6. Connecting Android Phone with Arduino

a) Connecting Arduino with Mobile Device Using the Bluetooth Module.

b) Control any two actuators connected to the development board using Bluetooth.

Aim : To Connect Android Phone with Arduino and Control any two actuators connected.

Apparatus Required:

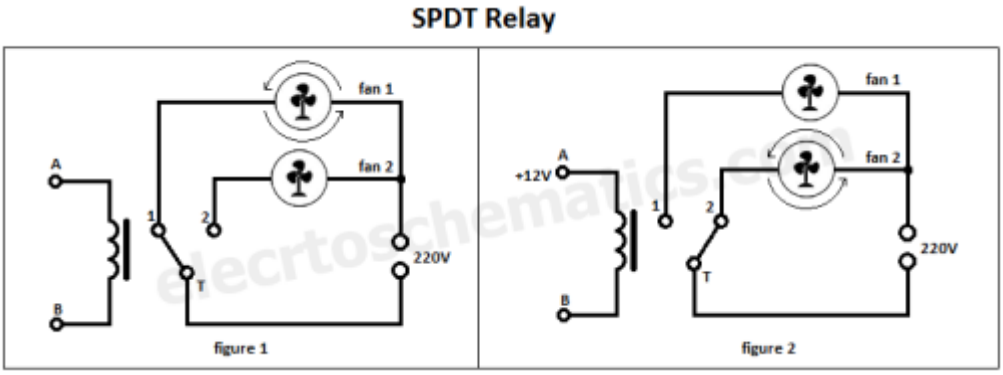
1. Arduino Uno Board.
2. Relay SPDT
3. Function Generator – (Ensure – Function should be Sine Wave)
4. Bulb
5. Servo Motor
6. Wires for Connection
7. Thinkercad platform

Description of Devices :

Single Pole Double Throw relays (SPDT Relay) - offer a normally open and a normally closed contact set in one relay. The moveable contact transfers continuity from one stationary contact to the other when the coil is energized or de-energized. Voltage isolation is then between opposing stationary contact and the moveable contact.

An SPDT relay can control two electrical or electronic circuits. It operates in two contacts position. As the SPDT Relay has two outputs so we can consider output 1 and output 2. In normal conditions, the input is

How does the Single Pole Double Throw Relay



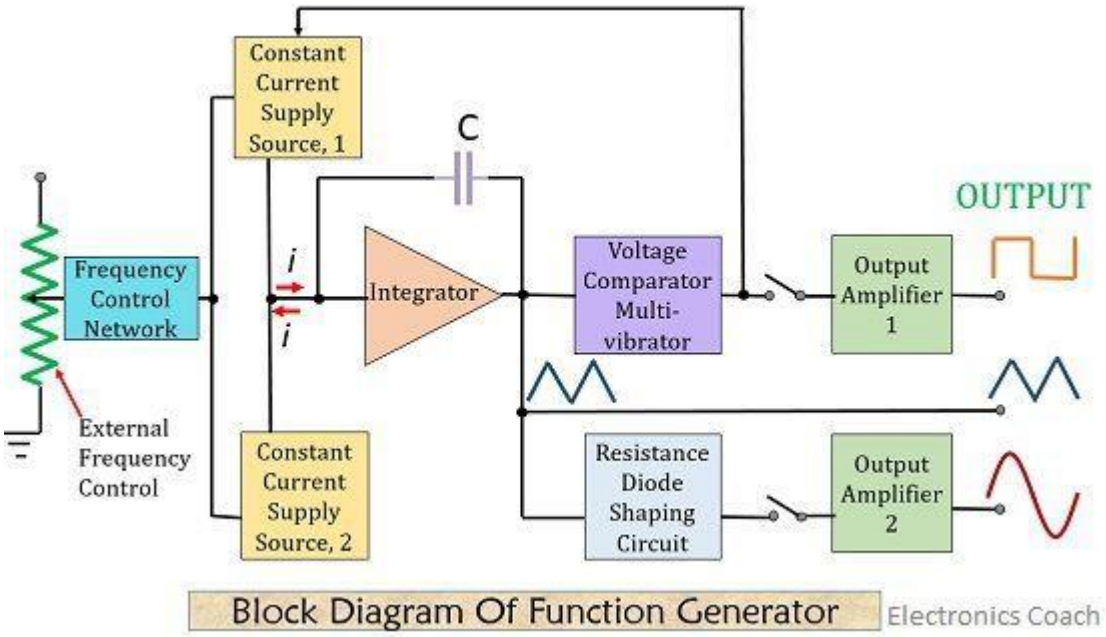
In figure 1 no DC voltage is applied to the coil so the terminal T is connected to contact 1 therefore the current can flow through fan 1 and it cannot flow through fan 2.

In figure 2 when DC voltage is applied to the coil and terminal T is now connected to contact 2 threfore the current doesn't flow anymore through fan 1 but now it flows through fan 2. connected to any of the output while another output is disconnected from the input.

Function Generator is a versatile instrument as an extensive variety of frequencies and waveforms are produced by it. The various waveforms generated by the function generator are suitable for various applications. It provides adjustment of wave shape, frequency, magnitude and offset but requires a load connected before adjustment.

