MIDLAND METROLOGY LTD

MBrin-3000A

Auto Touch Screen Brinell Hardness Tester

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Product Feature

Product Feature

●The fully automatic Brinell hardness tester, with its unique automatic turret structure system, allows users to customize the measurement target to match the hard alloy indenter, test force, and dwelling time before starting the test.

●After the measurement is completed, there is no need to move the workpiece, and the CMOS directly captures the indentation image.

●The world's advanced digital imaging technology is used to automatically find the most suitable pixels on the indentation image, high-speed analysis, and automatic reading.

●Automatically measure standard block indentation, shaded indentation, background blurred indentation, and elliptical indentation.

●This instrument has 12 levels of testing force and 16 different Brinell hardness testing scales, which can be freely selected;

●Equipped with 4 sets of ball indentor, all of which can automatically participate in testing;

●Equipped with two sets of objective lenses, both of which can participate in the measurement of indentation diameter;

●According to the selected scale, the objective lens and indentor automatically switch;

●Preset test force dwelling time and adjust the strength of the indentation light source for measurement;

●Real time display of loading time;

●Display measurement indentation length, hardness value, measurement frequency, etc;

●Select the conversion values between various hardness scales;

●The hardness test results can be printed out

Technical Specification

Name	Specification
Test Force	29.42N(30kg) 306.45N （ 31.25kg ） 612.9N （62.5kg）、 980.7N（100kg）、 1226N（125kg）、1839N（187.5kg）、 2452N（250kg）、4903N（500kg）、7355N（750kg）、9807N（1000kg）、14710N（1500kg）、29420N（3000kg）
Test Scale	HB 10/3000、HB 10/1500、HB 10/1000、HB 5/750、HB 10/500、HBW 10/250、HB5/250、HB 2.5/187.5、HB 10/125、HB5/125、HB10/100、HB 5/62.5、HB2.5/62.5、HB5/31.25 、HB2.5/31.25、HB1/30
Measuring Range	8~650HBW
Loading Mode	Worktable automatic lifting, loading, dwelling, unloading, and measurement
Maximum Test Height	500mm
Max Test Throat	200mm
Main Test Force Loading Time	5~8S
Dwelling Time	0-99S
Indenter /Objective Switch	Auto
Dimension	230*600*920mm

Technical Specification

Weight	130Kg
Objective Lens	1X、2X
Light Path Converting	Auto
Indenter Diameter（mm）	Φ1、Φ2.5、Φ5、Φ10 Installed in the Same Turret
Working Mode	One-click operation, automatic lifting, loading, dwelling, unloading, CMOS measurement
Indentation Image Measurement Method	Automatic Measurement
Indentation Image Repeated Measurement Accuracy	Repeatability ±0.8%
Data Display Mode	12.1 Inch Industrial Touch Screen
Data Output	Output report in WORD and EXCEL format, printable output; Graphics engine shows more features
Data Statistics	Hardness conversion: According to national standards, automatic Brinell - Rockwell - Vickers - Knob and other hardness numerical conversion, real-time display.
Light Source	LED
Functional Regulation	Infinite-controlled light source strength
Communication Interface	USB、RJ45LAN、WLAN、RS232
Dimensions mm(L×W×H)	1000×595×350
Supply Voltage	AC 220V/110V±5%，50~60 Hz

