



EZ Data Software System Operating Manual

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TENSILE TESTER 48

OVERVIEW

The EZ Data software system is designed to enhance your model 2000 ChemInstruments test platforms. This document describes how to use the EZ Data software. Should you have any problems or questions, please contact ChemInstruments at 513-860-1598.

SPECIFICATIONS

System Requirements	Personal computer operating Microsoft Windows 7, Windows 8, or Windows 10. Pentium processor, 1 GHz or higher. Minimum screen resolution: 1366 x 768 1 available USB port. 8 GB of RAM. 200MB of hard drive space.
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INSTALLATION

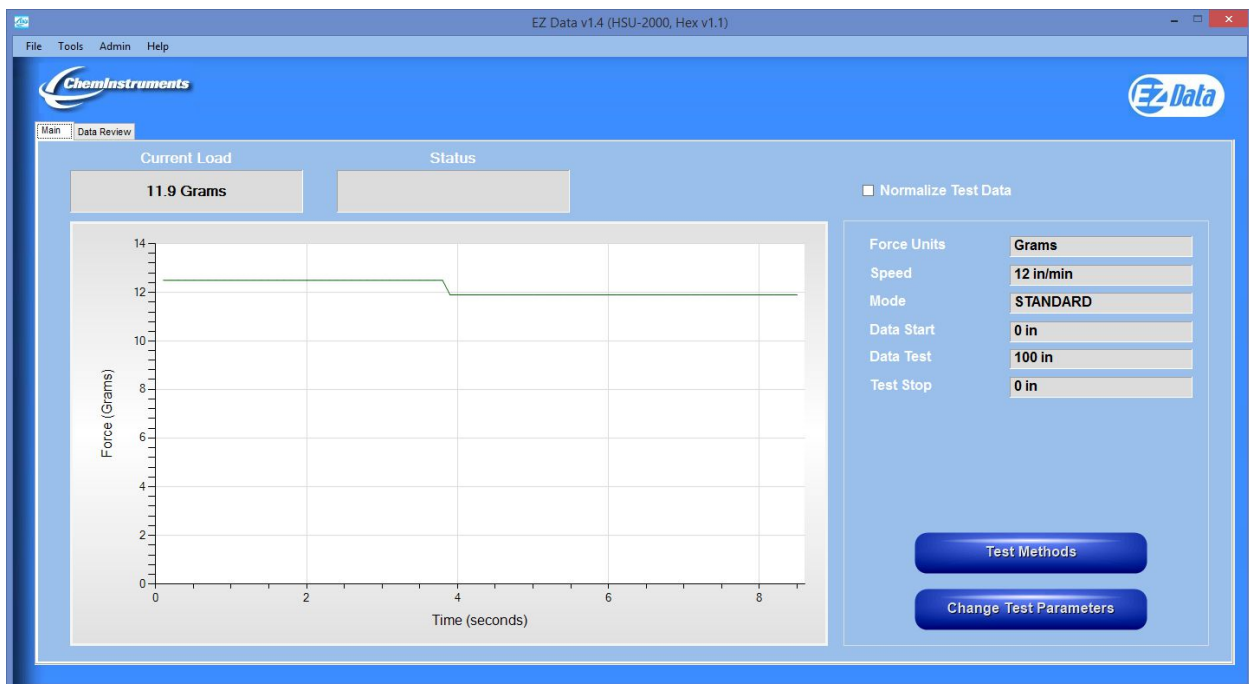
1. Insert the EZ Data USB flash drive into the computer.
2. Run the **EZDatavXX-setup.exe** file from the flash drive. XX represents the version number of the software.
3. Follow the on-screen instructions to complete the software installation.
4. The installation should have installed an “EZ Data Lab – 2000” program group and desktop icon on your computer.
5. It will also create a folder on your C: drive named EZ Data. The EZ Data System requires this folder and its sub-folders in order to operate correctly. Please do not delete.
6. Connect the provided USB cable from the test platform’s USB connector to the appropriate USB port on your computer.

OPERATION

The EZ Data software system can work with either a machine connected or not. With a machine connected, EZ Data will automatically detect the connected machine. If a machine is connected then only that type of machine's test data files can be reviewed, graphed, and tabulated.

If there is not a machine connected then EZ Data is used to analyze test data for any type of model 2000 ChemInstruments test platform.

The main screen is designed to provide all the necessary instructions on your computer screen. We will cover the areas that are common to all machines. For machine specific information, please refer to the machine's area at the back of this manual.



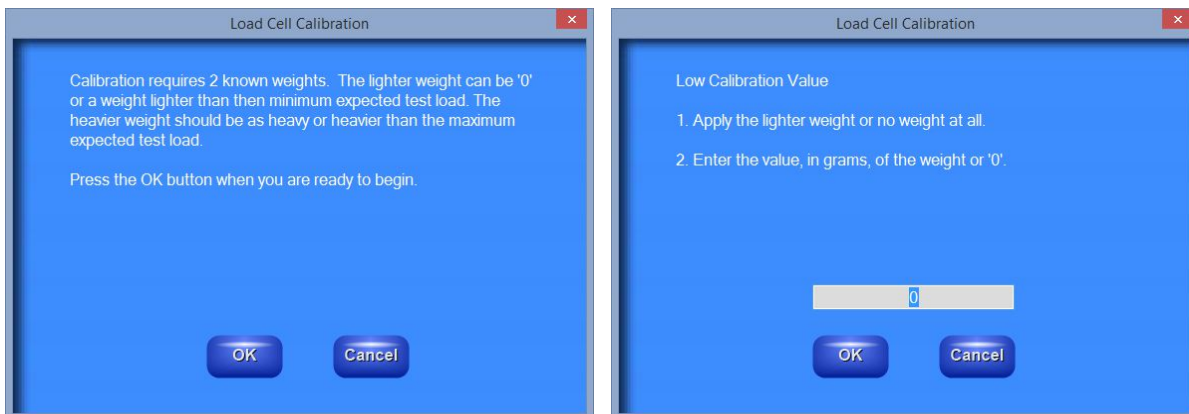
MAIN SCREEN - MENU BAR

TOOLS

CALIBRATE LOAD CELL

In order for the load cell to measure forces correctly, it is necessary to calibrate the system. The following procedure describes the calibration process.

1. Select the “CALIBRATE” button in the Setup section of the Operating Screen.
2. Follow the on-screen instructions exactly. (See Figure 3 – Calibration Screens)
3. Grams are the unit of measure for the calibration process.
4. The calibration process requires 2 known weights – a lighter weight and a heavier weight. The lighter weight can be no weight at all.
5. Make sure to hang the appropriate weight on the load cell grip when entering the low and high calibration values.
6. Make sure that the weight is not moving before pressing “OK”.
7. Verify the calibration by hanging some other known weight on the load cell grip and checking the display in the “Current Load” field.



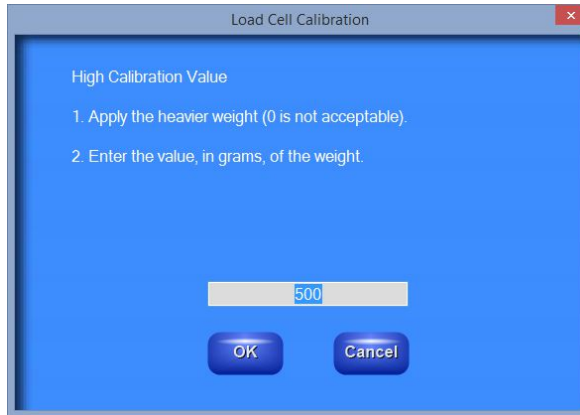


Figure 3 – Calibration Screens

OPEN SAVED TABULATE LIST

Allows for opening a previously saved tabulate list.

OPEN SAVED OVERLAY LIST

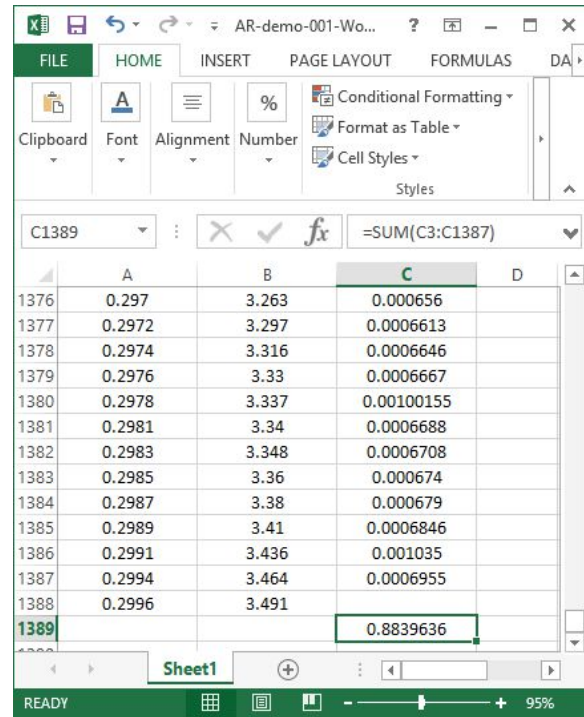
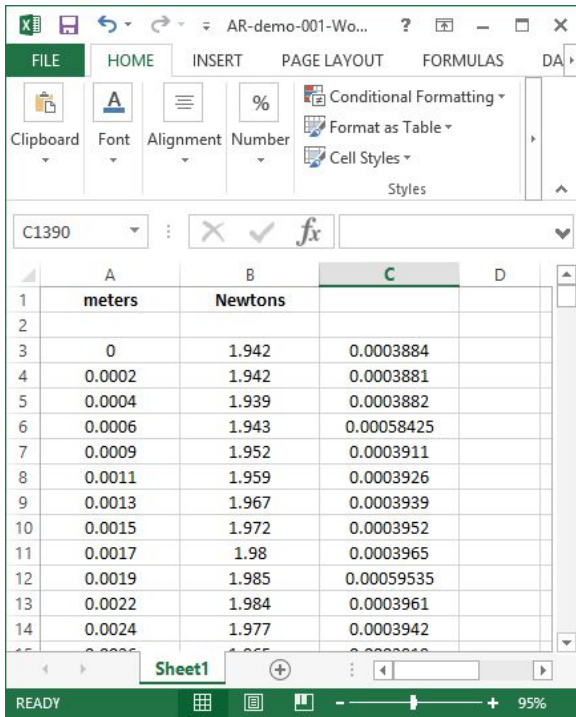
Allows for opening a previously saved overlay list.

SAVE EXCEL FILE TO COMPUTE WORK

Allows for saving an excel file in order to verify work calculation in EZ Data. The procedure is as follows:

1. Use the Tools\Save Excel File to Compute Work utility to save the selected test data to an excel spreadsheet.
2. The test data written to excel will be in the following format:
 - a. Column A will contain the distance measurement per data point in meters.
 - b. Column B will contain the test data measured in newtons.
3. The user will need to type the following formula in cell C3:
 - a. $=((B3+B4)/2)*(A4-A3)$
4. Copy and paste the formula to all cells in column C except for the last data point.
5. Type the following formula to compute work:

- a. $=\text{SUM}(C3:Cxx)$ where xx = last cell that contains data in column C
6. This cell will contain the work in joules.
 7. To calculate work in in-lb:
 - a. $\text{Work(in-lb)} = \text{Work(joules)} * 8.850746$



CALIBRATE TOUCH SCREEN

Allows for calibrating the touch screen display in the machine. Follow the directions on the touch screen for calibration. After the calibration data has been saved, the touch screen will go blank. The machine will need to have its power recycled.

