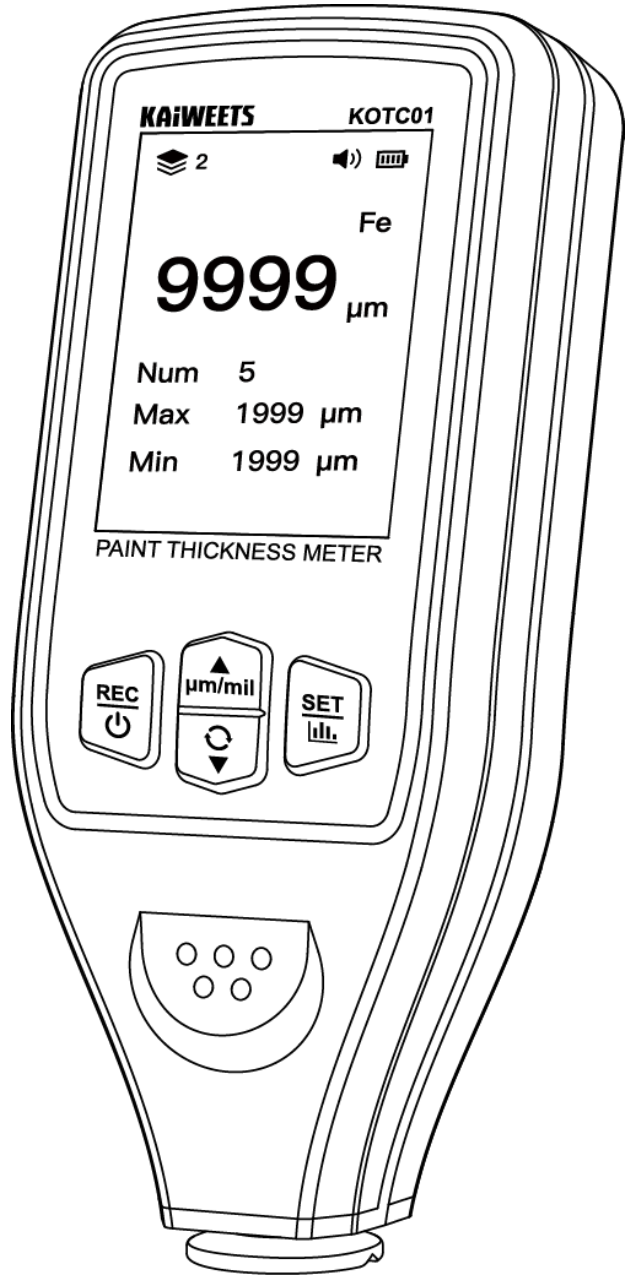
KAiWEETS

Users Manual

Paint Thickness Gauge

KOTC01



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Introduction

EN

Thank you for selecting the KAIWEETS KOTC01 Paint Thickness Gauge. The gauge adopts the principle of electromagnetic induction and eddy current effect to distinguish the properties of the metal substrate precisely. With the precision integrated probe, it can accurately measure the thickness of non–magnetic coatings on magnetic substrate surface (e.g. paint, rubber, enamel, etc.) and non–conductive coatings on non–magnetic metal substrate surface (e.g. paint, rubber, etc.). It is designed for non–destructive, fast and precise coating thickness measurement, which can be used in all kinds of major industrial workshops, labs and outdoor environment.

Features

Main functions and features

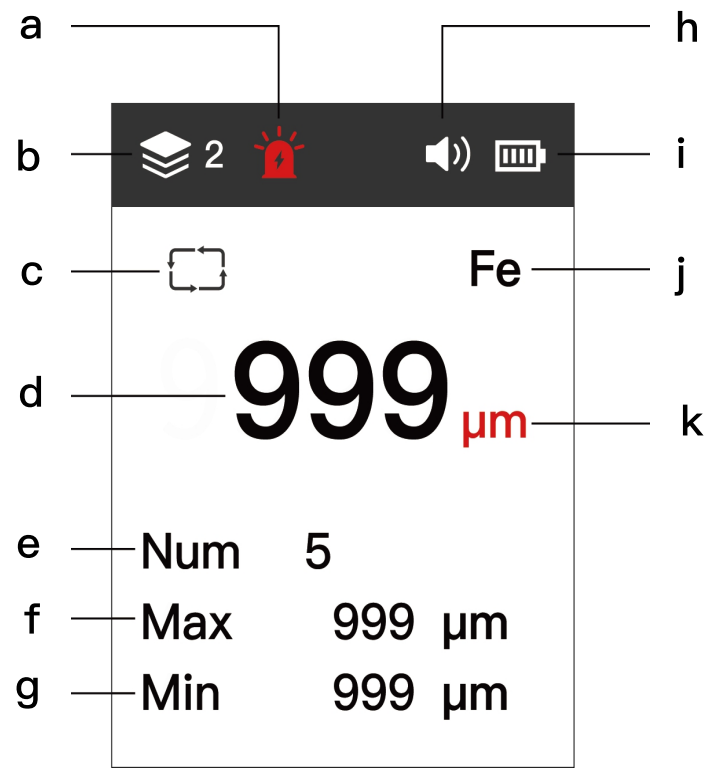
- 2–inch colour screen
- 4–direction rotating screen
- Built–in 850mAh lithium battery
- USB connection to PC for data export
- Data grouping, 8 groups and each 32 sets of data
- Calibration data grouping, respectively calibrating 8 groups of substrates
- Measurement directly display the thickness of the cladding and substrate material
- 3 calibration modes: basic, zero and specify thickness calibration
- Applicable to low–temperature environments, operating temperature range: –20˚C~60˚C

Other functions and features

- Bar chart display
- Upper and lower limit alarm function
- Settable Auto power off time
- Restoring factory settings and calibration values
- Statistics display: mean (Avg), maximum (Max), minimum (Min) and standard deviation (SDev)

Key and User Interface

a: Alarm limits on/off
b: Group (8 groups in all)
c: Continues measure sign
d: Thickness value
e: Measure times
f: Maximum value in data
g: Minimum value in data
h: Sound prompt on/off
i: Battery indication
j: Substrate property
k: Unit



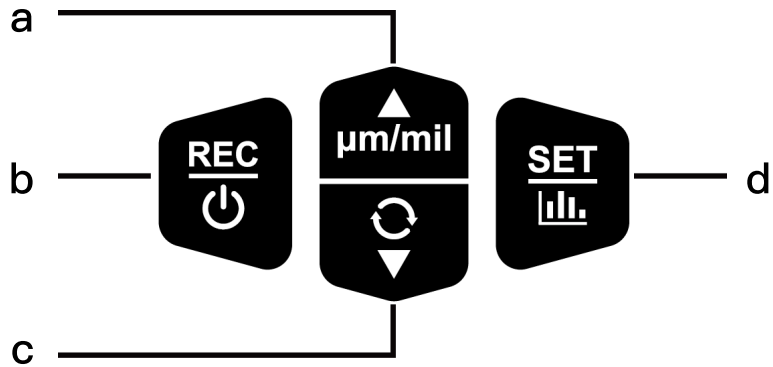
Note: Fe is for magnetic material, NFe is for non-magnetic material.

a: Unit switch/Select up

b: Storage/Power on-off

c: Rotation/Select down

d: Setting/Data Bar Chart Display Button



Home page

On the home screen, groups are displayed in the upper left corner *	
SET	Short press data bar chart display, press again to enter the statistics interface Long press to enter the menu
μm/mil	Short press to switch group Long press to switch unit of μm or mil
	Short press to switch group Long press to rotate the screen
REC	Short press to store currently measured values Long press to switch off

Note: After switching groups, the measured values may differ due to different calibration data.

Menu

On the home screen, long press  to enter the menu	
	Short press to select the options in the menu
	Short press to move forward or add 1 to the value
	Short press to move backward or subtract 1 from the value
	Short press to return to the previous

Calibration mode

Select 3 different calibration modes to calibrate the current group of data according to calibration needs, the following is a brief description of the basic calibration mode.

On the menu screen, select “Basic CAL” in “Thickness CAL” to calibrate the current group of data	
	Short press to switch the calibrating points: 1 (0μm), 2 (50μm), 3 (100μm), 4 (250μm) 5 (510μm), 6 (999μm), six points in all
	Short press to add 1 to thickness value
	Short press to subtract 1 from thickness value
	Short press to exit calibration mode

Lithium Battery Charging

- Built–in 3.7V 850mAh lithium battery power supply, non–removable. Please charge it in time if it can not be turned on or there is no power indication after turning on.
- Please use charging adapter with DC5V and over 1A to charge it, and the charging port is Type–C. (It is recommended to use phone charger.)

- The battery symbol scrolls when charging and changes to green when fully charged.
- Inserting USB while the gauge is powered on, long press the button 

on the home page to enter the charging interface. To return to the home page, long press the button again. (Unplug USB in this state, the gauge will shut down immediately).
- Inserting USB while the gauge is powered off, it enters the charging interface. Short press the button 

to turn on it. (Unplug USB in this state, the gauge will shut down immediately).

Battery Maintenance

Keep it with full power first if no in use for an extended period of time, and charge it once every six months to prevent battery damage.

Gauge Turning On and Off

Short press the button 

to turn on and long press it to turn off.

⚠ Please turn it on at least 5cm away from any metal substrate, or the other way is to lift it away from the metal substrate quickly after turning the gauge on. If it is turned on near the metal substrate, it will continuously emit a beeping sound. The gauge performs calibration balance during the power-on moment, and turning it on near the metal may affect its normal operation.

Close to metal substrate (x)

Away from metal substrate (√)

Calibration

This gauge is calibrated with standard substrate (random iron and aluminum blocks) when leaving the factory. To measure specific materials, zero calibration and calibration–film calibration should be performed on the target substrate to ensure the accuracy of the data.

● Zero calibration

Zero calibration is performed to calibrate the substrate's zero and aimed to obtain the more accurate zero.

⚠ Zero calibration is only applicable to the current power–on state, and can not be saved after power–off.

Operations:

1. Enter the menu, select basic cal in thickness cal. The screen will return to the home page. Measure the substrate once, a set of data will be shown on the screen. The gauge will emit a "beep" sound.
2. Long press the button , the main data will be cleared to zero, and the gauge will emit two "beep beep" sounds to indicate completion of calibration.
3. Repeat steps A and B for more accurate calibration data.

● Basic calibration

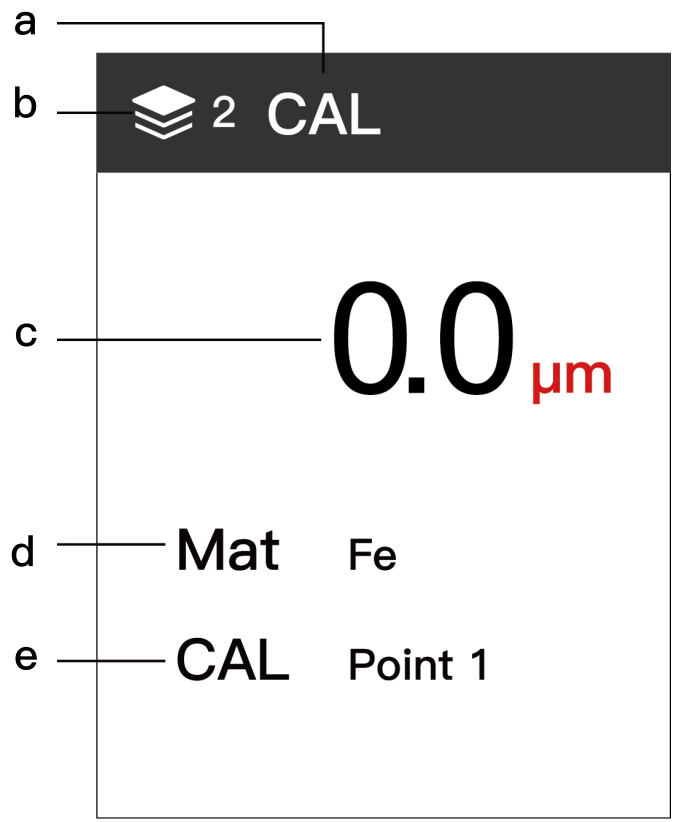
With different specification calibration–film, perform multi–spots calibrations on the substrate, ensuring the accuracy of measurements on different property substrates.

