

LS233

Coating Thickness Gauge

User Manual V2.02

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



I. Product Introduction

The coating thickness gauge is professionally used for measuring the thickness of car paint. The car body shell material is generally metal materials such as iron, aluminum and non-metallic materials such as carbon fiber, plastic, etc. The coating thickness gauge can measure the car paint thickness on iron and aluminum substrates. . Moreover, it can identify not only non-metal car bodies, but also the ferrous putty layer as well as the galvanized iron. The gauge has two displays on the front and the top separately. The two displays simultaneously display the test data. When measuring different positions of the car body, it is convenient to view the test data. Among them, the front display uses LCD, LCD ensures that the test results are clearly visible under strong light. The top display uses OLED, OLED ensures normal display in a low temperature environment of -40°C.



Standards for the product:

- DIN EN ISO 2808 Paints and Varnishes-Determination of Film Thickness
- JJG-818-2005 Verification Regulation of Magnetic and Eddy Current Measuring Instrument for Coating Thickness
- GB/T 4956-2003 Non-magnetic Coatings on Magnetic Substrates-Measurement of Coating Thickness-Magnetic Method
- GB/T 4957-2003 Non-conductive Coatings on Non-magnetic Basis Metals-Measurement of Coating Thickness-Eddy Current

II. Parameters

Probe tip	Ruby
Measuring principle	Fe: Hall Effect / NFe: Eddy current
Probe type	Built-in integrated probe
Measuring range	0.0-3000μm
Resolution	0.1μm:(0μm - 99.9μm) 1μm:(100μm - 999μm) 0.01mm:(1.00mm - 3.00mm)
Accuracy	≤±(3%H+2μm), H is the standard value
Unit	μm / mil



Measuring interval	0.5s
Minimum measuring area	Ø = 25mm
Minimum curvature	Convex:5mm / Concave:25mm
Minimum substrate thickness	Fe:0.2mm / NFe:0.05mm
Display	Front: 128×48 dot matrix LCD, top: 128×64 dot matrix OLED
Power supply	2 pcs of 1.5V AAA alkaline battery
Operation temperature range	-40℃-50℃
Storage temperature range	-50℃-60℃
Gauge size	100*60*24 mm
Weight(with battery)	80g

III. Features

1. No calibration, just zero adjustment.
2. Simple operation by pressing one button.
3. Fast measurement, 0.5s measuring interval.
4. Dual display design, display the measured value simultaneously. It is convenient to view the test data in real time when measuring at different angles.
5. Using LCD and OLED as display devices simultaneously, LCD ensures that the test results are clearly visible under strong light and OLED ensures normal display in a low temperature environment of -40℃.
6. The device can identify the ferrous putty as well as the galvanized iron substrate.
7. Wear-proof ruby probe tip for long-term use.
8. Dual-use probe for both iron and aluminum. The gauge can automatically identify the substrate and switch measurement mode rapidly.
9. "Fe", "NFe", "Fe/NFe" three measurement modes can be set.
10. The gauge can measure the non-magnetic coating thickness on metal substrates and non-conductive coating thickness on non-magnetic substrates.
11. Use advanced digital probe technology, these sensors are unsusceptible to interference and provide an excellent measuring accuracy. Even temperature change will not affect measurement and data remain stable to ensure a very good reproducibility over the complete measuring range.



IV. Operation

1. Power on/off

Power on:

Short press the power button to turn on the gauge. Display the version number and serial number, then the recorded data of last measurement are displayed after the gauge is turned on.

Power off:

Long press the button to shut down the gauge, or the gauge will automatically shut down in 3 minutes without any operation.

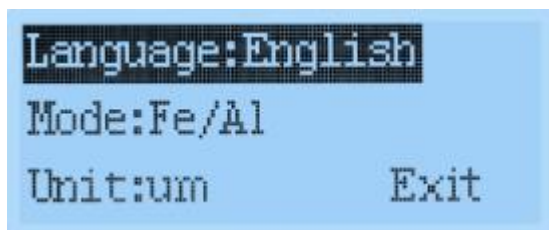
2. Device setting

In the off state, long press the button for 3s to enter the setting interface. After entering the setting interface, if there is no operation for more than 20 s, the gauge will automatically shut down. Short press the button can select the settings; Long press the button for 3 s and less than 5 s to confirm the settings; long press the button for 5 s, the gauge exits the setting and shuts down and the setting is invalid.