RECOVER LAST COMPLETE TEST

This will allow you to recover the last unsaved test. It will open the graph screen with this test's data so that you can save it. Once it is saved or another test is completed, this test will be erased.

ADMIN

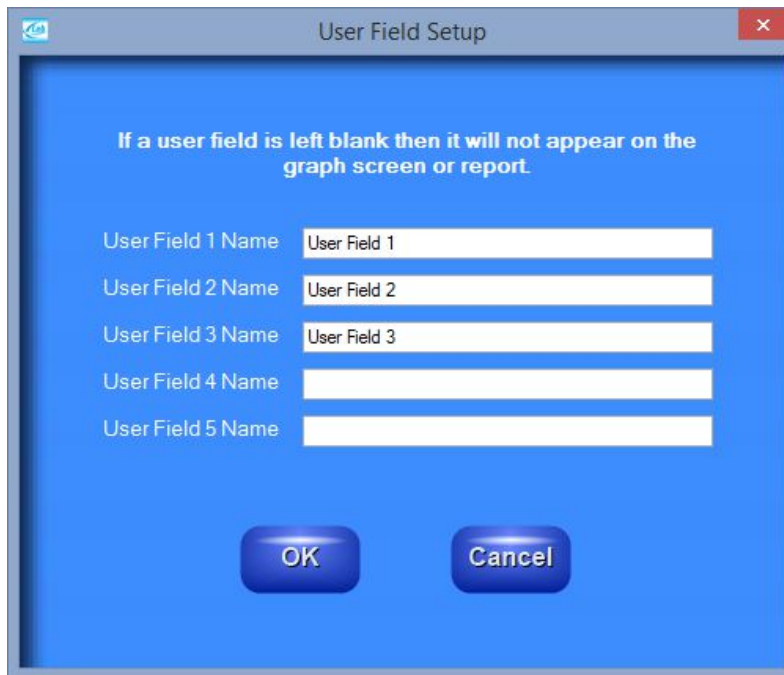
COMPANY NAME

Allows the user to change the company name that is printed on all reports.



USER FIELD NAME SETUP

Allows the user to customize the data that is saved with tests. There are up to 5 customizable fields.



GET USER NAME FROM WINDOWS

If this item is checked then EZ Data will pull the user name from the Windows login and assign it to the operator name field for test data. The operator name cannot be changed.

If this item is not checked then the user can enter the operator name or leave it blank.

VIEW RAW DATA ON GRAPH SCREEN

Allows the user to turn ON or OFF viewing raw test data on graph screen. If there is a lot of test data, then viewing the raw data on graph screen slows loading and cropping of the graph. If this item is checked, then the raw data will be viewable on the graph screen.

VIEW ZOOM CONTROLS ON GRAPH SCREEN

Allows the user to turn ON or OFF viewing zoom controls on graph screen. The zoom controls are similar to the controls used in EZ Lab to move the left and right markers in order to crop the test data. If this item is checked, then the zoom controls will be viewable on the graph screen.

SAVE DEFAULT REVIEW DATA PATH

If this item is checked then the user selected Review Data path will be saved upon exiting EZ Data and will be available upon re-entry to EZ Lab.

EXPORT OPTIONS

Allows the user to either export test data to Microsoft Excel or to a text file. The actual exporting of test data can be performed in the Data Review screen or the Graph screen.



STANDARD DEVIATION OPTIONS

Allows the user to select which type of standard deviation formula to use, either sample or population based. Past versions of EZ Lab and EZ Data strictly used the population based formula.



HELP

[MACHINE MANUAL](#)

This will open a pdf version of the connected machine's operating manual.

[EZ DATA MANUAL](#)

This will open a pdf version of this operating manual.

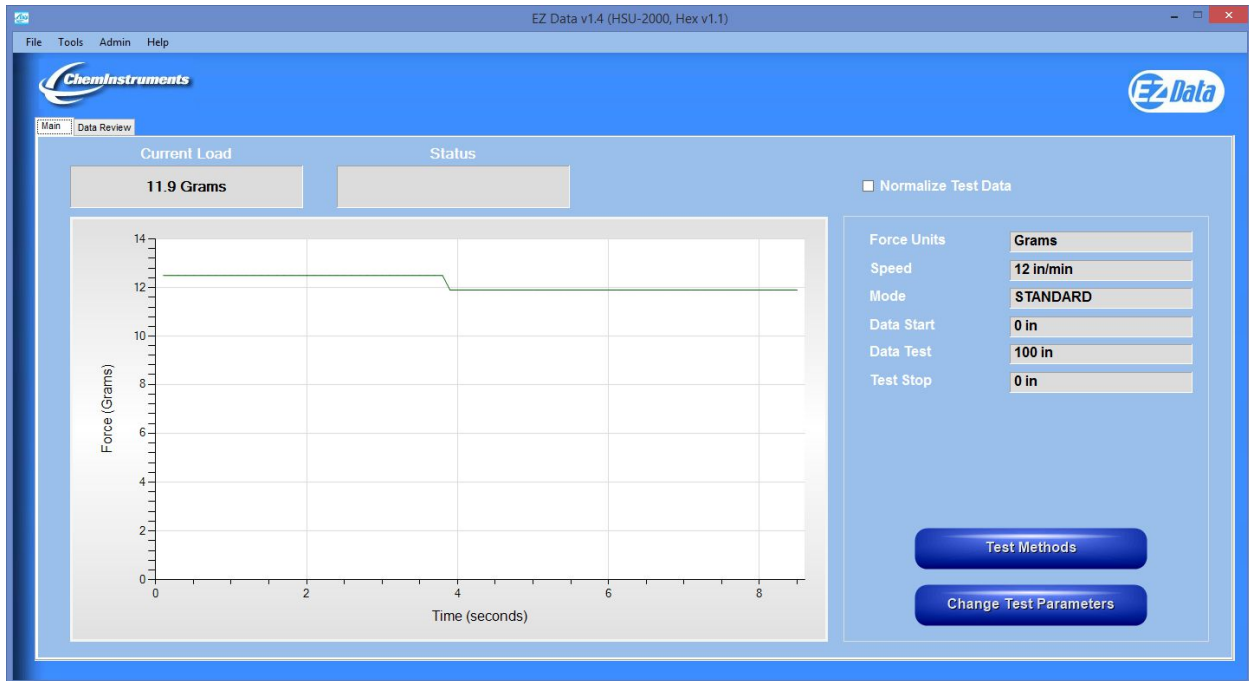
[ABOUT](#)

This will list EZ Data's software version. It will also list the connected machine type and its software and hardware version. It will report the number of demo tests still available or that the authorization code has been entered.

MAIN TAB

The main tab of the main EZ Data screen will show the current load being measured by the connected machine's load cell. The load cell value is shown as both a numeric value and graphically. The graph's data will clear every 5000 seconds.

The connected machine's test parameters are also displayed.



NORMALIZE DATA

Normalize Data will allow the graph's y-axis to be displayed as "Force/Width". The sample width is entered when this checkbox is "checked". The user will not be able to change the sample width in the graph screen after a test has been uploaded. To change the sample width, simply "uncheck" the box and then "check" it again.

The saved test data file contains the actual measured forces. If the "Normalize Data" feature is disabled and the graph is displayed again, the y-axis will display "Force" values.

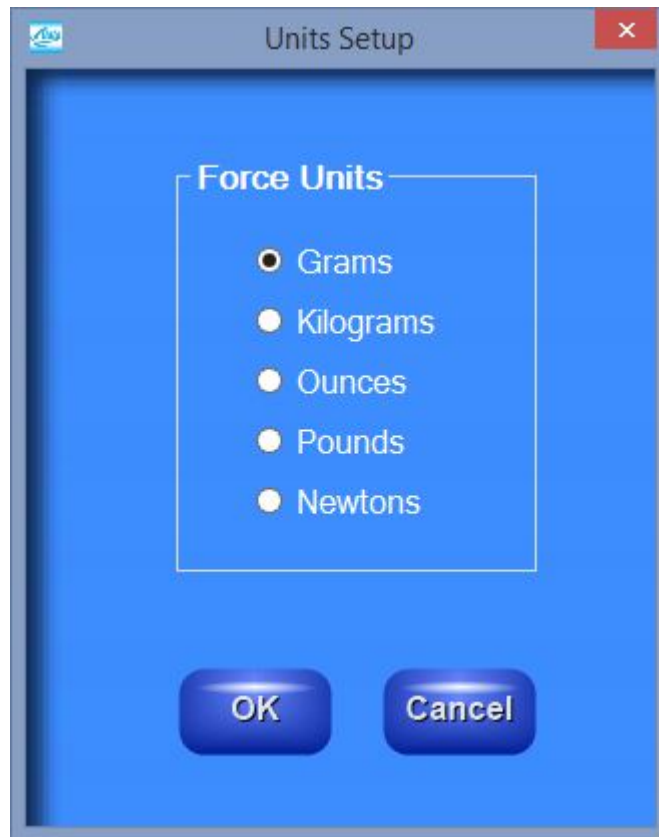
The "Normalize Data" box will remain "checked" until the user "unchecks" it.

BUTTONS

- **Change Test Parameters** – will allow the user to change the test setup for the machine.
- **Test Methods** – will allow the user to store up to 25 test methods for easy setup at a later time. This is only available in the HSU-2000, DS-2000, and TT-2000.

CHANGING FORCE UNITS FROM MAIN TAB

1. Click the box that shows the currently selected force units.
2. The following screen will appear.
3. Select the units and click OK.



Force units can also be changed from the Change Test Parameters screen.

DATA REVIEW TAB

The Data Review tab of the main EZ Data screen will show all test data saved in the given data path. Data review will default to the connected machine's test data directory. The data can be sorted by any of the columns as either ascending or descending. Clicking on the column header once will sort that column ascending. Clicking on the same column header again will sort that column descending.

Filename	Date/Time	Low (Newtons)	Average (Newtons)	High (Newtons)
ARData-008.dat	3/2/2017 3:05:09 PM	0.323	9.093	11.184
ARData-005-RevA.dat	3/2/2017 3:05:09 PM	8.725	9.879	10.691
ARData-007.dat	3/2/2017 3:03:15 PM	0.138	8.795	11.003
ARData-007-RevA.dat	3/2/2017 3:03:15 PM	8.163	9.64	10.761
ARData-006.dat	3/2/2017 3:02:03 PM	0.011	9.074	10.896
ARData-006-RevA.dat	3/2/2017 3:02:03 PM	8.92	9.791	10.734
ARData-005.dat	3/2/2017 3:00:24 PM	3.873	9.643	11.723
ARData-005-RevA.dat	3/2/2017 3:00:24 PM	9.237	10.202	11.424
ARData-004.dat	3/2/2017 2:45:52 PM	1.297	8.665	11.021
ARData-004-RevA.dat	3/2/2017 2:45:52 PM	7.924	8.831	10.019
ARData-003.dat	3/2/2017 2:44:13 PM	0.028	9.464	11.848
ARData-003-RevA.dat	3/2/2017 2:44:13 PM	8.374	9.63	10.868
ARData-002-RevA.dat	3/2/2017 2:43:01 PM	8.697	10	11.414
ARData-002.dat	3/2/2017 2:43:01 PM	4.328	10.278	11.954
ARData-001.dat	3/2/2017 2:41:50 PM	0.005	9.416	12.085
ARData-001-RevA.dat	3/2/2017 2:41:50 PM	8.798	9.931	11.192
AR-custom-2.dat	12/15/2016 4:12:54 PM	1.892	2.468	2.718
AR-custom-1.dat	12/15/2016 3:56:35 PM	1.068	1.958	2.618
AR-cons-10.dat	12/15/2016 3:47:38 PM	-0.008	2.248	3.092
AR-ramp-1.dat	8/2/2016 9:22:24 AM	9.391	9.936	12.843
AR-ramp-1-RevA.dat	8/2/2016 9:22:24 AM	9.614	10.577	12.843
AR-demo-017.dat	8/1/2016 2:55:20 PM	9.682	9.83	10.051
AR-demo-016.dat	8/1/2016 2:37:59 PM	9.843	9.869	9.893
AR-demo-015.dat	8/1/2016 2:08:27 PM	9.83	9.861	9.893

BUTTONS

- **Change Data Path** – will allow the user to select another test data path. If a machine is connected, then the data path selected must contain data files of the same type with the attached machine.
- **Graph** – will graph the selected file. See section Graph for more information.
- **Export** – will export all selected files' test data to an Excel file or a text file. An Excel or text file will be created for each test data file. See Export Options under the Admin menu on the main page.
- **Tabulate Data** – will tabulate all selected files. See section Tabulate Data for more information. The maximum number of files to tabulate is 100.
- **Overlay Data** – will overlay all selected files. See section Overlay Data for more information. The maximum number of files to overlay is 20.

- **Change Units** – will allow the user to change the force units. The data grid will be updated to reflect the new units selected.

GRAPH SCREEN

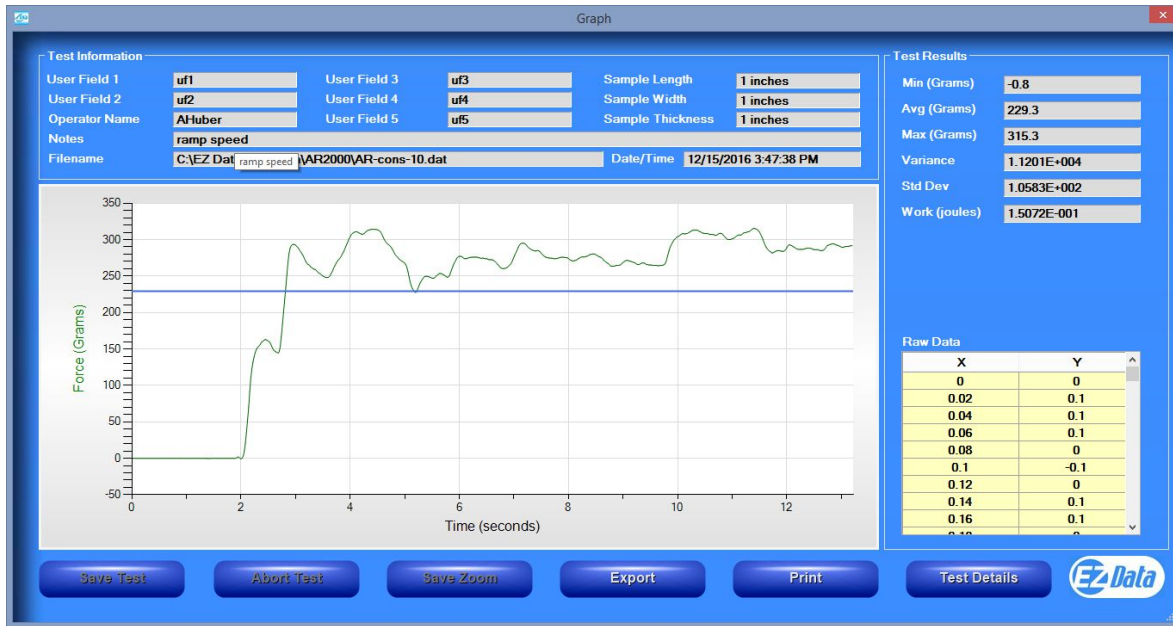
EZ Data will automatically display this screen after a test upload has been completed. This screen will also appear when the user selects a test from data review and selects the graph button. The graph screen will graph the measured forces versus time or distance, depending on the test platform. It will display the test information, test results, and raw data for the given test.

When this screen is displayed after a test upload has been completed, the user must either save the test or abort the test before leaving this screen. The machine will not allow the user to run another test until the current test is either saved or aborted.

The user can edit the following fields in the Test Information frame before saving a test: all of the user fields, sample length, sample width, sample thickness, and notes. However, the sample width cannot be changed if the “Normalize Test Data” box is checked on the main screen. The sample width is entered when the box is checked since it is used to compose the force per width graph required for the normalize data option. The date/time and operator name fields are loaded automatically and cannot be changed. The filename field will be loaded after the user saves the test. After the test is saved, all of the fields are locked and cannot be changed.

If all of the text in a field is not visible, simply move the mouse over the field and all of the text will be displayed in a separate box.

If loading or cropping of the graph is slow, then use the Admin menu “View Raw Data on Graph Screen” to turn OFF viewing raw data which will speed up loading and cropping.



SAVING A TEST

The graph screen contains a “Save Test” button and a “Save Test As” button. The differences will be outlined below.

SAVE TEST AS

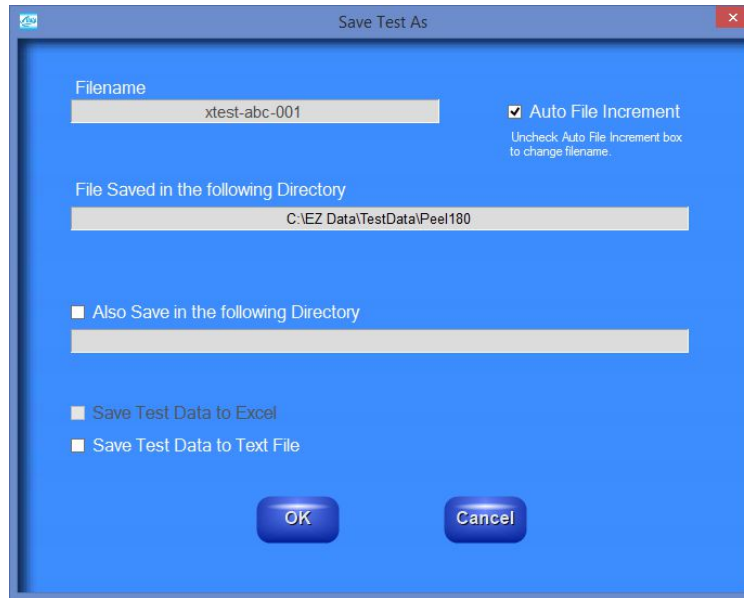
“Save Test As” will load the following screen.

Click the “Filename” box to enter the filename. To automatically increment the filename, check the “Auto File Increment” box. It will add the suffix, “-001” to the entered filename. The next test’s filename will automatically be entered as “filename-002”. If the “Auto File Increment” box is checked, then you cannot enter a new filename. Selecting “Auto File Increment” will also allow the user to use the “Save Test” button for subsequent tests. The “Save Test” button will save a test without displaying this screen.

All test data is automatically saved in the EZ Data folder listed. The user may also save the data to another location. They must check the box labeled “Also Save in the following Directory” and then enter a folder below the checkbox.

Checking the box next to “Save Test Data to Excel” will automatically write the test data to excel with the entered filename. This option will only be enabled if the “Export Options” is set to Excel.

Checking the box next to “Save Test Data to Text File” will automatically write the test data to a text file with the entered filename. This option will only be enabled if the “Export Options” is set to text.



SAVE TEST

“Save Test” will be enabled if the “Auto File Increment” box was previously selected. This button will not load an additional screen for saving the test. It will save the given test using the incremented file name. It will also save all of the previously selected options – additional folder location, Excel file, and/or text file.

The “Save Test” button is meant to be used for quickly saving tests after the user has specified a filename and selected the auto file increment function.

CROPPING GRAPHS

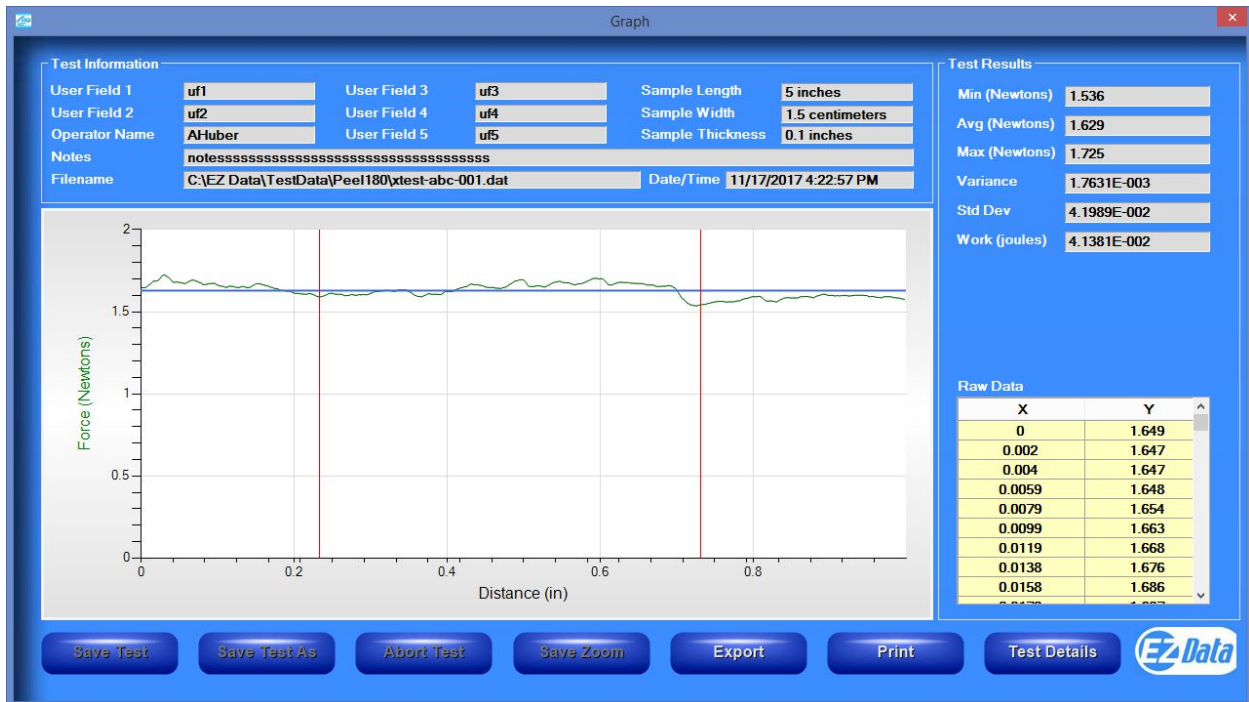
The graph screen provides a cropping feature. A graph can be cropped up to 3 times.

Note: Cropping a graph will not erase the data saved from the original test.

There are two ways to crop a graph.

Method 1:

1. Make sure that “View Zoom Controls on Graph Screen” under the Admin menu on the main screen is NOT checked.
2. Click on the graph at the first end point for the crop. A vertical red line will appear as shown below. You must click on the test data graph line.
3. Click on the graph at the second end point for the crop. A second vertical red line will appear as shown below.
4. Select “Recalculate” from the context menu that can be accessed by right-clicking on the graph.



Method 2:

1. Check “View Zoom Controls on Graph Screen” under the Admin menu on the main screen. The zoom controls will be loaded on the graph screen as shown below.
2. Use the arrow buttons to move the left and right marker lines to the desired location.
3. Select “Recalculate” to crop the graph.
4. The “Back” button will undo the last “Recalculate”.



GRAPH CONTEXT MENU

Right clicking on the graph will bring up another menu. Available options include copy graph, display original graph, go back after cropping data, auto scale the y-axis, and enable/disable a minor grid. The context menu is disabled until the uploaded test is saved.

- **Copy Graph** – will copy the graph to the clipboard and can then be pasted into other documents.
- **Toggle Raw Data and Zoom Controls** – will toggle between viewing the raw data and the zoom controls on the graph screen.
- **Clear Markers** – will erase one or both “crop” markers.
- **Recalculate** – will “crop” the graph to the marker location.
- **Save Markers** – will save the marker locations for automatic use for subsequent tests. Future tests will automatically display the markers at the same locations. The user will only need to click “Recalculate” to “crop” the test. The marker locations are saved until the user selects “UnSave Markers” from the context menu or they exit EZ Data. If the saved markers are out of the range for the new test, then an error message is displayed.
- **Calculate Modulus** – see “Elastic Modulus” below for a complete description.
- **Display Original Graph** – will go back to the original test graph after cropping.
- **Back** – will undo the last change made to the graph when cropping.
- **Auto Scale/Full Scale** – will change the scale of the y-axis of the graph. This feature allows for an enhanced view of the graph.
- **Enable/Disable Minor Grid** – will either enable or disable the minor grid of the graph.

RAW DATA CONTEXT MENU

Right clicking on the raw data grid will bring up another menu. The copy data option will allow the user to copy the x and y data to the clipboard. It can then be pasted into Microsoft Excel.

BUTTONS

- **Save Test** – will save the displayed test using the incremental file name specified previously in the Save Test As screen. This button is only enabled when the graph screen is displayed because a test has just completed.

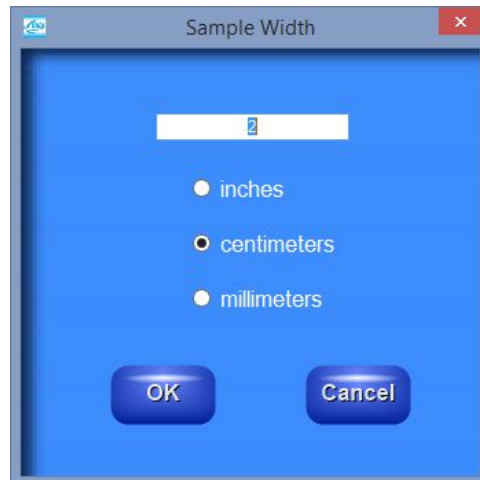
- **Save Test As**– will save the displayed test. This button will bring up the “Save Test As” screen which allows the user to setup test filenames and other test saving options. This button is only enabled when the graph screen is displayed because a test has just completed.
- **Abort Test** – will abort the displayed test. This button is only enabled when the graph screen is displayed because a test has just completed.
- **Save Zoom** – will save the cropped data as a new file with the same file name as the original but add the suffix “-RevA”. For example, “Test-001” becomes “Test-001-RevA”. Only one “-RevA” file per original test can be saved. Anytime the user selects the “Save Zoom” button, “-RevA” will be saved. If the “-RevA” already exists when the “Save Zoom” button is pressed, EZ Data will prompt the user if they want to overwrite the existing file.
- **Export** – will save the test’s raw data to Microsoft Excel or a text file. See Export Options under the Admin menu on the main page.
- **Print** – will allow the user to use any printing feature available on their computer in order to print a graph test report.
- **Test Details** – will display some test setup data for the given test.

TENSILE RESULTS

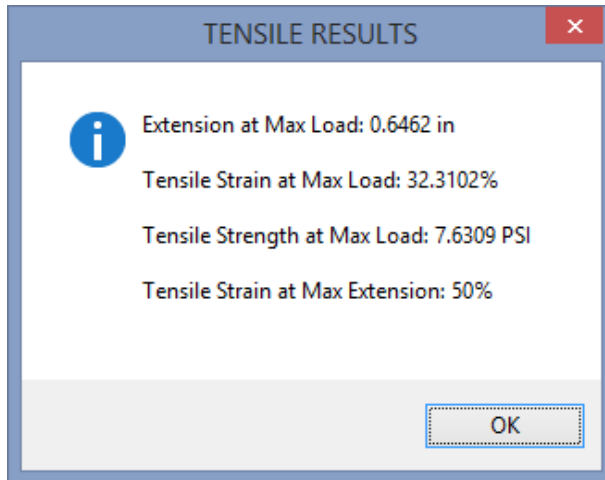
Tensile properties can be computed for the following test platforms: Tensile Tester, High Speed Unwind, and Dynamic Shear.

PROCEDURE FOR COMPUTING TENSILE VALUES

1. Sample Length, Sample Thickness, and Sample Width values must be entered prior to saving the test or displaying “Tensile Results”.
2. Enter these values by clicking the text box. The following screen will appear.



3. EZ Data will convert to the units needed depending on the speed units selected for the test.
4. Calculate elastic modulus if desired and then save the test. See “Elastic Modulus” in the next section for details on computing the elastic modulus value.
5. Press the “Tensile Results” button to see the tensile values for the given test.
6. Tensile results and elastic modulus will be available on the print out also.



CALCULATIONS

$$\textit{Tensile Strain at Max Load} = \frac{\textit{Extension at Max Load}}{\textit{Sample Length}} * 100$$

$$\textit{Tensile Strength at Max Load} = \frac{\textit{High Force Value}}{\textit{Sample Width} * \textit{Sample Thickness}}$$

$$\textit{Tensile Strain at Max Extension} = \frac{\textit{Maximum Test Extension}}{\textit{Sample Length}} * 100$$

Units for Tensile Strength:

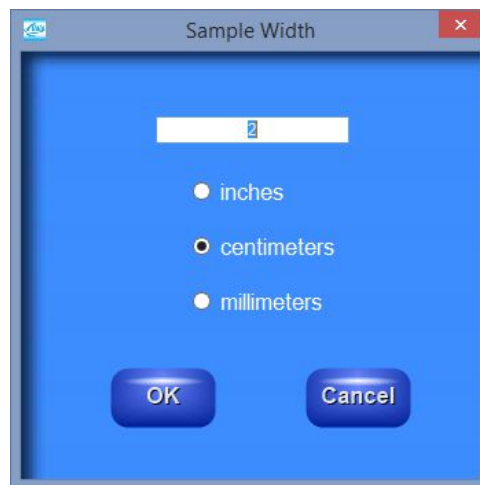
- English units: PSI
- Metric units: Pascals = N/m*m

ELASTIC MODULUS

Elastic Modulus can be computed for the following test platforms: Tensile Tester, High Speed Unwind, and Dynamic Shear.

PROCEDURE FOR COMPUTING ELASTIC MODULUS

1. The correct force units must be selected prior to running a test. Select pounds for English units and Newtons for metric units.
2. Sample Length, Sample Thickness, and Sample Width values must be entered in the graph screen prior to computing Modulus.
3. Enter these values by clicking the text box. The following screen will appear.



4. EZ Data will convert to the units needed depending on the speed units selected for the test.
5. Modulus must be computed prior to saving the test in order to save the computed modulus value with the test.
6. To compute modulus, select a point on the graph. This value is referred to as $y(n)$ in the calculation of elastic modulus below. The distance at this y value is referred to as $x(n)$ in the calculation.
7. Right click on the graph and select "Calculate Modulus".

- The modulus value, along with the x and y values used in the calculation will be displayed.

CALCULATIONS

$$\text{Elastic Modulus} = \frac{\left(\frac{y(n)}{\text{Sample Width} * \text{Sample Thickness}} \right)}{\left(\frac{x(n)}{\text{Sample Length}} \right)}$$

Units for Elastic Modulus:

- English units: PSI
- Metric units: Pascals = N/m*m

TABULATE DATA

The Tabulate Data Screen summarizes the data from a group of tests. It will calculate the average, standard deviation, and variance of the average, high, low, and work values computed during the tests. The maximum number of files to tabulate is 100.



The screenshot shows a software window titled "Tabulate - Unsaved Random Grouping". It contains a table with 7 columns: Filename, Average (Grams), High (Grams), Low (Grams), StdDev, Variance, and Work (pules). The table lists 17 individual test files and a summary section for Averages, Standard Deviations, and Variances. At the bottom, there is a "Data Path" field showing "C:\EZ Data\TestData\HSR2000" and three buttons: "Save List", "Export To Excel", and "Print". The EZ Data logo is also present in the bottom right corner.

Filename	Average (Grams)	High (Grams)	Low (Grams)	StdDev	Variance	Work (pules)
60castgloss-006.dat	30.9	34.1	25.3	2.0621E+000	4.2522E+000	1.8166E-001
60castgloss-005.dat	29.4	33	24.2	2.0290E+000	4.1169E+000	1.7326E-001
60castgloss-004.dat	30.3	34.1	25.3	2.1998E+000	4.8391E+000	1.7823E-001
60castgloss-003.dat	30	33	27.5	1.2596E+000	1.5865E+000	1.7644E-001
60castgloss-002.dat	31.2	36.3	25.3	2.2926E+000	5.2562E+000	1.8358E-001
60castgloss-001.dat	29.5	34.1	25.3	2.7085E+000	7.3362E+000	1.7349E-001
Fasson77920-002.dat	34.7	37.3	31.9	1.0697E+000	1.1442E+000	2.0409E-001
Fasson77920-001.dat	35.1	37.3	31.9	1.3453E+000	1.8100E+000	2.0671E-001
Fasson40443-004.dat	21.3	24.2	18.7	1.2857E+000	1.6531E+000	1.2545E-001
Fasson40443-003.dat	31.1	35.2	14.4	3.9777E+000	1.5822E+001	1.8306E-001
Fasson40443-002.dat	27	31.9	12.2	5.5770E+000	3.1103E+001	1.5908E-001
Fasson40443-001.dat	18.2	20.9	17.6	7.6245E-001	5.8134E-001	1.0721E-001
Averages	29.1	32.6	23.3			1.7102E-001
Standard Deviations	4.7042E+000	4.8273E+000	6.0448E+000			2.7639E-002
Variances	2.2129E+001	2.3303E+001	3.6537E+001			7.6392E-004

BUTTONS

- **Save List** - will save the table for easy recall at a later time. Follow the on-screen prompts to select a location to save and name the table.
- **Export to Excel** – will save the table to Microsoft Excel in the same format as displayed on the screen. This allows the user to use any of Excel's features to further analyze the test data. After selecting the export to excel button, follow the on-screen prompts to select a location and filename to save.
- **Print** – will allow the user to print the table using any print feature available on the computer.

OVERLAY DATA

The Overlay Data Screen creates a single graph with test data taken from up to 20 different tests.

The file names of the graphed tests will appear in the box to the right of the graph. In addition, you can use the mouse to “hover” over a particular test’s graph and the file name will be displayed for the given test.



CROPPING THE OVERLAY

The overlay screen provides a cropping feature. An overlay graph can be cropped only 1 time. The statistics are only available on the printed cropped overlay. The procedure for cropping the overlay is the same as cropping on the graph screen.

OVERLAY CONTEXT MENU

Right clicking on the graph will bring up another menu. Available options include copy graph, display original graph, go back after cropping data, auto scale the y-axis, and enable/disable a minor grid.

- **Copy Graph** – will copy the graph to the clipboard and can then be pasted into other documents.
- **Clear Markers** – will erase one or both “crop” markers.
- **Recalculate** – will “crop” the graph to the marker location.
- **Display Original Graph** – will go back to the original test graph after cropping.
- **Back** – will undo the last change made to the graph when cropping.
- **Auto Scale/Full Scale** – will change the scale of the y-axis of the graph. This feature allows for an enhanced view of the graph.

BUTTONS

- **Save List** - will save the overlay for easy recall at a later time. Follow the on-screen prompts to select a location to save and name the overlay.
- **Statistics** – will open a new window and display the average, high, low, standard deviation, variance, and work for the test files on the overlay graph
- **Print** – will allow the user to print the overlay using any print feature available on the computer.

TEST METHODS

Individual test parameters must be selected for each test that is to be conducted. These parameters can be saved as a unique test method. This test method can then be accessed at any time by identifying and selecting it for use at a later time. These saved test methods assure consistent and repeatable machine operation from one test and operator to the next. The following procedure explains how to use the Test Methods feature of EZ Data.

Note: The High Speed Unwind is the only test platform that provides the ability to save Test Method Parameters.

1. Select the “Test Methods” button on the Main screen.
2. You will now see the Test Methods screen which allows the user to either select an existing test method or create a new test method.



TO CREATE A NEW TEST METHOD

1. Select the “Add” button. This will open the HSU-2000 parameter setup screen.
2. Enter all parameter values for the test method.
3. Click on the “OK” button to save the test method for future use.
4. You will be prompted to enter a test method name. Enter the test method name and select “OK”.

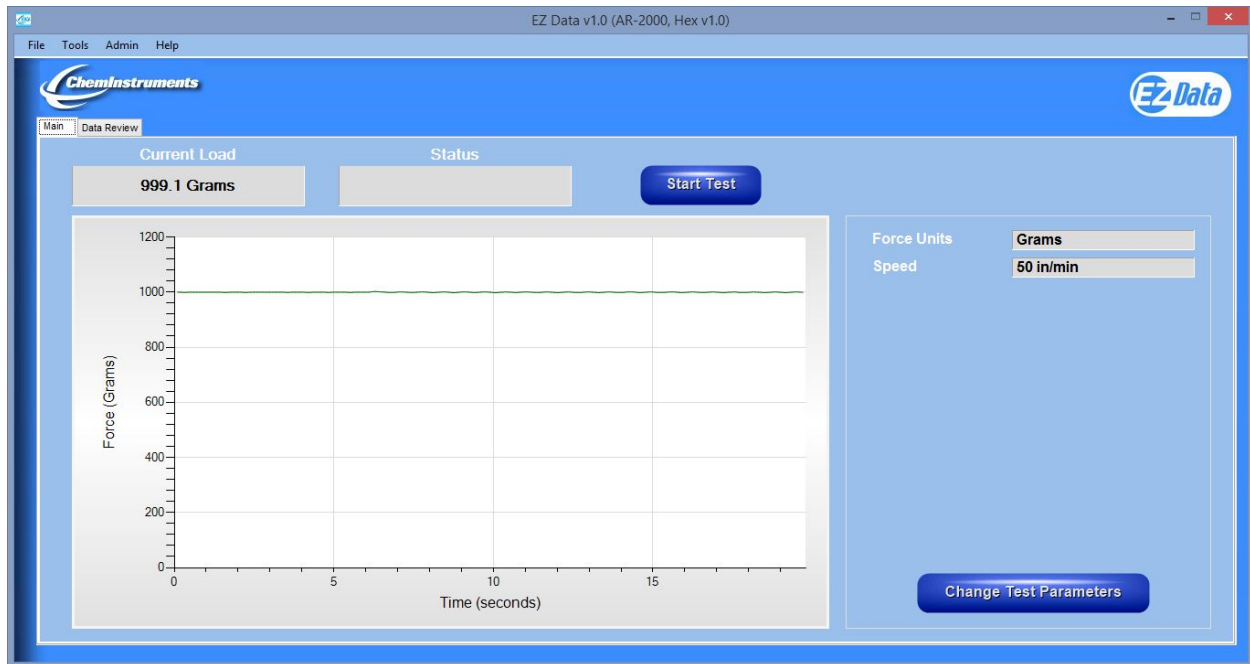
TO SELECT AN EXISTING TEST METHOD

1. Highlight a test method in the list and press the “Select” button.

The parameters from the selected test method will be programmed into the machine.

MACHINES

ADHESION RELEASE



RUNNING A REMOTE TEST

Selecting the “Start Test” button automatically starts a test regardless of sled position. To stop the test, move the sled past the “STOP” switch on the AR-2000 or press the “Stop Test” button in EZ Data. The motor must be running to use this feature.

AR setup for constant speed mode:

The dialog box is titled "AR-2000 Parameter Setup" and has a blue background. It is divided into three main sections: "Force Units", "Speed Units", and "Speed".

- Force Units:** A list of radio buttons with "Grams" selected. Other options are Kilograms, Ounces, Pounds, and Newtons.
- Speed Units:** A list of radio buttons with "in/min" selected. Other option is cm/min.
- Mode:** A list of radio buttons with "Constant Speed" selected. Other option is Ramp Speed.
- Speed:** A text input field containing the value "50". Above it, the text reads: "UNITS: in/min", "SPEED RANGE: 6 - 1200", and "INCREMENT VALUE: 1".

At the bottom of the dialog are two buttons: "OK" and "Cancel".

AR setup for ramp speed mode:

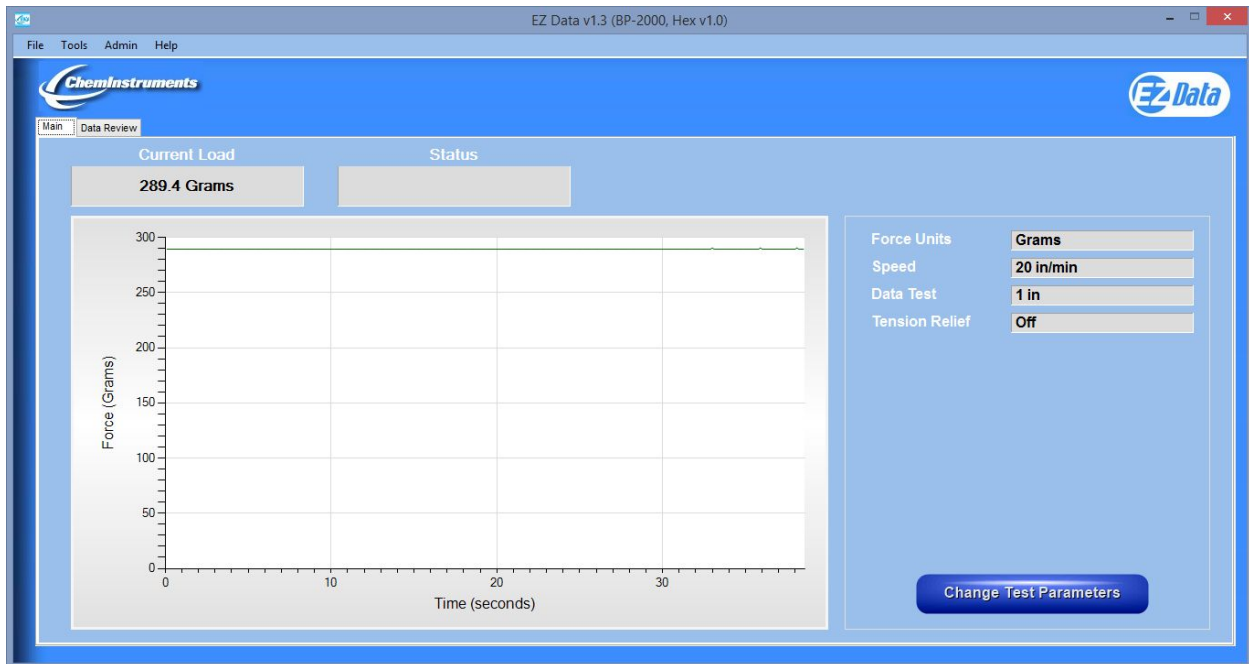
The dialog box is titled "AR-2000 Parameter Setup" and has a blue background. It is divided into three main sections: "Force Units", "Speed Units", and "Ramp".

- Force Units:** A list of radio buttons with "Grams" selected. Other options are Kilograms, Ounces, Pounds, and Newtons.
- Speed Units:** A list of radio buttons with "in/min" selected. Other option is cm/min.
- Mode:** A list of radio buttons with "Ramp Speed" selected. Other option is Constant Speed.
- Ramp:** A series of five input fields:
 - Start Force (0-50 grams): 50
 - Start Speed (in/min): 1.0
 - Speed Increment (in/min): 1.0
 - Step Length (1-10 seconds): 10
 - Number of Steps (2-10): 10

At the bottom of the dialog are two buttons: "OK" and "Cancel".

See AR machine manual for details on the setup parameters.

BURST PERF



Force Units

- Grams
- Kilograms
- Ounces
- Pounds
- Newtons

Speed Units

- in/min
- cm/min

Speed

UNITS: in/min

SPEED RANGE: 0.5 - 25

INCREMENT VALUE: 0.5

20

Tension Relief

- On
- Off

Offset

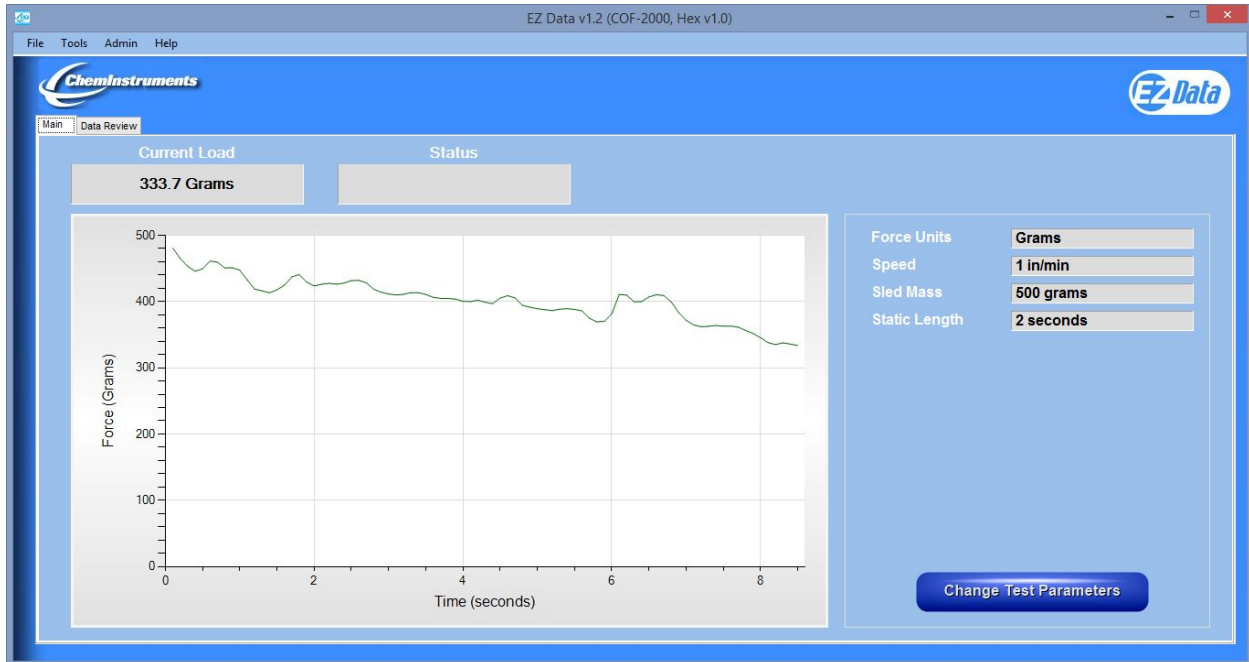
DATA TEST (0.25 - 1.50, 0.25 inch increment)

1

OK Cancel

See BP machine manual for details on the setup parameters.

