

IMPRESSIONS™ 2 LT

Advanced software applications

USER MANUAL



USER **MANUAL**

IMPRESSIONS™ 2 LT

Advanced software applications

Thank you for buying this advanced INNOVATEST® hardness testing instrument.

The product meets the applicable DIN, ISO-EN, ASTM and JIS standards.

Products and/or product specifications can change due to new technologies and continuous development.

We reserve the right to change or modify specifications of products without prior notice.

INNOVATEST Europe BV assumes no responsibility or liability for any errors or omissions in the content of this instructions.

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Read the "User Manual" thoroughly before usage, and properly operate the product.
In order to use the product safely, do not ignore visual cautions, warnings or safety symbols.

Please refer to the limited guarantee and responsibility issues in the INNOVATEST® guarantees conditions.

Table of Contents

1.	INTRODUCTION	7			
1.1	General instructions	7			
1.2	Target groups	8			
1.3	Liability and disclaimer	8			
1.4	Re-order	8			
1.5	Copyright	8			
1.6	Intended use	9			
1.7	Improper use	9			
1.8	Layout of the user manual	9			
2.	DESCRIPTION AND FUNCTION	10			
3.	SAFETY	11			
3.1	Used symbols	12			
3.2	Safety provisions	12			
3.2.1	Emergency Mode	12			
4.	INSTALLATION	13			
5.	BASIC OPERATION	14			
5.1	Start hardness testing software IMPRESSIONS LT	14			
5.1.1	Initializing	15			
5.1.2	Ready for testing	15			
5.2	Performing a basic hardness test	15			
5.3	Exit hardness testing software IMPRESSIONS LT	16			
5.4	Overview of the main interface	16			
5.4.1	Scale selection	17			
5.4.2	Archive	18			
5.4.3	Tester	19			
5.4.4	System	20			
5.4.5	Service	24			
5.4.6	Measured value	24			
5.4.7	Displacement value/Diagonal 1	24			
5.4.8	Depth value/Diagonal 2	24			
5.4.9	Batch list	25			
5.4.10	Indentation progress	25			
5.4.11	Statistics/conversion list	26			
5.4.12	Conversions	27			
5.4.13	Dwell time	27			
5.4.14	Shape correction	27			
5.4.15	Automatic/manual measurement mode	28			
5.4.16	Information/status field	28			
5.4.17	Save	28			
5.4.18	Escape	29			
5.4.19	Delete	29			
5.4.20	Program	29			
5.4.21	Measure	29			
5.4.22	Report	31			
5.4.23	Limits	31			
5.4.24	Start/Stop	32			
5.4.25	Light control	32			
5.4.26	Test force indicator	32			
5.4.27	Test head control	32			
5.4.28	Limit sliders visuals	33			
5.4.29	Zoom visuals	33			
5.4.30	Scrolling arrows visuals	33			
5.4.31	Light visuals	33			
5.4.32	Contrast visuals	33			
5.4.33	Brightness visuals	33			
5.4.34	Material pre-settings visuals	33			
6.	PROBLEM MESSAGES	34			

1

INTRODUCTION

This manual contains essential information concerning the operating system of the hardness tester, IMPRESSIONS™ 2 LT. A detailed description of the control functions will be given. This manual is part of the user manual of the machine.

Before getting started, first read the dedicated machine user manual, this contains vital information concerning, safety, installation, operation, maintenance, transport and technical specifications of the machine.

1.1 GENERAL INSTRUCTIONS

WARNING

*Before using the machine, read the “Safety chapter” of the dedicated machine user manual, thoroughly.
In case of doubt, the manufacturer should always be consulted.*

The dedicated machine user manual contains important warnings to use the machine, safely, professionally and economically. By following this information, hazards can be avoided, repair costs and downtime can be reduced, and the reliability and service life of the machine can be increased.

This manual must always be accessible and available to the user. Always keep a copy of this manual with the machine! Before you work with the machine or carry out any maintenance or repairs, you must first read the relevant chapter of the user manual completely.

Text indicated as following: **“EXAMPLE”**, refers to a button or selector in the software.

1.2 TARGET GROUPS

The **user / owner** is, as legal person, responsible for the intended use of the machine and for the training and deployment of the authorized persons. The user/owner keeps a record of qualifications and competences of these authorized persons.

Professional is a person who, based on their professional training, knowledge and experience, is able to assess the assigned tasks and is able to identify possible hazards. Furthermore, they are aware of the applicable standards and conventions. The competence level of persons and therefore the qualification assessment is done by the user/owner.

Educated / trained person is a person who has been trained in the assigned tasks and the possible hazards concerning improper use. Furthermore, this person is aware of the implemented protective devices and safety measures. The competence level of persons and therefore the qualification assessment is done by the user/owner.

Assembly, disassembly, maintenance and repair may only be carried out by **professionals**. Normal use can be carried out by **educated / trained persons**. The legally permissible minimum age is to be observed.

1.3 LIABILITY AND DISCLAIMER

All indications and instructions for operation, maintenance and repair are given with due regard to our current experience and insight. The original of this user manual was written in the English language and checked by INNOVATEST® in terms of content. This user manual has been compiled with the utmost care. Should you nevertheless detect imperfections and / or errors, we ask you to inform us in writing. Your suggestions are well appreciated and will help us to improve the manual in the future.

1.4 RE-ORDER

This manual will be supplied as an electronic copy. Also, a hard copy can be ordered, please note that there are costs associated with hard copies of this manual. A hard copy can be reordered at the address below:

INNOVATEST Europe BV
Borgharenweg 140
6222 AA Maastricht
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+31 43 3520060
www.innovatest-europe.com

1.5 COPYRIGHT

All rights reserved. No part of this manual may be reproduced, modified or utilized otherwise without prior written permission.

1.6 INTENDED USE

The intended use is the hardness testing of products. The machine is to be used in an industrial or laboratory setting. The machine is intended to be used by non-disabled trained full aged people. The machine may only be operated as described in this manual. The manufacturer is not liable for the damage caused by incompetent use (unintentional use). Only use the machine when it is technically in good working order and use it according to the intended use, paying attention to the safety and potential hazards referred to in this manual.

Manufacturer responsibilities expire when:

- not or insufficiently complying with the information in this manual
- using spare parts or parts not approved by the manufacturer
- the machine is operated incorrectly
- removing, manipulating or not using safety features
- changing functions of the machine
- unauthorized modifications to the machine are applied
- maintenance is not carried out according to instructions
- the machine is used unintentional

1.7 IMPROPER USE

Dangers and hazards can occur due to unintentional or improper use of the machine. The limits stated in the documentation may not be exceeded under any circumstances.

1.8 LAYOUT OF THE USER MANUAL

This manual may only be used with INNOVATEST® equipment designed for IMPRESSIONS™ 2 LT.

The complete user manual consists of:

- The dedicated machine user manual
- This IMPRESSIONS™ 2 LT user manual
- The dedicated machine's unpack instruction (attached to the packaging)
- Declaration of Conformity

2

DESCRIPTION AND FUNCTION

IMPRESSIONS™ 2 LT is the ultra-modern user interface of Innovatest hardness testing machines. It offers unparalleled simplicity in operation but yet, includes the most advanced functions found in hardness testing. With only a minimum of operator skills required, the software leads you through the set-up process, in just seconds, not even minutes. Standard features, complex tasks and advanced workflow at your fingertips.

Typical examples are:

- Scale setting
- Test methods setting
- Limits
- Conversion to other hardness scales
- File saving
- Test program saving
- Zoom function
- Etc.

Standardized hardness testing methods have been programmed in the software and can be selected at any time.

3

SAFETY



WARNING

Before using the machine, read the "Safety chapter" of the dedicated machine user manual thoroughly. In case of doubt, the manufacturer should always be consulted.

The dedicated machine user manual contains important warnings to use the machine, safely, professionally and economically. By following this information, hazards can be avoided, repair costs and downtime can be reduced, and the reliability and service life of the machine can be increased.

Definitions



WARNING:

Situation, operation or action that could potentially harm the professional or educated/trained person (operator) or lead to potentially dangerous situations for the professional or educated/trained person (operator).



CAUTION:

Situation, operation or action that could damage the machine.

NOTE:

Text with higher priority than plain text but not being a warning or caution.

3. SAFETY

3.1 USED SYMBOLS

The following symbols are used in this manual:

 This symbol indicates a **WARNING** or **CAUTION**.

3.2 SAFETY PROVISIONS

3.2.1 EMERGENCY MODE

Emergency is a situation of (potential) danger to a person or the machine.
In an emergency, one of the hardware emergency stop devices must be operated, causing the machine to stop immediately.

NOTE:
Information about the hardware emergency stop device, like its location/activation/reset, is described in the dedicated machine user manual.

The software detects this state by going into emergency mode by presenting information and controls:



Use available controls to create a safe situation.

NOTE:
Information about the available hardware controls to create a safe situation, like moving spindle, is described in the dedicated machine user manual.

Press **“OK”** to close IMPRESSIONS and return to WINDOWS.
For shutting down the machine, see dedicated machine user manual.

 **CAUTION:**
Only after creating a safe situation, it is allowed to restart the testing software.

4

INSTALLATION

We strongly recommend opting for installation and training of IMPRESSIONS 2 LT by INNOVATEST® service personnel.

5

BASIC OPERATION

This section gives a detailed description of the user interface and basic functionality of IMPRESSIONS™ LT.

NOTE:

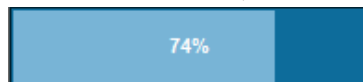
Some parts in this manual may relate to specific type of machines or optional software licenses and may differ or will be disabled by default.

5.1 START HARDNESS TESTING SOFTWARE IMPRESSIONS LT

1. If the software has been started with activated emergency switch, then see [Emergency mode](#).
2. If the hardness testing software was not started during tester power up, or after an emergency mode, then manually start hardness testing software by selecting shortcut on taskbar in WINDOWS:

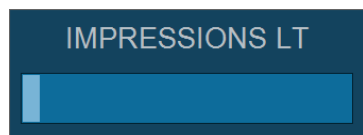


During startup several system functions and parameters will be checked.



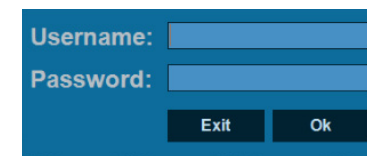
In case there are any [problems](#), a message will appear on the user interface

3. When there are no issues during initialization, the software will be started. The following progress bar will appear on your screen:



5. BASIC OPERATION

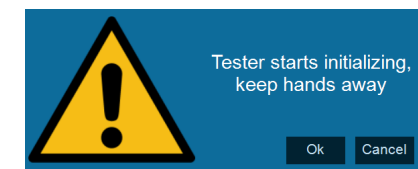
5. A correct start-up of the IMPRESSIONS™ LT system and the machine will show the login screen without any failure or error messages:



6. Fill in your [username and password](#) (the default username “admin” has no password). Press “**OK**” to continue, or press “**EXIT**” to [exit](#) IMPRESSIONS™.

5.1.1 INITIALIZING

1. Depending on the machine configuration, some tester components need to be initialized.
2. Some components need to move for initialization; possible (motorized) components are axes as in xy-stage, spindle and test head.
Before any automatic movements will be done by the machine, a message will be shown, to warn operator to keep hands away:



NOTE:

Only after pressing “**OK**”, machine components will move.

5.1.2 READY FOR TESTING

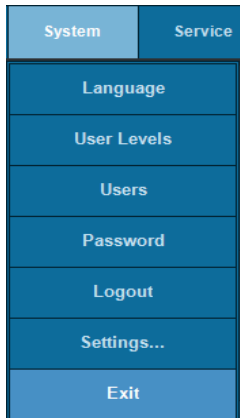
1. Follow-up any instructions as in the [status bar](#), like:
 - “**TURN DOWN SPINDLE AND REPOSITION WORKPIECE**”
 - “**OVERSHOOT! TURN DOWN SPINDLE AND REPOSITION WORKPIECE**”
2. The machine is ready for testing when:
 - Status bar message “**TURN SPINDLE TO START POSITION**”
 - The status bar is empty
 - The [START/STOP](#) button shows a bright green “**START**”.
 - Indenter is not touching the sample
3. Depending on active processes, this can take a while.
 - Sometimes it helps to press “**ESCAPE**” [refer to 5.4.18 escape].

5.2 PERFORMING A BASIC HARDNESS TEST

See dedicated machine user manual for instructions about steps to perform a hardness test.

5.3 EXIT HARDNESS TESTING SOFTWARE IMPRESSIONS LT

1. Select **"EXIT"** in the **"SYSTEM"** menu to exit the IMPRESSIONS™ software and return to Windows®.



WARNING:
Do not turn off the machine in this state.

2. Shut down Windows®, in common way, or use shortcut on taskbar



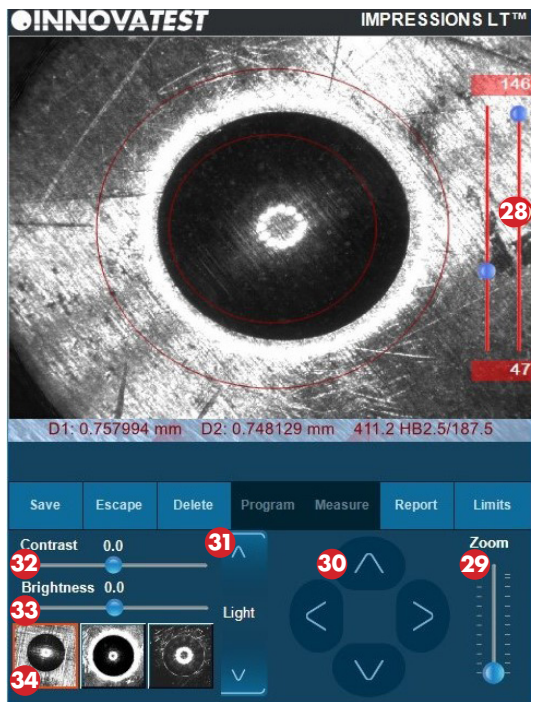
5.4 OVERVIEW OF THE MAIN INTERFACE

1. [Scale selection](#)
2. Handle the [archive](#)
3. [Tester](#) settings
4. [System](#) settings
5. [Service](#) mode
6. [Measured value](#)
7. [Displacement value/Diagonal 1](#)
8. [Depth value/Diagonal 2](#)
9. [Batch list](#)
10. [Indentation progress](#)
11. [Statistics/conversion list](#)
12. [Conversion setup](#)
13. [Dwell time setting](#)
14. [Shape correction setting](#)
15. [Automatic/Manual mode](#)
16. [Information and status field](#)
17. [Save](#) to batch list
18. [Escape](#)
19. [Delete](#) one or all measurements
20. [Program](#) mode
21. Optical [Measure](#)
22. Print/export [report](#)
23. [Limits](#) setting
24. [Start/Stop](#) button
25. [Light control](#)
26. [Test Force indicator](#)
27. [Test head control](#)



Optical measurement screen:

28. [Limit sliders](#)
29. [ZOOM](#) function
30. [Scrolling arrows](#)
31. [Light control visuals](#)
32. [Contrast](#) button
33. [Brightness](#) button
34. [Material pre-setting](#)

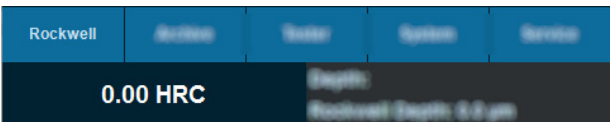


5.4.1 SCALE SELECTION

Press the **"SCALE SELECTION"** button to select the required scale.

Rockwell		Archive	Tester	System	Service
Rockwell			Depth: Rockwell Depth: 0.0 µm		
HRA	HRB	HRC	HR15N	HR30N	HR45N
HRD	HRE	HRF	HR15T	HR30T	HR45T
HRG	HRH	HRK	HR15W	HR30W	HR45W
HRL	HRM	HRP	HR15X	HR30X	HR45X
HRR	HRS	HRV	HR15Y	HR30Y	HR45Y

The selected hardness method is displayed in the button, e.g. **"ROCKWELL"**.
The (unit of the) selected scale is displayed in the measure value field (6), e.g. **"HRC"**.



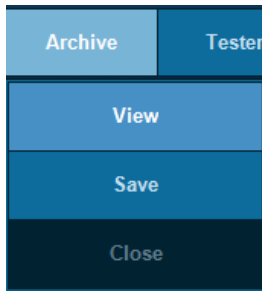
NOTE:
Be aware that changing the hardness scale, also the test settings will change and must be set for the selected scale.

5.4.2 ARCHIVE

In this area it is possible to save and recall measurements.

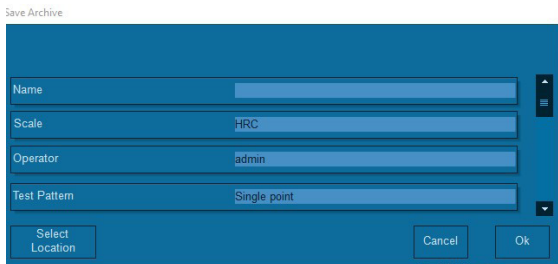
Test results, statistics, individual numbers, images in case of Brinell, test dates, user ID and workpiece information will be saved or recalled.

Selecting **“CLOSE”**, the selected file closes and the main screen shows the previously selected testing parameters.



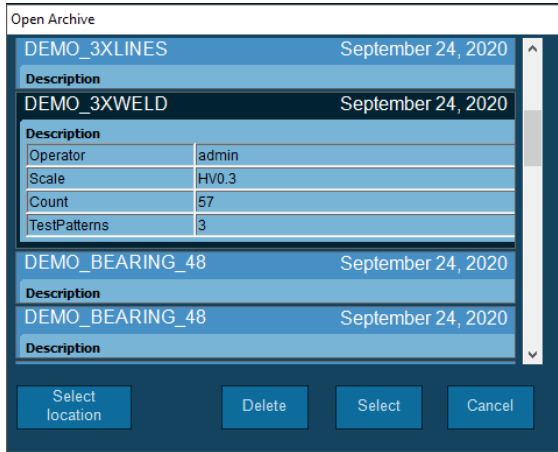
5.4.2.1 SAVING AN ARCHIVE

To save measurements and parameters select **“ARCHIVE”** -> **“SAVE”**.
Fill in a unique name for your archive and press **“OK”**.
For adding any extra description to your archive, press the **“+”** button. Pressing **“-”** will delete this description.



5.4.2.2 OPENING AN ARCHIVE

Click **“ARCHIVE”** -> **“VIEW”**.
A list of all saved measurements will be displayed. Selecting **“DESCRIPTION”** will show additional information of an archive (number of measurements, scale used, user, etc.).



