CHEMINSTRUMENTS

HIGH SPEED UNWIND

MODEL HSU-1100

OPERATING INSTRUCTIONS

PRODUCT DESCRIPTION

Congratulations on the purchase of your new ChemInstruments HSU-1100 High Speed Unwind. This versatile, user-friendly, carefully designed instrument allows you to perform high speed unwind tests

The unit has the following features:

- Selectable testing speeds from 1 to 400 feet per minute.
- Programmable data acquisition area.
- Four-digit LED read-out.
- Displays and stores the minimum, maximum, average, and elongation tests results.
- Measures in; kilograms, grams, newtons, pounds, and ounces.
- Compatible with EZ-Lab System Software

UNPACKING

BEFORE USING THIS EQUIPMENT PLEASE READ THE ENTIRE MANUAL.

ChemInstruments has made every effort to ensure that the HSU-1100 arrives at your location without damage. Carefully unpack the instrument and check for any damage that might have occurred during shipment. If any damage did occur during transit, notify the **carrier** immediately.

The ChemInstruments HSU-1100 consists of the following parts:
- The test frame, which includes the motor/drive mechanism and the data acquisition system.
- An envelope with this manual.
- Power cord.

Make sure all of these components are present before discarding the packaging material.

ASSEMBLY

Carefully remove the HSU-1100 High Speed Unwind from the packaging and set it on a sturdy bench top. ***Due to its weight and size, two people should be used to move the HSU-1100.*** The space required for the unit is approximately 22" long x 18" deep x 15" high. As with any precision piece of test equipment, it is preferable to locate the HSU-1100 in an area where temperature and humidity are controlled to standard conditions (72 ± 2°F, 50 ± 5% relative humidity).

Connect the power cord to its receptacle on the backside of the test frame at the far left side when viewed from the rear. Complete the connection by inserting the male end of the power cord into an appropriate AC outlet. Notice that the on/off power switch is located next to the power cord receptacle on the backside of the test frame. (See Photo)

The ChemInstruments' HSU-1100 High Speed Unwind is now ready for calibration and use. Before proceeding with calibrating the HSU-1100, it is advisable to become familiar with the Key Components of the HSU-1100 brief description of their function follows in the next section.

KEY COMPONENTS

- **POWER SWITCH** is located on the back panel of the control cabinet next to the power cord connection**.**

- **LOAD CELL UNWIND SPINDLE ASSEMBLY** consists of the unwind spindle and the internally attached load cell.

- **IDLER ROLLS** consisting of two spindles, one is a motor drive knurled roll.

- **REWIND SPINDLE** is a motor driven rewind spindle.

- **DISPLAY** provides test data and program parameters

- **CONTROL KEYS** used to recall test data and set test parameters

- **RS-232 CONNECTION** connects machine to computer for use of EZ-Lab System Software

- **CALIBRATION BRACKET** is the fixture used in calibrating the Load Cell.

OPERATION

THEORY OF OPERATION

A roll of test material is placed on the Unwind Spindle and threaded through the Idler Rolls and finally to the Rewind Roll. The operator programs the test speed, the distance of the test, and the area of data to be recorded. A load cell, sampling at a rate of 400 times per second, measures the force as the test material is unwound. The data collection system records the measurements and displays the high, low, average, and elongation in numerical values. This test data is saved in memory as a file available for review or exporting by connecting a RS232, 9-pin serial cable to an appropriate receiving program on your PC.

POWER UP

Turn on the Power Switch, which is located on the back panel of the test frame directly beside the power line receptacle. When you turn on the power, the HSU-1100 System will go through a self-check routine. After this is completed, the Display will show INSTANT FORCE.

" **Warning! Operating temperature for this equipment is 0 to 70 Celsius. The equipment needs to be completely free of condensation inside and out, before applying power.**"

SAFETY FEATURES

The HSU-1100 High Speed Unwind has numerous safety features incorporated into its design and operation. Two of these features need to be understood for proper operation of the HSU-1100.

The first is the emergency "Stop". This button when pushed stops the drive spindle of the HSU-1100. The second feature is overload protection for the load cell. If the load cell senses a force 10% greater than its maximum rating, the drive will stop and an error message is displayed.

CONTROL KEYS

The Control Keys control the Drive Spindle. Each of the Control Keys have their function are listed below them. It is recommended that you familiarize yourself with their function before attempting to run any test.

- Enter – Used to select test parameters when setting up test sequence.
- Up Arrow – Used to scroll through menu settings and test results.
- Down Arrow – Used to scroll through menu settings and test results.
- Units – Used to switch units of measure for both force and distance.

- Test – This key initiates the test sequence.

- Job – This key causes the drive spindle to turn at the preset jog speed.

- Stop – This key will stop the test and Drive Spindle.

MENU FORMAT

There are three distinct menus for the HSU-1100. They are the Load Cell Set Up, Machine Set Up, and Beep Set Up. To access theses, press and hold the Up Arrow and Down Arrow buttons for 3 seconds. The Display will change to Load Cell Set Up. Use the Up Arrow or Down Arrow buttons to scroll through the menu choices. When the desired menu is displayed, press the Enter Key to access the parameter settings for that menu.

Each of the four menus uses the Up $\uparrow$ and Down $\downarrow$ arrow Program Keys to access the modes within the menu. Once a parameter selection is made the Enter Key is used a second time to record the setting and return to the Run menu.

LOAD CELL CALIBRATION

It is important to calibrate the load cell to ensure that reliable data will be gathered. A calibration procedure is built into the software of the HSU-1100. This procedure should be followed upon first use of the HSU-1100 and whenever necessary thereafter. The following is the step-by-step procedure for calibrating the load cell.

MAKE SURE THE HSU-1100 HAS BEEN ON AND RUNNING FOR 30 MINUTES BEFORE PROCEEDING WITH CALIBRATION. TO AVOID THIS WARM UP PERIOD, LEAVE THE HSU-1100 ON.

CALIBRATION PROCEDURE

1. Locate the wire attached to the Unwind Spindle and place it over the Calibration Bracket pulley.

2. Simultaneously press and hold the Up Arrow and Down Arrow keys for 3 seconds to access the Load Cell Setup menu.

3. When Display shows Load Cell Setup, press Enter Key.

4. At the "Lo Cal" display, determine the Low Offset Value desired (Typically 0.00 grams). If 0.00 grams, make sure that you **do not** have a weight hanging from the calibration wire and press the Enter Key to record the value. The Display will change to, Hi Cal for High Offset Value.

NOTE: The calibration sequence defaults to grams as the unit of measure. Make sure your calibration weights and entries are in grams.

5. At the "Hi Cal" display, select a calibration weight close to the maximum expected test value and hang that weight on the calibration wire.

6. Set the High Offset Value on the Display to correspond with the selected calibration weight. You can change the displayed value by pressing the Up↑ and Down ↓ keys.

7. Make sure the **calibration weight is completely still**, and then press the Enter Key. The display will change to the "Instant Force" mode showing the current reading of force.

8. Verify the calibration by hanging a **different weight** on the calibration wire.

9. Repeat the calibration procedure if necessary.

AUDIBLE BEEP

The HSU-1100 has an audible beep feature that sounds each time a Program Key is pressed. This provides confirmation that electrical contact has been made by the key. This feature may be turned off by following this procedure.

1. Simultaneously press and hold the Up Arrow and Down Arrow keys for 3 seconds to access the Beep Setup menu. When the screen displays "Beep Setup", press Enter key to access it.

2. Use the UP Arrow or Down Arrow key to select "On" or "Off".

3. Once you made your selection press the Enter key. The display will go back to "Instant Force"

MACHINE SETUP

To program the parameters of a test, you will use the MACHINE SETUP menu. Press and hold the Up Arrow and Down Arrow keys for three seconds. The display will show LOAD CELL SETUP. Use the Up Arrow or Down Arrow key to scroll through the menu until MACHINE SETUP is on the display. Press the Enter key to access the MACHINE SETUP menu.

FOOT COUNTER

FOOT COUNTER sets the machine to measure the length of roll of tape, and the force to unwind it.

1. From MACHINE SETUP, use the Up Arrow or Down Arrow keys until FOOT COUNTER appears on the display and press the Enter key.
2. Press the Enter key when display reads SPEED SETUP.
3. Select units of measure by pushing the Units key. Once you have selected the desired units, press the Enter key.
4. Next, use the Up Arrow or Down Arrow keys to select the desired speed. Once the speed is selected, press the Enter Key.
5. Press the Test key to start the test. The test will automatically stop when the load cell reads less than 50 grams of force. Test results will appear on the display.

STANDARD

STANDARD allows you to test the force needed to unwind a section of your roll of tape.

1. From MACHINE SETUP, use the Up Arrow or Down Arrow keys until STANDARD appears on the display and press the Enter key.
2. When display shows SPEED SETUP, press the Enter key to set the speed.
3. Select units of measure by pushing the Units key. Once you have selected the desired units, press the Enter key.
4. Use the Up Arrow or Down Arrow to set the desired speed. Once the desired speed has been set, press the Enter key.

5. OFFSET SETUP allows you to program the length of the test. When OFFSET SETUP appears on the display, press enter.

6. DATA START allows you to unroll a length of material before starting your test. Use the Up Arrow or Down Arrow to set the desired length of material you would like to unwind prior to collecting a force measurement.

7. DATA TEST is the length of material you would like to perform your test on. The force will be recorded throughout this enter portion of the test. Use the Up Arrow or Down Arrow to set the desired test length. Once the desired test length has been set, press the Enter key.

8. TEST STOP allows you to unroll a length of material after the DATA TEST portion of the test has been completed. There will be no force data collected during this portion. Use the Up Arrow or Down Arrow key to set the desired length. Once the desired length has been entered, press the Enter key.

9. Press the Test key to start a test. Once a test is complete, the Up Arrow or Down Arrow can be used to display the test results.

STEP

STEP is a combination of FOOT COUNTER and STANDARD. It allows you to measure the force to unwind the roll, and the length of the roll. The first portion of the test will measure the unwind force; the second portion of the test will measure the remaining material on the roll.

1. From MACHINE SETUP, use the Up Arrow or Down Arrow keys until STEP appears on the display and press the Enter key.

2. When display shows SPEED SETUP, press the Enter key to set the speed.

3. Select units of measure by pushing the Units key. Once you have selected the desired units, press the Enter key.

4. Use the Up Arrow or Down Arrow to set the desired speed. Once the desired speed has been set, press the Enter key.

5. OFFSET SETUP allows you to program the length of the test in which force will be measured. When OFFSET SETUP appears on the display, press enter.

6. DATA TEST is the length of material you would like to perform your test on. The force will be recorded throughout this enter portion of the test. Use the Up Arrow or Down

Arrow to set the desired test length. Once the desired test length has been set, press the Enter key. When the program test length has been reached, the test will accelerate to the highest speed and measure the remaining length of the roll.

7. Press the Test key to start a test. Once a test is complete, the Up Arrow or Down Arrow can be used to display the test results.

THREADING

Threading the roll of test material or product to be tested is a simple procedure. The following description and diagram will provide you the necessary information.

1. Place the roll of material to be tested on the Unwind Spindle so that the loose end will unwrap in a clockwise direction.

2. Thread the test material through the Idler Spindles as shown in the diagram.

3. Wrap the end of the material onto an empty core that has been placed on the Rewind Spindle. Make sure the wrap is in a clockwise direction.

RUNNING A TEST

Various test methods written by organizations such as ASTM, PSTC, TLMI and others require a High Speed Unwind test. These tests are conducted to determine the different unwind forces needed to unwind a roll of tape. The ChemInstruments HSU-1100 can be used for many of these standardized test methods.

DO NOT EXCEED THE LIMIT OF YOUR LOAD CELL DURING TESTING. CHEMINSTRUMENTS IS NOT RESPONSIBLE FOR DAMAGE TO THE LOAD CELL DUE TO ABUSE OR MISUSE, INCLUDING OVERLOADING.

EZ-LAB SYSTEM 3.0

OVERVIEW

EZ Lab System software Version 3.0 is designed to enhance your model 1000 or 1100 ChemInstruments test platforms. The following procedure describes how to use the EZ-Lab System. Should you have any problems or questions after following this procedure, please call ChemInstruments at 513-860-1598, or contact us by e-mail at, ci@fuse.net.

INSTALLATION

Insert the EZ Lab disk into the computer. EZ-Lab will self install.

1. If EZ-Lab does not self install, select **RUN, (Drive):\Setup.exe**

2. Follow the on screen instructions to complete the software installation.

3. Connect the test platform's RS232 connection to the appropriate port on your computer with the provided RS232 serial cable.

4. On the computer, open the EZ-Lab program. This file will be located in a folder titled "EZ-Lab" on the C drive.

5. Double click on the file "EZLabv3.0". This will open the EZ-Lab System program and display the Main Screen.

6. Select the appropriate test platform button to activate the program. The operating screen will appear on your display.

OPERATION

This operating system is designed to provide all the necessary instructions on your computer screen. However, the following information will provide additional insight.

The Main Operating Screen is divided into 3 sections. The left and right sections are titled "**Setup**". Calibration of the load cell, choosing the units of measure, and changing the speed are controlled in the left and right "**Setup**" section. The right section, titled "**Setup**", is for setting the "**Units**" and "**Machine Mode**". The center section, titled "**Run Test**", is for setting the parameters of the test and creating test methods to automatically program test parameters.
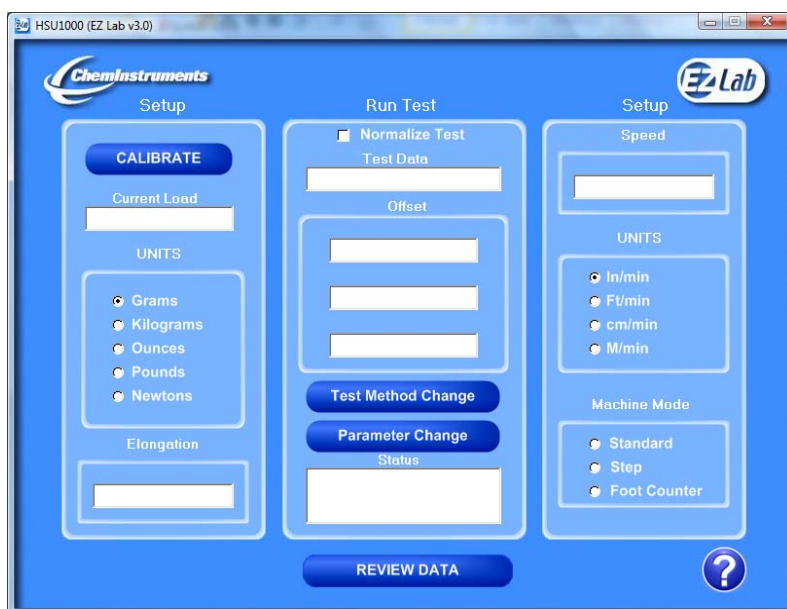
CALIBRATION

   In order for the load cell to measure forces correctly it is necessary to calibrate the system. The following procedure describes the calibration process. The test platform uses **Grams** for calibration.

1. Select the "**Calibrate**" button in the Setup section of the Main Screen.
2. Follow the on screen instructions exactly, and make sure to hang the appropriate weight on the load cell Grip when entering the high calibration value.
3. Verify the calibration by hanging some other known weight on the load cell Grip and checking the display in the Current Load field.
4. Click on appropriate bullet to select desired unit of measure.
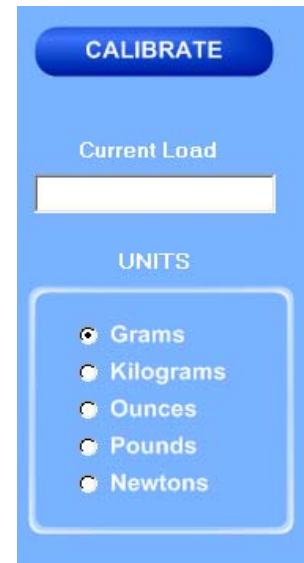
UNITS

   Click the bullet next to the unit of measure to select the desired unit for data collection and data analysis. All data will be displayed in the unit selected.
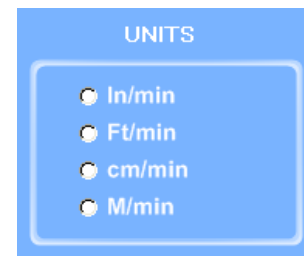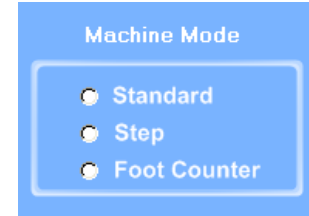
HELP

   The help button will open a "pdf" file of the machine manual. This manual contains operation instructions for both the test platform and the EZ Lab software. You must have Adobe Acrobat Reader on your computer to open "pdf" manual file. If the Adobe program is not already installed on your computer, a copy of it is included on the EZ Lab disk.

MACHINE MODE

Click the bullet next to the Machine Mode you would like to test in. Standard Mode measures the unwind force of the roll of tape. Foot Counter measures the length of the roll of tape. Step Mode measures the unwind force and the length of the roll of tape. You must select the Machine Mode before you can set the parameters of the test.
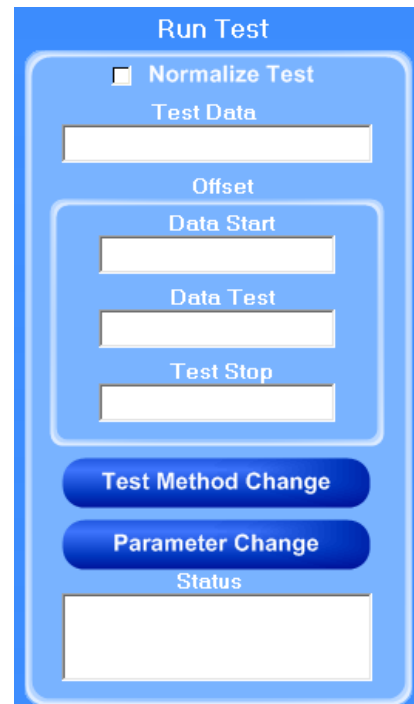
SETTING TEST PARAMETERS

Once a Machine Mode has been selected, the test parameters can now be programmed. Parameters can be programmed for individual tests, or test methods can be created to make setting test parameters more efficient and consistent.

PARAMETER CHANGE

Parameter Change allows the machine to be programmed to run a test. You must enter a value for every field. If you do not want one of the functions to take place during a test, enter 0 for the value and the program will not perform that function.

Data Start – allows you to program a length of material you would like the machine to unwind before measuring force.

Data Test – is the length you would like to test.

Test Stop – allows you to program a length of material you would like the machine to unwind after measuring force for the Data Test portion.

Speed – is the speed at which the test will be performed. For speeds above 200 ft/min the machine will automatically unwind 15 feet of material before performing the programmed test parameters.

TEST METHOD CHANGE

Test Method Change allows you to create test methods for efficient and consistent testing.

New – the Test Method Change screen will open and allow you to create a new test method.

Select – Highlight a test method and press the select button. The parameters from the test method will be programmed into the machine.

Delete – deletes the highlighted test method.

Delete All – deletes all created test methods.
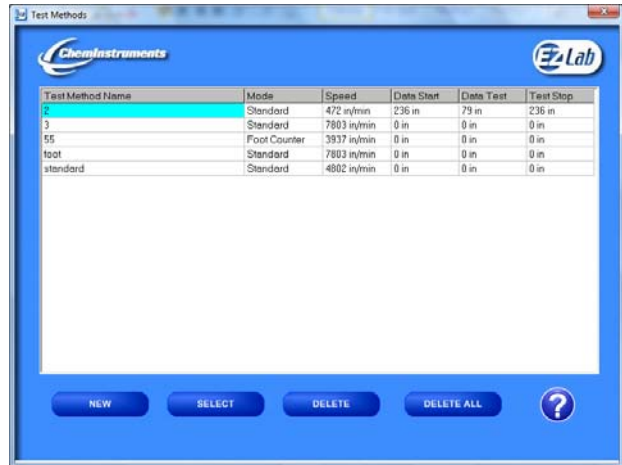
TEST METHOD CHANGE

Test Method Change allows you program pre-set test parameters. You must have an entry for every field. If you do not want one of the functions to take place during a test, enter 0 for the value and the program will not perform that function.

To enter parameters for a new test method, follow the directions for **PARAMETER CHANGE** on the previous page.
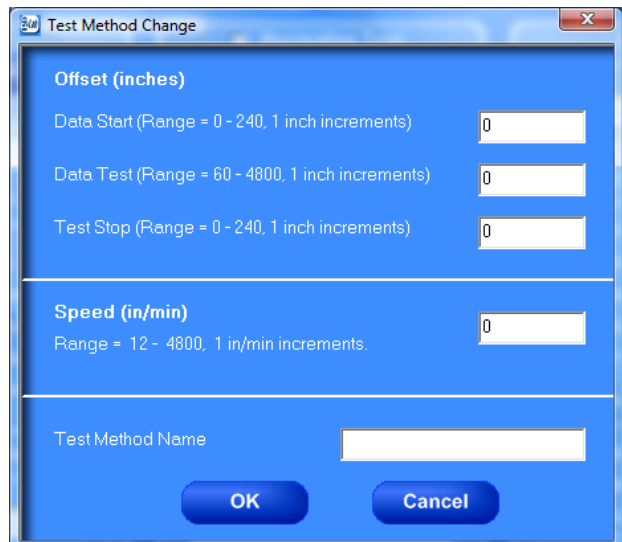
NORMALIZE TEST

Normalize Test stores test data as force per width. Click the box to turn on this feature.

DATA SET INFORMATION

Upon completion of every test, the "**Data Set Information**" will automatically appear. This allows the operator to record information about the test performed. It will also allow you select were test data is stored. All fields on the "**Data Set Information"** page are optional. The only required field is "**File Name**".

File Name – the only required field on the Data

Set Information page. You must enter a   file

name to save the test data.
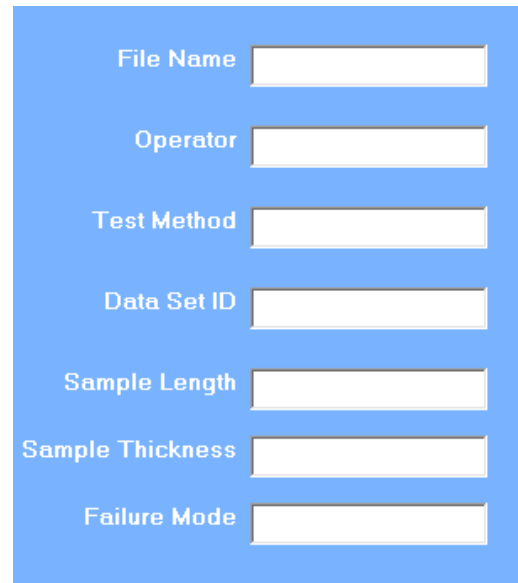
Test Method – optional field.

Data Set ID – optional field.

Sample Length – optional field.

Sample Thickness – optional field.

Failure Mode – optional field.
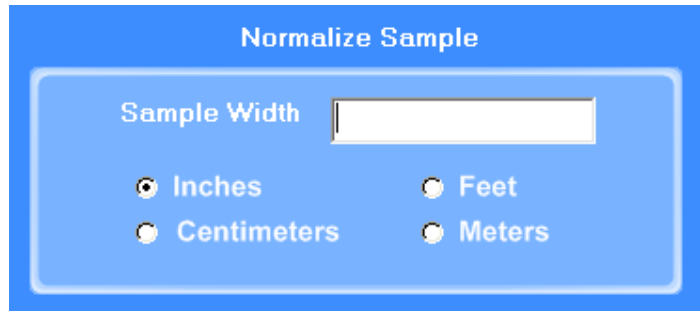
AUTO FILE INCREMENT

"**Auto File Increment**" automatically assigns a sequential number to the "**File Name**". It

allows the operator to perform tests without having to rename each test, but add a number to

the "**File Name"** to differentiate them. The feature is activated and deactivated by clicking

the box. While active, you will not be able to change any information entered into the "**File

Name**" field. EZ Lab will automatically assign sequential numbers in ascending order to

each new test performed.

(**Example:** *File Name* – Test. Activating *Auto File Increment* will change the *File Name*

Test to Test – 001. The next test performed will automatically be named Test – 002, then

Test – 003 and so on.)

NORMALIZE SAMPLE

Normalize Sample allows you to record the width of the samples being tested. It is also what the "**Normalize Data**" feature uses to calculate force per width.
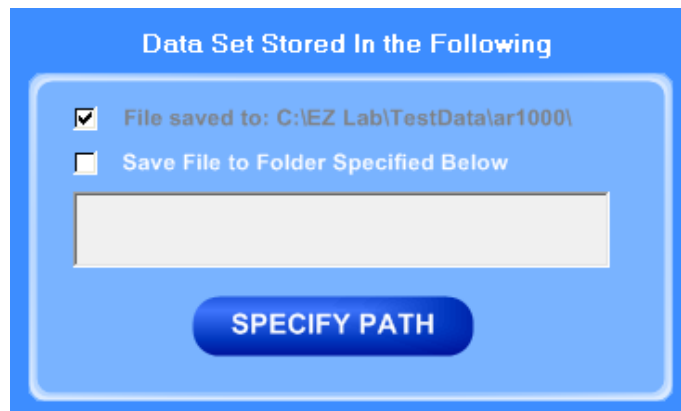
STORING DATA

All data is automatically stored in a folder on the computers C: drive. EZ Lab also has the option to store the "**Specify Path"** button will allow you to select an alternative location to store your data. Once the selection is made it will appear in the box above the "**Specify Path"** button. Click the box next to "**Save File to Folder Specified Below**" to activate the feature. Click the box again to turn the feature off. The previous entered storage location will remain in the box to show the last place data was saved.

FINISH AND ABORT

Once all the information has been correctly entered on the "**Data Set Information**" screen, click the "**Finish**" button. This will save the data and EZ Lab will automatically go to the "**Graph Screen**". The "**Abort"** button discards the data from the previous test and EZ Lab automatically goes back to the "**Main Operating Screen**".

