Coating Thickness Gauge

Code: 86239

User Manual V1.00

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

I. Product Introduction

The coating thickness gauge is professionally used for the measurement of the painting film thickness of car bodies. Generally, car bodies are made of metal materials, such as iron and aluminum, and non-metal materials, such as carbon fiber and plastics. The gauge can measure the painting film thickness on the ferrous and aluminum materials. Moreover, it can identify not only non-metal car bodies, but also the ferrous putty layer as well as the galvanized iron. With 3-color backlight indication, it makes the measurement results clear at a glance. The instrument also integrates Bluetooth function, which can use cell phone APP or WeChat mini program to record the paint thickness value of different parts of the car and the corresponding shell material, and can generate test reports and information plates to share with friends.

Product standards:

- *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 Base Metals - Measurement of Coating Thickness - Eddy Current.*

II. Technical parameters

Probe tip	Ruby
Measurement principle	Fe: Hall effect / Al: Eddy current
Probe type	Integrated
Measuring range	0.0-5000μm
Resolution	0.1μm/1μm/10μm
Accuracy	0-3000μm: ≤±(3%H+2μm), H is the standard value 3000-5000μm: ≤±(5%H+2μm), H is the standard value
Unit	μm / mil
Measuring interval	0.5 s
Minimum measuring area	Ø = 25mm
Minimum radius of curvature	Convex: 5mm / Concave: 25mm

Minimum substrate thickness	Fe:0.2mm / Al:0.05mm
Display	192×64 dot matrix LCD
Power supply	Rechargeable lithium battery 3.7V@1200mAh
Range of working temperature	-20℃-50℃
Storage temperature range	-20℃-60℃
Host size	108*70*31 mm
Weight (including battery)	88.8g
Data transfer	Bluetooth
Supply Voltage	DC5V
Operating Current	17mA
Operating Power Consumption	85mW

III. Product Features

1. No need for calibration, only zero adjustment is required.
2. Five buttons for powerful functions and easy operation.
3. Quick measurement, only 0.5s for one measurement.
4. With continuous measurement mode for fast slide detection.
5. The device can identify the ferrous putty as well as the galvanized iron substrate. It also features 3-color backlight display.
6. Built-in Bluetooth, can use APP, WeChat small program, to achieve the whole car test data recording, and generate test reports.
7. Built-in rechargeable lithium battery, the instrument ultra-low power consumption, charging once to last more than 50 hours of use.
8. The wear resistance of the ruby probe ensures the long-term effective use of the device.
9. The iron and aluminum dual-purpose probe can automatically identify iron, aluminum and non-metal substrates. And the device can quickly and automatically switch measurement mode.
10. Thanks to the advanced digital technology that processes the digital signal directly in the probe, the probe is not susceptible to interference and provides excellent measurement accuracy. Even the

change of temperature will not affect the accuracy of measurement. Readings remain stable to ensure good repeatability throughout the measurement process.

IV. Operation

1. Power on/off

Power on:

Shortly press the button to turn on the device. After powering on, the device firstly displays firmware version and SN, and then enters the measurement interface.

Power off:

Long press the button to turn off the device. The device will automatically shut down after 3 minutes without operation.

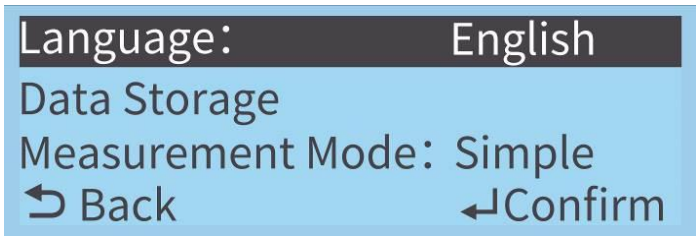
2. Device setting

In the power off status, long press the button for 3s, or short press the button in the measurement interface to enter the device setting interface. After that, if there is no operation for more than 3 minutes, the device will automatically shut down.

Note: *The buttons are for selection, the* button *is for confirmation, and the button is for back.*

2.1 Language setting

The instrument is available in Chinese, English, Russian, Turkish、Ukrainian, and German.
Setting method: In the main setting interface, select "Language" option to enter the language selection interface, select the desired language and confirm. The instrument then automatically returns to the main setting interface.