Click on the desired archive and press **“SELECT”**, to open the archive.

The **“ARCHIVE”** button on the main screen will start blinking, indicating that an archive is active. This enables viewing, checking and corrections of the measurements. From this menu it is also possible to handle the data for exporting or reporting.

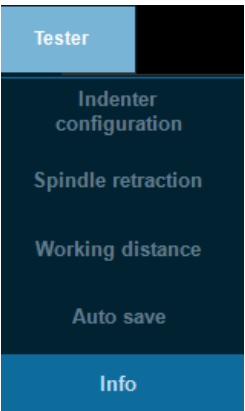
- From this menu it is also possible to:
- Open an Archive from another location (**“SELECT LOCATION”**)
 - **“DELETE”** an archive

NOTE:
An opened archive can never be stored with the same name. This is to protect the initial data from that archive. Save the archive with another name.

Press **“ARCHIVE”**-> **“CLOSE”** to close an opened archive, the archive button will stop blinking.

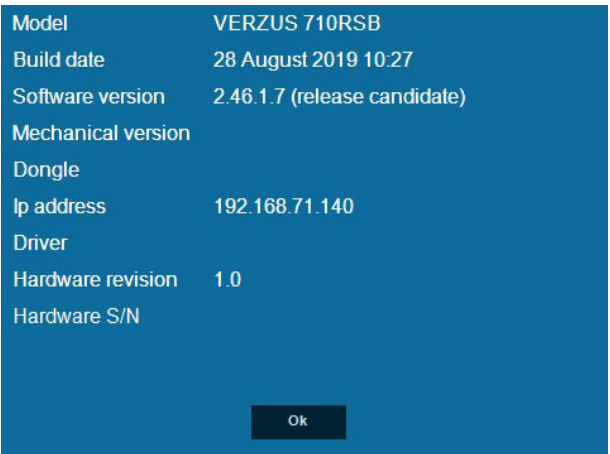
5.4.3 TESTER

This menu enables the general setup of the machine.
“INFO”: Shows the information of the machine’s hard- and software.



5.4.3.1 INFO

This screen shows the information of the machine’s hard- and software.



5.4.4 SYSTEM

This menu allows to set, change or delete users, usernames, user rights and passwords. The menu allows you to logout from the hardness testing software as a user or to exit from the software and return to the Windows® desktop.

System	Service
Language	
User Levels	
Users	
Password	
Logout	
Settings...	
Exit	

“LANGUAGE” is to set the language.
“USER LEVELS” is to view or edit user levels.
“USERS” is to view or edit users.
“PASSWORD” is to change your password.
“LOGOUT” the login menu appears. Enter name and password or press **“EXIT”** to exit hardness testing software
“SETTINGS...” to change the software configuration.
“EXIT” to exit from the software and return to Windows®.

5.4.4.1 LANGUAGE SETTINGS

The language of Impressions can be changed and even edited. This language system is independent of the language of the operating system.

● Afrikaans	● Greek	● Russian
● Albanian	● Hebrew	● Serbian
● Arabic	● Hindi	● Setsuana
● Armenian	● Hungarian	● Slovenian
● Azeri	● Icelandic	● Slovak
● Basque	● Indonesian	● Syriac
● Belarusian	● Italian	● Spanish
● Bulgarian	● Japanese	● Swedish
● Catalan	● Konkani	● Tamil
● Croatian	● Korean	● Tatar
● Czech	● Kyrgyz	● Thai
● Danish	● Latvian	● Turkish
● Dutch	● Lithuanian	● Ukrainian
● English	● Malay	● Vietnamese
● Estonian	● Maltese	● Yiddish
● Farsi	● Marathi	● 中文(简体中文)
● Finnish	● Mongolian	● 中文(新加坡)
● Faroese	● Norwegian	● 中文(香港特别行政区)
● French	● Polish	● 中文(黑山特别行政区)
● Gaelic	● Portuguese	● 中文(台湾)
● German	● Romanian	
Select	Edit	Cancel

Changing to a different language

Select the desired language and press **“SELECT”** to accept or **“CANCEL”** to exit. After selecting another language, IMPRESSIONS has to be restarted.

Edit a language

A	B	C	D	E	F	G	H	I	J	K	L	M	N
O	P	Q	R	S	T	U	V	W	X	Y	Z		
1	English	Abort											
	Translation	Aftbreken											
2	English	Above											
	Translation	Above											
3	English	Absolute											
	Translation	Absolute											
4	English	Accept											
	Translation	Accept											
5	English	Action Type											
	Translation	Action Type											
6	English	Active											
	Translation	Active											
	English	Add job											
		Cancel										Ok	

Although all common world languages are available, it is still possible to edit the translation of a language.

Select the desired language to edit and press **“EDIT”**. The following window will appear.

All words within the software are presented in alphabetical order. Click in the translation area and fill in the correct translation of the word in the selected language. Press **“OK”** to save or **“CANCEL”** to exit.

5.4.4.2 USER LEVELS

Users are linked to a certain user level. A user level can be created or modified with the **“USER LEVELS”** menu. For every user level, actions can be allowed or forbidden. This will disable or enable corresponding functions.

Certain user actions are grouped under a parent user action. If such a parent action is disabled, then all underlying actions will be disabled too. If a underlying action of a parent action is enabled, its parent action will also be enabled, since this is mandatory to access the underlying action.

Administrator	Level	Default
Default		
		Default level for "standard" users
	Forbidden actions	Allowed actions
	Service	Mode
	Users	Select scale
	Create user	Delete
	Modify user	Save
	Delete user	Overview
	Userlevels	Snapshot
	Create userl...	Dashboard
	Modify userl...	Start
	Delete userl...	Turret
		Head
		Focus
	<< Add	Close

To **“ADD”** a new user level, select the **“+”** (plus) button below the list of available user levels. Then fill in the name of the user level and an optional (but recommended) description. Now, select the actions you want to enable for this level and move them to the allowed list with the allow action button **“>”**. To forbid an action use the forbid action button **“<”**. By default all actions are forbidden.

With the Allow all **“>>”** and forbid all **“<<”** buttons all items can be moved from the forbidden list to the allowed list and vice versa.

When al settings have been done, click the **“<< ADD”** button to store the new user level.