GRAPH SCREEN
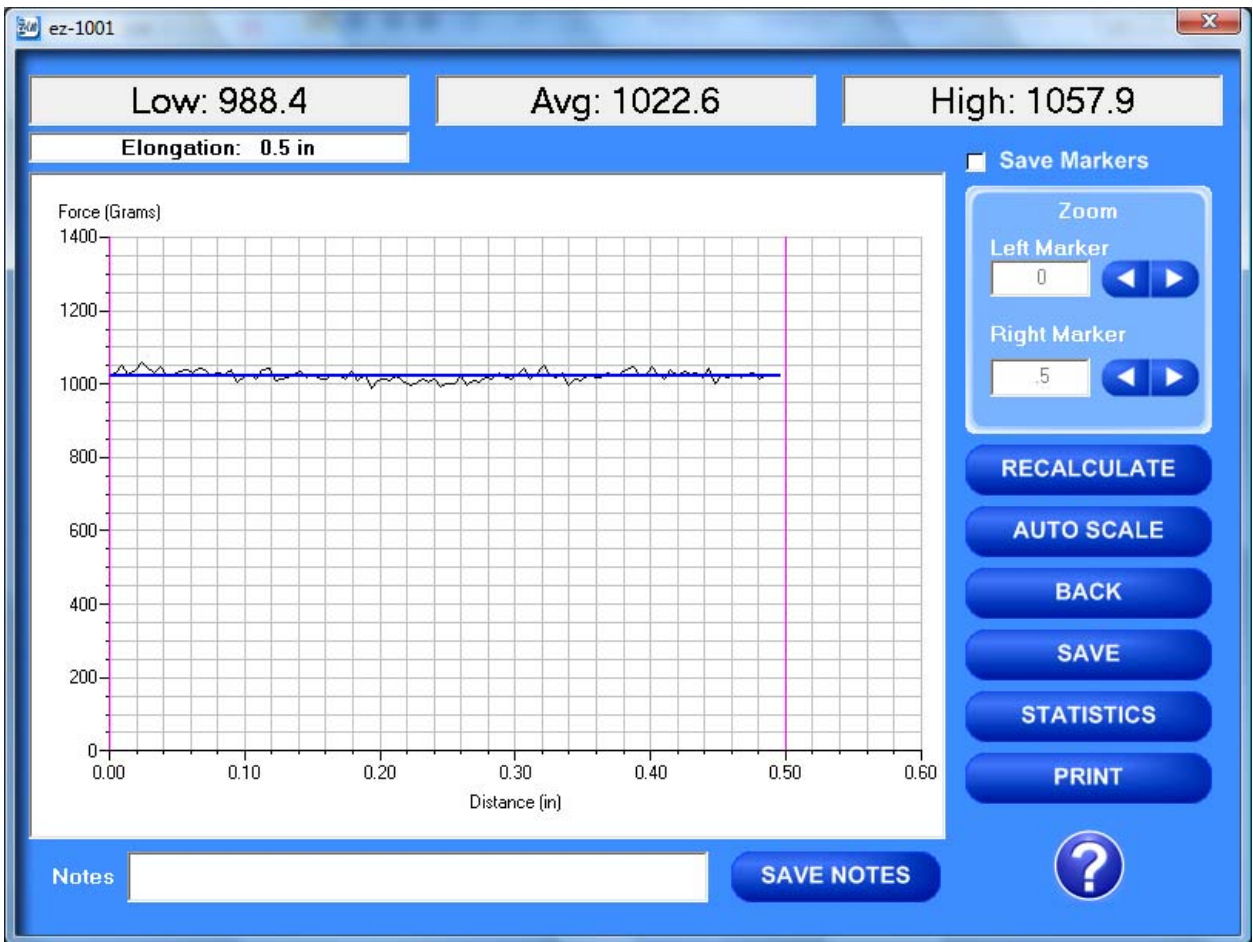
EZ Lab will automatically display the "**Graph Screen**" after the data has been entered on the "**Data Set Information**" screen. The Graph Screen will graph the profile of forces recorded during the test and will display the Low, Average, High, and Elongation values.

CROPPING GRAPHS

The "**Graph Screen**" provides a cropping feature. Notice the red vertical lines (markers) located at the left and right sides of the graph. These markers can be moved horizontally on the graph by using the arrows labeled "**Left Marker**" and "**Right Marker**". The field next to the arrows will indicate the position of the marker on the graph.

Note: Cropping a graph <u>will not</u> erase the data saved from the original test.

1. Using the arrows, move the left and right markers to the desired location.
2. Click the **"Recalculate"** button. This will change the data displayed on the graph page to reflect the area inside the markers. A graph can be recalculated up to 3 times.
3. After the **"Recalculate"** button has been selected, a **"Save Markers**, **Back**, and **Save**" buttons appear.

