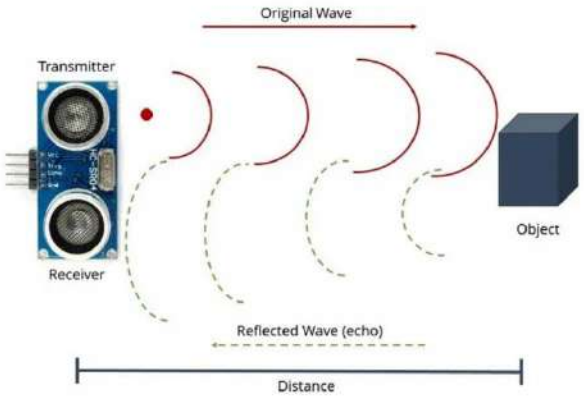
Modul 11

Interface Ultrasonic Sensor

1. Ultrasonic sensor

The Ultrasonic Sensor is arguably the most common distance measuring sensor, also known as the Sonar sensor. It detects the distance to objects by emitting high-frequency sound waves.



For an ultrasonic sensor to be parable with an Arduino, you'll need an ultrasonic sensor module. The Grove – Ultrasonic Sensor is my recommended pick that's built with significant benefits over the popular HC-SR04!

Wonder why it's a better option than the HC-SR04? Here's a comparative table!

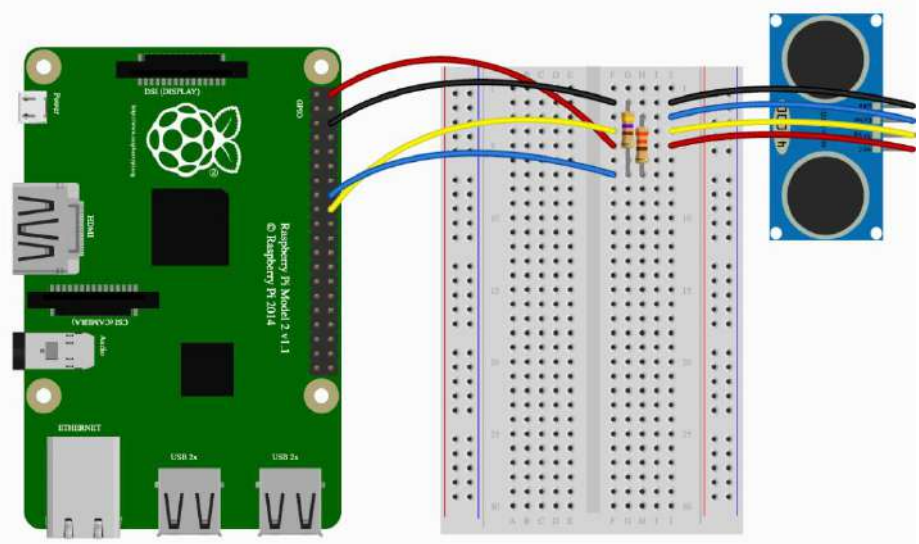
Sensor	Grove – Ultrasonic Distance Sensor	HC-SR04
Working Voltage	3.3V / 5V compatible Wide voltage level: 3.2V – 5.2V	5V
Measurement Range	3cm – 350cm	2cm – 400cm
I/O Pins needed	3	4
Operating Current	8mA	15mA
Dimensions	50mm x 25mm x 16mm	45mm x 20mm x 15mm
Ease of pairing with Raspberry Pi	Easy, direct connection	Voltage Conversion Circuit Required

EXAMPLE CODE:

```
import RPi.GPIO as GPIO
import time
GPIO.setmode(GPIO.BOARD)
TRIG = 16
ECHO = 18
i=0

GPIO.setup(TRIG,GPIO.OUT)
GPIO.setup(ECHO,GPIO.IN)

GPIO.output(TRIG, False)
print "Calibrating....."
time.sleep(2)
print "Place the object......"
try:
    while True:
      GPIO.output(TRIG, True)
      time.sleep(0.00001)
      GPIO.output(TRIG, False)

      while GPIO.input(ECHO)==0:
        pulse_start = time.time()

      while GPIO.input(ECHO)==1:
        pulse_end = time.time()

      pulse_duration = pulse_end - pulse_start
      distance = pulse_duration * 17150
      distance = round(distance+1.15, 2)

      if distance<=20 and distance>=5:
        print "distance:",distance,"cm"
        i=1

      if distance>20 and i==1:
        print "place the object...."
        i=0
      time.sleep(2)

except KeyboardInterrupt:
    GPIO.cleanup()
```

JOBSHEET 11

Lakukan perakitan komponen pada gambar di bawah ini dan gunakan script program Python untuk jarak antara sensor dengan benda.



LAPORAN HASIL PERCOBAAN: