

#1: How to Interface an Ultrasonic Sensor with Arduino using TinkerCAD || Ultrasonic Sensor Code ||

Introduction :

An [#Ultrasonic](#) Sensor is an electronic device that measures the distance of an object or obstacle via Ultrasonic sound waves (that travel faster than the speed of audible sound), and it converts the reflected ultrasonic wave into electric signals. It is one of the most reliable and accurate proximity sensors.

The [#sensor](#) is based on the measurement of the time of flight of an ultrasonic pulse, which is reflected by the ground, it sends out Ultrasonic waves that have a range of frequency above human hearing. Ultrasonic Sensor is commonly used in obstacle avoiding robots and automation projects.

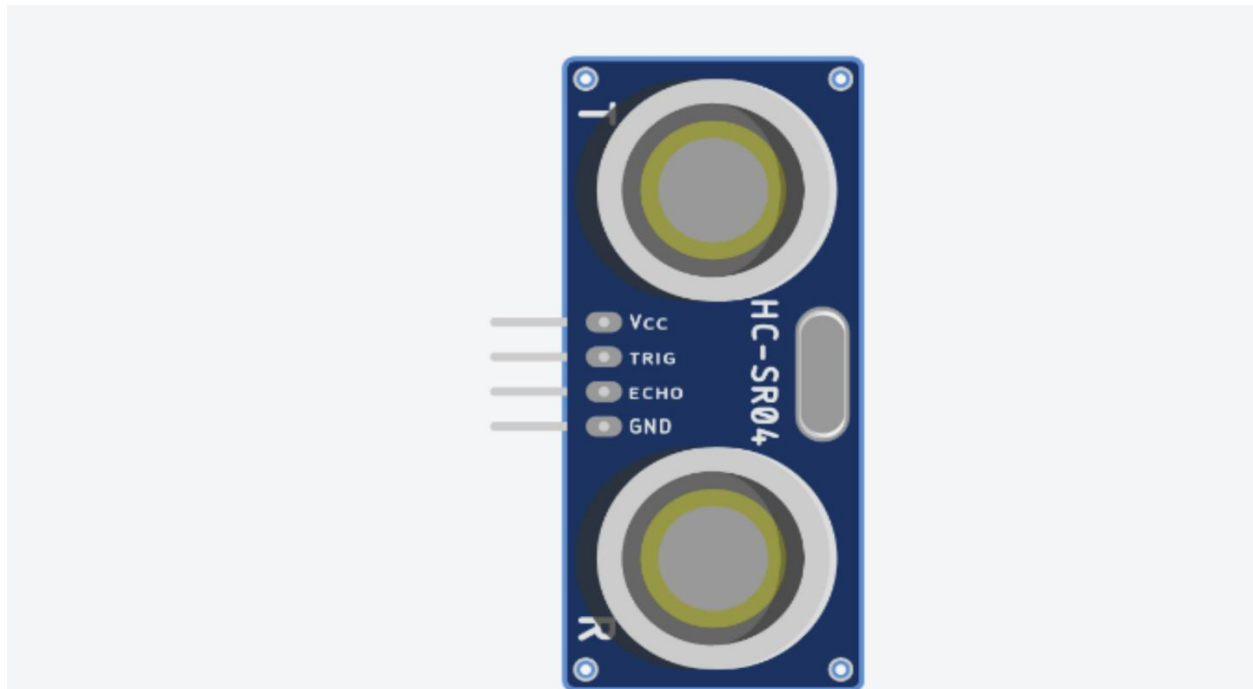
LIST:

Software Components of tinkercad :

1. [Ultrasonic Distance Sensor](#)
2. [Arduino Uno R3](#)

1. HCSR04:

Is the Ultrasonic Sensor used. An ultrasonic sensor contains two circular structures: one is the [#transmitter](#) and the other is a [#receiver](#). The transmitter transmits the ultrasonic sound while the receiver receives the reflected signal.

