UNI-T®

UT343D
Coating Thickness Gauge User Manual

P/N:110401108295X

PREFACE

Thank you for purchasing the new UT343D coating thickness gauge. In order to use this product safely and correctly, please read this manual thoroughly, especially the Safety Instructions part.

After reading this manual, it is recommended to keep the manual at an easily accessible place, preferably close to the device, for future reference.

Software and user manual can be found by searching UT343D on our official website, then go to the 'Docs & Software' tab. Users can also scan the 2D barcode below for software download.

LIMITED WARRANTY AND LIABILITY

Uni-Trend guarantees that the product is free from any defect in material and workmanship within one year from the purchase date. This warranty does not apply to damages caused by accident, negligence, misuse, modification, contamination and improper handling. The dealer shall not be entitled to give any other warranty on behalf of Uni-Trend. If you need warranty service within the warranty period, please contact your seller directly.

This warranty is the only compensation you can obtain. Uni-Trend will not be responsible for any special, indirect, incidental or subsequent damage or loss caused by any reason or speculation. As some areas or countries do not allow limitations on implied warranties and incidental or subsequent damage, the above limitation of liability and stipulation may not apply to you.

Table of Contents

I. Overview

UT343D is a high-accuracy coating thickness gauge, which can measure coating thickness on both ferrous and non-ferrous metals. This device has features of high precision and non-destructive measurement, and functions of single-point, multi-point averaging algorithm and quick judgment. It is widely used in manufacturing, metal processing, aerospace, marine mechanics, rail transport, scientific research, quality supervision, and other industries.

Features:

1. The measurement method conforms to the magnetic method of measuring the thickness of non-magnetic coating on the magnetic metal substrate of GB/T 4956.
2. The measurement method conforms to the eddy current method of measuring the thickness of non-conductive coating on the non-magnetic substrate of GB/T 4957.
3. Automatic identification of the ferrous or non-ferrous substrate
4. Gemstone embedding technology is adopted for the sensor, which is characterized by precision, wear resistance and stability.
5. Zero and two-point calibration methods are adopted to correct the sensor systematic error and ensure the measurement accuracy.
6. Single-point and multi-point quick judgment and prompt (display: "PASS" or "FAIL")
7. 3-color warning light indicates the current value attribute (green: qualified. red: below the limit. yellow: above the limit).
8. Power on/off and measurement are accompanied by audio indication.
9. The display of the screen can be automatically rotated and manually locked, so that users can read the measured values from different angles.
10. The high-capacity memory chip can store 500 groups of data, which can be exported for analysis through the host computer.
11. USB communication software: The product is connected to the computer software via USB for stored data exporting, tendency charts drawing, real-time online measurement, printing, etc.

II. Accessories

Open the packing box and take out the gauge. Please double check whether the following items are deficient or damaged.

1. The gauge ---------- 1 pc
2. User manual ---------- 1 pc
3. Standard coating thickness sheet ---------- 1set (5 pcs)
4. Ferrous substrate ---------- 1 pc
5. Non-ferrous substrate ---------- 1 pc
6. Sensor cover ---------- 1 pc
7. Hand rope ---------- 1 pc
8. USB cable ---------- 1 pc
9. AA alkaline battery ---------- 2 pcs

III. Safety Instructions

1. Please perform the two-point calibration before using the gauge. For the specific operation method, please refer to the calibration section of the manual.
2. Initialization self-test is needed for the gauge when it is turned on. Please do not put the gauge sensor close to any metal object when it is turned on. Otherwise, the gauge will not work and need to be restarted in an environment where there is no metal close to the sensor.
3. Please keep the sensor part clean and in good condition to avoid dust, oil and other factors affecting the measurement accuracy.
4. Do not use or store the gauge in high temperature, high humidity, flammable, explosive and strong magnetic field environments.
5. Clean the gauge casing with a soft cloth and mild detergent. Do not use abrasives or solvents to avoid damage to the gauge.
6. Do not disassemble or modify the gauge to avoid damage to it.
7. When the LCD displays the low battery symbol “▭”, replace the battery in time. Remove the battery if it is not used for a long time.
8. The battery is normal "AA" alkaline battery, which cannot be charged.
9. The standard coating thickness sheet is a high-precision accessory, which is related to the accuracy of the gauge and needs to be preserved properly to prevent scratches, corrosion, bending and deformation of the surface.
10. The metal substrates are high-precision accessories, which are related to the accuracy of the gauge and need to be preserved properly to prevent scratches, rust, oxidation and deformation of the surface.
11. If an error occurred in the use of the gauge, please restore the factory settings and perform the two-point calibration.

IV. Function Description

A. Structure description

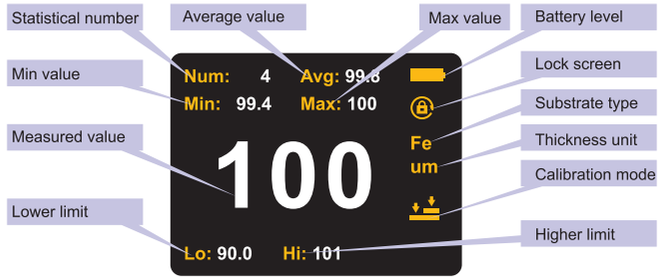
1. LED warning light
2. LCD screen
3. Power button
4. Set/Confirm/Calibrate button
5. Cancel/Clear button
6. Value-/Down/Quick judgment button
7. Value+/Up/Lock screen button
8. Sensor assembly
9. Hand rope hang buckle
10. USB communication interface
11. Battery compartment

B. Display interface description

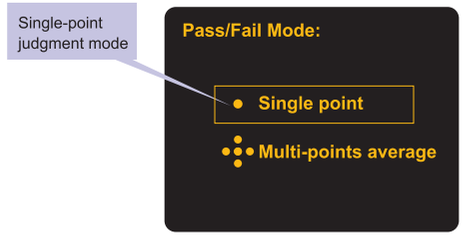
1. Menu icon description

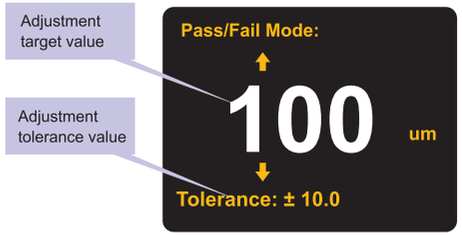
	Prompt tone setting		Backlight setting	um/mil	Unit setting
	Calibration mode setting		Higher limit setting		Lower limit setting
	LED warning light setting		Factory reset		Delete stored data
	Continuous measurement setting				

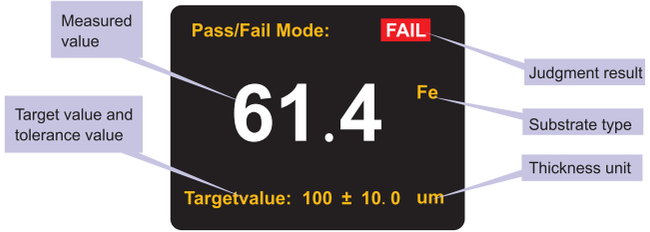
2. Measurement mode interface



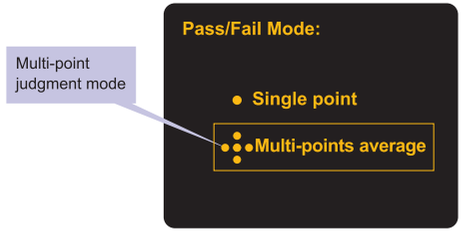
3. Single-point judgment mode interface:

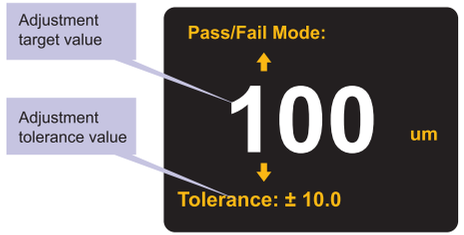


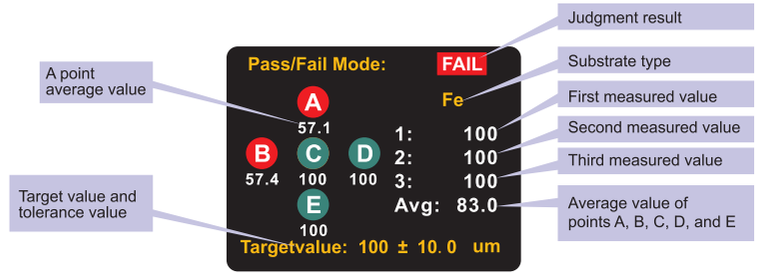




4. Multi-point judgment mode interface:







V. Operating Instructions

A. Replace the battery:

1. Turn the locking screw on the battery compartment counterclockwise, open the battery cover, and install 2 batteries in the direction indicated in the compartment.
2. Install the battery cover and turn the locking screw clockwise.
3. The battery level is indicated by the battery symbol " ▭ " at the top right of the screen.

B. Power on/off:

1. Power on: Long press the ⏻ button until the screen is on. If the buzzer is turned on, it will be accompanied by a power-on prompt tone.
2. Power off: Long press the ⏻ button until the screen is off. If the buzzer is turned on, it will be accompanied by a power-off prompt tone.

C. Normal measurement

1. Long press the ⏻ button to turn on the gauge. The gauge displays the initialization process, and enters the normal measurement mode after the initialization is completed.
2. Estimate the coating thickness of the measured object, and select the corresponding or close standard coating thickness sheet to perform the two-point calibration on the measurement substrate.
3. Selection of the substrate: A substrate with thickness or material close to the measured object and without coating should be selected as the measurement substrate as far as possible.
4. For the two-point calibration, please refer to the calibration section of the gauge.
5. After the two-point calibration, the coating thickness measurement can be performed on the measured object.

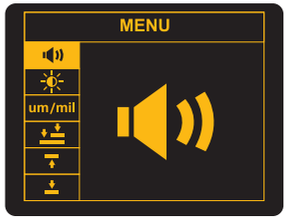
6. When measuring, select 3 to 5 measuring points on the surface of the measured object evenly, measure 5 times for each measuring point, and take the average value of the 5 times as the indicating value of the point.
7. After the indicating values of the 3 to 5 measuring points are measured, the average value of the values should be taken as the reference value of the coating thickness of the object.

Note:

1. Hold the gauge perpendicular to the substrate to be measured, and lightly press the gauge sensor against the substrate for measurement. It is necessary to keep the sensor in close contact with the surface of the substrate and avoid the measurement error caused by excessive force.
2. When the measured indicating value is greater than 1250μm and less than 1500μm, the screen displays OL to indicate the over range.
3. When the measured indicating value is greater than 1500μm, the gauge will not respond.

D. Menu settings

Short press the CAL button in the normal measurement mode to enter the menu settings mode:



1. Prompt tone setting

Select the prompt tone setting icon by using the and buttons, short press the button to enter the prompt tone setting menu, turn on/off the prompt tone by using the and buttons, and short press the button to confirm the setting or button to exit.

2. Backlight setting

Select the backlight setting icon by using the and buttons, short press the button to enter the backlight setting menu, set the backlight brightness by using the and buttons, and short press the button to confirm the setting or button to exit.

3. Unit setting um/mil

Select the unit setting icon **um/mil** by using the and buttons, short press the button to enter the unit setting menu, set the unit (μm/mil) by using the and buttons, and short press the button to confirm the setting or button to exit.

4. Calibration mode setting

Select the calibration mode setting icon by using the and buttons, short press the button to enter the calibration mode setting menu, select the calibration mode (zero/ two-point) by using the and buttons, and short press the button to confirm the setting or button to exit.

5. Higher limit setting

Select the higher limit setting icon by using the and buttons, short press the button to enter

the higher limit setting menu, adjust the higher limit by using the and buttons (short press to add/subtract 1 for the last digit, long press to add/subtract 1 for the penultimate digit, and continuously press without loosening to quickly adjust the value), and short press the button to confirm the setting or button to exit.

In the normal measurement mode, when the measured value is higher than the higher limit and the LED warning light is turned on, the LED warning light flashes yellow.

6. Lower limit setting

Select the lower limit setting icon by using the and buttons, short press the button to enter the lower limit setting menu, adjust the lower limit by using the and buttons (short press to add/subtract 1 for the last digit, long press to add/subtract 1 for the penultimate digit, and continuously press without loosening to quickly adjust the value), and short press the button to confirm the setting or button to exit.

In the normal measurement mode, when the measured value is lower than the lower limit and the LED warning light is turned on, the LED warning light flashes red; when the measured value is between the higher limit and lower limit, the LED warning light flashes green.

7. LED warning light setting

Select the LED warning light setting icon by using the and buttons, short press the button to enter the LED warning light setting menu, turn on/off the LED warning light by using the and buttons, and short press the button to confirm the setting or button to exit.

8. Factory reset

Select the factory reset icon by using the and buttons, short press the button to enter the factory reset menu, turn on/off the factory reset by using the and buttons, and short press the button to confirm the factory reset or button to exit.

9. Continuous measurement setting

Select the continuous measurement setting icon by using the and buttons, short press the button to enter the continuous measurement setting menu, turn on/off the continuous measurement by using the and buttons, and short press the button to confirm the setting or button to exit.

When the continuous measurement is turned on, the gauge will continuously measure until it is powered off or automatically powered off.

10. Delete stored data

Select the delete stored data setting icon by using the and buttons, short press the button to enter the delete stored data setting menu, turn on/off the delete operation by using the and buttons, and short press the button to confirm the delete or button to exit.

Note: The delete operation will clear the stored data in the gauge memory.

E. Data statistics

Statistical number (Num), average value (Avg), min value (Min) and max value (Max)

If you need to clear the current statistics, press the button for 2s to clear all stored data. The statistics will be reset to zero and the subsequent measured values will be restated.

F. Quick judgment mode

Note: The quick judgment mode is mainly applicable to the quick measurement and judgment of the coating thickness of automobiles and other industrial products.

In the normal measurement mode, long press the button to enter the quick judgment mode, select the single-point/multi-point judgment mode by using the and buttons, and short press the button to enter or long press the button to exit.

1. Single-point judgment mode

1) Press the and buttons to set the target thickness value, and short press the button to confirm the setting.
2) Press the and buttons to set the tolerance value, and short press the button to enter the single-point judgment mode.
3) Use the gauge to measure the coating thickness of the measured object.
4) The screen displays the measured indicating value and the judgment result (“PASS” or “FAIL”).
5) Short press the button to return or long press the button to exit.

2. Multi-point judgment mode

1) Press the and buttons to set the target thickness value, and short press the button to confirm the setting.
2) Press the and buttons to set the tolerance value, and short press the button to enter the multi-point judgment mode.
3) Use the gauge to measure the coating thickness of the measured object, measure 3 times near the same position, and the gauge will count the average value of 3 times into point A.

4) Change the measurement position, measure 3 times near the new position, and the gauge will count the average value of 3 times into point B.
5) Measure A, B, C, D and E (5 points) according to the above method.
6) After the measurement, the screen displays the average value of the 5 points and the judgment result (“PASS” or “FAIL”).
7) Short press the CLEAR button to return or long press the CLEAR button to exit.

G. Calibration of the gauge

Long press the CAL button in the normal measurement mode to enter the selected calibration mode:
Note: Zero calibration mode or two-point calibration mode depends on the calibration mode setting in the above menu settings.

Calibration mode	Icon	Description
Zero calibration		Simply place the sensor on an uncoated metal substrate for zero calibration.
Two-point calibration		On the basis of the zero calibration, stack a standard coating thickness sheet with known thickness and an uncoated substrate together for calibration to obtain a more accurate measurement result.

1. Zero calibration

1) Figure 1 appears on the screen, prompting users to place the gauge vertically on the uncoated substrate.
2) Lift it up after 2s. Zero will be displayed (as shown in Figure 2), and the gauge will automatically exit to the normal measurement mode.
3) At this point, the zero calibration is completed.

Figure 1

Figure 2

2. Two-point calibration

1) Figure 3 appears on the screen. Stack a standard coating thickness sheet with known thickness (e.g.: 500 μm) and an uncoated substrate together for calibration.
2) Lift up the gauge after 2s and the measured value will be displayed (as shown in Figure 4).
3) Press the ▲ and ▼ buttons to adjust the value to the actual thickness of the standard coating thickness sheet (as shown in Figure 5).

4) Press the CAL button to confirm the adjustment (or CANCEL button to cancel the calibration).
5) Figure 6 appears on the screen, prompting users to place the gauge vertically on the uncoated substrate.
6) Lift it up after 2s. Zero will be displayed (as shown in Figure 7), and the gauge will automatically exit to the normal measurement mode.
7) At this point, the two-point calibration is completed.

Figure 3

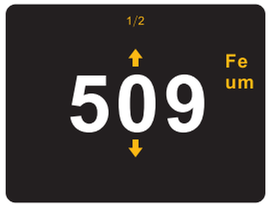


Figure 4

Figure 5

Figure 6

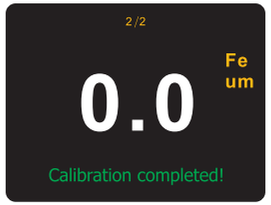


Figure 7

3. Calibration verification

Measure the standard coating thickness sheet according to the above normal measurement mode. At this time, the indicating value of the gauge should be within the accuracy range of the nominal value for the standard coating thickness sheet. For example, if the nominal value for the standard coating thickness sheet is 100μm, the indicating value of the gauge should be within ±(1+3%H)μm after calibration. If it is out of tolerance, recalibration is required.

Note: If the calibration result is inaccurate caused by incorrect operation, please restore factory settings and then recalibrate.

H. Auto rotatable screen

The gauge has a built-in gravity sensor, which automatically rotates the display during testing. It is convenient for users to read the value in any direction. The rotation angle is 0°, 90°, 180° and 270°. In the normal measurement mode, long press the button to turn on/off the rotary display function. When the rotary display is turned off, the lock screen symbol appears on the screen.

I. Data upload

1. Connect the USB cable to the computer and make sure the battery level of the gauge is sufficient.
2. Send real-time data or save the stored data to the computer and generate the report via the USB interface.

Note:

Regarding the use of the computer software, users can retrieve the Software User Manual from the Help option of the operation interface.

The USB interface cannot power the gauge up or charge the battery.

VI. Performance indexes

A. Technical specifications

Function	Measuring range	Thickness	Resolution	Accuracy	Explanation
Ferrous and non-ferrous substrates measurement	0～1250um	0～99.9um	0.1um	±(1+3%H)	Unit conversion: 1mil = 25.4μm
		100～1250um	1um		
	0～49.2mil	0～4.99mil	0.01mil	±(0.04+3%H)	
		5.0～49.2mil	0.1mil		
Minimum convex radius of curvature	5mm				
Minimum concave radius of curvature	50mm				
Minimum measured area diameter	20mm				
Minimum substrate thickness	0. 5mm				
Display screen	2-inch TFT LCD screen				Resolution: 320*240 pixels
Auto rotatable screen	Automatically rotates the display of the screen				Rotation angle: 0°, 90°, 180° and 270°
Unit conversion	μm/mil conversion				Metric/Imperial unit conversion

Alarm indication	The LED lights up in the corresponding color when the value exceeds the set value range for alarm.	
Audio indication	Measurement and alarms are accompanied by corresponding prompt tones.	
Limit setting	Any limit value can be set between 0~1200μm.	
Measurement method	Single/Continuous	
Statistical measurement	Max/Min/Average value	
Automatic identification	Automatic identification of the substrates	
USB communication	The product is connected to the computer software via USB for data storage and analysis.	
Data storage	500 groups	
Backlight brightness	5 levels	
Auto power off	5 minutes	
Low battery indication	Low battery indication at 2.2V±0.2V	Low battery symbol “ ▭ ” flashes.
Working environment	0~40 °C ⩽80%RH	
Storage environment	-20~60 °C ⩽75%RH	

B. General specifications

1. Display: 4-digit color LCD display
2. Refresh rate: 0.5s
3. Sensor type: Magnetic induction and eddy current composite sensor
4. Impact resistance: The gauge can withstand 1 meter drop
5. Power requirement: AA alkaline battery (2 pcs)
6. Dimensions: 152mm*65mm*35mm
7. Weight: About 180g (including batteries)

Uni-Trend reserves the right to update the content of this manual without further notice

UNI-T®

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说明书菲林做货要求：

序号	项目	内容
1	尺寸	尺寸：150x118mm
2	材质	封面与封底128g双铜，内页80g双铜
3	颜色	四色印刷
4	外观要求	完整清晰、版面整洁，无斑墨、残损、毛边、刀线错位等缺陷。
5	装订方式	钉装
6	表面处理	无
7	其它	无
版本		0

DWH 设 计	宣浩	MODEL 机型： Ut343D	Part NO. 物料编号：P/N:110401108295X
CHK 审核		UNI-T 优利德科技（中国）有限公司 UNI-TREND TECHNOLOGY (CHINA) LIMITED	
APPRO. 批准			