



TESA
TECHNOLOGY

User Manual

TESA RUGO-SURFACE

ROUGHNESS GAGE

06930016: RUGO-SURFACE

06930017: RUGO-SURFACE BT



Version 1, February 2026

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ME69.77177








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1 INTRODUCTION

1.1 Acknowledgments	<p>Dear user,</p> <p>Thank you for choosing TESA as your metrology partner. We appreciate your trust in purchasing this high-end equipment.</p> <p>Everyone at TESA extends a warm welcome to you – you are now part of our large family of TESA product users.</p> <p style="text-align: right;">Your TESA team</p>						
1.2 Warning	<p>All technicians or operators are required to read this quick start manual before installing, using, or performing any maintenance on this instrument. Non compliance with certain instructions or recommendations may result in malfunctions or the instrument failing to operate.</p>						
1.3 Copyright (document)	<p>The contents of this document are subject to change without notice. All rights reserved ©2026 TESA SARL and/or its subsidiaries and qualified representatives.</p> <p>The French version serves as the reference language. All other language versions are simply translations of the original French version.</p>						
1.4 Preamble	<p>The TESA RUGO-SURFACE is the result of more than 80 years of experience in the conception and manufacture of high-precision measuring equipment. It has been designed to meet the needs of a production environment and to offer its users an affordable, fast and accurate way to check the roughness of small or large workpieces in workshops or laboratories.</p> <p>This document describes in detail the different processes and procedures to follow for quick and easy operation of the TESA RUGO-SURFACE roughness gage.</p>						
1.5 Symbols	<p>Different types of symbols are used in this manual. They indicate important information that has to be taken into account to correctly use the measuring instrument.</p> <table border="1" data-bbox="512 1391 1388 1715"> <thead> <tr> <th data-bbox="512 1391 649 1458">Position</th> <th data-bbox="649 1391 1388 1458">Description</th> </tr> </thead> <tbody> <tr> <td data-bbox="512 1458 649 1581">  </td> <td data-bbox="649 1458 1388 1581"> Non compliance with these instructions can lead to incorrect measurement results. </td> </tr> <tr> <td data-bbox="512 1581 649 1715">  </td> <td data-bbox="649 1581 1388 1715"> Indicates a tip for more efficient use. </td> </tr> </tbody> </table>	Position	Description		Non compliance with these instructions can lead to incorrect measurement results.		Indicates a tip for more efficient use.
Position	Description						
	Non compliance with these instructions can lead to incorrect measurement results.						
	Indicates a tip for more efficient use.						

2 INTRODUCTION

2.1 General description

The RUGO-SURFACE roughness tester is an instrument for surface analysis that is unique in its category, combining roughness and profile measuring in a single instrument, with no need for a desktop computer to analyze the results.

The high-contrast, 7-inch color touchscreen is equipped with a modern interface and easy-to-use symbols for straightforward navigation. All new users will be fully operational from the start.

The integrated rechargeable battery enables the instrument to combine maximum mobility with autonomy, which makes it easy to take measurements directly on the workpiece without the need for cables.

The probe that comes with the instrument can measure profiles with a Z-axis measurement range of up to 3 mm. A special probe can extend the measuring range up to 20 mm, providing groundbreaking profile measurement performance for an instrument that combines both roughness and profile measurement.

The non-contact probe supplied with the instrument is used for measuring the primary profile, the roughness profile, and the waviness profile. 95 parameters are available according to ISO 3274, ISO 4287, ISO 12085, and ISO 21920.

The interchangeable optical probe can be rotated by 90° to enable transverse measurement.

A magnetic support allows the probes to be fixed in place and ensures reliability and safety in the event of accidental impact. The probe is automatically released from its support to prevent damage.

The calibration of 6 different configurations of the Probe holder + stylus can be saved for the rapid exchange of measuring configurations without having to carry out a new calibration.

The wide traversing range of 60 mm on the X-axis enables great flexibility in terms of measuring position.

Great flexibility of positioning for measuring parts with small or large dimensions by means of an integrated micrometric system with a usable Z stroke of 110 mm.

Static roughness measurement on rotating systems operating at constant speed, for large or cylindrical parts.

Automatic detection of the surface roughness of the part to determine the best measurement settings.

The USB interface allows images of the content displayed on the screen to be saved, or measurement reports to be saved in Excel or PDF format.

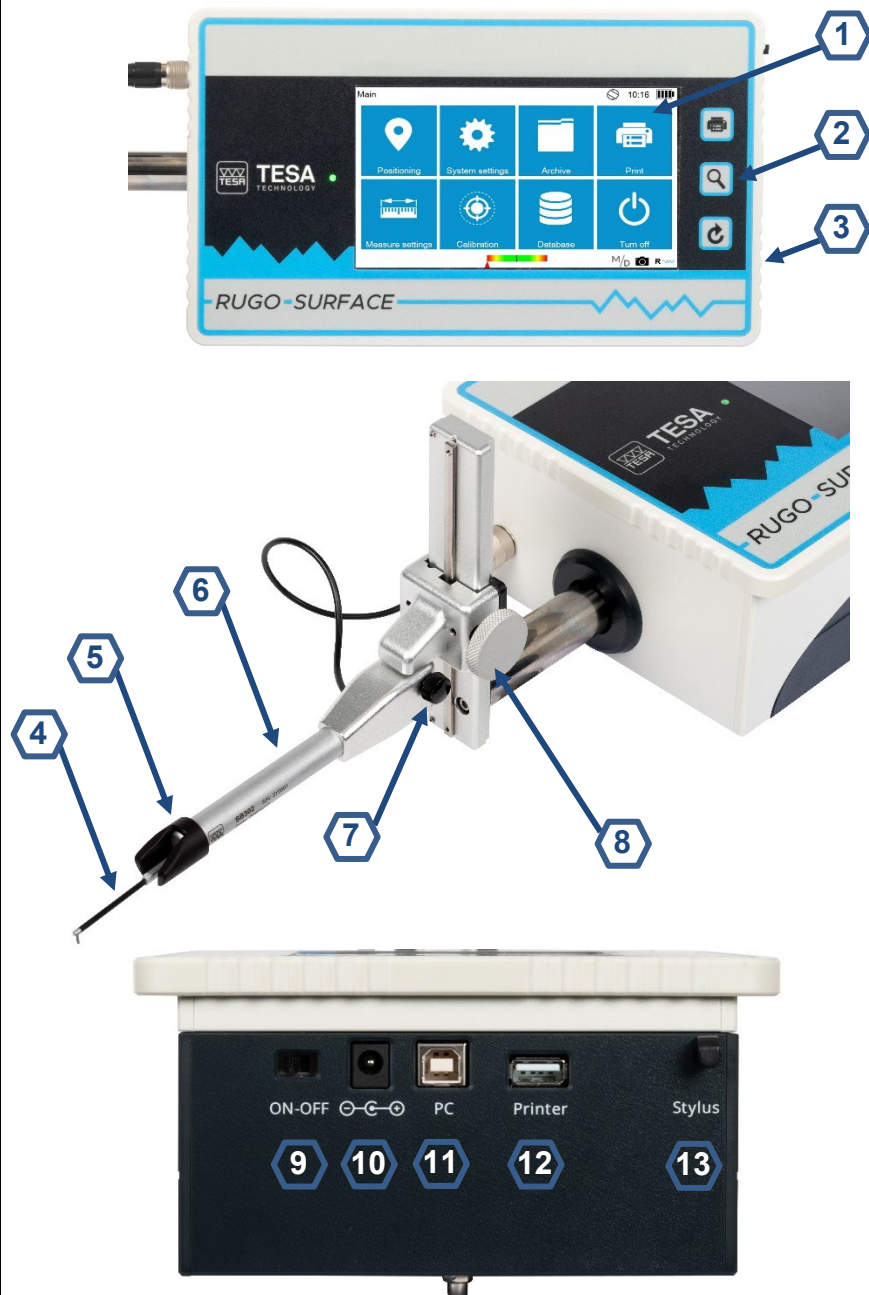
The instrument is compatible with industry-standard desktop printers for detailed printing on A4 paper.

The Bluetooth® version allows wireless connection to a portable printer.

A powerful internal 1 GHz microprocessor for the WINDOWS CE operating system enables the rapid processing of complex profiles.




2.2 Overview of the control elements

No.	Description
1	Display
2	Keyboard
3	Aluminum base
4	Stylus
5	Protection
6	Probe head
7	Locking screw for probe head
8	Micrometric support for adjusting the height of the stylus
9	ON/OFF switch
10	Connector for power supply
11	USB-B (PC)
12	USB-A (USB flash drive, printer)
13	Stylus for touchscreen



2.3 Overview of keyboard and display




	<p>Print button Press to start printing (the printer must be configured beforehand).</p>
	<p>Visualization button Press to view the last measurement taken.</p>
	<p>START/STOP button Press to start a new measurement. Press to stop the active measurement.</p>

2.4 Switching the instrument on and off

A switch on the side of the instrument is used to switch it on.

