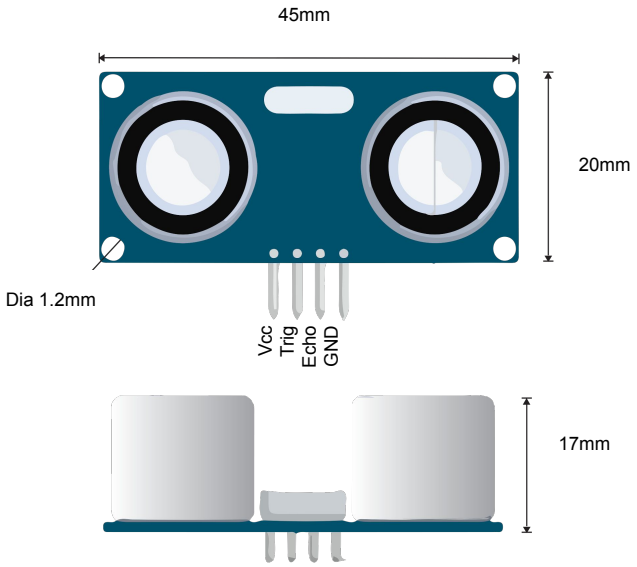
Z2M Part Number:
EMS-00005-A

Ultrasonic Sensor
(Technical Note)

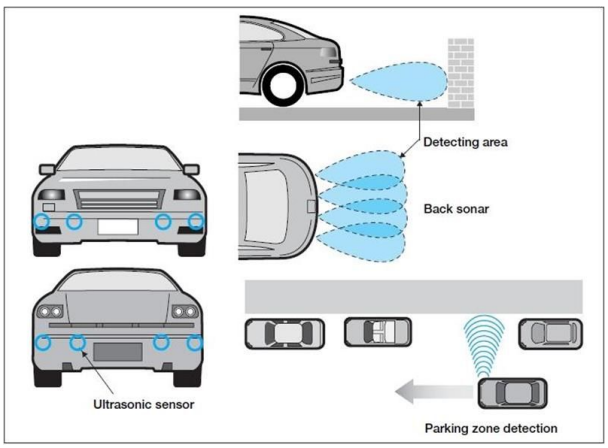
Ultrasonic Distance Sensor

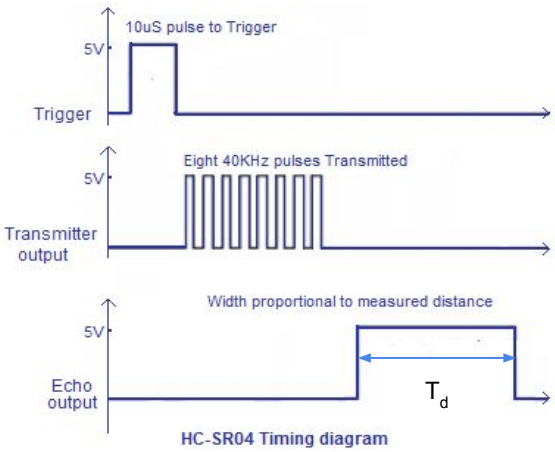
Ultrasonic sensor works in the way the bats do using echolocation. An Ultrasonic transmitter/receiver sensor is used to measure distance to an object by timing the delay of echo from the object after a signal has been transmitted. This integrated sensor shown here has two transducers, one is a transmitter sending sound pulse of frequency greater than 20kHz, while the other is a receiver which detects the reflected sound pulse and creates an electrical signal to estimate the distance.



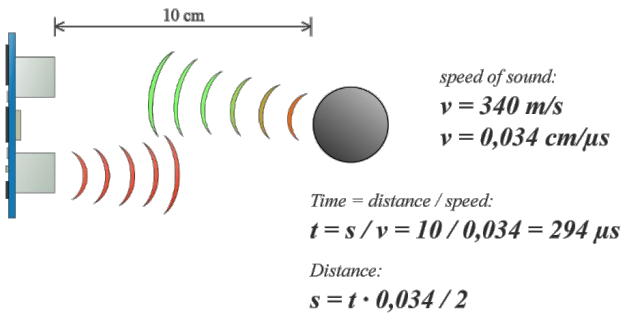
Applications

Ultrasonic sensors are used in automobiles for measuring distance between surrounding objects and vehicles.





It may also be used in non-touch distance measurement, such as in a distance meter. It is used in various application in domestic usage as well as in industries.