Main Setting Interface

2.2 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, select “Unit” to enter the unit selection interface, select the

desired unit and confirm. The instrument will automatically returns to the main setting interface.

2.3 Data/Vehicle Storage setting

1) Data storage in simple mode:

The interface has two options: “View Data” and “Delete All Data”. The number of stored data and the maximum capacity are displayed next to “View Data”. In simple mode, up to 60 measurements can be stored. “Delete All Data” can delete all stored measurement data.

2) Vehicle storage in expert mode:

The interface has two options: “View Vehicle” and “Delete All Vehicles.” The instrument can store data for up to 999 vehicles, with 19 components per vehicle and 6 measurements per component. “View Vehicle” displays the measurement data for each component, while “Delete All Vehicles” can delete the measurement data of all stored vehicles.

2.4 Measurement Mode setting

The gauge has two measurement modes: simple mode and expert mode (for detailed introduction, please refer to the "**4. Measurement**" section).

2.5 Alarm Switch setting

This option is only available in “Simple” mode. Select "On", and the “Alarm Value Settings” option will appear on the main setting interface.

2.6 Alarm Value Settings

1) Simple mode:

There are four options in the interface: “Severe Hi Limit”, “Above Hi Limit”, “Below Lo Limit” and “Severe Lo Limit”. The size relationship between the four is: Severe Hi Limit > Above Hi Limit > Below Lo Limit > Severe Lo Limit >= 0. If the alarm value settings do not conform to their size relationship, the interface will display "Error Limit Setting".

Setting method: Select "Alarm Value Settings" to enter the alarm value setting interface, select the alarm value to be set, short press the  button to confirm, and the cursor will move to the specific value of the alarm value. Short press the  buttons or long press the  buttons to increase or decrease the value. After the setting is completed, short press the  button to confirm.

2) Expert mode:

There are three options for the paint thickness alarm: “Suspected Dent Repair”, “Suspected Repaint”, and “Paint Too Thin”. The relationship between the three alarm values is: Suspected Dent Repair > Suspected Repaint > Paint Too Thin > 0. “Suspected Dent Repair” corresponds to the “Severe Hi Limit” in the simple mode, “Suspected Repaint” corresponds to the “Above Hi Limit” in the simple mode, and “Paint Too Thin” corresponds to the “Below Lo Limit” in the simple mode. Modifying any value will also change the corresponding value. If the alarm value setting does not conform to their size relationship, the interface will display "Error Limit Setting".

Setting method: Select "Alarm Value Settings" to enter the alarm value setting interface, select the alarm

value to be set, short press the button to confirm, and the cursor will move to the specific value of the alarm value. Short press the buttons or long press the buttons to increase or decrease the value. After the setting is completed, short press the button to confirm.

2.7 Tricolor Screen setting

The device can be set to enable or disable the three-color backlight of the screen. The default setting upon factory release is to have the three-color backlight enabled.

2.8 Rotate setting

The device can be set to turn on or off the screen rotation function, which is valid in the simple mode. If the screen rotation function is turned on, short press the buttons on the measurement interface can flip the screen.

2.9 Resolution setting

The instrument allows for resolution settings of 0.1μm, 1μm, and 10μm, and the factory default is 0.1um.

- 0.1μm Resolution: 0.1μm: (0μm – 99.9μm), 1μm: (100μm – 5000μm).
- 1μm Resolution: 1μm: (0μm - 5000μm).
- 10μm Resolution: 10μm: (0μm - 5000μm).

2.10 Reset

Setting Method: Select “Reset” to enter the selection interface, choose “Yes” or “No” and confirm. The instrument will then automatically exit to the main setting interface.