To **remove** a user level, use the **“-”** (minus) button; a user level can only be removed if it is not in use!

User levels can be modified by selecting a level from the list of available user levels and change the allowed/forbidden actions as described above.

5.4.4.3 USERS

To add a new user, click the “+” (plus) button, fill in the desired username and password and link this user to a user level. Press “OK” to store this new user.

To edit an existing user, select a user from the available users and click “EDIT”. Make the desired changes and click “OK”.

To delete a user, select a user from the list, press the “-” (minus) button and click “OK”. The service and admin user cannot be changed or deleted.

5.4.4.4 PASSWORD

In this dialogue the active (logged-in) user can change his/her password.

5.4.4.5 LOGOUT

The active user will be logged out and the login window will appear.

5.4.4.6 SETTINGS

In the settings menu general system settings can be configured.

ASTM E29 Rounding

By default, the hardness value is presented with two decimal places. Turning this parameter “ON” will change this to one decimal place. The rounding of the value is done according to the ASTM E29. (“ON” = 1 decimal place).

Clear measurements after export

If the values will be exported, the batch list will be cleared. (“ON” = the batch list is cleared after export).

Downscale before measure

Detecting an indent automatically on the highest camera resolution is slower than on lower resolution. To make the indent detection quicker, turn this setting ON. (“ON” = detect indent on lower resolution).

Student Mode

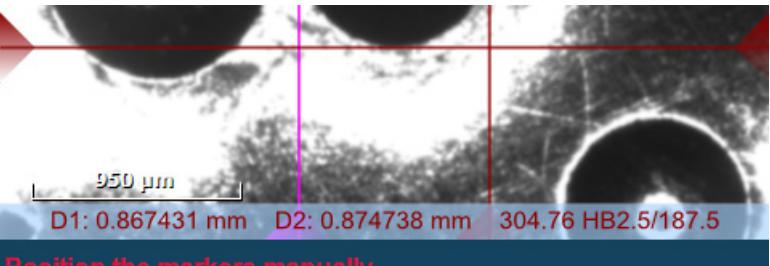
With student mode selected, the hardness value is not presented. Only the length of the diagonals will be visible. The hardness value needs to be calculated by “heart”. Mainly used for educational purposes (“ON” = Student mode).

Statistics

Turns on the statistics line in the live view of the camera. This doesn’t affect the statistic’s calculation in the report.

Show image scale

Turns on the image scale in the live view of the objective camera. (“ON” = Scale is ON).



Custom export filename

The filename of the exported data is a fixed format. Turning this setting on will give the user the chance to give each export file another name. (“ON” = Export filename is not fixed).

Export and Archive path

Setting to change the location of the export or archive file. This can also be a network location.

Units

Change measuring units from Inches to mm. If changed to Inches, the diagonals of the indents will still be in mm.

Shape correction

ISO and ASTM have a different shape correction table (Convex and spherical correction). This setting allows you to select which correction is used.

Diameter check

The diameter check for Vickers is not the same for ISO and ASTM. This setting allows you to select which diameter check is used.

“ISO” Diagonal check:

The difference between the lengths of the diagonals should not be greater than 5 %. If the difference is greater, this shall be stated in the test report.

“ASTM” Diagonal check:

For a Vickers indentation: if one half of either diagonal is more than 5 % longer than the other half of that diagonal, or if the four corners of the indentation are not in sharp focus, the test surface may not be perpendicular to the indenter axis.

Standard deviation

It is possible to select two different methods of calculating the standard deviation. Sample or non-sample based variance.

“SAMPLE BASED” not selected:

a measurement of the spread between numbers in a data set. The variance measures how far each number in the set is from the mean. Variance is calculated by taking the differences between each number in the set and the mean, squaring the differences (to make them positive) and dividing the sum of the squares by the number of values in the set.

“SAMPLE BASED” selected:

Identical to sample based not selected but dividing the sum of the squares by the number of values in the set minus 1.

Start delay

Start delay is used to delay the start action, if the start button is pressed accidentally. Setting this value to X seconds means; to start the test, press and hold the start button for at least X seconds. This feature is mainly used when working with a footswitch.

5.4.4.7 EXIT

This will close the hardness testing software and return to Windows®.

5.4.5 SERVICE

“SERVICE”: Opens the service menu, which is password protected. The settings of service menu are used by the INNOVATEST® service engineer.

⚠ CAUTION

It is strongly recommended NOT TO MAKE ANY CHANGES to the machine factory settings. If any changes are made to the standard factory settings, which result to the malfunctioning of the tester or the Software and such intervention of INNOVATEST® is required, the support will be charged.

5.4.6 MEASURED VALUE

This field shows the results of the last measurement; “0.00” indicates that no measurement is done, all other measurements are shown in [the batch list](#).

5.4.7 DISPLACEMENT VALUE/DIAGONAL 1

Shows the (Rockwell) sensor displacement or (Brinell) diagonal 1 in mm.

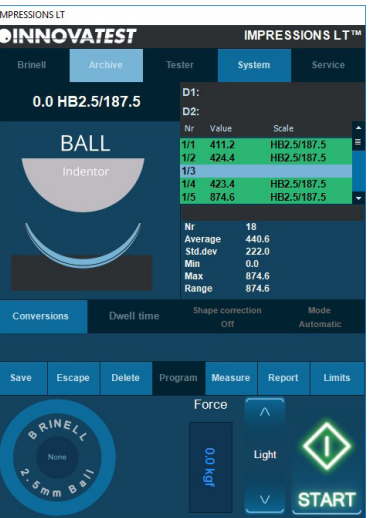
TIP: One mouse click on D1/D2 shows the average diameter

5.4.8 DEPTH VALUE/DIAGONAL 2

Shows the (Rockwell) depth in mm or the (Brinell) diagonal 2 in mm.

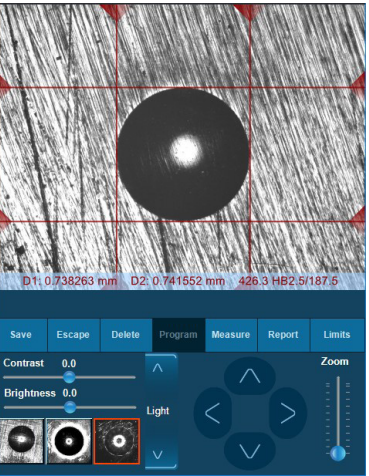
TIP: One mouse click on D1/D2 shows the average diameter

5.4.9 BATCH LIST



When selecting a result from the batch list (it will turn light blue), the measurement can be modified in the next menu (i.e. Brinell menu).

