



**TESA**  
TECHNOLOGY

## **Instruction Manual**

# **TESA TWIN-SURF**

## **PORTABLE ROUGHNESS GAUGE**



This document is confidential and only to be used internally by the company that has purchased a TESA portable roughness gauge. Before duplicating or transmitting it to third parties without any connection to the use of these instruments, an official request has to be sent to TESA.

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## 1 INTRODUCTION

### 1.1 Acknowledgements

Dear user,  
We would like to thank you for having chosen TESA as your metrology partner. We thank you for your confidence in purchasing one of our high-end portable roughness gauge TESA TWIN-SURF.  
Your metrological concerns are important to us and we are convinced that this instrument will meet your expectations. We are constantly striving to develop solutions adjusted to your needs.  
The result? Your satisfaction for many years. Our pleasure? To know that our products help you meet your needs in research, development and production in a quick and efficient way, and for a long time.  
The whole TESA team welcomes you to our family of TESA product users.

Your TESA team

### 1.2 Warning

This instruction manual must be read by every technician or operator before the installation, maintenance or use of the instrument. Not adhering to certain instructions regarding its use could lead to malfunction or deterioration of the instrument.

### 1.3 Copyright (document)

The content of this document has been created subject to subsequent modifications without prior notice. All modification rights are reserved.

The french version is the reference language. All other language versions are only translations.

### 1.4 Preamble

The TESA TWIN-SURF is the result of more than 80 years of experience in the conception and production of high-precision measurement equipment. It has been designed to meet the needs of a production environment and to offer its users an affordable, quick and precise way for dimensional control of small or large workpieces in workshops or laboratories.

This document describes the different procedures to be followed in order to allow for a quick and easy handling of our portable roughness gauge TESA TWIN-SURF.



### 1.5 Symbols

Several different types of symbols are used in this manual. They give important information that has to be taken into account in order to correctly use the measuring instrument.

Position	Description
	Not adhering to these instructions can lead to incorrect measurement results.
	Corresponds to an assistance for better use.

## 2 PRESENTATION

### 2.1 General description

TESA TWIN-SURF is a portable light and compact roughness tester controlled by a microprocessor and powered by a NiMh battery capable of providing high autonomy. The roughness tester is equipped with a high contrast monochrome OLED display. A high-precision translation mechanism fit a light aluminium alloy base with an interchangeable optical contact probe that can be rotated by 90° to enable transverse measurement.

The vertical range of 250 µm and a horizontal range of 16 mm deliver a high accuracy with a performance of calculation of 13 roughness parameters according to ISO 4287 / ISO 12085. Up to 51 roughness parameters are available with the TESA DATA-STUDIO software premium version.

Thanks the last generation of USB type C connector, the instrument can be recharged with a charger connected to a power supply or through a computer connection.

The TESA TWIN-SURF BLUETOOTH version integrates a wireless module to communicate with external digital systems such as tablets and smartphones equipped with the TESA DATA-STUDIO software.

Three buttons on the top of the instrument make you able to define measurement parameters, set tolerances on individual parameters and start the measurement. All configurations are automatically saved in the internal memory.

The whole system is designed to minimize power consumption as it is portable and powered by rechargeable battery.

The touch probe is the unit for acquiring data on the roughness of the surface to be measured. A sensing head supports the probe, which uses an optical sensor to translate the mechanism movement into an analogue electrical signal.

### 2.2 Operation/ Short description

No.	Description
1	Touch probe + protection
2	START/STOP (Start/stop measurement)
3	Display
4	Navigation button
5	Confirm button
6	Aluminium base
7	Raising feet

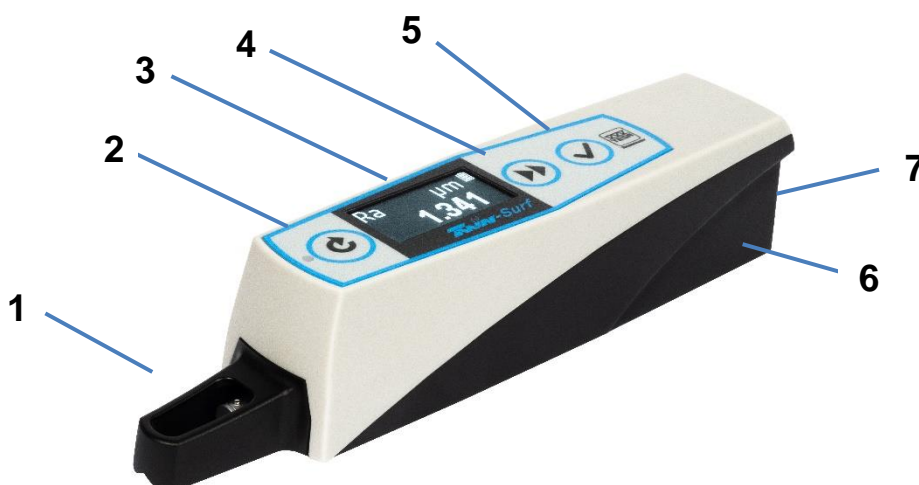





Fig. Description of the constitutive elements of the TESA TWIN-SURF


## 2.3 Overview keyboard and display



	Press to power ON or Long press to power OFF or When device is ON, press to start a new measurement or When measuring, press to stop the measurement or In the navigation menu, press to go back in the previous screen
	Navigation menu to continue selecting the various settings
	Press to enter the menu from the main screen or In the navigation menu, press to select a particular option


## 2.4 How to switch the instrument on/off

### To switch ON

Press the key 

The instrument is automatically switched off 1,5 minute after the last key operation (30 minutes if connected via BLUETOOTH).

### To switch OFF

Keep the key  pressed until the display disappears. All settings are kept and will be reloaded again next time the instrument is switched on.

## 2.5 Main functions

### Codes

By selecting this menu, you can save the results of your measurements in the instrument's memory. The status of the memory can be viewed by means of a filling bar in the code menu of the instrument.

### Position

By selecting this menu it is possible to see the current Z position of the touch probe. There is both an indicator showing its position within the available range and the value expressed in  $\mu\text{m}$ .

### Measurement set

By selecting this menu, it is possible to set the measurement parameters such as the standard, the number of cut-offs, the length of the cut-off, a variable delay between the moment the power button/start measurement is pressed and the actual start of the measurement. It is also possible to choose between automatic and manual return.

### Parameters

Selecting this item allows you to choose which roughness values to display at the end of the measurement (by default only Ra is displayed).

### Calibration

Selecting this menu allows the instrument to be calibrated using the roughness setting standard supplied with the TESA TWIN-SURF roughness gauge.