Operations:

1. On the home page, first switch to the group that needs calibration, then long press SET button

to enter the menu. Select basic cal in the thickness cal to enter calibration mode. The screen will display as follows:

a. Calibration mode
b. Current group number (8 groups in all)
c. Thickness value corresponding to calibrating point
Note: Except for zero, in other spots, the thickness can be adjusted according to the calibration film of thickness.
d. Substrate material
e. Calibrating points (6 points in all)
1 (0μm)　　2 (50μm)
3 (100μm)　4 (250μm)
5 (510μm)　6 (999μm)



2. At this moment, “CAL Point 1” is displayed at the bottom of the screen, and the main display area shows the calibration thickness value “0.0μm,” indicating zero is already calibrated. Measure once on the magnetic metal substrate or non–magnetic, the gauge will emit two “beep beep”

sounds, then the zero calibration is completed, and it will automatically jump to the next calibration point.

3. At this moment, “CAL Point 2” is displayed at the bottom of the screen, and the main display area shows “50.0μm”, indicating the second point with 50μm is already calibrated.

Note: it may be a value from 45 to 55.

Place a 50μm calibration–film (which may be a thickness value around 50μm) on the same substrate used for zero calibration previously. First, compare whether the gauge’s measurement is consistent with the calibration–film thickness. If not, adjust to the same value pressing 

or  button. Then measure again, 50μm calibration is completed, and it will automatically jump to the next calibration point.

4. Following the previous step (3), continue calibrating 3 (100μm), 4 (250μm), 5 (510μm), 6 (999 μm). After calibrating the sixth point (999μm), the gauge will automatically exit calibration mode.

● Specify thickness calibration

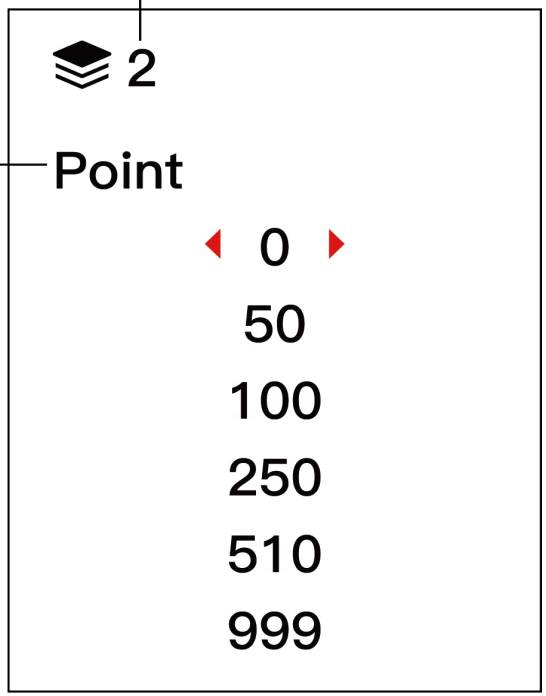
1. If only want to calibrate one of the six points, select thickness cal and then specify cal, which can choose calibration points, as shown in the following figure.

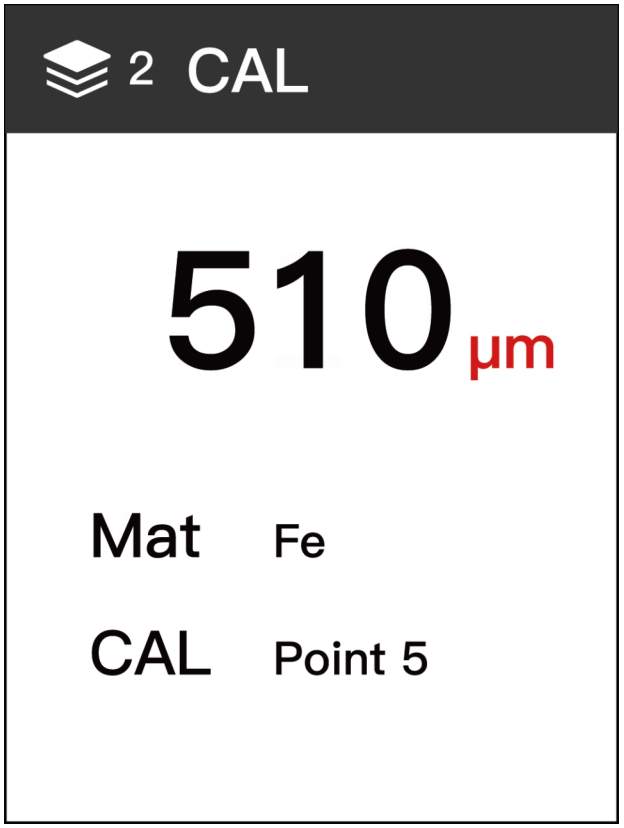
2. After selecting specify thickness, short press the button 

to enter the calibration interface, as shown in the following figure.

a. Current group number 8 groups in all, and each group of calibration data is mutual independence.

b. Short press / buttons to select the specify thickness.





