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Ultrasonic Sensor HC-SR04 and Arduino Tutorial

- ☐ [Dejan Nedelkovski \(http://howtomechatronics.com/author/howtom12_wp/\)](http://howtomechatronics.com/author/howtom12_wp/)
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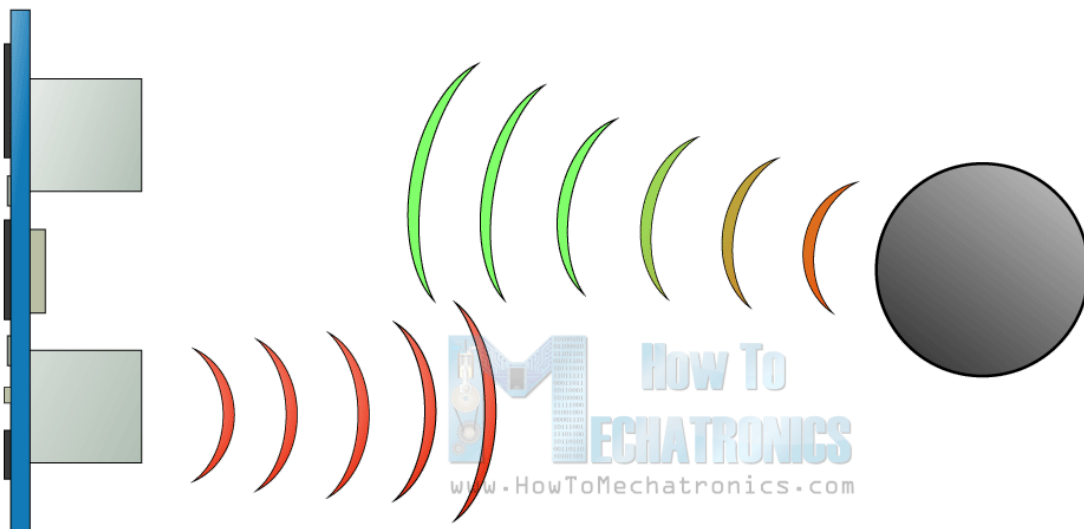
In this Arduino Tutorial we will learn how the HC-SR04 Ultrasonic Sensor works and how to use it with the Arduino Board. You can watch the following video or read the written tutorial below.

Ultrasonic Sensor HC-SR04 and Arduino Tutorial

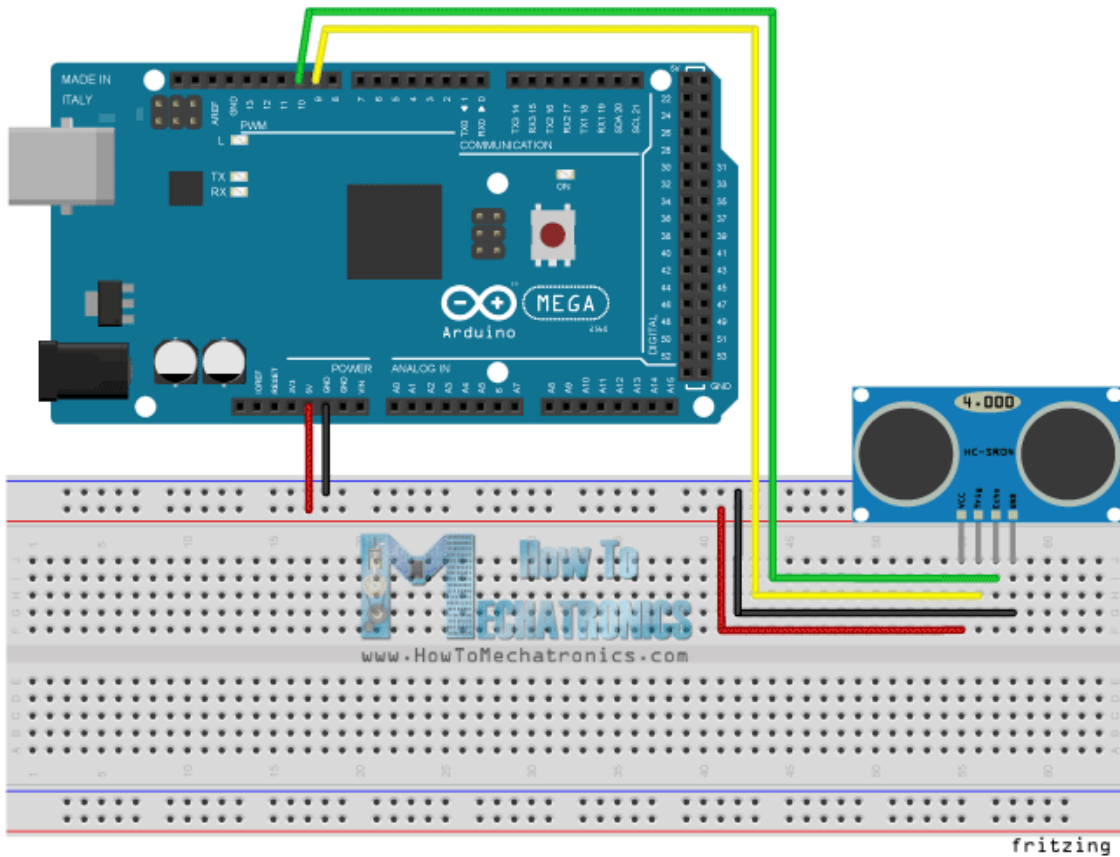


How It Works – Ultrasonic Sensor

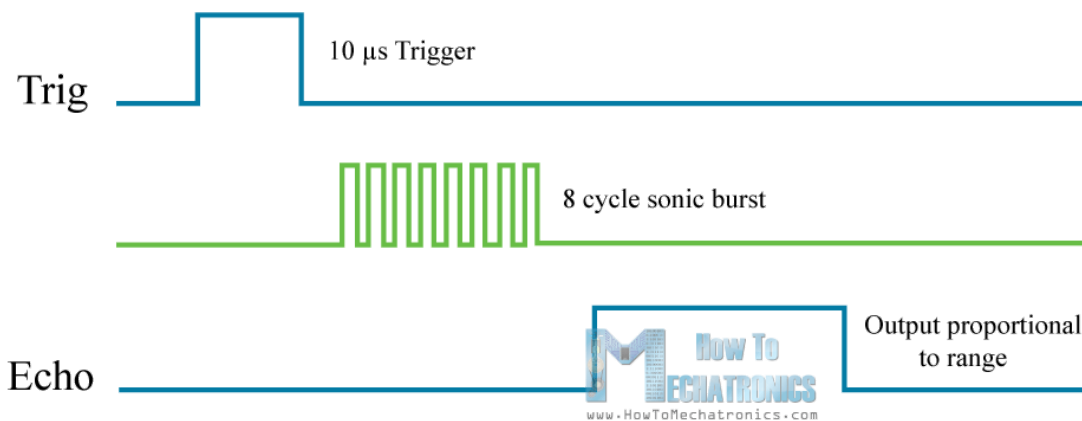
It emits an ultrasound at 40 000 Hz which travels through the air and if there is an object or obstacle on its path It will bounce back to the module. Considering the travel time and the speed of the sound you can calculate the distance.



The HC-SR04 Ultrasonic Module has 4 pins, Ground, VCC, Trig and Echo. The Ground and the VCC pins of the module needs to be connected to the Ground and the 5 volts pins on the Arduino Board respectively and the trig and echo pins to any Digital I/O pin on the Arduino Board.

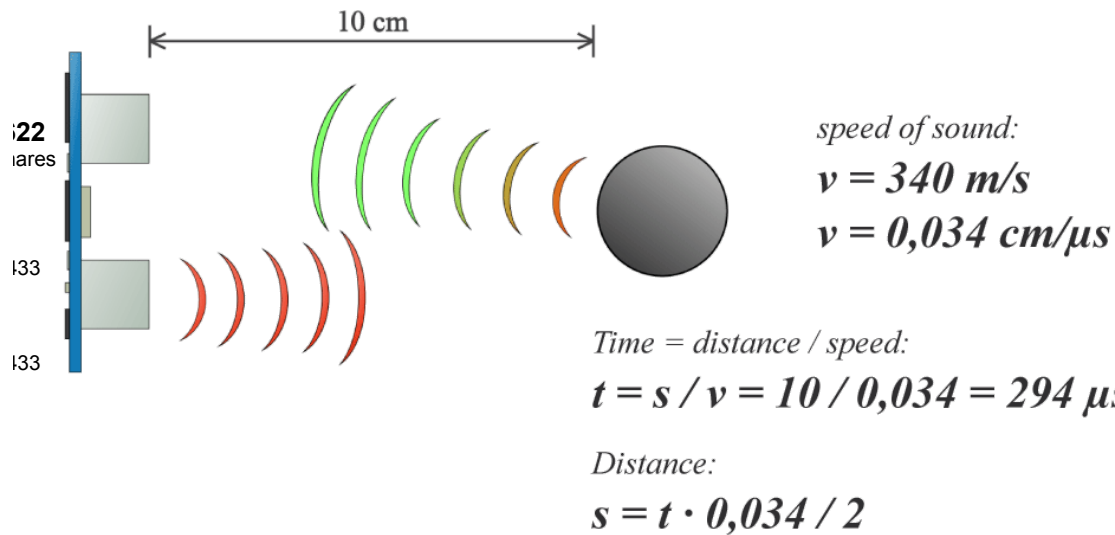


In order to generate the ultrasound you need to set the Trig on a High State for 10 μ s. That will send out an 8 cycle sonic burst which will travel at the speed of sound and it will be received in the Echo pin. The Echo pin will output the time in microseconds the sound wave traveled.



(<http://howtomechatronics.com/wp-content/uploads/2015/07/Ultrasonic-Sensor-Diagram.png?x57244>)

For example, if the object is 10 cm away from the sensor, and the speed of the sound is 340 m/s or 0.034 cm/ μ s the sound wave will need to travel about 294 μ s. But what you will get from the Echo pin will be double that number because the sound wave needs to travel forward and bounce backward. So in order to get the distance in cm we need to multiply the received travel time value from the echo pin by 0.034 and divide it by 2.



(<http://howtomechatronics.com/wp-content/uploads/2015/07/Ultrasonic-Sensor-Equations.png?x57244>)



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Ultrasonic Detector

Components needed for this tutorial

You can get these components from any of the sites below:

- Ultrasonic Sensor HC-SR04..... [Amazon](http://howtomechatronics.com/recommends/ultrasonic-module-hc-sr04-amazon/) (<http://howtomechatronics.com/recommends/ultrasonic-module-hc-sr04-amazon/>) / [Banggood](http://howtomechatronics.com/recommends/hc-sr04-ultrasonic-module-distance-measuring-transducer-sensor-bg/) (<http://howtomechatronics.com/recommends/hc-sr04-ultrasonic-module-distance-measuring-transducer-sensor-bg/>) / [GearBest](http://howtomechatronics.com/recommends/ultrasonic-sensor-hc-sr04-gearbest/) (<http://howtomechatronics.com/recommends/ultrasonic-sensor-hc-sr04-gearbest/>) / [DealExtreme](http://howtomechatronics.com/recommends/ultrasonic-module-hc-sr04-dealextreme/) (<http://howtomechatronics.com/recommends/ultrasonic-module-hc-sr04-dealextreme/>) / [ICStation](http://howtomechatronics.com/recommends/hc-sr04-ultrasonic-sensor/) (<http://howtomechatronics.com/recommends/hc-sr04-ultrasonic-sensor/>)
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**Please note: These are affiliate links. I may make a commission if you buy the components through these links. I would appreciate your support in this way!*

Source Codes

First you have to define the Trig and Echo pins. In this case they are the pins number 9 and 10 on the Arduino Board and they are named trigPin and echoPin. Then you need a Long variable, named "duration" for the travel time that you will get from the sensor and an integer variable for the distance.

In the setup you have to define the trigPin as an output and the echoPin as an Input and also start the serial communication for showing the results on the serial monitor.

In the loop first you have to make sure that the trigPin is clear so you have to set that pin on a LOW State for just 2 μ s. Now for generating the Ultra sound wave we have to set the trigPin on HIGH State for 10 μ s. Using the **pulseIn()** function you have to read the travel time and put that value into the variable "duration". This function has 2 parameters, the first one is the name of the echo pin and for the second one you can write either HIGH or LOW. In this case, HIGH means that the **pulseIn()** function will wait for the pin to go HIGH caused by the bounced sound wave and it will start timing, then it will wait for the pin to go LOW when the sound wave will end which will stop the timing. At the end the function will return the length of the pulse in microseconds. For getting the distance we will multiply the duration by 0.034 and divide it by 2 as we explained this equation previously. At the end we will print the value of the distance on the Serial Monitor.

```
/*
 * Ultrasonic Sensor HC-SR04 and Arduino Tutorial
 *
 * Crated by Dejan Nedelkovski,
 * www.HowToMechatronics.com
 */

// defines pins numbers
const int trigPin = 9;
const int echoPin = 10;

// defines variables
long duration;
int distance;

void setup() {
  pinMode(trigPin, OUTPUT); // Sets the trigPin as an Output
  pinMode(echoPin, INPUT); // Sets the echoPin as an Input
  Serial.begin(9600); // Starts the serial communication
}

void loop() {
  // Clears the trigPin
  digitalWrite(trigPin, LOW);
  delayMicroseconds(2);

  // Sets the trigPin on HIGH state for 10 micro seconds
  digitalWrite(trigPin, HIGH);
  delayMicroseconds(10);
  digitalWrite(trigPin, LOW);

  // Reads the echoPin, returns the sound wave travel time in microseconds
  duration = pulseIn(echoPin, HIGH);

  // Calculating the distance
  distance= duration*0.034/2;

  // Prints the distance on the Serial Monitor
  Serial.print("Distance: ");
  Serial.println(distance);
}
```