### System


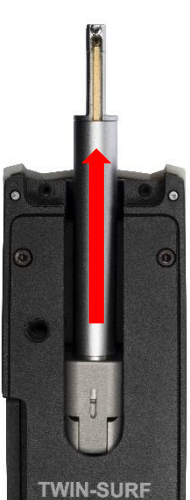
Selecting this menu item allows you to perform three functions:



- Activate and deactivate Bluetooth® (only for the Bluetooth® version)
- Change the language from English, French, German and Italian
- Activate the reprogramming mode in order to reprogram the instrument, update the firmware. Reprogramming process only possible through TESA DATA-STUDIO software

## 2.6 Transversal measurement

The probe holder permits the probe to swivel through  $90^\circ$  for inspecting a groove to depth. The transversal measurement allows to reach surface not accessible in the standard axis.

For the probe swivel, please follow the procedure:


	
<p>1. Unscrew two screws to remove the probe protection</p>	<p>2. Remove the probe by pulling out</p>

	
<p>3. Rotate the probe holder at 90°. You can use the help of a flat screwdriver.</p>	<p>4. Connect the probe in the new position. 5. Perform a new calibration in this configuration</p>

## 2.7 Measuring surface roughness

- 1 Switch on the roughness tester. Set desired functions from the menus, if necessary.
- 2 Choose the appropriate cut-off value to be used for the measurement according the table below (ISO 4288).

Ra (μm)	Cut-off (mm)	Lt (mm)
0,02 to 0,1	0,25	0,25 – 1,25
0,1 to 2	0,8	0,8 – 4,0
2 to 10	2,5	2,5 – 12,5

- 3 Choose the number of cut-off. The number usually selected is 5 cut-offs. For space reason, if the length is too long, you may change it by reducing the number of cut-off used for the measurement.
- 4 Position the probe so that its axis lied as far as possible parallel to the surface the be inspected. For checking purpose, use the menu **Position**, especially when access to the point is not easy.
- 5 Start the measurement cycle by pressing on . But you may use also the software TESA DATA-STUDIO to start remotely the measurement, to avoid any influence on the measuring application.



**Whenever possible, mount both the roughness tester and the work piece to be measured on a rigid testing surface, free from vibrations. Clean the surface to be checked thoroughly. While holding the unit in the hand, be sure you don't move during the measurement operation. If needed, take several measurements for comparison purposes. If one of them is varying by far from the others, this means that the unit has been moved during the exploration. The accessories that came with the unit (probe, probe guard and raising feet) make positioning easier.**



## 3 TECHNICAL SPECIFICATIONS

<b>Part number</b>	TESA TWIN-SURF roughness gauge No. 06930014 TESA TWIN-SURF BT roughness gauge No. 06930015
<b>Standard</b>	According to ISO 3274 - ISO 4287 - ISO 12085
<b>Parameters</b>	<p>Parameters according to ISO 4287:  <math>R_a - R_q - R_t - R_z - R_c - R_{max} - R_{Sm} - R_{Pc}</math></p> <p>Parameters according to ISO 12085:  <math>P_t - R - AR - R_x - PP_c</math></p> <p><b>Additional parameters with software TESA DATA-STUDIO Premium version (with license):</b></p> <p>Parameters according to ISO 4287:  <math>R_p - R_v - R_{sk} - R_{ku} - R_{\Delta q} - R_{\Delta a} - R_{mr\ rel} - R_{\delta c} - R_{mr(c)}</math>  <math>P_a - P_q - P_p - P_v - P_t - P_c - R_{Pc} - R_{3z}</math>  <math>P_{sk} - P_{ku} - P_{Sm} - P_{\Delta q} - P_{mr\ rel} - P_{\delta c} - P_{mr(c)}</math>  <math>R_k - R_{pk} - R_{vk} - A_1 - A_2 - Mr_1 - Mr_2</math></p> <p>Parameters according to ISO 12085:  <math>R_{ke} - R_{pke} - R_{vke} - A_{1e} - A_{2e} - Mr_{1e} - Mr_{2e}</math></p>
<b>Measuring range (Z)</b>	$R_a$ 0 to 50 $\mu m$ $R_t$ 0,05 to 200 $\mu m$
<b>Total length (X)</b>	(Numbers of cut-offs + 1) x $L_c$ (maximum 17,5 mm)
<b>Traverse length (X)</b>	Numbers of cut-offs x $L_c$
<b>Filter <math>\lambda_s</math></b>	$\Lambda_c / \lambda_s$ : 30 – 100 – 300 (According to ISO 3274)
<b>Resolution</b>	0,001 $\mu m$ / 0,01 $\mu inch$
<b>Cut-off length</b>	0,25 – 0,8 – 2,5 mm (According to ISO 4287) 1,5 – 2,5 – 4 – 8 – 12 – 16 mm (According to ISO 12085)
<b>Number of cut-offs</b>	1 up to 5
<b>Electronic filter</b>	GAUSS filter to ISO 11562
<b>Max permissible error</b>	0,05 $\mu m$ + (5 % R), R = Roughness in $\mu m$
<b>Probing system</b>	Optical
<b>Diamond-like stylus</b>	R=2 $\mu m$ , 90°
<b>Measuring force</b>	0,75 mN (According to ISO 3274)
<b>Displacement speed</b>	0,5 – 1 mm/s (measuring and positioning)

<b>Keyboard</b>	Three-key tactile keyboard protected against dust particles and oil splashes IP67
<b>Selectable languages</b>	English, Italian, German, French, Spanish, Portuguese, Chinese, Japanese, Korean <b>App TESA DATA-STUDIO:</b> English, Italian, German, French, Spanish, Portuguese, Chinese, Japanese, Korean
<b>Display</b>	OLED display monochromatic 128x64 pixels
<b>Power supply, battery</b>	USB-C charger Battery pack 2,4 V, 750 mAh Type NiMh Main power supply 100-240 V, 50/60 Hz USB maximum voltage 5V
<b>Operating temperature range</b>	+15 to +30°C
<b>Storage temperature range</b>	-10 to +50°C
<b>Full battery recharging time</b>	50 minutes
<b>Battery life</b>	about 300 measurements (0,8x5)
<b>Inside memory</b>	< 18 000 roughness parameters (0,8x5) or 30 measurements with graphical representations
<b>Connectors</b>	USB-Typ C (PC)
<b>Dimensions</b>	160 x 34 x 34 mm (roughness gauge alone)
<b>Weight</b>	200 g
<b>Packaging</b>	Suited plastic case
<b>Origin</b>	EU
<b>Countries for which the wireless transmitter is approved</b> <b>Only for 06930015</b>	EU, USA, Canada, Japan, Taiwan, South Korea Brazil, Australia and New Zealand. For other countries, please contact us.

## 4 DELIVERY CONTENTS

### 4.1 System components

Each configuration is composed of the following elements:

Description
TESA TWIN-SURF roughness gauge
SB 51 probe Article number 06960094
Main charger with EU and US charger adaptors Article number 04760150
Roughness setting standard Ra = 2,97 µm Article number 06960041
Adapter for 8 mm diameter support Article number 056633
Key to remove the probe protection
USB-A-C cable
USB key including: <ul style="list-style-type: none"> <li>• TESA DATA-STUDIO software</li> <li>• User manual</li> <li>• Measuring report</li> <li>• Declaration of conformity</li> </ul>
Transport suited case



### 4.2 Packaging


The elements that constitute the packaging of the TESA TWIN-SURF are very important, therefore you should keep them. It is absolutely necessary to use the original packaging when transporting the instrument in order to avoid any unfortunate deterioration which could cause malfunction or complete impossibility to use the instrument.

## 5 INSTALLATION, SECURITY & MAINTENANCE

<b>5.1 Location</b>	The instrument has to be installed in a location satisfying the general required conditions, but also the specific and very precise conditions regarding the environment, power supply, etc. It is essential to be able to identify important factors and to correctly prepare the zone the instrument is installed and used in.
<b>5.2 Place of use</b>	<p>In order to use the instrument correctly, the following precautions have to be taken into account:</p> <ul style="list-style-type: none"> <li>• Avoid placing the instrument close to a window, door, cooling or heating system.</li> <li>• Avoid causing recurrent temperature variations due to direct exposure of the instrument to the sun.</li> </ul>
<b>5.3 Lighting</b>	Use indirect or fluorescent light. Avoid direct exposure to the sun or any other strong light.
<b>5.4 Measuring surface</b>	<p>Choose a surface free of any vibrations that could lead to measurement or reading errors despite the stability of the mechanical and electronic components.</p> <p>Make sure that the surface can carry the weight of the machine and the workpiece to be measured. Ideally, the surface should not have any splits or joints.</p> <p>It is recommended to use a measuring surface that is big enough to enable smooth and easy movements of the instrument around the workpiece to be measured if the latter cannot be displaced manually.</p>
<b>5.5 Cleanliness</b>	Make sure that the measuring surface is clean, so that there is no dust, condensation or metal filings.
<b>5.6 Vibrations</b>	Floors of companies are constantly at risk of vibration due to different reasons: CNC and other machines, transportation vehicles and any other source of vibrations. These vibrations can directly influence the metrological performances of the machine.





## 6 FUNCTIONS

### 6.1 Calibration

To perform instrument calibration, enter main menu and select the item **Calibration** through the key . The following screen appear.



The steps are as follows:


1. **Enter nominal value:** Move with the button  to the box with the numerical value and change the value by pressing  until the desired value is obtained.
2. **Start calibration:** when the desired value is displayed, press  to go to the **start measure** item, then press  to start the calibration.
3. At the end of the measurement, the message **calibration done** is shortly displayed. No data is now available on the main menu. Perform a new measurement to display the last measuring value.

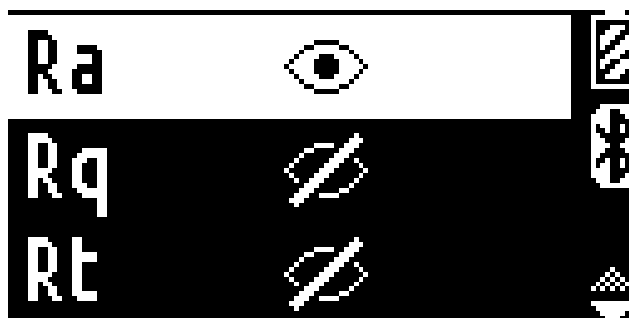




**Calibration with Ra if ISO 4287 standard**  
**Calibration with R if ISO 12085 standard**



**Calibration based on a measurement average is available from the software TESA DATA-STUDIO with max 5 measurement for a calibration.**

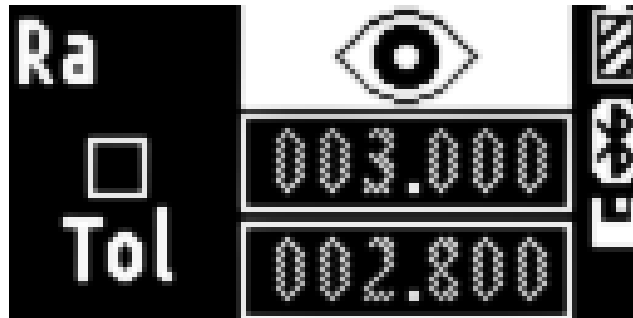
### 6.2 Parameters




To access the parameters selection screen, enter the main menu and select the **Parameters** item through the key . The following screen appear.





Parameters enabled for displaying are marked with the icon  while those that are not enabled are marked with the icon .

To access the parameters options setting screen, move to the desired parameters using the button  then confirm by pressing . The following screen appear.




1. To enable / disable the parameters, go to the icon  with button  then press .

2. To enable / disable tolerance, go to check box **Tol** with button  and press  to enable the tolerance.

3. **Set the tolerances values:**

Upper tolerance is the first value. Lower tolerance is the second value. Move on the desired digit with the button  and press  to set the wished value.

4. When finished, press  to go back to the **Parameters** screen.



**If a code has already been selected, no parameter modification is available. If you want to modify the parameters displayed with your code, proceed to the code modification only through TESA DATA-STUDIO.**

## 6.3 Measurement standard

To change the measurement standard, enter the main menu and select the item **Set measure**

with button



The following screen appear.



Press



to go in the **Standard** item and confirm with button



The following screen appear.



Go to the desired item with



and confirm by pressing



If ISO 428 has been selected, it is also possible to choose the unit of the measurement

between millimeters (mm) and inches (inch) by selecting the desired unit with



and

confirming with button



Press



to go back to **Set measure** screen.



**If a code has already been selected, no parameter modification is available. If you want to modify the parameters displayed with your code, proceed to the code modification only through TESA DATA-STUDIO.**



#### 6.4 Cut-off length

To change the cut-off length, enter the main menu and select the item **Set measure** with

button .

The following screen appear.




Press  to go in the **Cut-off L.** Item and confirm with button .

The following screen appear.



The value currently in use is displayed larger than the other values. To change the value, go to

the desired item with  and confirm by pressing .

Press  to go back to **Set measure** screen.



**Cut-off length only available for ISO 4287 standard**

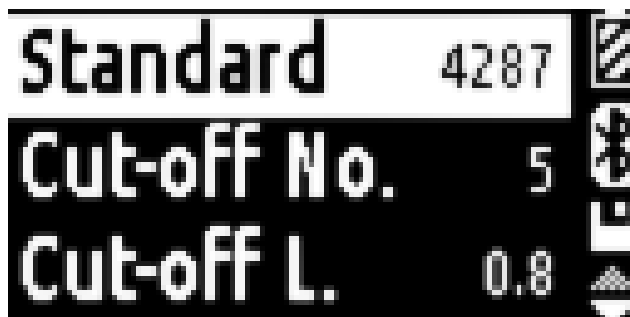


## 6.5 Cut-off number

To change the cut-off number, enter the main menu and select the item **Set measure** with

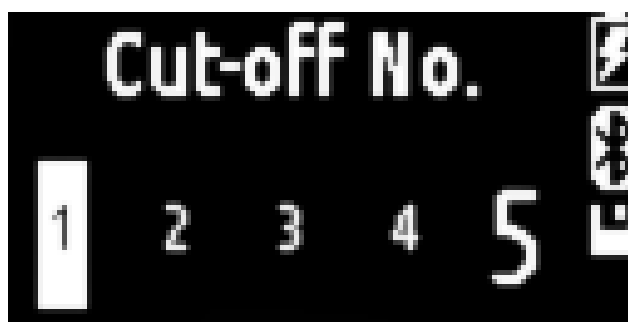
button .

The following screen appear.




Go to the item **Cut-off No.** with button  and confirm with button .

The following screen appear:



The value currently in use is displayed larger than the other values. To change the value, go to

the desired item with  and confirm by pressing .

Press  to go back to **Set measure** screen.



Cut-off number only available for ISO 4287 standard

## 6.6 Measurement length

To change the measurement length, enter the main menu and select the item **Set measure**

with button



The following screen appear.



Go to the item **Meas. L** with button



and confirm with button



The following screen appear.



The value currently in use is displayed larger than the other values. To change the value, go to

the desired item with



and confirm by pressing



Press



to go back to **Set measure** screen.



**Measurement length only available for ISO 12085 standard**

## 6.7 Measurement delay

To change the measurement delay, enter the main menu and select the item **Set measure**

with button .

The following screen appear.





Go to the item **Delay** with button  and confirm with button .

The following screen appear.



The value currently in use is indicated by the cursor position at the bottom.

To change the value, go to the desired item with button  and confirm by pressing .

Press  to go back to **Set measure** screen.



The value unit is in seconds.

## 6.8 Automatic return

To change the automatic return of the probe after measurement, enter the main menu and

select the item **Set measure** with button .

The following screen appear.




Go to the item **Return** with button  and confirm with button . The following screen appear.



The value currently in use is indicated by the indicator next to the corresponding text.

To change the value, go to the desired item with button  and confirm by pressing .

Press  to go back to **Set measure** screen.

## 6.9 Positioning

This menu option, which allows you to check the correct probe position against the surface to be explored, is very useful in the following two cases:


- When measuring grooves or bores.
- Prevent the probe from moving right up to the limit of the measuring area as the probe body is contacting the surface or ensures that the probe is still contacting the surface, otherwise the measurement will be interrupted.
- When measuring critical surface.  
Serves for positioning the probe correctly on concave or convex surfaces.

Enter the Position menu.

The following screen appear:



By manually moving the tip the indicated position should move accordingly.

Once correct operation has been verified, press  to go back to the main menu.

## 6.10 Start Measurement

When all the measurement settings are finished, press  to go back to the main screen.


Press  to start the measurement.

During the measurement the following screen is displayed.



The progress bar indicated the time status of the measurement.

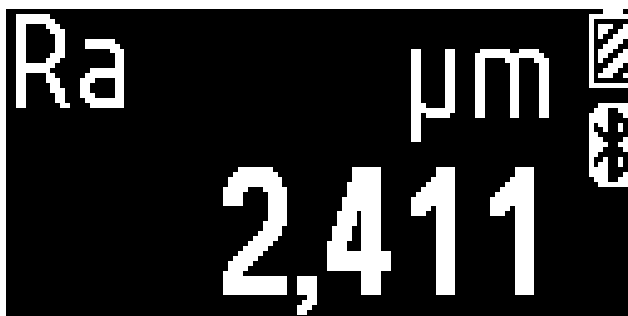
## 6.11 Stop Measurement

A measurement can be stopped while it is in progress by pressing the key . The following screen appears.



## 6.12 Measurement result display

The measurement results screen is displayed automatically at the end of each measurement. If only one parameter has been enabled, the following screen will be displayed showing the selected parameter.



If two parameters have been enabled, the following screen will be displayed showing the selected parameters.



If three parameters have been enabled, the following screen will be displayed showing the selected parameters.



By pressing on button you can scroll through the display of the various parameters.

If tolerances have been entered for parameters, the following screen will be displayed with the chosen parameters.





The down arrow indicates that the parameter is smaller than the lower limit entered. If an up arrow is displayed, the value would be greater than the upper limit entered. OK is displayed when the value is between the upper and lower limits.

### 6.13 Language

To change the language, enter the main menu and select **System**.  
The following screen appear:





To access the language selection screen, press button  until you reach the **Language** item, then press  to select the desired language.

### 6.14 Switch wireless connection on/off

To switch the wireless connection on / off, enter the main menu and select the item **System**.  
The following screen appear:

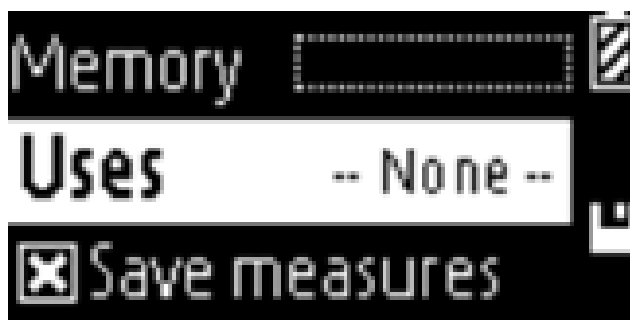


Bluetooth® is active when there is a cross in the corresponding box, otherwise Bluetooth® is deactivated when it is empty.

To change its status, press  to select **Bluetooth®** item and press . When the instrument is correctly connected to a digital system via Bluetooth®, the LED on the top of the instrument flash blue.

### 6.15 Store measurements

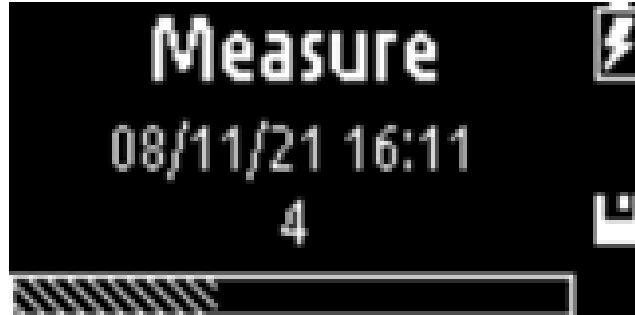
The measures can be stored in the internal memory of the instrument.  
Enter the main menu and select the item **Codes**.  
The following screen appear:



Store measurements is active when there is a cross in the corresponding box, otherwise measures are not stored when it is empty.



To change its status, press  to select **Save measures** item and press .


During the measurement, the number of the measurement stored appear (for example here is the 4th measurement saved).





#### Save measures in a code

If a code has been exported from TESA DATA-STUDIO to the instrument, the measures can be saved directly to a dedicate code.

To select the code, press button  until you reach the **Uses** item and press .

All code are listed. Select the code and press  to enable the code.

During the measure, the code name with the number of the measurement saved appear.

After each measurement, press  to save the measurement or press  to cancel the measurement.



**To remove a code or measures from the instrument, you can do it only from TESA DATA-STUDIO.**





## 6.16 Firmware update

For product improvement reason, the firmware can be updated.  
The firmware file is available from TESA Service team if needed.

Enter the main menu and select the item **System**.  
The following screen appear:



To access the Reprogramming selection screen, press button  until you reach the **Reprogramming** item and press  to validate the mode.

The following steps are available from the TESA DATA-STUDIO software:

1. Connect the instrument via USB cable
2. Open the menu Parameter **System settings**
3. Click on **Firmware update**
4. As soon as you start the firmware update process, the instrument is disconnecting from the software.
5. Select now the last firmware file.
6. Once selected, the firmware update progress value is displayed
7. Once finished, a window inform about the correct firmware update
8. The instrument restart with the new firmware version.



**If the process doesn't work, please check the driver installation with the driver taking place in the TESA DATA-STUDIO installation folder in folder Drivers/STM-Bootloader/Win10/ dpinst\_amd64.exe (if not W10 64 bits, choose the appropriate driver).**

**To control if the right driver is installed, activate the Reprogramming mode in the instrument menu. In the device manager, under the USB devices, the instrument must display "STM Device in DFU Mode".**

## 7 TESA DATA-STUDIO SOFTWARE

### 7.1 Free software

TESA DATA-STUDIO software is included with the TESA TWIN-SURF. A USB key included in the packaging provide the installation file.

Software features:

- Save measurements
- Display roughness profiles.
- Save codes with custom measuring settings.
- Customized Report in EXCEL or PDF with company logo.
- Up to 51 parameters with Premium version

For additional features, you need to activate the Premium version.

For that please order the TESA DATA-STUDIO with licence key, part number 06960091.

TESA DATA-STUDIO	Basic version (no licence)	Premium version (with licence)
Parameter	13 parameters	51 parameters
Charts	Roughness R	R, P, Rk
Code management	Max 10 codes	Unlimited
Statistic	Max 10 measures	Unlimited

### 7.2 Activation of licence key for TESA DATA-STUDIO

Include with TESA DATA-STUDIO with licence (paid version), an activation key is delivered similar to:

**AJGR0-C0P00-EQFW7-38JHU-3B1EW-E24PD**

The key can be inserted in the software Menu → About / License → Edit activation  
The software can be activated both online and offline.

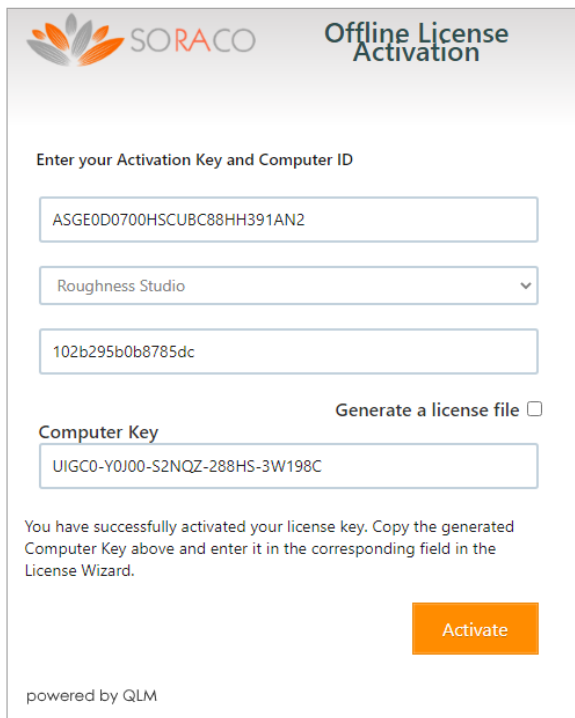
#### Online activation:

For the online activation it is only necessary to insert the activation key in “Online” mode and click in **Activate**.

The license mode should now display **Premium**.

#### Offline activation:

1. If the computer or tablet does not have a network connection, it is possible to select the “offline” mode.
2. Take not of the field **Computer ID** and continue the activation on a computer having a network connection.
3. From the computer with network connection, open url:  
[qlm3.net/sm/qlmcustomersite](http://qlm3.net/sm/qlmcustomersite)
4. Select **Activate a license** and insert the two values **Activation Key** and **Computer ID**, then select Roughness Studio from the drop down and click “Activate”.



5. The system generates a computer key, which has to be copied in the field **Computer key** of the device without network connection.
6. When **Computer key** is pasted in the field, click on **Activate**.
7. The license mode should now display **Premium**.

## 7.3 Deactivation of licence key for TESA DATA-STUDIO

The way to deactivate the licence is the same as for the activation.

A licence can be used for one computer only.

Deactivate the licence to use it on another computer.

### Online deactivation:

For the online deactivation it is only necessary in "Online" mode to click on **Deactivate**.

The licence is now deactivated.

The license mode should now display **Basic**.