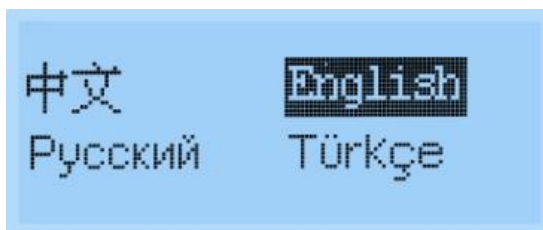
Language settings

The instrument is available in Chinese, English, Russian, Turkish.

Setting method: In the main setting interface, short press power button to select "Language" option, long press the button for 3 seconds to confirm the selection, short press the button again to select the desired language, long press the button for 3 seconds to confirm the selection, and return to the main setting interface.



Setting interface



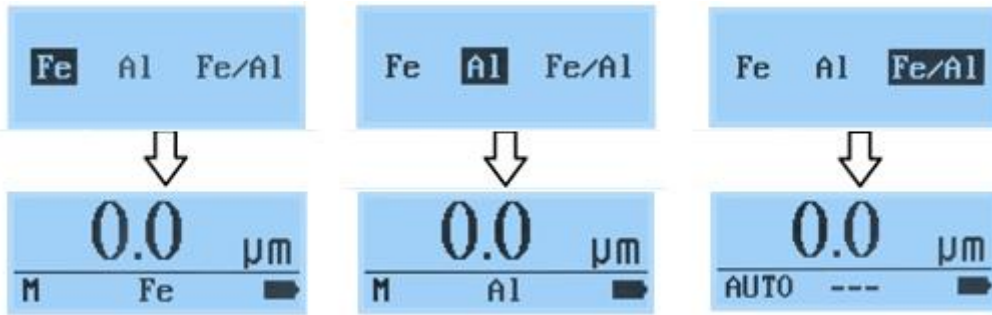
Language selection

Measurement modes selection

It has three measurement modes: ferromagnetic substrate measurement mode (Fe), non-ferrous substrate measurement mode (NFe) and automatic identification mode (Fe/NFe). In general, the Fe/NFe mode is recommended. This mode features identification of the ferrous putty and galvanized iron substrate. For application with clearly indicated substrate, the Fe or NFe mode can be set as a fixed mode.

Setting method: In the main setting interface, select "mode" option by short pressing power button, and long press the button for 3 seconds to confirm the selection. Shortly press the button to select the measurement mode. And long press the button for 3s to confirm the selection and back to the main setting interface.





Unit setting

The device can be set to the metric or imperial unit, and the factory default is metric.

Setting method: In the main setting interface, shortly press the button to select "Unit". Long press the button for 3s to confirm and then enter the unit selection interface. Shortly press the button to select your unit and long press the button for 3s to confirm and back to the main setting interface.



Main setting interface

Unit selection interface

Exit

In the main setting interface, short press power button to select "Exit", long press the button for 3 seconds to confirm and enter the measurement interface

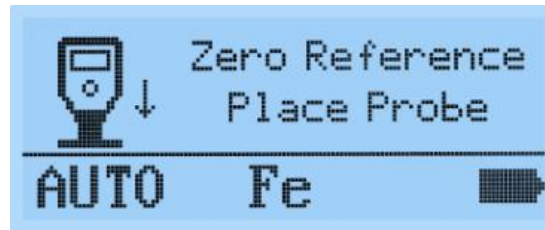
3. Zero adjustment

A zero-adjustment is required when using the gauge for the first time, after inserting new batteries, working with different materials or ambient temperature changes. Using iron-base and aluminum - base adjustment plates respectively to carry out zero adjustment. We strictly recommend carrying out the reference check on the uncoated original substrate, due to the difference of magnetic and conductive properties of the material, some measurement deviation will be caused. If this is not possible, please use the zero reference plates supplied by Linshang technology, there are Fe plate and NFe plate, please choose correctly according to the measuring materials.