COEFFICIENT OF FRICTION



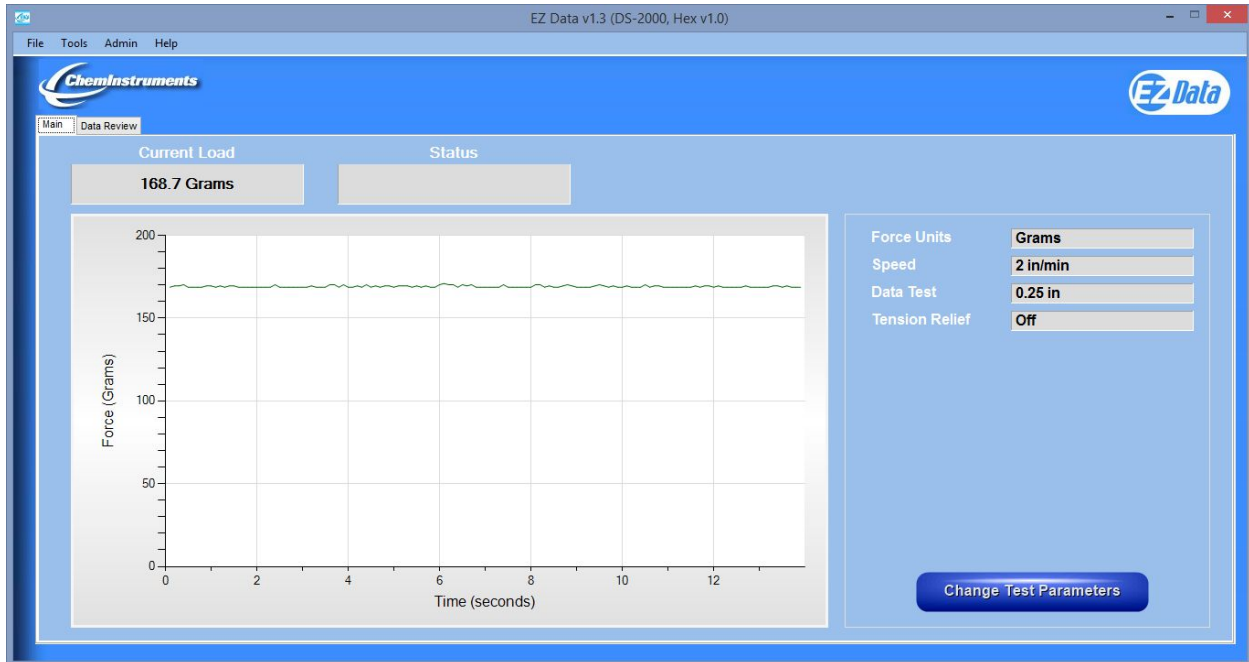
The screenshot shows the 'COF-2000 Parameter Setup' dialog box. It contains five configuration sections:

- Force Units:** Radio buttons for Grams (selected), Kilograms, Ounces, Pounds, and Newtons.
- Speed Units:** Radio buttons for in/min (selected) and cm/min.
- Speed:** UNITS: in/min, SPEED RANGE: 1 - 24, and a text input field containing 12.
- Sled Mass:** Range 1-2000 grams, and a text input field containing 500.
- Static Length:** Range 1-10 seconds, and a text input field containing 2.

Buttons for 'OK' and 'Cancel' are located at the bottom.

See COF machine manual for details on the setup parameters.

DYNAMIC SHEAR



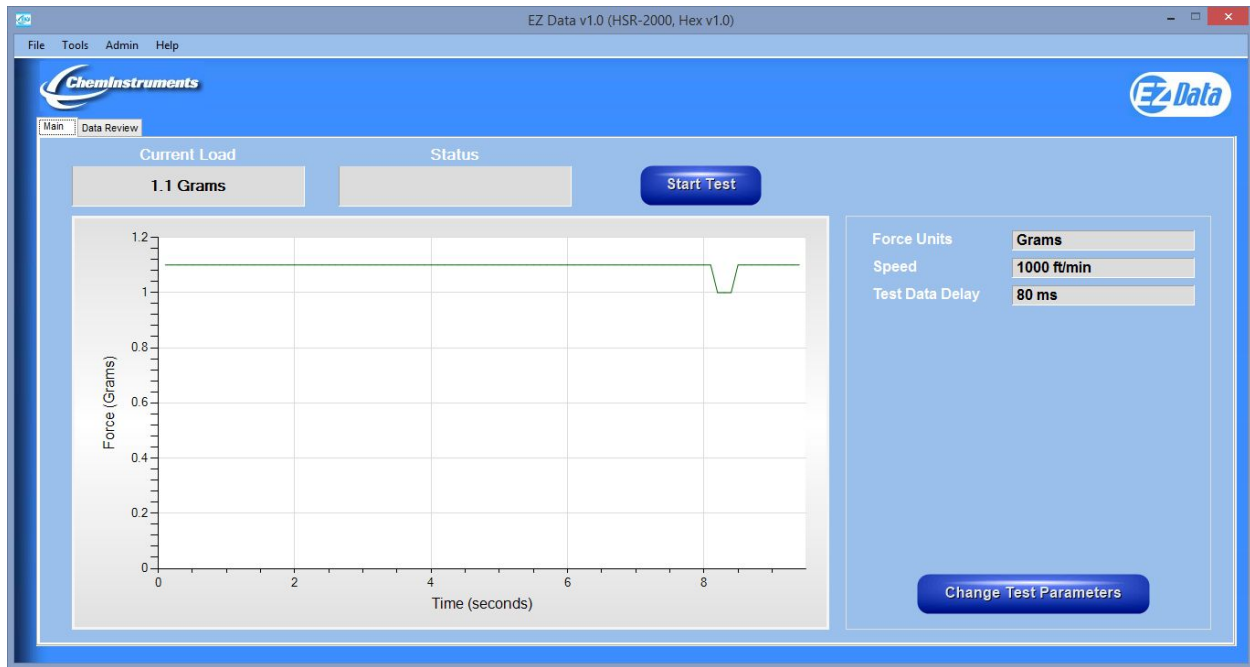
The screenshot shows the 'DS-2000 Parameter Setup' window. It contains several configuration sections:

- Force Units:** Radio buttons for Grams (selected), Kilograms, Ounces, Pounds, and Newtons.
- Speed Units:** Radio buttons for in/min (selected) and cm/min.
- Speed:** UNITS: in/min, SPEED RANGE: 0.05 - 2.00, INCREMENT VALUE: 0.05, and a text input field containing '2'.
- Tension Relief:** Radio buttons for On and Off (selected).
- Offset:** DATA TEST (0.25 - 3.50, 0.25 inch increment) and a text input field containing '0.25'.

At the bottom of the window are 'OK' and 'Cancel' buttons.

See DS machine manual for details on the setup parameters.

HIGH SPEED RELEASE



RUNNING A REMOTE TEST

Selecting the “Start Test” button automatically starts a test.

HSR setup for constant speed mode:

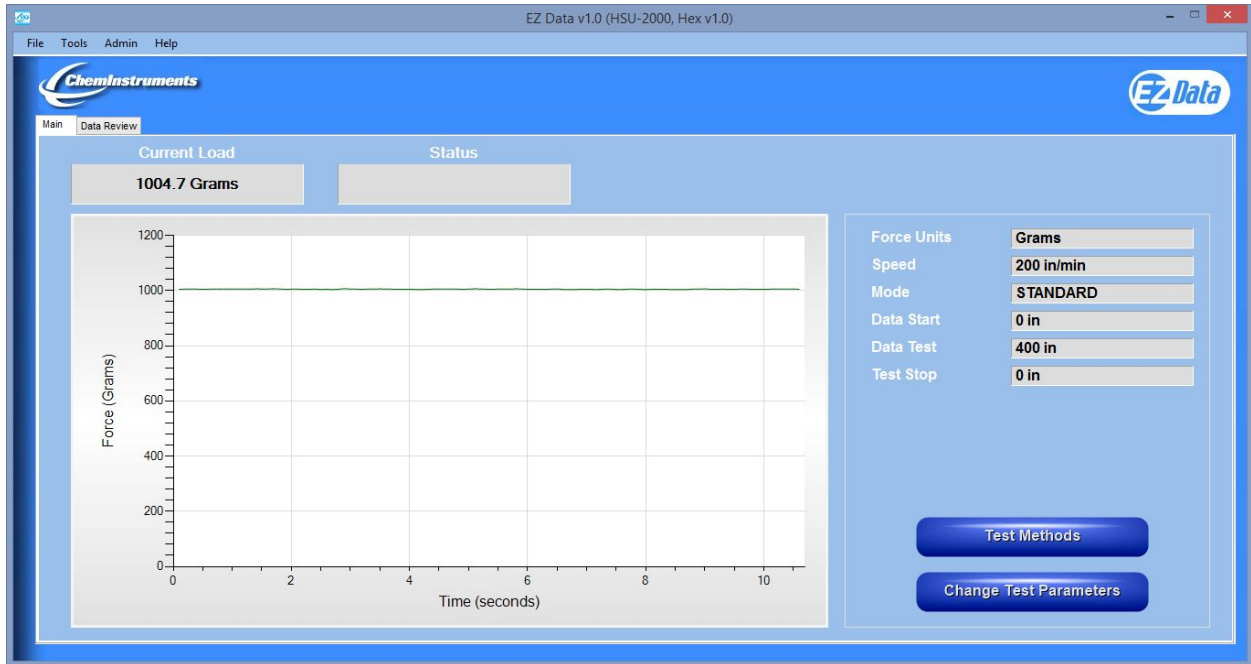
The screenshot shows the 'HSR-2000 Parameter Setup' dialog box with a blue background. It is divided into four main sections: 'Force Units', 'Speed Units', 'Speed', and 'Test Data Delay'.
- **Force Units:** A list of radio buttons for Grams, Kilograms, Ounces, Pounds, and Newtons. Grams is selected.
- **Speed Units:** A list of radio buttons for ft/min and M/min. ft/min is selected.
- **Mode:** A list of radio buttons for Constant Speed and Ramp Speed. Constant Speed is selected.
- **Speed:** A text input field containing the value '1000'. Above it, the text reads 'UNITS: ft/min', 'RANGE: 30 - 1000', and 'INCREMENT VALUE: 1'.
- **Test Data Delay:** A text input field containing the value '80'. Above it, the text reads 'RANGE: 0-100 ms' and 'INCREMENT VALUE: 1'.
At the bottom, there are two buttons: 'OK' and 'Cancel'.

