

User Manual

LDM100 Coating Thickness Gauge



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1 Introduction

Thank you for purchasing a CP Instruments Coating Thickness Gauge.

This hand-held device for coating thickness measurement with a separate probe is a highly intelligent and accurate measuring device with which layer thicknesses can be measured quickly and accurately on almost all metal surfaces. The instrument not only displays the film thickness but also automatically identifies the metal base (Fe stands for magnetic metals such as iron and steel, nFe denotes non-magnetic metals such as aluminum, metal alloys and non-magnetic steel). With the device different coatings can be measured:

- non-magnetic coatings, ceramics, enamels, plastics, rubber coatings;
- magnetic base materials such as iron or steel, non-ferrous metals such as nickel and chromium;
- corrosion protection coatings in the chemical and oil industries;
- non-conductive paints;
- plastic coatings and anodised coatings on non-magnetic conductive devices such as aircraft, household appliances, vehicles, completely alloyed doors and windows, as well as other aluminum products;
- electrically conductive coating material.

Specifications and prices of all CP Instruments devices can be found on our website:

<http://www.cp-instruments.pl>. You will also find our contact details there. Our staff will gladly help you with any questions.

2 Safety information

Please read this user manual carefully and completely before using the device for the first time. The device may only be used by carefully trained personnel.

- This meter may only be used in the manner described in this manual. Use of the meter elsewhere may result in dangerous situations.
- The device must not be exposed to extreme temperatures, direct sunlight, extreme humidity or moisture.
- The device housing may only be opened by qualified personnel of the CP Instruments.
- The measuring device must never be placed on the user interface (eg on the keyboard side of a table).
- Never use the meter with wet hands.
- No technical modifications may be made to the device.
- The device should only be cleaned with a damp cloth. Please do not use abrasives or solvent-based cleaning agents.
- The device may only be used with the accessories offered by CP-Instruments or equivalent.
- Furthermore, this meter must not be used if the environmental conditions (Temperature, humidity ...) are not within the limits specified in the specification.
- The measuring device must not be used in an explosive atmosphere.
- Before each use, please check the meter by measuring a known size.
- The limits specified in the specification for the measured quantities may under no circumstances be exceeded.
- Before starting the measurement, always check whether the correct measuring range has been set.
- If the safety instructions are ignored, it can damage the appliance and injury to the operator come.

This user manual is published by CP-Instruments without any warranty.

We expressly refer to our general warranty conditions, which can be found in our terms and conditions.

If you have any questions, please contact CP-Instruments.


3 Specification

Measuring range	0 ... 1250 μm / 0 ... 50 mil
Resolution	0,1 μm / 0,1 mil
Accuracy	$\pm (2 \% + 2 \mu\text{m}) / \pm (2 \% + 0,1 \text{ mil})$
Dimensions	166 x 68 x 30 mm
Weight	180 g (with batteries)
Ambient temperature	-10 ... +50 °C



Note: Perform a measurement only when the probe has reached the specified ambient temperature. Please do not observe the first measurement results if you are not sure whether the sensor has already reached the specified ambient temperature.



4 System description





4.1 User interface and buttons


Press the  short to turn on the device and long to turn off the device again. The meter automatically turns off after 180 seconds of inactivity.

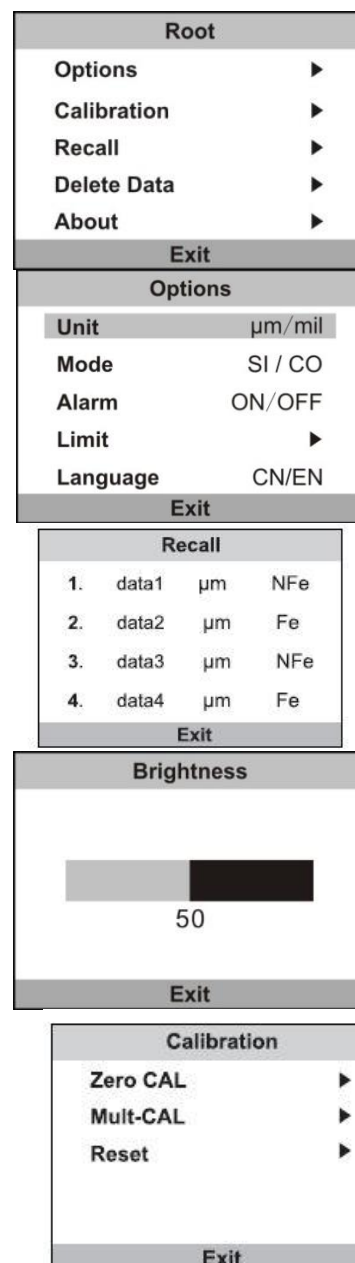
 (Menu/Back: Press the  long to get to the main menu. Press  briefly to return to the previous menu level.



 (Statistics/Height): Press the  short in measuring mode, to the statistics data. Max / Min. / Average values displayed by the device. This screen will be displayed in the next picture.

 (Data/Enter): Press the  short in measuring mode to display the recorded data. This screen will be displayed in the next picture.

 (Calibration/Backlight): In measurement mode, press and hold  to turn on the backlight. Then you can adjust brightness via  or .


Press the  to go to the page for calibration. The screen will be displayed in the next picture.





 (Delete/Down): Press the  in measurement mode to clear the recorded data.

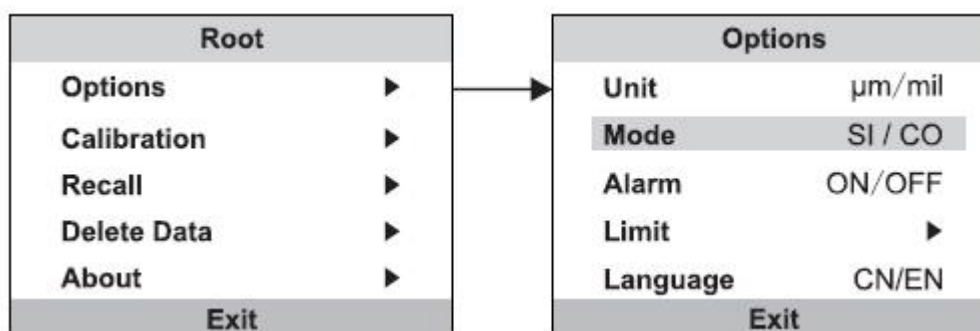
Delete Data			
1.	data1	μm	NFe
2.	data2	μm	Fe
3.	data3	μm	NFe
4.	data4	μm	Fe
Exit			

4.2 Line starting

Press the  to turn on the instrument. A beep sounds and "Model no. PCE-CT 27FN" is displayed on the screen

4.3 Measurement modes

The coating thickness gauge has two different measurement modes, the single measurement (SI) and the continuous measurement (CO). Long press  to enter the main menu. There, select the menu item "Options" and move on to Mode, where you press .



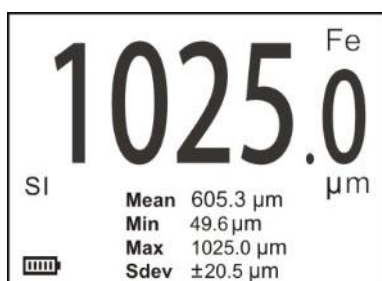
4.3.1 Single measurement

SI mode is the measurement mode of the single measurement:

Press the probe vertically against the surface to be measured. The unit will beep once and display the coating thickness value when the readings have been taken.

Note: Do not pull the probe over the surface to be measured.

The screen will be shown in the next picture:



1025.0 μm	measured value
Average 605.3 μm	the average of all recorded data
Min. 49.6 μm	the smallest measured value
Max. 1025.0 μm	the highest measured value

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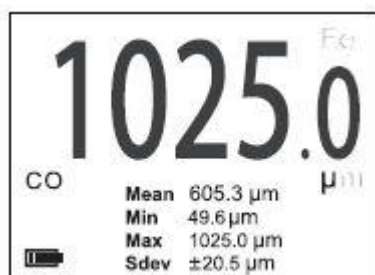
standard deviation $\pm 20,5 \mu\text{m}$	(2 % + 2 μm)
Fe	The measured material is a magnetic metal such as steel
NFe	The measured material is a non-magnetic metal such as aluminum

4.3.2 Continuous measurement

The CO mode is the measuring mode of continuous measurement:

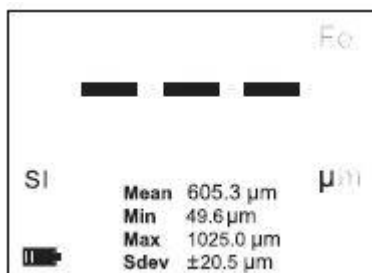
Press the probe vertically against the surface to be measured. The instrument will beep continuously and display the coating thickness reading when the readings have been taken.

Note: During the measurement, do not lift the probe off the surface to be tested until the measurement is complete. The screen will be displayed in the next picture:




4.4 Measuring range

The device measures layer thicknesses between 0 μm and 1250 μm . If the thickness is outside this range, "---" will appear in the display. The screen will be shown in the next picture:



4.5 Battery indicator

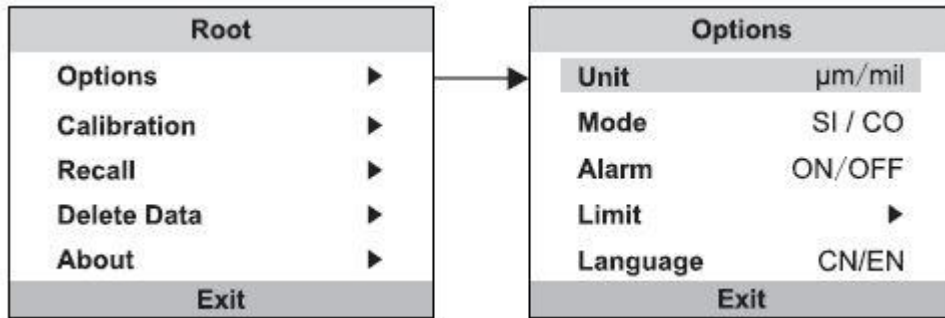
The device is powered by four AAA batteries. If the  icon is green, the battery is fully charged. After a period of use, the battery icon will become shorter, indicating the current capacity of the battery.

When the color changes from green to red and  starts flashing, the battery is almost dead.

Note: Please recharge the batteries or replace them when they are nearly empty. Otherwise, this could affect your measurement accuracy.

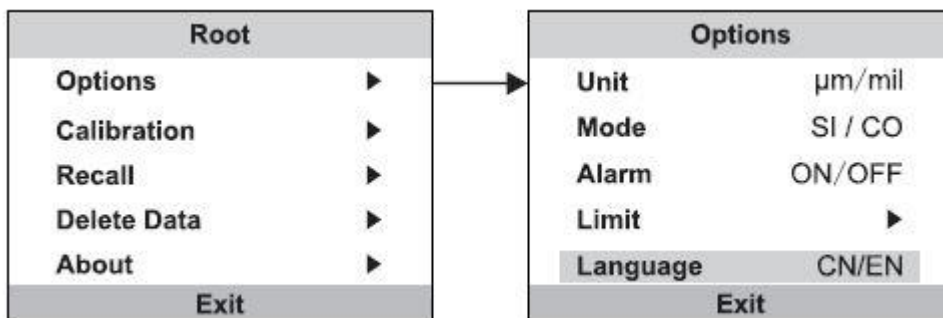
4.6 Selection of the measuring units

Press the **MENU** long to get to the main menu. Then move to the menu item "Unit" via the main menu for the options menu. Press the **DATA** to select between μm and mil.



4.7 Language selection

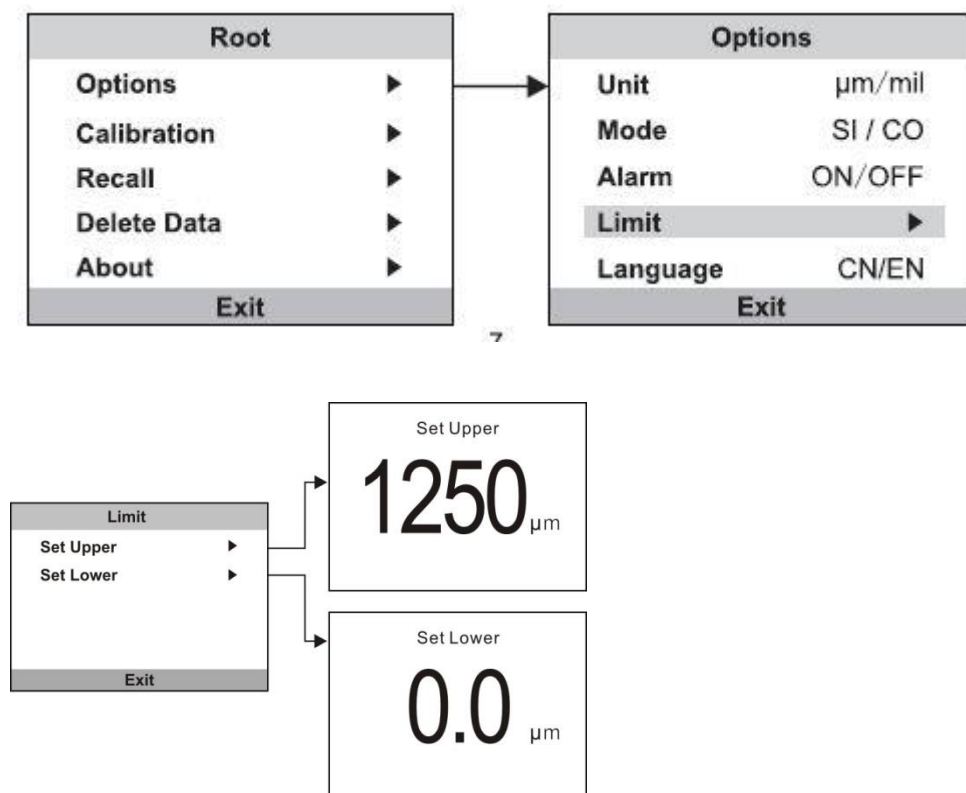
Press the **MENU** long to get to the main menu. Then move to the menu item "Language" via the main menu for the options menu. Press the **DATA** to select between English (EN), Chinese (CN) and German (DE).