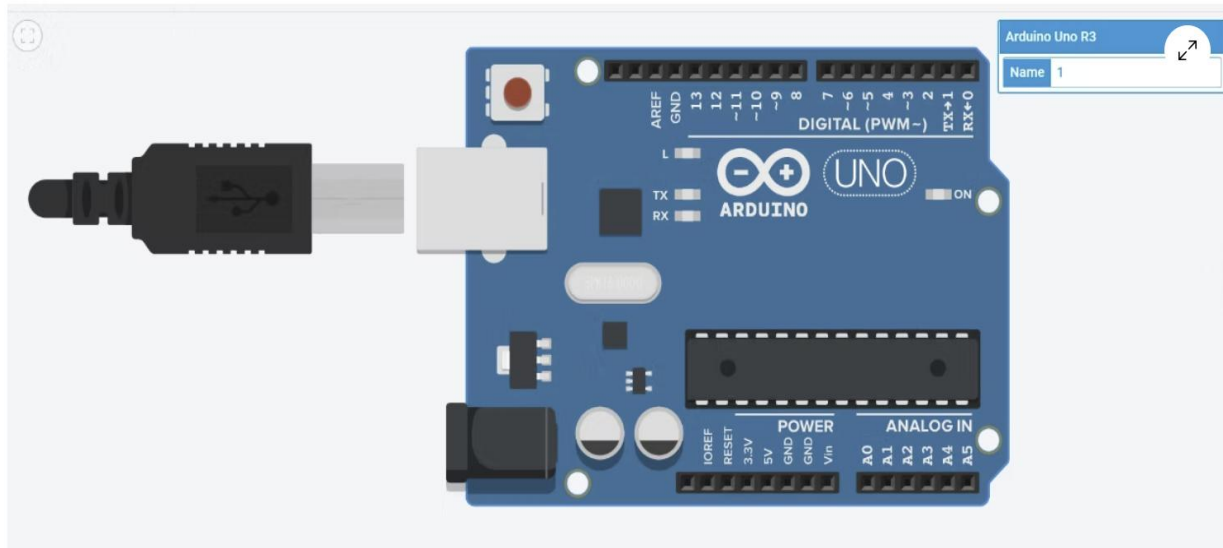


Specifications:

Operating voltage	5 V
Operating current	15 mA
Frequency	40 kHz
Measuring range	2 – 400 cm
Resolution	3 mm
Measuring angle	15 degrees
Trigger input signal	10 μ s high pulse

2. Arduino Uno R3:

The [#Arduino](#) is a micro-controller board that is based on the ATmega328P, it consists of digital and analog input/output pins that are interfaced with the ultrasonic sensor (used to send and receive data). the Arduino Uno IDE consists of a Serial Monitor that displays the output.



Arduino UNO R3

Circuit connections:

Ultrasonic sensor has 4 pins:

1. Vcc: connected to the 5V in Arduino
2. TRIG (trigger): connected to PIN 10 of the Arduino

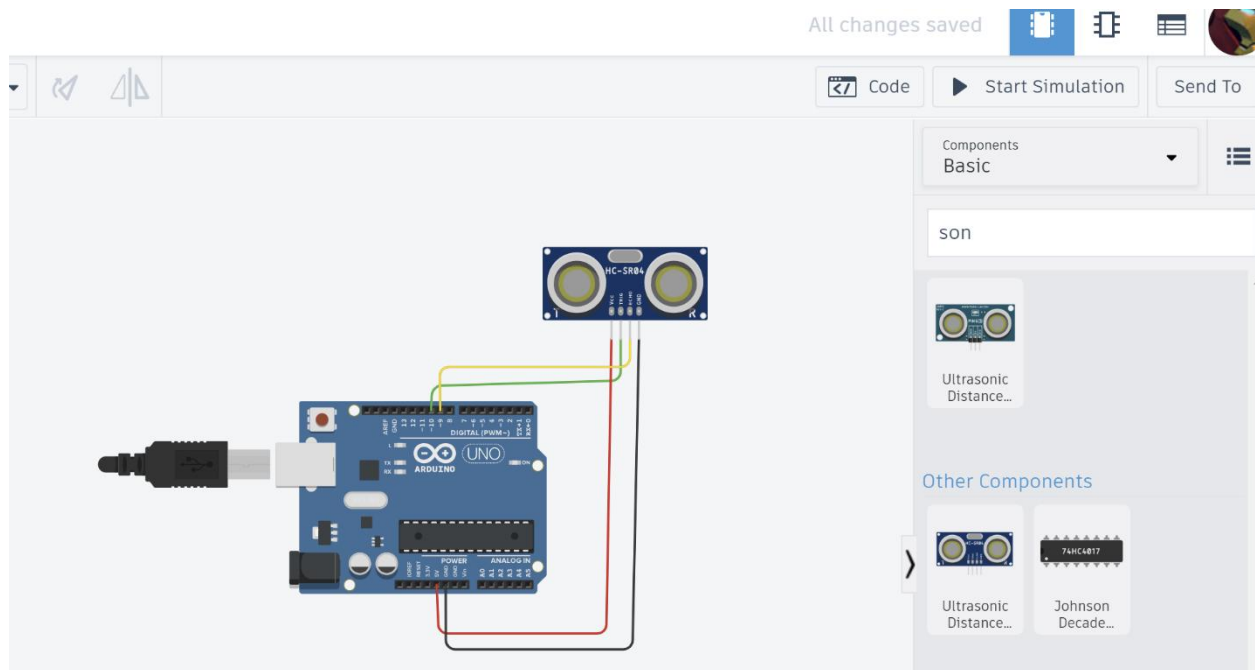
[#Trigger](#) is used as Transmitter, this pin is used to transmit the sound from the Ultrasonic sensor. Trigger should be high. It is connected to the digital pin of the Arduino and used as output pin.

3. ECHO: connected to PIN 9 of Arduino.

Echo is used as a Receiver, it receives the sound. It is connected to the digital pin of the Arduino and used as input pin. In this diagram, we have connected Echo to pin 9.

4. GND (ground): connected to the GND of Arduino

Circuit diagram:



The variables and pin connections are declared and defined before both the loops

There are 2 loops in the code:

1. **Void setup** -code here is run only once
2. **Void loop**- code run continuously to measure the distance

The code link is : <https://github.com/sami-118/tinker-cad-project.git>