HSR setup for ramp speed mode:

The screenshot shows the 'HSR-2000 Parameter Setup' dialog box with a blue background. It is divided into four main sections: 'Force Units', 'Mode', 'Ramp Speed', and 'Test Data Delay'.
- **Force Units:** A list of radio buttons for Grams, Kilograms, Ounces, Pounds, and Newtons. Grams is selected.
- **Mode:** A list of radio buttons for Constant Speed and Ramp Speed. Ramp Speed is selected.
- **Ramp Speed:** A list of radio buttons for 0-1 M/sec, 0-2 M/sec, 0-3 M/sec, 0-4 M/sec, and 0-5 M/sec. 0-1 M/sec is selected.
- **Test Data Delay:** A text input field containing the value '80'. Above it, the text reads 'RANGE: 0-100 ms' and 'INCREMENT VALUE: 1'.
At the bottom, there are two buttons: 'OK' and 'Cancel'.

See HSR machine manual for details on the setup parameters.

HIGH SPEED UNWIND



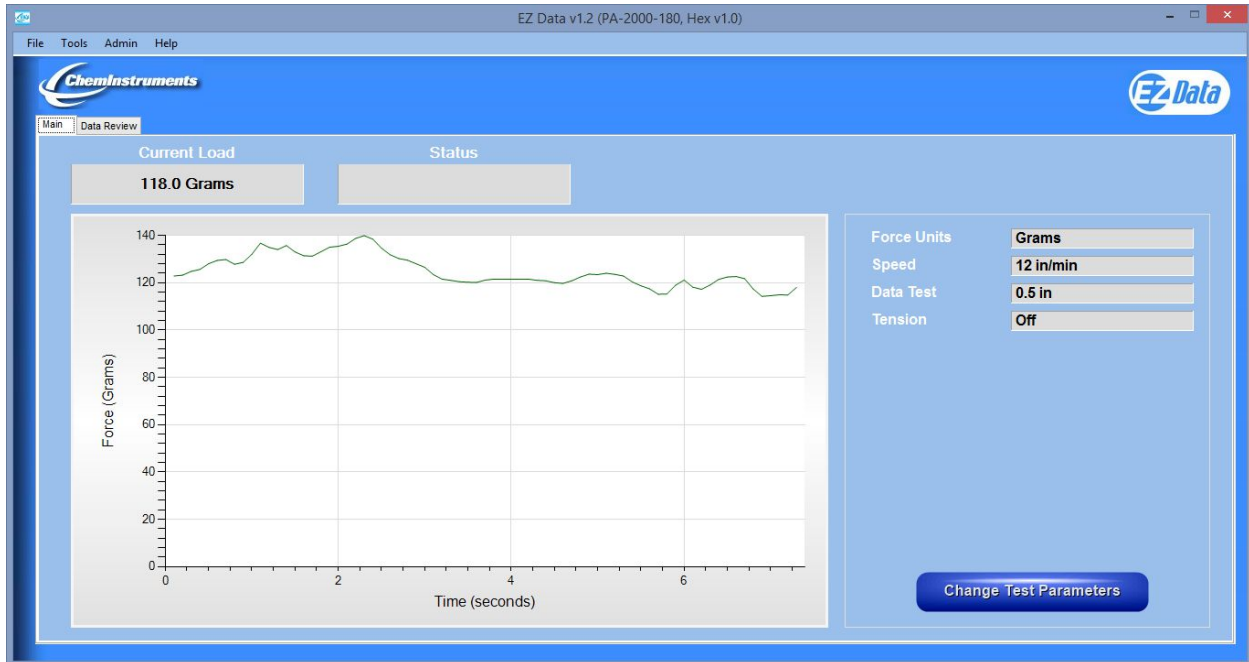
The screenshot shows the 'HSU-2000 Parameter Setup' window. It contains several configuration sections:

- Force Units:** Radio buttons for Grams (selected), Kilograms, Ounces, Pounds, and Newtons.
- Speed Units:** Radio buttons for in/min (selected), ft/min, cm/min, and M/min.
- Speed:** UNITS: in/min, SPEED RANGE: 12 - 4800, INCREMENT VALUE: 1, and a text input field containing 200.
- Mode:** Radio buttons for Standard (selected), Step, and Foot Counter.
- Offset:** Three text input fields: DATA START (0 - 240, 1 inch increment) with value 0, DATA TEST (60 - 4800, 1 inch increment) with value 400, and TEST STOP (0 - 240, 1 inch increment) with value 0.

Buttons for 'OK' and 'Cancel' are located at the bottom.

See HSU machine manual for details on the setup parameters.

180 DEGREE PEEL ADHESION



Force Units

- Grams
- Kilograms
- Ounces
- Pounds
- Newtons

Speed Units

- in/min
- cm/min

Speed

UNITS: in/min

SPEED RANGE: 1 - 24

12

Tension Relief

- On
- Off

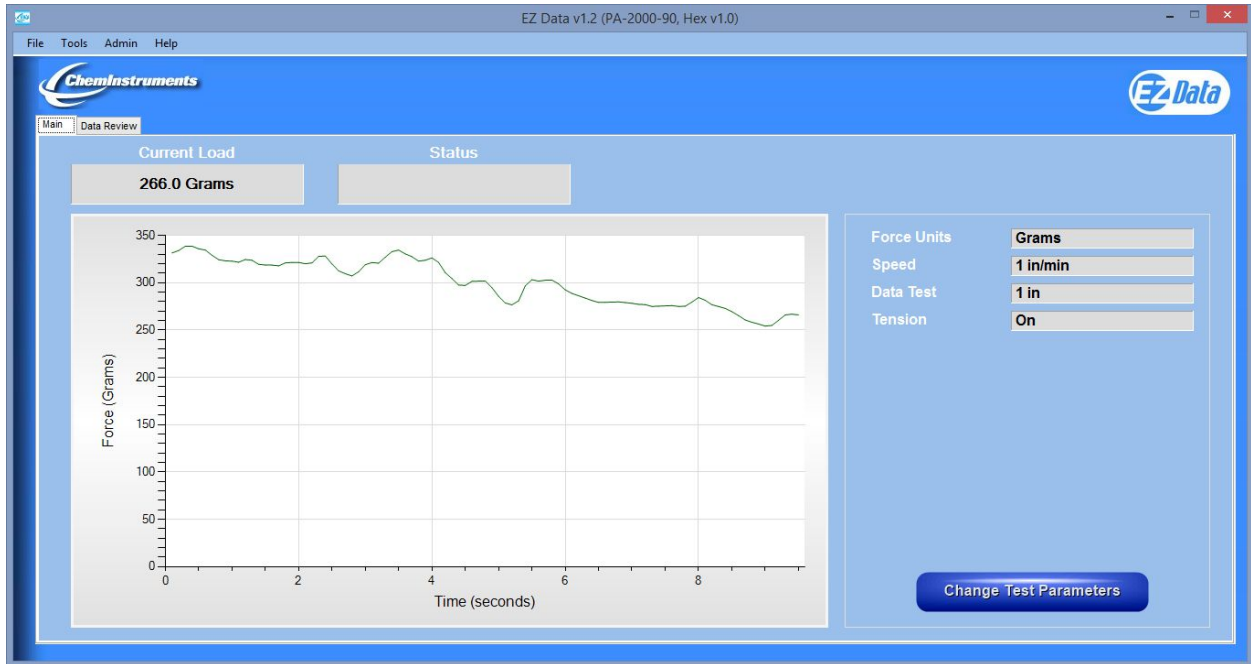
Offset

DATA TEST (0.5 - 4.5, 0.5 inch increment) 0.5

OK Cancel

See PA180 machine manual for details on the setup parameters.

90 DEGREE PEEL ADHESION



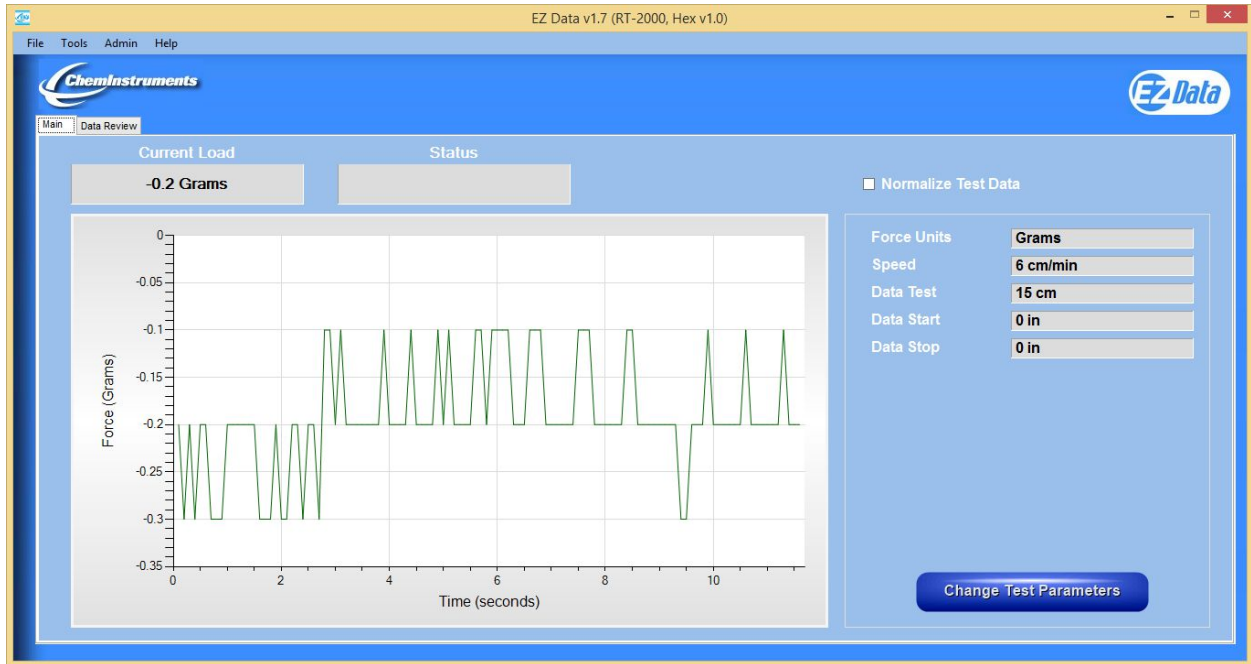
The screenshot shows the 'PA-2000-90 Parameter Setup' window. It contains several configuration sections:

- Force Units:** Radio buttons for Grams (selected), Kilograms, Ounces, Pounds, and Newtons.
- Speed Units:** Radio buttons for in/min (selected) and cm/min.
- Speed:** UNITS: in/min, SPEED RANGE: 1 - 24, and a text input field containing '1'.
- Tension Relief:** Radio buttons for On (selected) and Off.
- Offset:** DATA TEST (0.5 - 4.5, 0.5 inch increment) and a text input field containing '1'.

At the bottom of the window are 'OK' and 'Cancel' buttons.

See PA90 machine manual for details on the setup parameters.

