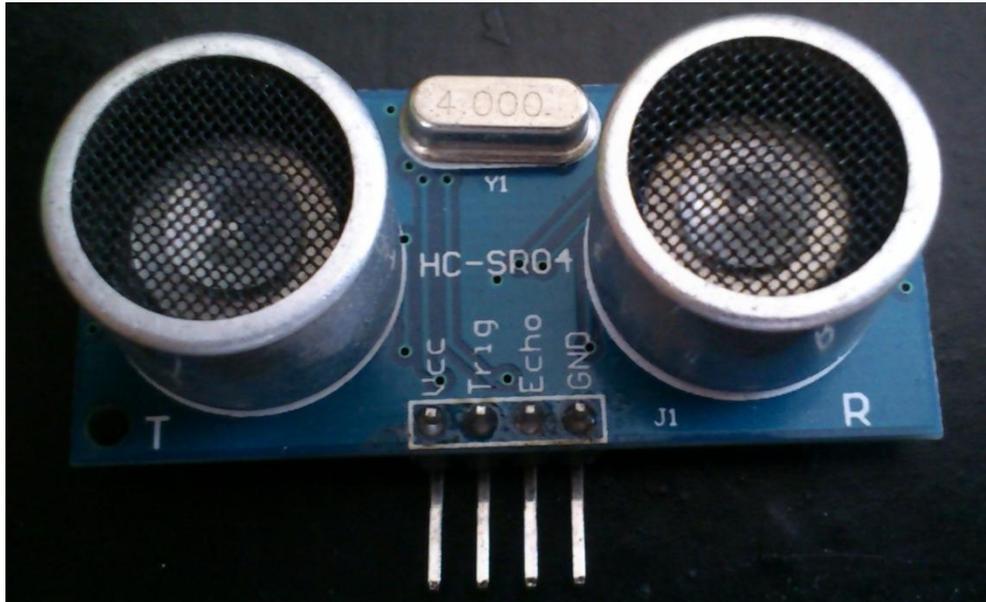


ULTRASONIC SENSOR MODULE



Description

The Ultrasonic sensor module is a convenient way for measuring distances from objects. This module has a lot of applications such as parking sensors, obstacle and terrain monitoring systems, industrial distance measurements, etc. It has a stable performance and high accuracy ranging from 2cm to 450cm with a resolution of 0.3 cm.

The module sends an ultrasonic signal, eight pulses of 40kHz square wave from the transmitter; the echo is then picked up by the receiver and outputs a waveform with a time period proportional to the distance. The connected microcontroller accepts the signal and performs necessary processing.

