

## Arduino Distance Driver

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## 1 Hierarchical Index

### 1.1 Class Hierarchy

This inheritance list is sorted roughly, but not completely, alphabetically:

<b>DistanceSensor</b>	<b>2</b>
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<b>UltrasoundDistanceSensor</b>	<b>3</b>
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## 2 Class Index

### 2.1 Class List

Here are the classes, structs, unions and interfaces with brief descriptions:

<b>DistanceSensor</b>	
<b>Arduino - Distance sensor</b>	<b>2</b>
<b>UltrasoundDistanceSensor</b>	<b>3</b>

## 3 File Index

### 3.1 File List

Here is a list of all files with brief descriptions:

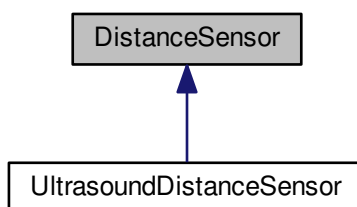
<b>DistanceSensor.cpp</b>	<b>5</b>
<b>DistanceSensor.h</b>	<b>6</b>
<b>UltrasoundDistanceSensor.cpp</b>	<b>7</b>
<b>UltrasoundDistanceSensor.h</b>	<b>8</b>

## 4 Class Documentation

### 4.1 DistanceSensor Class Reference

```
#include <DistanceSensor.h>
```

Inheritance diagram for DistanceSensor:



#### Public Member Functions

- virtual float [getDistance](#) ()=0

### 4.1.1 Detailed Description

Arduino - Distance sensor.

[DistanceSensor.h](#)

The abstract class for the distance sensors.

#### Author

Dalmir da Silva [dalmirdasilva@gmail.com](mailto:dalmirdasilva@gmail.com)

Definition at line 14 of file [DistanceSensor.h](#).

### 4.1.2 Member Function Documentation

#### 4.1.2.1 virtual float DistanceSensor::getDistance ( ) [pure virtual]

Gets the distance o the device from whatever is in front of it.

The distance in centimeters.

Implemented in [UltrasoundDistanceSensor](#).

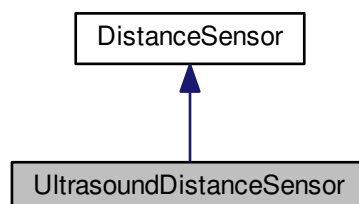
The documentation for this class was generated from the following file:

- [DistanceSensor.h](#)

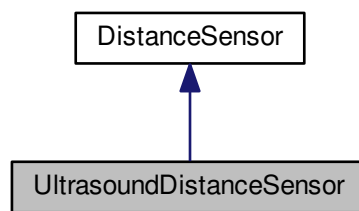
## 4.2 **UltrasoundDistanceSensor Class Reference**

```
#include <UltrasoundDistanceSensor.h>
```

Inheritance diagram for UltrasoundDistanceSensor:



Collaboration diagram for `UltrasoundDistanceSensor`:



#### Public Member Functions

- `UltrasoundDistanceSensor` (unsigned char `echoPin`, unsigned char `trigPin`)
- unsigned long `getEchoTime` ()
- float `getDistance` ()

#### Private Attributes

- unsigned char `echoPin`
- unsigned char `trigPin`

#### 4.2.1 Detailed Description

Definition at line 44 of file `UltrasoundDistanceSensor.h`.

#### 4.2.2 Constructor & Destructor Documentation

##### 4.2.2.1 `UltrasoundDistanceSensor::UltrasoundDistanceSensor ( unsigned char echoPin, unsigned char trigPin )`

Public constructor.

#### Parameters

<i>echoPin</i>	The echo pin.
<i>trigPin</i>	The trigger pin.

Definition at line 17 of file `UltrasoundDistanceSensor.cpp`.

#### 4.2.3 Member Function Documentation

##### 4.2.3.1 `float UltrasoundDistanceSensor::getDistance ( ) [virtual]`

Gets the distance o the device from whatever is in front of it.

The distance in centimeters.

Implements `DistanceSensor`.

Definition at line 29 of file `UltrasoundDistanceSensor.cpp`.

#### 4.2.3.2 unsigned long UltrasoundDistanceSensor::getEchoTime ( )

Gets the time between the send and reice the sound.

The time between the send and reice the sound.

Definition at line 22 of file [UltrasoundDistanceSensor.cpp](#).

#### 4.2.4 Member Data Documentation

##### 4.2.4.1 unsigned char UltrasoundDistanceSensor::echoPin [private]

The echo pin.

Definition at line 50 of file [UltrasoundDistanceSensor.h](#).

##### 4.2.4.2 unsigned char UltrasoundDistanceSensor::trigPin [private]

The trig pin.

Definition at line 55 of file [UltrasoundDistanceSensor.h](#).

The documentation for this class was generated from the following files:

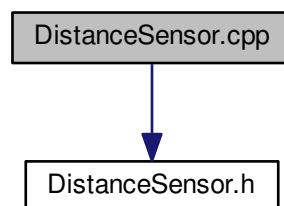
- [UltrasoundDistanceSensor.h](#)
- [UltrasoundDistanceSensor.cpp](#)

## 5 File Documentation

### 5.1 DistanceSensor.cpp File Reference

```
#include <DistanceSensor.h>
```

Include dependency graph for DistanceSensor.cpp:



#### Macros

- [#define \\_\\_ARDUINO\\_DRIVER\\_DISTANCE\\_SENSOR\\_CPP\\_\\_ 1](#)

#### 5.1.1 Macro Definition Documentation

##### 5.1.1.1 [#define \\_\\_ARDUINO\\_DRIVER\\_DISTANCE\\_SENSOR\\_CPP\\_\\_ 1](#)

Arduino - Distance sensor.

## [DistanceSensor.cpp](#)

The abstract class for the distance sensors.

### Author

Dalmir da Silva [dalmirdasilva@gmail.com](mailto:dalmirdasilva@gmail.com)

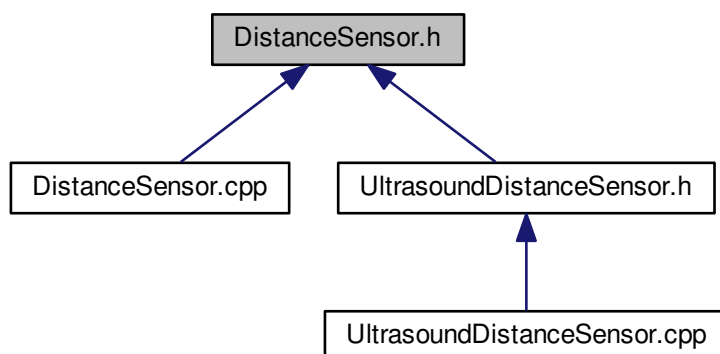
Definition at line 12 of file [DistanceSensor.cpp](#).

## 5.2 DistanceSensor.cpp

```
00001
00011 #ifndef __ARDUINO_DRIVER_DISTANCE_SENSOR_CPP__
00012 #define __ARDUINO_DRIVER_DISTANCE_SENSOR_CPP__ 1
00013
00014 #include <DistanceSensor.h>
00015
00016 #endif /* __ARDUINO_DRIVER_DISTANCE_SENSOR_CPP__ */
```

## 5.3 DistanceSensor.h File Reference

This graph shows which files directly or indirectly include this file:



### Classes

- class [DistanceSensor](#)

## 5.4 DistanceSensor.h

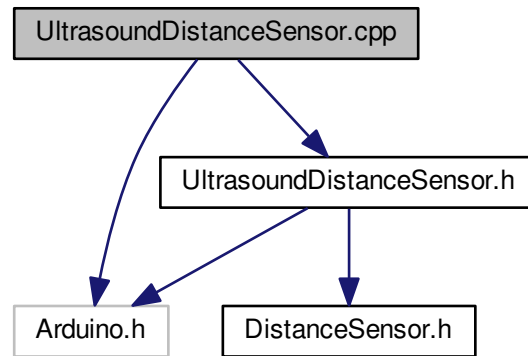
```
00001
00011 #ifndef __ARDUINO_DRIVER_DISTANCE_SENSOR_H__
00012 #define __ARDUINO_DRIVER_DISTANCE_SENSOR_H__ 1
00013
00014 class DistanceSensor {
00015 public:
00016     virtual float getDistance() = 0;
00023 };
00024
00025 #endif /* __ARDUINO_DRIVER_DISTANCE_SENSOR_H__ */
```

## 5.5 UltrasoundDistanceSensor.cpp File Reference

```
#include <Arduino.h>
```

```
#include <UltrasoundDistanceSensor.h>
```

Include dependency graph for UltrasoundDistanceSensor.cpp:



### Macros

- `#define __ARDUINO_DRIVER_ULTRASOUND_DISTANCE_SENSOR_CPP__ 1`

#### 5.5.1 Macro Definition Documentation

##### 5.5.1.1 `#define __ARDUINO_DRIVER_ULTRASOUND_DISTANCE_SENSOR_CPP__ 1`

Arduino - Ultrasound distance sensor.

[UltrasoundDistanceSensor.cpp](#)

The abstract class for the ultrasound distance sensor.

### Author

Dalmir da Silva [dalmirdasilva@gmail.com](mailto:dalmirdasilva@gmail.com)

Definition at line 12 of file [UltrasoundDistanceSensor.cpp](#).