If you want to display the results from the HC-SR04 Ultrasonic Sensor on an [LCD](#) (<http://howtomechatronics.com/tutorials/arduino/lcd-tutorial/>) you can use the following source code:

```
/*
 * Ultrasonic Sensor HC-SR04 and Arduino Tutorial
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 * Crated by Dejan Nedelkovski,
 * www.HowToMechatronics.com
 */

#include <LiquidCrystal.h> // includes the LiquidCrystal Library

LiquidCrystal lcd(1, 2, 4, 5, 6, 7); // Creates an LCD object. Parameters: (rs, enable, d4, d5, d6, d7)

const int trigPin = 9;
const int echoPin = 10;

long duration;
int distanceCm, distanceInch;

void setup() {
  lcd.begin(16,2); // Initializes the interface to the LCD screen, and specifies the dimensions (width and height) of the display

  pinMode(trigPin, OUTPUT);
  pinMode(echoPin, INPUT);
}

void loop() {
  digitalWrite(trigPin, LOW);
  delayMicroseconds(2);

  digitalWrite(trigPin, HIGH);
  delayMicroseconds(10);
  digitalWrite(trigPin, LOW);

  duration = pulseIn(echoPin, HIGH);
  distanceCm= duration*0.034/2;
  distanceInch = duration*0.0133/2;

  lcd.setCursor(0,0); // Sets the location at which subsequent text written to the LCD will be displayed
  lcd.print("Distance: "); // Prints string "Distance" on the LCD
  lcd.print(distanceCm); // Prints the distance value from the sensor
  lcd.print(" cm");
  delay(10);
  lcd.setCursor(0,1);
  lcd.print("Distance: ");
  lcd.print(distanceInch);
  lcd.print(" inch");
  delay(10);
}
```

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[HC-SR04 \(<http://howtomechatronics.com/tag/hc-sr04/>\)](http://howtomechatronics.com/tag/hc-sr04/)

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20

[1&url=http%3A%2F%2Fhowtomechatronics.com%2Ftutorials%2Farduino%2Fultrasonic-sensor-hc-](http://www.pinterest.com/pin/create/button/?guid=_bnSaxhQMoCk-1&url=http%3A%2F%2Fhowtomechatronics.com%2Ftutorials%2Farduino%2Fultrasonic-sensor-hc-sr04%2F&media=http%3A%2F%2Fhowtomechatronics.com%2Fwp-content%2Fuploads%2F2015%2F07%2Fultrasonic-sensor-tutorial-0001119.jpg&description=Ultrasonic%2BSensor%2BHC-SR04%2Band%2BArduino%2BTutorial)

[sr04%2F&media=http%3A%2F%2Fhowtomechatronics.com%2Fwp-content%2Fuploads%2F2015%2F07%2Fultrasonic-sensor-tutorial-0001119.jpg&description=Ultrasonic%2BSensor%2BHC-SR04%2Band%2BArduino%2BTutorial](http://www.pinterest.com/pin/create/button/?guid=_bnSaxhQMoCk-1&url=http%3A%2F%2Fhowtomechatronics.com%2Ftutorials%2Farduino%2Fultrasonic-sensor-hc-sr04%2F&media=http%3A%2F%2Fhowtomechatronics.com%2Fwp-content%2Fuploads%2F2015%2F07%2Fultrasonic-sensor-tutorial-0001119.jpg&description=Ultrasonic%2BSensor%2BHC-SR04%2Band%2BArduino%2BTutorial)



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90 RESPONSES

S Looney (<http://howtomechatronics.com/tutorials/arduino/ultrasonic-sensor-hc-sr04/>) November 24, 2015
(<http://howtomechatronics.com/tutorials/arduino/ultrasonic-sensor-hc-sr04/#comment-192>)

Please note the error in your fritzing wiring diagram that shows GND to VCC and VCC to echo.

Thanks

REPLY

Dejan Nedelkovski (<http://howtomechatronics.com>) November 25, 2015
(<http://howtomechatronics.com/tutorials/arduino/ultrasonic-sensor-hc-sr04/#comment-209>)

Thanks for the remark. I will change the that one.

REPLY

pradeep November 27, 2015 (<http://howtomechatronics.com/tutorials/arduino/ultrasonic-sensor-hc-sr04/#comment-219>)

Can you please email me the updated diagram of Ultrasonic Circuit sketch diagram ?

Thank you in advance,
Pradeep

Dejan Nedelkovski (<http://howtomechatronics.com>) November 27, 2015
(<http://howtomechatronics.com/tutorials/arduino/ultrasonic-sensor-hc-sr04/#comment-220>)

It's already updated.

pictorobo (<http://www.pictorobo.com>) April 13, 2017
(<http://howtomechatronics.com/tutorials/arduino/ultrasonic-sensor-hc-sr04/#comment-1889>)

connet vcc to +5 volt

REPLY

mujadidd (<http://www.engr.com>) November 30, 2015

(<http://howtomechatronics.com/tutorials/arduino/ultrasonic-sensor-hc-sr04/#comment-235>)

please give us the diagram of the ultra sonic with LCD

REPLY

Dejan Nedelkovski (<http://howtomechatronics.com>) November 30, 2015

(<http://howtomechatronics.com/tutorials/arduino/ultrasonic-sensor-hc-sr04/#comment-238>)

Here you can find details how to connect and use the LCD:

<http://howtomechatronics.com/tutorials/arduino/lcd-tutorial/>

(<http://howtomechatronics.com/tutorials/arduino/lcd-tutorial/>)

REPLY

Siddharth shetty February 25, 2016 (<http://howtomechatronics.com/tutorials/arduino/ultrasonic-sensor-hc-sr04/#comment-627>)

Can we use a led to indicate the distance???? If yes than can u pls email me the codes.... Thanks

Dejan Nedelkovski (<http://howtomechatronics.com>) February 25, 2016

(<http://howtomechatronics.com/tutorials/arduino/ultrasonic-sensor-hc-sr04/#comment-628>)

Yes, you can, but I don't have such a code.

