Hercules Sizing Tester - Rev 2.8-07 Software - Operation Instructions

Rev 2.8 software in its various sub-versions adds several features to the Hercules Sizing Tester.

1. Restored and improved RS232 communications

2. Switching into and out of Service Mode without powering down the HST.

3. Machine history is displayed in the Service Mode.

4. Demo Mode.

5. Automatic Display Dimming

1. RS232:

RS232 communications, as it existed in Rev 2.5, has been restored. It was disabled in Rev 2.7 to make room for other features. A larger chip now used for Rev 2.8-01 and later versions allowed restoring the removed feature without sacrificing any other feature.

What was called **Verbose Disabled** is now called **Terse**. It is still as shown in the Hercules Sizing Tester (HST) manual, sending only the time at the end of test – just one number.

What was called **Verbose Enabled** is now **Verbose 1.** It is fully compatible with the Rev 2.5 Verbose mode, including the minor errors like data order mixup in the second line and reversed Line Feed/Carriage Return sequences. It is still as shown in the older digital HST manual..It is there for users who already have a setup that receives data from a Rev 2.5 HST. Their setup will still work if they upgrade to Rev 2.8-01 or any later version.

New in Rev 2.8-01 and later versions is **Verbose 2.** It gives more complete information and is formatted so that if captured into a file, that file will be in "csv" format (comma separated values) suitable for a spreadsheet. Just load the file into Microsoft Excel or Open Office Calc as a "csv" file. Select comma (only) in the spreadsheet as the delimiter character.

Here is an example of Verbose 2 RS232 output:

```
Hercules Sizing Tester V2.8
www.HerculesSizingTester.com
Calibrated
Test Started
 Over ,12, Reflectance= ,100.0, %, Threshold= ,90.0, %, Time=    ,0.0, Seconds
 Over ,12, Reflectance=  ,99.6, %, Threshold= ,90.0, %, Time=    ,1.0, Seconds
 Over ,12, Reflectance=  ,95.2, %, Threshold= ,90.0, %, Time=    ,2.0, Seconds
 Over ,12, Reflectance=  ,92.7, %, Threshold= ,90.0, %, Time=    ,3.0, Seconds
 Over ,12, Reflectance=  ,91.4, %, Threshold= ,90.0, %, Time=    ,4.0, Seconds
 Trip ,11, Reflectance=  ,89.9, %, Threshold= ,90.0, %, Time=    ,4.8, Seconds
Under ,10, Reflectance=  ,88.7, %, Threshold= ,90.0, %, Time=    ,5.0, Seconds
Under ,10, Reflectance=  ,81.5, %, Threshold= ,90.0, %, Time=    ,6.0, Seconds
```

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```
Under ,10, Reflectance=  ,78.2, %, Threshold= ,90.0, %, Time=    ,7.0, Seconds
Test Halted
```

This RS232 data may be captured using Windows HyperTerminal, and selecting its Capture Text option on its Transfer menu. A capture may be stopped by selecting the same menus.

Here is the same data in a spreadsheet with appropriate columns and with the commas removed, done by simply loading the captured file (with a **.csv** filename extension) into a spreadsheet program:

Hercules Sizing Tester V2.8									
www.HerculesSizingTester.com									
Calibrated									
Test Started									
Over	12	Reflectance=	100	%	Threshold=	90	%	Time=	0	Seconds
Over	12	Reflectance=	99.6	%	Threshold=	90	%	Time=	1	Seconds
Over	12	Reflectance=	95.2	%	Threshold=	90	%	Time=	2	Seconds
Over	12	Reflectance=	92.7	%	Threshold=	90	%	Time=	3	Seconds
Over	12	Reflectance=	91.4	%	Threshold=	90	%	Time=	4	Seconds
Trip	11	Reflectance=	89.9	%	Threshold=	90	%	Time=	4.8	Seconds
Under	10	Reflectance=	88.7	%	Threshold=	90	%	Time=	5	Seconds
Under	10	Reflectance=	81.5	%	Threshold=	90	%	Time=	6	Seconds
Under	10	Reflectance=	78.2	%	Threshold=	90	%	Time=	7	Seconds
Test Halted									

The units are included but are automatically placed in separate columns.

The service mode provides RS232 output, regardless of which Terse or Verbose mode is chosen.

Here is a typical Service Mode screen.

```
-------------------------------
Hercules Sizing Tester V2.8-06
www.HerculesSizingTester.com


Times are updated every 10 minutes.


Number Of Power Ups =    117
Machine Operation Time =     56 Hours, 40 Minutes


Number Of Lamp Changes (= Number Of Lamp Timer Resets) =      0
Lamp Operation Time =     56 Hours, 40 Minutes
Replace lamps, and reset lamp timer, when lamp time exceeds 200 hours.


Test Complete Beep Time [Mode 2] = 1 second
Verbose [Mode 2] = Readable And CSV


Reflectance Setpoint = 80 %
Raw Data  R = 1442  M = 0966 ; Uncalibrated Reflectance =   96.5 %
```

The last line repeats at a fast rate, overwriting itself.

After accomplishing CALIBRATION, the last line will look like this:

```
Raw Data  R = 1442  M = 0966 ;   Calibrated Reflectance =  100.0 %
```

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Whenever data shown above the bottom line changes (from timers increasing, or from a user changing a selection, after a brief delay the entire Service Mode screen is re-sent.

2. CHANGING MODES:

The HST has two modes: Normal mode (used for ink and paper testing) and Service Mode (used for machine setup).

When the HST is turned on it enters Normal Mode. Entering Service Mode was formerly done by holding the CALIBRATE button while turning on the HST. Exiting the Service Mode was done by turning off the HST, then turning it back on to get back into Normal Mode. Those methods still work.

Now it is also possible to change modes without cycling power and without incurring a brief warm up setting period after doing so.

Turn on the HST. It is in Normal Mode. **Press and hold the CALIBRATE button. If the CHANGE LAMPS message appears, wait 1 second for it to go away. While still holding CALIBRATE press & release the SILENCE button three times, then release the CALIBRATE button after the screen changes.** The front panel lights will blink while doing that, and the buzzer will signal success with a coded beep pattern. The HST will switch to Service Mode.

Service Mode begins with a "Banner Screen". The banner screen is recognizable as the only display screen that is in ALL CAPITAL LETTERS.

To switch from Service mode to Normal mode, the Service Mode banner screen must be showing. Then use exactly the same button press sequence – hold CALIBRATE, press & release SILENCE 3 times.   The HST switches back to Normal mode.

3. SERVICE MODE SCREENS INCLUDE MACHINE HISTORY:

In the Service Mode the various screens (there are 11) are seen one at a time by pressing the SILENCE button, as the banner screen prompts. Silence cycles through the screens forward. To cycle through the screens in reverse, press the TEST button. SILENCE and TEST may be pressed in any order, such as going back and forth between two screens.

New Service Mode screens show machine history. In those screens, nothing can be changed by the user. They are for information. The order of some of the other Service Mode screens have been re-arranged.

In all Service Mode screens where something can be changed, the CALIBRATE button does the changing.

Here are all the Service Mode screens:

1. **Banner Screen** - Normally the banner screen will say SERVICE MODE. If the DEMO MODE has been selected, then it will say DEMO MODE. Whatever it says, if it is the Service Mode banner screen, **ALL THE TEXT OF THE BANNER SCREEN IN BOTH LINES WILL BE IN CAPITAL LETTERS.**   All capitals happens <u>only</u> in the Service Mode banner screen.

2. **Buzzer Mode** – Selects how long the buzzer beeps at the end of an ink and paper test. Has no effect

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on all the other short beeps.

3. **Verbose Mode** - (see Terse, Verbose 1 and Verbose 2 details above).

4. **Power Up Count** – A history screen, shows how many times the HST has been turned on.

5. **Machine On Time** - A history screen, shows how much total time that the HST has been powered up. In Rev 2.8-04 and later versions the storage space for this history is larger than in prior versions so the number accumulated during a normal machine lifetime will not exceed the storage space. The software also handles upgrade to the larger storage space automatically when installed in place of an earlier version. Rev 2.8-07 fixed a mistake that would occur once every 10,000+ hours of use, in the accumulated history recorded, which would make the history falsely gain an extra 10,000+ hours.

6. **Lamp Changes** - A history screen, shows how many times the lamps have been replaced. This number increases by one each time the lamp timer is reset. So don't reset the lamp timer unless lamps have actually been replaced, or this part of the history will be inaccurate. See the Demo Mode for a way to experiment and practice with lamp timer resets without upsetting the true machine history.

7. **Lamp Time** - A history screen, shows how long the lamps have been powered up since the last lamp timer reset.

NOTE: Both Machine On Time and Lamp time are updated every ten minutes of machine operation. So, the numbers won't change for ten minutes. See the Demo Mode for a way to see the timers change with less waiting time.

8. **Lamp Changes Message** - This screen reminds a user that the lamps are good for 200 hours of use. Additionally, it tells the user that either 200 hours of lamp use has not expired yet, or that it has expired. (See the lamp time screen for how much time has expired.)

9. **Reset Lamp Timer** - This screen allows a user to reset the lamp timer (or the DEMO MODE lamp timer). Press and hold the CALIBRATE button for 10 seconds to reset the lamp timer. A front panel light will blink during the 10 second wait. After the wait expires, the timer is reset and the user is prompted to push the TEST button, which takes the user back to the Service Mode banner screen. It is also possible to just turn off the power and start over after resetting the lamp timers as was done with older versions.

10. **Detailed Version** - This screen shows the detailed software version, the major version with dash number and sub version. For information only, no changes can be made in this screen. Starting with Rev 2.8-07 the full major version and subversion is shown (2.8-07) in most screens that formerly displayed just the major version (2.8), including the screen seen at power up before any buttons are pressed.

