



HDT-400L HARDNESS TESTER

Instruction Manual

Revision 052615-1

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LOGAN HDT-400L TABLET HARDNESS TESTER
INSTRUCTION MANUAL

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Note: Calibration instructions are supplied with calibration tools. They are ordered separately as a set.

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Section 1.0 SPECIFICATIONS

HARDNESS RANGE:	5-350N
HARDNESS ACCURACY:	±1%
DIAMETER RANGE:	2.0-35.0mm
DIAMETER ACCURACY:	±0.03mm
THICKNESS RANGE:	2.0-13.0mm
THICKNESS ACCURACY:	±0.03mm
MEASURE UNIT:	WEIGHT mg (milligrams) or g (grams) HARDNESS N (Newtons) or Kg (Kilogram, 1Kg=9.81N) or Sc (Strocobb, 1Kg=1.43Sc) DIAMETER mm (millimeters) or in (inches)
TIME PER TEST:	< or = 45 sec.
TEST METHOD:	Manual or Automated (maximum 99 tablets)
TEST DATA:	Tablet hardness and tablet diameter
TEST STATISTICS:	High & Low values, mean, SD, number tested...etc.
DISPLAY:	LCD (Selection of English or Chinese)
PRINTER OUTPUT:	Standard for PC printers
VOLTAGE:	110V/50-60Hz or 220V/50-60Hz

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Section 2.0 Description of HDT-400L Hardness Tester

HDT-400L Hardness Tester consists of the following components:

- Main unit
- Load-Cell Compartment (Attached with main unit)
- Tablet Jaw
- Printer and cables
- Hand held brush
- Accessories
- Customer optional accessories
- RS-232 Communication Cable

The Logan HDT-400L Hardness Tester is for testing the tablets or cores, sweets or capsules shape samples. The microprocessor control measurement system provides accuracy and versatility. All test results are shown on the digital LCD display and printed out on the printer. The range of hardness can be checked from 5-350N; the diameter and thickness range can be checked from 2.0-35.0mm. The hardness measurement can be selected as N, Kp or Sc. The diameter and thickness measurements can be selected as mm or inches.

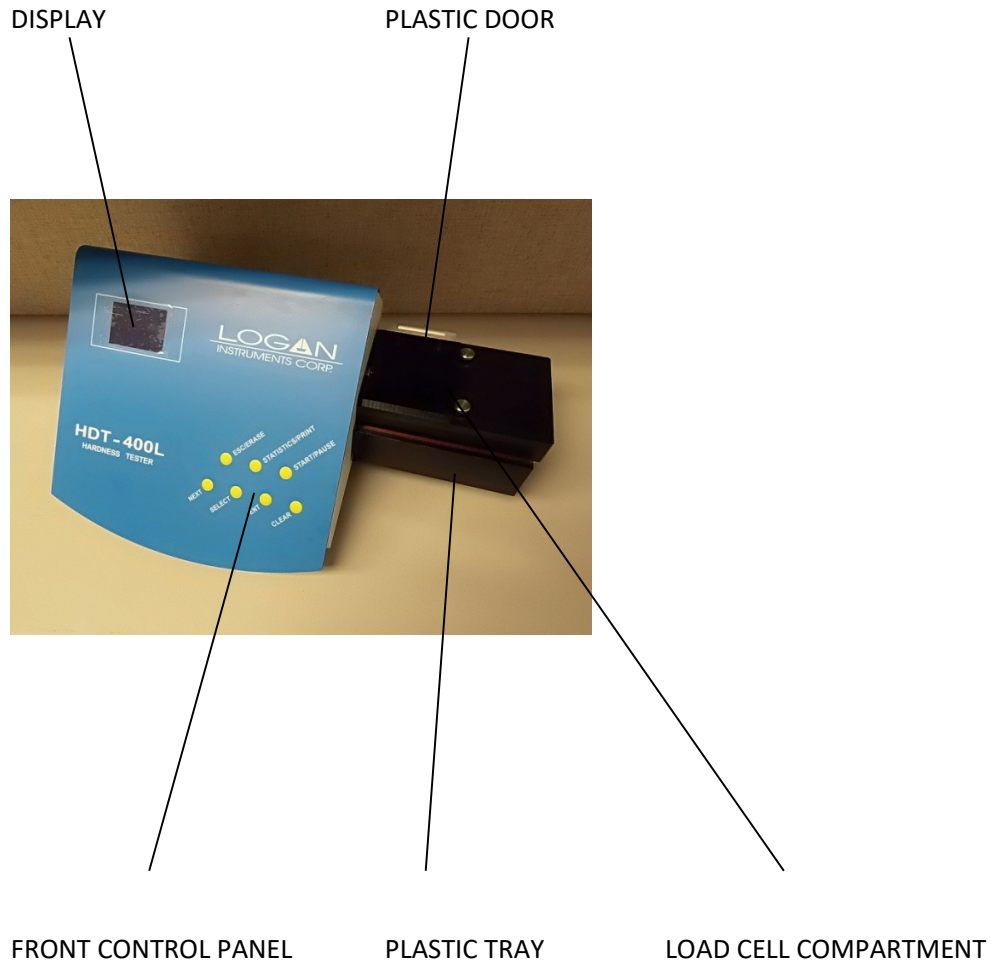
It is easy to operate the Logan HDT-400L. Lift the top cover and load the sample on the tray. The operation methods are manual or automatic. The manual mode starts with one measurement test at a time. The automatic mode can do up to 99 samples. A removable plastic tray is attached under the measurement compartment. The small hand held brush is provided to neatly remove sample fragments. The calibration is a simple procedure; which can be performed at any flat surface with standard tools.

