

I-TOUCH™

Hardness testing software

USER MANUAL



USER **MANUAL**

I-TOUCH™

Hardness testing software

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.

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Date of release: May 2021
Document number: RAD_X_UMITO Version: 2.0 (Original instructions)

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: **I-TOUCH™**. 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
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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 I-TOUCH™.

The complete user manual consists of:

- The dedicated machine user manual
- This I-TOUCH manual
- The dedicated machine's unpack instruction (attached to the packaging)
- Declaration of Conformity

2

DESCRIPTION AND FUNCTION

I-TOUCH is an advanced user operating system. The software incorporates manual hardness measurement for all common hardness scales, file storing, turret operation, manual focusing and many other advanced functions.

The software can convert hardness values to 3 different hardness (and tensile) scales simultaneously according to international standards (ISO/ASTM).

All data can be stored and exported into well-known formats as CSV and TXT. All data can be on a USB drive.

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 the software and this manual:



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



This symbol indicates an **ERROR**.

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.

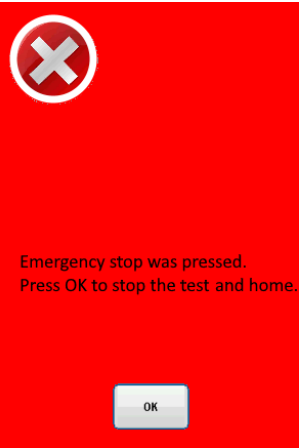
NOTE:

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

The software detects an activated emergency stop device, by disabling controls, including display.

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

Use available controls to create a safe situation, before restarting the machine.



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 exit emergency mode and restart the hardness testing software



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 I-TOUCH™ by INNOVATEST® service personnel.

5

BASIC OPERATION

This section gives a detailed description of the user interface and basic functionality of the I-TOUCH™ software. Each function will be explained in following subchapters.

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. BASIC OPERATION

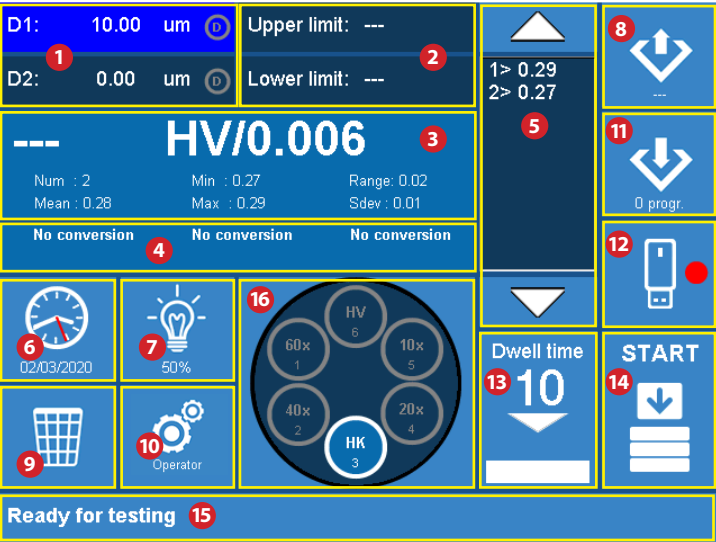
5.1 OVERVIEW OF THE MAIN INTERFACE

Layout and orientation of main interface depends on type of machine:

Mainly on Rockwell and Brinell testers without a turret:



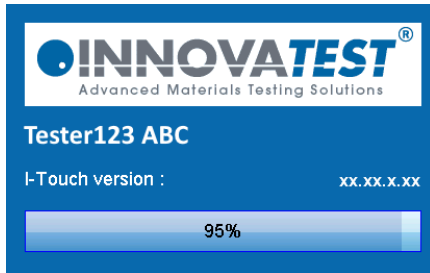
Mainly on Vickers and Brinell testers with a turret:



NR	Chapter	Default functionality	Alternative functionality (If pressed for more than 2 seconds)
1	5.4.1	Depth/diagonal information	Eyepiece setup
2	5.4.2	Limits entry	Limit setup
3	5.4.3	Measurement data & statistics / Scale selection	Save measurement into list
4	5.4.4	Conversions	(None)
5	5.4.5	Measurement list	(None)
6	5.4.6	Date/time adjust	Date/time setup
7	5.4.7	Light control	(None)
8	5.4.8	Load/delete program	(None)
9	5.4.9	Delete 1 selected measurement	Delete ALL measurements
10	5.4.10	General Setup	Information screen
11	5.4.11	Save program	(None)
12	5.4.12	Export/print measurements	Print or export
13	5.4.13	Dwell time and progress indication	Shape correction setup
14	5.4.14	Indenter displacement bar graph	Zeroing depth sensor/loadcell
15	5.4.15	Status bar	(None)
16	5.4.16	Turret control	Turret configuration

5.2 START HARDNESS TESTING SOFTWARE

1. **Hardware:** Make sure that the hardware emergency switch of the tester is not activated (anymore). For location and detailed info about the emergency switch, see dedicated machine user manual.
2. **Hardware:** Power ON the machine as indicated in the dedicated machine user manual. The machine will start up the testing software I-TOUCH automatically.
3. If the software has been started with activated emergency switch, then see [chapter “3.2.1 Emergency mode”](#).
4. During its initialization several system functions and parameters will be checked, in case there are any **problems**, a message will appear on the user interface.
5. When there are no issues during initialization, the software will be started. The following progress bar will appear on your screen, showing the software version and for what tester the software is configured. Show data is an example.

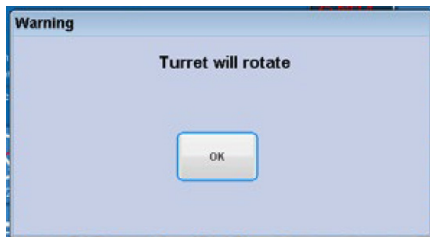


5.2.1 INITIALIZING

Depending on the machine configuration, some tester components need to be initialized.

5.2.1.1 TURRET

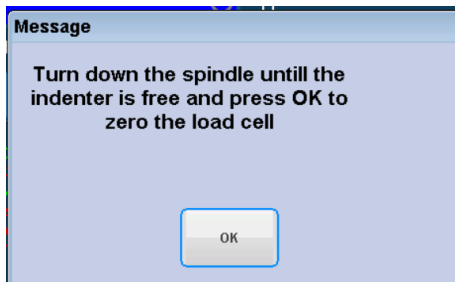
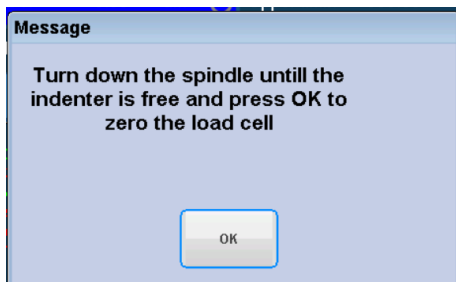
1. The device can warn that the turret will now rotate automatically.
2. Check that the indenter and objectives will not touch the workpiece when the turret is rotated, else move spindle down.



3. Touch the OK button to proceed with the homing sequence. During the homing sequence, the load motor retracts, and the turret is rotated to find the home position.
4. While the homing sequence is executed, the main screen appears.

5.2.1.2 DEPTH SENSOR/LOADCELL

1. The device can ask you to [zero the depth sensor/loadcell](#).

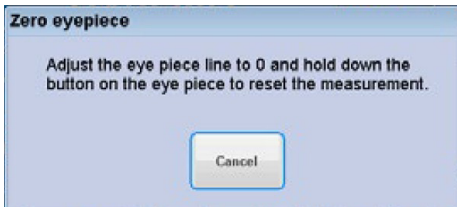


NOTE:

The depth sensor/loadcell can be zeroed at any time.

5.2.1.3 DIGITAL EYEPIECE

1. The device can ask you to [zero the digital eyepiece](#).
If you do not want to zero the eyepiece at this moment or you need to adjust the light intensity first to be able to see the specimen properly, press the CANCEL button to close the zeroing window.



NOTE:

The digital eyepiece can be zeroed at any time by pressing and holding the digital eyepiece hardware button for more than 2 seconds.

5.2.2 READY FOR TESTING

Follow any instructions as in the [status bar](#), like **“TURN SPINDLE DOWN”**:
If the status bar shows status **“READY FOR TESTING”**, then the device is ready for testing:



5.3 PERFORMING A BASIC HARDNESS TEST

Following example will describe, from start to end, a basic single point hardness test for a depth (like Rockwell) and a diagonal (like Brinell) scale.

NOTES:

*Actual steps may be different, depending on tester configuration and chosen scale.
For machine specific functionality/limitation, see dedicated machine user manual.*

5.3.1 FOCUS AND INDENT

Focus:

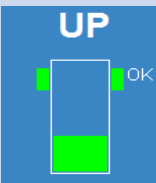
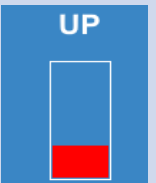
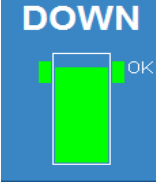
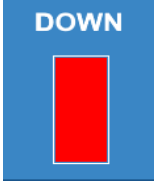
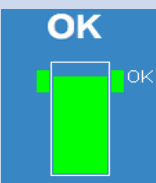
1. Position the specimen.
Turret tester: If tester has a rotating turret, make sure that the specimen is positioned so neither an indenter nor an objective can collide with the specimen.
2. If machine is configured with an object camera: Select the objective to find/focus the specimen. Start with a low magnification. Adjust the focus until the specimen surface is in focus, giving a sharp and crisp image. Adjust the [light level](#) if necessary. Change to a higher magnification for more accurate focusing.

Indent:

3. Select a [hardness scale](#) and the desired load that will be applied for the indentation.
4. Check that the tester is [ready for testing](#).
5. The [status bar](#) and [dwell time and progress](#) will show the different phases of the indentation cycle.
6. Depending on the hardware of the tester, see dedicated machine user manual, continue with one of the indentations described hereinafter.

5.3.1.1 INDENTATION ON AN AUTO START TESTER

Mainly on a Rockwell and Brinell tester without a turret.

Depth sensor	Or	Force sensor	
			• Move the elevator spindle upward, preferable without interruption and at a constant speed. • When the indenter touches the specimen and is pushed upward, the bar graph on the screen will slowly rise and "UP" is shown above the bar graph.
			• Keep turning the spindle upward with the indenter touching the specimen.
			• If text "UP" changed to "DOWN", you need to move the elevator spindle down until the text "READY" appears.
			• Stop moving the elevator spindle upward when the bar graph has reached the "OK" range, or the text about the bar changes to "OK".
			• Now the text "UP" will change to "STOP" and the bar graph background colour changes to red. • The indentation cycle starts automatically. • The indentation cycle can be stopped at any moment by selecting the area in which the bar graph is displayed.

5.3.1.2 INDENTATION ON A MANUAL START TESTER

Mainly on a Vickers and Brinell tester with a turret.

	• Bring specimen and indenter within 1mm from each other; see tester manual for available controls. • An indentation is started when touching the "START" button once.
	• Turret: - The device will automatically select the indenter that corresponds with the chosen hardness scale; the turret can rotate. • The indentation process will start • When the indentation is in progress, the START button changes into a STOP button. • The indentation cycle can be stopped at any moment by selecting the area in which the bar graph is displayed.

5.3.2 MEASUREMENT

1. The [status bar](#) and [dwell time and progress](#) show the different phases of the indentation cycle. Next step is to measure the indentation.
2. Depending on the selected scale, continue with one of the measurements described hereinafter.

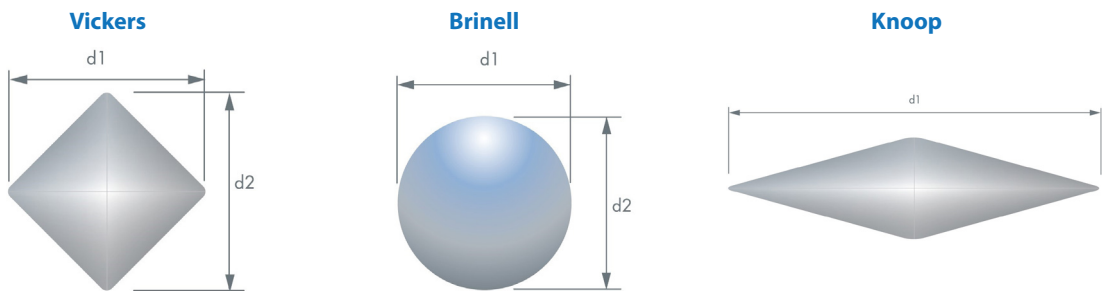
5.3.2.1 DEPTH (ROCKWELL)

1. When the indentation cycle is completed, the [Rockwell Depth](#) and the calculated hardness are displayed including [conversions](#).

5.3.2.2 DIAGONALS

1. Look through the eyepiece or microscope and bring the surface of the workpiece into focus.
2. If applicable, adjust [light levels](#).

For Vickers and Brinell, two diagonals are measured and entered to calculate the hardness value. For Knoop, only one diagonal is measured and entered to calculate the hardness value.



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

Digital Eyepiece	Analog Eyepiece
1. Measure diagonal D1, which is the diagonal of the horizontal diagonal of the indentation	
2. Press the button on the eyepiece to store D1	2. Select the appropriate entry field of the diagonal, enter the (nonius) value of D1 and select the "OK" button to store D1
3. 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 standards.	
4. 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 "----".	

5.3.3 ADDITIONAL SETTINGS BEFORE STARTING A TEST

- Hardness testing software I-TOUCH must be [started](#) without issues.
- Check that the objectives and indenters defined in the software match with the actually installed in the test head.
 - Tester with a turret: [turret configuration](#).
 - Tester without a turret: Software assumes required indenter for selected scale is installed.
- Check correct [eyepiece](#) configured.
- Select [conversions](#).
- [Set the dwell times](#) to the desired values.
- Set the [shape correction](#) to the correct shape and shape diagonal when this is applicable for the selected hardness scale.
- [Adjust light level](#) of the working light.

5.3.4 SAVE/REPORT/EXPORT

- When the ["AUTOMATIC SAVE MEASUREMENT"](#) option is not set, manually [save measurement](#) in the [measurement list](#).
Status bar shows a temporal reminder text ["CLICK ON RESULT TO ADD IT TO THE LIST"](#).
- All measurements in the [measurement list](#), conversions and statistics can be [exported](#) to an USB stick.

5.4 INTERFACE FUNCTIONS

5.4.1 DEPTH INFORMATION OR DIAGONAL ENTRY FIELDS/EYEPIECE SETUP

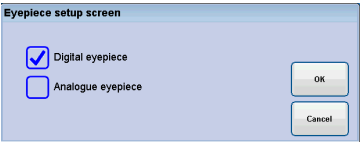
5.4.1.1 DEPTH INFORMATION OR DIAGONAL ENTRY FIELDS

Ind. displ.:	0.00 um	D1:	40.30 um		D1:	30.60 um	
Depth:	0.00 um	D2:	41.40 um				
Depth (Rockwell)		Two diagonals (Vickers/Brinell)			One diagonal (Knoop)		

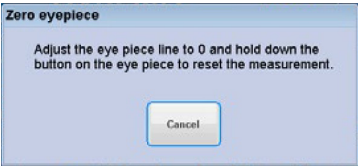
- When a Rockwell scale is selected, the indenter displacement and the depth are shown. The "indenter displacement" value is the distance the indenter moved relatively to the zero position of the depth sensor. The zero position is reached when the indenter is not touching anything. The indenter displacement value is shown when a new indentation is started and not when a measurement from the measurement list is selected. The indenter displacement shows the distance the indenter has moved relative to the zero position of the depth sensor. The "depth" value is the difference between the indenter displacement value during preload dwelling and the indenter displacement value during recovery dwelling. This is the actual Rockwell depth used to calculate the Rockwell hardness value. For the Vickers and Brinell hardness scales, two diagonals (D1 and D2) have to be entered, while for Knoop, only one diagonal (D1) has to be entered.
- How the diagonals are entered, depends on the type of machine-visuals:
 - Digital eyepiece: diagonals are automatically updated when the eyepiece button is pushed.
 - Analogue eyepiece/Brinell microscope: measure the horizontal and vertical diagonal of the indentation and enter the diagonals in the diagonal entry fields.

5.4.1.2 EYEPIECE SETUP

- The chosen eyepiece type is indicated by an 'A' when the analogue eyepiece is selected or a 'D' when the digital eyepiece is selected.
To change the eyepiece type, the alternative function of the diagonal entry fields is used by keeping either the D1 (selection window digital/analogue eyepiece) or D2 field touched for more than 2 seconds.



- When the digital eyepiece is selected, the device will ask you to zero the eyepiece:



- If you do not want to zero the digital eyepiece at this moment or you need to adjust the [light intensity](#) first to be able to see the specimen surface properly, press the ["CANCEL"](#) button to close the zeroing window.
- To zero the digital eyepiece:
 - Look through the digital eyepiece and adjust the rotary knobs on the eyepiece until both guiding lines touch each other.
 - Press and hold the button on the eyepiece for more than 2 seconds to confirm the zeroing
 - The zeroing screen will disappear. The digital eyepiece is now ready to use.Verify on screen that diagonal values d1=0 and d2=0.

5.4.2 LIMIT ENTRY & LIMIT SETUP

Upper limit: 100.00

Lower limit: 30.00

Upper limit setup screen

☒ Limit active

☐ Limit not active

OK

Cancel

When a hardness value has been calculated or a measurement is selected in the measurement list, the background colour of the measurement data & statistics field is either blue, red or green. When the background **colour is blue**, this means that both the upper and lower limit field is set to inactive and showing "----". When the background **colour is green**, this means that the hardness value is within the limits. When the **colour is red**, this means that the hardness value is outside of the limits. The hardness values in the measurement list will also be coloured depending on whether the value is within or outside the limits.

1. The "LIMITS" fields are used to enter the upper and lower limit individually.
2. The alternative function of the LIMITS fields allows setting the corresponding limit active or inactive by pressing either the upper limit or lower limit entry field for more than 2 seconds.

No limit(s) set

Background colour is blue

65.70 HRC

Num : 5 Min : 22.91 Range: 43.09

Mean : 48.71 Max : 66.00 Sdev : 19.13

No conversion No conversion No conversion

Upper limit: ---

Lower limit: ---

Depth: 68.60 um

Hardness value within limit(s)

Background colour is green

76.26 HB2.5/62.5

Num : 5 Min : 22.91 Range: 43.09

Mean : 48.71 Max : 66.00 Sdev : 19.13

No conversion No conversion No conversion

D1: 0.00 um Upper limit: 78.00

D2: 0.00 um Lower limit: 76.00

Hardness value outside limit(s)

Background colour is red

78.1 HB2.5/62.5

Num : 5 Min : 22.91 Range: 43.09

Mean : 48.71 Max : 66.00 Sdev : 19.13

No conversion No conversion No conversion

D1: 0.00 um Upper limit: 78.00

D2: 0.00 um Lower limit: ---

Selected Hardness value from list is within limit(s)

65.70 HRC

Num : 5 Min : 22.91 Range: 43.09

Mean : 48.71 Max : 66.00 Sdev : 19.13

Upper limit: 70.00

Lower limit: 30.00

Depth: 68.60 um

1 > 66.00

2 > 22.91

3 > 26.03

4 > 65.70

5 > 60.90

5.4.3 MEASUREMENT DATA & STATISTICS/SCALE SELECTION/SAVE MEASUREMENT

5.4.3.1 MEASUREMENT AND STATISTICS FIELD

111.2 HB2.5/15.625

Num : 6 Min : 22.91 Range: 88.31

Mean : 59.13 Max : 111.2 Sdev : 29.11

The measurement and statistics field shows either the calculated hardness value after entering the diagonal or the hardness value of a saved measurement when it is selected in the measurement list. When the limits are active, the colour of the measurement and statistics field indicates whether the hardness value is within the set limits or not. Additionally, the statistics data calculated over all saved measurements is shown.

1. Hardness value (calculated after entering the diagonal or from the measurement that is selected in the measurement list). When the hardness value shows "----", this means that a new measurement is created, but no diagonal have been entered yet, so no calculation is done yet.
 2. The current selected hardness scale.
 3. The current selected load.
 4. Statistics data over all saved measurements in the measurement list.
- "NUM" = number of saved measurements.
- "MIN" = minimum value of the saved measurements.
- "MAX" = maximum value of the saved measurements.
- "RANGE" = difference between the minimum and maximum value.
- "MEAN" = mean value calculated over the saved measurements.
- "SDEV" = standard deviation calculated over the saved measurements

NOTE:

When a non-standard dwell time (< 10 or > 15seconds) is used for Vickers or Knoop, this dwell time is added to the hardness, scale and force information. Example: Vickers hardness of 100 using a test force of 1kg and a dwell time of 16 seconds: 100 HV/1/16s

5.4.3.2 SCALE SELECTION

Touch the measurement and statistics field briefly to select the desired hardness scale and force. The following screen will appear:

Select hardness scale and force

Vickers	HRA	HRB	HRC	HRD	HRE
Knoop	HRF	HRG	HRH	HRK	HRL
Brinell	HRM	HRP	HRR	HRS	HRV
Rockwell	HR15N	HR30N	HR45N	HR15T	HR30T
HB	HR45T	HR15W	HR30W	HR45W	HR15X
HVT	HR30X	HR45X	HR15Y	HR30Y	HR45Y
HBall					

OK

Cancel

Some hardness scales and forces are disabled depending on the tester type.

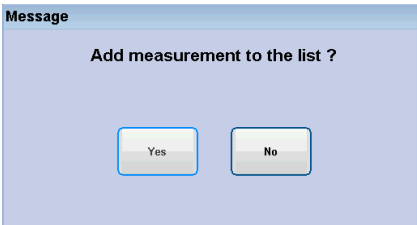
Touch the desired hardness scale in the left column and then touch the desired force from the right table.

Touch the "OK" button to confirm your choice or touch the "CANCEL" button to discard any changes.

5.4.3.3 SAVE MEASUREMENT(S)

To save a measurement, there are 2 possible modes: manual or automatic.

- In manual mode, the hardness value is saved when the measurement and statistics field is being pressed for more than 2 seconds. A popup appears with the question: **“ADD MEASUREMENT TO THE LIST?”**. Select **“YES”** to save the measurement.



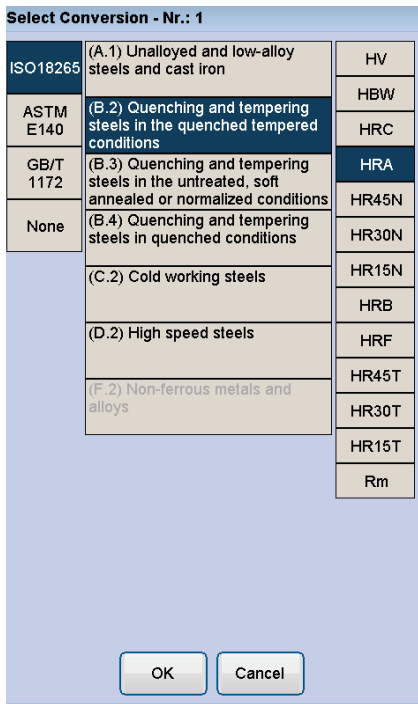
- In **automatic** mode, the hardness value will be saved automatically to the measurement list without any user interaction.

5.4.4 CONVERSIONS

The machine can store and show three user-selectable conversions of the current hardness value into three other hardness scales. The current conversions are shown in the conversions field:

253.94 HV10 ISO18265 (A.1)	242.46 HBW3000 ASTM E140 (Table 1)	61.66 HRA GB/T 1172 (Table 1)
-------------------------------	---------------------------------------	----------------------------------

The machine remembers the selected conversions, even after power OFF. To change one of the 3 conversions, touch the corresponding area in the conversions field. When for example conversion 1 is touched, the following screen appears:



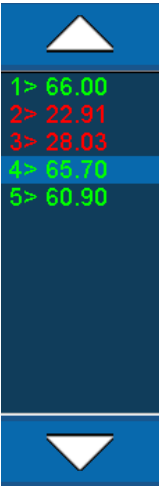
- The screen shows the current conversion data.
- To change the conversion, just select the desired standard in the left column, then select the desired metal type in the 2nd column and then select the desired conversion scale in the last column. Select **“OK”** to confirm.
- The conversion selection screen closes, and the new conversion is shown in the conversions field.
- When the hardness value cannot be converted into the selected conversion scale, the converted hardness value is displayed as **“---”**. This happens when the hardness value is outside the range of the chosen conversion scale or when a new measurement is not finished yet.

5.4.5 MEASUREMENT LIST

The measurement list contains all saved measurements. The device remembers all saved measurements, even after power OFF.

NOTE:

Up to a maximum of 150 measurements can be saved.



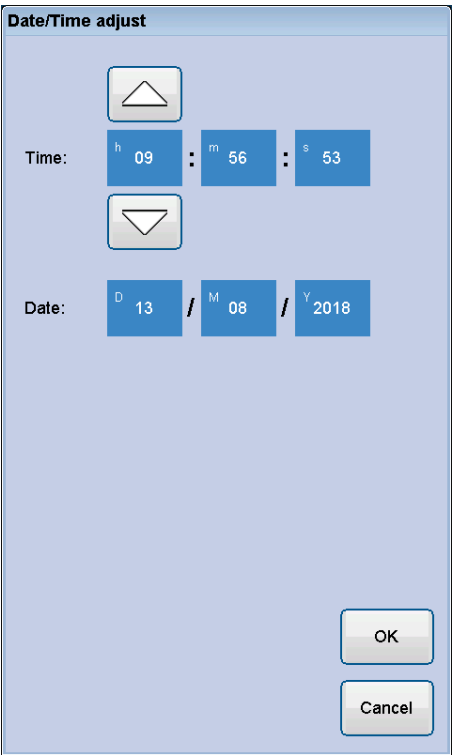
The measurement list can be browsed by touching the up or down button. Alternatively, a measurement can be selected from the list by touching the desired list item. When touching or selecting a measurement from the list, the hardness value and diagonal/depth of the selected measurement item is displayed. For Vickers and Knoop, also the dwell time is shown in case it is a non-standard dwell time (< 10 or > 15 seconds).

The color of the hardness value in the list indicates if the hardness of the measurement is within (green) or outside (red) the set **limits**.

5.4.6 TIME & DATE ADJUST/TIME & DATE SETUP

5.4.6.1 TIME & DATE ADJUST

The time/date button shows the current time of day and date in the current selected notation. The time and date are set by pressing the time/date button briefly. The following screen appears:



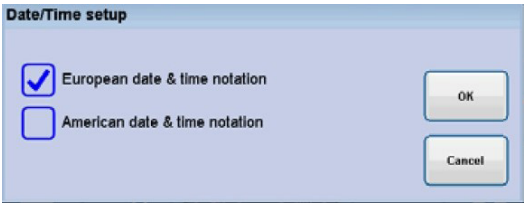
For example, to set the hour, touch the hours-field and adjust the value by touching the up and down button.

When the up or down button are kept touched, the value will automatically increase or decrease.

Touch the **“OK”** button to confirm your changes or touch the **“CANCEL”** button to discard any changes.

5.4.6.2 TIME & DATE SETUP

The time & date format can be configured with the alternative function of the time & date button by keeping this button selected for more than 2 seconds. The following screen appears:



The selected format will show “November 8th of 2016” as following:



European notation



American notation

The device remembers your choice, even after power OFF.

5.4.7 LIGHT CONTROL

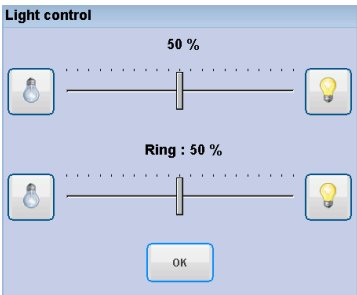


The light control button is used to set the light level of certain lights, like work light, object light and ring light.

See dedicated machine user manual for details about which lights are controllable.

The current light levels, in percent, are shown in the button.

When the light control button is touched briefly, a window with a slider appears

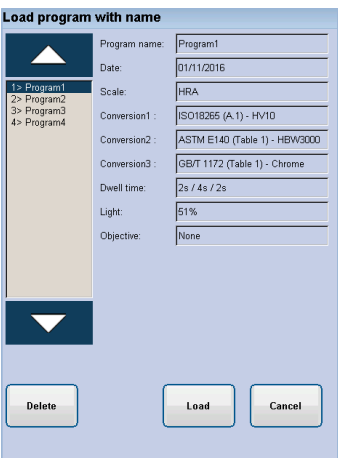


The light intensity is changed with the slider. The slider is set by keeping it selected while moving it horizontally. To adjust the light intensity with 1%, touch the buttons left and right of the slider.

Then touch the “OK” button to save the selected level and leave the screen. The device saves and remembers your setting, even after power OFF.

5.4.8 LOAD/DELETE A PROGRAM

It is possible to **save** settings in a program with a user-definable name, this to define predefined sets of settings and switching between these predefined sets easily. The load program button is used to recall a stored program



When the load button is pressed, the following window appears.

The left part of the window shows the list with the names of the stored programs.

The right part of the window shows the settings in the selected program.

You can browse through the list of programs by touching the up or down button. You can also select a program from the list simply by selecting the desired list item.

5.4.8.1 DELETE PROGRAM(S)

Programs can be deleted from the list by selecting the list item and then touching the “**DELETE**” button. Deleting programs can be done in 2 ways:

- Single program Programs, by selecting the list item and then pressing the delete button.
- Delete all the programs from the list, by selecting and hold the delete button for more than 2 seconds.

5.4.8.2 LOAD A PROGRAM

To load one of the saved programs, select the program name in the list and select the “**LOAD**” button.

A “---” below the load button icon is an indication that currently no program is loaded, or that a loaded program has been overruled by changing one of its settings.

When a saved program has been loaded, the name of the program is shown below the load button icon.



5.4.9 DELETE MEASUREMENT(S)

The “**DELETE MEASUREMENT**” button is used to delete a saved measurement or all saved measurements at once, from the measurement list.

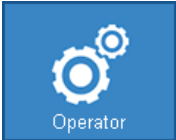


To delete a selected measurement, select the measurement or use the up/down buttons of the [measurement list](#) to select a measurement, then select the delete button briefly and confirm with the “OK”.

To delete ALL measurements, keep the delete button selected for more than 2 seconds and confirm your action with the “OK” button.

5.4.10 SETTINGS/INFORMATION SCREEN

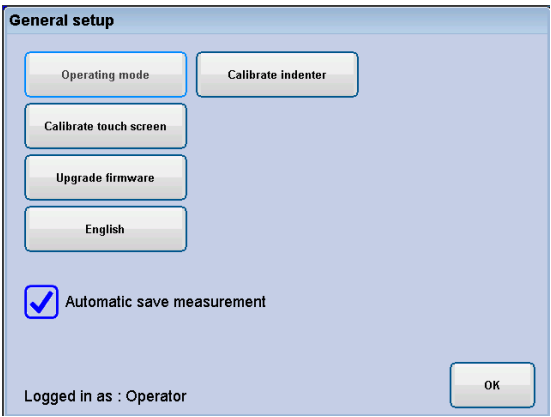
The settings button is used to change the operating mode, calibrate the touch screen, upgrade firmware, change the language or to enter the calibration screens.



In the settings button, the current operating mode is shown. The default operating mode, that is set at power ON is “OPERATOR”.