Reference:

http://acoptex.com/project/150/basics-project-009d-ultrasonic-sensor-hc-sr04-and-dc-5v-mg91-or-sg90-micro-servo-motor-mini-ultra-at-acoptexcom/#sthash.bRqtgLd6.dpbs
http://inspirationaltechnology.in

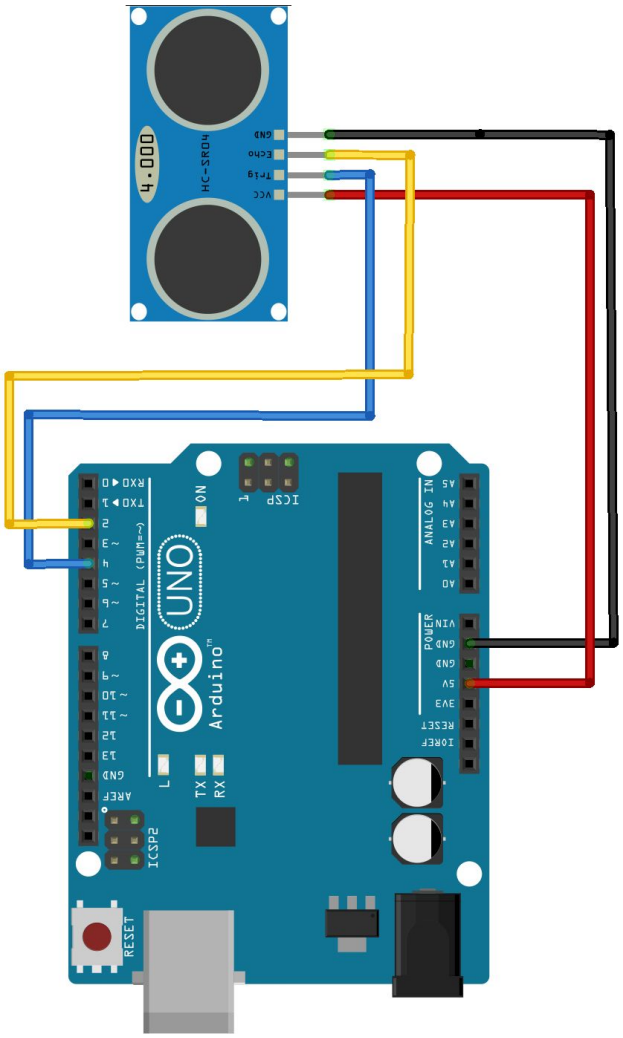
Z2M Part Number:
EMS-00005-A

Ultrasonic Sensor
(Application Note)

Project
To check the distance of the object which is in proximity of the ultrasonic sensor.

Procedure
Ultrasonic Sensor Module:

- Connect **Vcc** pin of sensor to **5V** of Arduino
- Wire **GND** pin of the sensor to **GND** of the Arduino
- Connect **Trig** pin to **pin 4** of Arduino
- Connect **Echo** pin to **pin 2** of Arduino
- Upload the code
- Watch the distance displayed

Schematic


Challenge
1. **Parking Buzzer:** Make the proximity alarm using a buzzer
2. **Obstacle avoiding robot** with robot car chassis, motors, and wheels

Components Required

Component	Part No.	Qty
Arduino UNO	EMX-00001-A	1
Ultrasonic Sensor	EMS-00005-A	1
Jumper Wires - M-F	EDA-00001-A	4

Code
```
const int trig = 4;
const int echo = 2;
/*defining the variables to store data*/
long duration;
int distance;
void setup() {
pinMode(trig, OUTPUT);
/* Sets the trigPin as an Output*/
pinMode(echo, INPUT);
/* Sets the echoPin as an Input*/
Serial.begin(9600); /* Starts the serial
communication with 9600 baudrate*/
}
void loop()
{
  digitalWrite(trig, LOW);
/* Clears the trigPin*/
  delayMicroseconds(2);
  digitalWrite(trig, HIGH);
/* Sets the trigPin on HIGH state for 10
micro seconds*/
  delayMicroseconds(10);
  digitalWrite(trig, LOW);
  /* Reads the echoPin, returns the sound
wave travel time in microseconds*/
  duration = pulseIn(echo, HIGH);
  distance= duration*0.034/2;
/* Calculating the distance by the
formula*/
  Serial.print("Distance: ");
  Serial.print(distance);
  Serial.println(" cm");
/* Displays the distance in cm on the
Serial Monitor*/
}
```

Use Monitor window on Arduino app to view data at baud rate of 9600 bits per second.