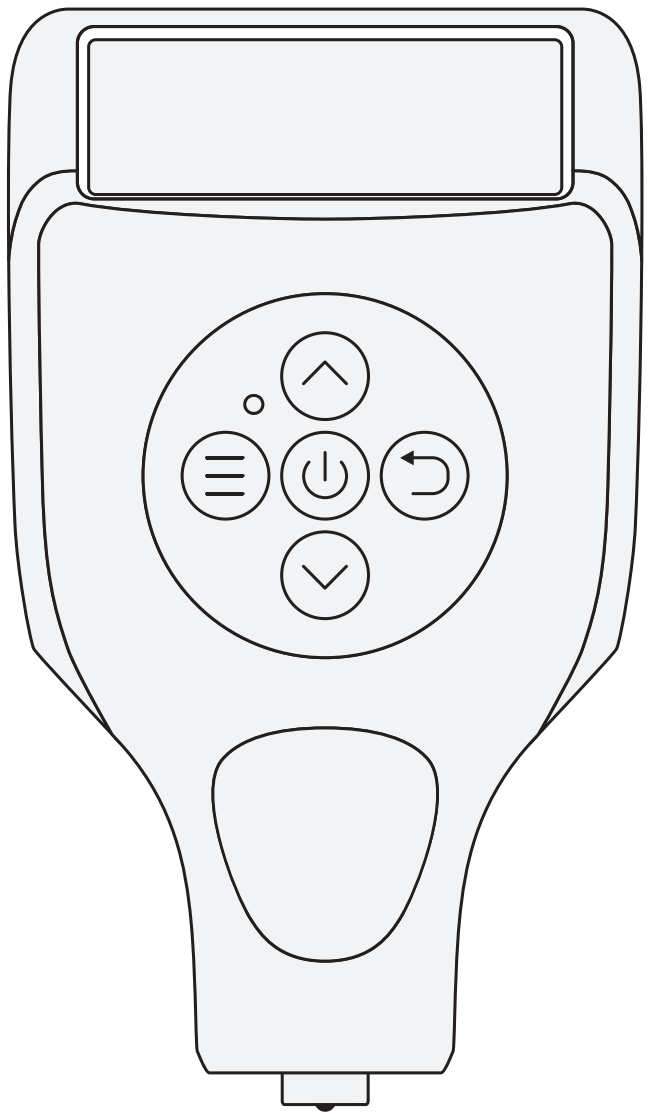
Coating Thickness Gauge

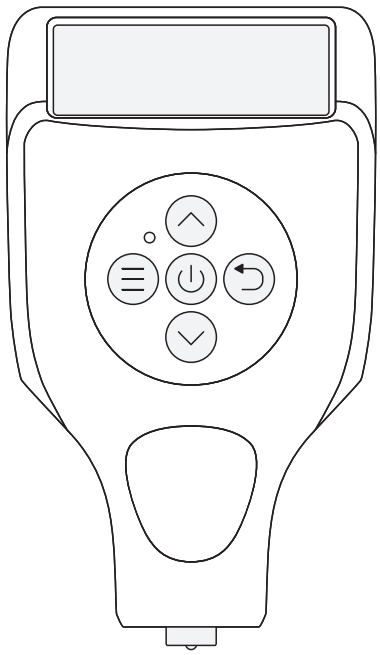
User manual



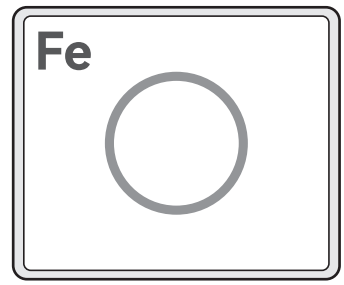
Contents

Accessories

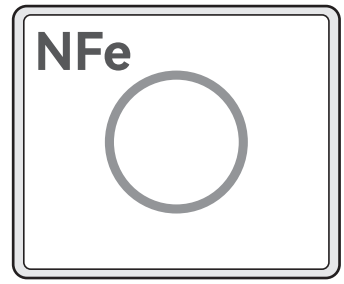
■ The device contain the following accessories.For the convenience of subsequent use , please donot throw away.



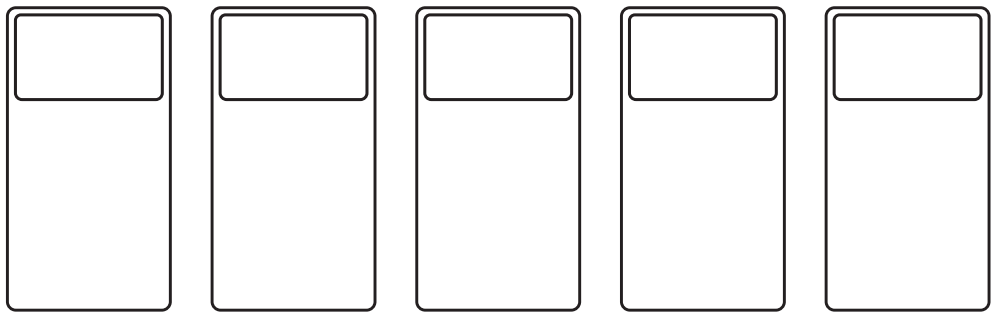
Device X1



Fe X1



NFe X1



calibration foils X5

wrist-band X1

*The specific attachment information is subject to the actual product at the factory