5.4.10.1 SETTINGS

When pressing the setup button briefly, the settings screen appears:



The settings screen gives access to the following functions:

1. Operating mode: To change the operating mode. Service technicians uses this function.
2. Calibrate the touch screen: To re-calibrate the touch screen. Follow on-screen instructions.
3. Upgrade firmware: To install new firmware using an USB stick. See beneath for a detailed instruction.
4. Language selection: To select another language. All text is displayed in the selected language.
5. Calibrate indenter. See beneath for a detailed instruction.
6. Automatic [save measurement](#): Select the checkbox to toggle between enable and disable the automatic save measurements mode.

Upgrade firmware

New firmware is installed using a USB stick. The new firmware (.hex file) should be located in a folder named: “Firmware” in the root of the USB stick.

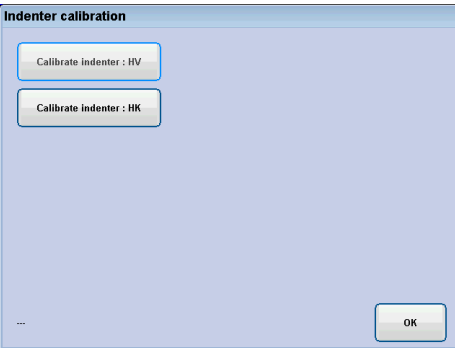
NOTE:

No other hex files except the hex file with the new firmware should be located in this “Firmware” folder on the USB stick. The USB needs to be formatted using the FAT(32) file system. The NTFS and exFAT filesystems cannot be used.

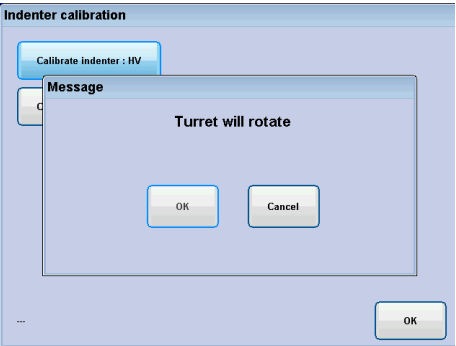
1. To install new firmware, touch the “UPGRADE FIRMWARE” button on the settings screen.
2. Now insert the USB stick. When the USB was already inserted and the upgrade process does not start, remove the USB stick and re-insert it.
3. When the firmware upgrade process is completed, the device will restart with the new firmware.
4. Check the firmware version number on the splash screen at start-up or on the information screen by keeping the settings button pressed more than 2 seconds.

Calibrate indenter

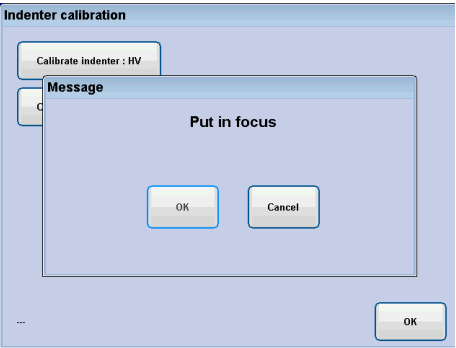
When the indenter has been replaced or another type of indenter has been installed, the indenter length may need to be calibrated again so the device knows the exact length of the indenter. The software needs the exact length of the indenter in order to determine the position at which the indenter will touch the specimen.



The screen shows one or more buttons, depending on how many indenters are instead. Touch the “CALIBRATE INDENTER: XX” button to start the calibration process for the selected indenter.

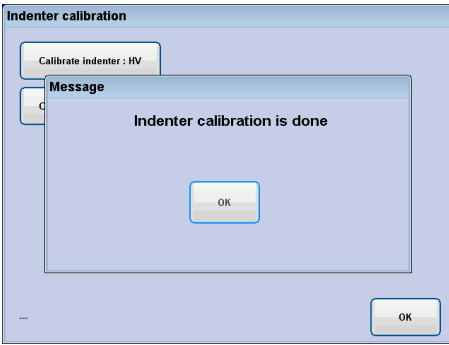


The screen can warn that the turret will rotate to the objective with the highest magnification. This objective is used to put the specimen in focus by adjusting of the elevator spindle. Touch the “OK” button to proceed. The turret rotates and selects the objective with the highest magnification.



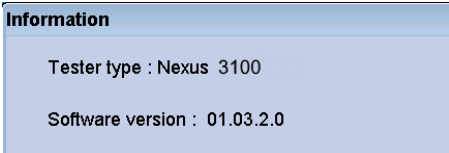
Look through the eyepiece and adjust the height of the specimen with the elevator spindle, until the specimen surface is in focus. When the specimen is in focus, touch the **“OK”** button. Now the indenter length is calibrated.

Touch **“OK”** to proceed.



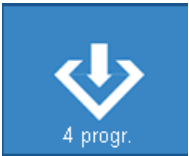
5.4.10.2 INFORMATION SCREEN

Select the General Setup button and keep it selected for more than 2 seconds, the information screen appears. This screen shows the tester type and the firmware version; shown data is example.



5.4.11 SAVE PROGRAM

To save the current set of settings as a program and attach a name to this program, select the save program button. Up to a maximum of 50 programs can be stored.



When pressing the save button, a window will appear with an automatically generated program name. To change the program name, simply select the program name field.



An alphanumeric keypad appears, allowing defining a new program name.

After entering a new program name and pressing the **“OK”** button to accept the changes and pressing **“OK”** to save the program, the current settings are saved using the entered name.



In the save program button, the number of saved programs is shown.

5.4.12 EXPORT/PRINT MEASUREMENTS

5.4.12.1 EXPORT MEASUREMENTS

All measurements in the measurement list, conversions and statistics can be printed or exported to a file on an USB stick. The location of the USB connector for the stick is indicated in the dedicated machine manual.

The button can have 2 functions, indicated by its icon.

Export to file:

After inserting the USB stick, the device needs several seconds to detect the USB-stick.



When the stick is not detected, re-insert the stick. The USB stick has to be formatted for the FAT(32) file system. Other file systems will not work.



INNOVATEST	
Nexus 605U	
TEST RESULT LIST	
OPERATOR	:
PART NR.	:
DATE	: 11/11/2019
TIME	: 14:15:28
HARDNESS SCALE	: HRA
CONVERSION 1	: None
CONVERSION 2	: None
CONVERSION 3	: None
FORCE	: 60000.000g
DWELL TIME	: 3s - 3s - 3s
MEASUREMENTS	: 3
AVG	: 83.43
MAX	: 99.11
MIN	: 75.50
S.DEV	: 11.08
RANGE	: 23.61
SINGLE VALUES	
1.	99.11 HRA
2.	75.50 HRA
3.	75.70 HRA

When the measurements are saved to an USB stick, the measurements will be saved to a file called "report.txt" in the root folder of the USB stick.