Tino December 29, 2015 (<http://howtomechatronics.com/tutorials/arduino/ultrasonic-sensor-hc-sr04/#comment-359>)

<http://howtomechatronics.com/tutorials/arduino/ultrasonic-sensor-hc-sr04/>

(<http://howtomechatronics.com/tutorials/arduino/ultrasonic-sensor-hc-sr04/>)

Hi,

Followed everything I guess.

Still I see that the distance will no be bigger than 1 cm:

0in, 0cm

0in, 0cm
0in, 0cm
0in, 0cm
0in, 1cm
0in, 0cm
0in, 0cm

I am using a Arduino DUE, for the rest anything is connected directly to the board.

Any ideas?

Best regards

REPLY

Dejan Nedelkovski (<http://howtomechatronics.com>) December 29, 2015
(<http://howtomechatronics.com/tutorials/arduino/ultrasonic-sensor-hc-sr04/#comment-362>)

The problem might be that you are using Arduino DUE, which has 3.3V pins and the ultrasonic sensors is working with 5V. Try using an resistor at the echo pin, as the 3.3V are fine for the Trig pin, but the Echo pin of the sensor will output 5V to your Arduino DUE which might damage it.

REPLY

Rhydo June 28, 2016 (<http://howtomechatronics.com/tutorials/arduino/ultrasonic-sensor-hc-sr04/#comment-1034>)

Make sure your trig and Echo pins are connected to digital pins 9 and 10 instead of 11 and 12.

REPLY

IAN December 30, 2015 (<http://howtomechatronics.com/tutorials/arduino/ultrasonic-sensor-hc-sr04/#comment-364>)

Unfortunately I get the same 0, 0, response for the ultrasonic sensor on the monitor as well using Mega 2560 using just the sensor code by itself???

Any other suggestions?

Cheers, Ian

REPLY

Dejan Nedelkovski (<http://howtomechatronics.com>) December 30, 2015
(<http://howtomechatronics.com/tutorials/arduino/ultrasonic-sensor-hc-sr04/#comment-368>)

Sorry to hear that but I have just tried this code as well and it's working perfectly with my HC-SR04. You got to be doing something wrong, or your sensor is not working properly.

REPLY

The Wisdom Wize (<http://Howtomechatronics.com>) April 27, 2017
(<http://howtomechatronics.com/tutorials/arduino/ultrasonic-sensor-hc-sr04/#comment-1938>)

Thanks for being so active on this.

amirul January 1, 2016 (<http://howtomechatronics.com/tutorials/arduino/ultrasonic-sensor-hc-sr04/#comment-376>)

what type of arduino should I use?

REPLY

Dejan Nedelkovski (<http://howtomechatronics.com>) January 1, 2016
(<http://howtomechatronics.com/tutorials/arduino/ultrasonic-sensor-hc-sr04/#comment-377>)

Well you can do it with almost any model which operating voltage is 5V.

REPLY

extremeus January 11, 2016 (<http://howtomechatronics.com/tutorials/arduino/ultrasonic-sensor-hc-sr04/#comment-443>)

hi,you forgot to write liquidcrystal in the lcd code

REPLY

Dejan Nedelkovski (<http://howtomechatronics.com>) January 11, 2016
(<http://howtomechatronics.com/tutorials/arduino/ultrasonic-sensor-hc-sr04/#comment-445>)

Yes thanks, it's fixed now.

REPLY

Haravey January 23, 2016 (<http://howtomechatronics.com/tutorials/arduino/ultrasonic-sensor-hc-sr04/#comment-500>)

Great video. Thanks. I'm trying to set this up to trigger a gate or relay at a predefined range to set off a light if something gets too close. Have you already developed a sketch for this scenario. I just can't seem to get it to work correctly myself. Thanks.

REPLY

Dejan Nedelkovski (<http://howtomechatronics.com>) January 24, 2016
(<http://howtomechatronics.com/tutorials/arduino/ultrasonic-sensor-hc-sr04/#comment-501>)

Thanks! Well this is a tutorial that can help you understand the basic working principle of the sensor and the code to get it working with the Arduino, but I don't have a specific code as what you have described. Every project is a unique and needs a unique code, but I don't make custom codes. I hope watching some of my other tutorials as well, will get your code writing knowledge good enough so you can make your own code for your project. Cheers!

REPLY

Thor January 31, 2016 (<http://howtomechatronics.com/tutorials/arduino/ultrasonic-sensor-hc-sr04/#comment-518>)

Hey, I got everything working and your tutorials are great! My display works, but it is just a blue screen. It is just blue and no numbers or anything on it, please help!

REPLY

Dejan Nedelkovski (<http://howtomechatronics.com>) January 31, 2016
(<http://howtomechatronics.com/tutorials/arduino/ultrasonic-sensor-hc-sr04/#comment-519>)

Well the problem is the contrast of the display. Use a potentiometer to adjust the contrast (as shown in my Arduino LCD Tutorial) or make a voltage divider with two resistors.

REPLY

Harvey February 6, 2016 (<http://howtomechatronics.com/tutorials/arduino/ultrasonic-sensor-hc-sr04/#comment-538>)

Can u email me or update the diagram of this project by adding the connections for the 16x2 lcd green screen ty in advance this website was a real help to me as my first arduino project and I use arduino uno is that OK or I have to change something in ue given project waiting for a quick response:)

REPLY

Dejan Nedelkovski (<http://howtomechatronics.com>) February 7, 2016
(<http://howtomechatronics.com/tutorials/arduino/ultrasonic-sensor-hc-sr04/#comment-544>)

Well combine the circuit schematics from my Arduino LCD tutorial and this one.

REPLY

Sougata (<http://www.techairy.tk>) February 9, 2016 (<http://howtomechatronics.com/tutorials/arduino/ultrasonic-sensor-hc-sr04/#comment-558>)

Hey Can you please upload/ Mail me the code and the diagram for measuring X-Axis And Y-Axis distance at the same time... Thanks

REPLY

Dejan Nedelkovski (<http://howtomechatronics.com>) February 9, 2016
(<http://howtomechatronics.com/tutorials/arduino/ultrasonic-sensor-hc-sr04/#comment-563>)

What do you mean, which example in this tutorial is that?

