TA0037 Ultrasonic Sensor

Introduction:

The TA0037 Ultrasonic is a very affordable proximity/distance sensor that has been used mainly for object avoidance in various robotics projects.

It essentially gives your Arduino eyes / spacial awareness and can prevent your robot from crashing or falling off a table.

It has also been used in turret applications, water level sensing, and even as a parking sensor.

This simple project will use the keyestudio SR01 Ultrasonic Sensor with an Arduino and a Processing sketch to provide a neat little interactive display on your computer screen.

Specification：

- Working Voltage: DC 5V

- Working Current: 15mA

- Working Frequency: 40KHz

- Max Range: 3--5m

- Min Range: 2cm

- Measuring Angle: 15 degree

- Trigger Input Signal: 10μS TTL pulse

Connection Diagram:
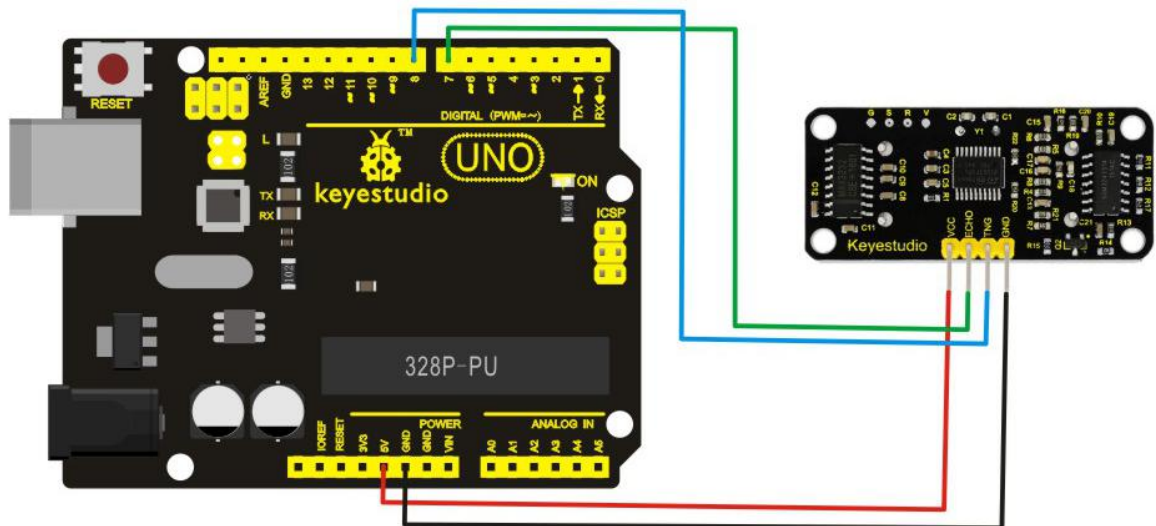
SR01 Ultrasonic Sensor	UNO Board
VCC	5V
GND	GND
Echo	Digital Pin 7
Trig	Digital Pin 8

Sample Code:

****

```
#define echoPin 7 // Echo Pin

#define trigPin 8 // Trigger Pin

#define LEDPin 13 // Onboard LED


int maximumRange = 200; // Maximum range needed

int minimumRange = 0; // Minimum range needed

long duration, distance; // Duration used to calculate distance


void setup() {
  Serial.begin (9600);
  pinMode(trigPin, OUTPUT);
  pinMode(echoPin, INPUT);
  pinMode(LEDPin, OUTPUT); // Use LED indicator (if required)
}
```

```
void loop() {
/* The following trigPin/echoPin cycle is used to determine the

   distance of the nearest object by bouncing soundwaves off of it. */

   digitalWrite(trigPin, LOW);

   delayMicroseconds(2);


   digitalWrite(trigPin, HIGH);

   delayMicroseconds(10);

   digitalWrite(trigPin, LOW);


   duration = pulseIn(echoPin, HIGH);


   //Calculate the distance (in cm) based on the speed of sound.

   distance = duration/58.2;


   if (distance >= maximumRange || distance <= minimumRange){

   /* Send a negative number to computer and Turn LED ON

   to indicate "out of range" */

   Serial.println("-1");

   digitalWrite(LEDPin, HIGH);

   }
```

```
  else {

  /* Send the distance to the computer using Serial protocol, and

  turn LED OFF to indicate successful reading. */

  Serial.println(distance);

  digitalWrite(LEDPin, LOW);

  }


  //Delay 50ms before next reading.

  delay(50);

}
```
****
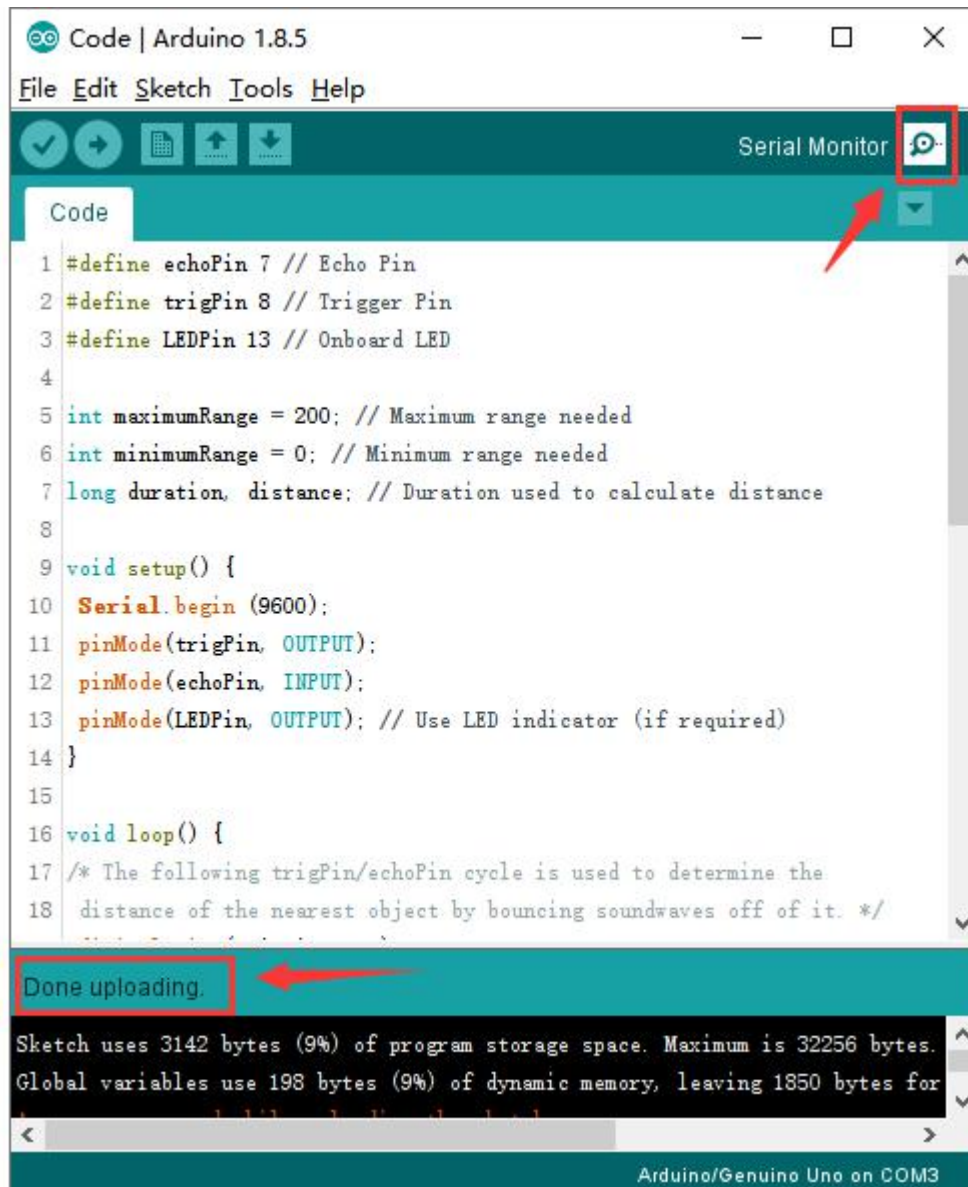
After upload the code to the board, open the serial monitor of Arduino IDE, you can see the distance value measured by ultrasonic sensor.