Contents

Introduction

Seeed ultrasonic sensor is non-contact distance measurement module, which is also compatible with electronic brick. It’s designed for easy modular project usage with industrial performance.

Model: SSPX010 (SEN136B5B)

Features

- Detecting range: 3cm-4m
- Best in 30 degree angle
- Electronic brick compatible interface
- 5VDC power supply

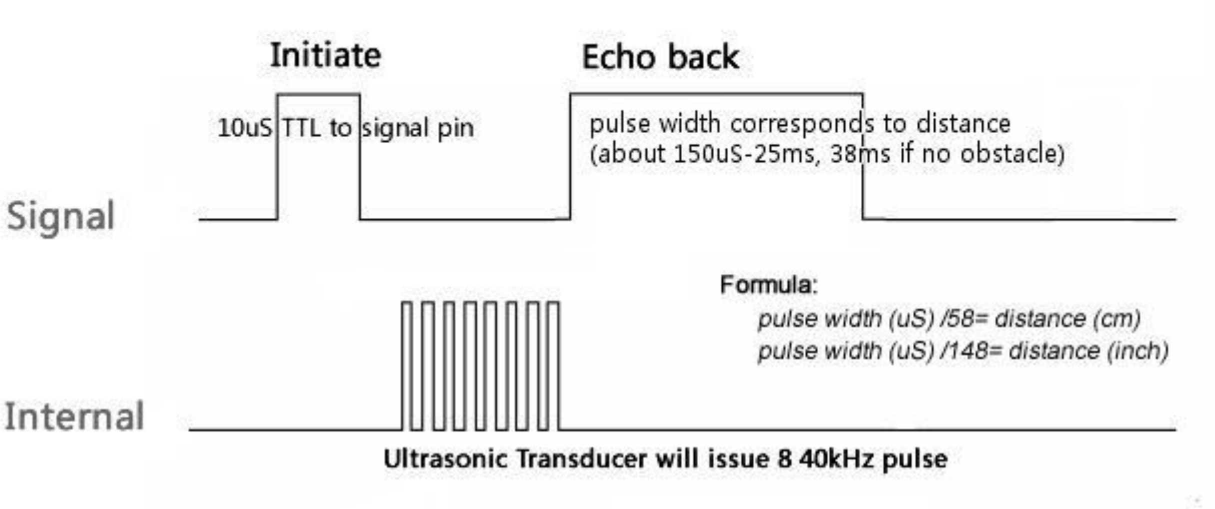
- Breadboard friendly
- Dual transducer
- Arduino library ready

Specification

Supply voltage	5V
Global Current Consumption	15 mA
Ultrasonic Frequency	40k Hz
Maximal Range	400 cm
Minimal Range	3 cm
Resolution	1 cm
Trigger Pulse Width	10 µs
Outline Dimension	43x20x15 mm

Usage

Hardware Installation


Initiate
Echo back
10uS TTL to signal pin
pulse width corresponds to distance
(about 150uS-25ms, 38ms if no obstacle)
Signal
Formula:
pulse width (uS) /58= distance (cm)
pulse width (uS) /148= distance (inch)
Internal
Ultrasonic Transducer will issue 8 40kHz pulse

A short ultrasonic pulse is transmitted at the time 0, reflected by an object. The senor receives this signal and converts it to an electric signal. The next pulse can be transmitted when the echo is faded away. This time period is called cycle period. The recommend cycle period should be no less than 50ms. If a 10µs width trigger pulse is sent to the signal pin, the Ultrasonic module will output eight 40kHz ultrasonic signal and detect the echo back. The measured distance is proportional to the echo pulse width and can be calculated by the formula above. If no obstacle is detected, the output pin will give a 38ms high level signal.

Programming

Includes important code snippet. Demo code like :

```
/*********************************************************************
******/
//      Function: Measure the distance to obstacles in front and print
the distance
//                        value to the serial terminal.The measured
distance is from
//                        the range 0 to 400cm(157 inches).
//      Hardware: Ultrasonic Range sensor
//      Arduino IDE: Arduino-1.0
//      Author:  LG
//      Date:    Jan 17,2013
//      Version: v1.0 modified by FrankieChu
//      by www.seeedstudio.com
//
//  This library is free software; you can redistribute it and/or
//  modify it under the terms of the GNU Lesser General Public
//  License as published by the Free Software Foundation; either
//  version 2.1 of the License, or (at your option) any later version.
//
//  This library is distributed in the hope that it will be useful,
//  but WITHOUT ANY WARRANTY; without even the implied warranty of
//  MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE.  See the GNU
//  Lesser General Public License for more details.
//
//  You should have received a copy of the GNU Lesser General Public
//  License along with this library; if not, write to the Free
Software
//  Foundation, Inc., 51 Franklin St, Fifth Floor, Boston, MA 02110-
1301 USA
//
/*********************************************************************
********/
#include "Arduino.h"
class Ultrasonic
{
        public:
                Ultrasonic(int pin);
        void DistanceMeasure(void);
                long microsecondsToCentimeters(void);
                long microsecondsToInches(void);
        private:
                int _pin;//pin number of Arduino that is connected with
SIG pin of Ultrasonic Ranger.
        long duration;// the Pulse time received;
};
Ultrasonic::Ultrasonic(int pin)
{
        _pin = pin;
}
/*Begin the detection and get the pulse back signal*/
void Ultrasonic::DistanceMeasure(void)
{
    pinMode(_pin, OUTPUT);
        digitalWrite(_pin, LOW);
        delayMicroseconds(2);
        digitalWrite(_pin, HIGH);
        delayMicroseconds(5);
        digitalWrite(_pin,LOW);
        pinMode(_pin,INPUT);
        duration = pulseIn(_pin,HIGH);
}
/*The measured distance from the range 0 to 400 Centimeters*/
long Ultrasonic::microsecondsToCentimeters(void)
{
        return duration/29/2;
}
/*The measured distance from the range 0 to 157 Inches*/
long Ultrasonic::microsecondsToInches(void)
{
        return duration/74/2;
}

Ultrasonic ultrasonic(7);
void setup()
{
        Serial.begin(9600);
}
void loop()
{
        long RangeInInches;
        long RangeInCentimeters;
        ultrasonic.DistanceMeasure();// get the current signal time;
    RangeInInches = ultrasonic.microsecondsToInches();//convert the
time to inches;
        RangeInCentimeters =
ultrasonic.microsecondsToCentimeters();//convert the time to
centimeters
        Serial.println("The distance to obstacles in front is: ");
        Serial.print(RangeInInches);//0~157 inches
        Serial.println(" inch");
        Serial.print(RangeInCentimeters);//0~400cm
        Serial.println(" cm");
        delay(100);
}
```