Coating Thickness Gauge

Model: LS221

User Manual V2.13

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

I Product introduction

The coating thickness gauge can be used not only to measure non-magnetic coatings such as paint, varnish, enamel, chrome and galvanizing on ferromagnetism metal substrates such as steel or iron, but also measure Non-conductive coatings such as paint, anodized layers or ceramic on non-magnetic metal substrates such as copper, aluminum, die cast zinc, brass etc. The gauge automatically identifies the substrate and switch measurement mode. It is widely used in manufacturing, metal processing, chemical industry, commodity inspection and other fields.

Standards for the product:

- *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*
- *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*

II Technical parameters

Probe tip	Ruby fixed
Measuring principle	Fe: Hall Effect / NFe: Eddy current
Probe type	External cable probe
Measuring range	0.0-5000μm
Resolution	0.1μm:(0μm - 99.9μm) 1μm:(100μm - 999μm) 0.01mm:(1.00mm - 5.00mm)
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	128×48 dot matrix LCD
Power supply	2pcs of 1.5V AAA alkaline battery
Range of operation temperature	0℃-50℃
Storage temperature range	-20℃-60℃
Host size	101*62*28 mm
Probe size	71*26*22 mm
Weight(with battery)	114g
Supply Voltage	DC3V
Operating Current	20mA
Operating Power Consumption	60mW

III Product advantages

1. No calibration, just zero adjustment.
2. One hand operation, only one button.
3. Fast measurement, 0.5s measuring interval.
4. Wear-proof ruby probe tip for long-term use.
5. The gauge automatically identify the substrate and switch measurement mode rapidly.
6. "Fe", "NFe", "Fe/NFe" three measurement modes can be set.
7. Measuring non-magnetic coatings on steel or iron and measure Non-conductive coatings on non-magnetic metal substrates in one gauge.
8. Thanks to the use of the most-advanced digital probe technology, these sensors are unsusceptible to interference and provide an excellent measuring accuracy. Even variations in temperature will not affect measurement and readings remain stable to ensure a very good reproducibility over the complete measuring range.

IV Operation

1. On/Off

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

Off: The gauge can be turned off by long pressing the button or automatically turned off in 3 minute after

no operation.

2. Settings

In the off state, press and hold the button for 3 seconds to enter the setting interface.

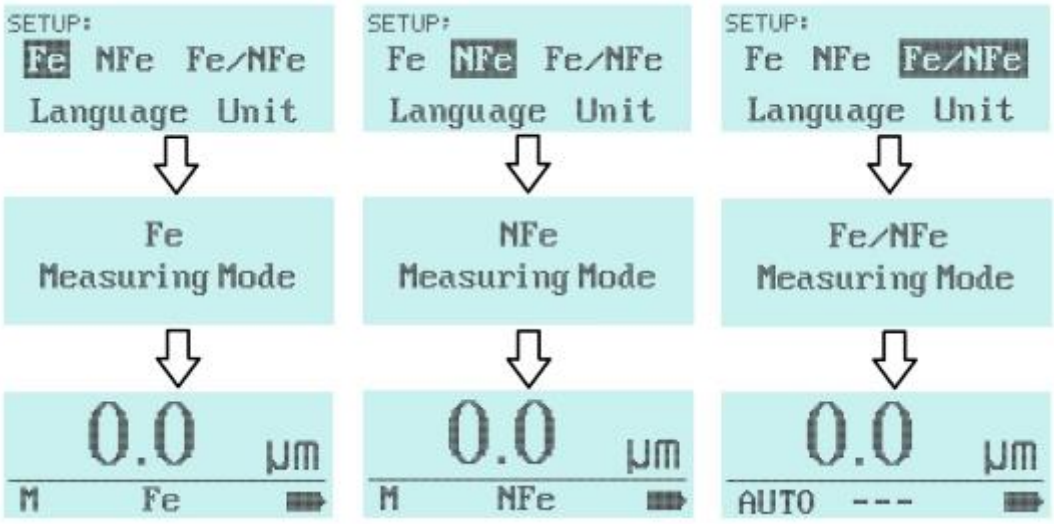
In the setting interface, if there is no operation for more than 20 seconds, the instrument will automatically shut down.

Short press corresponds to the "Select" function; long press for more than 3 seconds and less than 5 seconds corresponds to the "Confirm" function; long press for more than 5 seconds and does not release, the instrument will exit the setting interface and shut down, the setting is invalid.

2.1 Selection of measurement substrates

It has three measurement modes: iron-substrate measurement mode (Fe), non-ferrous substrate measurement mode (NFe) and automatic identification mode (Fe/NFe). In general, the Fe/NFe mode can be used. For application with clearly indicated substrate, the Fe or NFe mode can be set as a fix mode.

Short press to select the substrate to be measured, long press for 3 seconds to confirm the substrate option and enter the measurement interface.



2.2 Language settings

The gauge has two languages: Chinese and English, and the factory default is Chinese.

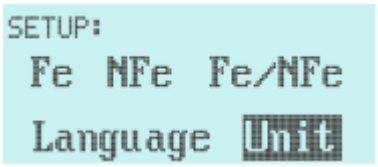
Setting method: Long press the button in the off state to enter the setting interface, short press to select “Language”, long press the button for 3 seconds to enter the Chinese and English selection interface, then short press again to select the required language, long press for 3 seconds to confirm the language selection and enter the measurement interface.