Specifications

- Model: HC-SR04
- Working Voltage: 5V DC

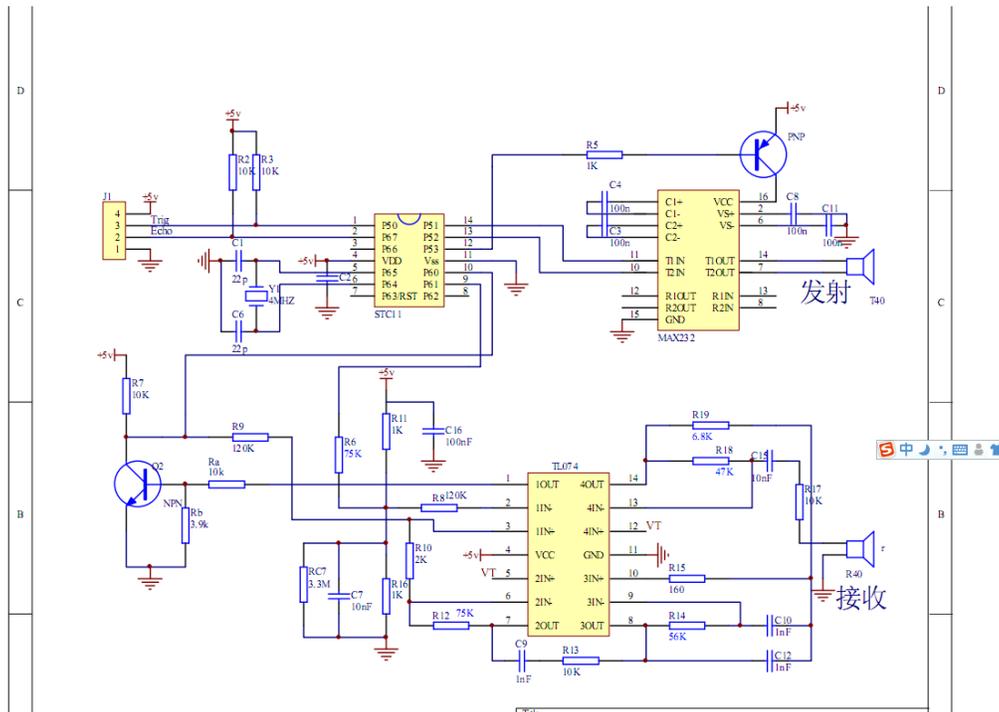
- Working Current: 15mA
- Static Current: Less than 2mA
- Output Signal: Electric Frequency signal, high level 5V, low level 0V
- Sensor angle: not more than 15 degrees
- Detection Distance: 2cm to 450cm
- High Precision: Up to 3mm
- Mode of Connection: VCC / Trig / Echo / GND
- Adopt I/O trigger through supplying at least 10 μ s sequence of high level signal
- Dimensions: 1.77in x 0.79in x 0.51in (4.5cm x 2.0cm x 1.3cm)
- Weight: 10g

Pin Configuration

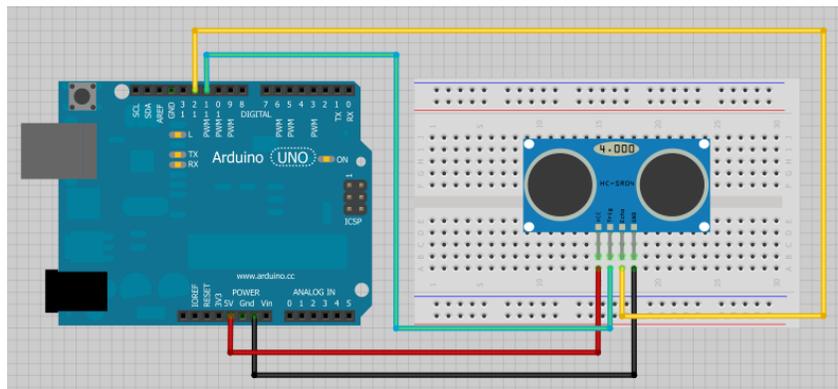


1. VCC: 5V DC power supply
2. Trig: trigger signal for starting the transmission with 10 μ s high time
3. Echo: output
4. GND: ground

Schematic Diagram



Wiring Diagram



Sample Sketch

```
const int trig = 3;
const int echo = 2;
long time, dist;
```

```
void setup(){
  Serial.begin(9600);
  pinMode(trig, OUTPUT);
  pinMode(echo, INPUT);
}

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

  time = pulseIn(echo, HIGH);
  dist = (time/2) / 29.1;

  Serial.print(dist);
  Serial.println(" cm");

  delay(500);
}
```

