

IMPRESSIONS™ 2 MT

Advanced software applications

USER MANUAL



USER **MANUAL**

IMPRESSIONS™ 2 MT

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.

Please contact our sales office for up-to-date information.

INNOVATEST Europe BV

Borgharenweg 140
6222 AA Maastricht
The Netherlands
Phone: +31 43 3520060
Fax: +31 43 3631168
info@innovatest-europe.com

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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.

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1

INTRODUCTION

This manual contains essential information concerning the operating system of the hardness tester, IMPRESSIONS™ 2 MT. 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 user manual of the machine, 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 IMPRESSIONS™ 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 re-ordered at the address below:

INNOVATEST Europe BV
Borgharenweg 140
6222 AA Maastricht
The Netherlands
+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 MT. The complete user manual consists of:

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

2

DESCRIPTION AND FUNCTION

IMPRESSIONS™ 2 MT is an advanced user operating system.
The software incorporates many advanced functions:

- Scale settings
- Test method settings
- Limits
- Image detection
- Conversion to other hardness scales
- File storing
- Data access over (W)LAND and USB
- Automatic or manual save measurement
- Report printing

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 SAFETY PROVISIONS

3.1.1 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.

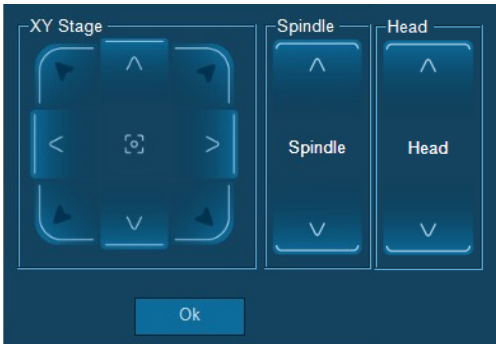
The software detects an activated emergency stop device, by presenting information and controls:



After releasing emergency switch, the software goes into an emergency mode where only manual controlled functionality is available.

Use available (software and hardware) controls to create a safe situation.

Depending on the hardware and motorized configuration of the tester, following controls are shown:



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 leave emergency mode and return to WINDOWS.

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 MT by INNOVATEST® service personnel.

5

BASIC OPERATION

This section gives a detailed description of the user interface and basic functionality of hardness testing software IMPRESSIONS:

1. Starting the software
2. Performing a basic test
3. Exiting the software
4. Overview of the main interface

NOTE:

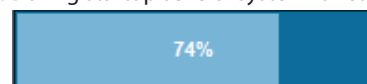
Some parts in this manual may relate to specific type of machines or optional software licenses and may differ or will be disabled by default.

5.1 START HARDNESS TESTING SOFTWARE IMPRESSIONS MT

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



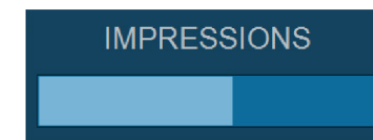
3. During startup several system functions and parameters will be checked



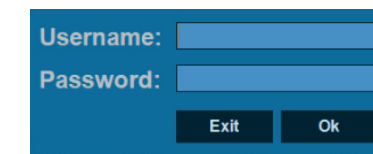
In case there are any [problems](#), a message will appear on the user interface

5. BASIC OPERATION

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



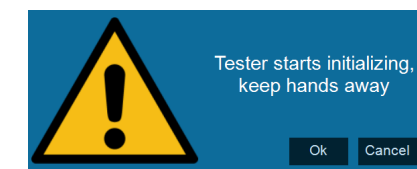
5. A correct start-up of the IMPRESSIONS™ system and the machine will show the login screen without any failure or error messages:



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. The machine is ready to testing when:
 - The [START/STOP button](#) shows a bright green “START”.
2. Depending on active processes, this can take a while.
 - Sometimes it helps to press “[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 MT

1. Select “EXIT” in the “[SYSTEM](#)” menu to exit the IMPRESSIONS™ software and return to Windows®.



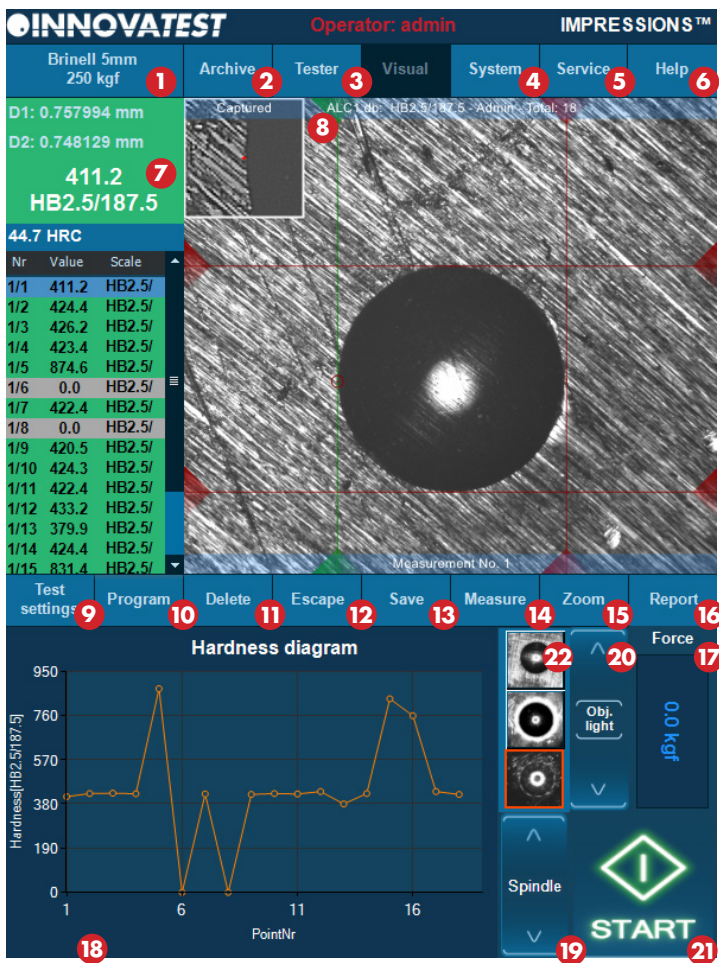
⚠ WARNING:

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. **Archive:** Saving and recalling measurements.
3. **Tester:** Tester specific settings.
4. **System:** General system settings.
5. **Service.**
6. **Help.**
7. **Results:** indent + measurement + batch list
8. **Camera view**
9. **Test settings**
10. **Program**
11. **Delete**
12. **Escape**
13. **Save**
14. **Measure**
15. **Zoom**
16. **Report**
17. **Test force indicator**
18. **Diagram**
19. **Table up/down**
20. **Light control**
21. **Start/Stop button**
22. **Material pre-settings (Optional)**



5.4.1 SCALE SELECTION

Press the **“SCALE SELECT”** button to select the required scale.
The selected scale is displayed in the button, e.g. **“VICKERS 2 KGF”**.

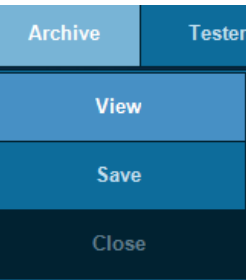
NOTE:

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

Vickers	1 gf	7 gf	25 gf	500 gf	5 kgf	50 kgf
Knoop	2 gf	8 gf	50 gf	1 kgf	10 kgf	100 kgf
Brinell	3 gf	9 gf	100 gf	2 kgf	20 kgf	120 kgf
HBT	4 gf	10 gf	200 gf	2.5 kgf	25 kgf	
HVT	5 gf	15 gf	300 gf	3 kgf	30 kgf	
	6 gf	20 gf		4 kgf	40 kgf	

5.4.2 ARCHIVE

In this area it is possible to save and recall measurements. **Test Settings** are also saved into the archive.
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 the double arrow **“≈”** 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.

Tester

Turret configuration

Spindle retraction

Working distance

Auto save

Info

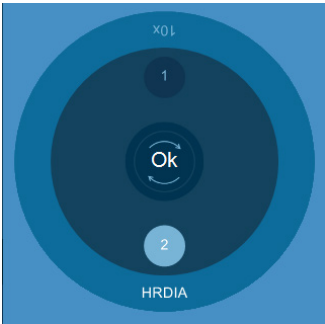
“TURRET CONFIGURATION” Settings to change the configuration of the indenter and objective.

“AUTO SAVE ON” Saves individual measurements in a batch immediately after completion.

“INFO” Shows the information of the machine’s hard- and software.

5.4.3.1 TURRET CONFIGURATION

In the turret configuration the physical contents of the test head and the installed optics is defined. This is necessary after changing an indenter or objective.



CAUTION:
Changing an indenter or objective must be done by a professional, an error in this configuration may severely damage your workpiece or the machine.

In some cases, it is not possible to change any indenter or objective, because this is protected by a higher log-in level showing the message:
“THIS POSITION CANNOT BE CHANGED”.

Changing an indenter
Select the indenter that needs to be changed, by clicking on that particular indenter. Replace the indenter as described in the dedicated machine user manual.

Tester

Turret configuration

Indenter Selection

Rockwell	Brinell	Vickers/Knoop	Extra
Diamond	1mm Ball	Vickers	Probe
1/16" Ball	2.5mm Ball	Knoop	
1/8" Ball	5mm Ball		
1/4" Ball	10mm Ball		
1/2" Ball			Empty
Cancel			

Select the new indenter. The following window can appear:

Indenter lenght

150940.00

Spindle

Focus

START

Ok

Cancel

Now select the **“START”** button. The machine will lower the indenter slowly until it hits the object. This is to determine the length of the new indenter. Press **“OK”** to save the indenter length when the motion has stopped.

CAUTION:
Skipping this step may increase the measuring time or damage the system during the next measurement. Therefore, it is essential that this is done by a professional only.

Changing an objective
Select the objective that needs to be changed by selecting that particular objective. Replace the objective as described in the dedicated machine service manual.

Tester

Turret configuration

Objective

Camera Only	Empty
0.7x	20x
1.5x	40x
2.5x	50x
5x	60x
6.3x	80x
10x	100x
Cancel	

5.4.3.2 AUTOSAVE

When **“AUTO SAVE”** is enabled, individual measurements in a batch list will be saved, immediately after completion of the test, without confirmation. It is recommended to enable this during Rockwell testing.

5.4.3.3 INFO

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

Model	FALCON 511
Build date	14 May 2018 09:17
Software version	2.40.2.3
Mechanical version	
Dongle	0x930455b
Ip address	127.0.0.1
Driver	LCA 3.18/AUX 3.10
Hardware revision	1.0
Hardware S/N	00.00.00.00.00.00.00.00.00.00.00.00.00.00.00.00
Serial number	51112152079
Ok	

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 IMPRESSIONS™ software as a user or to exit from the IMPRESSIONS™ 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 IMPRESSIONS™.
- “SETTINGS...” to change the software configuration of IMPRESSIONS™.
- “EXIT” to exit from the IMPRESSIONS™ 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.

Changing to a different language

● 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(澳门特别行政区)
● Gaelic	● Portuguese	● 中文(台湾)
● German	● Romanian	
Select Edit Cancel		

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	Altbreken											
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											

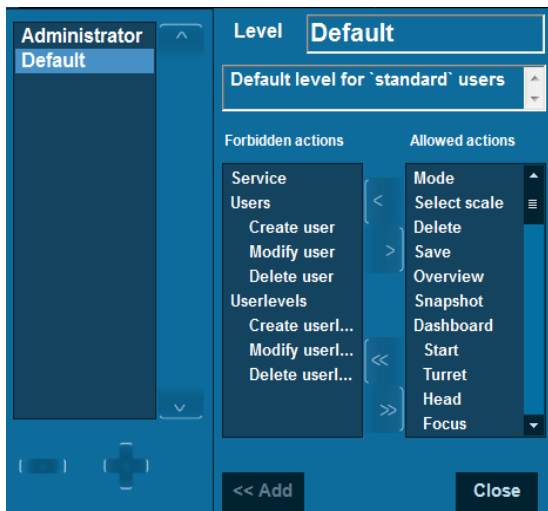
Although all common world languages are available, it is still possible to edit the translation of a language. Select the desired language to edit and press **“EDIT”**. The following window will appear.

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.



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.

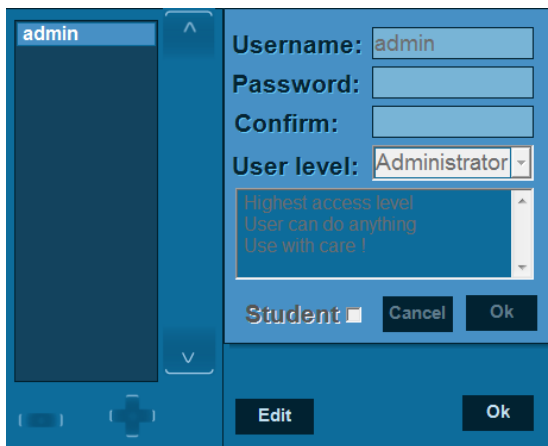
With the Allow all **“>>”** and forbid all **“<<”** buttons all items can be moved from the forbidden list to the allowed list and vice versa.

When all 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



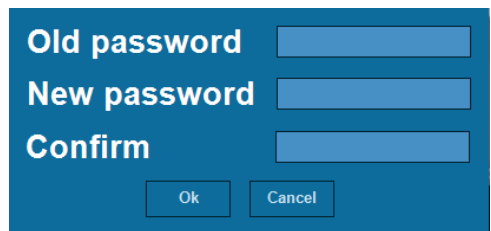
To add a new user, click the **“+”** (plus) button, fill in the desired username and password and link this user to a user level. Press **“OK”** to store this new user.

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.

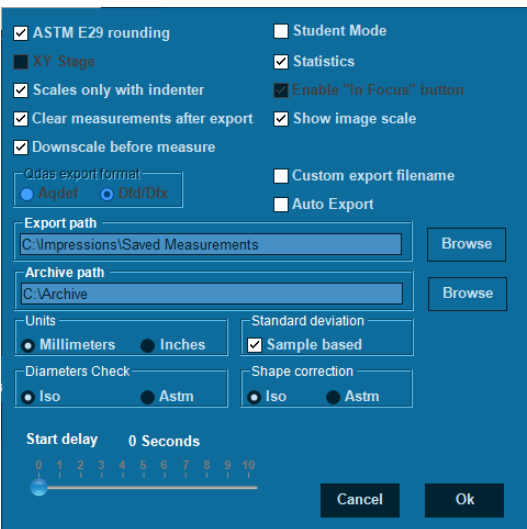


5.4.4.5 LOGOUT

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).

Scales only with indenter

If an indenter is not installed in the system, the scale is not selectable in the scale selection. (**“ON”** = scale is not selectable if indenter is not present).

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

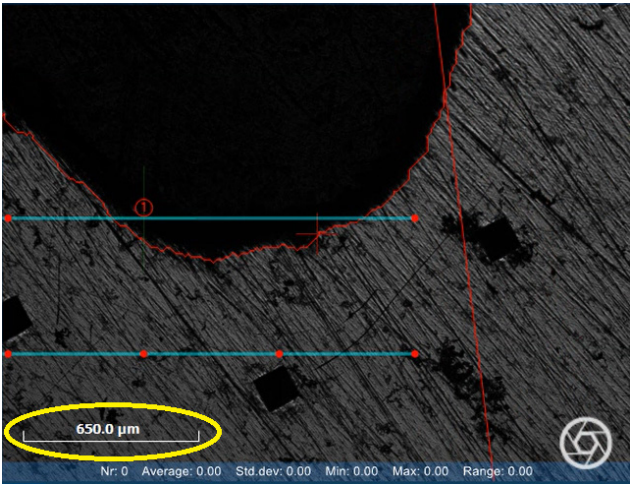
With student mode selected, the hardness value is not presented. Only the length of the diagonals will be visible. The hardness value needs to be calculated by “heart”. Mainly used for educational purposes (**“ON”** = Student mode).

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, concave 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 IMPRESSIONS™ 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:

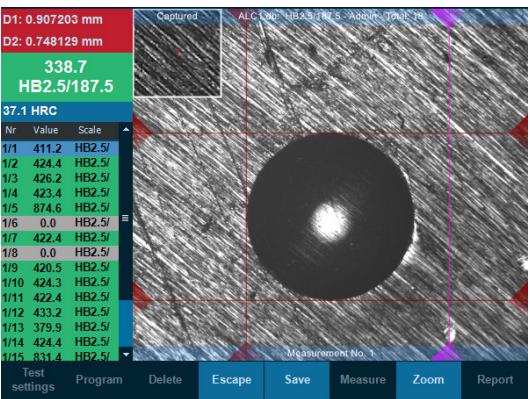
It is strongly recommended NOT TO MAKE ANY CHANGES to the machine factory settings. If any changes are made to the standard factory settings, which result to the malfunctioning of the tester or the Software and such intervention of INNOVATEST® is required, the support will be charged.

5.4.6 HELP

“HELP”: Opens the IMPRESSIONS™ user manual.

5.4.7 RESULTS

The results field shows the results of the last measurement, all other measurements are shown in the batch list.



D1 = Diameter 1 of indentation
D2 = Diameter 2 of indentation

338.7 HB2.5/187.5 = Hardness value
37.1 HRC = Converted value Nr, Value,
Scale = Batch list of measurement results

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

When selecting a result from the batch list (it will turn light blue), the measurement can be modified by selecting a crossline in the objective camera view and moving it to a new position.

Whenever the length of a diagonal results in an incorrect ratio according the used standard, the diameter box will turn RED.

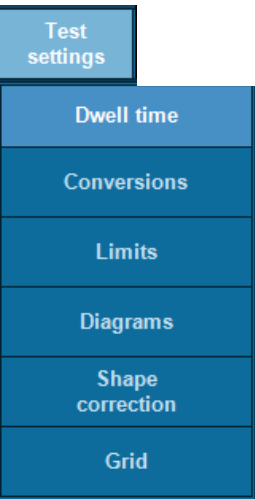
When the modification is done, the measurement can be saved with “SAVE”, deleted with “DELETE” or discarded with “ESCAPE”.

5.4.8 OBJECTIVE CAMERA VIEW

In the objective view, the workpiece will be visible through the selected objective (with magnification). The objective camera view can be selected for both live view and captured images.
In the upper part of the objective camera view, the view (LIVE or CAPTURED) and the selected hardness scale (like HV1) are visible.



5.4.9 TEST SETTINGS



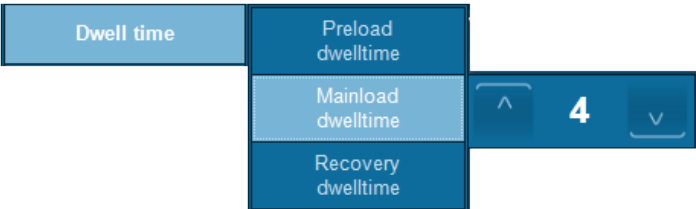
All specific test settings are configured here. These settings can be stored in a [program](#).

“DWELL TIME”: Dwell time settings for preload, main load and recovery.
“CONVERSIONS”: To select one or more conversions of the results into another standard/scale.
“LIMITS”: To indicate an upper and lower limit for test results.
“DIAGRAMS”: To set the diagram type for the results.
“SHAPE CORRECTION”: To set a correction for concave, convex or sphere-shaped materials.
“GRID”: To enable a grid in the camera view.

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

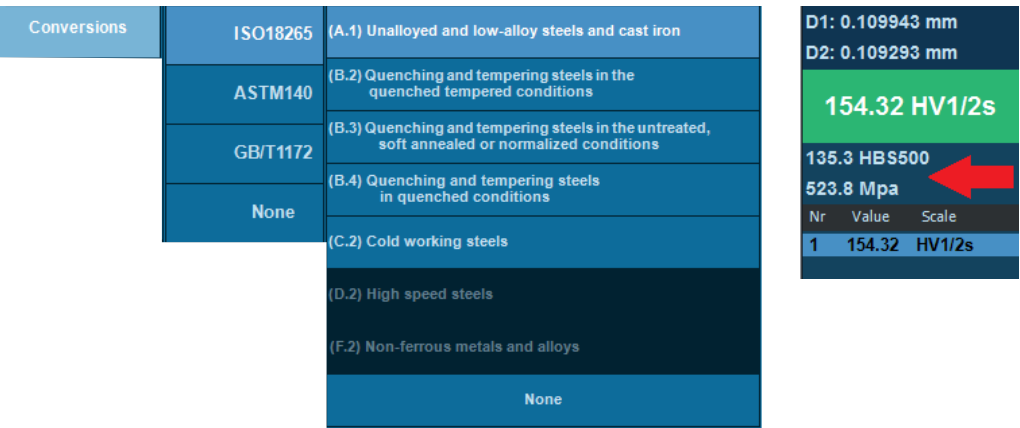
5.4.9.1 DWELL TIME

All dwell time settings can be configured in this menu (in seconds). **“PRELOAD”**, **“MAINLOAD”** and **“RECOVERY”** dwell times 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.