REPLY

Sougata February 10, 2016 (<http://howtomechatronics.com/tutorials/arduino/ultrasonic-sensor-hc-sr04/#comment-569>)

Actually I wanna know that, if i wanna connect two ultrasonic at a same time and show output in the display,,,,... then what will be the code??? thanks

sougata February 11, 2016 (<http://howtomechatronics.com/tutorials/arduino/ultrasonic-sensor-hc-sr04/#comment-576>)

Yea !!!!! I did it.... Anyway thanks.. ☐

REPLY

terry schulz February 25, 2016 (<http://howtomechatronics.com/tutorials/arduino/ultrasonic-sensor-hc-sr04/#comment-630>)

hi i have been working on HC-SR04 Ultrasonic Module and was wondering if you could send me a schematic of the project with the lcd hook up thank you for your time

REPLY

Aiden June 12, 2016 (<http://howtomechatronics.com/tutorials/arduino/ultrasonic-sensor-hc-sr04/#comment-998>)

Hi Sougata, Brilliant that you managed it! Could you give me the code? Thanks.

REPLY

Judy Kathryn March 3, 2016 (<http://howtomechatronics.com/tutorials/arduino/ultrasonic-sensor-hc-sr04/#comment-650>)

Is the source code for the sensor and LCD is under one sketch?? Or i need to use two arduino boards?? And if so, how can i connect the two then? □

REPLY

Dejan Nedelkovski (<http://howtomechatronics.com>) March 3, 2016
(<http://howtomechatronics.com/tutorials/arduino/ultrasonic-sensor-hc-sr04/#comment-655>)

It's one Arduino, one sketch. The ultrasonic sensor connection is as explained and for the LCD connection check my Arduino LCD Tutorial

REPLY

Gaurav Jagannath Alande March 3, 2016 (<http://howtomechatronics.com/tutorials/arduino/ultrasonic-sensor-hc-sr04/#comment-651>)

can you send me the code of interfacing arduino with HCSR-04 sensor -SG-90 servo motor n lcd with buzzer interfaing send me code plz

REPLY

Dejan Nedelkovski (<http://howtomechatronics.com>) March 3, 2016
(<http://howtomechatronics.com/tutorials/arduino/ultrasonic-sensor-hc-sr04/#comment-656>)

Sorry, I don't have such a code.

REPLY

vignesh March 12, 2016 (<http://howtomechatronics.com/tutorials/arduino/ultrasonic-sensor-hc-sr04/#comment-684>)

can i do the same with a pic controller? with an altered program

REPLY

Dejan Nedelkovski (<http://howtomechatronics.com>) March 12, 2016
(<http://howtomechatronics.com/tutorials/arduino/ultrasonic-sensor-hc-sr04/#comment-688>)

Yes, sure you can.

REPLY

Anamul March 21, 2016 (<http://howtomechatronics.com/tutorials/arduino/ultrasonic-sensor-hc-sr04/#comment-712>)

Can i use this code for arduino UNO board

REPLY

Dejan Nedelkovski (<http://howtomechatronics.com>) March 21, 2016
(<http://howtomechatronics.com/tutorials/arduino/ultrasonic-sensor-hc-sr04/#comment-713>)

Yes, you can.

REPLY

Ton April 1, 2016 (<http://howtomechatronics.com/tutorials/arduino/ultrasonic-sensor-hc-sr04/#comment-761>)

Dear Dejan, I am building a simple robot with this sensor. The problem is this: I want to avoid a collision at a distance of about 50 cm. How do I implement in code this value in the simple software I made. (the robot is programmed to drive an eight) with simple code as digitalWrite HIGH or LOW on two pins.

Regards, Ton.

REPLY

Dejan Nedelkovski (<http://howtomechatronics.com>) April 2, 2016
(<http://howtomechatronics.com/tutorials/arduino/ultrasonic-sensor-hc-sr04/#comment-762>)

Well the sensor can detect objects at that distance so I guess using some "if" statements you could make a simple code for avoiding collisions.

REPLY

Pramod [April 17, 2016 \(http://howtomechatronics.com/tutorials/arduino/ultrasonic-sensor-hc-sr04/#comment-823\)](http://howtomechatronics.com/tutorials/arduino/ultrasonic-sensor-hc-sr04/#comment-823)

Hi Dejan

Can I use HCSR 04 to send data to another HC SR04? I mean making one to act as transmitter and other as receiver? If yes how can I modify the code?

REPLY

Dejan Nedelkovski (http://howtomechatronics.com) [April 18, 2016 \(http://howtomechatronics.com/tutorials/arduino/ultrasonic-sensor-hc-sr04/#comment-828\)](http://howtomechatronics.com/tutorials/arduino/ultrasonic-sensor-hc-sr04/#comment-828)

Well I haven't tried something like that so I cannot say anything. You should try, it might be possible.

REPLY

rakan [April 18, 2016 \(http://howtomechatronics.com/tutorials/arduino/ultrasonic-sensor-hc-sr04/#comment-830\)](http://howtomechatronics.com/tutorials/arduino/ultrasonic-sensor-hc-sr04/#comment-830)

Dear,

I have an idea to measure the amount of water in a water tank.

It has been seen on your video experiment to Motion Sensor.

Question: Is it possible to transfer centimeter change in the screen to a percentage, for example 40%, 50%.

Thank.

Rakan

REPLY

Dejan Nedelkovski (http://howtomechatronics.com) [April 19, 2016 \(http://howtomechatronics.com/tutorials/arduino/ultrasonic-sensor-hc-sr04/#comment-832\)](http://howtomechatronics.com/tutorials/arduino/ultrasonic-sensor-hc-sr04/#comment-832)

Sure you just have to implement the math into the code.

REPLY

rakan [April 21, 2016 \(http://howtomechatronics.com/tutorials/arduino/ultrasonic-sensor-hc-sr04/#comment-837\)](http://howtomechatronics.com/tutorials/arduino/ultrasonic-sensor-hc-sr04/#comment-837)

can I get your email,we want contract with you for this adea please.
thanks.

rakan [April 23, 2016 \(http://howtomechatronics.com/tutorials/arduino/ultrasonic-sensor-hc-sr04/#comment-847\)](http://howtomechatronics.com/tutorials/arduino/ultrasonic-sensor-hc-sr04/#comment-847)

can I get your email,we want contract with you for this idea.
thanks.

REPLY

William [May 20, 2016 \(http://howtomechatronics.com/tutorials/arduino/ultrasonic-sensor-hc-sr04/#comment-928\)](http://howtomechatronics.com/tutorials/arduino/ultrasonic-sensor-hc-sr04/#comment-928)

Dear, it possible the ultrasonic can detect the water leakage on the water pipe? mean the ultrasonic can receive the frequency or other value to show that when the water pipe has leakage, the value will changing?
thanks

REPLY

Dejan Nedelkovski (<http://howtomechatronics.com>) [May 20, 2016 \(http://howtomechatronics.com/tutorials/arduino/ultrasonic-sensor-hc-sr04/#comment-935\)](http://howtomechatronics.com/tutorials/arduino/ultrasonic-sensor-hc-sr04/#comment-935)

Well I'm not quite sure about this. I guess the ultrasonic wave could bounce when it would hit the water but I can't say whether it would work for your idea.