How to test

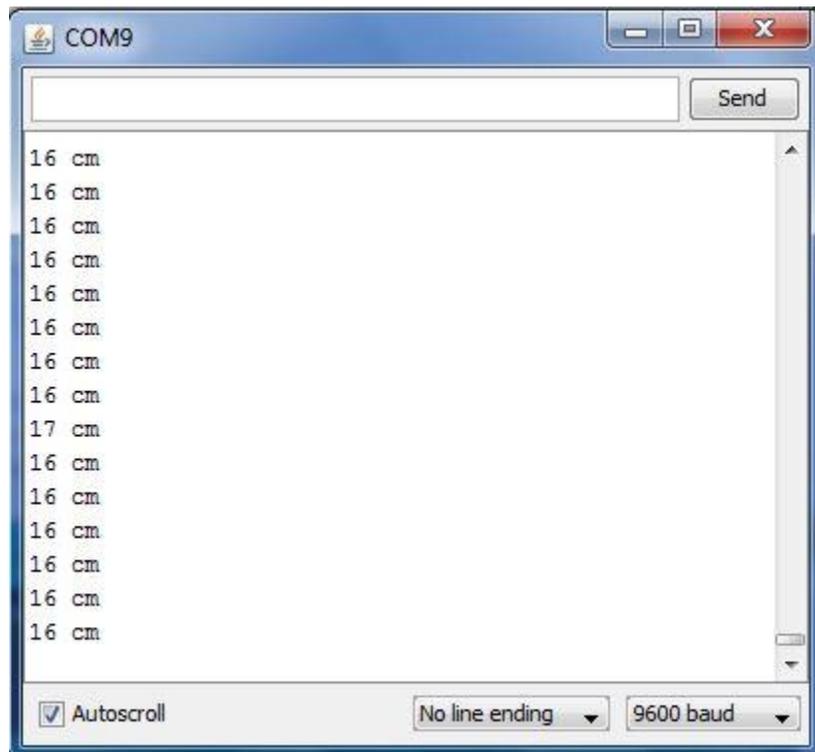
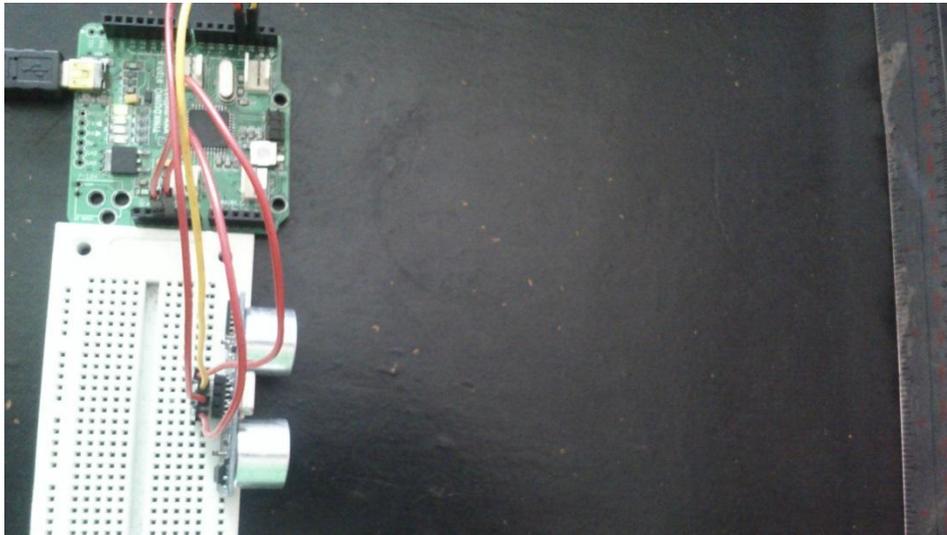
The components to be used are:

- Microcontroller (any compatible arduino)
 - HC-SRO4 Ultrasonic sensor module
 - 1 Pin M-M connectors
 - Breadboard
 - USB cable
1. Connect the components based on the figure shown in the wiring diagram using a M-M pin connector. VCC pin is connected to the 5V power supply, GND pin is connected to the GND and the Trig and Echo pins are connected to the digital I/O pins. Pin number will be based on the actual program code.
 2. After hardware connection, insert the sample sketch into the Arduino IDE.
 3. Using a USB cable, connect the ports from the microcontroller to the computer.
 4. Upload the program.

5. See the results in the serial monitor.

Testing Results

The serial monitor shows the distance (cm) between the sensor module and the ruler.



When the sensor module was moved closer:

