

User Guide

Elcometer 224

Surface Profile Gauge

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These operation instructions are a short User Guide only. A copy of both this Instruction Manual and an English language extended version are available for download on our website elcometer.com. For the avoidance of doubt, please refer to the original English language version.



The Elcometer 224 Model T meets the Radio and Telecommunications Terminal Equipment Directive. The Model B meets the Electromagnetic Compatibility Directive. This product is Class B, Group 1 ISM equipment according to CISPR 11. Class B product: Suitable for use in domestic establishments and in establishments directly connected to a low voltage power supply network which supplies buildings used for domestic purposes. Group 1 ISM product: A product in which there is intentionally generated and/or used conductively coupled radio-frequency energy which is necessary for the internal functioning of the equipment itself.



This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Modifications not expressly approved by Elcometer Limited could void the user's authority to operate the equipment under FCC rules.

This Class B digital apparatus complies with Canadian ICES-003

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Bluetooth are trademarks owned by Bluetooth SIG Inc and licensed to Elcometer Limited. Bluetooth SIG QDID = B014393

All other trademarks acknowledged.

Gauge dimensions: Integral: 168 x 73 x 37mm (6.61 x 2.87 x 1.46"); Separate: 141 x 73 x 37mm (5.55 x 2.87 x 1.46")

Gauge Weight: Integral: 218g (7.69oz) including batteries; Separate: 161g (5.68oz) including batteries.

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1 GAUGE OVERVIEW AND BOX CONTENTS

Gauge Overview

- 1 LED Indicators - Red (left), Green (right)
- 2 Colour Screen
- 3 Multifunction Softkeys
- 4 On/Off Key
- 5 Separate Probe Connection
- 6 Internal Probe
- 7 Wrist Strap Connection
- 8 Battery Compartment (1/4 turn open/close)
- 9 USB Data Output Socket (below cover)

Box Contents

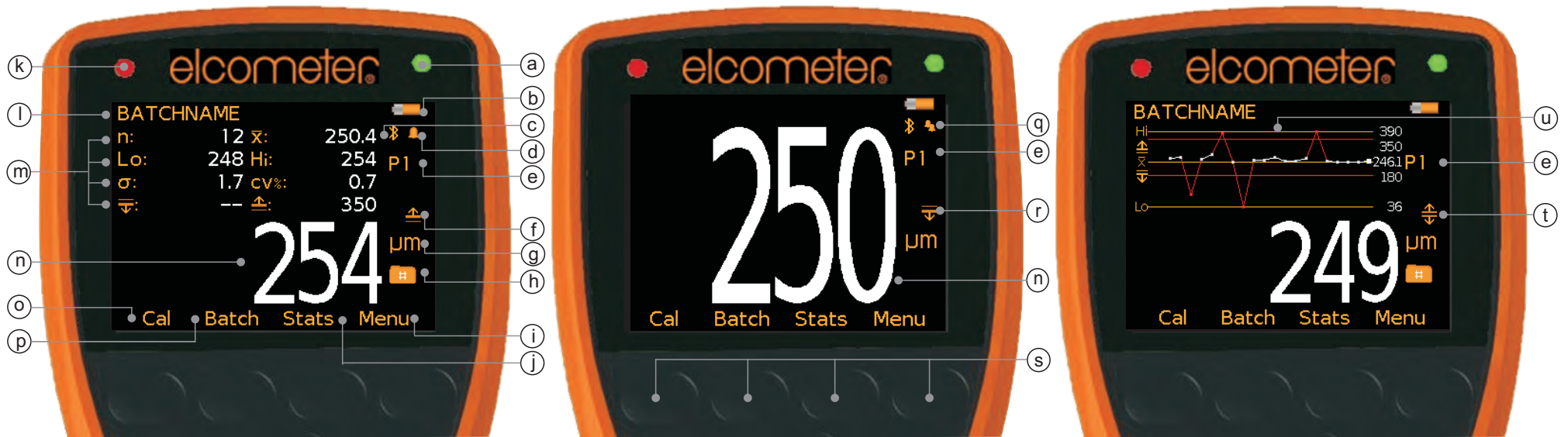
- Elcometer 224 Surface Profile Gauge
- Calibration Test Foils; Nominal Values 125 & 500µm and Glass Zero Tile (Integral gauges)^a
- Test Certificate
- Wrist Harness
- Protective Case (Model B); Transit Case (Model T)
- 1 x Screen Protector
- Probe Protection Cap (Integral gauges)^a
- 2 x AA Batteries
- USB Cable & ElcoMaster™ 2.0 Software (Model T)
- User Guide



^a For separate gauges, the test foils, glass zero tile and probe protection cap are supplied with the separate probe.

2 USING THE GAUGE

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a	Green LED	BT	l	Batch Name (displayed when in batching)	T
b	Battery Life Indicator	BT		Date & Time (displayed when not in batching)	T
c	Bluetooth On	T	m	User Selectable Statistics - 4 rows	BT
d	Daily Alarm On	T	n	Reading Value	BT
e	Probe Scale	BT	o	Calibration Softkey	BT
f	Upper Limit On	T	p	Batch Softkey	BT
g	Units of Measurement - μm , mils, mm, inch	BT	q	Interval Alarm On	T
h	Batch Type - normal, counted average	T	r	Lower Limit On	T
i	Menu Softkey	BT	s	Softkeys	BT
j	Statistics Softkey	BT	t	Upper and Lower Limits On	T
k	Red LED - Reading outside limit	T	u	Trend Graph (last 20 readings)	T

3 GETTING STARTED

- 1 Press and hold the ON/OFF button until the Elcometer logo is displayed
- 2 Select your language using the **↑↓** softkeys
- 3 Select "Auto" or "Manual" screen brightness settings
- 4 Follow the on screen menus



To access the language menu when in a foreign language:

- 1 Switch the gauge OFF
- 2 Press and hold the left softkey and switch the gauge ON
- 3 Select your language using the **↑↓** softkeys

4 CONNECTING THE PROBE - SEPARATE GAUGES ONLY

- 1 Rotate the probe plug to align the pins
- 2 Screw in the collar - clockwise



5 TAKING A READING

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- 1 Hold the probe by its sleeve
 - 2 To take a reading, bring the probe down onto the surface whilst holding it perpendicular
 - 3 For subsequent readings, lift the probe off and then replace it onto the surface
 - 4 To accurately assess the surface profile 5-10 readings should be taken over a surface area of 150mm² (6 sq. in.). The average of these readings will indicate the surface profile peak-to-valley height of that area.
- ▶ For Elcometer 224 Model T gauges whilst in batching, users can pre-define the number of readings using the counted average function. Press Batch/New Batch/Batch Type, select “Counted Average” and set the number of readings as required. The average of this pre-defined number will be saved into memory. The individual readings with counted average are not saved into memory.
- | | |
|---|---|
| <p>✓ DO</p> <ul style="list-style-type: none">• Hold the probe by the probe sleeve• Firmly place the probe onto the surface• Allow the metal base to make contact with the surface - to improve accuracy | <p>✗ DO NOT</p> <ul style="list-style-type: none">• Drag the probe over the surface• Bang the probe down hard onto the surface• Swing the probe by its cable |
|---|---|
- ▶ The display will dim if inactive for more than 15 seconds and will go ‘black’ if inactive for the period defined in Menu/Setup/Display/Screen Timeout. Press any key or tap the gauge to awaken it.
- ▶ The gauge will switch off automatically after 5 minutes of inactivity.
- ▶ - - - indicates reading outside range of probe.

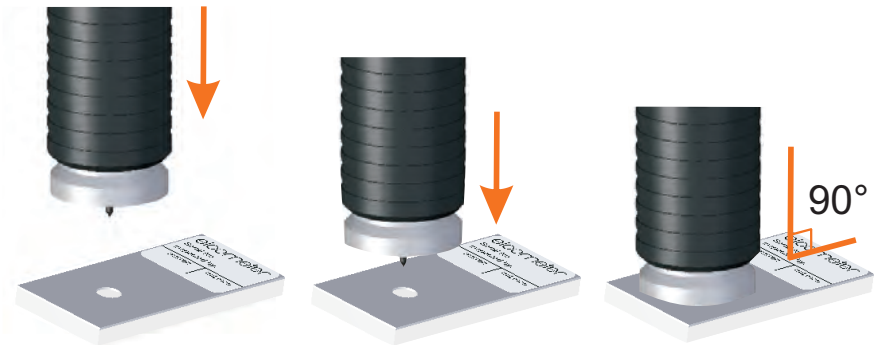
6 CALIBRATING AND TESTING THE GAUGE CALIBRATION

To calibrate (using the glass zero tile):

- 1 Press the Cal softkey
- 2 Select “Calibrate” (Model T)
- 3 Follow the on-screen instructions.

To test calibration (Model T):

- 1 Press the Cal softkey
 - 2 Select “Test Calibration” and follow the on-screen instructions
 - 3 When prompted, either place the probe on to the glass zero tile or on the centre of the foil resting on the glass tile, making sure the pin goes through the hole in the centre of the foil.
- ▶ After continued use, the precision manufactured probe tip will wear, increasing the tip size and will then need to be replaced. This is a user replaceable item. Please contact your Elcometer sales representative to order new probe tips and tip replacement tool.



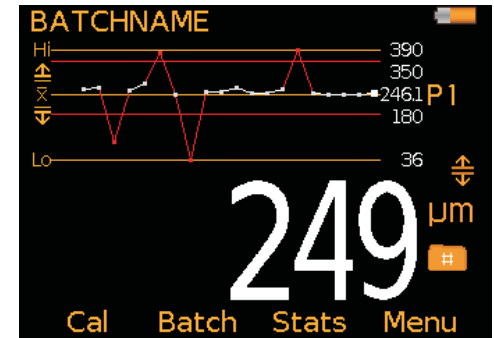
7 BATCHING (MODEL T)

- 1 To use the Batching memory facility, press the Batch softkey
 - 2 Select “New Batch” or “Open Existing Batch” to add readings
 - 3 Copy, Rename, Review batch data and Clear readings from or Delete a batch
 - 4 Fixed Batch Size allows users to pre-define the number of readings to be stored in a batch. Once all readings have been taken the gauge automatically opens a new batch with a link to the original batch name. For Example *NewBatch* becomes *NewBatch_1*, *NewBatch_2*, etc.
- ▶ Save each reading into memory or store the average of a pre-defined number of readings using the Counted Average function.

8 DISPLAYING GRAPHS (MODEL T)

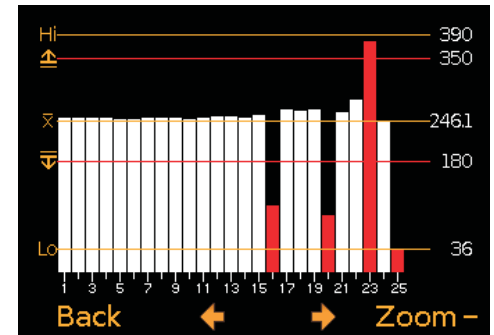
UN To display the trend graph of the last 20 readings:

- 1 Press the Batch softkey
- 2 Select “New Batch” or “Open Existing Batch”
- 3 Press the Stats softkey and select “Show Graph on LCD”.
 - ▶ Red points signify a reading outside the batch’s limits (if set).



