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US-015 High Accuracy Ultrasonic Sensor

Introduction

Ultrasonic sensors (also known as transceivers when they both send and receive, but more generally called transducers) work on a principle similar to radar or sonar which evaluate attributes of a target by interpreting the echoes from radio or sound waves respectively. Ultrasonic sensors generate high frequency sound waves and evaluate the echo which is received back by the sensor. Sensors calculate the time interval between sending the signal and receiving the echo to determine the distance to an object.

This technology can be used for measuring wind speed and direction (anemometer), tank or channel level, and speed through air or water. For measuring speed or direction a device uses multiple detectors and calculates the speed from the relative distances to particulates in the air or water. To measure tank or channel level, the sensor measures the distance to the surface of the fluid. Further applications include: humidifiers, sonar, medical ultrasonography, burglar alarms and non-destructive testing.

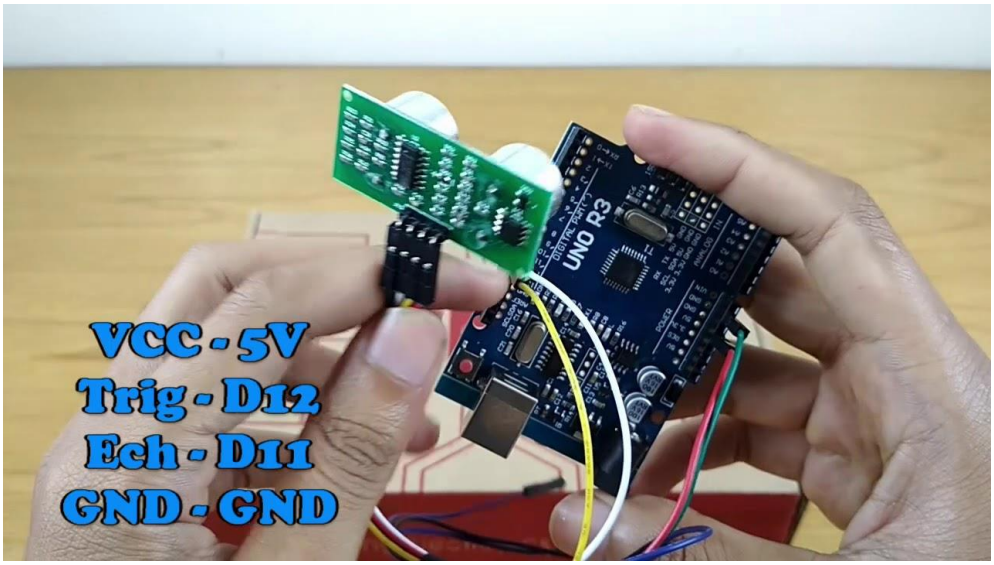
Systems typically used transducer which generates sound waves in the ultrasonic range, above 18,000 hertz, by turning electrical energy into sound, then upon receiving the echo turn the sound waves into electrical energy which can be measured and displayed.The technology is limited by the shapes of surfaces and the density or consistency of the material. Foam, in particular, can distort surface level readings.

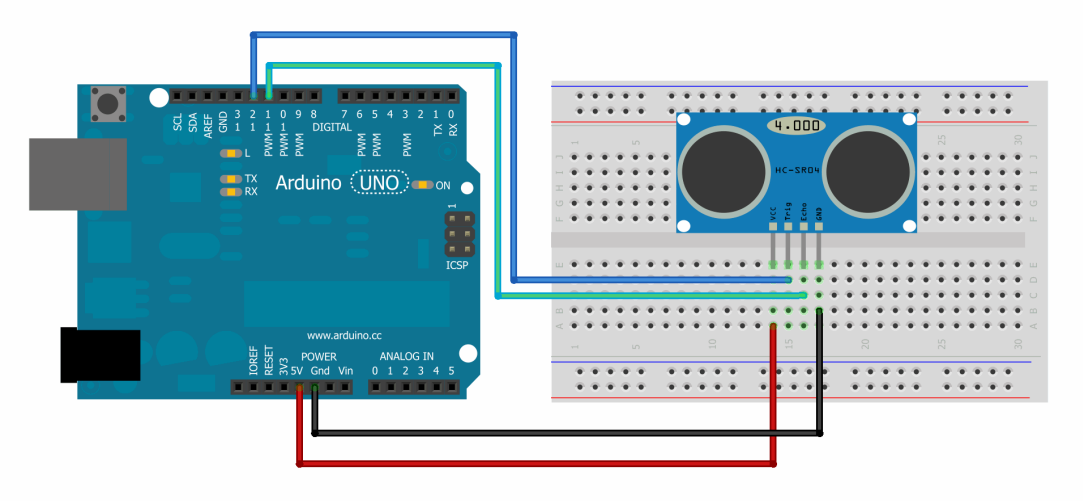
Specification

- Ultrasonic Module
- Resolution up to 0.5 mm
- Can realize 2 cm to 4 m non-contact ranging function, the power supply voltage is DC 5 v, working current is 2.2 mA, support GPIO communication mode
- Operating temperature:0~+70°
- Output mode: GPIO
- Detection angle: less than 15°
- Detecting precision: 0.1cm+1%
- Size: 45mm*20mm*1.2mm

- Color is shown as pictures
- Condition: New PLS NOTE that due to lighting effects, monitor's brightness/ contras settings etc, there could be some slight differences in the color tone of the pictures and the actual item!
- Article-Nr.:5401418, 54014182, 54014183, 54014185, 54014180

Image Set Up Diagram





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Packing List

- 1X ARDUINO UNO
- Male to female jumper wires
- 1X USB Cable
- 1X half breadboard
- 1X US-015 Ultrasonic sensor

Requirements

Necessary hardware to follow this guide:

- Arduino Uno
- US High Accuracy Ultrasonic Sensor module
- Male to female jumper wires
- Half breadboard

Product Views

FRONT

BACK

Pin Assignments

	Pin Symbol	Pin Function Description
1	VCC	5v Power Supply
2	Trig	Trigger Input Pin
3	Echo	Receiver Output Pin
4	GND	Power Ground

Hardware Interface/Setup

- Its working is quite simple, it has a trigger and an echo pin.
- A signal of +5V is sent over to Trigger pin.
- When ultrasonic sensor gets a trigger signal on its trigger pin then it emits an ultrasonic signal from the transmitter.
- This ultrasonic senor, then goes out and reflected back after hitting some object in front.
- This reflected ultrasonic signal is then captured by the receiver of ultrasonic sensor.
- As the sensor gets this reflected signal, it automatically make the Echo pin high.
- The time for which the Echo pin will remain HIGH, depends on the reflected signal.

Example Code

This is example code for ultrasonic sensor.

```
#include <NewPing.h>

#define TRIGGER_PIN  12
#define ECHO_PIN     11
#define MAX_DISTANCE 200

NewPing sonar(TRIGGER_PIN, ECHO_PIN, MAX_DISTANCE);

void setup() {
  Serial.begin(115200);
}

void loop() {
  delay(50);
  Serial.print("Ping: ");
  Serial.print(sonar.ping_cm());
  Serial.println("cm");
}
```

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Applications

1. Robotics barrier
2. Object distance measurement
3. Level detection
4. Security systems
5. Vehicle detection/avoidance