User Manual V1.0.2

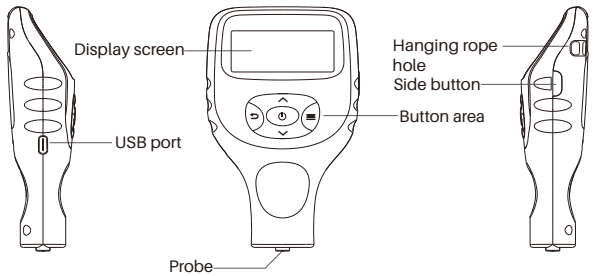
EC-680 Automotive Paint Meter

1. Introduction

This instrument can non-destructively measure the thickness of non-conductive coatings on metal surfaces, as well as the thickness of non-ferritic metal coatings on ferromagnetic metals (such as iron, nickel, and cobalt). Specific applications include measuring the thickness of paint or galvanized coatings on iron, martensitic stainless steel surfaces, as well as the thickness of paint or plastic films on aluminum and copper surfaces.

This instrument is designed for vehicle paint inspection. It can measure paint thickness while simultaneously identifying materials such as iron galvanized and iron powder paste. The device exhibits strong interference resistance and operates normally in complex electromagnetic field environments.

2. Schematic diagram of appearance



Key Instructions

Key	Function
^	Up key: Turn page up; Switch options
v	Down key: Turn page down; Switch options
≡	Menu key: Open menu; Confirm
⮌	Back key: Go back to the previous page and delete the latest data
⏻	Power key: Power on/off; Zero calibration
Side button	Short press to rotate the screen; long press to switch display styles

3. Precautions

3.1 Battery Installation

(1) Insert the battery according to the positive and negative terminal markings inside the battery compartment.
(2) After loading the battery, securely fasten the battery cover to prevent it from popping out.
(3) When the instrument is not in use for an extended period, please remove the battery and store it properly.

3.2 Others

(1) Avoid direct contact with corrosive chemicals.
(2) Avoid use in strong magnetic field environments (e.g., near magnets) to prevent probe damage.
(3) Strictly prevent strong electric current and static electricity shocks.
(4) Some car bodies may be misidentified as iron-zinc bodies due to material differences.
(5) Ensure the car's paint is clean, as dust and dirt on the paint surface may affect measurement accuracy.

4. Power on/off

Power on: Press the power button briefly when the device is off to turn it on.
Power off: Hold the power button for more than 3 seconds while the device is on.
Note: When powered on, the instrument automatically shuts down after prolonged inactivity (no button press or measurement).

5. Zero calibration

During instrument calibration, hold the power button and immediately press the probe end against the surface of the object being measured. As the probe retracts into the instrument, the zero calibration will be triggered. When the display interface shows "Cal. Finish!", lift the instrument off the object surface and release the button.
Note: Holding the button for more than 3 seconds will trigger the instrument shutdown if no calibration action is performed.

6. Measurement Steps

Step 1. Prepare the test specimen.
Step 2. Move the probe end away from the metallic object and turn on the instrument.
Step 3.The instrument probe is vertically pressed onto the surface of the object under test. During the process of the probe retracting into the instrument, the instrument automatically identifies the substrate properties and measures the thickness of the coating (plating). To continue the measurement, the probe can be lifted away from the object and then pressed back onto its surface.

7. Display

7.1 Rotate Screen

In the measurement interface, short-press the side button, and the screen will rotate 180°.

7.2 Mode

On the measurement interface, long-press the side button. When you hear a "beep," release the button to switch the display style.
(1) **Simple**: This is the bold font mode, where measured data will not be saved.
(2) **General**: This mode displays the maximum, minimum, average, and statistical count of data, with a maximum of 99 records. If more than 99 records are recorded, the instrument will automatically update with the latest data and discard the oldest.
(3) **Chart**: Column charts display measurement data in real time, with a maximum of 10 historical measurement sets cached simultaneously. When the number of measurements exceeds 10, subsequent new measurements are automatically replaced by the earliest data using a first-in-first-out rule, and the chart is refreshed accordingly.
Note: On the measurement interface for "General" and "Chart", press and hold the Return key to display the "Delete Latest Data?" prompt. Select Yes or No using the Up/Down keys, then confirm with the Menu key.

7.3 Substrate Properties

Iron: ferromagnetic metal substrate; Non-iron: non-ferromagnetic metal substrate; Iron-zinc: iron-zinc coated substrate; Iron powder putty: suspected iron powder putty.

