# US-015 Ultrasonic Distance Measurement Module V2.0

## 1. Overview

US-015 is the highest resolution on the market, repeat the best measurement of the best distance measurement module; US-015 resolution higher than 1mm, up to 0.5mm, ranging accuracy; repeat the measurement of good consistency Stable and reliable. US-015 ultrasonic distance measurement module can achieve 2cm ~ 4m non-contact ranging function, the supply voltage of 5V, the working current of 2.2mA, support GPIO communication mode, stable and reliable.

## 2. Resolution and repeatability test screenshots

Figure 2.1 for the hand to take US-015 measurements, hand with a small jitter measurement screenshots, we can see less than 1mm jitter can be measured; display resolution of 0.01mm.
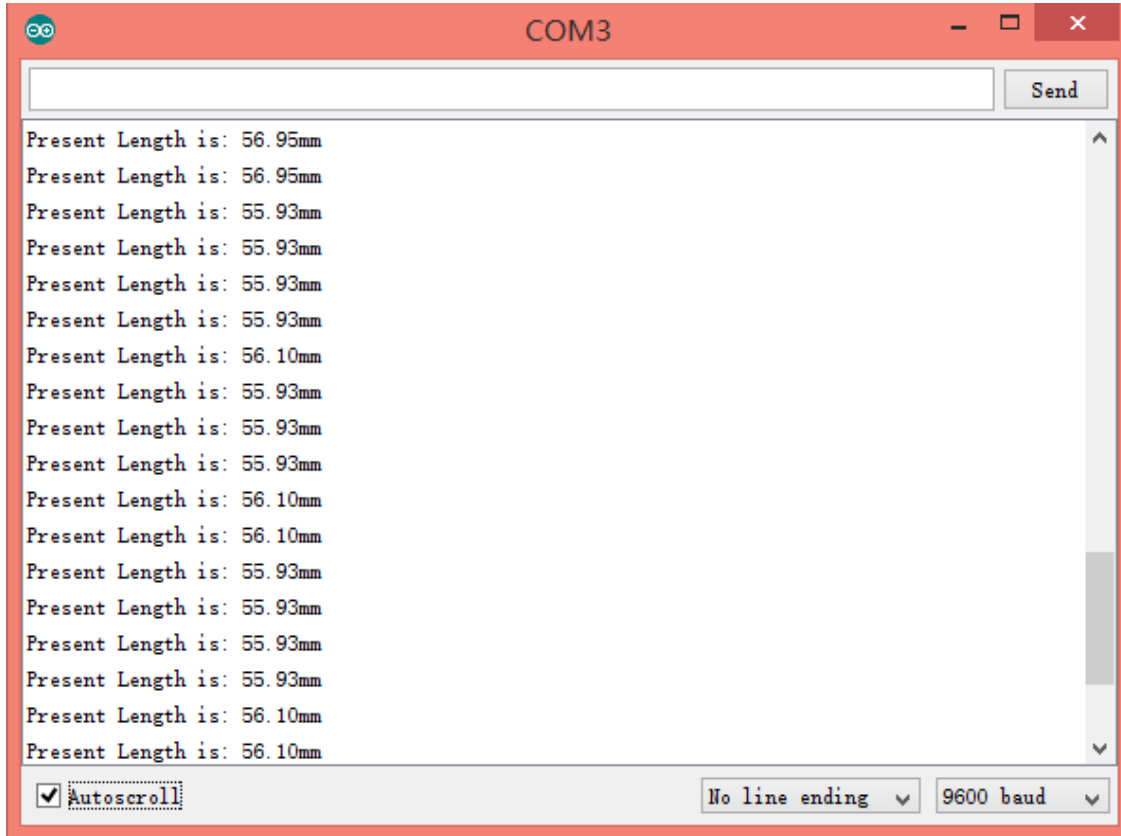
Figure 2.1: Handheld US-015 tiny jitter measurement screenshots

Figure 2.2 for the US-015 fixed, after a period of time after the screenshot, we can see repeat the measurement of good consistency. Display resolutionof0.01mm
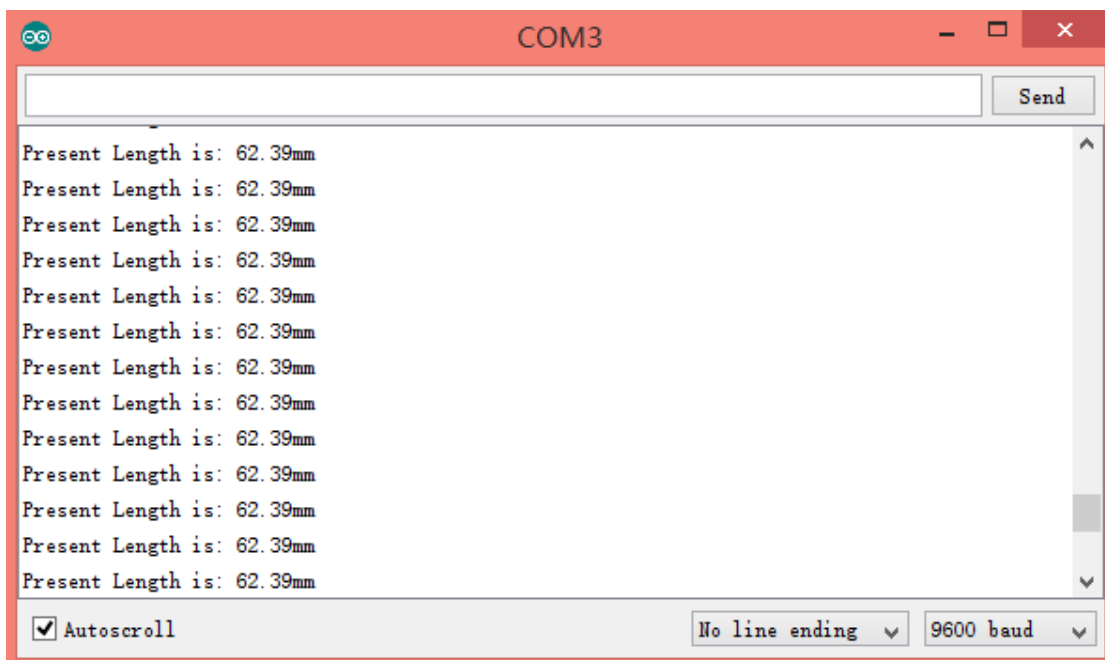


Figure 2.2: Repeated measurement screenshots

Refer to Appendix 2.1 and Figure 2.2 for the routines used.

# 主要技术参数

The main technical parameters

Electrical parameters US-015 Ultrasonic distance measuring module

Operating voltage DC 5V

Working current 2.2mA

Operating temperature 0 ~ +70 degrees

Output mode GPIO

Sensing angle is less than 15 degrees

Detection distance of 2cm-400cm

Detection accuracy 0.1cm + 1%
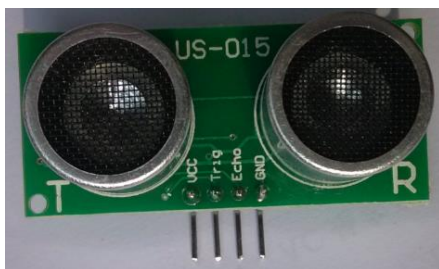
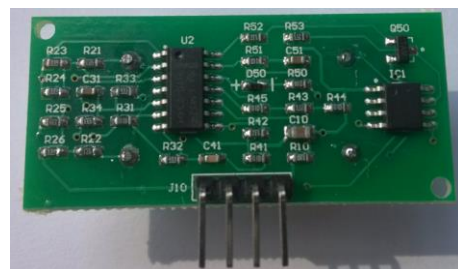Resolution higher than 1mm (up to 0.5mm)