The instrument automatically switches off 5 minutes after the last operation (30 minutes if connected by Bluetooth®).

 **If the instrument is switched off using the ON/OFF switch, the date setting disappears.**

2.5 Transverse measurement

The articulated probe holder allows the probe to be rotated through 90° for inspection of the bases of the groove.
The transverse measurement can be used to reach surfaces that are not accessible using the standard axis.

To align the probe, unscrew the fixing screw of the Probe holder (Pos. 3 in section 2.2) to enable the Probe holder to rotate freely.
The screw can be screwed in from both sides depending on the alignment of the probe.

3 TECHNICAL SPECIFICATIONS

Part number	TESA RUGO-SURFACE, no. 06930016 TESA RUGO-SURFACE BT, no. 06930017
Standards	According to ISO 3274 - ISO 4287 - ISO 12085 – ISO 21920
Measured parameters (94 roughness parameters) <ul style="list-style-type: none"> • Roughness parameters • Waviness parameters • Primary profile parameters • Central profile parameters • Dominant waviness parameters 	<p>Parameters according to ISO 3274/ISO 4287/21920:</p> <p>Ra – Rz – Rq – Rp – Rv - Rt - Rsk – Rku – RSm – Rc – RΔq – Rdq – RΔa – Rda – Rmax – R_{PC} - R_{δc} – Rdc - Rmr (c) – Rmc (c) - Rlr – Rlo – RHSC – R3z – Rmr Rel – Rcm (p) - Hp – Ep</p> <p>Wa – Wz – Wq – Wp – Wv – Wt – Wsk – Wku – WSm – Wc – WΔq – Wdq – W_{PC} – W_{δc} – Wdc – WLo – Wlr – WHSC</p> <p>Pa – Pq – Pp – Pv – Pt – Psk – Pku – PSm – Pc – PΔq - Pd_q – PPC – P_{δc} - Pdc – Plo – Plr – PHSC</p> <p>Rk – Rpk – Rvk - A1 -Rak1 – A2 – Rak2 - Mr1 – Rmrk1 – Mr2 - Rmrk2 - Rpk* - Rvk*</p> <p>WDt – WDc - WDSm</p> <p>Parameters according to ISO 12085:</p> <p>R – AR – Rx</p> <p>W – AW – Wx – Wte</p> <p>Pt</p> <p>Rke – Rpke – Rvke - A1e – A2e – Mr1e – Mr2e</p>
Measuring range (μm)	Ra 0 to 200 μm Rt 0.05 to 600 μm
Total length (X)	(Number of cut-offs + 1) x Lc (maximum 48 mm)
Evaluation length (X)	Number of cut-offs x Lc
Traversing length (X)	Up to 60 mm
Filter λs	Λc/λs: 2.5 – 8 – 25 (acc. to ISO 3274)
Resolution	0.0001 μm/0.0001 μinch
Cut-off length Lc	<p>Cut-off length (mm): 0.08 – 0.25 – 0.8 – 2.5 – 8 mm (Acc. to ISO 4287 and ISO 21920)</p> <p>Pattern A/B (mm): 0.02 – 0.1 / 0.1 – 0.5 / 0.5 – 2.5 / 2.5 – 12.5 (acc. to ISO 12085)</p>
Number of cut-offs	1 to 20 (for cut-off 8 mm from 1 to 6)

Electronic filter	GAUSS in compliance with ISO 16610-21		
Max. permissible error, roughness	0.025 μm + (4% R), R = roughness in μm		
Measuring range, Z-axis, profile	3 mm with Probe holder SB302 + stylus 1-Y (roughness and profilometry) 3 mm with Probe holder SB302 + stylus 4-S (roughness and profilometry) 20 mm with Probe holder SB402 + stylus 8-S (profilometry)		
Max. permissible error, profile	<table border="0"> <tr> <td>3 mm range: (SB302 + stylus 4-S) X-axis: $\pm(3.5 \mu\text{m}+L/10)$, L in mm Z-axis: $\pm(4 \mu\text{m}+H)$, H in mm Angle of traceability: 80° upward 70° downward</td> <td>20 mm range: (SB402 + stylus 8-S) X-axis: $\pm(3.5 \mu\text{m}+L/10)$, L in mm Z-axis: $\pm(4 \mu\text{m}+0.2 H)$, H in mm Angle of traceability: 80° upward 70° downward</td> </tr> </table>	3 mm range: (SB302 + stylus 4-S) X-axis: $\pm(3.5 \mu\text{m}+L/10)$, L in mm Z-axis: $\pm(4 \mu\text{m}+H)$, H in mm Angle of traceability: 80° upward 70° downward	20 mm range: (SB402 + stylus 8-S) X-axis: $\pm(3.5 \mu\text{m}+L/10)$, L in mm Z-axis: $\pm(4 \mu\text{m}+0.2 H)$, H in mm Angle of traceability: 80° upward 70° downward
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Probe system	Inductive Height adjustment up to 110 mm Can be rotated 90° for lateral measurements Stylus with interchangeable magnetic system		
Diamond shape	90° diamond – 2 μm radius – Y style 60° diamond – 2 μm radius – R style 12° angle chisel – 20 μm radius – S style		
Measuring force	0.75 mN (acc. to ISO 3274)		
Displacement speed	0.0 – 0.25 - 0.5 – 1 mm/s (in measuring and positioning mode) (0.0 mm/s for vibration measurement)		
Keyboard	Three-button touchscreen keyboard with IP67-rated protection against dust particles and oil splashes		
Languages available	English, French, German, Italian, Spanish, Portuguese, Russian, Czech, Japanese, Korean, Chinese		
Display	7-inch color TFT touchscreen		
Graphics displayed	Roughness, waviness, dominant primary waviness, pattern, Abbott curve and coordinated distribution		
Integrated functions for the CAD processing of profiles	- Coordinates: Cartesian – On the profile – At an intersection – End point – Maximum – Minimum - Lines: Best fit – Polar – Discontinuous – Between two or more points – Parallel		

User Manual for RUGO-SURFACE

	<p>- Arcs: Best-fit – Discontinuous – For three or more points – Center and radius – Tangent</p> <p>- Coordinates: Aligned coordinates – Vertical – Horizontal – Radius – Angle – Straight line distance</p> <p>- Advanced: Horizontal or vertical reference, scale factor of Z-axis.</p>
Power supply, battery	<p>12 V battery, 3000 mAh</p> <p>NiMH type</p> <p>Main power supply 100-240 V, 50/60 Hz</p> <p>Battery charger, 18 V/3.3 A</p>
Operating temperature	+15 to +30 °C
Storage temperature	-10 to +50 °C
Time to fully recharge battery	2 hours
Battery life	Approximately 1000 measurements (0.8x5)
Internal memory	<p>< 4000 roughness measurements</p> <p>< 1000 profile measurements</p>
Connector	<p>USB Type B (PC)</p> <p>USB Type A (printer)</p>
Printer	<p>Integrated PDF printer</p> <p>External printer, e.g. type HP or EPSON</p> <p>Portable USB or wireless printer (Article no. 06960090)</p>
Dimensions	320 x 160 x 85 mm (roughness gage only)
Weight	3300 g
Packaging	Plastic case
Origin	EU

4 DELIVERY DETAILS

4.1 System components

Each configuration is made up of the following elements:

Designation
Portable roughness gage RUGO-SURFACE
Probe holder SB302 Article number 06960207
Stylus 1-Y Article number 06960200
Main charger Article number 056639AFM
Power cord with EU plug
Roughness specimen Ra = 2.97 µm Article number 06960041
Micrometric support
Key for tightening the micrometric support
Stylus for touchscreen
Contents of the USB flash drive: <ul style="list-style-type: none"> • CE certificate • Product information • User Manual • Test report
Fastening for protection during transport
Carrying case




4.2 Packaging

Keep the packaging materials that came with your RUGO-SURFACE. They are very important and must be stored. This is because the instrument must always be transported in its original packaging to prevent any accidental damage that could cause it to malfunction or even render it completely unusable.



Please use the fixing bracket for transport over long distances. This fixing mechanism prevents damage to the internal parts of the roughness gage.

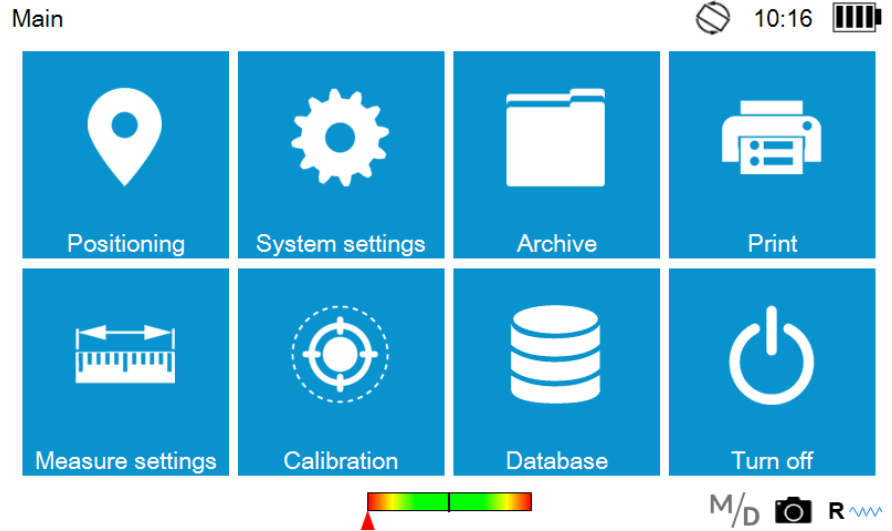
5 INSTALLATION, SECURITY AND MAINTENANCE

<p>5.1 Location</p>	<p>The instrument must be installed in a location that satisfies the general requirements, as well as the very specific conditions relating to the environment, the power supply, and other factors. It is therefore essential to identify the important factors and prepare the installation and operating area correctly.</p>
<p>5.2 Place of use</p>	<p>To ensure correct use, please take the following precautions into account:</p> <ul style="list-style-type: none"> • Do not place the instrument near a window, door, air conditioner, or heat source. • Do not expose the instrument to direct sunlight, as this can cause recurrent temperature variations.
<p>5.3 Lighting</p>	<p>Use indirect or fluorescent light. Do not expose the instrument to direct sunlight or other bright light.</p>
<p>5.4 Recycling</p>	<p>Do not dispose of this type of equipment with household waste. Comply with the regulations governing electronic equipment at the end of its useful life.</p> 
<p>5.5 Measuring surface</p>	<p>Choose a measuring surface as free as possible from vibrations that could cause errors in measurement or reading, despite the stability of the mechanical and electronic components.</p> <p>Make sure that the selected surface can support the weight of the machine and the part to be measured. Ideally, the surface should be free from cracks and joints.</p>
<p>5.6 Cleanliness</p>	<p>Make sure that the measuring surface is clean, i.e., free of dust, condensation, and metal shavings.</p>
<p>5.7 Vibrations</p>	<p>Workplace floors are constantly subject to vibrations for a variety of reasons: CNC machines, presses, transport vehicles, and all other sources of vibration. These vibrations can directly influence the metrological performance of the instrument.</p>

6 FUNCTIONS

6.1 Main display

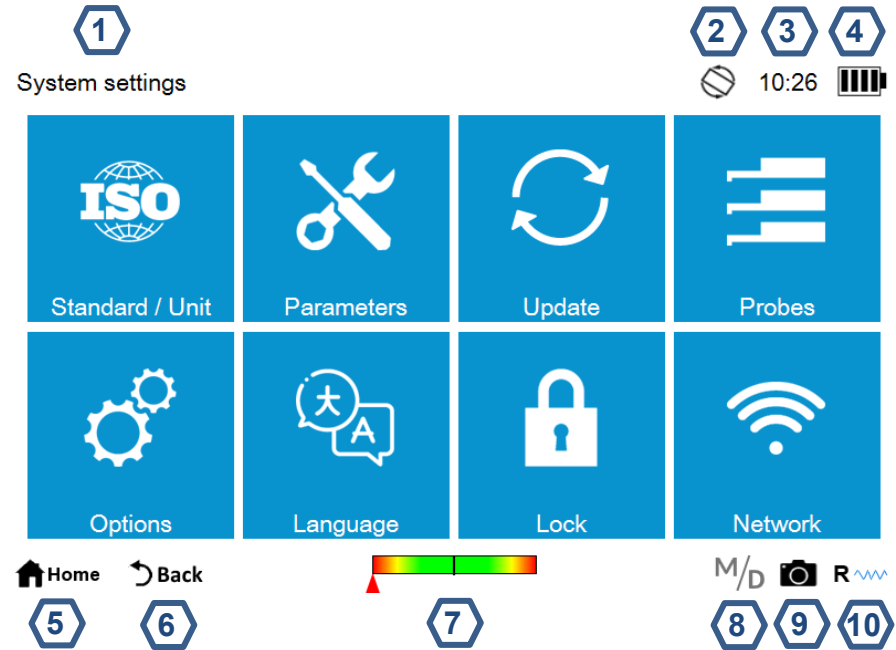
The following home screen displays the various menus available on the instrument.



Menu	Description of the menus on the home screen
Positioning	Positioning of the probe Manual displacement of the probe along the X-axis
System settings	Different settings of the instrument
Archives	History of recent measurements Measurements stored in memory
Print	Printer configuration
Measurement settings	Various parameters for setting the measurement
Calibration	Calibration of the instrument
Database	Access to the measurement programs (codes)
Turn off	Putting the instrument into standby

The display is made up of two horizontal strips: one in the upper area and one in the lower area. These areas contain several symbols that provide rapid access to certain functions of the system, as well as other symbols dedicated to navigating between displays and menus.

The following display shows the System settings menu. Press **System settings** to access.



No.	Description of quick access symbols
1	Display of the current screen title
2	Allows the display to be rotated by 180°
3	Display of the current time. Quick access to the Time and Date Settings menu
4	Display of the battery level or charge level when connected to the main power supply. Quick access to the System Information menu
5	Back to Home menu
6	Back to previous display
7	Display of the current position of the probe Quick access to the Positioning menu
8	Select automatic backup of the measurement in the archives or database
9	Take a screenshot of the active window and save the image to the USB flash drive.
10	Display of the current measuring mode Quick access to the Measure settings menu

6.2 Calibration in roughness gage mode

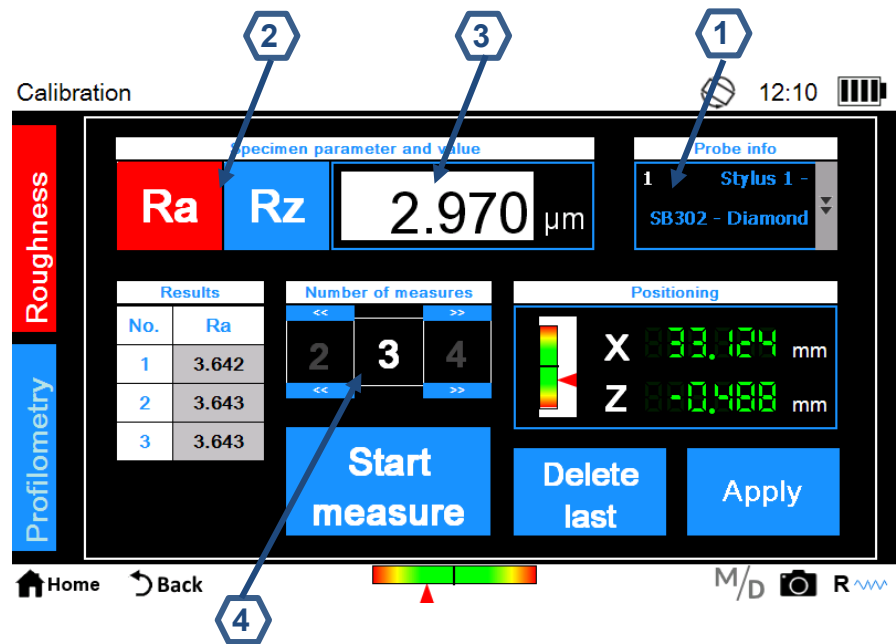


To access the calibration menu, select the **Calibration** symbol on the home screen.

Select **Roughness** mode at the left side of the window.

The selected configuration is displayed on a red background.

Please use the roughness specimen supplied with the instrument.



No.	Steps for calibrating roughness
1	Select the probe that is best suited to the roughness
2	Select the parameter used for calibration
3	Enter the value of the roughness specimen
4	Select the number of measurements to be carried out
5	Carry out each individual measurement by pressing the Start measure button <div style="text-align: center;">Start measure</div> Provided at least one measurement has been taken, the last measurement can be deleted by pressing the Delete last button <div style="text-align: center;">Delete last</div>
6	At the end of the calibration cycle, press the Apply button <div style="text-align: center;">Apply</div> to confirm and finalize the calibrating operation. The calibration is now saved for this particular hardware configuration.

6.3 Calibration in Profilometry mode

This step requires the following equipment:

- **For measuring profiles < 3 mm**
 - Profile standard 2.5 mm (06960208)
 - Probe holder SB302 (06960207) and stylus 4-S (06960205)
- **For measuring profiles < 20 mm**
 - Profile set 20 mm (06960210)
The profile set includes Probe holder SB402, stylus 8-S (06960206) and the Profile standard 15 mm (06960209)

The styluses used for the Profilometry mode are chisel-shaped (beveled edge) at 12° with a radius of 20°.

