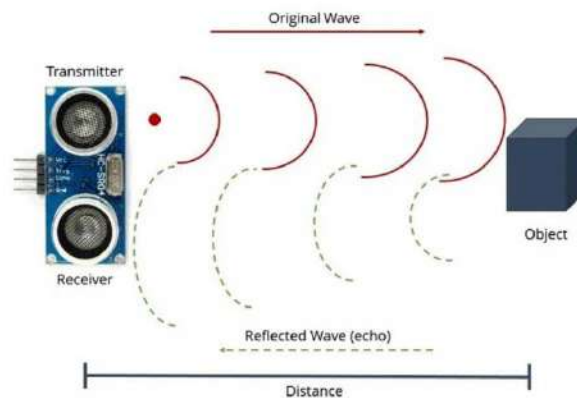


# Modul 11

## 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
<b>Working Voltage</b>	3.3V / 5V compatible Wide voltage level: 3.2V – 5.2V	5V
<b>Measurement Range</b>	3cm – 350cm	2cm – 400cm
<b>I/O Pins needed</b>	3	4
<b>Operating Current</b>	8mA	15mA
<b>Dimensions</b>	50mm x 25mm x 16mm	45mm x 20mm x 15mm
<b>Ease of pairing with Raspberry Pi</b>	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)

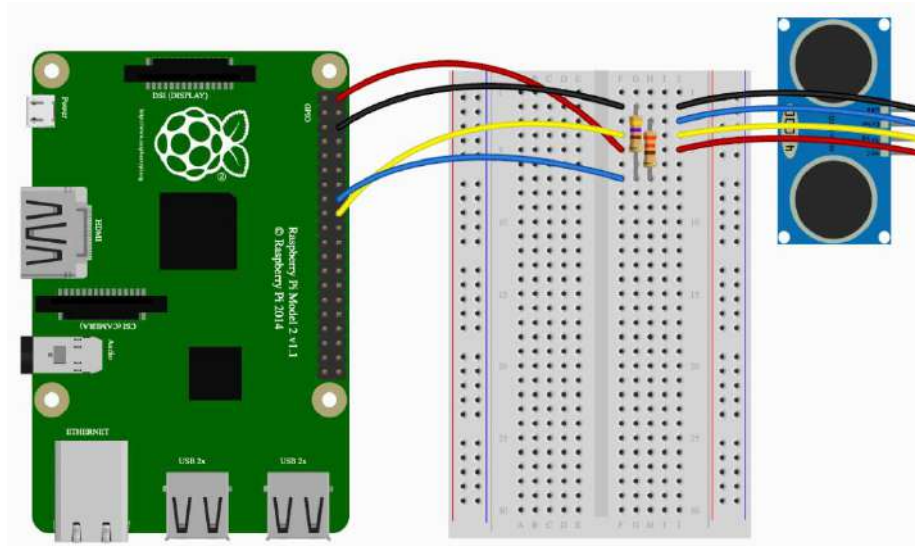
        if distance<=20 and distance>=5:
            print "distance:",distance,"cm"
            i=1

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

except KeyboardInterrupt:
    GPIO.cleanup()
```

## JOB SHEET 11

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



LAPORAN HASIL PERCOBAAN: