Starr Instruments
63 Waterview Close
DANDENONG SOUTH
VICTORIA 3175, AUSTRALIA
PH: 03 8787-3636

ABN: 33 998 859 720

TGX-01
Ultrasonic Thickness Gauge

User Manual

Please read this manual carefully before using and reserve it for reference.

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I. Product introduction

The TGX-01 Ultrasonic thickness gauge adopts the principle of the reflected plus ultrasonic measurement. This method specialises in thickness measurement of materials that can transmit ultrasonic waves such as metals, plastics, ceramics, glass, etc. The instrument employs a professional design with a resolution of up to 0.01 mm.

The product conforms to the standard: JJF1126-2004 Calibration Specification for Ultrasonic Thickness Gauge.

II. Parameter

Measuring Range	0.8-350mm(45#steel)
Resolution	0.8-100mm:0.01mm 100-350mm:0.1mm
Accuracy	0.8 - 10mm: ±0.05mm 10 - 350mm: ±0.5%
Sound Velocity Range	1000 ~ 9999m/s
Probe	5MHz φ10 double-crystal probe
Display	240 × 160 dot matrix LCD
Units	mm/inch
Power Supply	2 x AAA alkaline battery
Host Size	142 * 72 * 28 mm
Weight	230g
Operation Temperature Range	-10~50℃，0~85%RH（No condensation）
Storage Temperature Range	-10~60℃，0~85%RH（No condensation）

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III. Characteristics

1. The TGX-01 adopts a professional design with a resolution of up to 0.01 mm as well as good stability and accuracy.
2. With the functionality of automatic gain change, the instrument automatically selects the appropriate gain according to the material type and thickness to achieve the best results.
3. With the QC judging function, it can judge whether the materials are qualified according to the upper and lower specification limits.
4. The statistical function automatically counts the maximum, minimum and average of the last 9 measured values.
5. The instrument can adjust sound velocity in 3 ways: setting sound velocity based on material/ thickness/ manually.

IV. Operation

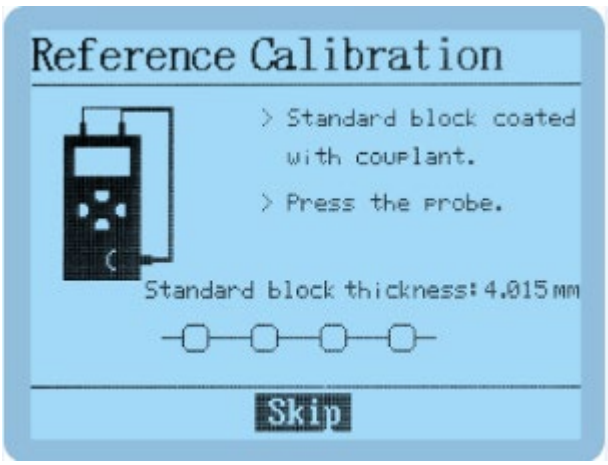
1. Turn on/off

Turn on: A short press of the Enter button will turn the gauge on, the version number and a serial number of the instrument will be displayed, and then enter the interface of benchmark adjustment.

Turn off: A long press of the Enter button or click "turn off" in the menu bar will power off the instrument.

2. Reference calibration

After entering the interface of "Reference Calibration", the user can perform the calibration or skip the step. When the instrument has not been used for a long time, it is recommended to calibrate it.



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If it prompts that the calibration fails, the possible reasons are as follows:

- The wrong calibration block is being used. Please use the standard block in the lower right corner of the instrument to calibrate.
- There is not enough coupling fluid applied to the standard block. Please apply enough coupling fluid, press the probe tightly against the standard block and keep it still until the calibration is prompted.
- Instrument malfunction meaning it may need to be repaired.

3. Measurement

Apply coupling fluid on the surface of the material, press the probe of the instrument tightly and keep it still, then the user can get the thickness of the material. When the probe is well coupled with the material to be tested, the coupling mark on the right side of the screen will remain still and a buzzer will prompt.

The instrument has the following two measurement modes:

(1) Statistical mode

The interface of the statistics mode is shown in the bottom left figure. The instrument simultaneously displays the maximum, minimum and average values of the current statistical data. These results are based on the last 9 valid measurements. When it is less than 9 data, the actual data will be on display.

(2) QC mode

The interface of the QC mode is shown in the bottom right figure. The instrument judges whether the measured value is qualified according to the upper and lower specification limits.

Note: The sound velocity of various materials is different. Please set different sound velocity according to different materials to avoid measurement errors.