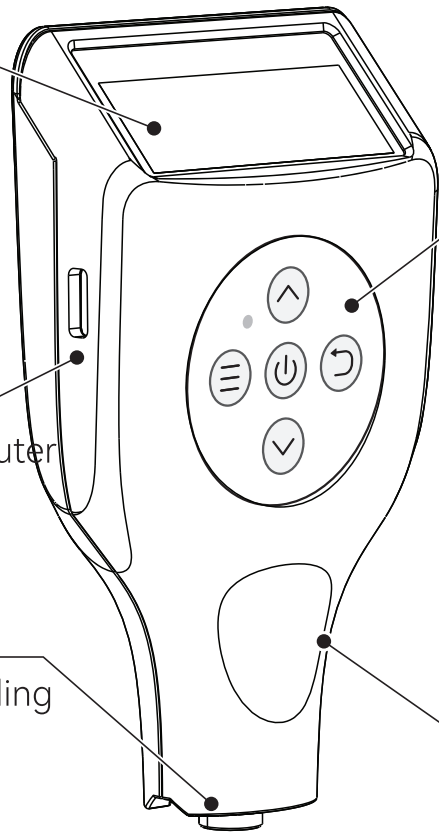
2.Structure

LCD Screen

■Display readinds

Keyboard

■Buttons
■LED Indicator



Type-C interface

■connect upper computer
■power supply
((not support charging)

Probe

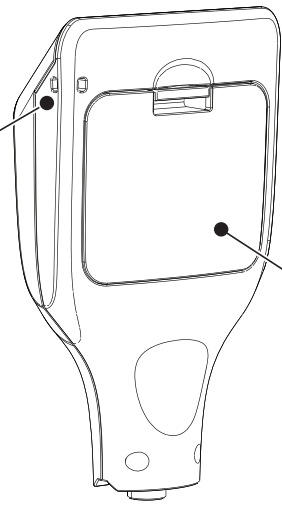
■measured to get reading

Grip handle

■Grip area
■Concavenon-slip structure

Wrist-band hole

■install wrist-band



Battery cover

■Insert 2*1.5V AAA batteries

3.Keys description

LED Indicator

■**Green light:**

· Power on

· Normal communication

■**Red light:**

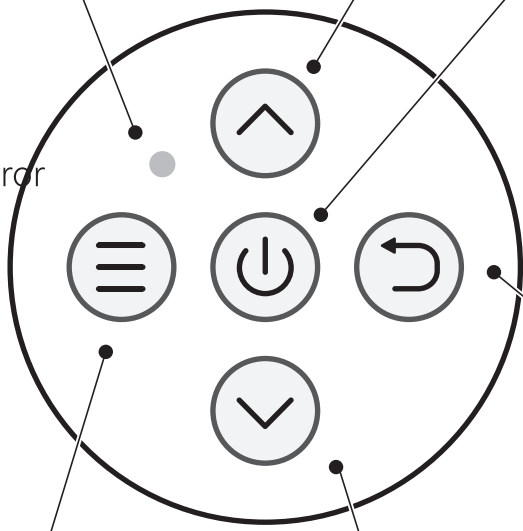
· Power off

· Limit alarm

· Low battery

· End of the menu

· Communication Error



Up key

■**Page up**

■**Adjust value**

Power Key

■**ON/OFF:**

· Short press to turn on

· Long press 1s to turn off

Back/Delete

■**Back/Cancel**

· Back to previous menu

· Back to main menu

· Cancel

■**Delete value** (CarPro)

· Delete the last value

· Long press to delete panels data

OK/Menu

■**OK:**

· Confirm adjustment/modification/ delete operations

■**Menu:**

· Main interface: enter setting menu

· Setting menu: enter next submenu

Down key

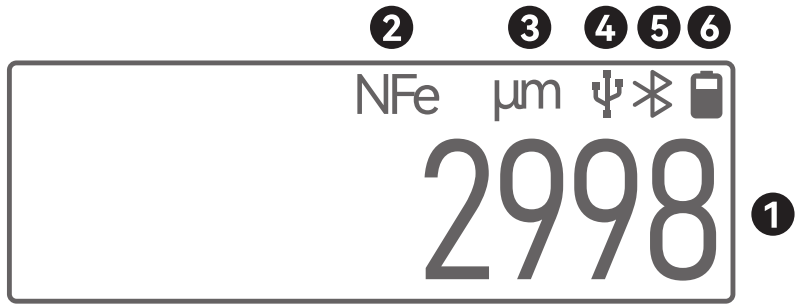
■**Page down**

■**Adjust value**

4.Device Introduction

4.1.Display description*

■ Press ⏻ turn on the device.screen display shown as below:



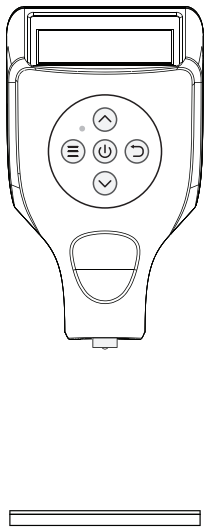
Attachment:screen display legend

❶	2998	Measured value.it will display the last value when restart.
❷	NFe	Substrate.The device identify the substrate automatically, and display Fe or NFe.
❸	µm	units. 1000µm=1mm.
❹	ψ	USB connection status.When the device is connected to USB, this icon will be displayed.
❺	✻	Bluetooth connectionstatus. ✻ Indicates that not connected. ✻ Indicates that connected.
❻	▮	Battery indicator. ▮ Batteries charged or the device is operated via the USB ; ▯ Batteries are discharged,please replace the batteries.

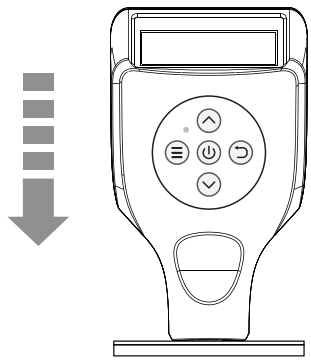
*As the device is updated ,the functions and interfaces may change.

4.2.Measure Correctly

■ The device already do calibration in the factory ,you can use it directly.



1. Put the probe towards to the surface of the workpiece

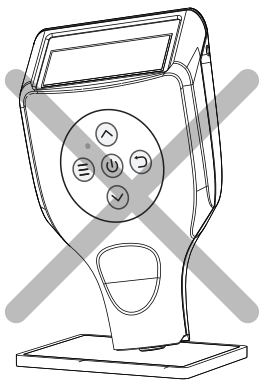


2. Quickly and steadily place the probe onto the surface

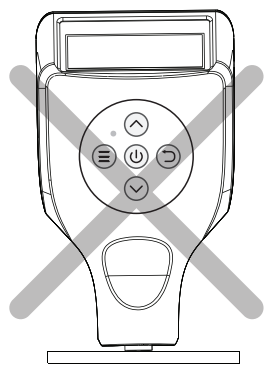
3. The screen will display the value after "beep"

■ Noted:The probe should vertical and press tightly on the surface.

■ Please avoid the following wrong methods:



Wrong reason:
Not vertical to the surface

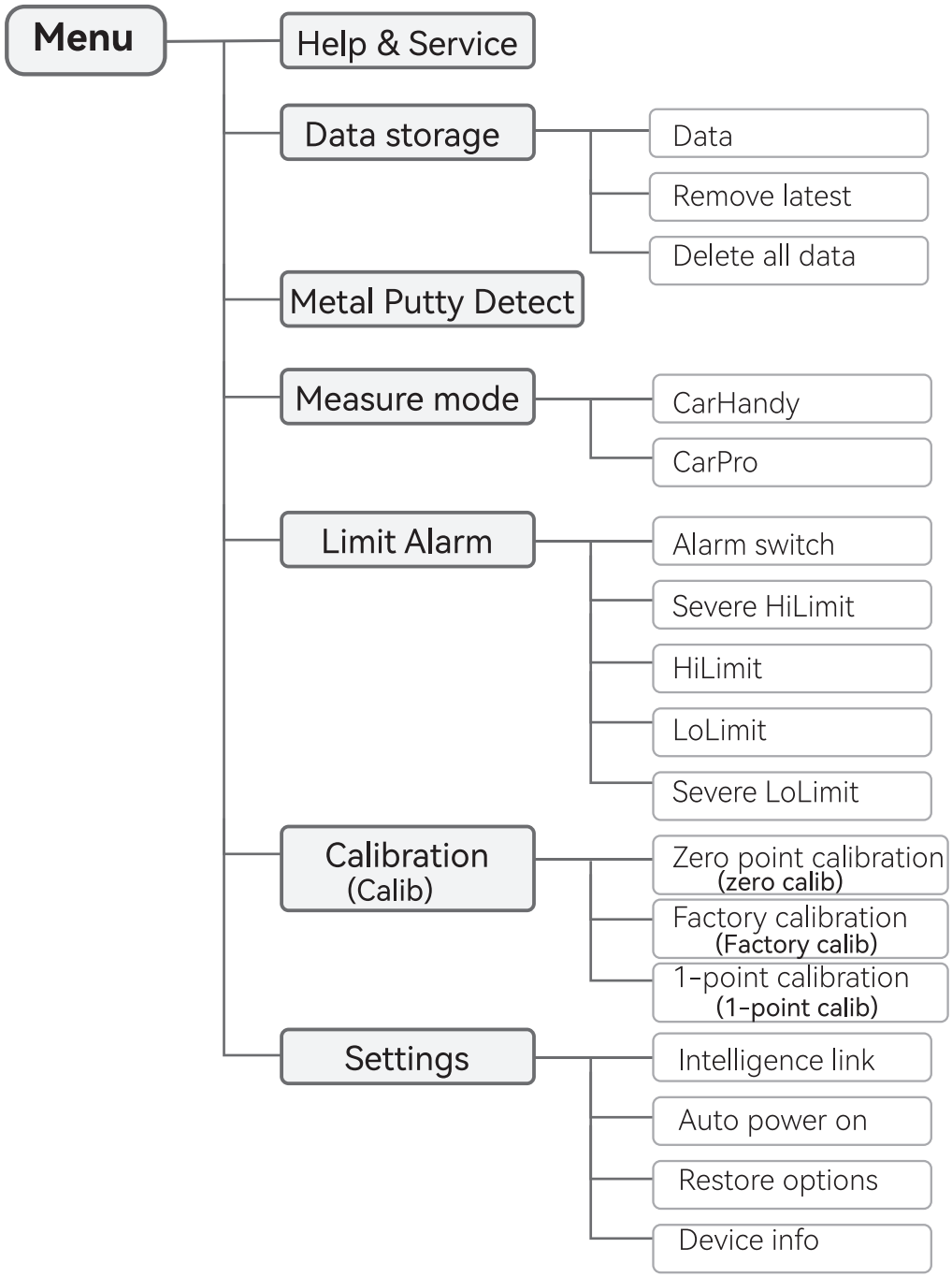


Wrong reason:
Not press tightly on the surface

Wrong reason:
Not test by the probe

4.3.Menu Function

■ Press menu key ☰ to enter the function menu.You can use arrow key to select the functions and also change the parameter values.
Menu structure as follows:



4.4.Auxiliary tips: Metal putty detect

- when there is metal putty inside the paint ,other device cannot identify it . but our model havce metal putty detect function .
- when detect metal putty on the part ,the screen will show as follows:

- In the case of metal putty,the value will show similar as normal thickness, but it doesn't represent the actual paint thickness.
- Metal putty check only for car paint,Not applicable to other industrial products.
- The device prompt only represents a reference based on the external detection , and does not mean the actual internal structure.