It is also possible to calibrate the instrument using the contents of the delivery, i.e. Probe holder SB302 (06960207) and stylus 1-Y (06960200). Attention: This configuration involves an undefined measuring error because the stylus is not chisel-shaped. When calibrating, use Profile standard 2.5 mm without the calibration step for the cylinder.




To access the Calibration menu, select the **Calibration** symbol on the home screen.

Select the **Profilometry** mode at the left side of the window.

The selected configuration is displayed on a red background.

STEP 1: Measurement of the roughness specimen

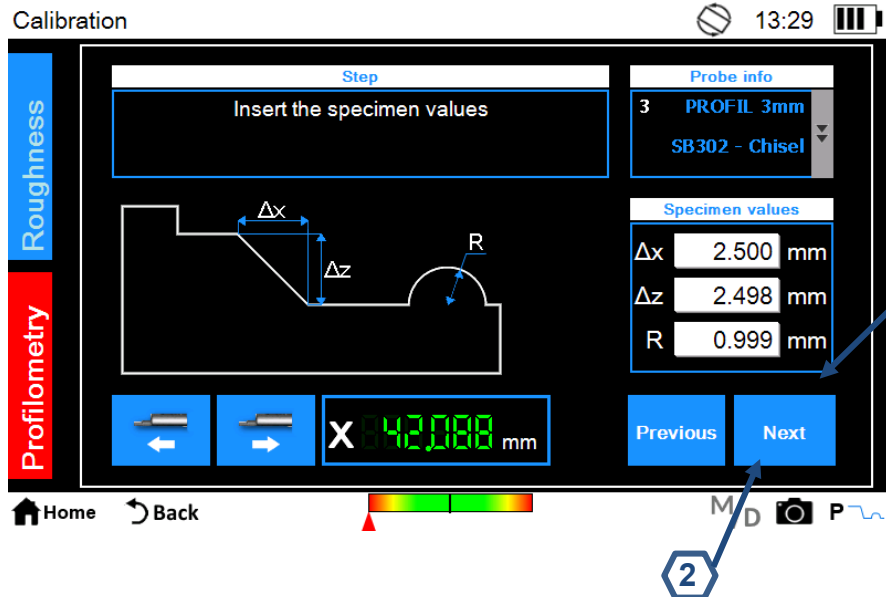
Please use the roughness specimen according to the configuration.


No.	STEP 1: Measurement of the roughness specimen
1	Select the probe that is best suited for profilometry
2	Enter the value of the roughness specimen
3	Place the probe on the roughness specimen, then press Next  to carry out the first step of the roughness calibration

STEP 2: Measurement of the profilometry specimen, insertion values

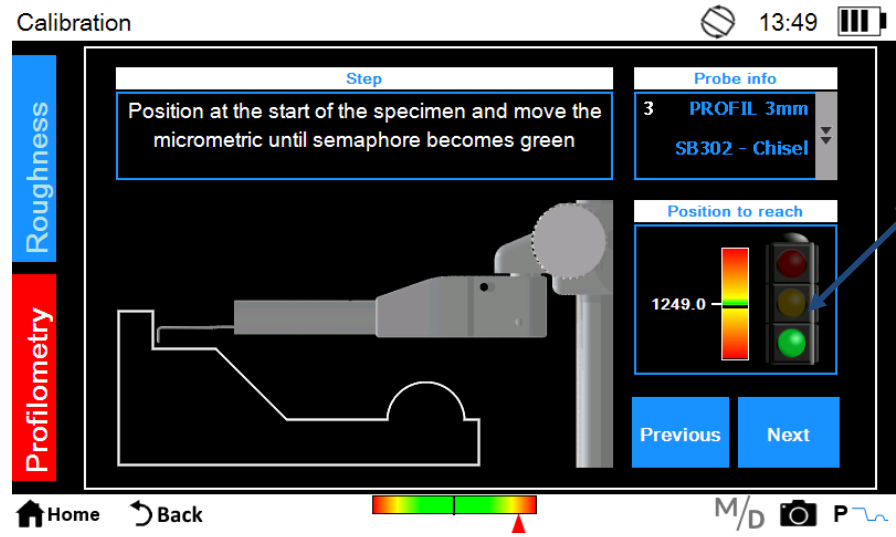
Please use the profilometry specimen according to the configuration:


- **For measuring profiles < 3 mm**
 - Profile standard 2.5 mm (06960208)
- **For measuring profiles < 20 mm**
 - Profile standard 15 mm (06960209)



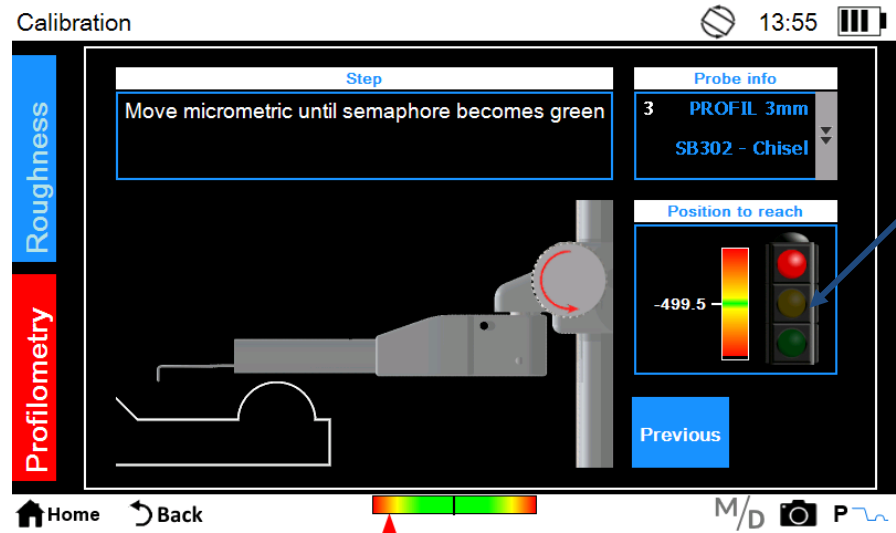
No.	STEP 2: Measurement of the profilometry specimen, insertion values
1	Enter the values given ΔX , ΔZ and R supplied with the specimen.
2	Press the Next button  .


STEP 3: Measurement of the profilometry specimen, upper level



No.	STEP 3: Measurement of the profilometry specimen, upper level
1	Position the probe on the profilometry specimen on the raised starting area.
2	Following the indicator on the display, turn the dial on the micrometer support counterclockwise until the indicator light (i.e. semaphore on graphic) turns green.
3	Press the Next button  . The instrument carries out the measurement.

STEP 4: Measurement of the profilometry specimen, lower level



No.	STEP 4: Measurement of the profilometry specimen, lower level
1	Following the indicator on the display, turn the dial on the micrometer support clockwise until the indicator light (i.e. semaphore on graphic) turns green.
2	Press the Next button  . The instrument carries out the measurement.
3	The instrument measures the area of the specimen containing the cylinder.

When the calibration is complete, a confirmation message appears to indicate that the procedure for calibrating the profile mode has been completed.

The calibration is now saved for this particular hardware configuration.

6.4 Adjusting the roughness measurement

The parameters for the measurement are configured by clicking on the

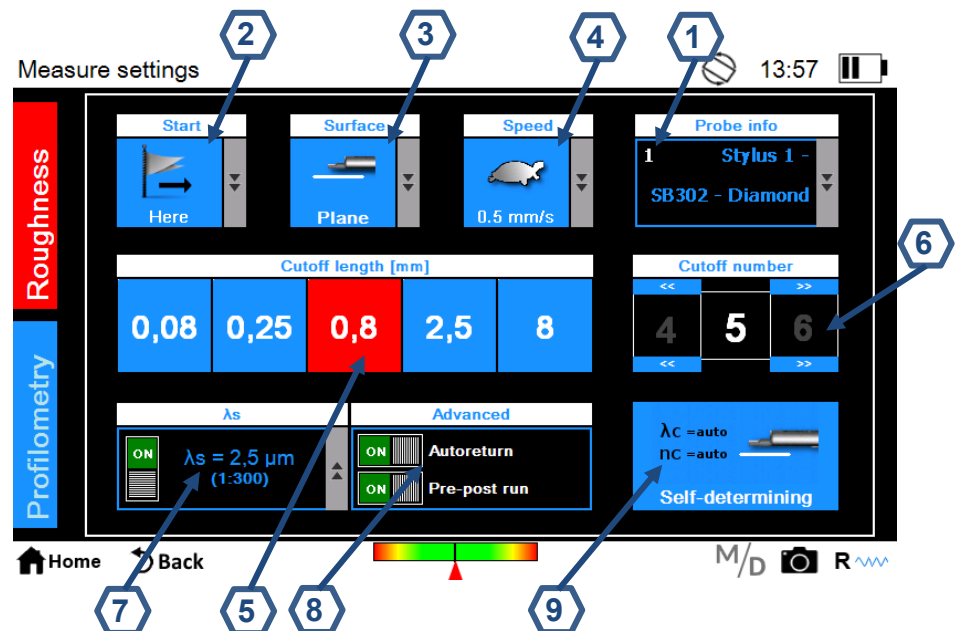


Measure settings button



Select the roughness mode or profilometry mode at the left side of the window.

The selected configuration is displayed on a red background.

If mode selected is **Roughness**, the following display appears.



No.	
1	Selecting the type of probe (Probe info) The different combinations of Probe holder and stylus are saved together with their latest calibration.
2	Selecting the starting point for the measurement (Start) The measurement can be started either from the current position or from the zero position, i.e., the far end of the X-axis.
3	Selecting the measuring surface (Surface) If the measuring surface is flat, select Flat (i.e. Plane in graphic). If the measurement surface is curved, select Curved .
4	Selecting the measuring speed (Speed) The available options are 0.25/0.5 or 1 mm/s The static speed of 0 mm/s allows the measurement of rotating parts. The rotational or translational speed of the part to be measured is required in this case.
5	Selecting the cut-off length (Cutoff length [mm]) The selected value appears on a red background. The available options are 0.08/0.25/0.8/2.5 or 8 mm

	 The cut-off length is only available with standards ISO 4287 and ISO 21920.
6	Selecting the number of cut-offs (Cutoff number) The available options range from 1 to 20, except for the cut-off length of 8 mm that is limited to 6.
	 The number of cut-offs is only available with standards ISO 4287 and ISO 21920. The number of cut-offs generally selected is 5. If this length is too long due to a lack of space, the number of cut-offs used for the measurement can be reduced.
7	Selecting the lambda filter S (λ_s) The lambda filter S can be deactivated.
8	Selecting Advanced Choice of activating an automatic return (Autoreturn) to the starting position at the end of the measurement Choice of activating the pre-run (Pre-post run) at the start and end of the measurement.
9	Selecting automatic determination of the roughness (Self-determining) Automatic determination is an advanced function that automatically estimates the value of the RSm parameter and the cut-off length to be used (according to the standard ISO 4288)

Measuring condition: R-parameter							
ISO4288: '96							
Non-periodic profile				Periodic profile or RSm		Measuring Condition	
Ra, Rq, Rsk, Rku or RΔq		Rz, Rv, Rp, Rc, or Rt				Sampling length: $\ell_r =$ CutOff λ_c (mm)	Evaluation length ℓ_n (mm) = $5 \times \ell_r$
Ra (μm)		Rz (μm)		RSm (mm)			
Over>	Less≤	Over>	Less≤	Over>	Less≤		
0.006	0.02	0.025	0.1	0.013	0.04	0.08	0.4
0.02	0.1	0.1	0.5	0.04	0.13	0.25	1.25
0.1	2	0.5	10	0.13	0.4	0.8	4
2	10	10	50	0.4	1.3	2.5	12.5
10	80	50	200	1.3	4	8	40

Conditions for measuring roughness according to the standard ISO 4288

6.5 Adjusting the profile measurement

The parameters for the measurement are configured by clicking on the

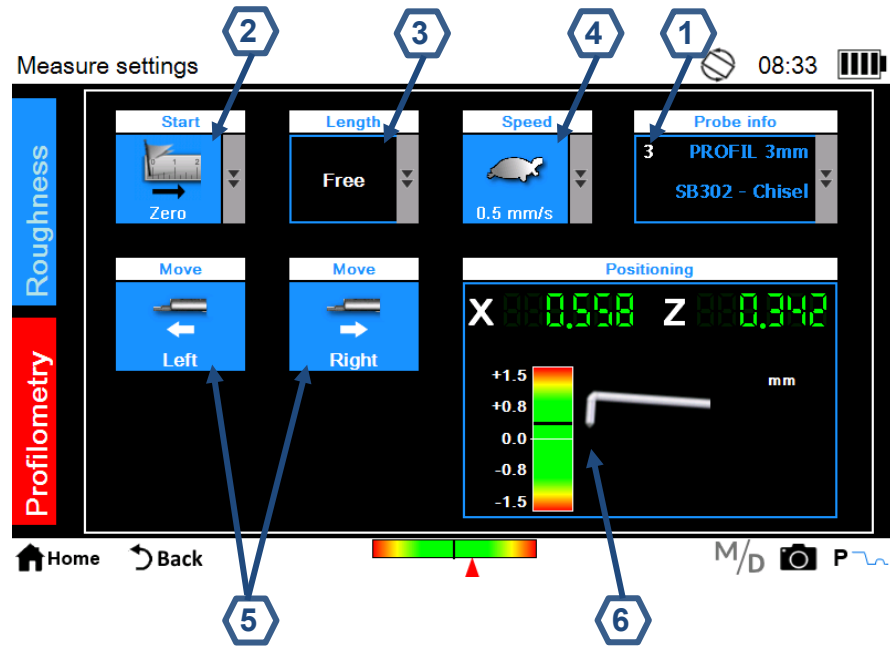


Measure settings button

Select the roughness mode or profilometry mode at the left side of the window.

The selected configuration is displayed on a red background.

If the mode selected is **Profilometry**, the following display appears:



No.	
1	Selecting the type of probe (Probe info) The different combinations of Probe holder and stylus are saved together with their latest calibration.
2	Selecting the starting point for the measurement (Start) The measurement can be started either from the current position or from the zero position, i.e., the far end of the X-axis.
3	Selecting the measuring length (Length) The measuring length can be defined either as a distance in mm or as a free length. If the measuring length is a free distance, the operator must press the Start measure button again to stop the measurement.
4	Selecting the measuring speed (Speed) The available options are 0.25 or 0.5 mm/s
5	Horizontal movement (X-axis) of the translation unit
6	Visualization of the position of the X-axis and the Z-axis (Positioning)

6.6 Analysis of roughness measurement results

The menu of the results for the roughness measurements is displayed automatically at the end of each measurement or after a measurement has been loaded from the archives or database.

If the results of a measurement have already been loaded into memory and the user is in another menu, it is possible to return to the measurement




results display at any time by clicking on the visualization button

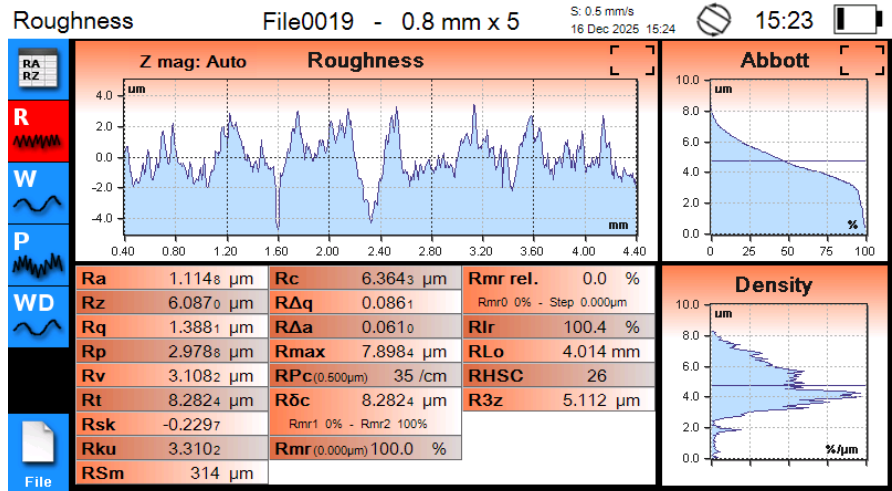
Roughness File0019 - 0.8 mm x 5 S: 0.5 mm/s 16 Dec 2025 15:23