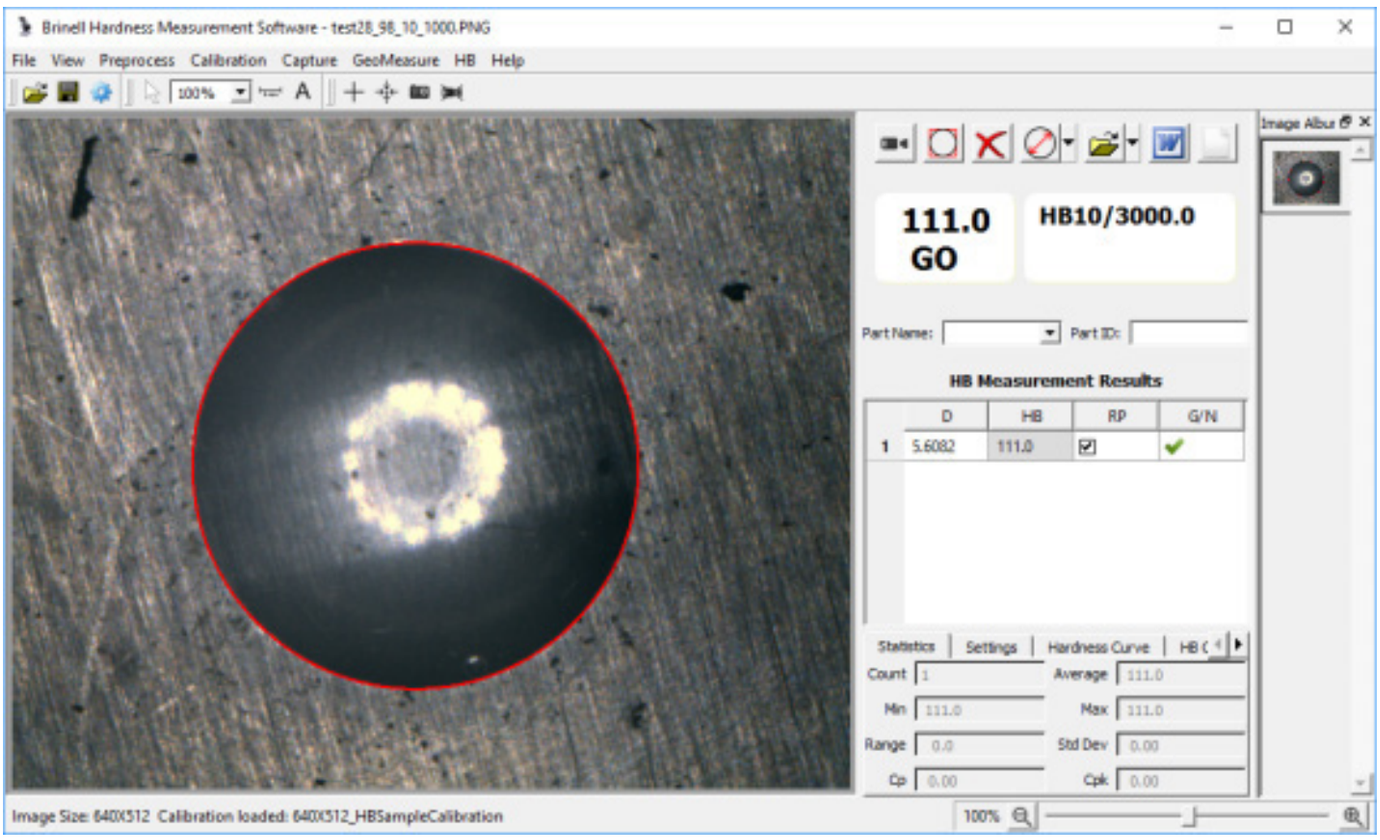
Packing List

Name	Specification	Quantity
Brinell Hardness Tester		1
Ball Indenter	φ10、φ5、φ2.5、φ1	4
Objective Lens	1×、2×	2
Accessory Case		1
Reading Microscope	20×	1
V-shape Test Stage		1
Large Test Stage		1
Small Test Stage		1
Dust Cover		1
Hex Wrench		1
Power Line		1
Fuse	2A	2
Brinell Hardness Block	（150～250） HBW3000/10	1
Brinell Hardness Block	（150～250） HBW750/5	1
Brinell Measuring System	Integrated in the Host	1
Product Certificate		1
Instruction Manual		1

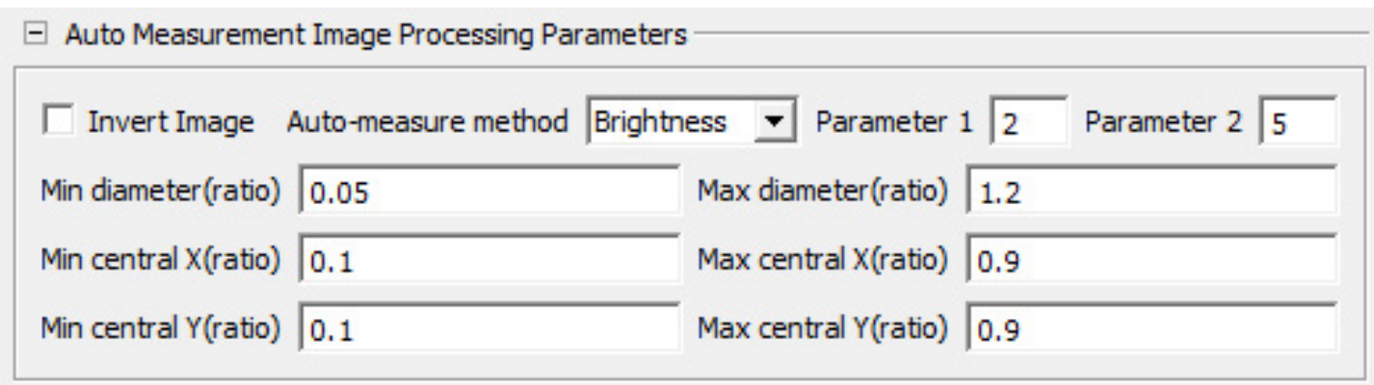
Brinell Hardness Measurement Software

Brinell Hardness Measurement Software is mainly used in automatically measuring the Brinell indentations and calculate their hardness values. The utility functions include hardness conversion, report generating, and data archiving etc.

Main interface: At first time opening after installation, user will need to manually adjust the splitters to have the user preferred sizes among the displays. To do that, move the mouse cursor to the splitter region, the cursor shape should become a splitter, mouse drag move to adjust.



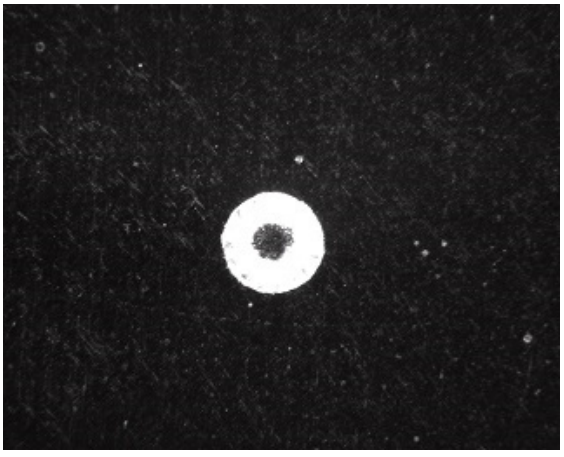
Main Interface



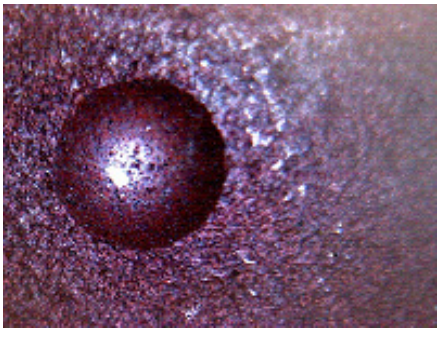
Auto Measurement Image Processing Parameters:

- Invert Image: Needs to be checked in cases the indentations on some test materials, as shown below, appears to be brighter than the sample surface.