To display the Batch Readings Graph:

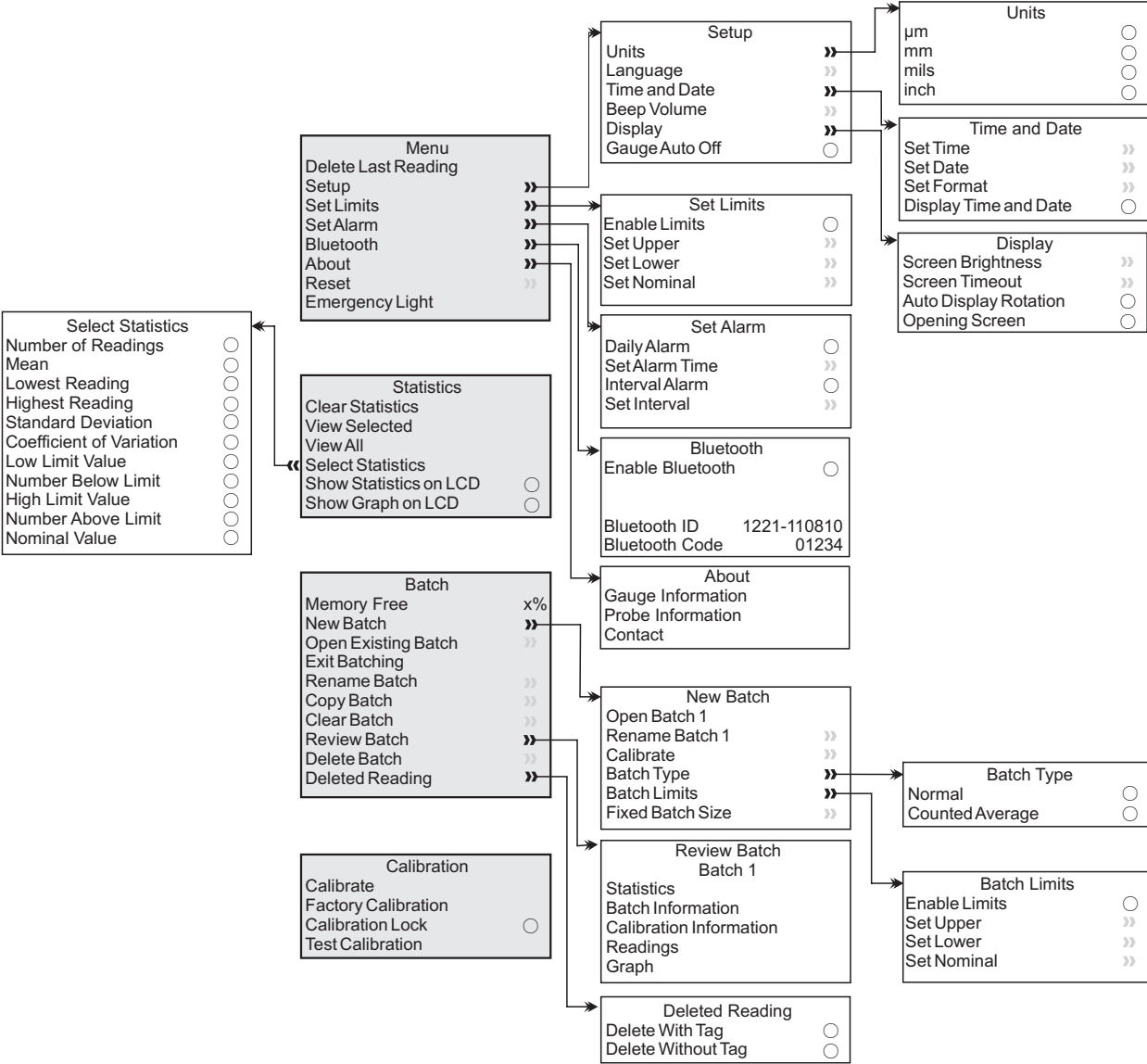
- 1 Select the appropriate batch name from Batch/Review Batch
- 2 Select “Graph”.
 - ▶ Red columns signify a reading outside the batch’s limits (if set).
 - ▶ Press the Zoom softkey followed by ← or → to review individual readings as required.