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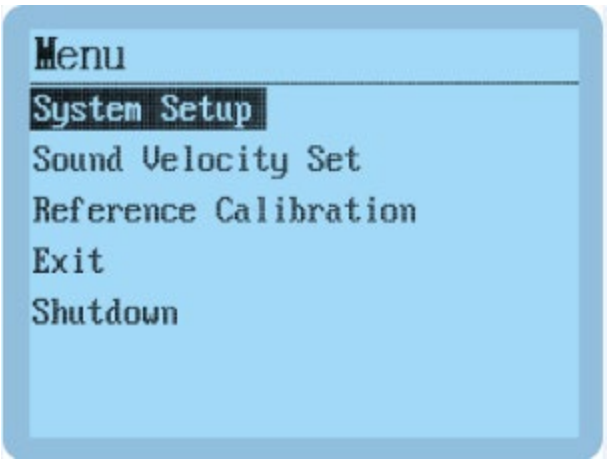
4. Setting and Calibration

A short press of the Enter button in the measurement state enters the [main menu] of the instrument. There are five sub-options. The user can use the buttons ▲▼ to select the options of [system Setup/sound velocity set/Reference calibration/Exit/Shutdown]. Short press on the button Enter to confirm your selection.

(1) System Setup



Language: A short press of the Enter or Del button enters the language selection. The two buttons ▲ or ▼ are available to select language. A short press on the button Enter completes the setting.

Unit: A short press of the button Enter to enter the unit selection. The two buttons ▲ or ▼ are available to select units. A short press on the button Enter completes the setting.

Auto-Off: Short press on the button Enter or Del to enter the Auto-Off. The two buttons ▲ or ▼ are available to select shutdown time. A short press on the button Enter completes the setting.

Mode: Short press the button Enter or Del to enter the mode selection. The two buttons ▲ or ▼ are available to select measuring modes. A short press on the button Enter completes the setting.

Limit Set: The limit setting is only displayed in QC mode. Short press the button Enter to enter the interface of limit settings. The two buttons ▲ and ▼ are available to select [upper limit/lower limit/return]. Short press on the button Enter to enter the value adjustment, and short press the buttons Cal Del ▲▼ to adjust the value. A short press on the button Enter confirms the selection.

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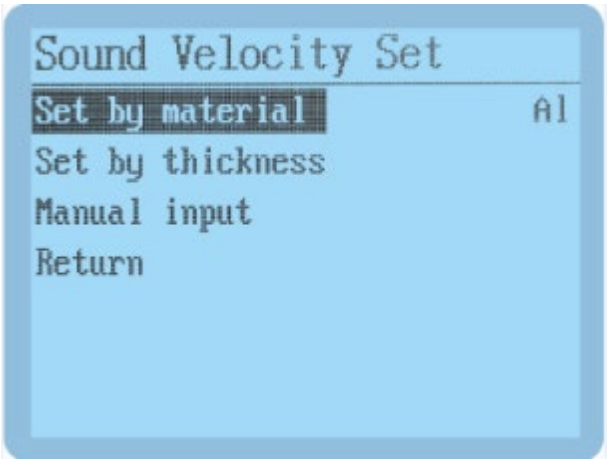
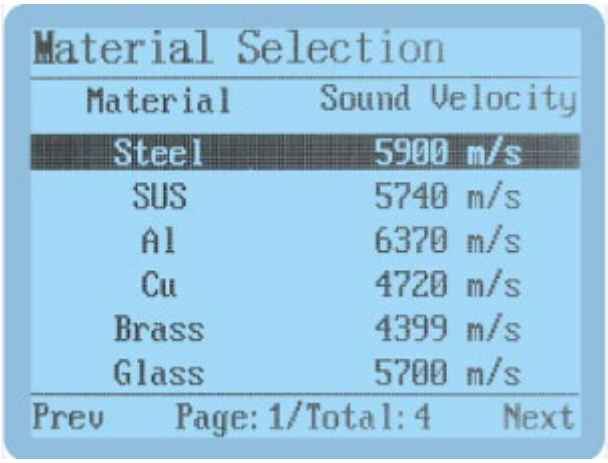
Factory Settings: Short press the button Enter to enter the restoring factory interface. The two buttons ▲ and ▼ are available to switch [Yes/No]. A short press on the button Enter confirms the option and returns to menu

(2) Sound Velocity

Short press the buttons ▲▼to select [Set by material/Set by thickness/Manual input/Return]. A short press on the button Enter confirms the selection.



Set by material: The user can set the sound velocity according to the known material. Short press the button Enter to enter the interface of material selection, and short press the buttons Cal Del ▲▼ to select the corresponding materials. A short press on the button Enter confirms the selection.