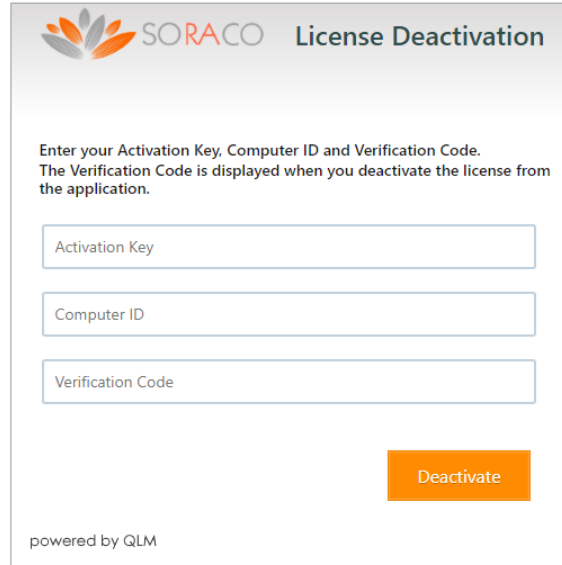
### Offline deactivation:

The offline release of the license is not registered immediately on the server.

For this reason the software generated a **deactivation code** which must be communicated to the server, in order to RE-ACTIVATE the license on another device.

**IMPORTANT:** the Deactivation Code has one day of validity (until midnight)

1. Click on Deactivate and confirm to create the **deactivation code**
2. After taking note of the **deactivation code**, from the computer with network connection, open url:  
[qlm3.net/sm/qlmcustomersite](http://qlm3.net/sm/qlmcustomersite)
3. Select **Deactivate license** and insert the two values **Activation Key** and **Computer ID**, the same as the activation phase, plus the **verification code (Deactivation code)**.



4. After clicking on **Deactive**, the license is officially released and ready to be put on another device.

## 7.4 Connection to the computer

The TESA TWIN-SURF can be connected to a computer using Bluetooth® or USB connection. In order to view the data, it is necessary to use the TESA DATA-STUDIO software.



**TESA DATA-STUDIO software is also available for the smartphone and tablets, ANDROID version only.**

## 7.5 Code management

The code definition makes you able to store all your measurement in a define measuring configuration. Each measurement can be store in the same code, to perform statistics and reporting.


### Create a new code:

A new code creation is only possible from the software. After created, you can save the code in the instrument according following procedure.



On the software, click on  to open the Code menu.




Click on  to create a new code. Set the code settings according to the part to be measured.

<

Insert new Code


Save




Code name

CodeName


Picture






Save profile

Don't save ☐




Return

Automatic ☒




Delay

2 sec




Standard

ISO4287




Unit

mm




Cutoff number

5



Cutoff length


2,5 mm





Parameters

<

Codes










Memo (3)

>

Cylinder hole (3)

2,5 mm x 5





Ra

Rz

Rt

Tol.

3.000 µm


2.000 µm


12.000 µm


11.000 µm

12.000 µm

10.000 µm









## Send a code to the instrument:




Click on  to transfer to code in the instrument. First make sure your instrument is connected.



When the code is on instrument, the logo  appear on the code view.

If you want to start the measurement from the software and store it in the appropriate code,



enable the code in the software by clicking on . The code name will be displayed in the main window.


## Export measuring results to TESA DATA-STUDIO:

When measures are done, you can transfer the measurement in the software.



On the software, select the menu Code by clicking on  and synchronize all latest



measurements by clicking on .

All new measurement for each codes are now available from the software. To display the new measurements, click on the appropriation code name.

After the synchronization, the software asks you if you want to **remove the measurement** in the internal memory of the instrument.



After the synchronization, the software asks you if you want to **remove the measurement** in the internal memory of the instrument.

## Statistics:

All measurement from a same code can be displayed on an EXCEL document to display the Statistics values Min, Max, Average and  $\sigma$ .

In the code you want, click on the 3 dots and select **Statistics**.


The EXCEL file will be automatically created.

## Recalculation:

The recalculation allow to recalculate new parameters of a measurement made with parameters that would have been forgotten.

To do this, define the new desired measurement parameters from the main menu of the software.



Once defined, select the desired measurement and click on the icon .

This procedure allows to add the new parameters in the existing measurement.

If the recalculation has been performed in a measurement included in a code, then all measurements of the code will have the new parameters defined by the recalculation

The new parameters will appear in blue.

## Rename a measurement :



In the measurement, click on the icon  to rename a measurement.

## Remove a code in the instrument:

To remove a code in the instrument, connect the instrument to TESA DATA-STUDIO, enter the code menu and select the code you want to remove from the instrument. Click on the 3 dots and select **Delete from instrument**.



**You can only create a new code from the software.**

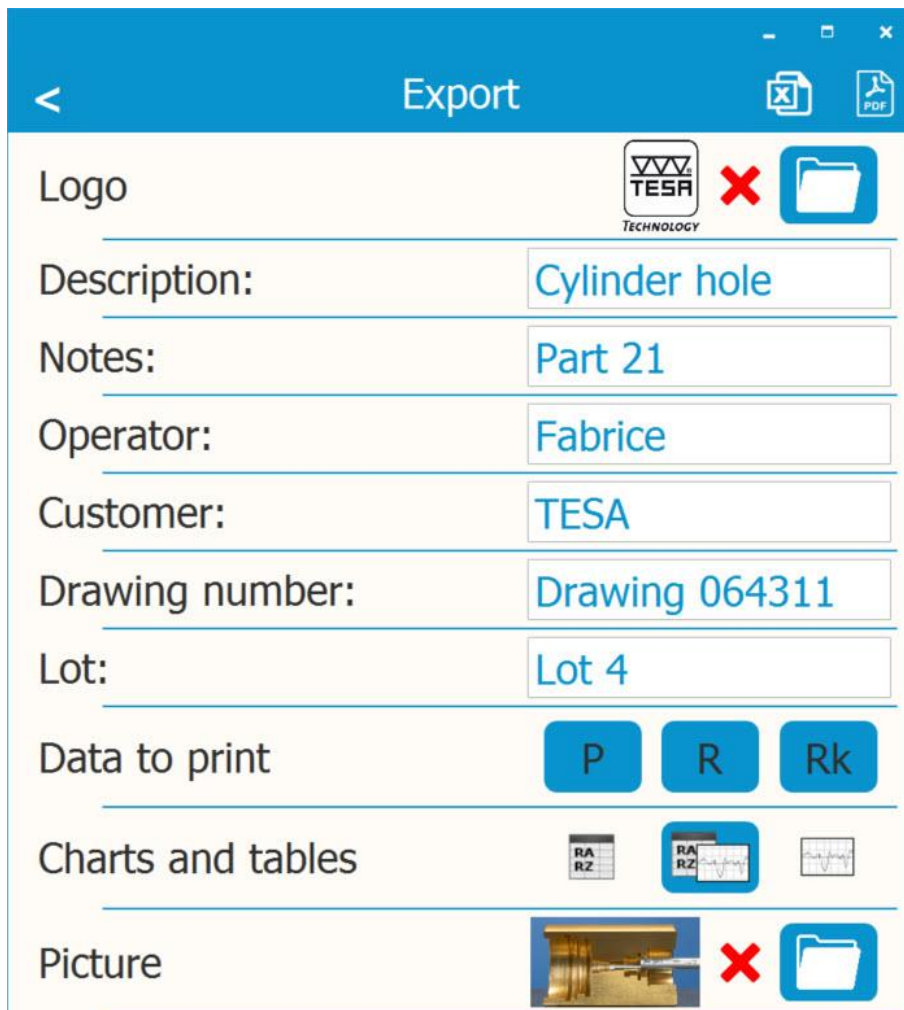
**No code is available when you receive a new TESA TWIN-SURF.**