4.5.Auxiliary tips: Limit Alarm

- Many user has an expected value for the paint thickness , and the value within the range can be judged as qualified, so the device with the "limit alarm" function.
- When this function is turned on, the main interface displays as follows:

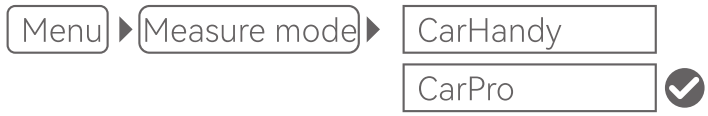
■ The limit alarms judge the measurement readings based on four values, and the user can customized these values.
For more details ,please see the following demonstrate.

Attached:Screen display demonstrate

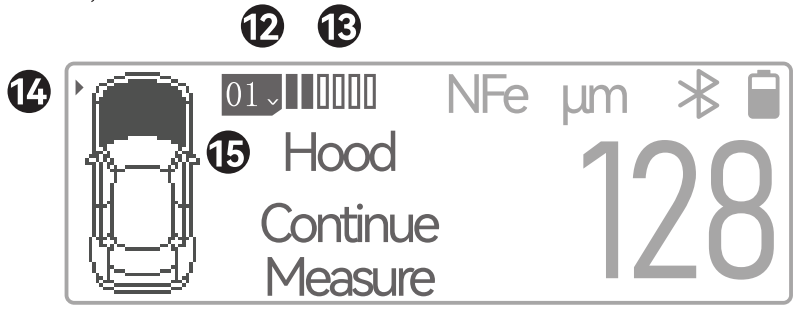
❼	Metal Putty HiLimit	Prompt area.When the reading meets the alarm conditions,it willdisplayed the prompt of the possible problems . such as: Metal Putty HiLimit Severe HiLimit LoLimit Severe LoLimit When there are both metal putty and over-limit readings, the metal putty is displayed only .
❽	⇞250	Severe HiLimit value.When the measured reading exceeds this value, the current number will be displayed in reverse color ⇞250 ,And it will prompt: Severe HiLimit
❾	↑170	Himit value.when the reading between this value and severe HiLimit， the current number will be displayed in reverse color ↑170 ,And it will prompt: HiLimit
❿	↓30	LoLimit value.when the reading between this value and severe value, the current number will be displayed in reverse color ↓30 ,And it will prompt: LoLimit
⓫	⇟0	Severe LoLimit value.When the measured reading exceeds this value, the current number will be displayed in reverse color ⇟0 ,And it will prompt: Severe LoLimit

4.6.Convert Mode: CarPro

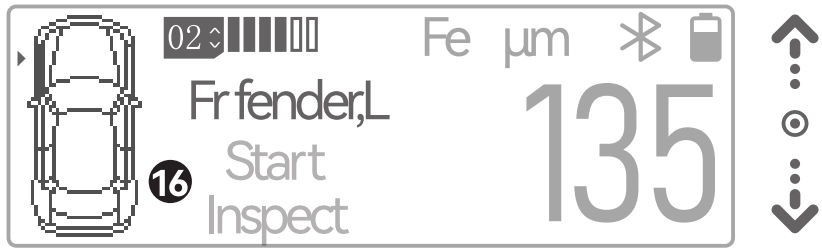
- In order to meet the needs of users for more refined and professional vehicle inspction.Besides the CarHandy mode,the device also provide CarPro mode,we can change it through measure mode:



- In the CarPro mode, with the body panels as the group, 19 panels are recommended to be inspected, and 6 points for each panels to be inspected to comprehensively evaluate the vehicle condition.
- After switching to the CarPro mode, a body panel icon area is added to the left to indicate the currently detected panels and the points have been detected, as follows:



- In the CarPro mode, when the measurement of a panel is completed, you can press the up and down key to change next panel.



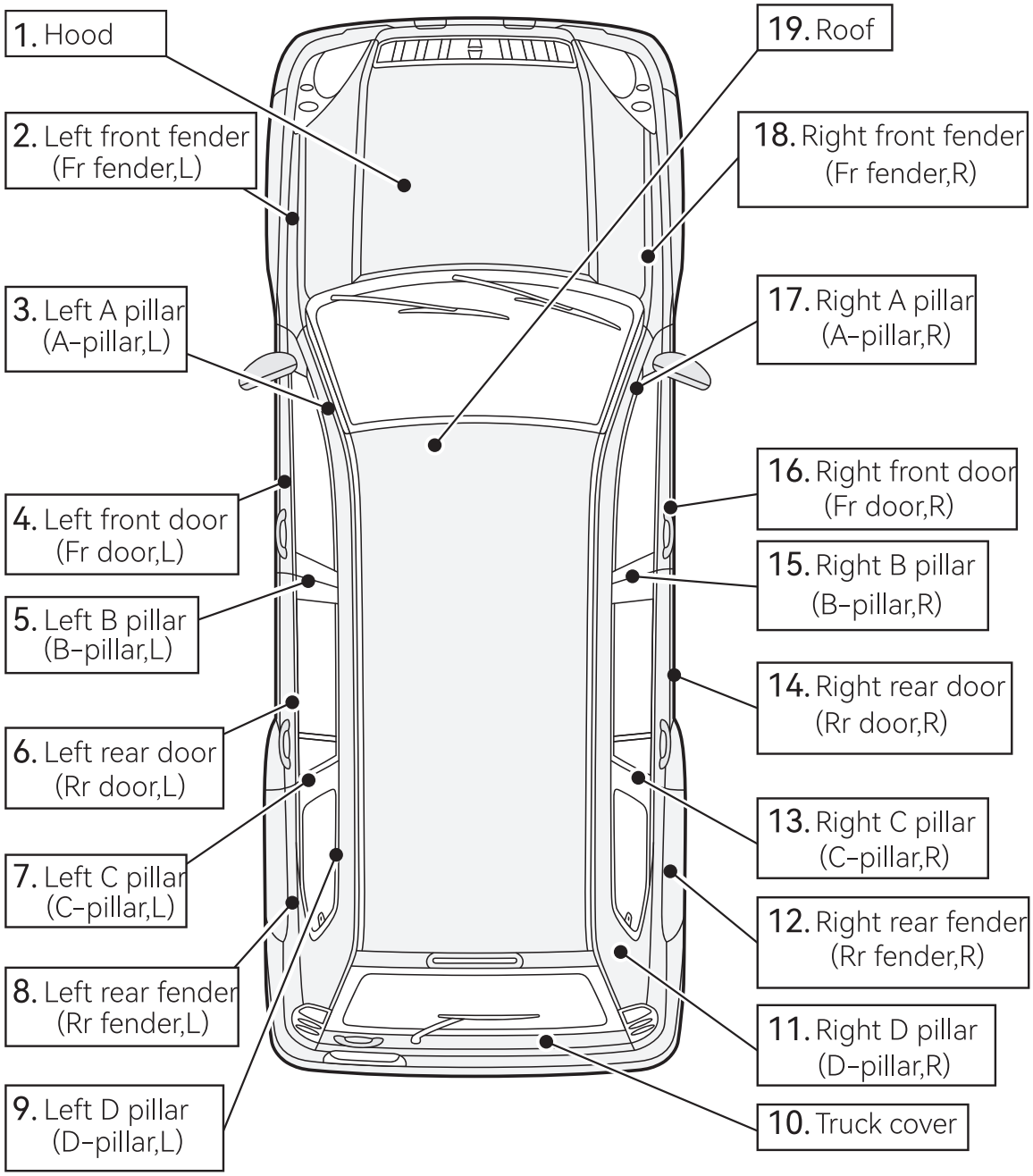
- If the current panel has measured 6 points and still continues to measure, the new data will cover the 6th point's data .
- In the main interface, press the return key to remove the latest data.

■In the CarPro mode, when a certain point of the panel is checked, and the device determines that there may be a problem with the point,it will give a corresponding prompt alarm, shown as following:

Attached: Screen display legend

⑫ ⑬	01	Inspection progress bar. Indicates the numbers of the panel currently being measured, and how many point has been measured.Such as 03 Represents the current inspection of the 3rd panel, 4 points have been tested.
⑭ ⑮	Hood	Body panels icons and names.These two areas are used to remind the user of the current position and name. ▶ The small triangle is indicated the currently measurement area.
⑯ ⑰	Start Inspect Body filler	Prompt area. This area displays the measurement suggestions and panels problems.When a possible problem is detected, the following prompt will be displayed: Metal Putty Iron powder putty inside interferes the actual data. Thinner paint Not painted properly,suggests replacement panel. Rework Scratch,Respray or Filled body panel Body filler The paint thickness at this point is severe higher than the original.

Attached: Body panels reference (SUV / MPV)