REPLY

William [May 23, 2016 \(http://howtomechatronics.com/tutorials/arduino/ultrasonic-sensor-hc-sr04/#comment-945\)](http://howtomechatronics.com/tutorials/arduino/ultrasonic-sensor-hc-sr04/#comment-945)

Sir, because i need use ultrasonic sensor to detect the water pipe leakage which is receive the frequency / pulse from the water pipe, it possible the ultrasonic sensor can receive the frequency/ pulse ?? since this is ultrasonic project, would u can take time explain the concept of the ultrasonic sound use in detect water pipe leakage, i very confuse, thanks for reply me....

asda [May 20, 2016 \(http://howtomechatronics.com/tutorials/arduino/ultrasonic-sensor-hc-sr04/#comment-930\)](http://howtomechatronics.com/tutorials/arduino/ultrasonic-sensor-hc-sr04/#comment-930)

MY HC SR04 is always gives maximum output 24 cm .
what to do now >

REPLY

Dejan Nedelkovski (<http://howtomechatronics.com>) [May 20, 2016 \(http://howtomechatronics.com/tutorials/arduino/ultrasonic-sensor-hc-sr04/#comment-937\)](http://howtomechatronics.com/tutorials/arduino/ultrasonic-sensor-hc-sr04/#comment-937)

How come? Did you connect everything properly as presented in the tutorial, as well as, did you use the exactly same source code?

REPLY

SAYAN SETH [June 1, 2016 \(http://howtomechatronics.com/tutorials/arduino/ultrasonic-sensor-hc-sr04/#comment-989\)](http://howtomechatronics.com/tutorials/arduino/ultrasonic-sensor-hc-sr04/#comment-989)

Which Software have you used to Draw this circuit design

REPLY

Dejan Nedelkovski (<http://howtomechatronics.com>) [June 1, 2016 \(http://howtomechatronics.com/tutorials/arduino/ultrasonic-sensor-hc-sr04/#comment-990\)](http://howtomechatronics.com/tutorials/arduino/ultrasonic-sensor-hc-sr04/#comment-990)

Fritzing.

REPLY

yoangel August 13, 2016 (<http://howtomechatronics.com/tutorials/arduino/ultrasonic-sensor-hc-sr04/#comment-1130>)

hello, if I want the measurement is not displayed in cm, if not in liters or ml as should be the formula? since I want to use this sensor to measure the water level of a tank

REPLY

Dejan Nedelkovski (<http://howtomechatronics.com>) August 14, 2016 (<http://howtomechatronics.com/tutorials/arduino/ultrasonic-sensor-hc-sr04/#comment-1145>)

If you know the dimensions of the tank you can use and transform the unit "cm" to measure the "liters" of the tank.

REPLY

Anant September 23, 2016 (<http://howtomechatronics.com/tutorials/arduino/ultrasonic-sensor-hc-sr04/#comment-1202>)

Hey Dejan, is it possible to add a sound in the output so that the distance can also be used by the blinds!!

REPLY

Dejan Nedelkovski (<http://howtomechatronics.com>) September 25, 2016 (<http://howtomechatronics.com/tutorials/arduino/ultrasonic-sensor-hc-sr04/#comment-1205>)

Sure it's possible.

REPLY

fatso October 9, 2016 (<http://howtomechatronics.com/tutorials/arduino/ultrasonic-sensor-hc-sr04/#comment-1266>)

i connected the sensor to pic 16f877a and i wanted to measure the volume of water in a tank but i m getting false results what might be the problem

REPLY

Dejan Nedelkovski (<http://howtomechatronics.com>) October 14, 2016
(<http://howtomechatronics.com/tutorials/arduino/ultrasonic-sensor-hc-sr04/#comment-1286>)

Sorry but I haven't tested this module with the particular microcontroller.

REPLY

Malik October 11, 2016 (<http://howtomechatronics.com/tutorials/arduino/ultrasonic-sensor-hc-sr04/#comment-1273>)

hi, i have checked this and many other codes but it is not giving accurate distance , only giving 2 inches. In addition I want to modify the range how I can do that?

REPLY

Dejan Nedelkovski (<http://howtomechatronics.com>) October 14, 2016
(<http://howtomechatronics.com/tutorials/arduino/ultrasonic-sensor-hc-sr04/#comment-1291>)

The code is working 100%, so you either have a wrong connection or your sensor is faulty.

REPLY

Nicky Puff October 20, 2016 (<http://howtomechatronics.com/tutorials/arduino/ultrasonic-sensor-hc-sr04/#comment-1325>)

Dude, your tutorials are fcking awesome !!!

I never find like this tutorial...

easy to understand, easy to implement... so yeah 😊

Do you have private contact ? i have final project in my college and need new idea from you... Could you ? 😊

Thanks so much

REPLY

Dejan Nedelkovski (<http://howtomechatronics.com>) October 22, 2016
(<http://howtomechatronics.com/tutorials/arduino/ultrasonic-sensor-hc-sr04/#comment-1336>)

Thanks! Sorry but I don't work on private projects.

REPLY

Mike Crawford October 26, 2016 (<http://howtomechatronics.com/tutorials/arduino/ultrasonic-sensor-hc-sr04/#comment-1356>)

Hi mate, I wonder how to graph the data cast from the Ultrasonic Sensor on app inventor, could you help me with it? Thx and best regards.

REPLY

Dejan Nedelkovski (<http://howtomechatronics.com>) October 29, 2016
(<http://howtomechatronics.com/tutorials/arduino/ultrasonic-sensor-hc-sr04/#comment-1367>)

Hi there. Well sorry but all I can say is to check my tutorial on app inventor and in combination with this tutorial, make the project on your own.

My work is teaching the basics of a particular sensor, module or a program, and your are that one that should use the knowledge gained from those tutorials to make a specific project.

Cheers!

REPLY

Agus salim October 31, 2016 (<http://howtomechatronics.com/tutorials/arduino/ultrasonic-sensor-hc-sr04/#comment-1377>)

hi...nice project1

i have a question,,

what code arduino mega match with another tipe of arduino?like a nano,uno..etc

thank you

REPLY

Dejan Nedelkovski (<http://howtomechatronics.com>) November 9, 2016
(<http://howtomechatronics.com/tutorials/arduino/ultrasonic-sensor-hc-sr04/#comment-1406>)

It's the same code.