The operation and design of the Logan HDT-400L Hardness Tester are in full compliance with the valid monograph for the USP, EP, CP and JP. The load cell in this system offers 10 times more accurate results than required. The instrument itself is made from high quality metal which meets in full the actual GLP requirements.

Unlike the HDT-300, this unit is compatible with the Shimadzu Balance AX200. The HDT-400L and AX200 combine to give information on the weight of the testing material. This information will be printed along with the summary report.

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Section 2.0 Logan HDT-400L Hardness Tester

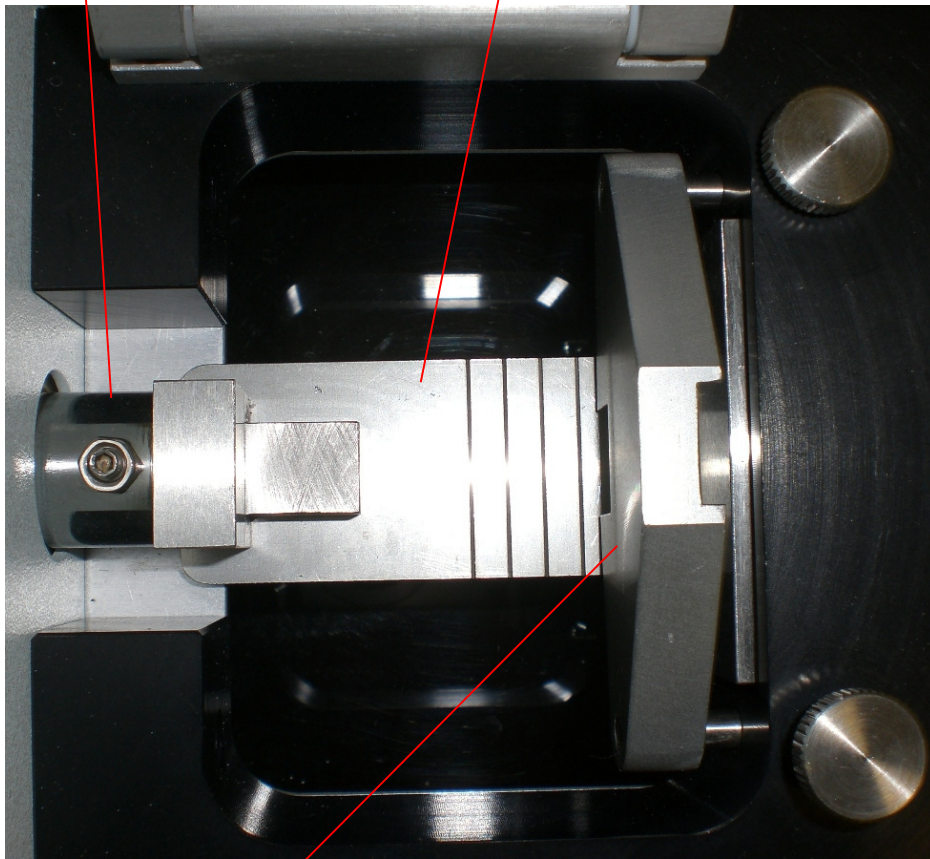


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2.1 Logan HDT-400L Hardness Tester – Load Cell Compartment

PLUNGER

SAMPLE CARRY PLATE

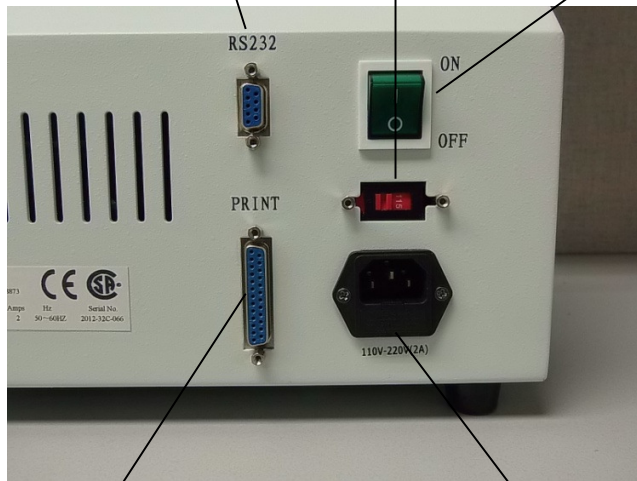


TABLET JAW

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2.2 Logan HDT-400L Hardness Tester – Rear View

RS-232 Communication Port Voltage Select Switch Power On/Off Switch



Printer Port

Power Cord Connect

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Section 3.0 HDT-400L Front Panel Controls

Display:
Display testing function and results

“ESC/Erase” Key

There are two functions of the key. First is to quit programming mode and go back to Main Menu. Second, it eliminates the data from the last sample during a test if any error occurred, so that you can clear the mistake and resume the test.

“Statistics/Print” Key

Display and print out the statistical test result. It will also end a Manual test.

“Start/Pause” Key

Press “Start/Pause” key once, HDT-400L will start a test. Press it during the plunger stroke, and the plunger will withdraw to its home position. It will wait to be pressed again to go back testing the current sample.

When the HDT-400L is paused, you can erase the data from the last sample by pressing “ESC/Erase” key. You can also end the test by selecting “Statistic/Print” key.

“Next” Key

When display is more than one page, “Next” key will loop through these pages. If it is in programming mode, “Next” key will change the setting of a highlighted item by looping through the available values.

“Select” Key

If there is a more than one field to edit in an item of Main Menu in programming mode, “Select” key will let you loop through all the fields from left to right.

“Ent” Key

You can enter the programming mode from Main Menu by pressing “Ent” key. The first item will be highlighted and ready to change. You can accept the change and go to the next item by pressing “Ent” key.

“Clear” Key

Clears the display and returns to Main Menu. It could also abandon or cancel a test if pressed when the HDT-400L is paused.

Section 3.1 HDT-400L Rear Panel Controls

POWER SWITCH	To turn on/shut off the unit
POWER RECEPTICAL	To connect the power cord
VOLTAGE SELECT SWITCH	To select 110V or 220V
PRINTER PORT	To connect the printer
RS-232 COMMUNICATION PORT	To connect with AX200

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Section 4.0 Installation and Setup

- 4.1 Remove the unit from packing box.
- 4.2 Unpack the unit and check accessories
- 4.3 Lock the Tablet Jaw in the Load Cell Component
- 4.4 Connect power cord to power jack
- 4.5 Make sure the printer is off and then connect to printer port
- 4.6 Connect RS-232 cable to AX200 (optional)
- 4.7 Switch power on to start the HDT-400L into "Self Test" mode.

Note: Please see details from Logan HDT-400 I/Q package

Section 5.0 Operating with HDT-400L

Turn power switch on. The HDT-400L would go into “Self-Test” mode as soon as the power is on. After it passes the “Self-Test” mode the HDT-400L will automatically go to the Main Menu. If any problem is detected during “Self-Test”, the HDT-400L will give an alert.

5.1 Main Menu

When the HDT-400L is powered on, it will go into “Self-Test” mode and the display shows (in order):

“HDT-400
Detect initial position
A/D conversion
The balance
The load cell”

And then “Press any key to main menu”

Press any key, the display shows the first page of the Main Menu, for example:

Function: Auto
Quantity: 100
Unit: N, mm

You can enter programming mode from main menu by pressing “Ent” key. The first line of Main Menu will be highlighted and ready for new settings. To exit programming mode and go back to Main Menu, press “ESC/Erase” key twice.

The main menu contains 9 lines of information, but only displays 3 lines per page. The “Next” key is used in the Main Menu as the “Page Down” key; use the “Next” key to loop through the main menu pages. “Real Time” is always shown on lower right corner of the display in main menu. The items in Main Menu specify how a test would be conducted. They are:

(page one)

Function:

You can set the Function as “Manual” or “Auto”. For “Manual” function, the operator needs to press the “Start/Pause” key to test every sample. Once the plunger finishes crushing the sample and returns to home position, the HDT-400L refreshes the display with data gathered from this sample, and waits for the operator to clean the Load Cell Compartment, load the next sample, and press “Start/Pause” key to test it. If you press “Statistic/Print” key the test will end and the statistical result will be given by the printer and on the display. During a Manual test you can test up to 100 samples.

For “Auto” function, the operator needs to specify the total number of samples in a test. The HDT-400L will move automatically to test one sample after another. Between each sample, it will pause for a given period to allow the operator to get rid of sample fragments and load a new one. The display will keep refreshing with new data after testing each sample. A statistical result is given by pressing “Statistic/Print” key.

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Quantity:

It specifies the number of samples in the "Auto" function. The value could be from 1 to 100. In "Manual" function, it will be displayed as 100 and is not changeable.

Unit: x, xx

It sets the unit used for the test. The first x could be "N" (Newton), "Kg" (Kilogram) or "Sc" (Strocobb). The second xx could be "mm" (millimeter) or "In" (Inches).

(page two)

Low Limit: xxx ("N", "Kg" or "Sc")

The low limit should be no more than 350N.

High Limit: xxx ("N", "Kg" or "Sc")

The high limit should be no more than 350N.

Pause: xxs

It specifies the paused period in number of seconds before the HDT-400L starts testing the next sample in Auto Function. It is from 0 to 20 seconds. It would not take effect in Manual Function.

(page three)

Date: 20xx-xx-xx

Here sets the date with the format: Year-Month-Date.

Time: xx:xx

Here sets the real time with 24 hour format: Hour:Minute.

Thickness:

It could be "Yes" or "No". When "Yes" is selected, the plunger of the HDT-400L works with two strokes. First, it moves right to touch the sample (should be loaded standing vertically) gently and measure the thickness. Then it moves left and pulls the sample down. The plunger crushes the sample in the second stroke and measures the hardness. When this line is set to "No", the plunger only works with the second stroke without measuring the thickness of the sample.

Note: Please see Logan HDT-400L OQ package for detailed procedures of running a test.

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5.2 HDT-400L & AX200 Weight-Print Mode

Unlike the HDT-300, the HDT-400L can link up with the Shimadzu AX200 Balance. Before turning on each product, make sure to connect the RS-232 cable from the AX200 to the HDT-400L. Once the connection is made, it will read "0.000." Once this is complete; turn on the HDT-400L. During initialization for the HDT-400L, it will run through a list and checkpoints. Make sure the HDT-400L reads:

"HDT-400 Tester

- √ Detect initial
Position
- √ A/D conversion
- √ The load cell
- √ The balance"

If this is the case, the two units are correctly connected. Keep in mind that the balance connection is optional. The HDT-400L can work normally like the HDT-300 without the AX200. In this case the HDT-400L reads:

"HDT-400 Tester

- √ Detect initial
Position
- √ A/D conversion
- √ The load cell
- X The balance"

Check that the AX200 is in its right mode to connect with the HDT-400L by following these steps:

- 1 – Hit menu eight times till you get to "intFACE"
- 2 – Once at "intFace" hit "Tare/Enter"
- 3 – Hit menu until you see "if win." This is the mode connected to the HDT-400L
- 4 – Once that is selected, hit "Tare/Enter" to save the setting
- 5 – Hit power to go back to "0.0000"

Now the AX200 is able to weigh the tablets and send the information to the HDT-400L. Here are instructions on how to use the AX200 with the HDT-400L.