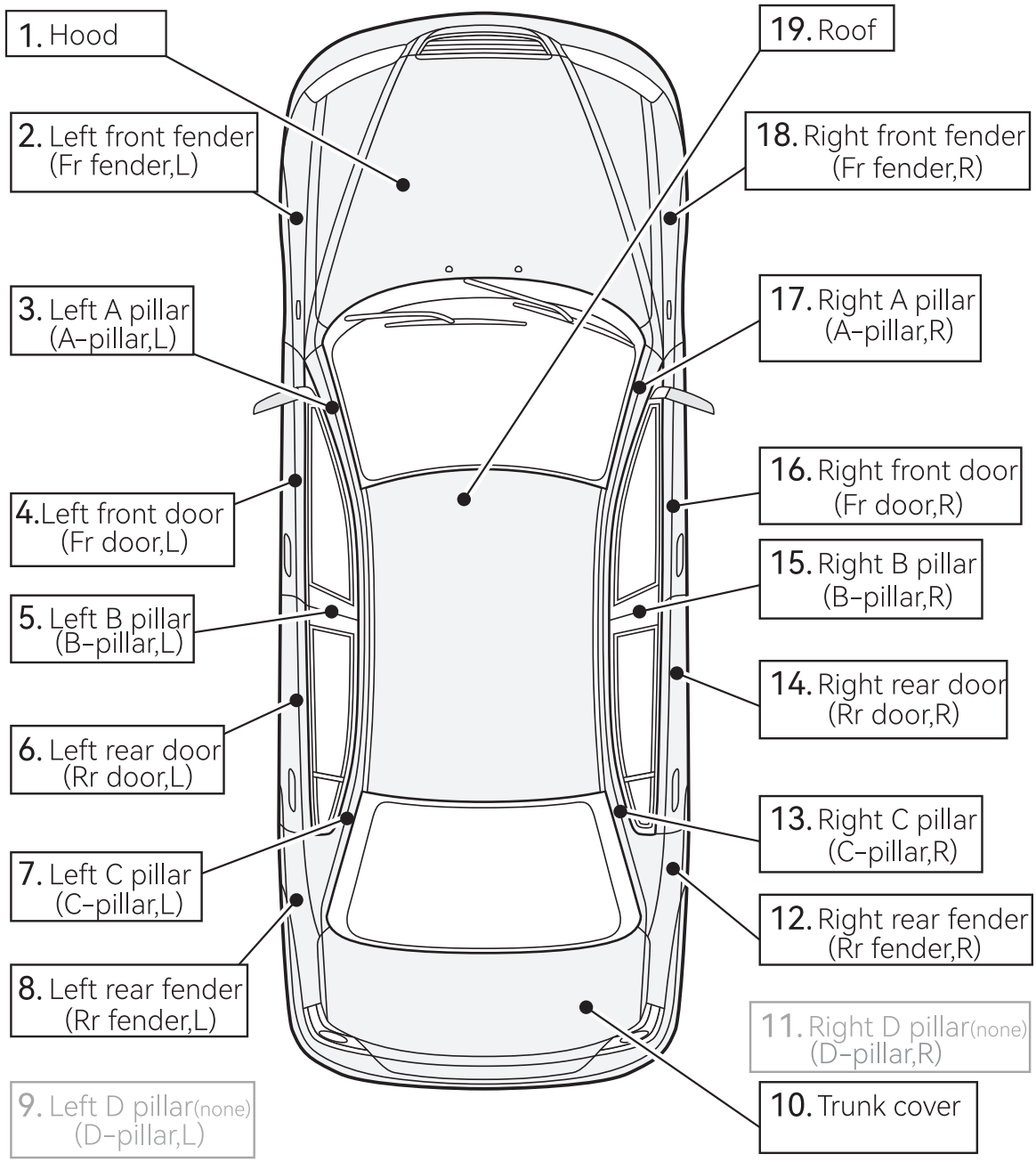


Notes:

1.The 5th,7th,13th and 15th B-pillar and C-pillar,we should open the door to test

2.The 9th and 11th Left and Right D-pillar,Only some model have this panels,You can follow up the actual situation to test or skip .

Attached: Body panels reference（Car）

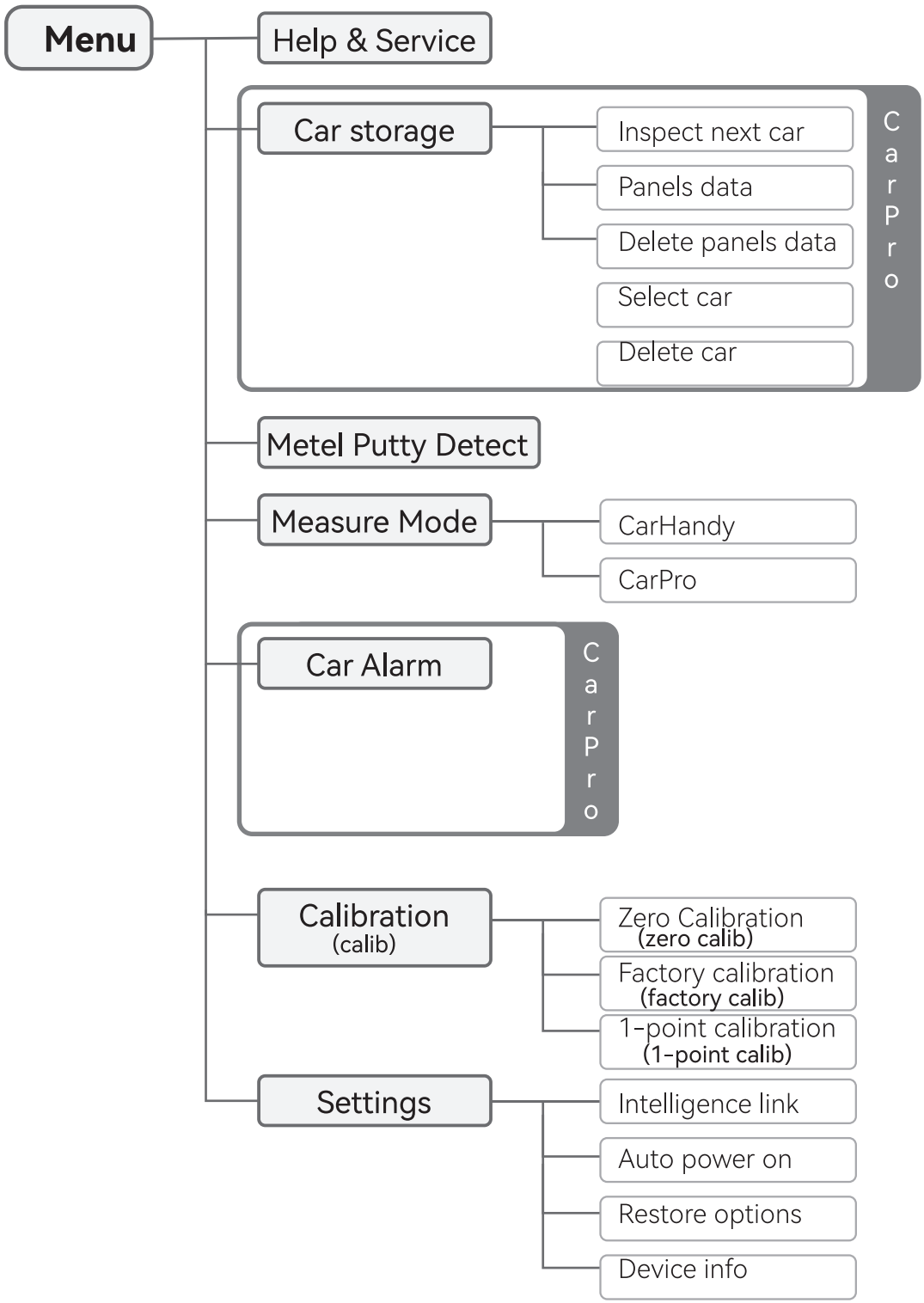


Notes:

1.The 5th and 15th B-pillar,we should open the door to test.