REPLY

Harshit (<http://howtomechatronics.com>) April 19, 2017
(<http://howtomechatronics.com/tutorials/arduino/ultrasonic-sensor-hc-sr04/#comment-1908>)

is it possible to stop dc motor with the help of PIR sensor??

REPLY

Dejan Nedelkovski (<http://howtomechatronics.com>) May 11, 2017
(<http://howtomechatronics.com/tutorials/arduino/ultrasonic-sensor-hc-sr04/#comment-1988>)

Sure, it's possible.

REPLY

brahim May 23, 2017 (<http://howtomechatronics.com/tutorials/arduino/ultrasonic-sensor-hc-sr04/#comment-2032>)

I want to determine the coordinates(x,y,z) of a point in space(room for exemple) by using ardouino, is that possible? and how to do it ?

REPLY

Dejan Nedelkovski (<http://howtomechatronics.com>) May 24, 2017
(<http://howtomechatronics.com/tutorials/arduino/ultrasonic-sensor-hc-sr04/#comment-2039>)

You might be able to achieve that using this ultrasonic sensor. If you know the angle and the distance to the object you can determine it's coordinates.

REPLY

Gustavo [May 31, 2017 \(http://howtomechatronics.com/tutorials/arduino/ultrasonic-sensor-hc-sr04/#comment-2061\)](http://howtomechatronics.com/tutorials/arduino/ultrasonic-sensor-hc-sr04/#comment-2061)

is there any way to reduce te maximun distance measured?? great tuto by the way

REPLY

Dejan Nedelkovski (<http://howtomechatronics.com>) [June 1, 2017 \(http://howtomechatronics.com/tutorials/arduino/ultrasonic-sensor-hc-sr04/#comment-2069\)](http://howtomechatronics.com/tutorials/arduino/ultrasonic-sensor-hc-sr04/#comment-2069)

Reduce the distance in what way? I didn't get it. The range of the sensor is from ~2cm up to 4m.

REPLY

brian burroughs [June 1, 2017 \(http://howtomechatronics.com/tutorials/arduino/ultrasonic-sensor-hc-sr04/#comment-2063\)](http://howtomechatronics.com/tutorials/arduino/ultrasonic-sensor-hc-sr04/#comment-2063)

hi do you have a wiring schematic for the whole thing combined? the distance sensor and the lcd?

REPLY

Dejan Nedelkovski (<http://howtomechatronics.com>) [June 1, 2017 \(http://howtomechatronics.com/tutorials/arduino/ultrasonic-sensor-hc-sr04/#comment-2070\)](http://howtomechatronics.com/tutorials/arduino/ultrasonic-sensor-hc-sr04/#comment-2070)

Sorry I don't have it, but you can combine them easily if you check my Arduino LCD Tutorial.

REPLY

brian burroughs [June 11, 2017 \(http://howtomechatronics.com/tutorials/arduino/ultrasonic-sensor-hc-sr04/#comment-2106\)](http://howtomechatronics.com/tutorials/arduino/ultrasonic-sensor-hc-sr04/#comment-2106)

have you got a wiring diagram for the distance sensor combined with the lcd?

REPLY

brian burroughs [June 11, 2017 \(http://howtomechatronics.com/tutorials/arduino/ultrasonic-sensor-hc-sr04/#comment-2110\)](http://howtomechatronics.com/tutorials/arduino/ultrasonic-sensor-hc-sr04/#comment-2110)

Quick question Dejan, I want to hook the distance sensor up with a raspberry pi 3, all tutorials I see seem to use resistors, how come ya don't need them with the arduino but ya need them with the pi?

could i do it on the pi without resistors?

REPLY

carmine [June 26, 2017 \(http://howtomechatronics.com/tutorials/arduino/ultrasonic-sensor-hc-sr04/#comment-2155\)](http://howtomechatronics.com/tutorials/arduino/ultrasonic-sensor-hc-sr04/#comment-2155)

hello i am carmine from rome,

it is possible to change the absolute reading to a relative reading with a potentiometer change to a relative distance on the display?

Thank you

REPLY

Dejan Nedelkovski (http://howtomechatronics.com) [June 28, 2017 \(http://howtomechatronics.com/tutorials/arduino/ultrasonic-sensor-hc-sr04/#comment-2163\)](http://howtomechatronics.com/tutorials/arduino/ultrasonic-sensor-hc-sr04/#comment-2163)

You should be able to do that if you modify the code to compensate the initial reading, probably with a simple arithmetic operation.

REPLY

Chris [June 26, 2017 \(http://howtomechatronics.com/tutorials/arduino/ultrasonic-sensor-hc-sr04/#comment-2156\)](http://howtomechatronics.com/tutorials/arduino/ultrasonic-sensor-hc-sr04/#comment-2156)

Can the ultrasonic sensor turn on 24/7? for everyday? Will it burn or get hot? Thanks

REPLY

Dejan Nedelkovski (<http://howtomechatronics.com>) June 28, 2017

(<http://howtomechatronics.com/tutorials/arduino/ultrasonic-sensor-hc-sr04/#comment-2162>)

That's a good question. Well it's electronics, so it should be able to work, but I cannot tell how reliable these cheap sensors are.

REPLY

Matt June 27, 2017 (<http://howtomechatronics.com/tutorials/arduino/ultrasonic-sensor-hc-sr04/#comment-2158>)

Super useful thanks for sharing!

REPLY

naja July 20, 2017 (<http://howtomechatronics.com/tutorials/arduino/ultrasonic-sensor-hc-sr04/#comment-2243>)

hello its is true this sensor can detect from 2cm – 4meter? and if distance over than 4meter, what will show at lcd display?

REPLY

Dejan Nedelkovski (<http://howtomechatronics.com>) July 23, 2017

(<http://howtomechatronics.com/tutorials/arduino/ultrasonic-sensor-hc-sr04/#comment-2251>)

That's true. If the measured distance is over 4 meters it won't give you correct values, just some random numbers.

REPLY

naja July 23, 2017 (<http://howtomechatronics.com/tutorials/arduino/ultrasonic-sensor-hc-sr04/#comment-2254>)

isnt not have any solution if like that?

Hannu Olin [November 22, 2017 \(http://howtomechatronics.com/tutorials/arduino/ultrasonic-sensor-hc-sr04/#comment-2712\)](http://howtomechatronics.com/tutorials/arduino/ultrasonic-sensor-hc-sr04/#comment-2712)

Thanks for the clear explanation. Still I dont understand. The counting starts when echoPin (input) gets the state HIGH (in this example). And the counting stops, when it gets the state LOW. Their time difference is 10us in the pingPin and their time difference is 10us in the echoPin. It is always the the same. The distance doesnt make any difference. The begin of the signal is moving as fast as the end of the signal. What actually starts the counting. It has to start, when the signal goes to pingPin. And it has to stop, when the signal come sback to echoPin. Would You please explain me more.

