

Ultrasonic Sensor Using Arduino

Introduction

An ultrasonic sensor, when paired with an Arduino, becomes a powerful tool for measuring distance using sound waves.

How it works

An ultrasonic sensor (like the popular HC-SR04) emits a high-frequency sound wave from its transmitter. This sound wave travels through the air until it hits an object and bounces back to the sensor's receiver. The Arduino then measures the time it takes for the echo to return, calculates the distance to the object based on the speed of sound, and can trigger actions accordingly.

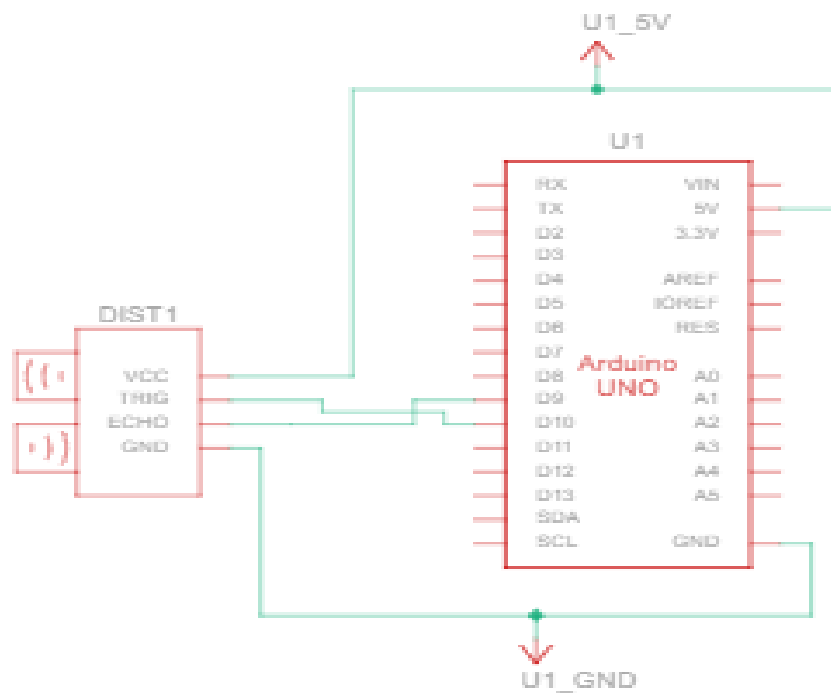
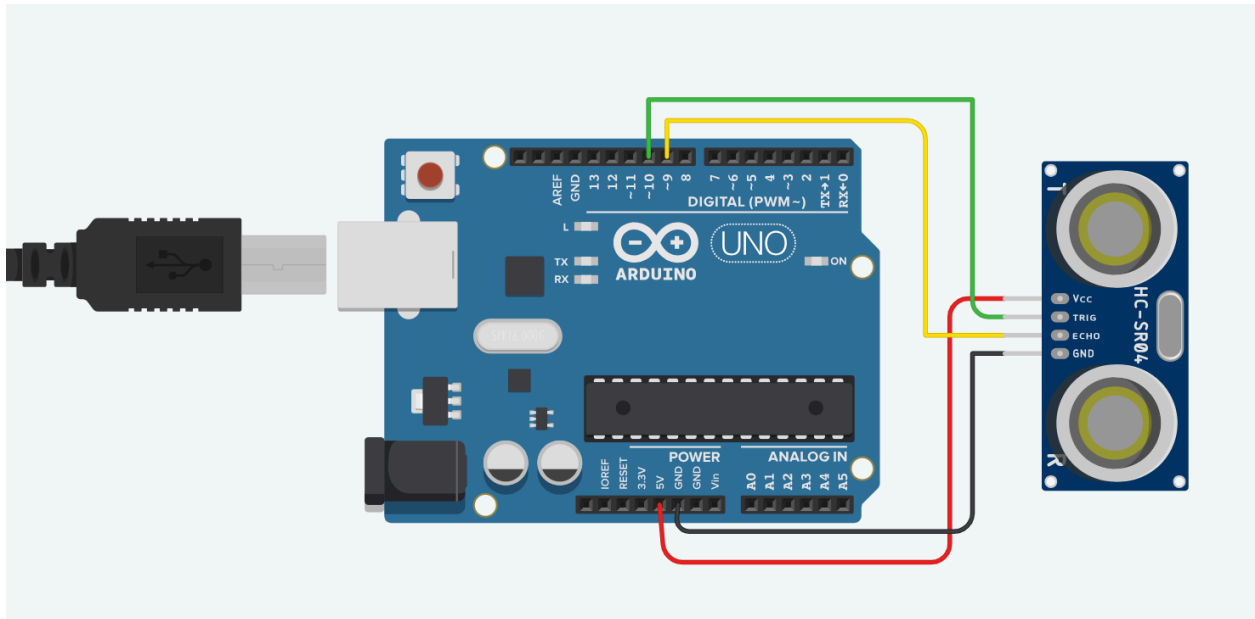
Common Features:

- **Range:** Typically between 2 cm and 400 cm
- **Accuracy:** Often within a few millimeters
- **Working Voltage:** Usually 5V, compatible with most Arduino boards

Popular Uses:

- Obstacle detection in robotics
 - Automated parking systems
 - Liquid level measurement
 - Smart home motion detection
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Circuit Diagrams



C++ code:

```
int trigpin =10;
int echopin=9;
long time;
int distance;

void setup()
{
    pinMode(10,OUTPUT);
    pinMode(9,INPUT);
    Serial.begin(9600);
}

void loop()
{
    digitalWrite(10,LOW);
    delayMicroseconds(2);
    digitalWrite(10,HIGH);
    delayMicroseconds(10);
    digitalWrite(10,LOW);

    time=pulseIn(9,HIGH);
    distance=time*0.034/2;

    Serial.print("Distance: ");
    Serial.println(distance);
}
```

Components:

1. Arduino Uno r3
2. Ultrasonic Distance Sensor (4 pin)