After confirming "Yes", the default parameters are as follows:

Item	Language	Unit	Measurement Mode	Alarm Switch	Tricolor Screen	Rotate	Resolution
Reset	No Reset	μm	Simple	ON	ON	OFF	0.1

Item	Severe Hi Limit	Above Hi Limit	Below Lo Limit	Severe Lo Limit
Reset	350μm	170μm	30μm	0μm

Note: *The saved measurement data remains unchanged.*

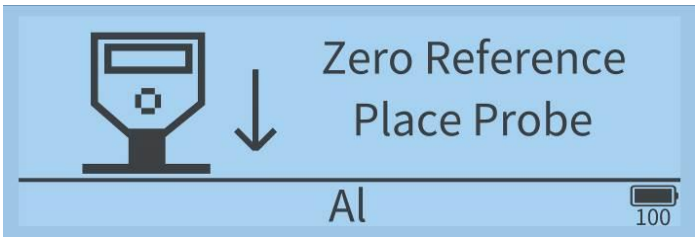
3. Zero adjustment

Zero-adjustment is suggested in the purpose of reducing measurement errors under circumstances as below: the device is used for the first time, the battery is replaced, the measurement material or environment temperature changes. Using iron-base and aluminum-base adjustment plates respectively

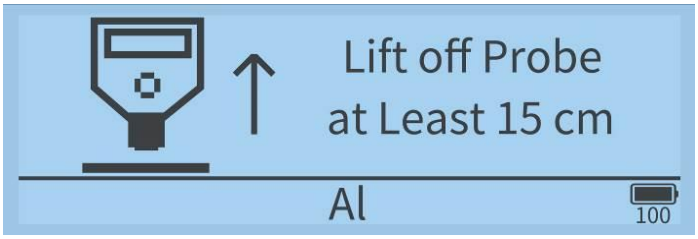
to carry out zero adjustment.

3.1 When to measure the zero adjustment plate, the device will display a measurement value. (In the measurement, press the probe vertically against the central position of the zero adjustment plate. Keep the probe stable without tilting or shaking.)

3.2 Keep the probe still, and long press the button for 3s, the device will prompt: “Zero Reference, Place Probe” (as shown in the figure below).



3.3 After hearing the buzzer alert, the device will prompt: “Lift off Probe at Least 15cm” (as shown in the figure below). Then release the button, lift the probe and leave the zero adjustment plate for more than 15 cm.



3.4 After hearing the buzzer alert again, the LCD displays “0.0”, indicating that the zero adjustment is complete.

3.5 After that, place the testing film marked with the standard value on the zero adjustment plate, if the value is stable and consistent with that on the standard film (deviation: ±5µm), the device can be used normally.

Note: *Due to the roughness of, and dust, scratches, etc. on the workpiece surface, after zero adjustment, the device may not necessarily display 0µm when measuring the same position again. The operation of the device must be correct and skilled; otherwise it will cause the instability of the measurement value.*

4. Measurement

- Single measurement

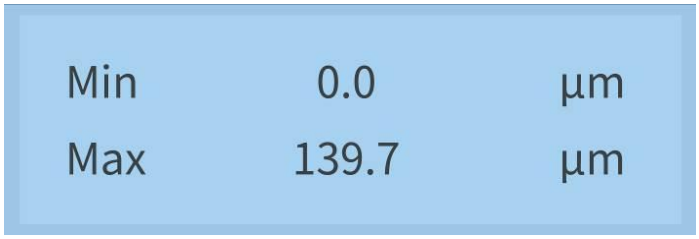
1) Hold the non-slip groove with your fingers.
2) Press the probe against the tested object surface vertically. Keep the probe stable, do not tilt or

shake. Measurement value will appear on the display with buzzer alerts and indicator light.

3) To continue the measurement, you can lift off the probe away from the object to be measured, and then follow step 2) again.
4) When the device identifies the ferrous putty, it will turn on the red backlight. The buzzer alerts for two times. And the interface of the device will prompt: “Ferrous putty!”.
5) When the device identifies the galvanized iron, the substrate is displayed as “FeZn”.

- Continuous Measurement

1) Hold the non-slip groove with your fingers.
2) Press the probe against the tested object surface vertically. Keep the probe stable, do not tilt or shake. Measurement value will appear on the display with buzzer alerts and indicator light.
3) Continue to press and hold the probe for 2s, the instrument enters the continuous measurement mode, 0.5s to measure a data, you can slide the probe to measure different positions of the measured object.
4) When the probe is lifted, the continuous measurement mode ends. If the current measurement mode is simple mode, the instrument will display the maximum and minimum values under continuous measurement.



