The principle of ultrasonic sensor is very simple. The transmitter of the ultrasonic wave emits a beam of ultrasonic waves. At the same time as the emission, the timing starts. The emitted ultrasonic waves propagate in the medium. The sound waves have reflective properties and will be reflected back when encountering obstacles. , when the ultrasonic receiving end receives the reflected ultrasonic wave, the timing stops. When the medium is air, the sound speed is 340m/s. According to the recorded time t, use formula to calculate the distance between the launch position and the obstacle.

Testing Process:

(1) **Max Range:** Continue to increase the distance. When the data disappears, or appears an obvious error. This section is the Max Range.

(2) **Min Range:** Quickly decrease the distance starting from a certain value. Until the value disappears or there is an obvious error in the value.

(3) **Measuring Angle:** I would first place a long object in front of the sensor, first horizontally and vertically on the table. Until the value changes. This is Measuring Angle.

(4) **Accuracy:** For accuracy, I measure a set of data with a ruler to get the actual data. Then I will use the sensor to measure and get the result. Compare the two data to draw conclusions.

(5) **Precision:** For Precision, I measure a set of data many times, such as more than ten times, to get Precision