Place the corresponding calibration–film on the magnetic metal substrate or non–magnetic and measure once. The gauge will emit two “beep beep” sounds, indicating calibration is completed, and it will automatically jump back to the home page.

Note:

- Calibrating the six points which forms a period one by one can only use the same one substrate. Changing the substrate during the process may lead to inaccurate data.
- Keeping the magnetic materials (such as iron) away when calibrating the non–magnetic substrates (such as aluminum), otherwise, it may lead to incorrect data.
- Each group's calibration data are independent of each other, such as, calibrating the group 1, the other seven groups will not be affected.

⚠ During calibration, If the gauge shows "Err", then measure the current thickness once again. If "Err" is still shown after several measurements, please press the button 

to return to the home page and calibrate again with eligible calibration–film and substrate.

Basic Measurement

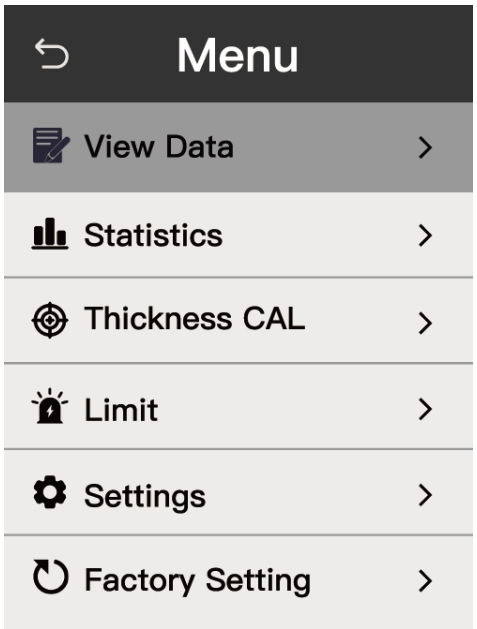
1. Prepare the sample to be tested.
2. Place the gauge in vacant space, away from the metal substrate, and turn it on.
3. Start measuring: Place the gauge vertically and press lightly on the sample. It will emit a "beep" sound, indicating the measurement is completed, on the main display area shows the result data. Quickly move the gauge away from the sample by more than 5cm, and proceed with next measurement after 1 second.

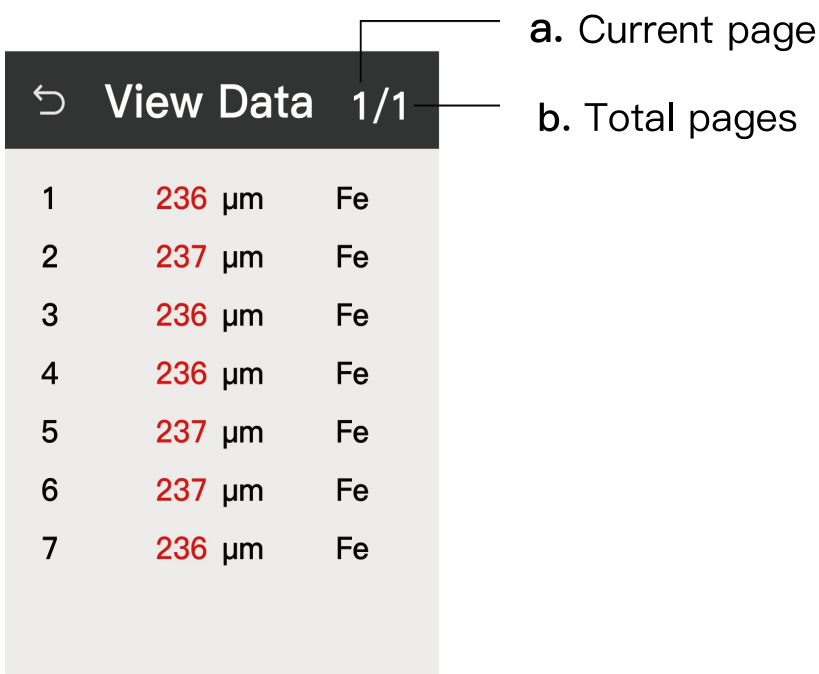
Menu Details

View and Delete Data

- View data

1. On the home page, long press the button SET to enter the menu, select the “View Data” option, and then short press it again for the list of stored data.
2. Press the button µm/mil / ▲▼ to view the last/next page of record.
3. Short press REC to return to the previous.
4. Short press the button µm/mil / ▲▼ will not enter the mode if there is no stored records.