Block Diagram and Working of Function Generator

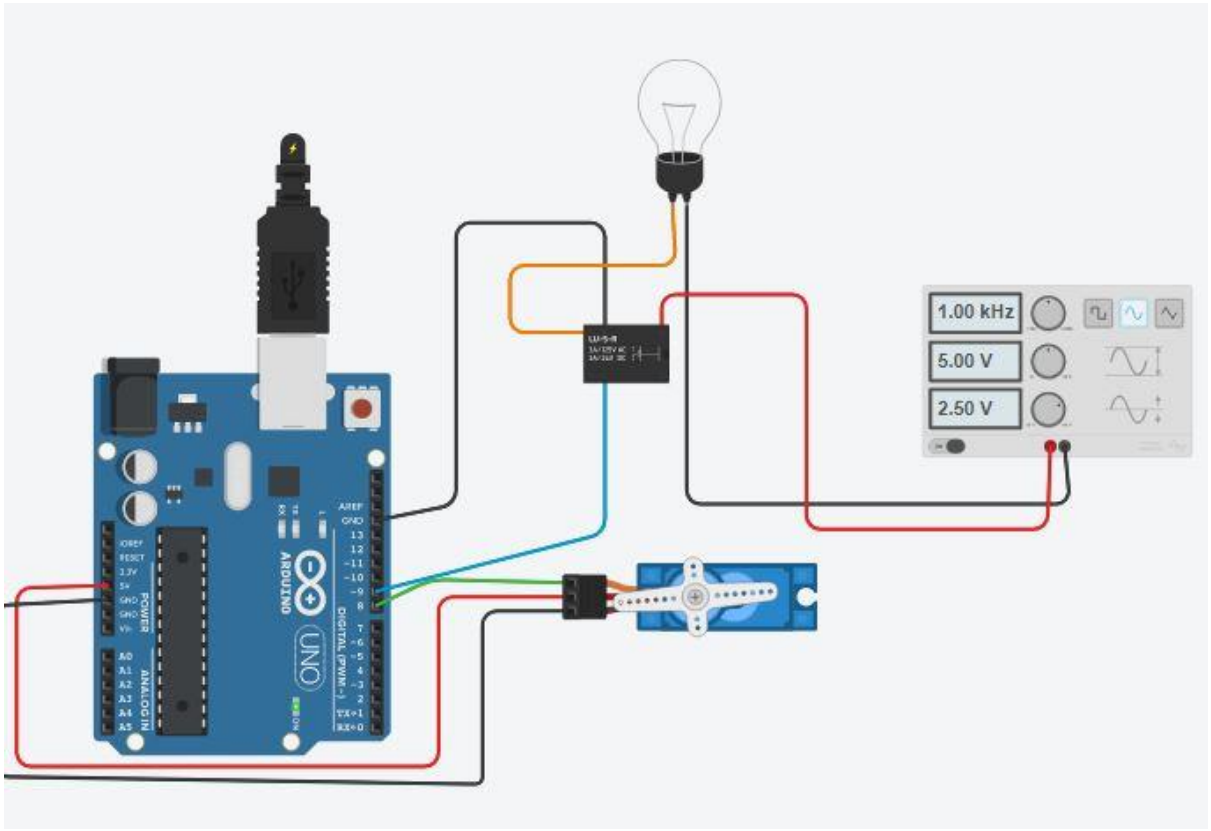
The figure below shows the block diagram of the function generator-



A frequency control network used here whose frequency is controlled by the variation in the magnitude of current. The current sources 1 and 2 drives the integrator.

By using Function Generator, we can have a wide variety of waveforms whose frequency changes from 0.01 Hz to 100 KHz. The two current sources are regulated by the frequency controlled voltage.

Circuit Connection

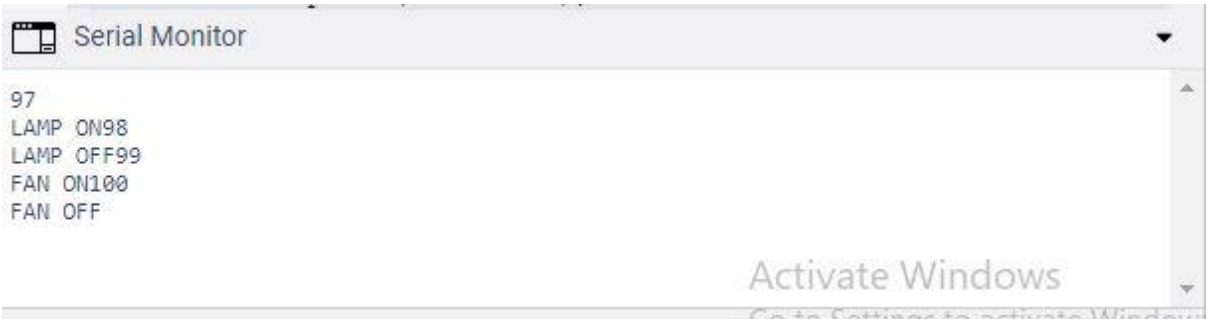


Code :

```
#include<Servo.h>
Servo fan;
int lamp=9;
int ok;
void setup()
{
  Serial.begin(9600);
  fan.attach(8);
  fan.write(0);
  pinMode(lamp,OUTPUT);
}
void loop()
{
  if(Serial.available()>0)
  {
    ok=Serial.read();
    Serial.print(ok);
    Serial.print("");
    Serial.println();
    delay(100);
    if(ok=='a')
    {
      digitalWrite(lamp,HIGH);
      Serial.print("LAMP ON");
    }
    else if (ok=='b')
    {
      digitalWrite(lamp,LOW);
      Serial.print("LAMP OFF");
    }
    else if (ok=='c')
    {

      fan.write(70);
      Serial.print("FAN ON");
    }
     else if (ok=='d')
    {
      fan.write(0);
      Serial.print("FAN OFF");
    }
  }
}
```

Output : (Bulb will NO if – a pressed , Bulb will OFF if – b pressed , Motor ON- C Press, Motor OFF- D press)



Result :

Connected Android Phone with Arduino and Control any two actuators connected using Arduino Uno Board