*/\* 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*

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*modified 30 Aug 2011*

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*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;

}