- **Delete data**

1）Delete all data

1. On the view data page, long press the button SET to clear all lists of data, and the gauge will emit two “beep beep” sounds to indicate the completion.

2. Short press the button REC to return to the previous.

2）Delete individual data

1. On the view data page, press the button SET to select the first set of data in the current page, then select the wanted set by the button μm/mil or ▼. Short press the button SET to delete it, accompanied by a “beep” sound to indicate the completion.

2. Short press the button REC to return to the previous.

Statistics

The Statistics includes the measuring times, the average, the max, the min, and the standard deviation.

1. On the home page, long press the button SET to enter the menu. Select the “Statistics” option by the button μm/mil or ▼, then press the button SET again for the list of the statistics.

2. Short press the button REC to return to the previous.

Restore Factory Settings

1. On the home page, long press the button SET to enter the menu. Select the “Factory Setting” option by the µm/mil or , then press the button SET again for setting page. Press the button SET to select [YES], and the gauge will be restored to factory state with all parameters and calibrated default value.

2. Short press the button REC to return to the previous.

⚠ All calibration data for the 8 groups will be cleared and restored to factory default value after this operation.

Alarm Limits Value

The alarm limits value can be set to define the upper and lower limits for alarm prompts during measurements, which can be turned off. When the measured value exceeds the upper limit, the screen will flash the symbol , and an alarm sound “beep...beep...” will be emitted. When the measured value is below the lower limit, the screen will flash the symbol , and an alarm sound “beep...beep...” will be emitted. Press any one of buttons to stop the warning when the upper or lower limit is exceeded to warn.

Operations:

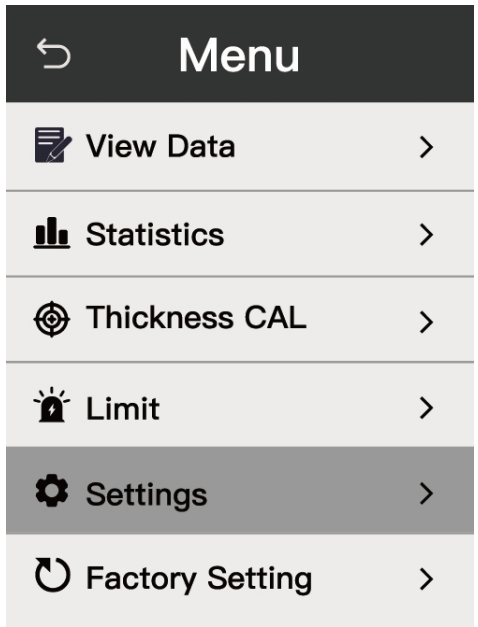
1. On the home page, long press the button SET to enter the menu. Select the “Limits” option by the button µm/mil or , then press the button SET for limits setting page.
2. Use the button µm/mil or to select the “Upper Limit,” “Lower Limit,” or “On–off” option, then press SET button for the corresponding setting page.
3. On the upper or lower limit setting page, short press the button µm/mil or to increase or decrease the value. Long press for quick adjustment.
4. On the On–off setting page, short press the button µm/mil or to select “On” or “Off,” upwards or downwards, then press the button SET to confirm.
5. Short press the button REC to return to the previous.

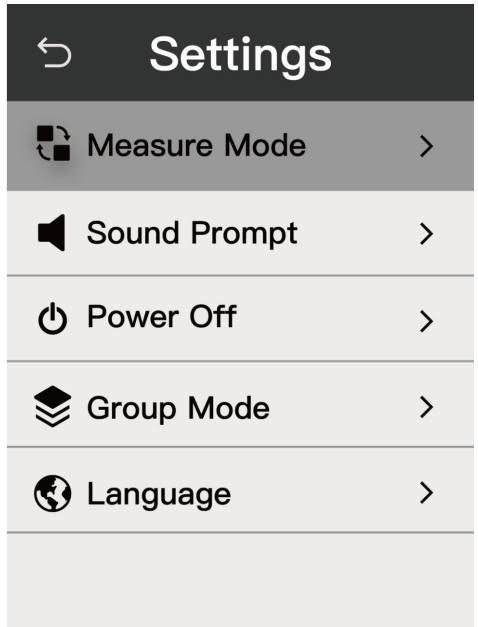
Note:

- The range of upper and lower limit settings is 0–1999µm.
- When the upper limit is set to 1999µm, the upper limit alarm is off.
- When the lower limit is set to 0µm, the lower limit alarm is off.