11. **Raw Sensor Data** - This screen shows the raw sensor data, Reference sensor to the left (R=), Measurement sensor to the right (M=).

The correct range of Raw Sensor Data is different with Rev 2.8 (this applies to Rev 2.7 also), compared to the range shown in the Hercules Sizing Tester manual section 6 page 2, which applied to Rev 2.5 and prior versions. With the white tile placed on the HST, raw data values should be from 0800 to 2400 for both Reference and Measurement. Examples of good white tile raw data:

| Raw Sensor Data | | Raw Sensor Data | | Raw Sensor Data |

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| R=1458 M=0983 | | R=1634 M=1716 | | R=2034 M=1274 |

12. **Reflectance Percentage Display** - This screen is much like the Normal Mode reflectance display, with the CALIBRATE button setting whatever is on top of the HST dish window to 100.0%. It is now possible to go back and forth between raw sensor data and reflectance percentage without powering down the HST (and incurring additional warmup settling time) and without switching back and forth between Service Mode and Normal Mode. This Reflectance display in Service Mode feature is in Rev 2.7 also.

13. **Reflectance Percentage Display And Raw Sensor Data**- This screen shows both the reflectance percentage in the bottom row at the left, and shows the raw sensor data simultaneously, Reference sensor in the top row at the right (R=), Measurement sensor in the bottom row at the right (M=). The CALIBRATE button is used to set the item on the dish window to 100.0% reflectance.

After the Reflectance screen, the next screen is back to the Service Mode banner screen.

4. DEMO MODE:

Because lamp resets are done so seldom, and for several other reasons, Rev 2.8-01 and later versions have a DEMO MODE as part of the Service Mode, which allow practicing resetting a dummy lamp timer instead of the real lamp timer. The real timer keeps on counting time in the background correctly while the DEMO MODE showing speeded up dummy times is in effect.

In the DEMO MODE, the 10 minute timer updates are done every 30 seconds (thus racking up an indicated 60 minutes in the demo timers in just 3 minutes of actual time). That makes it reasonable to watch the History screen timers change without a long wait.

In DEMO MODE, all history values shown are artificial and always start with the same numbers when entering DEMO MODE.

To enter the DEMO MODE, first enter the Service Mode and have its banner screen showing (it is the only screen having ALL CAPITAL LETTERS). Then, hold the CALIBRATE button, and press & release the TEST button three times. The banner screen will change from saying SERVICE MODE to DEMO MODE.

To Exit DEMO MODE do the same steps – Banner screen showing (ALL CAPITALS), hold the CALIBRATE button, and press & release the TEST button three times. Demo Mode is also exited if power is turned off. Demo mode will not be active when power is turned on.

While in DEMO MODE, try all the Service Mode screens. Try a lamp timer reset, and watch the effect of it. Try it again! Switch to Normal Mode and run tests or measure tiles. Switch back to Service Mode and DEMO MODE will still be in effect. Exit DEMO Mode and see the true machine history in the Service Mode screens.

There is no harm in leaving the HST in DEMO MODE for a long time. Even if switching to Normal Mode while DEMO MODE remains in effect, the timing of ink and paper tests is not affected. That timer is not sped up by the DEMO MODE.

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5. DISPLAY DIMMING:

For longer display life, Rev 2.8-01 and later versions reduce the brightness of the display after a long period of inactivity. After 30 minutes of no button presses by the user, the display brightness is reduced. That enhances the display's life in those situations where the HST is left powered up for very long times. Press any button and the display immediately goes to full brightness.

In DEMO MODE within the Service Mode, due to the speeded up demo timers, the display will go dim if no buttons are pressed for 1.5 minutes.

In the Normal Mode, the display will never go dim during a running test, however long the test is. Not even if the HST was left in DEMO MODE.

6. NEW BUZZER MODES:

Rev 2.8-05 and later versions has more user selectable options for the end of sizing test buzzer action than prior versions have. An option of continuous buzz (no time out of the sound) was added. For each of the available times (0.5 second, 1 second, 2 seconds, 5 seconds, 10 seconds, 20 seconds, 10 minutes, and Continuous (no time out of the sound), there are three additional choices. The original constant Beep, a new Warble sound which make the buzzer more audible in noisy environments, and a Flash mode with the same sound as the Warble mode, but after a few seconds the display flashes brightly also, to give better visual indication that a sizing test is done. While the display is flashing, the sizing test results can still be read. For short buzzer times, the flashing starts when the beeping stops. For longer buzz times, the flashing starts after 5 seconds of beeping. The flashing runs continuously, until either the SILENCE or the CALIBRATE button is pressed. It will also stop if the reflectance set point is dialed down to a lower number to get a second sizing test time from the same start of test moment with the same inked paper sample. One choice is Flash 0Sec (No Beep). It makes not sound (zero beep time) and begins flashing immediately at the end of a sizing test and like the other Flash choices continues to flash the display until stopped by the user.