4.8 Alarm function

To adjust the alarm range, long-click on **MENU** to get to the main menu. Then move to the menu option "Alarm limit" via the main menu for the options menu.

Press the **Stats▲** or **CLR▼** (long for fast scroll) to adjust the range.



4.8.1 Switch on/off the alarm

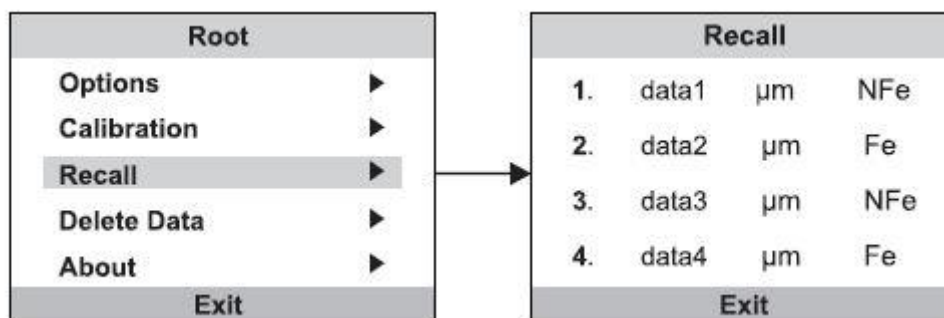
Press the **MENU** long to get to the main menu. Then move to the menu item "Alarm" via the main menu for the options menu. Press **DATA** to turn the alarm on or off. When the alarm is on, the unit displays the following picture on the display:



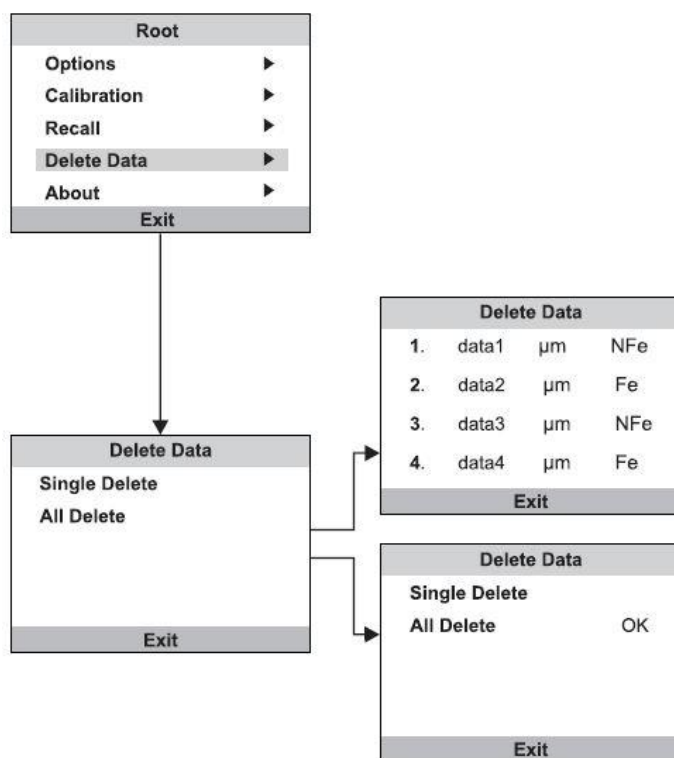
If the measurement is outside the alarm limits, the unit will beep three times to signal this.

4.9 Stored values

Press the **DATA** to display the stored data and press **Stats▲** or **CLR▼** to display the last 50 stored values.