## 5.6 UltrasoundDistanceSensor.cpp

```

00001
00011 #ifndef __ARDUINO_DRIVER_ULTRASOUND_DISTANCE_SENSOR_CPP__
00012 #define __ARDUINO_DRIVER_ULTRASOUND_DISTANCE_SENSOR_CPP__ 1
00013
00014 #include <Arduino.h>
00015 #include <UltrasoundDistanceSensor.h>
00016
00017 UltrasoundDistanceSensor::UltrasoundDistanceSensor(
00018     unsigned char echoPin, unsigned char trigPin) : echoPin(echoPin), trigPin(trigPin) {
00019     pinMode(echoPin, INPUT);
00019     pinMode(trigPin, OUTPUT);
00020 }
00021
00022 unsigned long UltrasoundDistanceSensor::getEchoTime() {
00023     digitalWrite(trigPin, HIGH);
  
```



```

00024     delayMicroseconds(100);
00025     digitalWrite(trigPin, LOW);
00026     return pulseIn(echoPin, HIGH, US_SENSOR_PULSE_IN_TIMEOUT);
00027 }
00028
00029 float UltrasoundDistanceSensor::getDistance() {
00030     float time = (float) getEchoTime();
00031     return time / US_SENSOR_2_TIMES_US_PER_CM;
00032 }
00033
00034 #endif /* __ARDUINO_DRIVER_ULTRASOUND_DISTANCE_SENSOR_CPP__ */

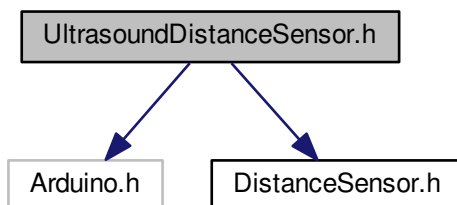
```

## 5.7 UltrasoundDistanceSensor.h File Reference

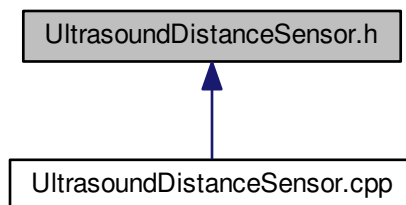
```
#include <Arduino.h>
```

```
#include <DistanceSensor.h>
```

Include dependency graph for UltrasoundDistanceSensor.h:



This graph shows which files directly or indirectly include this file:



### Classes

- class [UltrasoundDistanceSensor](#)

### Macros

- #define [US\\_SENSOR\\_CM\\_PER\\_US](#) 0.03463
- #define [US\\_SENSOR\\_US\\_PER\\_CM](#) 28.8
- #define [US\\_SENSOR\\_2\\_TIMES\\_US\\_PER\\_CM](#) 57.7
- #define [US\\_SENSOR\\_PULSE\\_IN\\_TIMEOUT](#) 11540.0

## 5.7.1 Macro Definition Documentation

## 5.7.1.1 #define US\_SENSOR\_2\_TIMES\_US\_PER\_CM 57.7

Doubles the time, counting the time to go and back.

(US\_SENSOR\_US\_PER\_CM\*2)

Definition at line 34 of file [UltrasoundDistanceSensor.h](#).

## 5.7.1.2 #define US\_SENSOR\_CM\_PER\_US 0.03463

Arduino - Ultrasound distance sensor.

[UltrasoundDistanceSensor.h](#)

The abstract class for the ultrasound distance sensor.

## Author

Dalmir da Silva [dalmirdasilva@gmail.com](mailto:dalmirdasilva@gmail.com) Centimeters per microsecond.

Definition at line 20 of file [UltrasoundDistanceSensor.h](#).

## 5.7.1.3 #define US\_SENSOR\_PULSE\_IN\_TIMEOUT 11540.0

2 meters How many microseconds can wait.

Enough to go and back 2 meters of distance.

(US\_SENSOR\_2\_TIMES\_US\_PER\_CM\*2\*100)

Definition at line 42 of file [UltrasoundDistanceSensor.h](#).

## 5.7.1.4 #define US\_SENSOR\_US\_PER\_CM 28.8

Microseconds in 1 centimeter.

(1/US\_SENSOR\_CM\_PER\_US)

Definition at line 27 of file [UltrasoundDistanceSensor.h](#).

## 5.8 UltrasoundDistanceSensor.h

```

00001
00011 #ifndef __ARDUINO_DRIVER_ULTRASOUND_DISTANCE_SENSOR_H__
00012 #define __ARDUINO_DRIVER_ULTRASOUND_DISTANCE_SENSOR_H__ 1
00013
00014 #include <Arduino.h>
00015 #include <DistanceSensor.h>
00016
00020 #define US_SENSOR_CM_PER_US 0.03463
00021
00027 #define US_SENSOR_US_PER_CM 28.8
00028
00034 #define US_SENSOR_2_TIMES_US_PER_CM 57.7
00035
00042 #define US_SENSOR_PULSE_IN_TIMEOUT 11540.0
00043
00044 class UltrasoundDistanceSensor : public DistanceSensor {
00045 private:
00046
00050     unsigned char echoPin;
00051
00055     unsigned char trigPin;
00056
00057 public:
00058
00065     UltrasoundDistanceSensor(unsigned char echoPin, unsigned char trigPin);
00066
00072     unsigned long getEchoTime();
00073
00079     float getDistance();

```

```
00080 };  
00081  
00082 #endif /* __ARDUINO_DRIVER_ULTRASOUND_DISTANCE_SENSOR_H__ */
```

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