

Brinell Hardness Indentation Measurement System Operation Manual

Sinowon Innovation Metrology Manufacture Limited www.sinowon.com

# Preface

Thank you for purchasing Brinell hardness indentation measurement system, to avoid any unnecessary damage and loss, please read this Manual carefully before operation and keep it safety for further study.

BrinScan applies advanced visual technology, shooting the indentation by portable digital microscope and identifying the indentation precisely even under complex background to measure Brinell hardness. Operator does not need predicate edge of the indentation, record indentation length, and check hardness table. BrinScan can realize auto-measuring, auto-recording, auto-saving and auto-generating hardness measuring chart.

## Safety Notice

**Danger**: 1. Dangerous: put the unit vertically or horizontally on the table, and avoid drop.

**Danger :** 2. When heating, smoking or peculiar smell, please stop using and cut off electricity, and contact us for after sales service.

Warning : 3. Keep away with heating source, heating wire easily lead to damage isolation layer.

## Notes before Using

**Note :** 1. Avoid strong vibration.

Note : 2. Avoid working in high temperature, high humidity and dust environment.

**Note :** 3. Keep specimen in a stable table, no shake.

**Note :** 4. Do not unpack, repair or modify the system.

Note : 5. The system without waterproof function, keep away with water.

## Maintenance

- 1. Keep clean the system and packing well after used.
- 2. Keep away chemicals.
- 3. Cut off power supply when long time no using.

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# 1. Introduction of Components



# 2. Operation Steps

- 1. Start Tablet.
- 2. Connect Brinell microscope with computer by USB cable.
- 3. Start software, Installed software is BrinScan3.0.
- 4. Select Camera, first start the software, have to manually select camera.
- 5. Camera Calibration :

① The recommended calibration is using indentation on Brinell hardness blocks, below is the reference table:

Microscope Type	Reference Substance	Microscope Measuring Range	
			Hardness Range
(0.5X)	Standard Brinell hardness	2.4mm-6mm	(143-415) HBW10/3000
	blocks		
(1.0X)	Standard Brinell hardness	0.6mm-3mm	(150-600) HBW2.5/187.5
	blocks		

②Note: During calibration, please move the indentation to the middle of software viewing window.

- 6. Calibration Measurement.
- 7. Generate Calibration.
- 8. Brinell Measurement, press trigger once to get result.
- 9. Generate Test Report.

Note: read carefully the software operation manual.

## 3. Technical Data

Name	Brinell Hardness Indentation Measurement System-BrinScan
Indentation Diameter Range	0.6mm-6mm
Brinell Hardness Resolution	1HB
Software System	BrinScan3.0
Operation System	Win8、Win10, 32/64, office
Illumination	Ring LED
Working Environment	Temperature 0°C~50°C Humidity 30%~80%
Power Supply	USB Power Supply, DC5V
Dimension	24*24*176mm
Gross/net Weight	1.2Kg/1Kg

## 4. FAQ

NO	Phenomenon	Reason	Solution
1	Video is not Clear	Dirty on Surface of	Clean Surface of Specimen
		Specimens	
2	Software interface shows no software	Can not recognize software	Shut down software and re-insert
	dongle	dongle	USB, then restart
3	USB cable can not recognize Microscope	Poor Contact	Check all the connection ports

## 5. After Sales Service

## 5.1 Warranty Steps

- One years warranty for main unit only for quality problem, the others accessories are not under warranty. Refer packing list of ultrasonic hardness tester.
- Please show invoice and warranty card in case need repair.
- We ask for charges for accessories not under warranty

# 6. Storage and Shipping Notice

• Storage should be far away from the vibration, corrosion, moisture, dust, also should be stored at a normal temperature and humidity. Please put in the original packing box before transportation to avoid any damage.

# 7. Software Introduction

## 7.1 Introduction

BrinScan3.0 the main functions of BH with automatic video image. It supports all operations with straightforward test process, precise and stability measuring result. By linking control the hardness equipment, the industrial camera obtain the image of indentation, automatic measuring HB and output the testing data.

## 7.2 Operating Environment

Operation System: Microsoft Windows XP/ Windows 7/ Windows 8/8.1 / Windows 10(32/64Bit)

## 7.3. Interface Introduction

### 7.3.1 Interface

Main Contain 4 Pages: 1. Measuring Page;

- 2. Calibration Page;
- 3. Setting Page;
- 4. About Page;



### 7.3.1.1 Measuring Page

Main function: Testing the BH indentation, Setting the parameter of measure, Display the test data and output data etc.

Main six region: 1. Video; 2.Measuring Instrument; 3.Calibration; 4.Setting and display the parameter of measure; 5. Display testing result and output; 6.Operating Measure.



#### • Video Display

Display the real-time image of indentation, It is capable of setting point and testing on the region and make sure the result of measurement

#### Measuring Instrument

Include:

Testing Circular By Automatic: Click "ENT", measuring the diameter of circular.

Frame Select Circular : Framing the circular, Click "ENT", Measure the diameter of circular during the video display region.

Three Points Select Circular: Click three points, Click "ENT" measure the circular diameter. Two Point Measure Circular: Click two points, Click "ENT" measure the circular diameter.

### Calibration Option

Fast to option different rate of calibration .

### • Setting and display the parameter of measure

Including Setting, Display, New Construction

1). Setting and display the parameter

Click "Parameter Setting", as follow

Brinell Measurement Setting 🛛 🕹 🗙										
	Para	meters ———								
Ball Dia D (mm): 10 Add Delete										e
		Force (Kg	f):	3000						
	S/N	Hardness Scale	Ball	l Dia D (mm)	0.10	)2F/D^2	Force (Kgf)		Force (N)	
	1	HBW10/3000	10		30		3000		29411.765	
	2	HBW10/1500	10		15		1500		14705.882	
	3	HBW10/1000	10		10		1000		9803.922	
	4	HBW10/500	10		5		500		4901.961	
	5	HBW10/250	10		2.5		250		2450.980	
	б	HRW10/100	10		1		100		980 392	
	Othe	r Parameters Standard:	D	IN18265	V	Up	oper Lim	61	18	
		Dwell Time:	0.	5	s	Lov	wer Limi	76	6	
	Mod	e								
		Mode:	B	atch Mod	V	,	Average:	10	)	
			Cá	ancel		0	K			

This page have Force of HB, Standard of switch, Upper Lim, Lower Lim, Model etc.

2). New Measurement

Click "New Measurement" as follow:

New Measurement		X
Name:	Test	
Cance	el OK	

Import name "Test" and click "OK" will new building a test, and will be deleted of last data

#### • Display Measure result and output

Including : Display The Record , Delete, Hardness Conversion, Export Word, Excel, The Curve Of Hardness



1).Delete:

Select measuring record, click "delete".

2). Hardness Conversion: (contain 17 types of hardness content)

Hardness Conversion $X$								
Select	t	S/N	Content	A				
		1	HBS					
		2	HBW					
		3	НК					
		4	HRA					
		5	HRB					
		6	HRC					
Decimal Di 4 🔹 Cancel OK								

3).Export Word and ExcelClick "Output Word"/"Output Excel"4).The curve of HBW:

Da	220 HE Curve	3W10/3000
S/N	Diameter (mm)	HBW
1	4.08	220
	X HBE	

## 7.3.1.2 Calibration

1).Video; 2). Measuring instrument; 3). Calibration operate



#### 1).Video Display

Display the real-time image of indentation, It is capable of setting point and testing on the region and make sure the result of measurement

#### 2). Measuring Instrument

Include:

Testing Circular By Automatic: Click "ENT", measuring the diameter of circular.

Frame Select Circular : Framing the circular, Click "ENT", Measure the diameter of circular during the video display region.

Three Points Select Circular: Click three points, Click "ENT" measure the circular diameter.

Two Point Measure Circular: Click two points, Click "ENT" measure the circular diameter.

#### 3). Calibration Operate

Calibration Method: By calibration screen and HB block Calibration Item: One testing data one item. How to creative calibration: By testing item and AVG Calibration: a camera and a magnification correspond a calibration record Automatic Calibrate and Manual Motive Calibrate

#### 7.3.1.3 Setting Page

1).System Setting; 2). Camera Setting ; 3).Drewing Setting

#### 1). System Setting

М	easure	Calibratio	on Setti	ng	About							X
System	Operato Op	or Derator:	dfsdfsdfddo	d		Show Re Value	sult	Line Char	V			
	Origi	nal Pas				Langu	e Iage	English	V			
Camer	New	/ Passw										
۵ 	С	onfirm:										
Drav				Mo	odify							
<	Report	Parameters										
		Title:	dddd									
	Depa	artment	dfdfdf									
	Sam	pling R	23123456	%								
			Export	Image								
						1					S	ave

Operator Name Setting: Using operator name is ok ; Passport Setting Report Parameters Setting Show Result: Bar graphic and curve graphic Language: Chinese and English

### 2). Camera Setting

Contain Settings : Camera Type; Virtual Camera; Real-time information; Light Source

M	easure	Calibration	Setting	About	×
System	Camera Camera Virtual ( No Driv	a Selection - Type C Camera er Camera	Camera Name	Camera Device Name	Resolution Category: All Informatio  Select S/N Content
Camera					1 Mouse Coordinate 2 Camera Info 3 Dwell Time Mouse Zoom
Draw	Enu	merate			Light Source       Select       Brightness:
					Save

### 3). Drew Setting.

M	easure	Calibration	Set	ting	About			X
۶y	Draw	ing parameters –						
ste	S/N	Measurement Type		S/N	Drawing Conte	nt		
В		Full Image Circle			Indicatrix			
		Frame Circle			Result Graph		Result	
		Two-point Circle			Result Text		Ttooutt	
Ca		Three-point Circle					$\mathbf{X}$	
me		Cross-line Circle						
ira		Full Image Quadrilateral						
		Frame Quadrilateral		l	-ont size: 3			
		Four-point Ωuadrangle		Lii	ne Width: 2	•		
D		Ouadrilateral		1	ine Type: E	ullline 🔻		
rav		т			ine type.	an enter y		
<					0			
					0			
	,							
			_	_	_			
								Save

## 7.4. How To Operation

## 7.4.1 Camera Selection

First open the software or need change the camera, Please Click "Camera Selection" .Read picture as follow :

M	easure	Calibratio	n Setting	About	×
System	Camera Camera Virtual ( No Driv	a Selection Type Camera er Camera	Camera Name USB2.0 Camera	Camera Device Nam 6558773D-8655-11D 00A0C9223196	Resolution 320 * 240 640 * 480 Belect S/N Content 1 Meure Coordinate
Camera					Camera Info Camera Info Camera Info Dwell Time Mouse Zoom
Draw	Enu	merate			Light Source       Select         Brightness:
					Save

## 7.4.2 Camera Calibration

## 7.4.2.1 Camera Calibration Info:

Measure	Calibration	Setting	About	X
				Calibrate Measured Item Calibration Type Hardness Blocks (Picture)(640 * 480)(1.000)
All		t		S/N Pixel Real Value (mm) Calibration Value Calibration (Pixel/mm) Type Delete Clean Generate
				Calibration S/N Name (Pixel/mm) Parameter
•				ENT Delete Matching Selected

## 7.4.2.2 Calibrate Measured Item:

Measure	Calibration	Setting	About					×
	Mouse(D) and 0.00	or A			Calibrate Measure Ca (Picture)(640 * 480 S/N Pixel	d Item libration Type 1)(1.000) Real Value (mm)	Hardness Bla Calibration Value (Pixel/mm)	Calibration Type
Y. :					Delete Calibration S/N Name	Clean ca (PT	Gene	rate Parameter
				ENT	.⊲ Delete	Matchir	ng Seleo	F

### 7.4.2.3 Calibrate Real Value:

Measure	Calibration	Settin	ig .	About								×
		Cali	brate Rea	I Value					×		$\sim$	
				Pixel:	377.539	Real	Value: 4.0	75381 mm		Туре	Hardness Blo	ocks 🔻
	3/2		₩推块计算 Ball Dia	D (mm):	Brine	ell Hardness Force	Value: 220	0		(mm)	Calibration Value (Pixel/mm)	Calibration Type
		S	N Hardna	- Scolo	Poll Dia D (mm)	0 1025 (DA 2	Eorce (Kaf)	Force (NI)				
1	1 2 2 2 2 2	37	HRW10	3000		30	3000	29411 765				
		2	HBW10	1500	10	15	1500	14705.882				
The second	A CASE	3	HBW10,	1000			1000	9803.922				
and the		4	HBW10,	'500			500	4901.961		loop	Gono	rata
1. 6			HBW10,	250		2.5	250	2450.980		lean	Gene	late
a server			HBW10,	100				980.392				
		7	HBW5/7	50			750	7352.941		Cali (Div	ibration Value	Parameter
4.50/23					取消	0	К					
							•		_			
					ENT		De	elete	Ma	atchin	g Selec	ted



### 7.4.2.4 Create Calibration:



Measure	Calibration	Setting	About	×
¥. 6				Image: State of the state
				ENT Delete Matching Selected

When you open the camera, the software will automatic load the calibration, If no matching will been hint as follow.



## 7.5 Measure HBW

### 7.5.1 Click Measure



### 7.5.2 Brinell Measurement Setting

To better measure please select correct impression force: Eg: Test Ball Dia:10mm Force:3000kgf ; So we would choice HBW10/3000

Br	inell	Measurement S	Sett	ing					
	Para	meters							
	В	all Dia D (mm	ר): 10				dd	Delet	e
	Force (Kgf			3000					
	S/N	Hardness Scale	Ball	Dia D (mm)	0.102F/I	⊃^2	Force (Kgf)	Force (N)	
	1	H <b>BW1</b> 0/3000	10		30		3000	29411.765	
	2	HBW10/1500	10		15	1500		14705.882	
	3	HBW10/1000	10		10		1000	9803.922	
	4	HBW10/500	10		5		500	4901.961	
	5	HBW10/250	10		2.5		250	2450.980	
	б	HRW10/100	10		1		100	980 392	
	Othe	r Parameters							
	Othe	Standard:	D	IN18265	V	Up	oper Lim	618	1
		Dwell Time:	0.	5	s	Lov	wer Limi	76	İ.
	Mod	e							
		Mode:	B	atch Mod	•	,	A∨erage:	10	
			Cá	ancel		0	K		

#### 7.5.3 Select Measure



#### 7.5.4 Measure

As follow picture our software could automatic find impression .



#### 7.5.5 Output the data

After complete the testing , you could output the data by Word or Excel.

Measure	Calibration	Setting	About				×
	Mouse(Elline (8.005)			220HBWP	K	000	Calibrate 🔻
	23/			d:4.075m	Ö	Force (Kg): 3000	Upper Limit: 618
S. St.	11 4/2		1			Ball Dia (mm): 10	Lower Limit: 76
	1 AL	oi	1. 5		new	Name: Test	Mode: Batch M
		1			Data	<b>220</b> HE	3W10/3000
-	1.44	inter a		K. A.	S/N E	Viameter (mm)	HBW
9.4				18-26-26	1 4	.08	220
		States -		Bard States		.08	220
		Marriel	1	Store la	3 4 4 4	.08	220
es de			de la	1. Per			
				ENT			
					X	HB	

	A	В	C	D	E	F	G	H	I
1									
2				Brinell	Hardness Rep	ort			
3	Department:	DepartmentA			Date:	2016-06-23		Operator	r: OperatorA
4	Specimen:	Test			Quantity:		4	Sampling Rate	: 100%
5	Parameters.	Force (Kgf)	Ball Dia (mm)	Lower Limit	Upper Limit	Dwell Time	K=0.102F/D2	=0.102F/D2 Standard	
6	T di di di coloris.	3000	10	76	618	0.5s		DIN18	265
7			•						
8	S/N	Diameter (mm)	HBW					MPa	NG/Pass
9	1	4.08	220						Pass
10	2	4.08	220						Pass
11	3	4.08	220						Pass
12	4	4.08	220						Pass
13									
14		Street St	-			a tree		100.000	
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28		3. 4		2		3.4	the second second		
29		State of the set	The second	73			States a	ne 13	
30									
31	Total	Average	Min	Max	Error Range	Deviation	CP	CPK	
32	4	219.948	219.7607	220.0276	0.2669	0.1254	0.355	-583.984	
33		2							





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