RA	Ra 1.114 ₈ μm	Rmr rel. 0.0 %	WPC(0.500μm) 4 /cm	Pδc 14.845 ₈ μm
RZ	Rz 6.087 ₀ μm	Rmr0 0% - Step 0.000μm	Wδc 9.770 ₈ μm	Rmr1 0% - Rmr2 100%
R	Rq 1.388 ₁ μm	Rlr 100.4 %	WLo 4.000 mm	PLo 4.828 mm
W	Rp 2.978 ₈ μm	RLo 4.014 mm	Wlr 100.0 %	Plr 100.4 %
P	Rv 3.108 ₂ μm	RHSC 26	WHSC 2	PHSC 14
WD	Rt 8.282 ₄ μm	R3z 5.112 μm	Pa 3.032 ₃ μm	Rk 3.877 ₅ μm
File	Rsk -0.229 ₇	Wa 2.461 ₀ μm	Pq 3.551 ₇ μm	Rpk 1.115 ₅ μm
	Rku 3.310 ₂	Wz 5.486 ₀ μm	Pp 7.425 ₈ μm	Rvk 2.410 ₈ μm
	RSm 314 μm	Wp 3.589 ₉ μm	Pv 7.420 ₀ μm	A1 61.203 ₂ μm ²
	Rc 6.364 ₃ μm	Wq 2.812 ₀ μm	Pt 14.845 ₈ μm	A2 86.165 ₂ μm ²
	RΔq 0.086 ₁	Wv 1.896 ₁ μm	Ps 0.104 ₄	Mr1 11.0 %
	RΔa 0.061 ₀	Wt 9.770 ₈ μm	Psk 0.104 ₄	Mr2 92.9 %
	Rmax 7.898 ₄ μm	Wsk 0.522 ₅	Pku 1.997 ₂	Rpk* 2.023 μm
	RPc(0.500μm) 35 /cm	Wku 1.844 ₄	PSm 878 μm	Rvk* 3.167 μm
	Rδc 8.282 ₄ μm	WSm 2666 μm	Pc 8.748 ₃ μm	WDt 6.018 ₁ μm
	Rmr1 0% - Rmr2 100%	Wc 3.688 ₅ μm	PΔq 0.088 ₂	WDC 3.486 ₇ μm
	Rmr(0.000μm) 100.0 %	WΔq 0.009 ₅	PPc(0.500μm) 16 /cm	WDSm 910 μm

Home Back M/D R W

No.	
1	Selecting the parameter display mode
2	Selecting the roughness profile display mode (R)
3	Selecting the display mode for the waviness profile (W)
4	Selecting the display mode for the primary profile (P)
5	Selecting the display mode for the dominant waviness (WD)
6	Activating the list of symbols for managing the process of exporting data
	Save the measurement in memory
	Save the measurement in a code
	Export the measurement in EXCEL format
	Print the measurement in the selected format

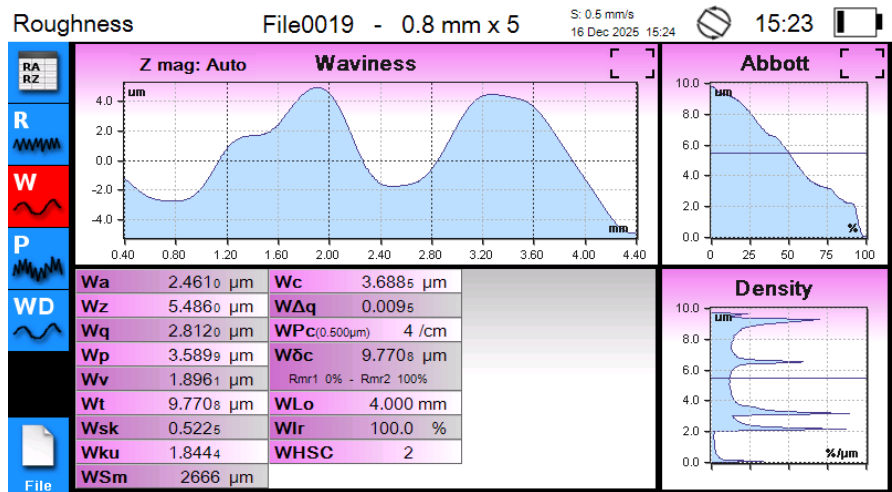

Recalculate the results (if measuring parameters have changed)



Home Back

M/D  R 

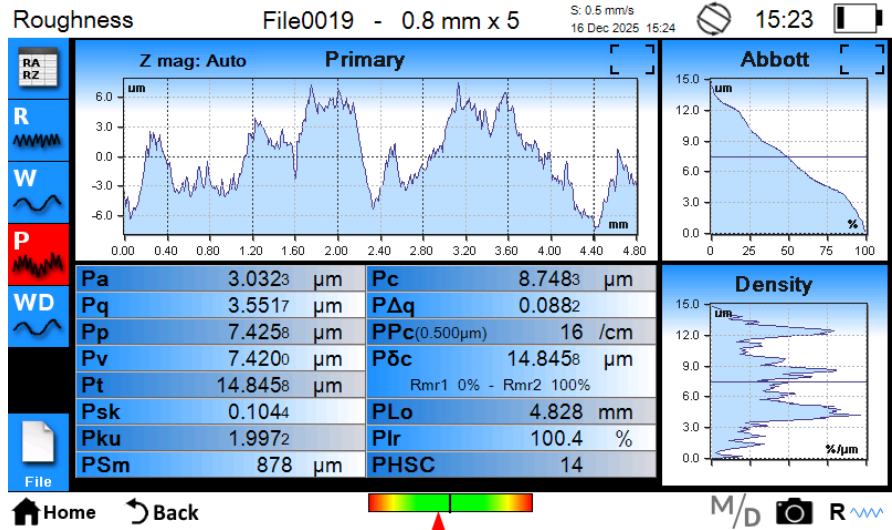
Selecting the roughness profile display mode (R)



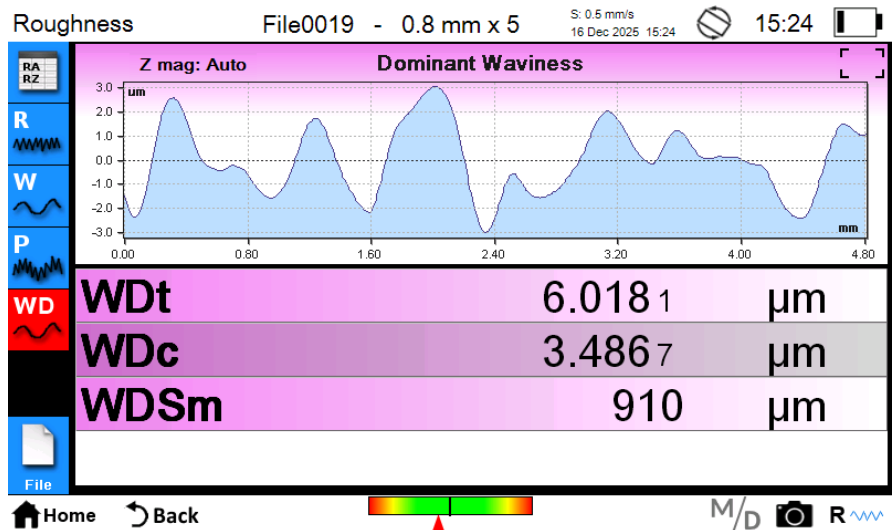
Home Back

M/D  R 

Selecting the display mode for the waviness profile (W)



Selecting the display mode for the primary profile (P)




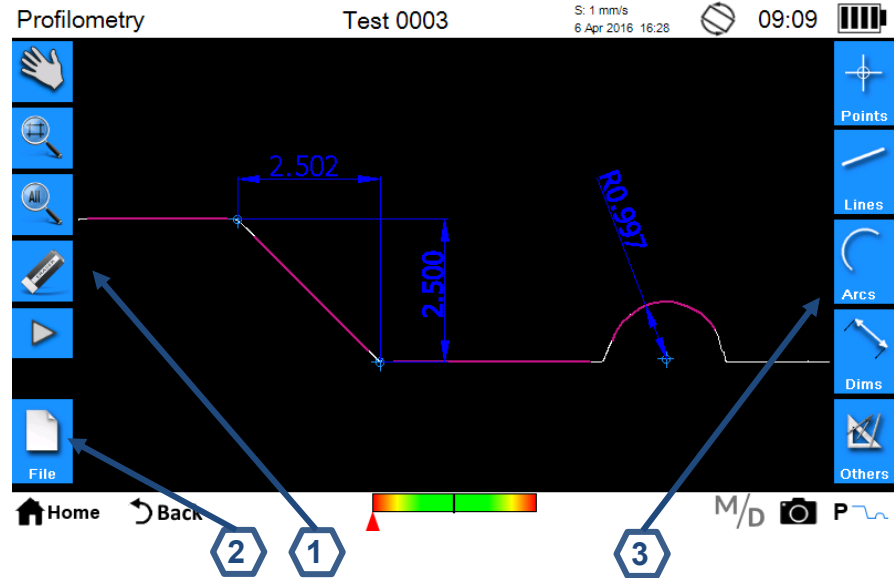
Selecting the display mode for the dominant waviness (WD)













6.7 Analysis of profile measurement results

The results menu for the profile measurements is displayed automatically at the end of each measurement or after a measurement has been loaded from the archive or database.

If the results of a measurement have already been loaded into memory and the user is in another menu, it is possible to return to the measurement

results display at any time by clicking on the visualization button .




No.		
1	General tools	
		Selecting the dragging mode for moving through the profile
		Selecting the zoom profile mode
		Selecting the profile preview mode
		Deleting a selected entity
		Activating a list of additional symbols for managing cancellation and restoration operations
		Activating the list of symbols for managing the process of exporting data
2	Activating the list of symbols for managing the process of exporting data	
		Save the measurement in memory
		Save the measurement in a code
		Export the measurement in EXCEL format
		Export the measurement in DXF format
		Export the measurement in ASC format
		Print the measurement in the selected format

3 Tools for analyzing the profile for inserting onto the profile

	Point-type insertions (Points)
	Line-type insertion (Lines)
	Arc-type insertion (Arcs)
	Dimensions-type insertion (Dims)
	Insertion of additional functions (Others) <ul style="list-style-type: none"> • Horizontal or vertical reference • Scale factor of the Z-axis • Suppression of insertions on the profile

6.8 Archive management

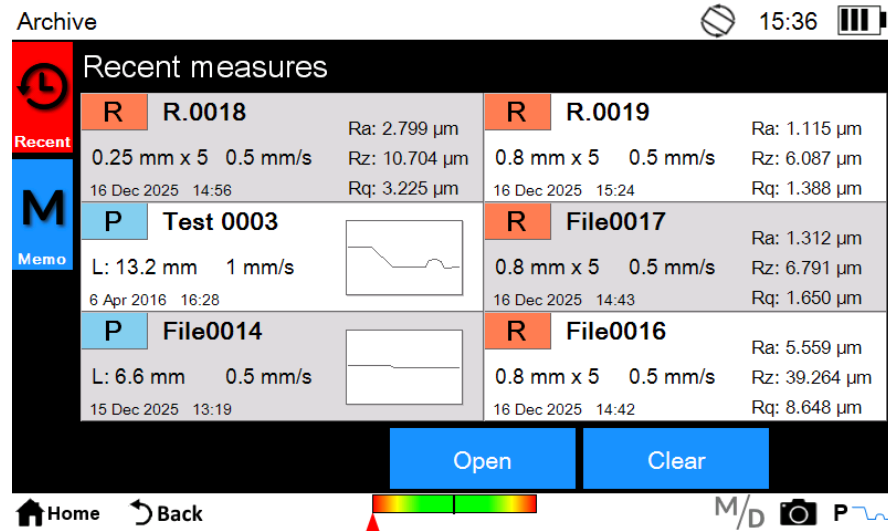
To access the Archive management menu, select the **Archive** symbol  on the home screen.

Two selections are available from the **Archives**:


- **Recent**: Last 6 measurements taken
- **Memo**: Measurements recorded

Select **Recent** mode at the left side of the window.

The selected configuration is displayed on a red background.



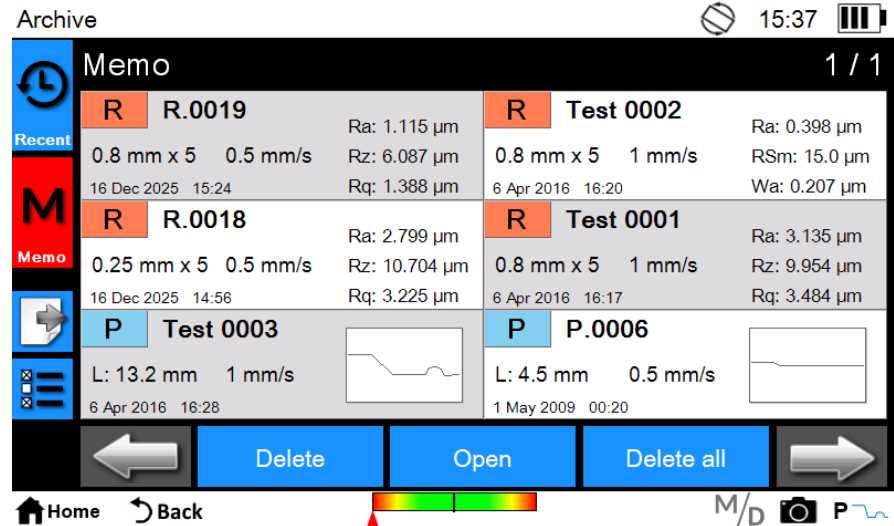
To open a measurement, select the required measurement and click on the **Open** button or double-click directly on the required measurement.

 The list of recent measurements can contain a maximum of 6 measurements. Each time data from previously saved measurements or newly acquired measurements are saved, these data are moved to the top of the list, and the following entries are all shifted down one position. This deletes the last preceding entry from the list, and

if it has not been saved previously, it is also physically deleted from the archives.


Select **Memo** mode at the left side of the window.


The selected configuration is displayed on a red background.



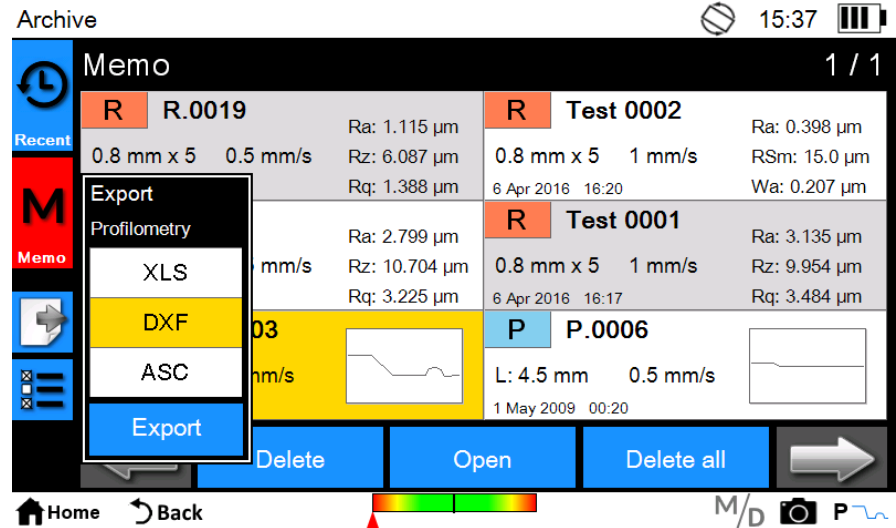
To open a measurement, select the required measurement and click on the **Open** button or double-click directly on the required measurement.

The recorded measurements are displayed in groups of 6. Use the arrows to move between pages if more than 6 measurements have been recorded.


The  button can be used to send the measurement to the USB flash drive in EXCEL format.

One or more measurements can be selected using the  button.

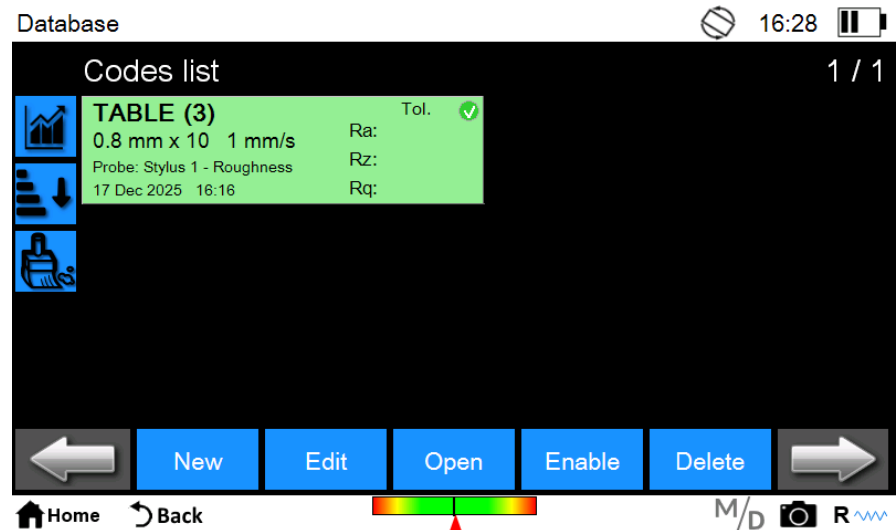
If a profile measurement is selected, the measurement can be exported in the following formats: XLS/DXF/ASC.




6.9 Database management/Code creation




To access the archive management menu, select the **Database** symbol  on the home screen.

A code is a saved measuring program that the user can recall at any time. It contains the required measurement parameters.



Creating a new code/measuring program

 **A code is a saved measuring program that the user can recall at any time. It contains the required measurement parameters.**


1. Define the measurement parameters in the **Measure settings** menu  and define the parameters of roughness to be measured in the **System settings** menu  and the **Parameters** submenu .

2. Click on the **Database** menu  on the home screen.

3. Press New  to create the new code.



Attention: The measurement parameters must have been set before this step.

4. After each measurement, press the  button to save the measurement in the code.

Activation of a code from the list


Select a code from the list and click on **Enable** .

A “seen” indicator appears on the active code in green.

The number of measurements contained in the code is displayed in parentheses.

TABLE (3)	Tol.	✓
0.8 mm x 10 1 mm/s	Ra:	
Probe: Stylus 1 - Roughness	Rz:	
17 Dec 2025 16:16	Rq:	

Changing a code in the list

Press the Edit  button to change the code parameters.






The code can only be edited if no measurements have been recorded.

Statistics

The statistics include all parameters and indicate the MIN, MAX, AVERAGE, and other values.