8. Function Settings

How to access the configuration menu: In the measurement interface, press and hold the menu key to open the menu. Here, you can configure the instrument's functions. The instrument will not respond during measurement after entering the configuration menu.

8.1 Mode

Press the menu key to switch between the Simple, General, and Chart.

8.2 Data Storage (shown only when the style is General or Chart)

(1) View Data: Press and hold the up/down keys to browse through the data one by one. You can view up to 99 measurement data points.
(2) Delete All Data: Press and hold the menu key to display the "Yes/No" prompt. Select the option using the up/down keys, then confirm with the menu key.

8.3 Alarm Set

(1) **Alarm switch**: Press the confirmation key to activate or deactivate the alarm. When the alarm switch is in the "OFF" position, the "Set the alarm value" function cannot be activated.

(2) **Set the alarm value**: When the alarm switch is set to "ON", enter the "Set the alarm value" menu to configure thickness ranges in different colors (short-press the menu key to select the parameter, then use the up/down keys to adjust the value; after completion, press the return key). Depending on the measurement result, the backlight will illuminate in green, yellow, or red. The conditions for each color illumination are as follows:

①Green, accompanied by a "beep" sound. Conditions: The substrate is iron, non-iron, or iron-zinc, and the thickness value falls within the green range set in the menu.

②Yellow, accompanied by the audible prompt "beep-beep". Conditions: The substrate is iron, non-iron, or iron-zinc, and the thickness value falls within the yellow range set in the menu.

③Red, accompanied by the audible signal "beep-beep-beep". Conditions: The thickness value falls within the red range set in the menu, or no metal is detected. For special cases, when the base material is iron powder putty, it displays bright red with a special audible alert.

8.4 BKL Set

Shortly press the menu key to enter the screen brightness settings interface. The instrument supports four brightness levels: a short press of the up key increases the screen brightness incrementally, while a short press of the down key decreases it incrementally.

8.5 Unit

Short press the menu key to switch units.

8.6 Resolution

Short press the menu key to switch display resolution.

Note: When the selected unit changes, the resolution will automatically adjust to the corresponding unit.

8.7 Bluetooth

Short press the menu key to turn Bluetooth on/off. After connecting to the mobile app, the measurement interface will display in a fixed minimalist large-screen style and cannot be switched.

Note: To reduce power consumption and extend battery life, you can turn off Bluetooth when not in use.

8.8 Reset

Short press the menu key to restore factory settings. Use the up/down keys to select Yes or No, then press and hold the menu key to confirm.

Note: All statistics will be deleted after restoring factory settings.

9.USB data transfer

When the display style is set to "General" or "Chart", the pdf report can be directly exported to a computer via a USB data cable.

Note: Note: The "General" and "Chart" display formats share and store data uniformly, with all measured data exportable as a single PDF report.

10. How to download the mobile App

Scan the QR code below using your mobile browser or the built-in scan function (Apple users can type "xthick" directly in the iOS Store search bar) to access the search interface. Enter "xthick.apk" in the search bar to download the App to your phone. After installation, open the App and connect to the device via Bluetooth. The real-time data interface in the App allows you to view live measurement data and statistical data.

Note: Before pairing or connecting via Bluetooth, enable Bluetooth on both the device and your phone, and enable phone location services.

11. Functions and Technical Parameters

Type	EC-680
Measuring principle	Iron: magnetic induction; Non-iron: eddy current effect
Measuring range	0~5000μm
Accuracy	±(2%reading+1μm), ≤2000μm ±(3%reading+2μm), 2001~3000μm ±(5%reading+2μm), >3000μm
Resolution ratio	0.1μm, 1μm, 10μm, can be set in the menu
Calibration	Zero calibration
Unit	μm, mm, mil
Iron powder putty identification range	0~2000μm
Identification range of galvanized iron	3~1000μm
Minimum radius of curvature of substrate	5mm convex surface; 25mm concave surface
Minimum measuring area	Diameter 15mm
Minimum substrate thickness	Iron: 0.20mm; Non-iron: 0.03mm
Reaction time	<0.5 seconds
Display	Color screen
USB data transmission	Supports (Type-C port)
Bluetooth and mobile App	Support
Service temperature	-10~50℃
Storage temperature	-20~60℃
Source	2 pcs AAA 1.5V alkaline batteries
Levels of protection	IP40
Outline dimension	108*67*28mm
Shell material	ABS
Weight	Approximately 64g (excluding the battery)