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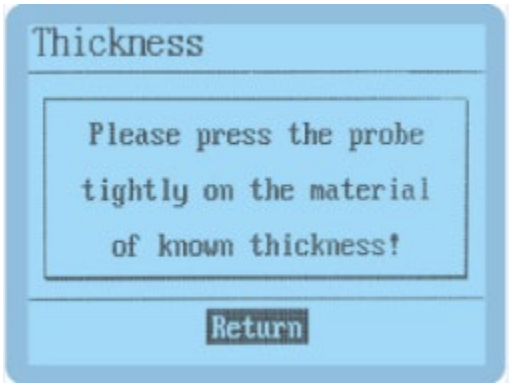
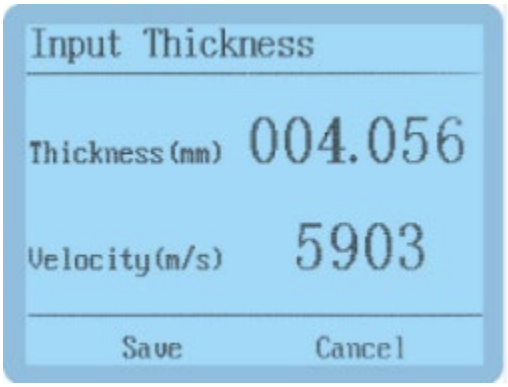
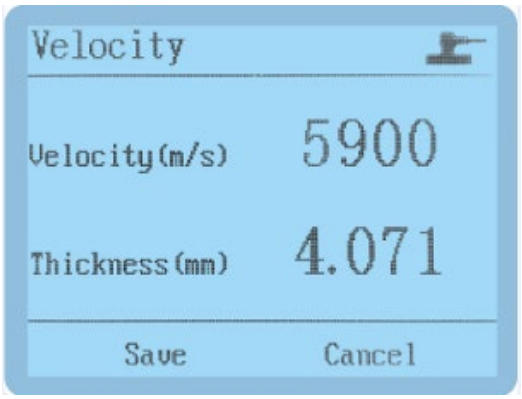
Set by thickness: Knowing the thickness of the material, the user can measure the sound velocity through the thickness. A short press of the Enter button prompts the interface to "Please press the probe tightly against the material with known thickness". Press the probe of the instrument tightly against the surface of the material with couplant and keep it still. The instrument will automatically jump to the interface of "Enter the actual thickness of the material" where the user can short press the buttons Cal Del ▲▼ to adjust the value. A short press of the button Enter selects [Save].





Manual input: A short press of the button Enter to enter the interface of setting the sound velocity manually and short press the buttons Cal Del ▲▼ to adjust the value. The user can check whether the thickness displayed on the interface is consistent with the thickness of the currently measured material during the adjustment process. A short press on the button Enter selects [Save]. The setting is completed.



(3) Reference calibration

The function " Reference Calibration" in the main menu is the same as the "Benchmark Calibration" when the instrument is powered on.

(4) Exit

A short press of the button Enter exits the main menu and enters the measurement interface.

(5) Shutdown

A short press of the button Enter turns off the instrument.

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5. Quickly set the sound velocity

In the measurement mode, short press the button Cal to enter the interface of the sound velocity manual setting. From there just adjust the current sound velocity according to the measured value

VI. Check measurement records

In the measurement mode, short press the buttons ▲▼ to enter the browsing interface to view historical data. The instrument stores a total of 9 sets of data. When more than 9 sets of data are exceeded, the oldest recorded value is automatically deleted. Record 1 is the earliest test data, and it is pushed back in turn. Recorded data is not lost when the instrument powers off.

When pressing the button ▲ to check, the number of recorded data increases successively from the first one; when pressing the button ▼ to check, the number of recorded data decreases from the maximum to the bottom.

In the historical browse mode, a short press of the button Del displays the interface of data deletion. Select [Yes] with a short press on the button Enter to delete all recorded data.

V. Precautions

1. The sound velocity is a key parameter for ultrasonic thickness measurement. Only by setting the correct sound velocity can an effective thickness value be obtained. It is recommended to use the material of known thickness.
2. The probe should be kept in the center of the point to be measured, and the periphery of the probe should not be suspended outside the surface to be measured.
3. The other surface of the tested material must be parallel or coaxial with the tested surface.
4. For coarse-grained materials such as cast iron, a large amount of ultrasonic waves will be scattered. When the numerical value is abnormal, it means that this material is not suitable for this instrument to measure.
5. The probe can be easily scratched on rough surfaces. Try to reduce sliding the probe on rough surfaces. If the probe is seriously worn, it should be replaced in time.
6. When the instrument has worked for a long time, it is recommended to perform a reference calibration to avoid the influence of the external environment on the instrument.
7. The probe and standard block should be cleaned to prevent them from being corroded after using.

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VI. Packing List

Number	Products' name	Quantity
1	Ultrasonic Thickness Gauge	1
2	Ultrasonic dual-crystal probe(5MHz)	1
3	1.5V AA Alkaline battery	2
4	Coupling Fluid	1
5	Silicone Case	1
6	Instructions	1
7	Certificate/Warranty Card	1