## 1. Size



图 4.1： US-015 正面图　　图 4.2：US-015 背面图

The size of the module: 45mm * 20mm * 1.2mm. There are two mechanical holes with a radius of 1mm on the plate, as shown in Figure 4.3
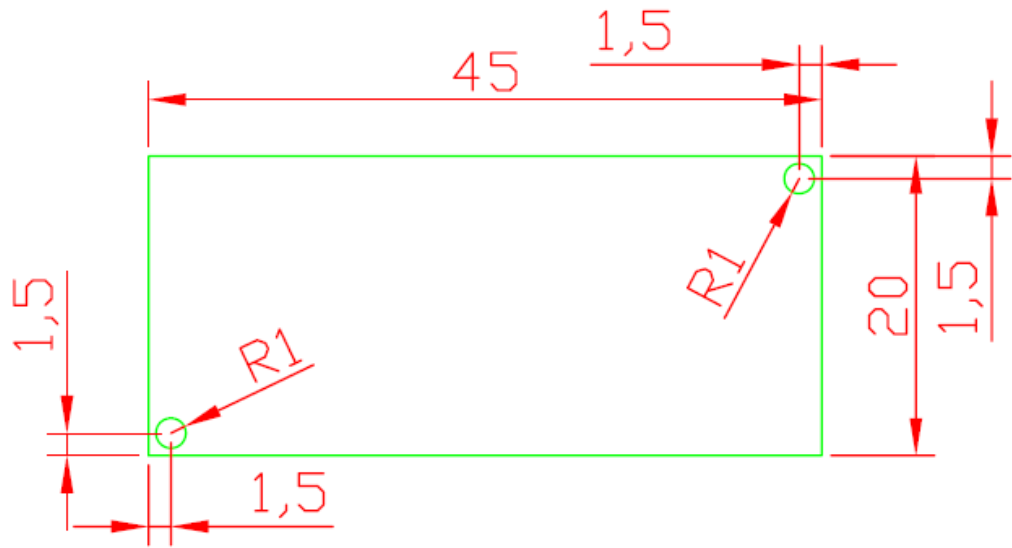
图 4.3

## 2.　Interface description

　　The module has an interface: 4 Pin power supply and communication interface. 4 Pin interface is 2.54mm pitch bending needle, as shown in
Figure5.1



图 5.1：4 Pin 接口

- From left to right number 1, 2, 3, 4. They are defined as follows:

- · No. 1 Pin: connected to VCC power supply (DC 5V).

- · 2 Pin: connected to the external circuit of the Trig side, enter a pin above the 10uS above the high level, can trigger the module ranging.

- · 3 Pin: access the external circuit Echo side, when the distance measurement, this pin will output a high level, the width of the ultrasonic round trip time and the sum.

- · No. 4 Pin: access to the external circuit of the ground. 地。

## Appendix: US-015 High-precision ranging routines, (Arduino routines).

```
unsigned int EchoPin = 2;

unsigned int TrigPin = 3;

unsigned long Time_Echo_us = 0;

//Len_mm_X100 = length*100

unsigned long Len_mm_X100  = 0;

unsigned long Len_Integer = 0; //

unsigned int Len_Fraction = 0;

void setup()

{

    Serial.begin(9600);

    pinMode(EchoPin,  INPUT);

    pinMode(TrigPin,  OUTPUT);
```

```
    }

void loop()

{

    digitalWrite(TrigPin, HIGH);

    delayMicroseconds(50);

    digitalWrite(TrigPin, LOW);


    Time_Echo_us = pulseIn(EchoPin, HIGH);

    if((Time_Echo_us < 60000) && (Time_Echo_us > 1))

    {

      Len_mm_X100 = (Time_Echo_us*34)/2;

      Len_Integer = Len_mm_X100/100;

      Len_Fraction = Len_mm_X100%100;

      Serial.print("Present Length is: ");

      Serial.print(Len_Integer, DEC);

      Serial.print(".");

      if(Len_Fraction < 10)

        Serial.print("0");

      Serial.print(Len_Fraction, DEC);

      Serial.println("mm");

    }
```

```
        delay(1000);

    }
```