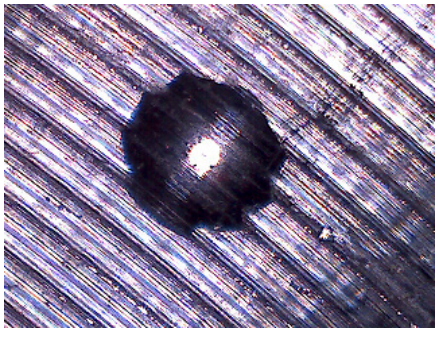
Brinell Hardness Measurement Software



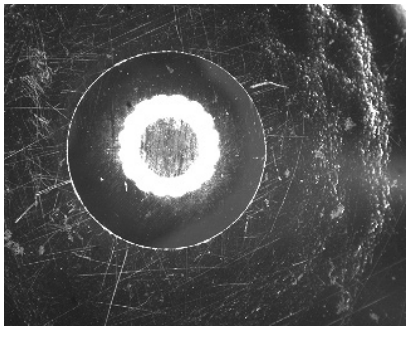
- Auto-measure method：Under typical circumstances, the indentation image shows brightness contrast between the indentation and the sample surface, the default Brightness method is used, and the parameter 1 is set at default 2. In some cases as shown in below #1, the sample surface shows shiny grain, this parameter should be set to 1. For sample surfaces with large scratches as shown below #2, this parameter should be set a large value, e.g, 6. If in cases there is no light intensity contrastas shown in #3, the Auto-measure method Edge should be chosen.



1）Shiny spots on surface



（2）Large scratches

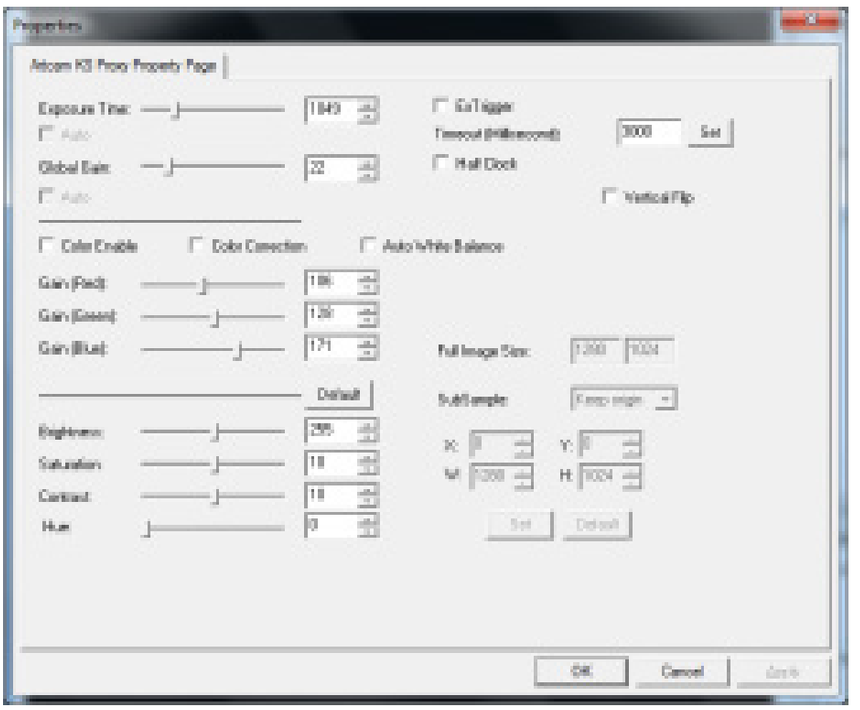


3）No light intensity contrast

Brinell Hardness Measurement Software

Camera Settings

Click  to bring out the camera setting dialog, user may change camera settings such as exposure time and global gain to adjust image light intensity

