/\* 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.

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// 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;

}