- Single click: shows indent info; diagonals (7)(8)
- Double click: enables re-measure



When the modification is done, the measurement can be saved with “SAVE”, deleted with “DELETE” or discarded with “ESCAPE”.

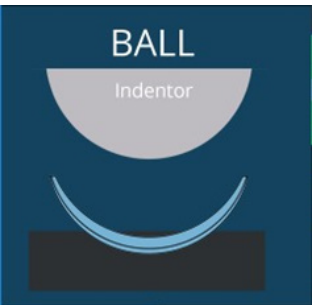
5.4.10 INDENTATION PROGRESS

The indenter animation will indicate each stadium of the indentation. Before an indent, the pictures shows indenter shape and all planned load stages:

Rockwell:

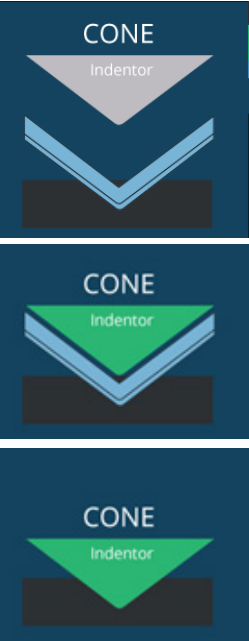


Brinell:



Under the indenter animation a progress bar will be shown:

Animation



Text

Turn down spindle and reposition workpiece

Or

Turn spindle to start position

Applying preload

1/1

Dwelling 1.6

1/1

For instance, for a Rockwell measurement, following indenter animations will be shown:

Preload

The indenter animation will move downwards until it reaches the pre-load position. The tester will now first apply the pre-load (3kgf for superficial scales and 10kgf for regular Rockwell scales).

Mainload

After the pre-load has been applied the tester will automatically apply the main load. After the main load has been applied the tester will pause according to the selected dwell time. When the dwell time has passed, the tester will unload the main force automatically and return to the pre-load position. Were it remains according the selected recovery dwell time.

Result

The hardness value measured will be displayed above the indenter animation.

5.4.11 STATISTICS/CONVERSION LIST

Statistics of the measurement will be shown here when the **“STATISTICS”** option is enabled in the **“SYSTEM SETTINGS”**[4], Conversions of the measurement will be visible after single click, when a hardness scale **“CONVERSIONS”**[12] was selected

5.4.12 CONVERSIONS

In this menu several conversions to different standards/scales/material can be selected.

Conversions	ISO18265	(A.1) Unalloyed and low-alloy steels and cast iron
	ASTM140	(B.2) Quenching and tempering steels in the quenched tempered conditions
	GB/T1172	(B.3) Quenching and tempering steels in the untreated, soft annealed or normalized conditions
	None	(B.4) Quenching and tempering steels in quenched conditions
		(C.2) Cold working steels
		(D.2) High speed steels
		(F.2) Non-ferrous metals and alloys
		None

In the statistics **conversion list** the conversions will be shown.

NOTE:
Converting is material depended, and not to be used for quality matters. Mostly it is used for internal checks.

5.4.13 DWELL TIME

All dwell time settings can be configured in this menu (in seconds). **“PRELOAD”**, **“MAINLOAD”** and **“RECOVERY”** dwelltimes are enabled for all depth scales and only **“MAINLOAD”** dwell time for other scales. The minimum set time is 1 second and the maximum is 999 seconds in steps of 1 second. Select arrow up **“^”** or down **“v”** to in or decrease the dwell time value. To accept the values, click on the value, or press **[ENTER]**.

Dwell time

Preload dwelltime

Mainload dwelltime

Recovery dwelltime

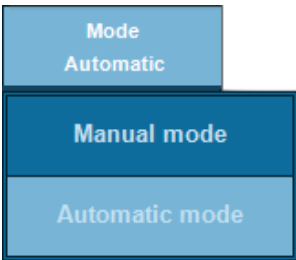
10

5.4.14 SHAPE CORRECTION

Depending on the hardness scale, shape corrections will be available.

When the material under test has a **“CONVEX”**, **“CONCAVE”** or **“SPHERE”** shaped form, the radius in mm can be entered. This radius will be taken into account when determining the hardness value. Select **“OK”** to save the setting.

5.4.15 AUTOMATIC/MANUAL MEASUREMENT MODE



5.4.15.1 AUTOMATIC

After an indentation has been made:

1. Brinell scale: The diameter measurement of the indentation will be done automatically.
Rockwell scale: The depth measurement of the indentation will be done automatically.
2. After processing, the hardness value appears on the screen (6).
3. Hardness value will be automatically saved and added to the batch list (9).

5.4.15.2 MANUAL

After an indentation has been made:

1. Brinell scale: The diagonal measurement of the indentation has to be done manually.
Rockwell scale: The depth measurement of the indentation will be done automatically.
2. After processing, the hardness value appears on the screen (6).
3. Hardness value must be saved (and added to batch list) manually by press **"SAVE"**;

5.4.16 INFORMATION/STATUS FIELD

In the information/status field vital information will be displayed in RED concerning: warning and error messages, instructions and status of measurements.

Examples:

- **"TURN SPINDLE TO START POSITION"**
- **"TURN DOWN SPINDLE AND REPOSITION WORKPIECE"**
- **"PRESS BIOS BUTTON TO MEASURE"**
- **"POSITION THE MARKERS MANUALLY"**
- **"OVERSHOOT! TURN DOWN SPINDLE AND REPOSITION WORKPIECE"**
- **"MEASUREMENT SAVED"**

5.4.17 SAVE

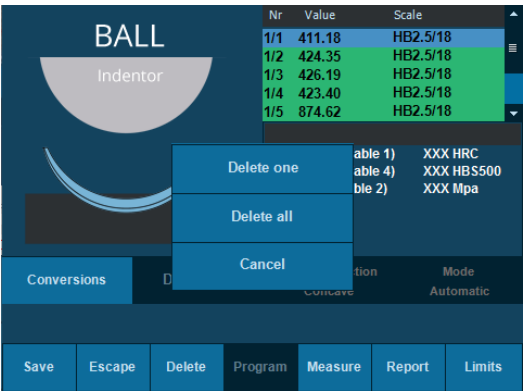
After a measurement has been made, the result can be saved to the [batch list](#).
If an indentation has been remeasured, press **"SAVE"** to replace the results.