2.The 9th and 11th Left and Right D-pillar,Most of the car don't have ,You can skip it.

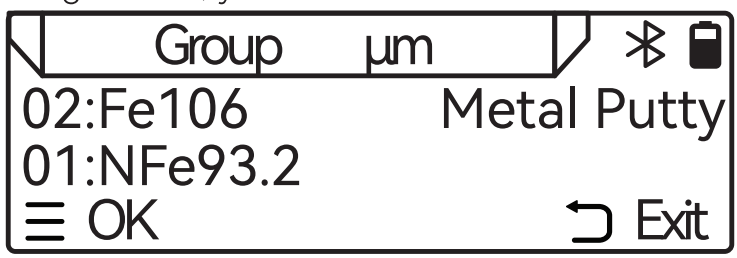
■ When exchange to CarPro mode,the device menu structure will show as follows:



4.7.Measurement data management

A.CarHandy: Data storage

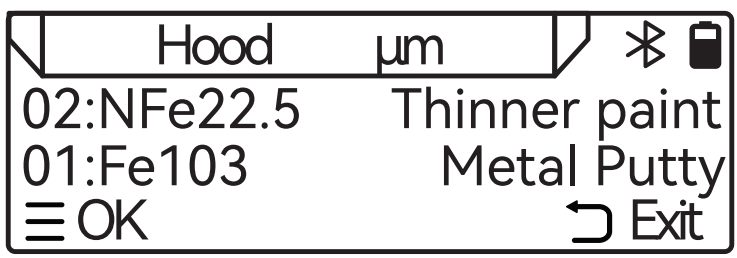
- In CarHandy mode, the device will record 60 historical measurement data.
- When the 60 data is full and there are new readings, the oldest data will beoverwritten.
- In the data storage menu, you can view or delete the measurement data.



- In the data list,each row represents a test reading,and each row displays from front to back:number, substrate,reading and possible problem .

B.CarPro: Car storage

- In CarPro mode, the device records data in groups of car panels. A total of 999 cars, 19 panels per car, and 6 points of data for each panel.
- In this mode, the data storage will converted to car storage.。
- In the car storage,you can view or delete car panels measurement data.



- In the panels data, each row represents a test reading,and each row displays from front to back:number, substrate,reading,and possible problem .

5.Other function description

1.Buzzer and LED indicator

- When performing detection or partial operation, the buzzer will beep,and the indicator light will flash.

2.Screen backlight

- When performing detection or key operation, the screen backlight will light up and automatically turn off after a period of time to save batteries

3.Auto power ON when test

- When the device is turned off, the device will automatically power on and display the readings when pressing the recognizable substrate with the probe.
- You can turn off or turn on this function in the menu settings.

4.Automatic power off

- When no opertation within 2 mins, the device will automatically power off.

5.Continuous measurement

- When the device is pressed on the substrate and held for a few seconds, the device will start continuous measurement.

6.Restore default options

- It will restore the various settings of the device to the factory default state.
- This function will not delete measurement data and calibration data.

7.Help&Service·Intelligent interconnection

- Download the APP on AppStore or Google Play store by searching "coatingmaster"

Calibration

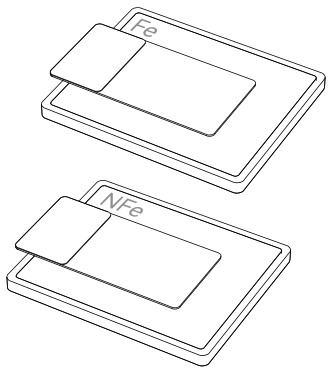
■ When meet the following situation,please do calibration:

A. The screen display "please do calib".

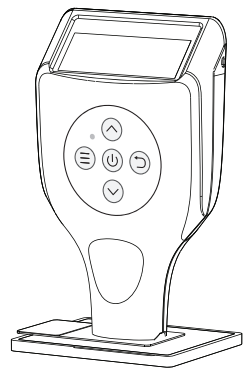
B. The reading does not match the normal expected value.

How to determine the deviation

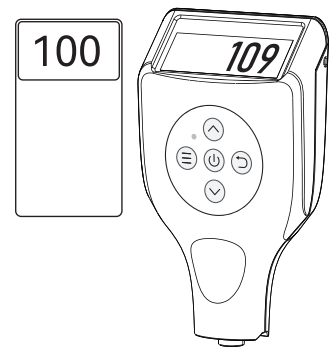
■ Test different calibration foils on Fe and NFe.If the reading has a large deviation with the foils shows,then need to do calibration:



1. Place the foils at the center of substrate



2. Probe sticks vertically to the foils and substrate to obtain readings



3. Compare the reading on device with the foils thickness

■ The normal deviation of this device :

< 1000μm ± (1μm+2% coating thickness);

> 1000μm ± (1μm+5% coating thickness)

Different calibration foils,The allowable reading range is roughly as follows:

Standard thickness（μm）	Allowable error（μm）	Reading range（μm）
50	2	48 ~ 52
100	3	97 ~ 103
250	6	244 ~ 256
500	11	489 ~ 511
1000	51	949 ~ 1051