To clear the data, press **MENU**. Then move to the menu item "Data deletion" via the main menu for the options menu. Then you can choose **DATA** between "single deletion" (deletion of individual data) and "total deletion" (deletion of all values).



4.10 Accuracy measurement

The user can control the accuracy of the device according to the given reference standards. The device is supplied with standard plastic films. These can be used to test the measurement accuracy of the instrument with the help of supplied calibration blocks. They can also be used to protect the sensor on rough or hot surfaces. The measured value should be within the accuracy range specified in the operating instructions. For example, if the accuracy is specified as $\pm 2\% + 2 \mu\text{m}$, the measurement result should be between 47 and 53 μm when the Coating Thickness Gauge is used to measure a 50 μm film thickness plastic film. Otherwise, the device must be calibrated.

4.11 Calibration

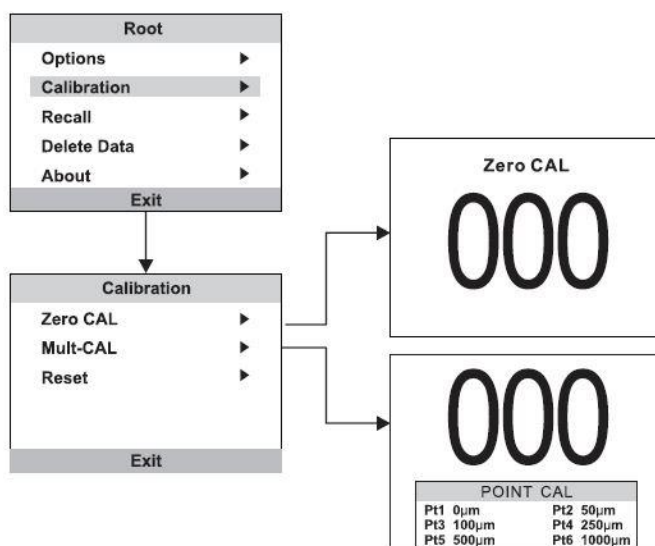
The instrument has been factory calibrated and a built-in self-test function performed before the measurement. Therefore, it usually only needs to be tested before the measurement if the measured value is 0 when measuring an uncoated metal. If this is not the case, a zero point calibration should be performed.

4.11.1 Zero-point calibration



Press the **CAL_{XX}** and select "Zero Point Calibration" by briefly pressing **DATA** and "000" will flash on the screen. Then measure an uncoated substrate. When "0" is displayed on the screen, the zero calibration is successful. After this process, the instrument can usually be reused for accurate coating thickness measurements. Nevertheless, due to abnormal base materials or extreme environmental conditions, additive errors may occur. If this is the case, you can use the standard plastic films to perform a multipoint calibration.

4.11.2 Multipoint calibration

Use the instrument to place standard plastic films on a calibration block if the value found is outside the accuracy limits of this manual. Lift the probe ("Pt1 ~ μm " flashes in the screen to), press **Stats▲** or **CLR▼** (for fast scrolling) to set the value of the actual thickness. Repeat this with other plastic films. The use of two of these standard plastic films is better for calibration than just one. For example, you can use a thin and, alternatively, a thick foil. If the coatings to be measured are relatively close to the thickness of the other, it is sufficient to use only a film of similar thickness for the calibration.



4.12 Factory settings

If zeroing with standard plastic films does not work, it may be necessary to reinitialize the device. First press briefly  select "Reset", then "Complete Reset" and confirm with 

"Complete reset" will flash in the display and indicate together with a beep that the initialization is completed. To ensure high measurement accuracy, it is recommended to perform a zero point calibration after initialization. All previously saved values and settings are deleted after initialization and the device is reset to factory settings.

Note: When measuring the coating thickness of alloys such as aluminum or stainless steel alloy, the instrument must be calibrated as follows:

1. Turn on the coating thickness gauge, initialize it to factory settings, and turn it off.
2. Turn it back on and calibrate it to 6 standard slides (if accuracy was affected, keep the unit away from any material during the entire calibration process).

5 Disposal

NOTE according to the battery regulation (BattV)

Batteries must not be disposed of with household waste: The end user is legally obliged to return. Used batteries can be returned, among other things, to designated collection points or CP-Instruments.

Collection point according to BattV:

Checkpoint Instruments
ul. Klecińska 125 bud.BETA
54-413 Wrocław

For the implementation of the ElektroG (take back and disposal of WEEE) we take back our equipment. They are either recycled by us or disposed of by a recycling company according to legal requirements.

6 Contact

For questions about our product range or the measuring device please contact CP-Instruments:
kontakt@cp-instruments.pl

Postal:

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