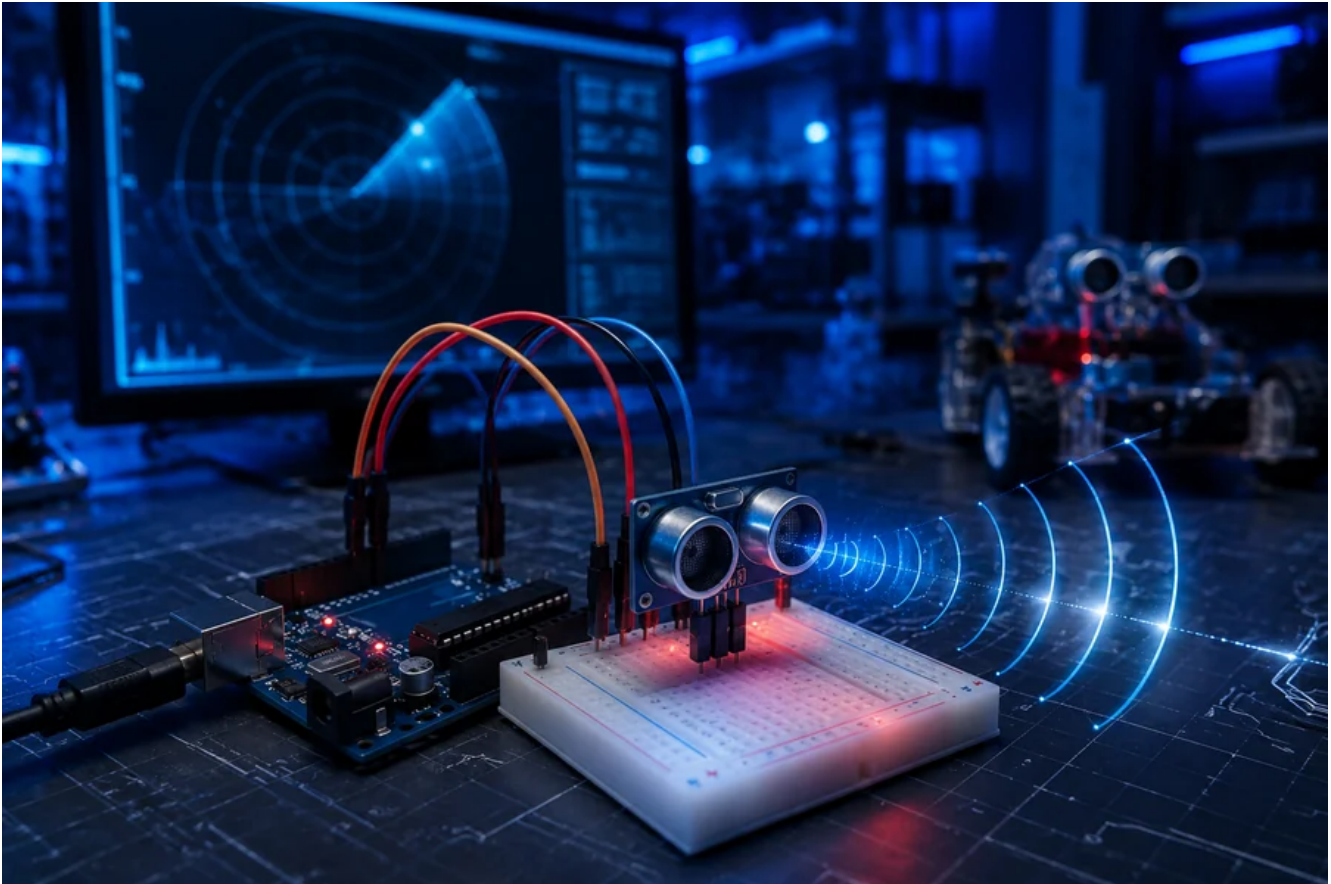


Arduino HC-SR04 Ultrasonic Sensor Lab Manual

Printable pinout, wiring, code, build steps, expected results, and troubleshooting for every Arduino tutorial on the WolfieWeb Arduino page.

Arduino HC-SR04 Ultrasonic Sensor Lab Manual



Goal: Measure distance using trigger and echo timing. This is the foundation of obstacle detection.

Pin Codes and Wiring Map

Part / Lead	Arduino Pin / Connection	Purpose
VCC	5V	Sensor power
GND	GND	Common ground
TRIG	D9	Arduino sends 10 microsecond pulse
ECHO	D10	Arduino measures pulse return time

Step-by-Step Build Instructions

Step 1: Mount the HC-SR04 facing forward with the two round transducers unobstructed.

Step 2: Wire VCC to 5V and GND to GND first.

Step 3: Wire TRIG to D9 and ECHO to D10. Keep the sensor wires short for stable readings.

Step 4: Upload the distance sketch and open Serial Monitor at 9600 baud.

Step 5: Move your hand from 10 cm to 50 cm away and verify readings change smoothly.

Expected Result

The serial monitor prints distance values in centimeters. Values should shrink as your hand moves closer.

Troubleshooting

Problem	What to check
Always reads 0	TRIG/ECHO are swapped, ECHO pin is wrong, or sensor is not powered.
Random spikes	Sensor is angled, target is soft fabric, or wires are loose.
No serial output	Serial Monitor baud rate is not set to 9600.

Arduino Code

```
const int trigPin = 9;
const int echoPin = 10;

void setup() {
  pinMode(trigPin, OUTPUT);
  pinMode(echoPin, INPUT);
  Serial.begin(9600);
}

void loop() {
  digitalWrite(trigPin, LOW); delayMicroseconds(2);
  digitalWrite(trigPin, HIGH); delayMicroseconds(10);
  digitalWrite(trigPin, LOW);
  long duration = pulseIn(echoPin, HIGH);
  float distanceCm = duration * 0.0343 / 2;
  Serial.println(distanceCm);
  delay(250);
}
```

Scan the QR code on the package README or visit www.wolfieweb.com/works01.html for the live tutorial page.