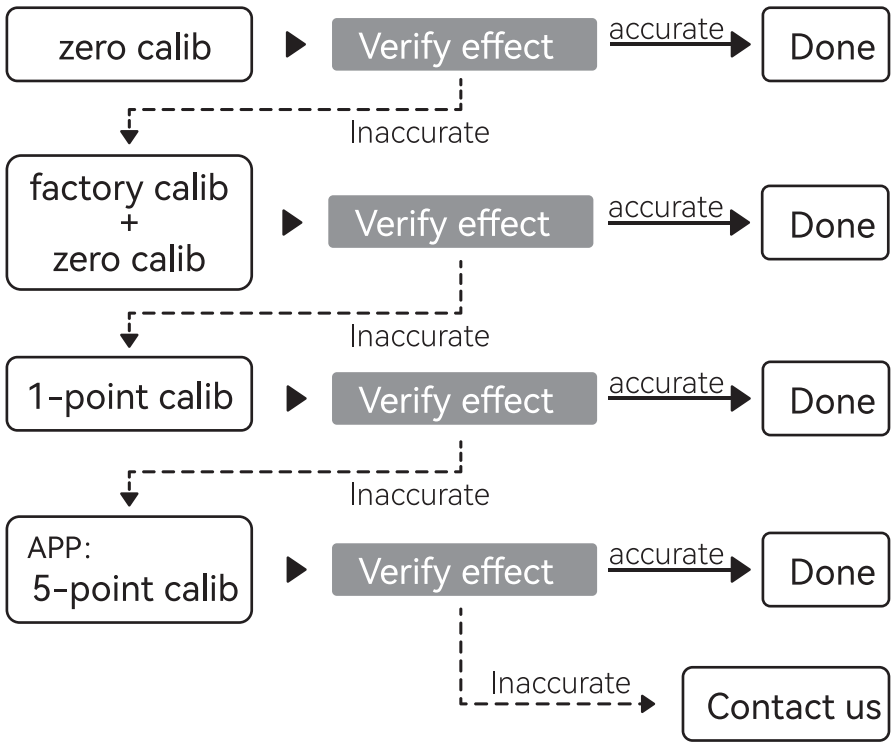
■ When the deviation is greater than the above value, please do calibration.

6.1.Calibration process

■ The device provide 4 calibration method:

1. Zero calib 2.Factory calib 3. 1-point calib 4. 5-point calib(on APP)

■ When need to do calibration,Our recommended calibration steps is:



■ In most cases, it is not necessary to complete all calibration steps.

■ After done zero calibration or 1-point calibration ,please verify the effect by 100μm plastic shims.if it's accurate ,no need to do futher steps.

■ If both zero calibration and 1-point calibration cannot get accurate reading ,we can connect APP to do 5-point calibration.

Calibration Notes

■ Fe and NFe need to be calibrated separately.

For example:if the reading on Fe is inaccurate ,then do calibration on Fe, otherwise,do calibration on NFe.

6.2.Factory calibration

- When the device cannot be calibrated normally or the readings are erroneous due to some wrong operations occasionally, you can do factory calibration.
- Steps: Menu ☰ → Calib→ Factory calib.
- After done factory calibration,in order to meet the current use environment,we suggest to do "zero calibration".
- Factory calibration only clears the calibration data.it won't affect or delete the previous measurement data.

6.3.Zero,1-point and 5-point calibration

- Zero calib,1-point calib steps:menu ☰ → calib → zero calib, 1-point calib
- 5-point calib: Do it on APP
- More details ,please scan the QR code to watch our video :

Calibration video

6.4.APP download and use video

Download CoatingMaster APP, And watch teaching video

Get it on Google Play

Available on the App Store

CoatingMaster

Teaching Video

7.Troubleshooting

A.Inaccurate or unstable measurement

Cause	Solutions
Error measurement	Refer to the manual and video,use the correct operation method
Calibration error	Refer to the manual and video,Do calibration again.
Edge effect	Do not perform any measurement at the edge.it will cause inaccurate reading or false alarm.
Inappropriate substrate properties	The substrate with mixed components,uneven, weak magnetic, and weak conductivity is not suitable.
Substrate too thin	Min. thickness of substrate is 0.4mm. If lower than it ,it will cause inaccurate reading.
Substrate too curved	Min. curvature is 5mm ,Curved surface will affect measurement accuracy.
Rough/unclean substrate	Please clean the substrate and try to measure the smooth surface of the substrate.
Soft surface of the substrate	Soft surface will cause the inaccurate reading, Please measure hard surfaces.
Environmental conditions	The humidity range is 10~85%RH,otherwise it may cause inaccuracy or even damage to the device.

Temperature is too high or too low	The applicable temperature range is -10~50℃, otherwise it may cause inaccuracy or even damage to the device.
Static electricity or strong electromagnetic field	The device is sensitive to magnetic and electric fields, such as :near magnets, horns/motors containing magnets,high-power electrical appliances in operation etc.

B.Unable to power on

Cause	Solution
Batteries discharged	Insert new batteries
Batteries with reverse polarity	Check the polarity of the inserted batteries.
Batteries loose	Check that the batteries are inserted correctly.

C.Abnormal display

Cause	Solution
Display delay or color change	The ambient temperature beyond the use range may make the screen display poor, please apply within the normal range
Blurred screen	Strong static electricity may make the screen display disorderly.Please stay away from the static electricity environment

D.Other technical problems

Cause	Solution
Others	Please contact technical support

8.Device parameters

Appearance parameters	
Size	106*62*25 mm（Not included the probe）
Weight	54.2g（Not included the battery）

Technical data	
Applied Occasion	non-magnetic coating on magnetic substrate; Insulating coating on conductive and non magnetic substrate
Measure range	0~3000μm（1000μm=1mm) Professional Edition 0~2000μm（1000μm=1mm) Standard Edition
Resolution	0.1μm（0~99.9μm） 1μm（100~3000μm）
Min.measuring area	10*10mm
Thinnest substrate	0.4mm
Min.curvature	convex:5mm,concave:5mm
Environment	Tem -20~50℃; Hum 10~85%RH
Accuracy	0~1000μm: ±(1μm+2%coating thickness) Above 1000μm: ±(1μm+5%coating thickness)