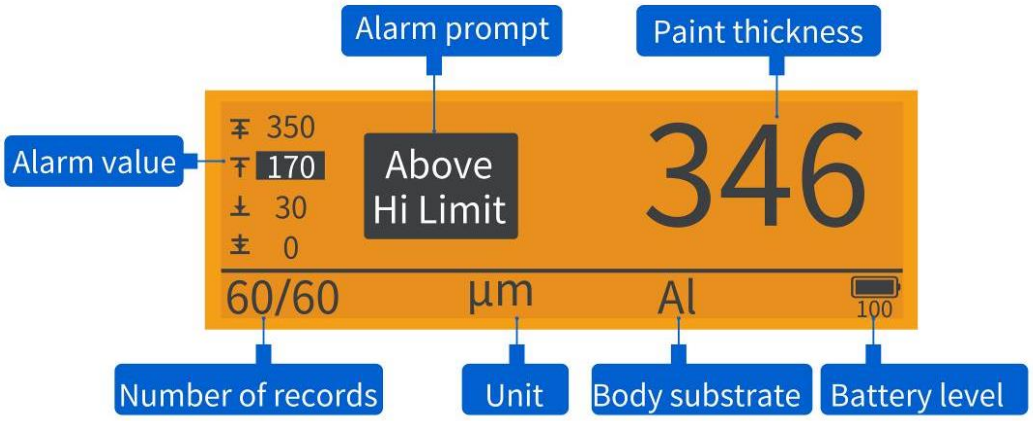
Interface display after continuous measurement in simple mode

- Different color backlight according to the measured thickness:

White backlight: The measured paint thickness is between the "Below Lo Limit" and the "Above Hi Limit".
Yellow backlight: The measured paint thickness is between the "Above Hi Limit" and the "Severe Hi Limit", or between the "Below Lo Limit" and the "Severe Lo Limit".
Red backlight: The measured paint thickness is > "Severe Hi Limit" or < "Severe Lo Limit".

Simple Mode:

When the alarm switch is not turned on, only the measured value is displayed. After the alarm switch is turned on, four alarm values appear on the left side of the screen. When the measured value reaches a certain alarm value, the screen will give a corresponding alarm prompt and the buzzer will sound twice.



Turn on the limit alarm measurement result

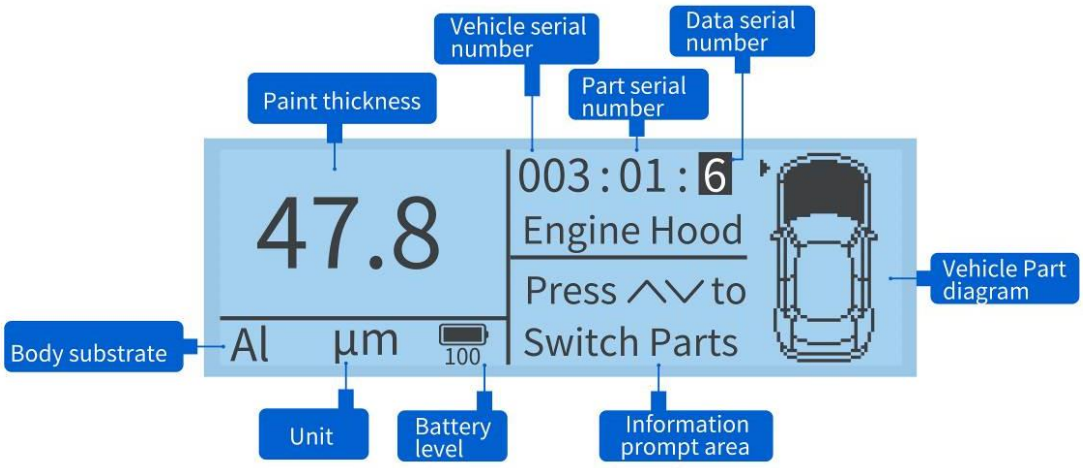
Measurement results without the limit alarms

In the measurement interface of the simple mode, if the screen rotate function is turned on, short press the ⌃⌄ to flip the screen.

In simple mode, in the measurement interface, short press the ↵ button to enter the interface of “Delete Latest Data”, or long press the ↵ button to enter the interface of “Delete All Measurement Data”.

