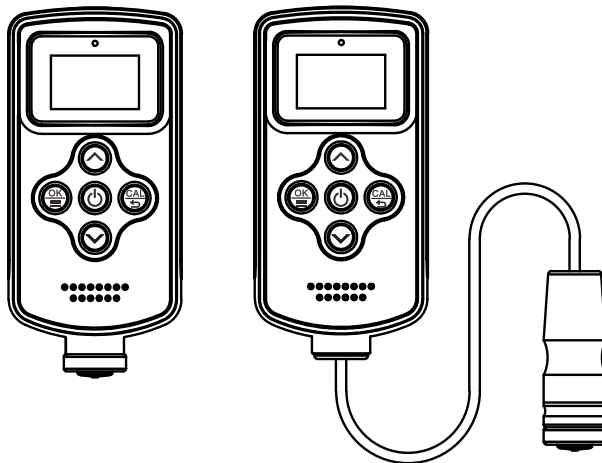


# COATING THICKNESS GAUGE

## OPERATION MANUAL



V1.0

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## Overview

This Series thickness gauge can quickly and accurately detect the thickness of various coatings coated on metal substrates. It complies with ISO 2178, ISO 2360, GB/T 4956, GB/T 4957, ASTM B499, widely used in surface engineering inspection fields such as manufacturing, metal processing, chemical industry, etc. It is the basic equipment of coating surface treatment industry.

The Fe-based probe can detect the thickness of various non-magnetic coatings sprayed on various magnetic metal substrates (such as steel), such as paint layer, powder coating layer, porcelain coating layer, chrome plating layer, copper plating layer, galvanizing layer of iron plate layer etc.

The Non-Fe probe can detect the thickness of all insulating coatings sprayed on non-magnetic metal substrates (such as aluminum, copper, brass, stainless steel, etc.), such as paint layer, powder coating, porcelain coating, etc.

Basic working principle: Magnetic method Figure 1-1; F & NF Figure 1-2.

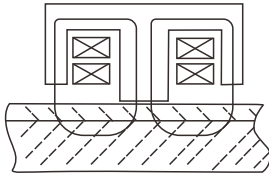


Figure 1-1 Magnetic

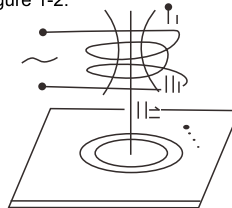


Figure 1-2 F & NF

## Features

- Quickly & accurately detect the coating thickness on magnetic substrate and Non Magnetic substrate;
- Compact design for one hand operation;
- Automatic substrate recognition, one-key test (no manual operation required);
- Single and multi point calibrations;
- LCD Display, buzzer, auto stand-by;
- High wear-resistant probe, no less than 800,000 measurements;
- Test reaction speed: Fe mode 10 times per second, NFe mode 1~ 2 times per second, automatic mode 1-2 times per second;
- Easy 0 Calibration: as long as the probe touches the substrate, lightly press the menu button to reset to 0;
- $\pm$  numbers show the test value, and clear to check the 0 Cal. which improves the test accuracy;
- With temperature control system and high-end chip control system, Good linearity, stability and repeatability;
- The basic calibration correction method can be used to update and correct the system error of the probe to ensure the accuracy of the instrument during the measurement process;
- Negative number display function to ensure the accuracy of the 0 cal. of the instrument and improve the test accuracy;
- Buzzer selection prompt during operation;
- Manual power off and auto power off;
- Low battery alarm;
- Low power design, stand-by current  $< 10 \mu\text{A}$ ;
- Fast Measuring
- Detachable double probe
- High precision
- High stability

## Notes

- Before measuring, please stay away from other electrical equipment (such as strong magnet, speakers, transformer and induction cooker with strong electromagnetic field) to ensure that the instrument will not be affected by the surrounding magnetic field, otherwise the measurement result will be inaccurate ;
- Before measuring, please clean any attached substances on the measured surface, such as dust, grease and rusts etc ;
- Before measuring, please check the critical thickness of the base metal, if it is bigger than it, the thickness gauge will not respond, the data is inaccurate ;
- Before measuring, please be noted that the roughness of the standard sheet should be similar as the sample which to be tested ;
- Before measuring, please pay attention to the influence of the radius of curvature of the surface, it may be unreliable to measure the surface with the radius of curvature  $< 3\text{mm}$  ;
- Before measuring, please carry on the zero calibration ;
- When measuring, please do not to measure at the inner corner and near the edge of the sample. Generally, it is very sensitive to the abrupt change of the surface shape of the sample ;
- When measuring, please press the probe vertically to keep the pressure constant, otherwise the measuring data will be inaccurate ;
- Since each data is not exactly the same, please take several more measurement in each measured area, especially for rough surface ;
- When “Low battery” displayed, it will automatically shut down to protect the battery. It needs to be charged.