Parameter Settings

1. On the home page, long press the button SET to enter the menu. Select the “Settings” option by the button µm/mil or , then press the button SET for the settings page.
2. Use the button µm/mil or to select the “Measurement Mode,” “Sound Prompt,” “Power Off,” “Group Mode,” or “Language” option, then press the button SET for the corresponding setting page.





● Measurement mode

1) Single

Each measurement will only update one data. Please lightly press the gauge vertically on the measurement object quickly and vertically.

2) Continues

Just lightly press the gauge on the measurement object without releasing it. The data will continuously update, accompanied by a “beep” sound for each update.

Operations:

1. On the measure mode setting page, Select the “Single” or “Continues” option by the button 

or 
, then press the button 

to confirm.

2. Short press the button 

to return to the previous.

● Sound prompt

1. On the sound prompt setting page, select the “On” or “Off” option by the button 

or 
, then press the button 

to confirm.

2. Short press the button 

to return to the previous.

● Power off

The gauge provides five options of automatic power-off time options for users to save power. When there is no operation within the selected auto power-off time, it will automatically shut down.

Operations:

1. On the power off setting page, select the “30 seconds,” “1 minute,” “2 minutes,” “5 minutes,” or “10 minutes” auto power-off time by the button 

or  , then press the button 

to confirm.
2. Short press the button 

to return to previous.

● Group mode

The gauge provides 8 data groups for users to choose from, and the home page shows the corresponding group number  1. Each group can store up to 32 sets of data, which is mutual independence. The calibration parameters for each group are independent, allowing users to calibrate and store data for different measuring environments.

Operations:

1. On the group mode setting page, switch data groups by the button 

or  , then press the button 

to set the selected data group.
2. Short press the button 

to return to previous.
3. On the home page, short press the button 

or  to switch data groups quickly.

● Language

1. On the language page, select Chinese or English by the button 

or  , then press the button 

to set the selected display language.
2. Short press the button 

to return to previous.

Other Functions

Screen Rotation

On the home page, long press the button  to rotate the screen. Each time will rotate the screen by 90 degree.

Bar Chart Mode

On the home page, short press the button 

to enter the bar chart mode. Press it again to switch to the statistics page (if no measurement data is stored, short pressing is invalid). Short press the button 

to exit to the home page.

Computer Software

The gauge is equipped with computer software CTM (Coating Thickness Meter). CTM has functions such as exporting records, producing bar charts, calculating the max/the min/ the average value, producing printable reports, exporting to Excel, and system settings.

Specifications

Model	KOTC01
Measuring principle	Magnetic induction (F–probe); Eddy current (N–probe)
Measuring units	μm; mil
Measuring range	0~1700μm; 0~66.93mil
Resolution	0.1μm@(0~99.9μm); 1μm@(100~1700μm)
Accuracy	±(2+2%*H)μm @ (0~500μm); ±(2.5%*H)μm @ (500~1700μm)
Measurement modes	Single; Continues
Min curvature	convex 5mm; concave 30mm
Min substrate thickness	Magnetic material 0.2mm; non–magnetic material 0.05mm
Display	2–inch color screen
Rotating screen	4–direction
Data storage	8 groups and each 32 sets of data
Data export	√
Bar chart	√
Upper and lower limit alarm	√
Battery specification	3.7V 850mAh lithium battery
Working temp and humidity	–20℃~60℃; 0%~80%RH
Storage temp and humidity	–20℃~60℃; 0%~70%RH
Size	120x52x26mm

Maintenance

- Keep in high temp and humidity environment for a long time is not allowed. When the gauge is not in use for a long time, please put it inside the box and keep it in a dry and cool place.
- Keep the surface clean. Please wipe off the dust with wet soft cloth. Do not clean the gauge with corrosive cleaning fluid.
- Keep it with full power if no operations for a long time and charge it once every six months to prevent battery damage.

3 Years Warranty

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