Expert Mode:

In expert mode, 19 parts of the vehicle can be measured at different points, and each part can store 6 measurement data. Short press the ⌃⌄ button to switch the current measured part. The top view of the vehicle is displayed on the right side of the interface, and the part name is displayed next to the vehicle view. The vehicle number, part number, and the number of measurement data of the current part are displayed above the part name. When 6 data are stored, it will prompt "Press " ↑ / ↓ " to Switch Parts.” After the data is full, continuing to measure will not be stored, but the interface will prompt "6 Points Have Been Measured, Press ↓ to Switch Vehicle Parts". If the current part is the 19th part, the prompt will change to "19 Parts Have Been Measured, Press the ↩ to Switch Vehicles". When there is no measurement data for the part, the interface will display "---".

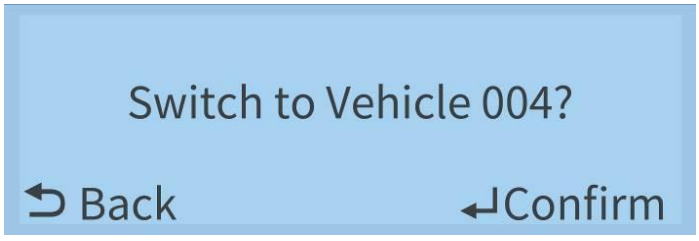


Expert mode measurement result

There are three alarm values in expert mode. When the measured value reaches a certain alarm value range, a prompt will be given on the interface and the buzzer will sound twice.

In the measurement interface of expert mode, short press the button, the instrument will display the prompt "Delete Latest Data for This Part?" Long press the button will prompt “Delete All Data for This Part?"

In the measurement interface of expert mode, if the current vehicle has measurement data, short press the button to enter the switch vehicle interface. If the current vehicle is the 999th vehicle, the interface prompts "999 vehicles stored, clear all?" Short press the button to delete all vehicle data. If you short press the button, the data will not be deleted and the storage will be overwritten from the first vehicle. The interface prompts "Data for 001 vehicle exists, overwrite?" Short press the to select the vehicle to be overwritten.



Switch vehicle interface

V. Bluetooth communication

The instrument has built-in Bluetooth communication module, which can use mobile APP and WeChat Mini Program.

Note: *After connecting to the* Mini Program *or* CTGauge *APP, the instrument measurement interface is fixed in simple mode without alarm. It will return to the set mode after disconnecting Bluetooth.*

1. Mobile APP Installation Requirements and Methods

Use the mobile browser scan the QR code on the instrument download and install the CTGauge App. After the installation is complete, the “CTGauge” icon will appear as shown below.

2. How to connect the device

1) Open the APP. If there is no bound Bluetooth device, then enter the Bluetooth setting interface. Click "Start Searching", prompt "Searching for device... " and list the available Bluetooth devices that are searched; click the "Stop Searching" button to stop searching for Bluetooth devices. Selecting gauge serial number will bind the selected gauge (prompt: each gauge has a unique serial number).After the connection is successful, it will automatically enter into the main measurement interface and Bluetooth icon will be displayed at the bottom right of the gauge screen.
2) If the APP has a bound Bluetooth device, automatically search and connect the bound Bluetooth device. When the connection is successful, it will automatically enter the “Measure” interface.

3. WeChat Mini Program Download

Scan the cover QR code with mobile WeChat to download the WeChat mini program.

VI. Attentions

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. Some car bodies may be misjudged as iron-zinc car bodies due to the base material.
3. Please ensure that the paint surface of the car body is clean. Dust, dirt and other foreign objects on the surface will affect the measurement accuracy.
4. When the device displays “Low Battery”, it should be charged in time.
5. If the instrument is not used for more than half a year, it needs to be charged regularly to prevent the battery from being damaged by excessive discharge.

VII. Packaging details

S/N	Item	Quantity	Unit
1	Coating thickness gauge	1	set
2	Fe zero adjustment plate	1	pcs
3	Al zero adjustment plate	1	pcs
4	Standard film	1	pcs
5	User manual	1	pcs
6	Certificate/Warranty card	1	pcs

VIII. Services

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.