**Maximum 10 codes in the instrument (Basic version).**




## 7.6 Report management

Different type of report model are available to display results as a chart or a table. Following information are available, from a measurement in a code or a memo:

- Logo: company logo displayed on the top of the report
- Description
- Notes
- Operator
- Customer
- Drawing Number
- Lot
- Data to print: Profile charts Primary, Waviness, Roughness and Rk.
- Charts and tables: Parameters only, parameters + charts, charts only.
- Picture



**Export**

Logo:   

Description:

Notes:




Operator:

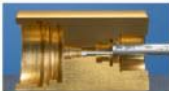


Customer:

Drawing number:

Lot:

Data to print:

Charts and tables:   

Picture:   

## 8 PORTABLE PRINTER

### 8.1 Connection

The portable printer is only through Bluetooth® connected.

To use the printer with the TESA TWIN-SURF, a link between both devices must be made through the TESA DATA-STUDIO software.



First start the Bluetooth® in the TESA TWIN-SURF menu.  
 After turn on the portable printer.

Select the menu printer settings (only available if an instrument is connected to the software).  
 Activate the scan to detect the printer.

Select the printer that appears and connect, in order to create the link between the TESA TWIN-SURF and the printer. The number displayed is written on the bottom face of the printer.

Once the link is completed, there will be no need to use the software in case of printing.  
 The printing will be done directly between the TESA TWIN-SURF and the printer via Bluetooth®.

After each measurement, the main menu let you choose if you want to print the measuring result.

Press  to enable the printing or press  to disable the printing.

After the printing is enable, the connection to the printer is automatic.



**The TESA TWIN-SURF can be connected only to one device at the same time.  
 Either to the software TESA DATA-STUDIO or to the portable printer.**

**Be sure the printer is turned on to enable the print.**

**Only the TESA TWIN-SURF BT can be connected to the portable printer**

### 8.2 Power supply

The portable printer is powered with a rechargeable battery.

A USB-C cable is delivered with the printer to recharge the battery.

You can use the USB port of your computer or the TESA TWIN-SURF power supply



## 9 TROUBLESHOOTING

The instrument is equipped with an internal self-diagnostics system to allow you to detect the most common errors.

For each error message, a solution procedure should help you to resolve your issue.

Error message	Error reason	Solution
<b>Mechanism jammed</b>	The moving part of the instrument has jammed. The instrument suffered a shock, or the electronic components have been damaged.	By pressing the switch on / start measurement button, the instrument should unlock.
<b>Limit switch not released</b>	The limit switch that allows the instrument to perform the measurement doesn't work properly.	By pressing the switch on / start measurement button, the instrument should unlock.
<b>Limit switch pressed in measure</b>	Faulty signal of the switch. The electronic board of the instrument doesn't work properly	By pressing the switch on / start measurement button, the instrument should unlock.
<b>Measure range limit exceed</b>	The useful range of the instrument has been exceeded.	It is advisable to check the height at which the measurement is performed. If the problem persists, check that the probe is correctly inserted.
<b>Parameter R not calculable</b>	The values calculated in calibration differ too much from the nominal values of the sample.	It is advisable to check the sample on which the calibration is performed and/or the value of the sample entered the instrument.
<b>Calibration no valid</b>	The values calculated in calibration differ too much from the nominal value of the sample	It is advisable to check the sample on which the calibration is performed and/or the value of the sample entered the instrument.
<b>Redo calibration !</b>	The instrument has been reprogrammed or reset.	The instrument has no calibration inside it. Perform a new calibration
<b>Battery is too low</b>	The battery doesn't have enough charge to perform the measurement.	The instrument must be charged.
<b>Measures memory full</b>	The memory of the instrument is full	Using the software to remove the internal memory of the instrument, see chapter 7.5.
<b>Battery error</b>	The battery is damaged	The battery must be replaced, if the problem persists send the instrument for service.

Additionally to the solution procedure mention in the figure, a firmware reset can help you to solve the issue. Please follow the step below.

### Firmware reset procedure:

1. Shut off the instrument.
2. Press and hold two buttons of the right side.
3. Press and hold the third button on the left side.
4. Release the three buttons.
5. If the reset has been done successfully, the instrument display "No data available". The device will ask to redo a calibration when you try to perform a new measurement.

If the problem remains the same, please contact TESA Service.

## 10 REPLACING THE BATTERY

It is mandatory to use the TESA Battery, part number N° 064222.

Once you have the replacement battery, you need a screwdriver with TORX 5 type.

1. Unscrew the 6 screws from the bottom side to access the battery place



2. Disconnect the battery by gently pulling the cable connector



3. Connect the new battery connector to the electronic board of the instrument



4. Place the battery in place



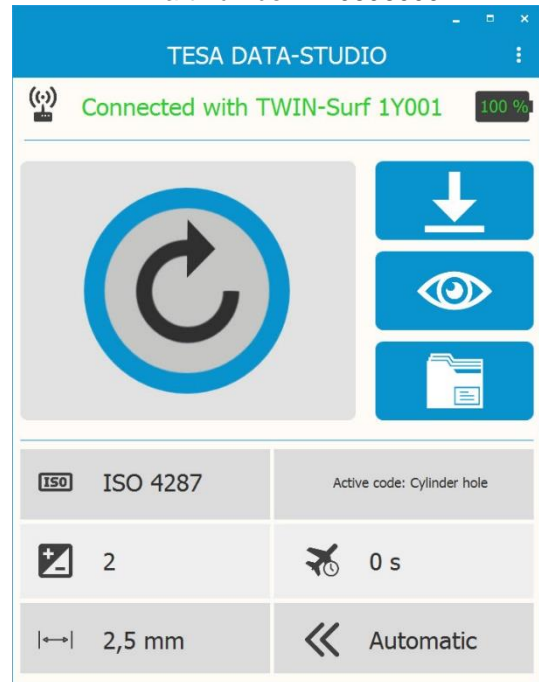
5. Close the lower plate of the instrument with the six screws
6. Check that the instrument turns ON. The battery icons should be displayed.
7. Allow the instrument to discharge in order to set the battery charge percentage. Use the instrument until the battery is completely discharged and the instrument automatically turn off
8. When the battery is discharged, fully charge the instrument (approximately 50 minutes)