When this file already exists, a popup message appears: **"OVERWRITE FILE?"**
When **"YES"** is pressed, the file will be overwritten. After the file is written, a popup message appears: **"FILE WAS WRITTEN"**. Press the **"OK"** button to proceed.

Print measurements:

Measurement will be sent to (built-in) printer.



5.5.12.2 PRINT OR EXPORT TO USB

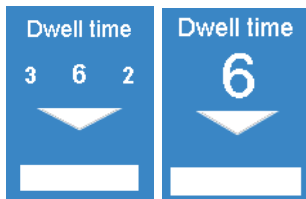
Set the function of the button:



5.4.13 DWELL TIME AND PROGRESS INDICATION/SHAPE CORRECTION SETUP

5.4.13.1 DWELL TIME AND PROGRESS INDICATION

The dwell time and progress are combined in the dwell time and progress indication field:



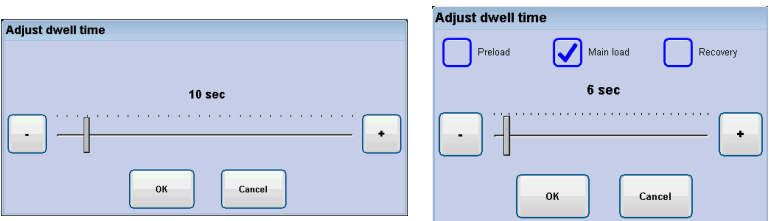
In case a **Rockwell** scale is selected, the tester applies the preload force, then the main load force and finally the recovery load. Each force application is followed by a corresponding dwell time during which the force is maintained. These dwell times are shown in the indication field, in seconds.

In case a **non-Rockwell** scale is selected, the tester applies the main load, followed by the main load dwell time, which is shown in the indication field, in seconds.

- When an indentation cycle starts and the desired force for the indentation phase is reached, the corresponding dwell time value will start counting down to zero.
- When the value reaches zero, the next phase of the indentation cycle starts.
- When the indentation cycle is completed, the dwell time values reset back to their start values. The lower part of the field shows a triangular or ball shape representing the indenter and a rectangular/concave or convex shape that represents the specimen surface.
- When an indentation is started, the progress indication will show the position of the indenter while moving towards the specimen surface.
- When the specimen surface is reached, the progress indication field changes to a bar graph that represents the measured force until the selected force is reached.



To set the dwell time, press the dwell time and progress indication field briefly. One of following screen appears:



First, select the dwell time that needs to be adjusted by pressing the appropriate checkbox (for non-Rockwell there is only the main load dwell time). Then keep the slider selected while moving it horizontally to adjust the dwell time. For fine adjustments use the "+" and "-" buttons to increase and decrease the dwell time in steps of 1 second. Press **"OK"** to save the changed dwell time and leave the screen. Press the **"CANCEL"** button to discard any change.

The device will remember the saved change, even after power OFF.

5.4.13.2 SHAPE CORRECTION SETUP

NOTE:

The shape correction can only be set when a hardness scale is selected for which the shape correction is relevant. Shape correction is not relevant for Knoop hardness and Brinell measurements. For Rockwell only convex shape correction is relevant.

The Dwell time and progress indication field indicates the current selected shape correction in the lower area. The device will remember the setting, even after power OFF.



Convex shape correction

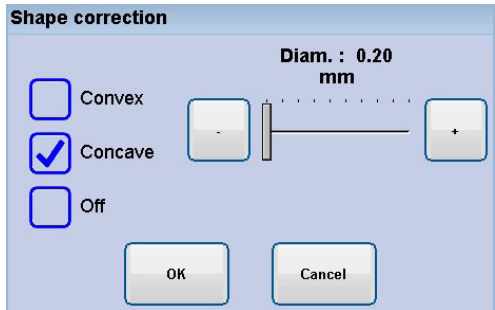


Concave shape correction



No shape correction

To set the shape correction, keep the dwell time and progress indication field selected for more than 2 seconds. The following screen appears:



In above menu, the shape correction is set to the desired shape and shape diagonal. The shape is set by selecting one of the 3 checkboxes at the left of the screen briefly: **“CONVEX”**, **“CONCAVE”** and **“OFF”**. When selecting convex or concave, the shape diagonal is set with the slider for coarse adjustments or the **“+”** and **“–”** buttons for fine adjustments. Select the **“OK”** button, to save your change and leave the screen. Select the **“CANCEL”** button to discard any changes.

5.4.14 INDENTER DISPLACEMENT BAR/ZERO THE DEPTH SENSOR OR LOADCELL

5.4.14.1 INDENTER DISPLACEMENT BAR

Mainly on a Rockwell and Brinell tester without a turret.

Depth Sensor	Or	Force Sensor	
			Indenter displacement bar: empty displayed above the bar graph: “READY” Tester ready; indenter not touching specimen, but possibly specimen is just approaching indenter.
			Bar: partly filled Text: UP Indenter has just pushed upwards by specimen. Continue to move elevator spindle upwards.
			Bar: full Text: DOWN Need to move spindle DOWN, till READY, before start over indentation.

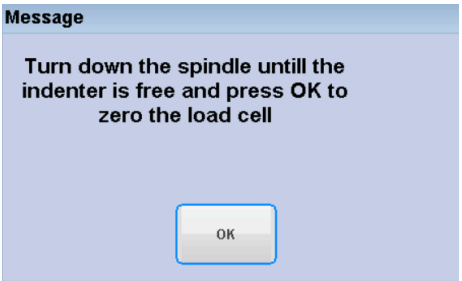
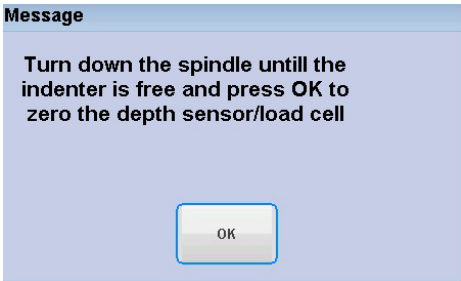
		Bar: almost full Text: OK, or bar in OK area. Elevator spindle moved indenter in good location/force for starting indentation cycle.
		Bar: (not applicable) Text: STOP Color: background red. During the indentation cycle, pressing the bar graph while the text “STOP” is shown, the indentation cycle is stopped immediately.