## 1. System Layout

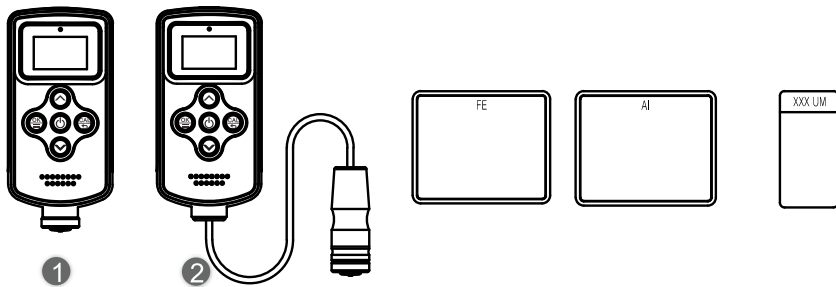


Figure 2 Thickness Gauge Layout

Note: 1. The thickness gauge is classified into ① integral type and ② split type according to the probe;  
2. ① **Fe-Based**, ② **Non Fe** (AL ect), according to the probe.



## 2. Power

### 2.1 Power on

The instrument can be powered by lithium battery and USB. As long as the battery is a live or inserted into USB, briefly press the power key for 0.5s to start up.


### 2.2 Power off


When powered by the lithium battery, the instrument will automatically shut down if there is no operation for a certain period of time (60 seconds by default, which can be changed in the Settings). It can also be shut down by pressing the power button for more than 3 seconds.

When using USB power supply, it cannot be shut down automatically, but it can be shut down manually to continue charging.

## 3. Basic operation

### 3.1 Menu operation

 indicates that it's selected or there are sub-menu items;

 indicates that there are other options to continue to flipping, and indicates the current position of the sub-menu option displayed, in Figure 3 "Main Menu".

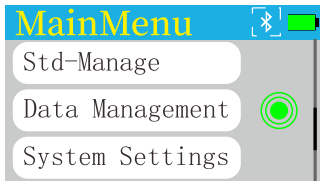


Figure 3 Main Menu

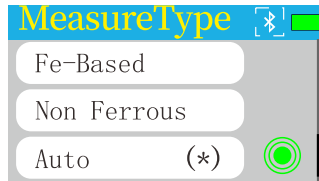


Figure 4 Measurement Type

### 3.2 Enter the Main Menu

Press the "OK" key in the measurement interface to enter the main menu, and press the up key or down key in the main menu interface to switch the sub-menu options to be entered.

The Main Menu including following sub-menu items:

1. Calibration: Calibrating or modify the Cal. Value;
2. Measurement Type: Fe-Based, Non-Fe, Auto, please select the right one for measurement;

**Caution:** Some models only have a single measurement type.

3. Measurement Mode: Basic Mode, QA Mode, Statistical Mod,Continuous Mode;

4. Standard Management: Check Standard, Measure Standard, Input Standard, Tolerance Settings, Empty Standard;

5. Data Management: User can check the records (Basic Records, Quality Records, Statistical Records) here, and Delete All;

6. System Settings: Auto Save, Buzzer, Bluetooth, Inch/ $\mu\text{m}$ , Auto Print, Pass/Fail, Language , Standby Time, Backlight Time,Restore, Instrument Info...

### 3.3 Operation Confirm

It's used to confirm the operation which you want to do, such as the delete records shown as figure 5.

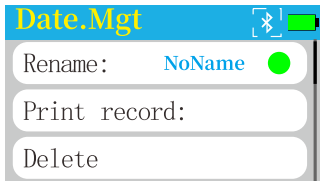


Figure 5 Delete Records confirm

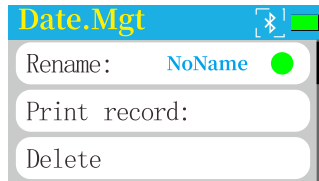


Figure 6 Rename the record's name

Press "OK" to execute the selected operation, press "CAL" cancel .

### 3.4 Rename the record's Name

The record's name can be renamed here with alphabet and Arabic numerals, shown as Figure 6.

Press "UP" or "DOWN" to select letter;

Press "OK" to change the position;

Press "POWER" to confirm;

Press "CAL" to cancel the operation.

### 3.5 Editing Record

User can input the "Average No." in "Statistical Mode" measurement.

Press "OK" , to call out Figure 7; Press "OK" again, to select the input area, Press "UP" or "DOWN" to change the number; press "CAL" to save the setting, press "CAL" again to return previous interface.

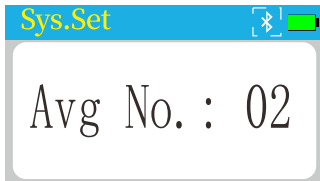


Figure 7 Input Average No.



Figure 8 Caption

### 3.6 Caption Details

Following information is shown in the caption:

- ① In Measurement interface: Measure Type / Measure Mode / Units / Bluetooth on(off) / USB / Battery Icon, as the figure 8 shown.
- ② In System Setting interface: "MainMenu" / Bluetooth on(off) / USB / Battery Icon

## 4. Calibration

Press “OK” in measuring interface into the “Main Menu”, press “OK” again into the “Calibration”, press “UP” or “DOWN” to select the calibration type, as the Figure 9 shown.