ROLLING TACK



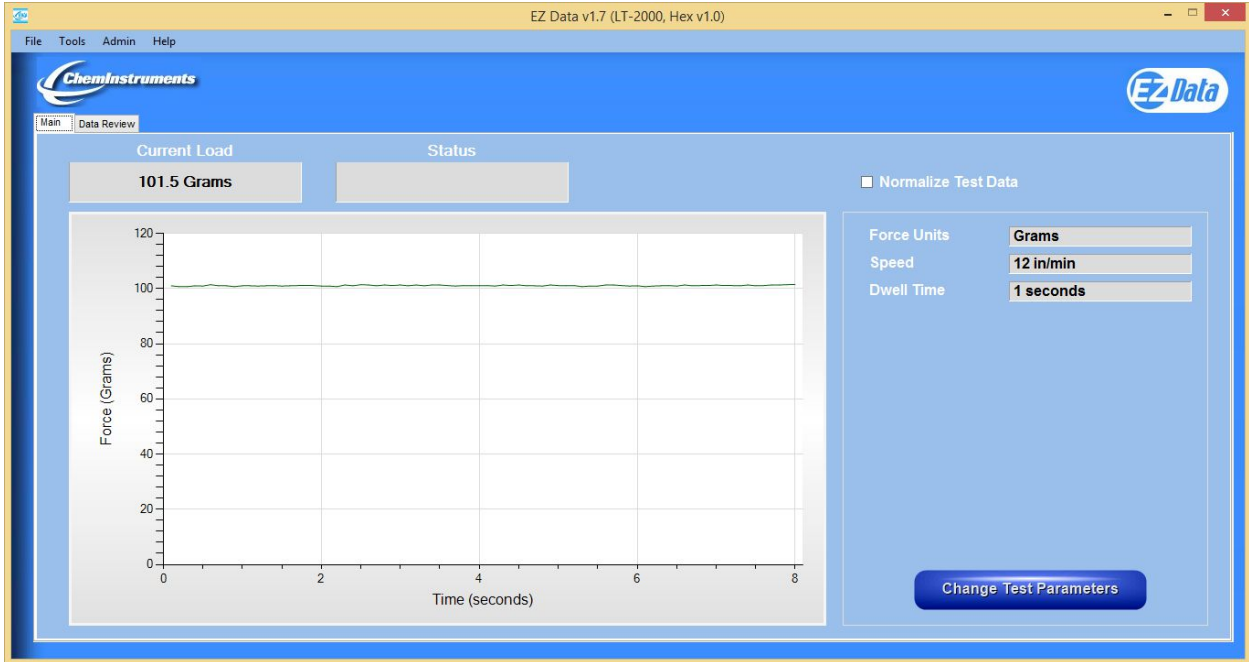
The screenshot shows the 'RT-2000 Parameter Setup' dialog box. It contains several sections for configuring test parameters:

- Force Units:** Radio buttons for Grams (selected), Kilograms, Ounces, Pounds, and Newtons.
- Speed Units:** Radio buttons for in/min (selected) and cm/min.
- Speed:** UNITS: in/min, SPEED RANGE: 1 - 24, and a text input field containing '1'.
- Mode:** Radio buttons for Standard (selected) and Batch. Below are input fields for 'Number of Batches' (5) and 'Dwell Time' (2).
- Offset:** Three input fields for 'DATA START (0 - 0.5, 0.1 inch increment)' (0), 'DATA TEST (0.5 - 8, 0.5 inch increment)' (1), and 'DATA STOP (0 - 0.5, 0.1 inch increment)' (0).

At the bottom of the dialog are 'OK' and 'Cancel' buttons.

See RT machine manual for details on the setup parameters.

LOOP TACK



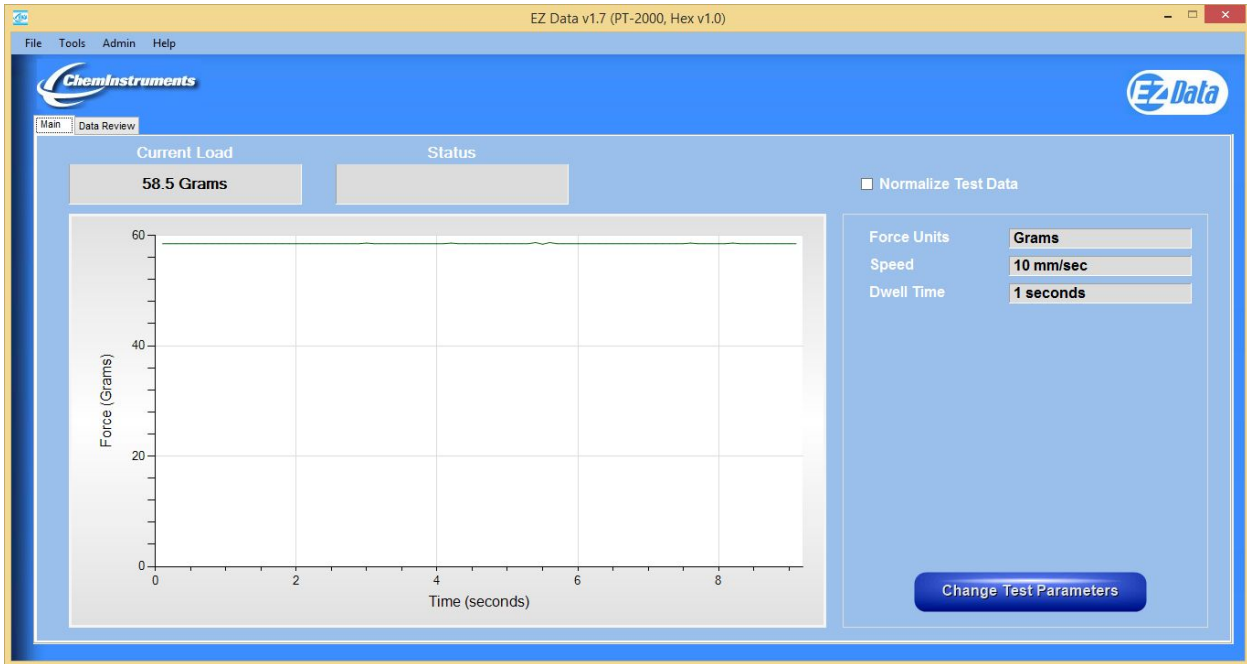
The screenshot shows the 'LT-2000 Parameter Setup' dialog box. It contains the following configuration options:

- Force Units:** Grams
- Speed Units:** in/min, mm/min
- Speed:** UNITS: in/min, SPEED RANGE: 6 - 36, Value: 12
- Dwell Time:** 1-30 seconds, Value: 1
- Mode:** D 6195 Test Method, Other Test Method

Buttons for 'OK' and 'Cancel' are at the bottom.

See LT machine manual for details on the setup parameters.

PROBE TACK



The screenshot shows the PT-2000 Parameter Setup dialog box. The dialog box is titled "PT-2000 Parameter Setup" and contains several configuration options:

- Force Units:** Grams (selected), Kilograms, Ounces, Pounds, Newtons.
- Speed Units:** in/min, mm/sec (selected).
- Speed:** UNITS: mm/sec, SPEED RANGE: 2 - 15, 10.
- Dwell Time:** 1-30 seconds, 1.
- Mode:** D 2979 Test Method (selected), Other Test Method.

Buttons for "OK" and "Cancel" are located at the bottom of the dialog box.

See PT machine manual for details on the setup parameters.

PROBE MATERIAL ANALYZER

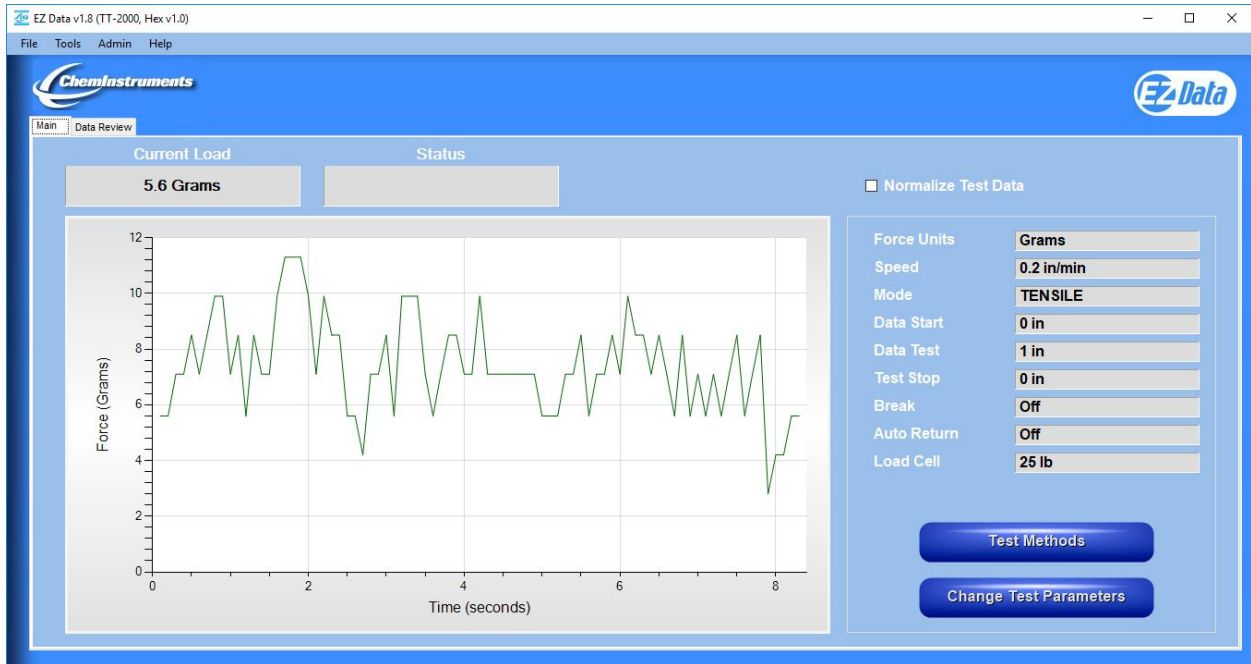


The screenshot shows the 'PMA-2000 Parameter Setup' dialog box. It is organized into several sections for configuring test parameters:

- Force Units:** Radio buttons for Grams, Kilograms, Ounces, Pounds, and Newtons.
- Speed Units:** Radio buttons for in/min and cm/min.
- Start Force:** Radio buttons for ON and OFF. Below are input fields for Force (5-50 grams) and Speed (0.02-40 in/min), both set to 5.
- Test Mode:** Radio buttons for FORCE and INSERTION. Below are input fields for Force (5-5000 grams) set to 25 and Speed (0.02-40 in/min) set to 5.
- Dwell Time:** Input field for Dwell Time (0-60 seconds) set to 1.
- Retraction:** Input fields for Retraction (0.025-4 in) set to 1 and Speed (0.02-40 in/min) set to 2.5.
- Buttons:** 'OK' and 'Cancel' buttons are located at the bottom.

See PMA machine manual for details on the setup parameters.

TENSILE TESTER



The screenshot shows the 'TT-2000 Parameter Setup' dialog box. It has a title bar with 'EZ Data TT-2000 Parameter Setup' and a close button. The main area is a blue background with several white-bordered panels.

- Force Units:** Radio buttons for Grams (selected), Kilograms, Ounces, Pounds, and Newtons.
- Speed Units:** Radio buttons for in/min (selected) and cm/min.
- Speed:** UNITS: in/min, SPEED RANGE: 0.1 - 25, INCREMENT VALUE: 0.1, and a text input field containing '10'.
- Load Cell Size:** Radio buttons for 10 LB, 25 LB (selected), 50 LB, 100 LB, and 200 LB.
- Offset:** Three text input fields: DATA START (0.00 - 2.00, 0.25 inch increment) with '0', DATA TEST (0.25 - 22.00, 0.25 inch increment) with '1', and TEST STOP (0.00 - 2.00, 0.25 inch increment) with '0'.
- Mode:** Radio buttons for Tensile (selected), Compression, Loop, and Cycle.
- Auto Return:** Radio buttons for ON and OFF (selected).
- Break:** Radio buttons for ON and OFF (selected).

 At the bottom, there are two buttons: 'OK' and 'Cancel'.

See TT machine manual for details on the setup parameters.