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Manual Mode for HDT-400L

After the settings have been made on the HDT-400L, press "Start" on the unit for each test. It will bring you to a screen that reads: "Load sample on balance and press PRINT"

No.:X" ←(X=1 for the first test)

At this point, action needs to be taken from the user:

1 – Zero the balance

2 – Place a tablet on the balance

3 – Hit print. This will transfer the weight to the HDT-400L. The weight will appear on the HDT-400L screen.

Note: From the moment you hit print on the AX200, the HDT-400L will start counting the seconds before it will start the plunger to do the rest of the test. You can change the seconds within the HDT-400L menu.

4 – Once the HDT-400L test is complete, hit print and the results will be printed out with the weight.

Note: When the HDT-400L is waiting for the load of the tablet after being weighed, it cannot go back to the main menu. The process of the test has already started.

Auto Mode for HDT-400L (after the settings have been made for the HDT-400L) In Auto Mode, there are only a few differences:

1 – After the first run, the HDT-400L will set up for the second run automatically.

2 – The printer will print the information summary after the last test run. It is not necessary to push the print button at this time.

Note: Make sure that the AX200 and the HDT-400L are using the same measuring units for the weight. This will keep the printer from printing false data.

5.3 Caution Items

- When the plunger force is below the LOW LIMIT setting, or over the HIGH LIMIT setting the Audio Alert will beep and the plunger will stop.
 - Press "Start/Pause" key to stop the test.
 - To delete the data for this test, press "ESC/Erase" key.
 - To keep the data for this test, press "Start/Pause" key to continue.
- If there is no sample in Load Cell Compartment, the plunger will stop and return to stand by position. Place new sample in the sample carrier and press "Start/Pause" key to continue.
- When hardness is over 125% (20 Kg) of the plunger force the audio alert will beep. The display will show "Over Load", the plunger would go back to stand by position, beep and stop automatically.
- The MFR recommends warming up the HDT-400L Hardness Tester for about 15-20 minutes before performing any test; this is for the unit to build up the test power.

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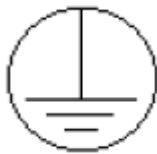
Section 6.0 Maintenance

- 6.1 Always keep the Hardness Tester at a dry and flat surface.
- 6.2 All surfaces:
After test, please clean by using a dry cloth. Do not use any solvent.
Lay on clean flat surface. Do not store on a vertical position.
- 6.3 Load-cell Compartment:
Keep on a flat and clean surface.
Clean the surface with a dry cloth. Do not use any solvent.
- 6.4 Drive Shaft
Make sure both shafts are dry at all times.
Clean shaft with dry cloth. Do not use any solvent.



Fuse Replacement Instruction:

To replace the fuse, turn off the power switch. Gently press the fuse holder knob in and turn counter clockwise. Take the old fuse out and replace it with a new fuse (Part# 3AG-5AMP at 250VAC)



Ground Symbol

Do not remove any screws with ground symbol next to it.

Section 7.0 Trouble Shooting

Symptom	Possible Cause
No Power	Check Line Cord Check Fuse
In "Self-Test" mode LCD shows: "Optical sensor problem"	Check connection XSH on the main PCB; also check the space of the encoder.
"A/D converter problem"	Turn off the power and restart again, if the symptom still occurs, check the 5V power supply.
"Load-cell Problem"	Check connection XS10 is tight. If it is tight, contact Manufacturer or your distributor.
Keeps beeping	Contact manufacturer or your distributor for service.

If further assistance is needed please contact your local distributor or Logan Instruments:

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