5.4.9.2 CONVERSIONS

In this menu several conversions to different standards/scales can be selected. In the results list the conversions will be shown beneath the actual measurement result.

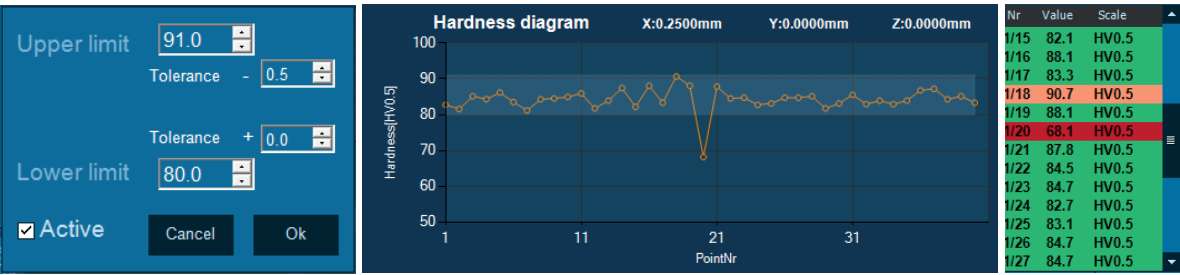


In the results list the conversions will be shown beneath the actual measurement result.

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

5.4.9.3 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. The last measured values and the values in the batch list will turn red if the value is outside of these limits.



After the limits have been set, an upper and lower limit bar will appear in the diagram. 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 above shown example, respectively for measurement 18 and 20 this is the case.

5.4.9.4 DIAGRAMS

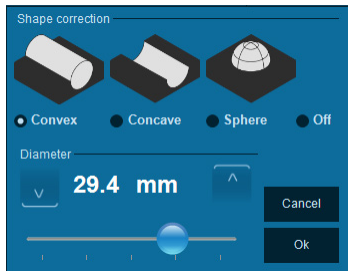
Diagrams	Hardness diagram
	Case depth diagram
	Jominy test
	Multiple lines
	Force depth
	Color mapping

Hardness values can be displayed in several ways. The **"HARDNESS DIAGRAM"** simply shows the hardness values for all subsequent test points. The **"CASE DEPTH DIAGRAM"** shows the hardness values as a function of depth. The depth value is the distance to the edge of the object under test. If a test has been executed according to ISO-642 then the **"JOMINY TEST"** diagram is appropriate.

Advanced diagram settings:

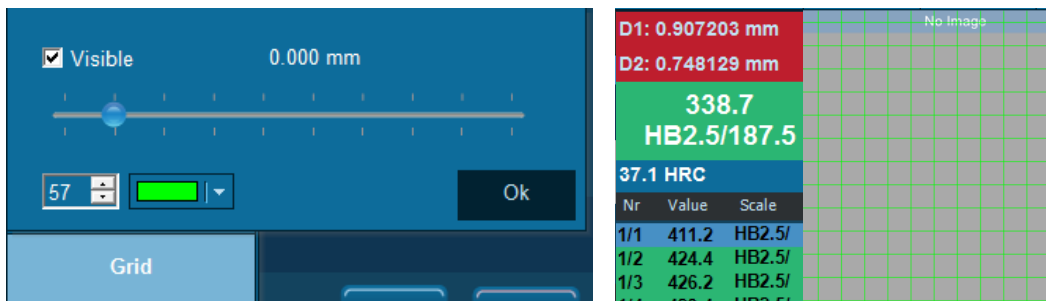
Select the **"MULTIPLE LINES"** For the visualisation of multiple patterns in one graph. **"FORCE DEPTH"** will display, in 2 separate lines, the course of test force on the indenter and depth of the indentation (for Rockwell).

5.4.9.5 SHAPE CORRECTION



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.

5.4.9.6 GRID



In the **"GRID"** menu it is possible to display a grid in the objective camera view. Size, thickness and color of the grid lines can be set. Set the desired properties of the grid and check **"VISIBLE"** before pressing **"OK"**.

5.4.10 PROGRAM

Program	Delete
View	
Save	
Close	

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.

5.4.11 DELETE

After a measurement has been made, it will be listed in the batch list of measurements.

Delete one
Delete all
Cancel

"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.

5.4.12 ESCAPE

Test settings	Program	Delete	Escape	Save	Measure	Zoom	Report
---------------	---------	--------	--------	------	---------	------	--------

"ESCAPE" will return to the main screen, after or during a measurement.

5.4.13 SAVE

Test settings	Program	Delete	Escape	Save	Measure	Zoom	Report
---------------	---------	--------	--------	------	---------	------	--------

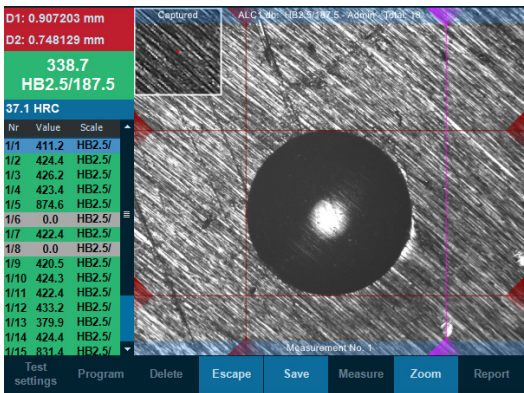
After a measurement has been made, the result can be saved to the [batch list](#). If an indentation has been remeasured, press **"SAVE"** to replace the results.

5.4.14 MEASURE

"MEASURE" turns ON optical measurement mode indicated by four cross lines. Cross lines are placed at the correct positions, automatically. If the measurement has to be done manually or if the automatic result is not satisfying, the cross lines can be placed manually. The buttons **"ESCAPE"** and **"SAVE"** are available during and after a measurement. Press **"ESCAPE"** to stop measuring or **"SAVE"** to save the measurement to the batch list of results.

5.4.14.1 EXAMPLE OF MODIFYING A MEASUREMENT

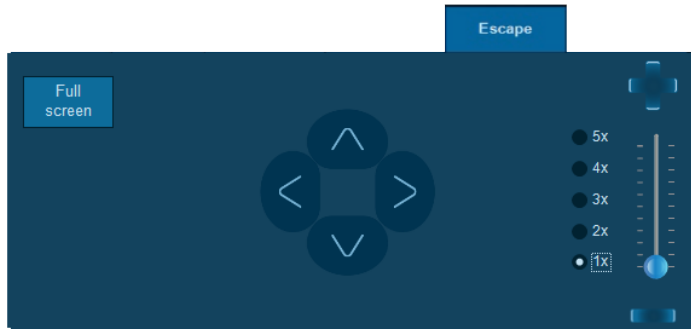
If any need to correct a measurement, press the **"MEASURE"** button again.



This image shows an example of an indentation where the right cross line is not at the correct position. Diagonal D1 and D2 have an incorrect ratio according to the used standard, indicated by the red color in the results bar. The incorrect placed cross line can be selected, the color will change from red to purple. A cursor control with four arrows will be available on the dashboard. A cross line contains a marker in the form of a little red dot, that can be seen in the magnification in the upper left corner of the camera view. This red dot can be positioned on the corner of the Vickers indentation with the four arrows on the dashboard, the mouse wheel or dragging it with the mouse.

5.4.15 ZOOM

Press **“ZOOM”** to enter the zoom mode.
“FULL SCREEN” maximizes the camera view to full screen mode. Press the button again to return to normal viewing mode. A slider allows to magnify the camera view, **“+”** enlarges the image and **“-”** reduces the image.
Also, several predefined zoom levels (1x to 5x) can be selected. The arrows enable scrolling through the image when the image is enlarged. Press **“ESCAPE”** to exit zoom mode, the last selected zoom level will stay active in the current image, as long as it is active.