Mainly on a Vickers and Brinell tester with a turret.

	Text: START When pressing the bar graph, the indentation cycle will start.
	Text: STOP When pressing the bar graph, the indentation cycle is stopped immediately.

5.3.14.2 ZERO THE DEPTH SENSOR/LOADCELL

1. The depth sensor/loadcell can be zeroed at any time by pressing and holding the indenter displacement bar under the text **“READY”** for more than 2 seconds.
2. A popup appears, indicating to move the elevator spindle down and to press **“OK”** to zero the depth sensor/loadcell.



5. BASIC OPERATION

5.4.15 STATUS BAR

The status bar at the bottom of the main screen is used to show the current state of the device.
The status bar does not behave as a button, but is a field to show information.
The status bar can show:

Red warning messages:

“Maximum number of measurements reached”.
“Click on result to add it to the list”

Instruction messages:

“Turn spindle down”
“Turn spindle up to OK”, “Turn spindle up”
“Press START”
“Position sample not closer than 0.5 mm from the indenter and press start”

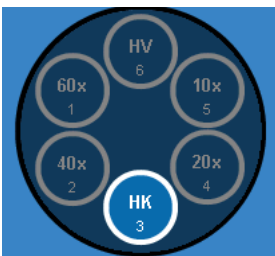
Current state of the machine:

“Ready for testing”
“Applying test force”, “Applying preload”
“Dwelling”, “Preload dwelling”
“Recovery”, “Recovery dwelling”
“Retracting indenter”



5.4.16 TURRET CONTROL/TURRET CONFIGURATION

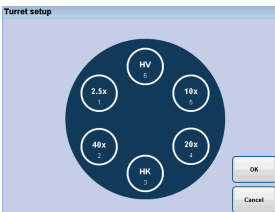
5.4.16.1 TURRET CONTROL



Clicking on an objective or indenter, will move the turret to that position.

CAUTION:
Always make sure that the turret is free to rotate.

5.4.16.2 TURRET CONFIGURATION



To define the contents of the turret locations, press and hold any location for more than 2 seconds.

Change the contents by toggling on its location.
To indicate that a position is empty, select “---”.

NOTE:
After replacing an indenter, an [indenter calibration](#) is needed.

See dedicated machine user manual how to physically replace indenter/objective.

5.5 EXIT HARDNESS TESTING SOFTWARE

Because I-TOUCH is a so-called embedded program, the software will stop during turning off of the machine.
See dedicated machine user manual about instruction how to turn off the machine.

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. Problem messages and warning messages will be displayed in the [status bar](#) (in RED).
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.
Whenever a problem message occurs, first reboot the system, when the problem persists, write down the error message and contact your service representative.

Following troubleshooting list shows the most common errors which may occur, their possible causes, and countermeasures to be taken against such errors.

Problem	Possible cause	Possible solution
User interface LCD does not light up.	- Power is not supplied. - Fuse has burnt out. - Mains Cable is connected improperly or broken. - LCD defective.	- Check power mains & supply. - Replace fuse. - Check mains cable otherwise contact service representative. - Contact service representative.
Abnormal hardness value.	When using a digital eyepiece and the digital eyepiece is not zeroed properly after powering ON, the measurement of the diagonal will be incorrect.	Switch OFF the device, wait for a few seconds and switch it ON again. Then execute the zeroing properly, see chapter 5.4.1.2 eyepiece setup.
The status bar turns RED and one or more error messages are shown.	- The power has been switched OFF and ON too fast, without waiting in-between. - A technical problem causes the device to go into the error state. A bad connection, mal-functioning sensor, electronic problem can be such a cause.	- Switch OFF the power, wait for a few seconds, then switch ON the power again. - Write down the error message(s) because this gives valuable information about the cause of the problem. Contact your service representative.
After pressing the START button, nothing happens	No indenter is being configured in the turret setup	Select an indenter for turret position 2.
A USB stick is inserted but the machine does not detect it, indicated by a red circle to the right of the USB stick icon.	- The USB stick is not detected properly. - The USB stick is not formatted for use with the FAT(32) file system. - The USB stick is defective.	- Switch OFF the device, wait for a few seconds and switch it ON again. - Format the USB stick for use with the FAT(32) file system. - Try another USB stick.
When the USB stick is inserted, the device does not respond anymore, until the USB stick is removed again.	The USB stick is defective or not suited for use with the device.	Try another USB stick.

After entering the diagonals, the hardness value is "—", thus invalid.	- When using a digital eyepiece and the calibration factor for the used objective is not correct, the measurement of the diagonal will be incorrect. - When using a digital eyepiece and the eyepiece is not zeroed properly after powering ON, the measurement of the diagonal will be incorrect. - The shape correction has a very small or zero diagonal. - The indent is not OK because the indenter tip is dirty. - The indent is not OK because the surface of the specimen is too rough.	- Contact your service representative to check the calibration values of the objectives. - Switch OFF the device, wait for a few seconds and switch it ON again. Then execute the zeroing properly, see chapter 5.4.1.2 eyepiece setup. - Check the diagonal of the shape correction to see if it is zero or very small. - Clean the indenter tip. - Polish the specimen surface.
When trying to enter a limit, the device does not respond.	The specific limit is not set active.	First set the limit to active by selecting the specific limit field for more than 2 seconds. Then select "LIMIT ACTIVE" and select the "OK" button.
Nothing happens when touching the touch panel in areas where a button or touch sensitive area is displayed.	The touch screen is not calibrated properly anymore.	Execute the touch screen calibration, which can be found in the settings menu.
Turret: Indenter not present	Required indenter for selected hardness scale not available in Turret configuration	Change scale or indenter.
"Sample positioned too close to indenter"	The workpiece is too close to the indenter when starting the measurement.	Increase the distance between the workpiece and the indenter to 1 mm, by moving the spindle downwards or the head upwards (depends on the tester type).
"Collision detected"	The loadcell detects a load that is not being applied by the loadmotor. This can occur when the spindle is moved too far upwards, or the head is moved too far downwards, which results in the workpiece touching the indenter.	This error message can only be cleared when the load is removed, i.e. when the spindle is moved downwards or the head is moved upwards. When this error message is cleared before the load is removed, it will reappear.

[illegible][illegible]

[illegible][illegible]

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