**11 ACCESSORIES**

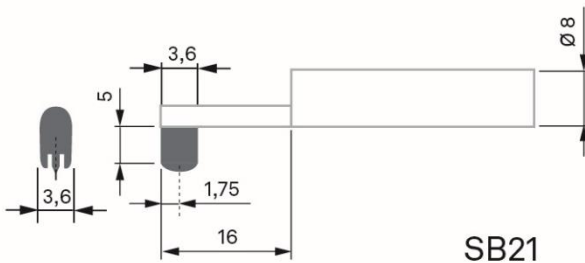
**Printer for TWIN-SURF**  
Part number N° 06960090



**TESA DATA-STUDIO software**  
Part number N° 06960091



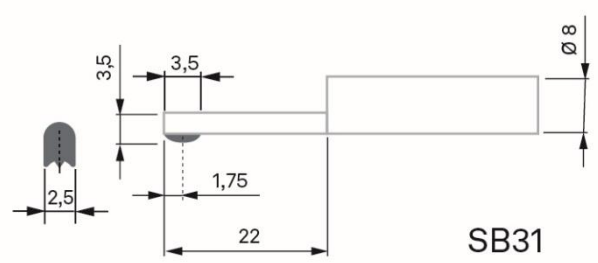
**Probe SB21 for TWIN-SURF**  
Part number N° 06960092



**SB21**

For groove of depth < 5 mm

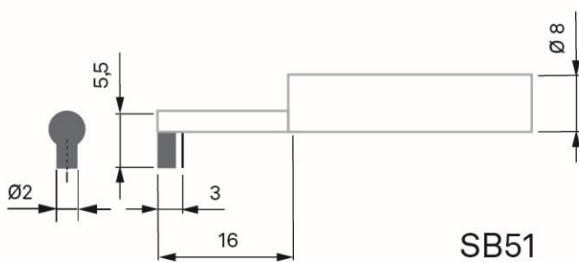
**Probe SB31 for TWIN-SURF**  
Part number N° 06960093



**SB31**

For planes and holes.  
For small bores of  $\varnothing > 4$  mm  
Max depth 20 mm

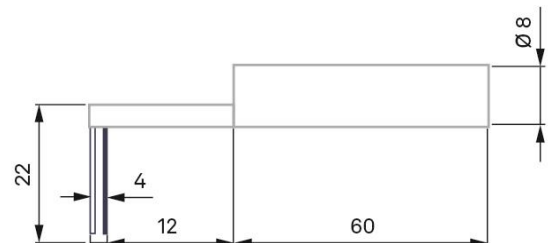
**Probe SB51 for TWIN-SURF**  
Part number N° 06960094



**SB51**

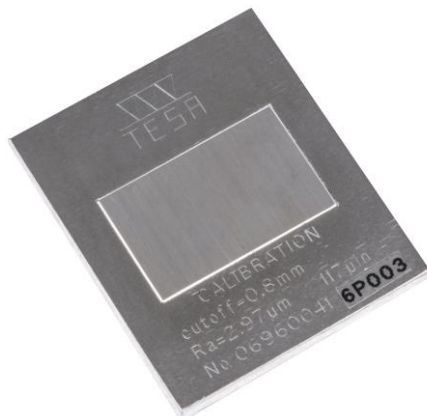
For concave surfaces and for measuring at 90°  
For groove of depth < 5 mm

**Probe SB121 for TWIN-SURF**  
Part number N° 06960095



For grooves of depth < 20 mm

**Roughness setting standard, Ra = 2.97 µm**  
Part number N° 06960041



**USB A-C cable**  
Part number N° 04760152







**100 mm probe extension for TWIN-SURF**  
Part number N° 06960096



**Power supply for TWIN-SURF**  
(EU and US adaptor included)  
Part number N° 04760150








## 12 SPARE PARTS

<p><b>Battery for TWIN-SURF</b> Part number N° 064222</p> 	<p><b>Transport case for TWIN-SURF</b> Part number N° 064223</p> 
<p><b>Adapter for 8 mm diameter support</b> Part number N° 056633</p> 	<p><b>Thermal paper for portable printer (4 rolls)</b> Part number N° 00760250</p> 

## 13 RADIO CERTIFICATION

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

Countries / regions	Radio certification number
Europe (RED)	According declaration of conformity
USA (FCC)	FCC ID: XPYNINAB22
Canada (IC)	IC: 8595A-NINAB22
Japan (MIC)	 R 204-810001
Taiwan (NCC)	內含發射器模組.:  CCAJ18LP0B51T3
South Korea (KCC)	 R-C-ULX-NINA-W151
Brazil (ANATEL)	 <div> <p>“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 and New Zealand (ACMA)	 The NINA-B221 and NINA-B222 modules are compliant with the standards made by the Australian Communications and Media Authority (ACMA).



## 14 OPEN SOURCE SOFTWARE

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## 15 DECLARATION OF CONFORMITY

We herewith certify that this product was manufactured and inspected in our workshop.

We declare under our sole responsibility that this product is in conformity with standards and technical data as specified in our sales document (user manual, web site).

In addition, we certify that the measuring equipment used to check this product refers to national master standards. The traceability of measuring value is guaranteed by our Quality Assurance.

Compliant with :  

Quality Assurance

## 16 WARRANTY

TESA shall remediate any operating defects resulting from a manufacturing defect, within the limit of the following provisions. The regular warranty shall cover the first year from the date of sale.

In justified warranty cases, TESA shall choose one of the following services:

- free repair by TESA or a TESA-certified service shop, or
- free replacement, or
- credit note for the product subject to the claim.

All other services or compensation under a warranty claim are excluded.

The warranty shall not cover any damage resulting from incorrect, incompetent or negligent use, a maintenance defect or failure, external influences, failure to comply with service instructions, or any other hazard, including cases of force majeure.

(Extract from our general sales conditions 2012 edition)

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