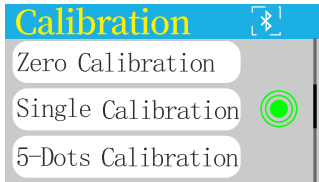


Figure 9 Calibration

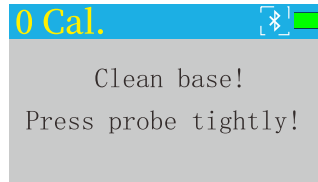


Figure 10 Zero Calibration

### 4.1 Zero Calibration

Press “OK” to carry on the calibration, the screen will show “Clean base! Press probe tightly!”.

Press the probe vertically and stably on the uncoated base until a drop sounds (buzzer on) and the ADC value displayed, then the calibration is completed. Press the “OK” to confirm, and press the “CAL” to cancel the calibration.

Note: 1. The data should be 0, when measured the base, otherwise measure again,  
2. There is a shortcut for the 0 cal.: In the case of normal measurement, keep the probe pressed, press the “OK” key, and hear the buzzer beep or prompt that the zero calibration is completed, that is, the zero calibration is completed.

## 4.2 1 Dot calibration

When figure 11 shown on the screen, you may carry on 1 dot calibration.

Press the probe vertically and stably on the film until the “Observed Value” is appeared. The “Observed Value” should be same as the thickness of the film, if not, you can modify the “Observed Value” via input the right data in “Actual Value”. After input the right data, press “CAL” to verify, press “OK” to confirm, Pres “CAL” to cancel the input.



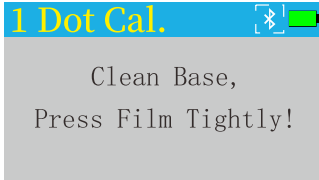


Figure 11 1 Dot Calibration

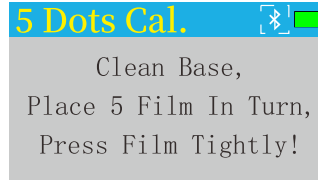


Figure 12 5 dots calibration 1/4

Note: When measure the std film, the value should be same as the actual thickness, if not re-calibrate again.

### 4.3 5 dots calibration

When figure 12 shown on the screen, you may carry on 5 dots calibration.

Following steps show you how to take the five dots calibration of Fe-based.

Figure 13 indicates that now it's measuring the 1st film, put the 1st std film on the base, and then press the probe vertically and stably on the film until the "Observed Value" and the "Actual Value" are appeared, when the data are same as the thickness of the STD film then then measure the 2nd STD film, otherwise input the right thickness of the film, and the gauge will automatically save it; then measure the next film until the 5 PCS film are all tested, and figure 15 will be shown, press "CAL" to verify the calibration, press "OK" to confirm to save, press "CAL" to cancel the calibration,

During the calibrating process, press "CAL" to cancel this calibration, figure 14 will be shown, press "OK" to confirm to cancel this calibration, or this calibration will be continue .....

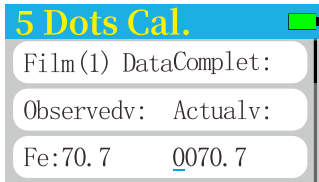


Figure 13 5 dots calibration 2/4

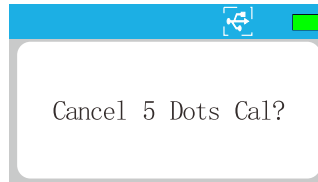


Figure 14 5 dots calibration 3/4

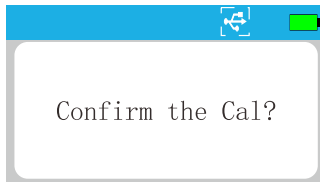


Figure 15 5 dots calibration 4/4

Notes:

- The material for calibration should be same as the DUT, if you can not find the same material, the attached standard material plate could be used for calibration, but there will be some errors with the difference between the DUT and the attached standard material plate;
- After calibration on the material to be measured, the reading on the DUT is accurate; however, if the properties of the material to be measured and the standard material plate are inconsistent, the measurement reading on the standard plate will be inaccurate, which is determined by the principle and nature of the instrument , not a malfunction;
- 5-Dots calibration includes Fe mode and NFe mode. If the first film is Fe mode, then the current five-dots calibration is based on Fe mode, otherwise it is NFe mode;
- 5-Dots calibration: needs to measure the film with a gradient from small to large;

## 5. Measure type

Measure type include: Fe, NFe, Auto;

Fe: Only iron-based coating thickness can be measured;

NFe: Only non-ferrous coating thickness can be measured;

Auto: Automatic identify the currently measured material and display of current Fe/NFe data.