flowchart system.

The paper programs is set to 3 water level conditions, that is “AMAN” at water level ≤ 5 cm from
ultrasonic sensor, “SIAGA” at 5 cm ≥ dist ≤ 10 cm from ultrasonic sensor, and “AWAS” at ≥ 10 cm
from ultrasonic sensor. Designing software programs using Arduino software with C programming language.

Hardware design:

Plant uses a glass aquarium with a door hole on the front. Aquarium measuring 50 x 30 x 20 cm. The door opening is 5 x 5 cm in size. The door is used using acrylic material with a size of 7 x 7 cm.

The working principle of the ultrasonic sensor is the transmitter sending ultrasonic waves, then
measuring the time required until the arrival of the reflection of the object. Ultrasonic sensor used is SRF-05. The time difference when transmitted to capture returns is used as a reference calculation of how far the distance between

the sensors with the object that reflects the ultrasonic waves [8]. Ultrasonic Sensor Devan tech SRF-05 with the following specifications:

- Works on a 5 volt DC voltage
- Current load of 30 mA - 50 mA
- Generate a wave frequency of 40 KHz
- The range of detectable distance of 3 cm - 400 cm
- Requires a minimum input trigger of 10 uS

It can be used in two choices of input trigger mode and echo output mounted on different pins or

input trigger and echo output mounted in one pin the same.

Requirement for this Project:

The ultrasonic sensor SRF-05 has the following views (Figure 4): This sensor is detect the object like water ,box, pen book etc this sensor have two parts one is trig other one is eko. Trig is for input and eko is for output.

Figure 4. Ultrasonic SRF-05.

The SRF-05 ultrasonic schematic can be seen as follows (Figure 5).

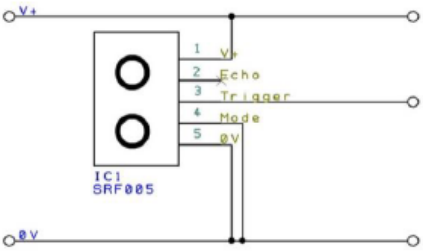

Figure 5. Schematic ultrasonic sensor.

Dc motor: In general there are 2 types of servo motors. Namely servo standard and continuous servo. Standard servo motors are only capable of moving in a

semi-circle or 180 degrees, while continuous-type servo motors are capable of rotating by 360 degrees. The servo motor used is a continuous-type servo motor. Continuous types can rotate up to 360 degrees. Servo motors have the following display .

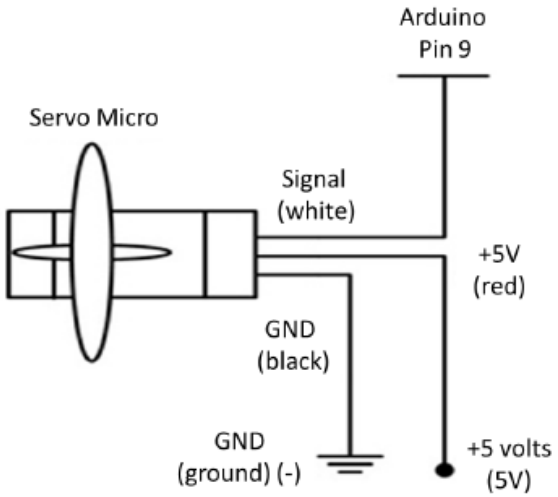

Figure 7. Schematic servo motor 360 degree.

Arduino Nano*:* Arduino Nano is a microcontroller based on Atmega 328P. Arduino Nano has

more or less the same function as Arduino Duemila nove, but with different parts. Arduino Nano has a DC power cable, and works with Mini-USB cable. Arduino Nano has 22 digital pin I / O (consisting of6 pins PWM output), 8 pin analog I / O, and reset button [12]. Parts of the Arduino Nano have the following appearance (Figure 8).

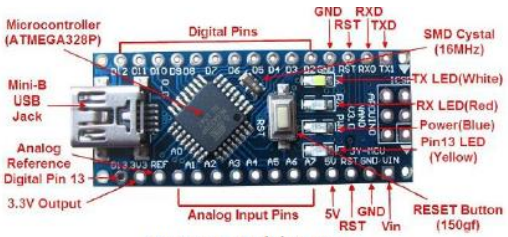

Figure 8. Arduino nano.

The schematic of Arduino Nano can be seen as follows (Figure 9).

Figure 8. Arduino nano.

The schematic of Arduino Nano can be seen as follows (Figure 9):

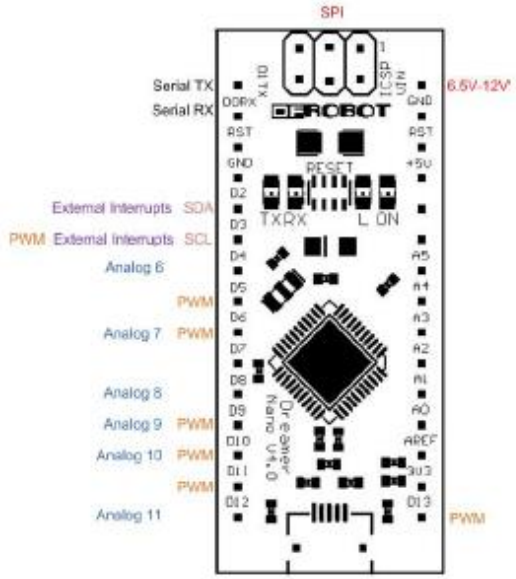

Figure 9. Schematic of arduino nano.

Battery:

The nine-**volt battery**, or **9-volt battery**, is a common size of **battery** that was introduced for the early transistor radios. It has a rectangular prism shape with

rounded edges and a polarized snap connector at the top. This type is commonly used in walkie-talkies, clocks and smoke detectors. It is use to Power Up Arduino and Dc Motor

Code of this Project:

```
const int eko=8;
const int trig=7;
int mesafe;
int sure;

void setup() {
  pinMode(trig,OUTPUT);
  pinMode(eko,INPUT);
  pinMode(9,OUTPUT);

  Serial.begin(9600);
}

void loop() {
   digiaWrite(trig, LOW);
```

```
 delayMicroseconds(10);
 digitalWrite(trig, HIGH);
 delayMicroseconds(20);
 digitalWrite(trig, LOW);
 sure = pulseIn(eko, HIGH);
 mesafe= (sure/29.1)/2;
 Serial.println(mesafe);


 if(mesafe<=5){

    digitalWrite(9,HIGH);

    Serial.println("START")

 }

else{
   digitalWrite(9,LOW);

    Serial.println("STOP");
}

 delay(100);
}
```

Conclusions:

Our design is in conformity with the intended purpose. The prototype of water level control system works well in distributing water in accordance with the water level, so it can be one of the contributors in the drainage system especially in the dam area to the surrounding environment. Based on the test results, the prototype can function well. From the sensor side,

ultrasonic sensor is a good distance detection sensor with error 2.15% based on test results. Constraints in the use of 360 degree servo motors can be handled using the TIP 120, so the 360 servo motor can function as desired.

References:

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