REPLY

Dejan Nedelkovski (<http://howtomechatronics.com>) [November 23, 2017 \(http://howtomechatronics.com/tutorials/arduino/ultrasonic-sensor-hc-sr04/#comment-2716\)](http://howtomechatronics.com/tutorials/arduino/ultrasonic-sensor-hc-sr04/#comment-2716)

Well according the code and the logic of the trigger and echo pins your are totally right to be confused, so I was, but here's the trick:

When we activate the trigger input (`digitalWrite(trigPin, HIGH);`), we send the ultrasound wave but at the same time, the sensor raises the echo pin internally. So the echo pin is already HIGH when the program gets to the `pulseIn()` function, which means the counting will depend on the objects distance.

REPLY

Rohitash [November 28, 2017 \(http://howtomechatronics.com/tutorials/arduino/ultrasonic-sensor-hc-sr04/#comment-2746\)](http://howtomechatronics.com/tutorials/arduino/ultrasonic-sensor-hc-sr04/#comment-2746)

the sensor is taking reading very fast i want to take it reading every .5 sec what should i do

REPLY

Dejan Nedelkovski (<http://howtomechatronics.com>) [November 28, 2017 \(http://howtomechatronics.com/tutorials/arduino/ultrasonic-sensor-hc-sr04/#comment-2750\)](http://howtomechatronics.com/tutorials/arduino/ultrasonic-sensor-hc-sr04/#comment-2750)

You can add a delay or some kind of time counter into the program.

REPLY

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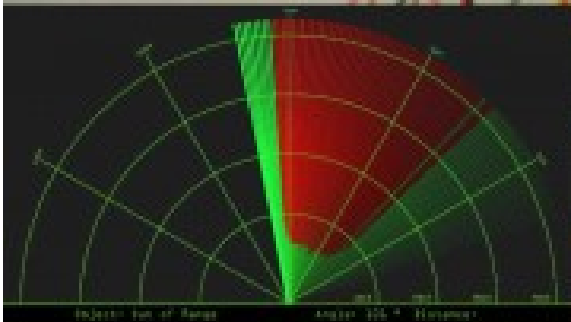
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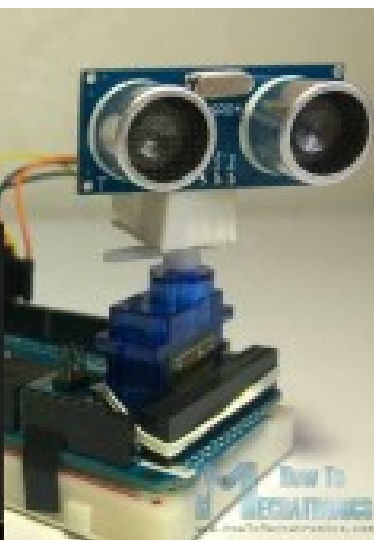
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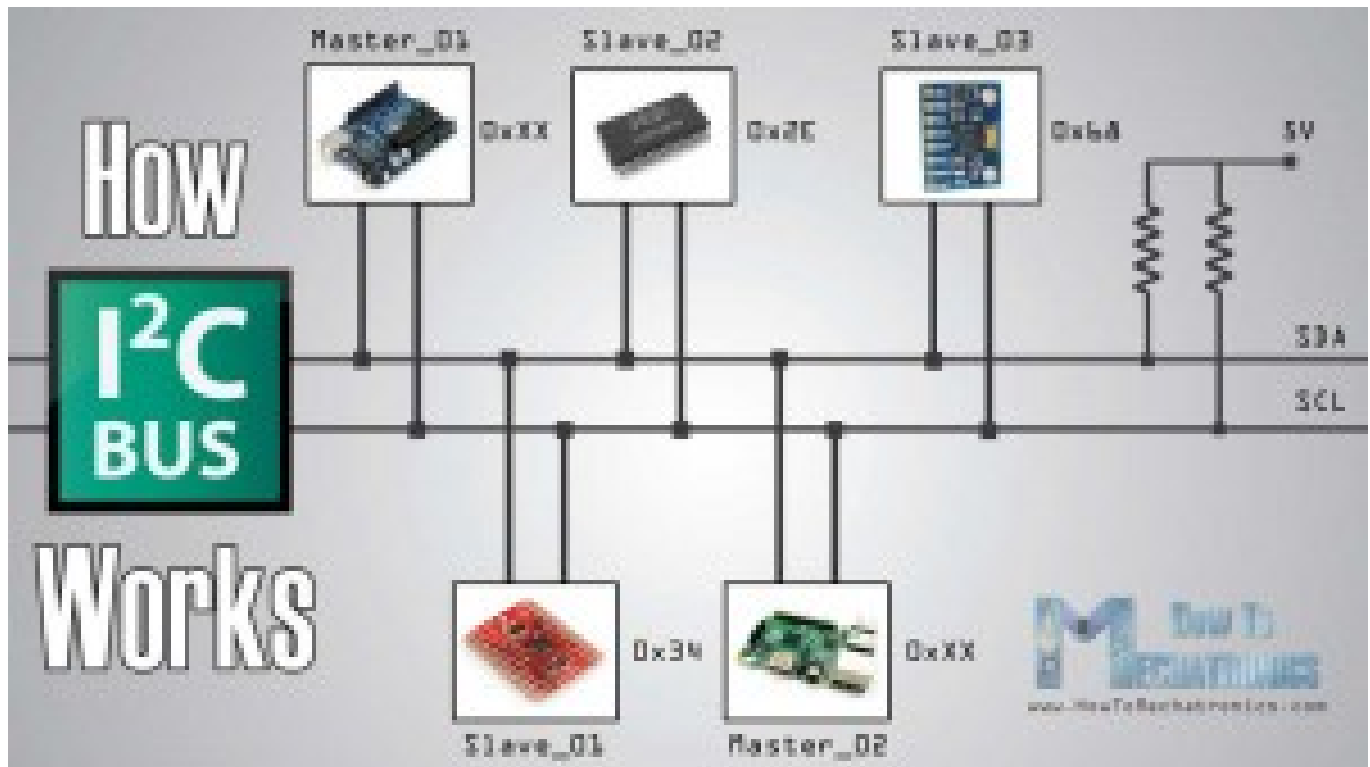




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