

## CONTINUATION

Dear User,

We are pleased for your patronage of purchasing our LD Series Shore Durometer. Before using the instrument, please read the manual carefully and keep it well to give you help when you can not learn it or there is something wrong with it.

Description in the manual is based on the newest products. Owing to improvement or other changes, contents of manual may differ from practical situation. Our company will reserve the right of recension at any moment. Please kindly forgive not to notify the revised place one by one.

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Ver:1.00 Con:20170609

LD Series  
User Manual

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**DIGITAL SHORE DUROMETER**

For  
LD-D  
LD-A  
LD-AO



温州山度仪器有限公司  
WENZHOU SUNDOO INSTRUMENTS CO.,LTD



Thank you for your patronage to purchase LD Series Shore Durometer.

Owing compact structure, precise measurement, easy carry, pretty shape and simple operation, the instrument is mainly used to measure hardness of soft plastic, rubber, felt, leather, printing roller etc.

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- ☉ : collect present data in manual.
- ☉ : collect data continuously at regular time.

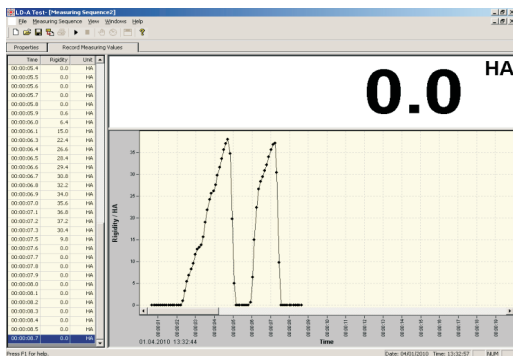
Note: The device command should be input again when changing between Measuring Sequence and Text Files.

### Maintenance

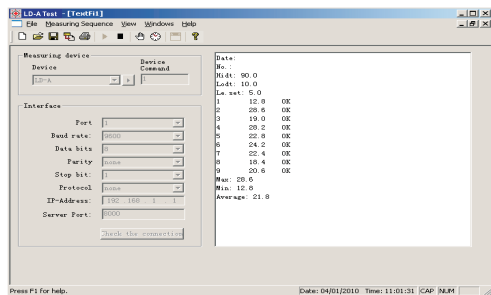
1. The instrument should avoid impact, pressure, and don't put in strong magnetic field, wet or greasy environment.
2. If do not use durometer with long time, please take out the battery, and keep it well.
3. Do not tear, repair or update the instrument by yourself, which may cause a permanent malfunction.

### Packing List

Number	Parts Name	Quantity
1	Main Body	1
2	USB pouer adaplор	1
3	Nicro USB data cable	1
4	Calibration Block(only typeA/D)	1
5	USB wireless receiver	1
6	Software CD	1
7	Manual	1
8	Qualification Certificate	1



Picture 19



Picture 20

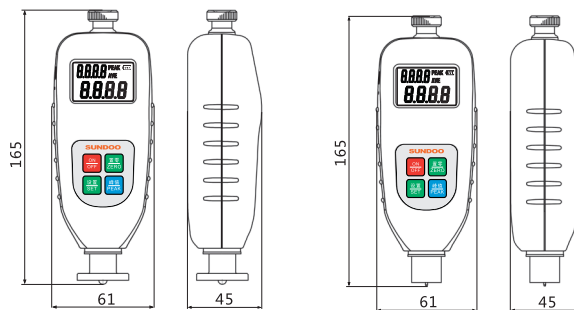
Icon explanation:

- 📄 : transfer the test data to EXCEL.
- ▶ : open port to start test.
- : close port to stop test.

### Overview

LD Series Digital Shore Durometer is mainly used to measure hardness of soft plastic, rubber, felt, leather, printing roller etc. Owing compact structure, precise measurement, easy carry, pretty shape and simple operation, etc. The instrument combines measuring system with data process, which is widely used in chemical industry and research institutions.

### Product appearance and dimension



(AO type appearance and dimension)

(A/D type appearance and dimension)

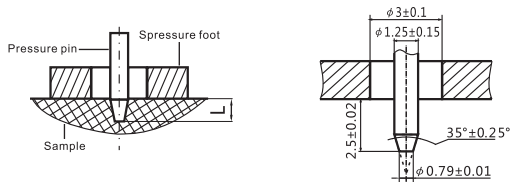
Picture 1

### Working

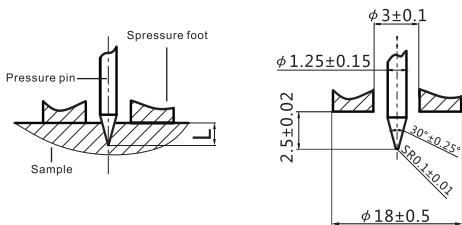
The basic principle of the instrument (Picture 2 on page 2) is using the steel pressure pin to vertically press the surface of test sample, while the pressure foot surface and the sample surface is contacting firmly, it will appear extension length "L" of test tip against pressure surface. Then use the value of "L" to show the hardness of the test sample, the larger "L" is, the

lower the hardness value is. The smaller "L" is, the higher the hardness value is.

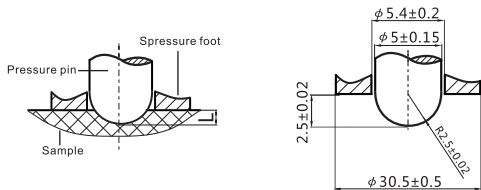
$HA = 100 - L / 0.025$  (HA is value of shore A durometer)



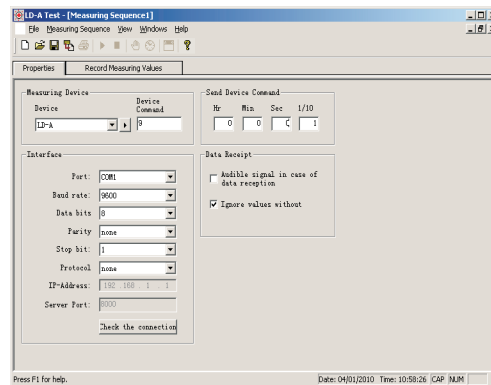
$HD = 100 - L / 0.025$  (HD is value of shore D durometer)



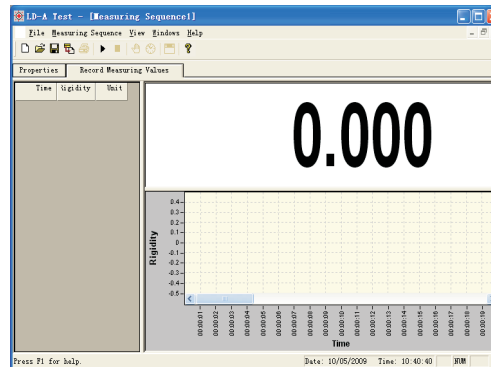
$HAO = 100 - L / 0.025$  (HAO is value of shore AO durometer)



Picture 2

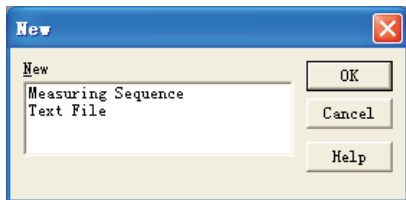


Picture 17



Picture 18

- (4) The New dialogue box will pop up with two mode for choice:  
Measuring Sequence and Text File (picture 16).



Picture 16

① Plot point at testing curve

A. When instrument is in normal measuring state, choose measuring sequence in new dialogue box, choose corresponding model in "Device", choose corresponding port in "Port", select 9600 in baud rate, input 9 in device command, and set time of computer capturing force signal in "Send Device Command". 1 / 10 means 0.1 seconds (Picture 17 on page 11: when Hour is 0, minute is 0, second is 0, and "1/10" is 1, it indicates that Time For computer to draw dot is 0.1 seconds).

B. After setting parameter well, click on "Record Measuring Values" changing into curve interface.

C. Click on Start button "▶", and then click TIMER button "⌚" to collect test data curve (Picture 18 on page 11).

D. When test finished, click Stop button "■" to stop test (Picture 19 on page 11).

E. Click on "Save" button in File menu to save data.

② Output measuring data

A. In the new dialogue box for text file, select corresponding model in type of device, select corresponding serial computer port in port. Baud rate is 9600, enter 1 in Device Command.

B. Click beginning button "▶" to open the serial port, then press manual orders "⌚" one time, send order 1 to equipment, the saved value will input to computer (picture 20 on page 11), or press SET on instrument all along to output data.

Parts name and function

1、Tectum nut

Take down tectum nut, there is an installation screw (M7\*0.5) and install the durometer to special stand.

2、Charging hole (data communication port)

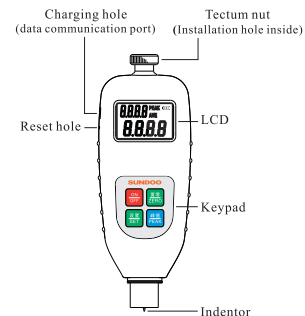
It is used to charging or data transmission.

3、Reset hole

It is used to reset for crash.

4、LCD

High definition display, clear show under strong shine, show current test status and test data.



Picture 3

Main Function

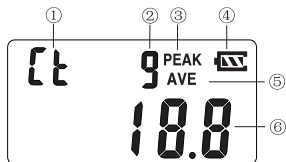
1. Measure real-time tracking value. Hold peak value. Automatic measurement in set time. Automatic save and calculate average value.
2. Automatic power off without operation, power off time is set freely, low battery indicator.
3. Micro USB port connect to computer for data communication, and review testing curve by matched software.
4. Wireless communication module inside, communicate with computer via USB wireless.

Parameters

- Measuring Range: 0~100.
- Resolution: 0.2.
- Error: within 20~90, error  $\leq \pm 1$ .
- Working Temperature:  $20 \pm 10^\circ\text{C}$ .

- Transport Temperature: -27℃~+70℃.
- Relative Humidity: 15%~80% RH.
- Power: 800mAh rechargeable lithium battery(The longest charging time is 1.5 hours)
- Use Time: about 500 hours continuously.
- Dimensions: L165×W61×H45 mm.
- Net weight: about 0.36kg.

### Display



Picture 4

- ①Display of ct: symbol of computer communication state.  
Display AT: symbol of automatic time set measuring state.
- ②Times of measurement.
- ③Peak is the symbol of holding peak status.
- ④Battery capacity state and charging indicator.
- ⑤AVE is the symbol of average (When flicker, the screen shows the current average).
- ⑥ Measurement of hardness value.

### Button Function

#### 1. ON/OFF Button

Press the button to turn on the instrument, and press it again to turn it off.

#### 2. ZERO Button

Under "set" state, press "ZERO" button to escape Under "non-set" state, press "ZERO" button to zero the value.

#### 3. Peak/Plus button

Press "Peak" button while the instrument is in real-time tracking state, the screen shows "PEAK" symbol, it enters into holding peak mode (Shown value is maximum test value). Press the "peak" again, "PEAK" disappears, the

put specimen on the base, slowly press down the handle, making the hardness tester and sample contact completely, reading the test value within one second, the screen shows the hardness values.

### Port Output and Print

The instrument is Micro USB port, use USB data cable to connect to computer installation CD driver (route: CD driver/English/Measuring software/LD/USB to COM) to get virtual port function. The instrument has wireless communication module inside, with USB wireless receiver (driver route: CD driver/English/Measuring software/LD/USB wireless receiver), to communicate to computer. It can review the testing curve or output data by matched software. The required station and operation are as follows:

#### 1. Hardware Environment:

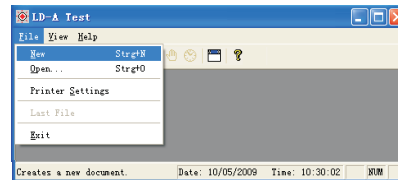
- (1) CPU: Celeron 1G or above.
- (2) Memory: 256MB or above.
- (3) Available Capacity of Hard Disk: above 300MB.
- (4) CD Driver: CD-ROM or DVD-ROM.

#### 2. Software Environment:

- (1) Operation System: Window XP (32 bits).

#### 3. Detail Operation

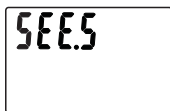
- (1) Connect the instrument to computer via USB data cable or USB wireless receiver and install driver.
- (2) Put equipped CD into CD-ROM, open the software path: CD\English\measuring software\LD\LD-A test\LD-A test.exe.
- (3) Click new file options in file menu (picture 15).



Picture 15



corner shows "AVE", current value will be the average.  
When screen shows "nonE" (picture 14), it indicates that there is no saved value in instrument. Waiting for few seconds without operation, it will back to measuring interface automatically. press "ZERO" button or wait few seconds to escape.



Picture 13



Picture 14

### Battery

When the screen shows '☐', it indicates lack of power, please charge the instrument with USB power adaptor. The battery capacity state shows rolling mode. When it shows '☒', it indicates the charging is finished and pull up USB power adaptor timely. The longest charging time is 1.5 hours.

### Measurement

#### 1. Durometer calibration

Press ON/OFF to turn on, the pressure pin extends at maximum length, the screen shows "0". When the pressure pin is fully contacted with glass plate, the extending length of pressure pin is 0, the value onscreen should be "100±1".

#### 2. Choose measuring state

According to test requirements, choose appropriate measuring state, including real-time tracking state, state of measurement at regular time, auto-save and calculate average state, and holding peak state.

#### 3. Manual measurement

Put the sample on the glass plate, hand-hold hardness tester to make pressure needle vertical to sample surface, making pressure needle slow and smooth press into the specimen, when the testing foot is contacted with sample surface, read the value within one second, and the screen shows the hardness value.

#### 4. Measurement at constant load stand

Hardness Tester will be fixed at the lower end of special fixture,

instrument returns to tracking measuring state. In the set state, press "PEAK" button to increase the parameter.

In the state of automatic save and calculate average value, press "peak" button all along can delete the current times of testing value.

#### 4. SET Button

Under measuring state, press "SET" button into the set interface. Press "SET" again to switch during setting parameters.

##### ① Set times of measurement

The instrument enters the surface of setting times of measurement when it show "SAVE" on the screen (picture 5), the screen's lower right corner shows the times. Then it will add one times by pressing "PEAK", if pressing "PEAK" all along, the times will increase continuously.



Picture 5

When the times is 1, the durometer will show current value. When testing times is 2~9 (picture 5), the instrument will enter into state of auto-save and calculating average. Under this state, the durometer will save and show current measuring value and times. When reaching pre-set times, "AVE" on screen will flicker, and showed value is the current average. press "ZERO" button or wait few seconds to escape.

Note: Under this measuring state, pressing "PEAK" button, screen shows "PEAK", and also displays and saves max value of current test.

When test times is "0" (picture 6 on page 6), the instrument enters into real-time tracking state. press "ZERO" button or wait few seconds to escape.

While the test times is "AT" (picture 7 on page 6), the instrument will enter into state of measurement automatic time, time set is the third point in page 6. press "ZERO" button or wait few seconds to escape.

Note: Under these two types of measuring state, press "PEAK", the screen will show "PEAK" symbol, the instrument enters into holding peak state.

##### ② Set automatic power off time

While it shows "P.oFF", instrument enters set interface of automatic

power off. The power off time will show on the top right corner.(set freely 1~60 minutes,0 means not power off automatically, factory default is 10 minutes). Pressing "PEAK" will add the time, pressing "PEAK" all along will add the value continuously.press"ZERO"button or wait few seconds to escape.



Picture 6



Picture 7

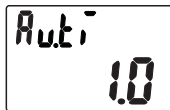
### ③Set regular time of measurement

While screen shows "Au.ti" (picture 9), instrument enters into setting regular time of measurement. The upper right corner shows the time (set freely from 1~99 (0.1~9.9s), factory default is 10(1s)). The regular time will add by pressing "PEAK" button, and it will increase continuously by pressing "PEAK" all along.press"ZERO"button or wait few seconds to escape.

When the instrument is in state of measurement at regular time, it begins to calculate time when pressure foot contacts testing surface completely. When reaching the set time, the screen locks the displayed value, and when pressure foot leaves testing surface, the value back to zero waiting for next test.



Picture 8



Picture 9

### ④Set minimum captured value

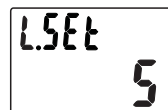
In the testing process, the test value will not be saved when it is less than the minimum captured value. Please select appropriate minimum captured value as required.press"ZERO"button or wait few seconds to escape.

While the instrument shows "L.SET" (picture 10), it enters into set

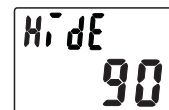
interface of minimum captured value. The upper right corner shows the minimum captured value (5~99HA set free, factory default is 5HA). Press "PEAK" once, the minimum captured value will add one. Press "PEAK" button all along, the value will be increased continuously.press"ZERO"button or wait few seconds to escape.

### ⑤Set upper limit

When screen(Picture 11) shows "Hi'dE", the instrument enters into set interface of upper limit. The upper right corner shows the upper



Picture 10

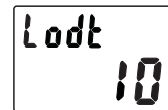


Picture 11

limit(5~99HAset free, factory default is 90HA). Press "PEAK" once, the upper limit will add one.Press"PEAK"all along,the value will increase continuously.press"ZERO"button or wait few seconds to escape.

### ⑥Set lower limit

When screen shows "Lodt" (picture 12), instrument enters into set interface of upper limit. The upper right corner shows upper limit



Picture 12

value(5~99HA set freely, factory default is 10HA). Press "PEAK" button once, lower limit will add one. Press "PEAK" all along, the value will increase continuously.press"ZERO"button or wait few seconds to escape.

### ⑦Review saved value

When the instrument is under state of automatic save and calculating average(picture 13 on page 8), screen shows "SEE.S", press "PEAK" button to cycle review the saved value average. When the upper right