NOTE: Set **"MODE AUTOMATIC"** to automatically save the result.

5.4.18 ESCAPE

Escape: This will ignore the last measurement or go back to previous state.

5.4.19 DELETE



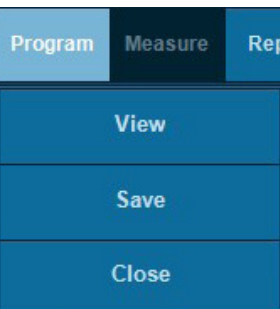
After a measurement has been made, it will be listed in the [batch list](#) of measurements.

"DELETE" enables the removal of individual measurements or all measurements from the batch list:

- To delete a selected individual reading from the batch list. Select individual measurements (light blue bar) and press **"DELETE ONE"**.
- To delete all measurements in the batch list, select **"DELETE ALL"**.

Select **"CANCEL"** to leave the menu without deleting a measurement.

5.4.20 PROGRAM



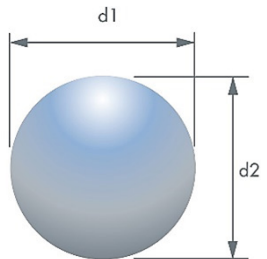
In the **"PROGRAM"** menu, settings of custom programs can be stored. This is convenient for frequently returning tests and will reduce the setup time for the tester:

- Press **"VIEW"** to select an existing custom program.
- Press **"SAVE"** to store the current setup of the tester in a custom program.

5.4.21 MEASURE

"MEASURE" turns ON optical measurement.

Following figure shows the definitions of the diameters to calculate Brinell hardness.



Depending on the physical connection of a BIOS camera to the tester, continue with one of the measurements described hereinafter.

5.4.21.1 MEASUREMENT WITH AN MICROSCOPE OR EYEPIECE

NOTE: No BIOS camera may be connected.

Following table shows how to enter the diagonals to calculate hardness.

Digital eyepiece	Analog eyepiece
1. After pressing the "MEASURE" for the first time after an indent is done, the diagonal D1 of the indent can be entered.	
2. Measure diagonal D1, which is the diagonal of the horizontal diagonal of the indentation	
3. Press the button on the eyepiece to store D1	3. Select the appropriate entry field of the diagonal, enter the (nonius) value of D1 and select the "OK" button to store D1
	Enter D1: [mm] .5 Cancel Ok
For Vickers/Brinell:	
4. The diagonal field for D2 is automatically selected after storing D1. Rotate the eyepiece 90 degrees and measure diagonal D2, which is the diagonal of the vertical diagonal of the indentation. Store D2 in similar way as D1. When the difference between D1 and D2 is higher than 5%, the background of the diagonal fields is coloured red. This indicates that the diagonal difference is not according to the specification standards.	
5. The hardness value is automatically calculated. The hardness result is shown on the screen. When the hardness value is out of range for the selected scale, the hardness will be displayed as "----".	

5.4.21.2 MEASUREMENT WITH A BIOS (BRINELL INDENT OPTICAL SCANNER)

NOTE: BIOS camera must be connected.

1. After pressing the **"MEASURE"** for the first time after an indent is done, a live picture from the BIOS camera will be seen in the Brinell optical [measure screen](#).
2. If applicable, adjust [light levels](#), [contrast](#), [brightness](#) or material pre-settings
3. After pressing the **"MEASURE"** button again, a captured picture from the BIOS camera will be seen in the screen, including cross-lines.
4. If **"MANUAL MEASUREMENT"** then press **"MEASURE"** again to confirm correct locations of cross lines.
5. After processing, the hardness value appears on the screen.

5.4.21.3 MODIFY A MEASUREMENT

If any need to correct a measurement, press the **"MEASURE"** button again.

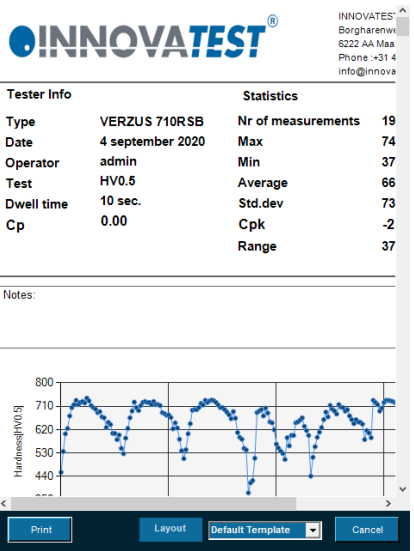
5.4.22 REPORT

"REPORT" opens the menu to configure, print or export a report. A report can contain statistics, diagrams, tester settings, measured values, etc.



"PRINT": Opens a print preview of the report.

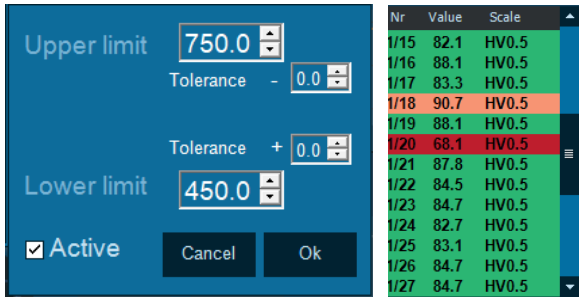
In the preview the report can be printed, exported (.PDF and .XLSX .CSV) and edited (company info).



"EXPORT" exports the measurements in the CSV format and location as set in the **"SYSTEM"**, **"SETTINGS"**.

5.4.23 LIMITS

This menu gives access to the **"UPPER"** and **"LOWER"** limits settings. Check **"ACTIVE"** to activate the limit settings. Press **"OK"** to save the setting.



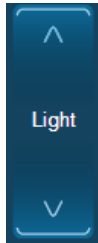
It is also possible to set a tolerance to these limit settings. The hardness value will turn orange if the measured hardness is within this tolerance, indicating that the value is close to the limit settings as a pre-warning. The hardness value will turn red if the value is out of the limits. In the shown example, respectively for measurement 18 and 20 this is the case.