Code TABLE - 0.8 mm x 10 S: 1 mm/s 17 Dec 2025 16:16 16:29

Measures list 1 / 1

	1 R.0025	Ra: 1.598 μm Rz: 7.864 μm Rq: 2.278 μm
	2 R.0024	Ra: 1.063 μm Rz: 5.663 μm Rq: 1.374 μm
	3 R.0023	Ra: 1.037 μm Rz: 5.611 μm Rq: 1.343 μm

← Delete Open Delete all →

Home Back M/D R

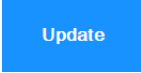
	<p>It is possible to generate an EXCEL file with statistics for a code with several measurements.</p> <p>Press the  button to export the statistics file to the USB flash drive.</p>
6.10 Automatic recording	<p>Automatic recording of a value in the archives or database is possible.</p> <p>Click on the  button at bottom right of the screen for the different recording options.</p> <p>It is also possible to select the name of the automatically recorded measurement.</p>

7 FIRMWARE UPDATE

If improvements are made to the functionality of the instrument, the firmware can be made available by the TESA Service team if necessary.

To access the menu, go to the **System settings**  menu and the **Update**  submenu.


Insert the USB flash drive with the update file in the root directory of the USB flash drive.

The update is carried out automatically by clicking on the Update button .

8 PORTABLE PRINTER

8.1 Connection

This portable printer can only be connected via Bluetooth®.

To access the print menu, select the **Printer** icon  on the home screen.

1. Start the portable printer.
2. Choose the compact BLUETOOTH printer
3. To search for the printer, click on the **Printer selection** field. A new window appears to display the detected printers.
4. Select the required printer.
5. When selected, the printer appears in the printer selection field.
6. When sending the print job for printing, the display of the portable printer shows the pairing information. Once this is complete, press the center button on the keyboard of the portable printer to confirm the pairing. This action is required for the first printout only.



8.2 Power supply

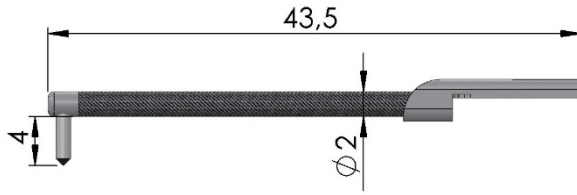
The portable printer is powered by a rechargeable battery.
 A USB-C cable for recharging the battery is supplied with the printer.
 The USB port on your computer can be used.



9 ACCESSORIES

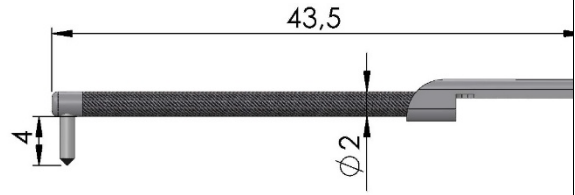
Stylus 1-Y

For groove depths < 4 mm
Article number 06960200



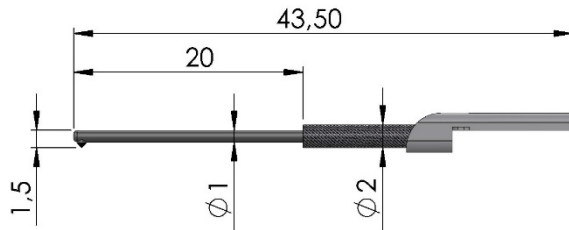
Stylus 1-R

Stylus for measuring Ra < 0.1 microns
Article number 06960201



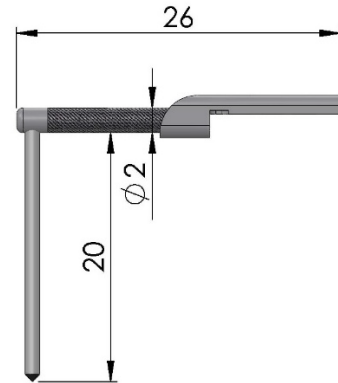
Stylus 2-Y

For bore Ø > 2 mm, depth < 20 mm
Article number 06960202



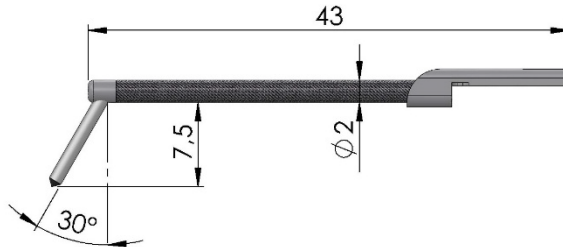
Stylus 3-Y

For groove depths < 20 mm
Article number 06960203



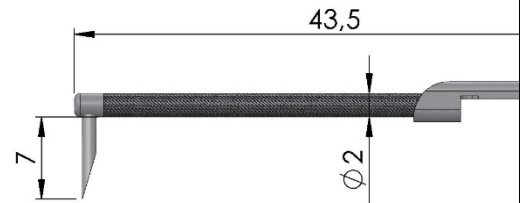
Stylus 5-Y

For blind bores
Article number 06960204



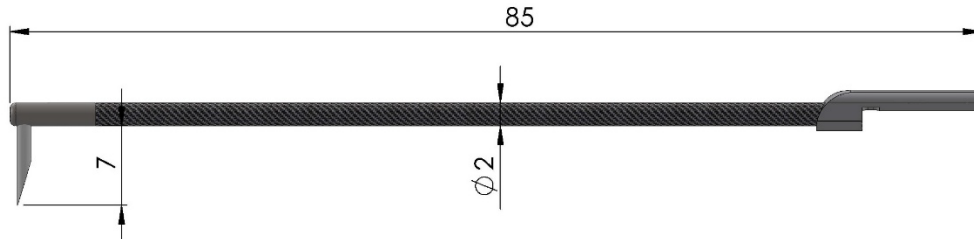
Stylus 4-S

For profilometry < 3 mm
(for Probe holder SB302)
Article number 06960205



Stylus 8-S

For profilometry < 20 mm
(for Probe holder SB402)
Article number 06960206



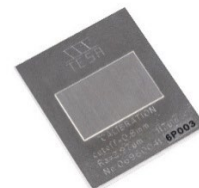
Probe holder SB302

Article number 06960207



Specimen Ra = 2.97 µm

Article number 06960041



Profile standard 2.5 mm
Article number 06960208



Profile standard 15 mm
Article number 06960209



20 mm profile set
Probe holder S402, including stylus 8-S and Profile standard 15 mm
Article number 06960210



Mains power supply
Article number 056639AFM








Portable wireless printer
Article number 06960090



10 RADIO CERTIFICATION

The NINA-B222 module is certified for use in the following countries/regions:

Countries/regions	Radio certification number
Europe (RED)	According to the declaration of conformity
USA (FCC)	FCC ID: XPYNINAB22
Canada (IC)	IC: 8595A-NINAB22
Japan (MIC)	 R 204-810001
Taiwan (China) (NCC)	內含發射器模組.:  CCAJ18LP0B51T3
South Korea (KCC)	 R-C-ULX-NINA-W151
Brazil (ANATEL)	<div style="border: 1px solid black; padding: 5px; text-align: center;">  <p>ANATEL 06870-18-05903</p> </div> <div style="border: 1px solid black; padding: 5px; margin-top: 5px;"> <p style="font-size: small;">"Este equipamento opera em caráter secundário, isto é, não tem direito a proteção contra interferência prejudicial, mesmo de estações do mesmo tipo, e não pode causar interferência a sistemas operando em caráter primário."</p> </div>
Australia et New Zealand (ACMA)	 The NINA-B221 and NINA-B222 modules are compliant with the standards made by the Australian Communications and Media Authority (ACMA).

11 DECLARATION OF CONFORMITY

We hereby certify that this equipment has been manufactured and inspected in our workshops. We declare that, to the best of our knowledge, this equipment complies with the standards and technical specifications listed in our commercial documents (Quick Start Guide, website).

We also certify that the measuring equipment used to examine this material meets the requirements of the relevant national standards. Traceability of the measured values is guaranteed by our quality assurance system.

in accordance with:



Quality assurance

12 WARRANTY

TESA PMI warrants that, under conditions of normal use, the product is free from manufacturing or material defects for a period of one (1) year, or longer in case of a corresponding extension of the warranty period by TESA PMI, provided that the instructions for use and maintenance are strictly complied with. This warranty takes effect with the delivery of the product.

If warranty claims are duly justified, TESA PMI can offer one of the following services, which is the only recourse available to the customer in the event of a warranty claim:

- Cost-free repair by a TESA PMI-certified maintenance workshop or a TESA PMI-approved repair workshop
- Replacement free of charge or
- Credit note for the full price of the product covered by the warranty claim.

The warranty does not cover any damage that results from incorrect, incompetent, or negligent use, lack of maintenance, external influences, failure to comply with maintenance instructions, or any other risk, including cases of force majeure.

(Excerpt from our General Terms and Conditions of Sale, 2023 edition)