Easy ultrasonic 4-pin sensor monitoring (hc-sr04)

by Giedow on October 4, 2012

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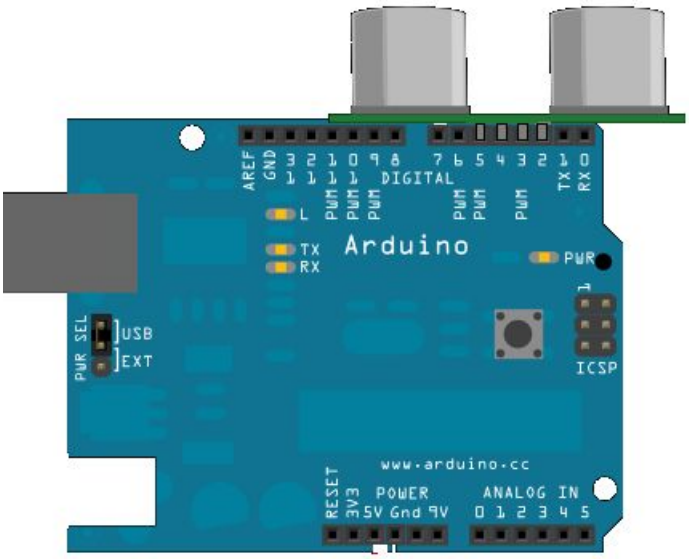
Intro: Easy ultrasonic 4-pin sensor monitoring (hc-sr04)

hello Instructables,
I have had some trouble with my cheap ultrasonic sensor (hc-sr04) and today I found a really easy solution.
It is a really simple edit of the normal 3pin code.

The new code(4pin):

```
void setup() {
pinMode (2,OUTPUT);//attach pin 2 to vcc
pinMode (5,OUTPUT);//attach pin 5 to GND
// initialize serial communication:
Serial.begin(9600);
}

void loop()
{
digitalWrite(2, HIGH);
// establish variables for duration of the ping,
// and the distance result in inches and centimeters:
long duration, inches, cm;

// The PING))) is triggered by a HIGH pulse of 2 or more microseconds.
// Give a short LOW pulse beforehand to ensure a clean HIGH pulse:
pinMode(3, OUTPUT);// attach pin 3 to Trig
digitalWrite(3, LOW);
delayMicroseconds(2);
digitalWrite(3, HIGH);
delayMicroseconds(5);
digitalWrite(3, LOW);

// The same pin is used to read the signal from the PING))): a HIGH
// pulse whose duration is the time (in microseconds) from the sending
// of the ping to the reception of its echo off of an object.
pinMode (4, INPUT);//attach pin 4 to Echo
duration = pulseIn(4, HIGH);

// convert the time into a distance
inches = microsecondsToInches(duration);
cm = microsecondsToCentimeters(duration);

Serial.print(inches);
Serial.print("in, ");
Serial.print(cm);
Serial.print("cm");
Serial.println();

delay(100);
}

long microsecondsToInches(long microseconds)
{
// According to Parallax's datasheet for the PING))), there are
// 73.746 microseconds per inch (i.e. sound travels at 1130 feet per
// second). This gives the distance travelled by the ping, outbound
// and return, so we divide by 2 to get the distance of the obstacle.
// See: http://www.parallax.com/dl/docs/prod/acc/28015-PING-v1.3.pdf
return microseconds / 74 / 2;
}

long microsecondsToCentimeters(long microseconds)
{
// The speed of sound is 340 m/s or 29 microseconds per centimeter.
// The ping travels out and back, so to find the distance of the
// object we take half of the distance travelled.
return microseconds / 29 / 2;
}
```

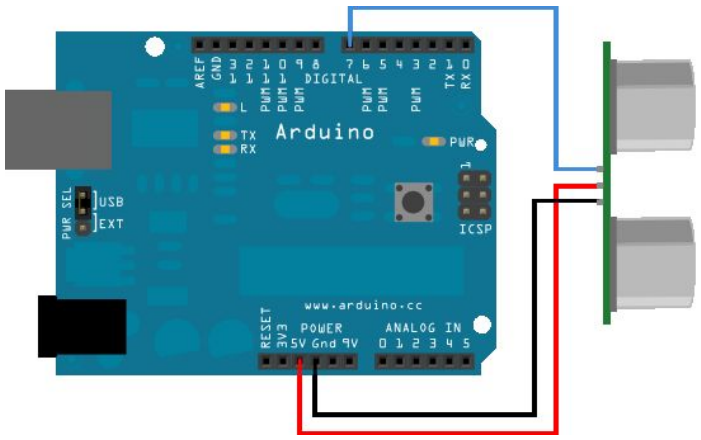


Step 1: 3-pin code

Code

```
/* Ping))) Sensor

This sketch reads a PING))) ultrasonic rangefinder and returns the
distance to the closest object in range. To do this, it sends a pulse
to the sensor to initiate a reading, then listens for a pulse
to return. The length of the returning pulse is proportional to
the distance of the object from the sensor.

The circuit:
* +V connection of the PING))) attached to +5V
* GND connection of the PING))) attached to ground
* SIG connection of the PING))) attached to digital pin 7

http://www.arduino.cc/en/Tutorial/Ping

created 3 Nov 2008
by David A. Mellis
modified 30 Aug 2011
by Tom Igoe

This example code is in the public domain.

*/

// this constant won't change. It's the pin number
// of the sensor's output:
const int pingPin = 7;

void setup() {
// initialize serial communication:
Serial.begin(9600);
}

void loop()
{
// establish variables for duration of the ping,
// and the distance result in inches and centimeters:
long duration, inches, cm;

// The PING))) is triggered by a HIGH pulse of 2 or more microseconds.
// Give a short LOW pulse beforehand to ensure a clean HIGH pulse:
pinMode(pingPin, OUTPUT);
digitalWrite(pingPin, LOW);
delayMicroseconds(2);
digitalWrite(pingPin, HIGH);
delayMicroseconds(5);
digitalWrite(pingPin, LOW);

// The same pin is used to read the signal from the PING))): a HIGH
// pulse whose duration is the time (in microseconds) from the sending
// of the ping to the reception of its echo off of an object.
pinMode(pingPin, INPUT);
duration = pulseIn(pingPin, HIGH);

// convert the time into a distance
inches = microsecondsToInches(duration);
cm = microsecondsToCentimeters(duration);
```

```
Serial.print(inches);
Serial.print("in, ");
Serial.print(cm);
Serial.print("cm");
Serial.println();

delay(100);
}

long microsecondsToInches(long microseconds)
{
// According to Parallax's datasheet for the PING))), there are
// 73.746 microseconds per inch (i.e. sound travels at 1130 feet per
// second). This gives the distance travelled by the ping, outbound
// and return, so we divide by 2 to get the distance of the obstacle.
// See: http://www.parallax.com/dl/docs/prod/acc/28015-PING-v1.3.pdf
return microseconds / 74 / 2;
}

long microsecondsToCentimeters(long microseconds)
{
// The speed of sound is 340 m/s or 29 microseconds per centimeter.
// The ping travels out and back, so to find the distance of the
// object we take half of the distance travelled.
return microseconds / 29 / 2;
}
```



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