9 DOWNLOADING DATA & UPGRADING YOUR GAUGE

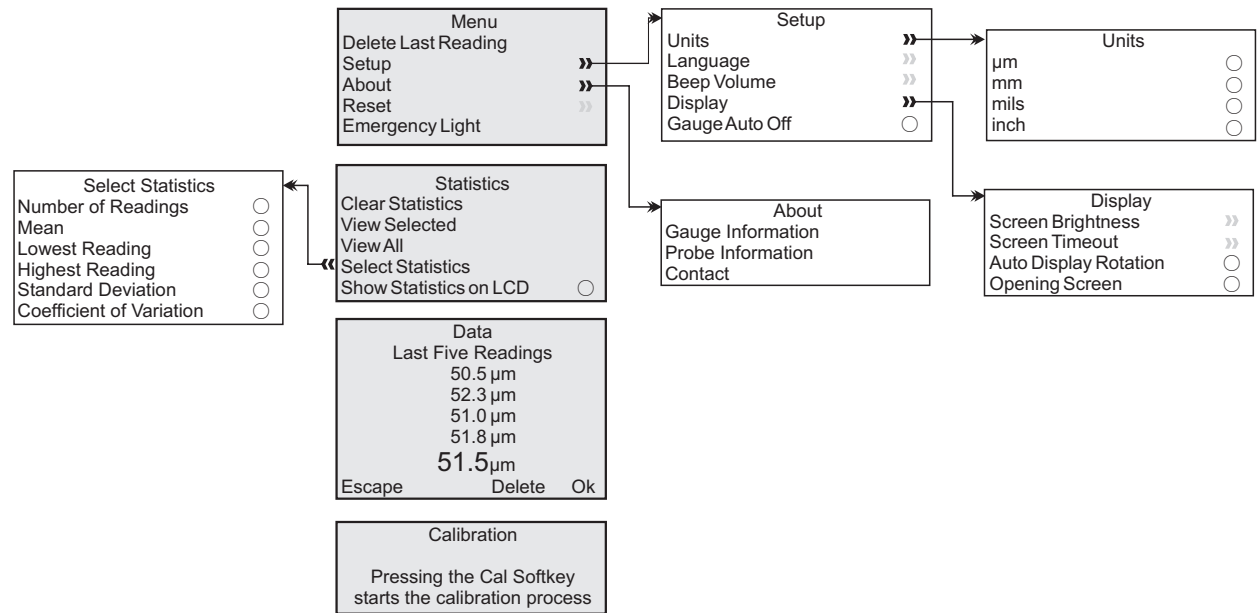
- 1 Using ElcoMaster™ 2.0 - supplied with the Elcometer 224 Model T, and available as a free download at elcometer.com - all gauges can transmit readings to a PC for archiving and report generation. Data can be transferred via Bluetooth® (Model T) or USB
- 2 All Elcometer 224 gauge firmware can be upgraded to the latest versions, as they become available. Elcometer 224 B & T models can be upgraded by the User via ElcoMaster™ 2.0
- 3 ElcoMaster™ 2.0 will inform you of any updates when the gauge is connected to the PC with an internet connection.

10 MENU STRUCTURE - ELCOMETER 224 MODEL T



11 MENU STRUCTURE - ELCOMETER 224 MODEL B

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12 ADDITIONAL INFORMATION

Battery Type		2 x AA batteries, rechargeable batteries can also be used	
Operating Temperature		-10 to 50°C (14 to 122°F)	Relative Humidity 0 to 95%
Gauge Dimensions (h x w x d)	Integral	16.8 x 7.30 x 3.70cm (5.61 x 2.87 x 1.46")	Gauge Weight with supplied batteries
	Separate	14.1 x 7.30 x 3.70cm (5.55 x 2.87 x 1.46")	
Can be used in accordance with: ASTM D 4417-B, SANS 5772, US Navy NSI 009-32, US Navy PPI 63101-000			