5.4.16 REPORT

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

Snapshots	Report
Print	“PRINT”: Opens a print preview of the report. In the preview the report can be printed and edited (company info). “TEMPLATE EDITOR”: Opens the template editor. In the editor the report template can be modified (layout, content etc.) and saved. “EXPORT” exports the measurements in CSV format and location as set in the “SYSTEM SETTINGS”, see chapter 5.4.4.6.
Template Editor	
Export	

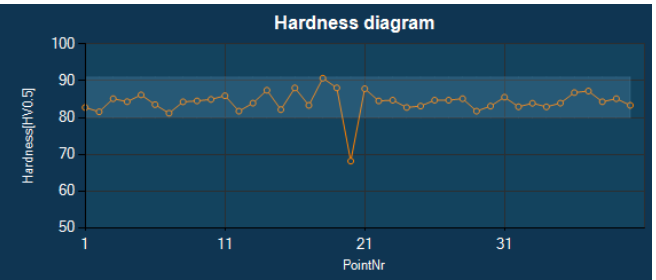
5.4.17 TEST FORCE INDICATOR



When the indenter is active, this indicator shows the force that is applied to the indenter.
This gives an indication of the actual force on the indenter during preload, main load and recovery for depth scales and only main load for all other scales.

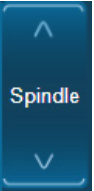
5.4.18 DIAGRAM

The diagram shows the graphical representation of the measured hardness values. Refer to [chapter 5.4.9.2](#) for more information on the different types of diagrams.



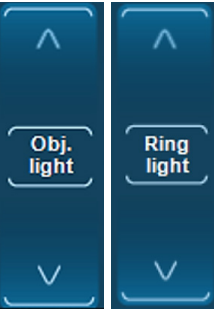
5.4.19 TABLE

With the button **“SPINDLE”**, the Z-axis moves up and down.



5.4.20 LIGHT CONTROL

The **“LIGHT”** of all objectives and cameras can be controlled with these buttons.
Clicking in the center will change the control of the light source. (Objective light and Ring light).



5.4.21 START/STOP



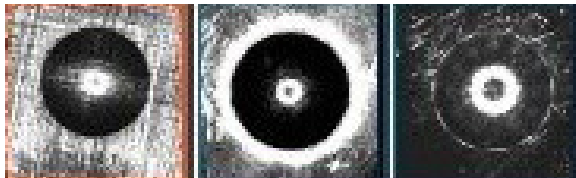
The **“START/STOP”** button can have following status:

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

5.4.22 MATERIAL PRE-SETTINGS (OPTICAL)

By pressing one of these buttons, above mentioned Brinell optical settings, like contrast and brightness, 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 	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
 Emergency switch pressed, application will exit now 	If above does not solve the problem or if the message occurs without activating the emergency switch, contact your service representative.

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 initialize xy-stage Ok	Machine with motorized XY-table. During initialization of the XY-table, the limits for the X and Y-axis cannot be found. If reconnecting the cable to the XY-table does not solve the problem, 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.

Message	Description
 Force too high! Ok	If the measured force is not equal in both loadcells. If there is no visible damage, contact your service representative
 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.

Message	Description
 System not initialized! Ok	The user interface is released by the software before the initialization has ended. Contact your service representative.
 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.

[illegible]

[illegible][illegible]

Distributor :

CORPORATE HEAD OFFICE

INNOVATEST Europe BV

Manufacturing, Distribution & Service

Borgharenweg 140

6222 AA MAASTRICHT

The Netherlands

Phone: +31 43 3520060

Fax: +31 43 3631168

info@innovatest-europe.com

www.innovatest-europe.com

INNOVATEST Deutschland GmbH Sales & Service

Phone: +49 245 670 59 500

info@innovatest-deutschland.com

www.innovatest-deutschland.com

INNOVATEST Shanghai Co., Ltd. Sales & Service

Phone: +86 21 60906200

info@innovatest-shanghai.com

www.innovatest-shanghai.com

INNOVATEST USA Company Sales & Service

Phone: +1 267 317 4300

info@innovatest-usa.com

www.innovatest-usa.com

INNOVATEST Polska sp. z o.o. Sales & Service

Phone: +48 697 099 826

info@innovatest-polska.pl

www.innovatest-polska.pl

INNOVATEST Japan Co., Ltd. Sales & Service

Phone: +81 3 3527 3092

info@innovatest-japan.com

www.innovatest-japan.com

INNOVATEST South East Asia Sales & Service

Phone: +65 6451 1123

info@innovatest-singapore.com

www.innovatest-singapore.com