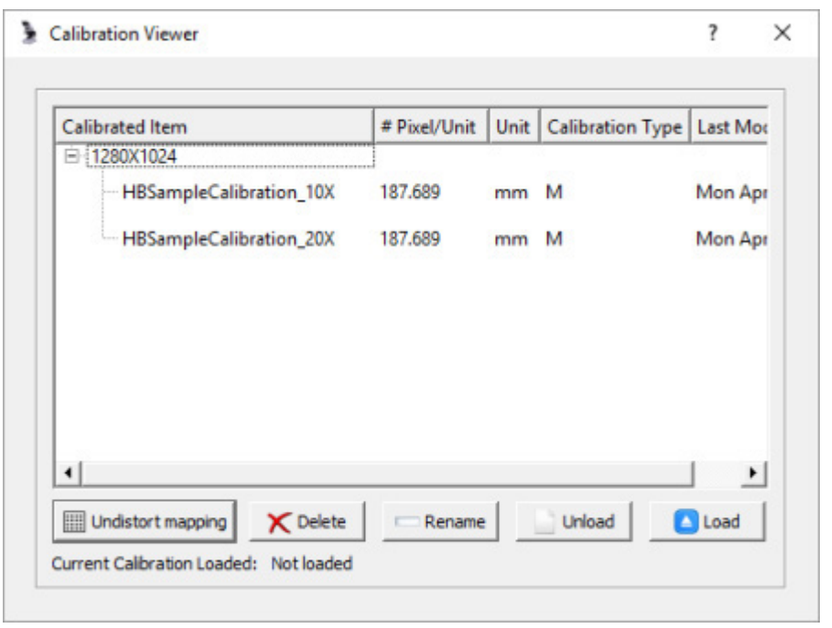


Conversion

Select the conversion table and the test scale to be converted to, the converted results will be shown in the measurement result table in a separate column. To delete the column, just click on the Delete Converted Hardness Column button.

Calibration

Select main menu Calibration -> Calibration viewer, pass the password check (or click OK if no password is set). In the calibration viewer dialog, user may select calibration, rename a calibration, unload current calibration, or delete calibrations.



Brinell Hardness Measurement Software

1)Standard test block: Unload current calibration if it is loaded, measure the indentation on the standard test block and enter the HB value of the test block. For better accuracy, system provides function to re-calibrate with average on multiple indentation points. To do this, measure on multiple indentation points on the test block, click on Recalibrate with sample average button and enter the HB value of the test block, current calibration is re-calibrated and saved. 2)Optical ruler: Take a snap shot with the system camera on an optical ruler, click on the Select main menu Calibration -> Manual calibration, mouse drag move from one line to another (separated far enough), enter the physical distance between the two lines, and enter a name for the calibration.

On-screen keyboard:

If the On Screen Keyboard is enabled and under Software on the dialog by selecting main menu File->View/Edit configurations, the software will invoke its built-in On Screen Keyboard whenever needed. Note if Use System On-Screen Keyboard is checked, then the On-Screen Keyboard by the operating system that comes with PC will be invoked, in this case IME for foreign language is accessible.

(a) PC system on-screen keyboard

(b) built-in on-screen keyboard of this software

Brinell Hardness Measurement Software

Automated Test and Measurement

After the test points are generated, click on the Auto Test Measure button ▶ to start the automation process. To pause the automation, mouse click on the image. To resume, click on the Auto Test Measure button.

Data Saving and Retrieval

Click the dropdown arrow on the tool button to select Open data file or Save data file, Open data file / Save data file to save/restore the measurement results. To save, select the path to store and name the data file.

Hardness Test Report

An example WORD report is as shown below. The WORD and EXCEL report template files hb_re-port_en.doc and hb_report_en.xls are under the installation bin directory, and they can be customized, e.g, with LOGO and title etc.

Brinell Hardness (HB) Test Results

Submitter		Date Submitted	
Part Name		Part ID	
# of Samples		Sample Description	
Qual. UL	280	Qual. LL	120
Machine ID		Meas. Standard	
Indenter Diam. (mm)	10	Force (Kg)	3000.0

Test Results

#	D	HB	Converted HRC	#	D	HB	Converted HRC
1	5.6082	111.0					
2	4.0952	217.8					

Indentation Images

1. 
2. 

Statistics

Maximum	217.8	Minimum	111.0
Average	164.4	Std. Dev.	37.76
Cp	0.71	Cpk	0.39

Operator	Test Date	Auditor	Audit date
	2016.4.4		