Setting interface | Language selection | Language confirmation

2.3 Unit settings

The gauge may be set metric or imperial unit. The factory default is metric unit, μm.

Setting method: Long press the button in the off state to enter the setting interface, short press to select “Unit”, long press for 3 seconds to enter the unit selection interface, then short press the button again to select the required unit, long press for 3 seconds to confirm the unit selection and enter the measurement interface.



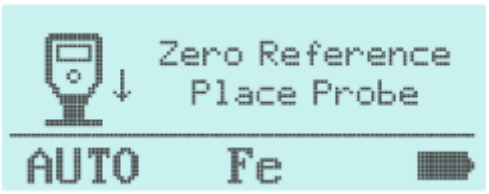
Setting interface | Unit selection | Unit confirmation

3. Zero adjustment

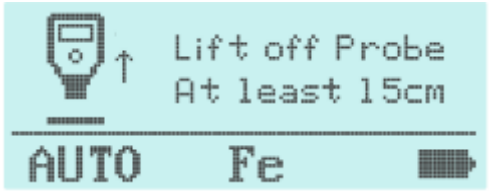
A zero-adjustment is required when using the gauge for the first time, after inserting new batteries, working with different materials or ambient temperature changes. We strictly recommend carrying out the reference check on the uncoated original substrate, due to the difference of magnetic and conductive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

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.

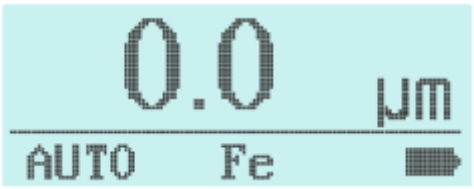
2) Hold the probe still, pressing the button, a buzzer sound will be heard. The gauge will display “zero reference place probe” (as shown in below picture).



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.



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



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 ±1μm, 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 0μm, since surface roughness, dirt, scratches etc. 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

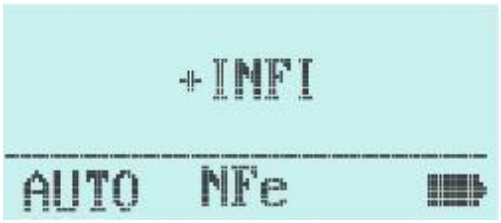
1) Use fingers to hold probe where there is non-slip groove.

2) Press the probe vertically on the surface of the object to be measured. Keep the probe steady and do not tilt or shake it. The result will be shown on the screen, and there will be a buzzer.

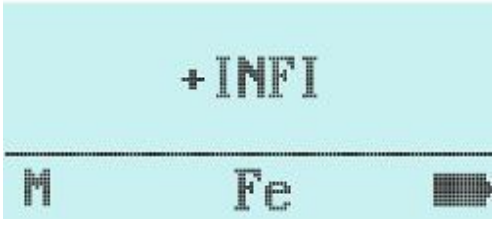
3) To continue measuring, lift the probe away from the object. Repeat the operation of step 2).

4) When measuring, the following interfaces may appear.

- +INFI Over range or non-metal substrate: The valid measurement range is exceeded, or the measured object is a non-metal substrate.



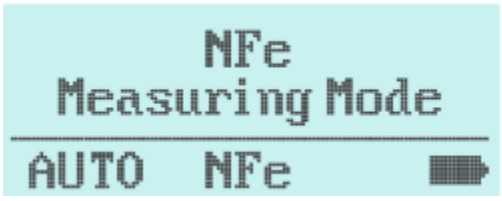
- +INFI Over-range or non-ferrous substrate:In the manual iron-based measurement mode, the valid measurement range is exceeded or the measured object is a non-ferrous substrate.



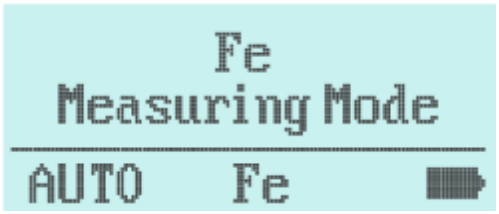
- +INFI Over-range or non-metal substrate: in the manual non-ferrous measurement mode, the valid measurement range is exceeded or the measured object is a non-metal substrate.

- -INFI: When the measured value is less than -100μm. The gauge needs zero adjustment.

- In the automatic identification mode, When Fe substrate is changed to NFe substrate, the interface is: NFe measurement mode.



- In the automatic identification mode, When NFe substrate is changed to Fe substrate, the interface is: Fe measurement mode.



5. Check measurement records

In measurement mode, 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 won't loss after powering off.

V Precaution

1. The measurement should be point contact. It is strictly forbidden to slide the probe on the surface of the object.
2. During the measurement, the probe should be kept at the center of the point to be measured.
3. Keep away from strong magnets (magnets, stereos, etc.) and strong electromagnetic fields

(transformers, induction cookers, etc.).

4. Zero adjustment is recommended before the gauge is used.
5. Please ensure that the surface of the object under test is clean, dust and dirt on the surface to be tested will affect the measurement accuracy.
6. When the screen display low battery, new battery should be used.

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

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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