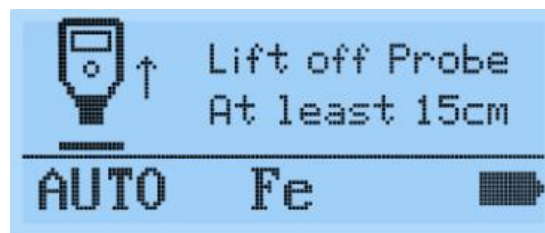
3.1 Measuring the plate or uncoated original substrate, a measured value will be displayed on the gauge, please make sure the probe tip is placed perpendicularly and evenly on the surface.

3.2 Hold the probe still, long press the button for 3s, the gauge will display "zero reference place probe" (as shown in below picture).

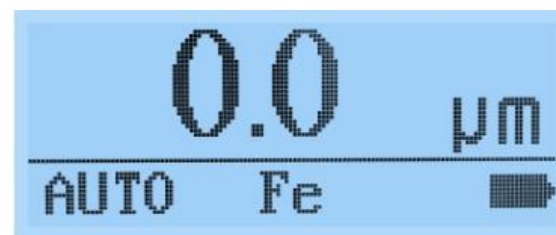




3.3 After hearing a buzzer sound, the gauge will display “Lift off probe at least 15 cm” (as shown in below picture), release the button and lift the probe away from the plate (substrate) for at least 15 cm.



3.4 The zero adjustment completed when there is the buzzer sound again, and the LCD screen displays 0.0.



3.5 After the zero adjustment is completed, place the standard film on the plate (substrate), if the measurement value is stable and deviation from standard value within $\pm 3\mu\text{m}$, the gauge can be used normally.

Note: After the zero adjustment completed, when repeating measurement on the same spot, the reading may not always be $0\mu\text{m}$, since surface roughness, dirt, scratches etc. It might cause variances. The operation of the gauge should be correct and proficient; otherwise, it will lead to instability of the measured values.

4. Measurement

- 1) Use fingers to hold gauge where there is non-slip groove.
- 2) Press the gauge vertically on the surface of the object to be measured. Keep the gauge steady and do not tilt or shake it. The result will be shown on the screen, and there will be a buzzer.
- 3) To continue measuring, lift the gauge away from the object. Repeat the operation of step 2).



- 4) When the device identifies the ferrous putty, the buzzer alerts for two times. And the interface of the device will prompt: "Ferrous putty". When the device identifies the galvanized iron, it will turn on the green backlight. The substrate is displayed as "FeZn".

5. Check measurement records

In measurement mode, short press the button to check historical data. The gauge stores 9 sets of data. When more than 9 sets of data are stored, the earliest recorded value is automatically deleted, and "No.1" is the last test data. Recorded data will not loss after powering off.

V. Precaution

1. The device must be zero adjusted respectively with the iron-base and aluminum-base zero adjustment plates. Otherwise, there may be abnormal identifications of the ferrous putty and galvanized iron substrate.
2. Do not slide the probe on the car surface, which will result in damage to the paint and the gauge.
3. Please keep the car paint surface clean, the dust and dirt on the paint surface will affect the measurement accuracy.
4. When the gauge displays "low battery", the battery needs to be replaced.

VI. Packing list

No.	Description	Quantity	Unit
1	Coating Thickness Gauge	1	Set
2	Fe zero-adjustment plate	1	pcs
3	NFe zero-adjustment plate	1	pcs
4	Standard film	1	pcs
5	User manual	1	pcs
6	Drawstring bag	1	pcs
7	Certificate / Warranty card	1	pcs
8	1.5V AAA alkaline battery	2	pcs



VII. Service

1. The gauge has one-year warranty. If the gauge works abnormally, please send the whole gauge to our company for maintenance.
2. Provide users with spare parts and lifelong maintenance services.
3. Provide the users with the gauge calibration service.
4. Free technical support for long term.

Manufacturer: Shenzhen Linshang Technology Co., Ltd.

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