User Manual V1.1.2

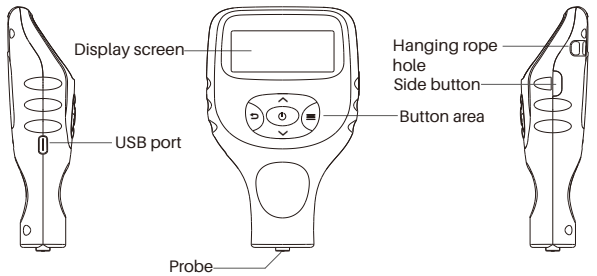
EC-680S Automotive Paint Meter

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; Switch section
v	Down key: Turn page down; Switch options; Switch section
≡	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 Display Style

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) **Car**: The system measures data across 19 distinct sections, with each section recording up to 6 data points. Use the up/down keys to switch between sections, and long-press the key to proceed to the next vehicle.
Note: On the measurement interface for "General" and "Car", 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 Car.

8.2 Screen Color

(1) **Single Color**: The screen displays a bright blue backlight (all measurement results remain unchanged).
(2) **Multiple Colors**: The backlight displays green, yellow, or red based on measurement results. To enable multiplecolors, select the menu and set thickness ranges for each color (long press the menu key to choose the object, then adjust the values by pressing the up/down keys. After setting, press the back key to exit). Description of color display conditions:

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". 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.

8.3 Bluetooth

Press and hold 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.

8.4 Data Storage (shown only when the style is General)

(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.

8.5 Vehicle Storage (Only when the style is Car)

(1) View Vehicle: Press and hold the up/down keys to select the vehicle or part to view, then confirm with the menu key.
(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.

8.6 Unit

Press and hold the menu key to switch units.

8.7 Resolution

Press and hold the menu key to switch display resolution.
Note: When the selected unit changes, the resolution will automatically adjust to the corresponding unit.

8.8 Restore factory settings

Press and hold 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 "Car", the pdf report can be directly exported to a computer via a USB data cable.
Note: When the display style is set to "Car", only the data report for the current vehicle (1 vehicle) can be exported.

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-680S
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	Dot matrix LCD screen
USB data transmission	Supports (Type-C port)
Bluetooth and mobile App	Support
Service temperature	-10~50°C
Storage temperature	-20~60°C
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)