

HC-SR04 Ultrasonic distance sensor

Getting started using your sensor simply requires direct connection to your Arduino or you could follow the hook-up diagram further down the page to build a slightly more complex circuit.

Simple Distance Measurement

Connect directly to your microcontroller and start reading distance right away

- Ultrasonic range finder
- Arduino
- Jumper Wire

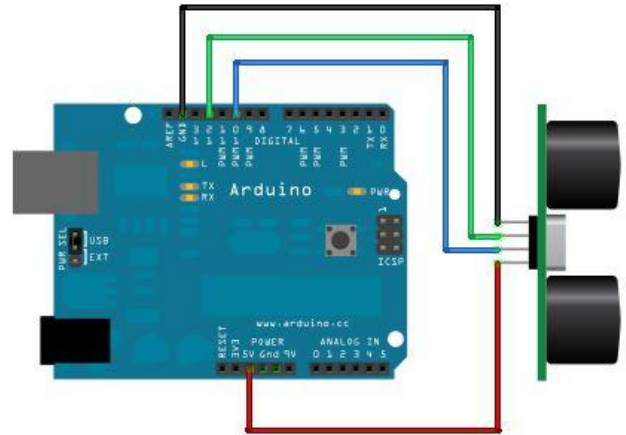
This code returns the distance in Inches. Remove the *.39 to return cm instead of inches. You could make float ultrasoundValue = 0; but then you can't print it unless you transfer it into another type, but it could be used for further calculations.

```
unsigned long echo = 0;
int ultraSoundSignal = 9; // Ultrasound signal pin
unsigned long ultrasoundValue = 0;

void setup()
{
  Serial.begin(9600);
  pinMode(ultraSoundSignal,OUTPUT);
}

unsigned long ping(){
  pinMode(ultraSoundSignal, OUTPUT); // Switch signalpin to output
  digitalWrite(ultraSoundSignal, LOW); // Send low pulse
  delayMicroseconds(2); // Wait for 2 microseconds
  digitalWrite(ultraSoundSignal, HIGH); // Send high pulse
  delayMicroseconds(5); // Wait for 5 microseconds
  digitalWrite(ultraSoundSignal, LOW); // Holdoff
  pinMode(ultraSoundSignal, INPUT); // Switch signalpin to input
  digitalWrite(ultraSoundSignal, HIGH); // Turn on pullup resistor
  // please note that pulseIn has a 1sec timeout, which may
  // not be desirable. Depending on your sensor specs, you
  // can likely bound the time like this -- marcmerlin
  // echo = pulseIn(ultraSoundSignal, HIGH, 38000)
  echo = pulseIn(ultraSoundSignal, HIGH); //Listen for echo
  ultrasoundValue = (echo / 58.138) * .39; //convert to CM then to inches
  return ultrasoundValue;
}

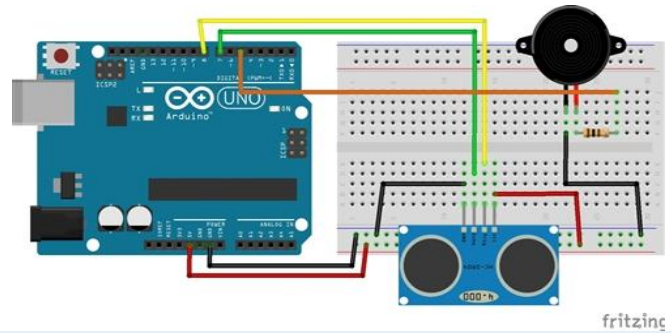
void loop()
{
  int x = 0;
  x = ping();
  Serial.println(x);
  delay(250); //delay 1/4 seconds.
}
```



Distance based piezo tone

The following circuit sounds a piezo buzzer when an object is detected. The tone will get progressively louder as the object draws closer to the sensor.

- Ultrasonic range finder
- Piezo speaker
- 10 kohm resistor
- Arduino
- Jumper Wire



```
const int TRIG = 8;
const int ECHO = 7;
const int BUZZ = 5;
void setup(){
  pinMode(TRIG, OUTPUT);
  pinMode(ECHO, INPUT);
  pinMode(BUZZ, OUTPUT);
  Serial.begin(9600);
}

void loop(){
  long duration, inches, cm;
  digitalWrite(TRIG, LOW);
  delayMicroseconds(2);
  digitalWrite(TRIG, HIGH);
  delayMicroseconds(10);
  digitalWrite(TRIG, LOW);
  duration = pulseIn(ECHO, HIGH);
  inches = duration / 74 / 2 ;
  cm = duration / 29 / 2 ;

  Serial.print(inches);
  Serial.print("in, ");
  Serial.print(cm);
  Serial.print("cm");
  Serial.println();

  if(cm < 20){
    analogWrite(BUZZ, (20 - cm) * 10);
  }else{
    digitalWrite(BUZZ, LOW);
  }
  delay(100);
}
```