5.4.24 START/STOP



- “START”** Green button: The tester is ready to start a hardness test. All conditions to start are ok.
- “STOP”** Red button: The machine is busy. If the start/stop button is red, the button can be selected to stop the activity of the machine.
- “START”** Disabled button: The tester is not ready to start to start (check Settings)

5.4.25 LIGHT CONTROL



The illumination intensity of the **“LIGHT”** on the test table can be controlled with this button.

5.4.26 TEST FORCE INDICATOR



The **“FORCE”** indicator will display shows the current applied force to the indenter. This gives an indication of the actual force on the indenter during preload, main load and recovery load for depth scales and only main load for all other scales.

5.4.27 TEST HEAD CONTROL

Visual in interface (Examples):	Contents of the test head:	Available actions in interface:
	Test head with 1 location. 1 indenter (“BRINELL 1MM BALL”) An external indent measure camera (“BIOS 1”)	No controls; shown indenter is the needed indenter based on chosen hardness scale. Shown camera is the detected camera.
	1 indenter (“ROCKWELL DIAMOND”) No external indent measure camera installed (“NONE”)	

NOTE:
Software assumes that the indicated indenter is installed, else incorrect hardness values will be calculated.

5.4.28 LIMIT SLIDERS VISUALS

For a Brinell measurement, measurement limits have to be set. The limits can be modified by changing the slider position. Left slider, inner circle is the upper limit, right slider, outer circle is the lower limit. The red circles do not have to be in the middle of the measurement.

5.4.29 ZOOM VISUALS

A slider allows to magnify the camera view.

5.4.30 SCROLLING ARROWS VISUALS

The arrows enable scrolling through the image when the image is enlarged. However, when selecting a measurement line, the scrolling arrows allows to move the measurement line.

5.4.31 LIGHT VISUALS

The arrows UP and DOWN allow to control the internal illumination. Press and hold the button on the BIOS to control the light intensity.

5.4.32 CONTRAST VISUALS

This scroll bar adjusts the contrast. This is done “live” meaning that any change of these settings can be seen in the live image.

5.4.33 BRIGHTNESS VISUALS

This scroll bar adjusts the brightness. This is done “live” meaning that any change of these settings can be seen in the live image.

5.4.34 MATERIAL PRE-SETTINGS VISUALS

By pressing one of these buttons, above mentioned visuals settings are pre-defined:

- First setting is for brushed metal
- Second setting is for polished metal
- Third setting is for shallow/small indentations



6

PROBLEM MESSAGES

⚠ WARNING

If the personnel detect problems or dangers, the user/owner or his authorized representative must be informed immediately. The user/owner or his authorized representative informs the manufacturer.

The machine's software has a central control. In this control several problems can be detected and registered. A message is displayed on the user interface when a problem occurs. Based on these messages, problems can easily be found and solved. However, not all problems are detected by the control system. These are more complex malfunctions or malfunctions that occur rarely.

Following table shows the possible messages during a problem and their possible solutions.

Message	Description
 Collision switch active Ok	Turret is hitting an object. Spindle too far up, or head too far down. If above is not the case, contact your service representative.
 Emergency switch pressed, release switch for further action	See for an instruction to release the emergency switch: dedicated tester user manual: chapter Emergency stop If above does not solve the problem or if the message occurs without activating the emergency switch, contact your service representative.
 Emergency switch pressed, application will exit now Ok	

6. PROBLEM MESSAGES

Message	Description
 Failed moving to home position Ok	Machine with load motor. During initialization the home switch near the load motor is not activated, failing to move to home position. If a reboot does not solve the problem, contact your service representative.
 Failed moving to safe position Ok	Machine with motorized head. During initialization the head failed to retract approx. 1 cm from the current position. If there is no visible obstruction in the head, contact your service representative.
 Failed to find upper limit Ok	Machine with motorized head. For a special protocol (e.g. crankshaft), the head has to be in the highest position. Failing this will result in the message. Contact your service representative
 Failed to initialize turret Ok	During initialization the home switch in the turret is not found within a certain time. If there is no visible obstruction in the turret, contact your service representative.
 Failed to move spindle down Ok	Machine with motorized head and spindle. During initialization the spindle failed to lower approx. 1 cm from the current position. If there is no visible obstruction in the head, contact your service representative.
 Failed to open connection to Com[nr] : Comport name Ok	Communication failure to the indicated port. The port is present but cannot be opened by the operating system. If a reboot does not solve the problem, contact your service representative.
 Force too high! Ok	If the measured force is not equal in both loadcells. If there is no visible damage, contact your service representative

Message	Description
 Indenter not present Ok	If a hardness scale is selected which is not suitable for the selected indenter. To avoid above mentioned, activate the "SCALES ONLY WITH INDENTER" option in the "SYSTEM"/"SETTINGS" menu. Alternatively, the indenter could be changed. If above does not solve the problem, contact your service representative.
 Loadcell not configured Ok	Configuration of the loadcell(s) is incorrect. If a reboot does not solve the problem, contact your service representative.
 Missing connection for Com[nr] : Comport name Ok	Communication failure to the indicated port. The port is not present and therefore cannot be opened by the operating system. If a reboot does not solve the problem, contact your service representative.
 Motor timeout reading position Ok	Machine without euroboard. Internal communication failure. If a reboot does not solve the problem, contact your service representative.
 Object detected Ok	The loadcell detects an unwanted force in the turret. If there is no visible obstruction in the turret, contact your service representative.
 Running low on diskpace! Ok	The impressions hard disk is running out of diskpace. If cleaning the archive does not solve the problem, contact your service representative.
 System not initialized! Ok	The user interface is released by the software before the initialization has ended. Contact your service representative.

Message	Description
 Timeout depthmeter readout Ok	Internal communication failure between electronics and PC. If a reboot does not solve the problem, contact your service representative.
 Unsupported scale Ok	If a hardness scale value is selected which is not in range of the value of the selected indenter. To avoid above mentioned, activate the "SCALES ONLY WITH INDENTER" option in the "SYSTEM"/"SETTINGS" menu. Alternatively, the indenter could be changed. If above does not solve the problem, contact your service representative.
 Unsupported tester Ok	The dongle that is being used is not usable with the installed impressions software. Contact your service representative.
 Upper limit not reached Ok	Machine with motorized head. When the head is in the highest position, but this is not detected. Contact your service representative.

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