Note: When the feature is turned on, EZ Lab will save two different files. One file will include all of the data recorded from the test. The other file will be the data automatically cropped by using the "**Save Markers**" feature. These files will be differentiated by the suffix **"-RevA"**. The **"-RevA"** file will be the data automatically cropped by the "**Save Markers**" feature. (Example: Test-001 and Test-001-RevA)

SAVE MARKERS

EZ Lab automatically records the data from the entire test. The "**Save Markers**" feature will hold the place of the left and right marker for future tests. This will automatically crop all test performed while the feature is on. To turn this feature on, click the box located next to "**Save Markers**". A check mark will appear in the box. To turn it off, click the box again and the check mark will disappear. Turning off this feature will reset the left and right marker to the left and right sides of the graph. Future tests will not be cropped automatically.

AUTO SCALE

The "**Auto Scale**" button changes the scale of the Y axis of the graph. This feature allows for an enhanced view of the graph profile. Clicking the "**Auto Scale**"

button activates the feature. The button will change to "**Full Scale**".

Clicking the **"Full Scale"** button will restore the graph back to the original scale of the Y axis.

BACK

The "**Back**" button is used to undo changes made when cropping the graph. It will appear after the graph has been cropped by moving either of the markers and clicking the "**Recalculate**" button. "**Back**" will only undo the last recalculation done to the graph.

SAVE

The "**Save**" button will save the cropped data as a new file with the same "**File Name**" as the original file but add the suffix "**-RevA**". (Example: Test-001 becomes Test-001-RevA) Only one "**-RevA**" file per original test can be saved at a time. Anytime you click the "**Save**" button, a "**-RevA**" file will be saved. If there is an existing file name with a "**-RevA**" file already, the existing "**-RevA**" file will be replaced.

STATISTICS

The "**Statistics**" button will open a new window and display the **Variance**, **Standard Deviation**, and **Work (joules)** of the data displayed on the graph. The data displayed on this screen will change anytime a change is made to the graph. To exit out of this screen, click either the "**OK**" button or the red "**X**" button. EZ Lab will automatically go back to the graph page.
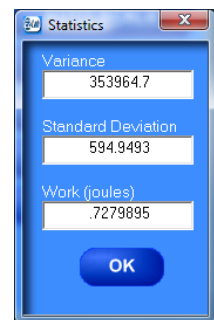
PRINT

"**Print**" will allow you to use any printing feature available to your computer. Highlight the desired printer and click the "**Print**" button. This will take you to your computers print menu. You may exit this screen by clicking either "**Cancel**" or the red "**X**" buttons.

NOTES
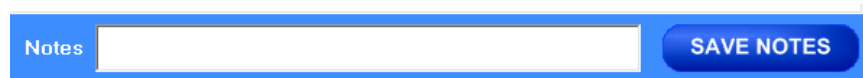
The "**Notes**" field allows you to enter notes. Clicking the "**Save Notes**" button will save the notes. The notes will be stored with the information entered on the "**Data Set Information**" page.

HELP

The help button will open a "pdf" file of the machine manual. This manual contains operation instructions for both the test platform and the EZ Lab software. You must have Adobe Acrobat Reader on your computer to open "pdf" manual file. If the Adobe program is not already installed on your computer, a copy of it is included on the EZ Lab disk.

REVIEW DATA

The "**Review Data**" button is located on the Main Operating Page. The "**Review Data**" feature will allow access previously recorded test data. The "**Review Data**" button will take you to the screen pictured below.

Every time the "**Review Data**" feature is accessed, the screen will automatically display the test data located in the **EZ Lab** test data folder located on your computers **C:** drive. The individual tests will be displayed in chronological order with the most recent test appearing on the top of the list. This screen will display the test's File Name, date and time the test was performed, Low, Average, and High values for the test performed. To access the test data from a test file, click the

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File Name. You will notice the File name is now highlighted. Once a file is highlighted, you may now use the buttons on the screen to access the test data.

GRAPH

The "**Graph**" button will access the "**Graph screen**". This is the same "**Graph Screen**" displayed immediately following the "**Data Set Information Screen**". For instructions on operating the "**Graph Screen**".

FILE DETAILS

"**File Details**" will display all the information entered on the "**Data Set Information screen**". It will also display the Test Speed, Length of Test, Average, High, Low, Stand Deviation, Variance, Work, and Notes recorded for the individual test. File Details will only display this information for one test.

DELETE

"**Delete**" will permanently delete the test file.

DELETE ALL

"**Delete All**" will permanently delete all the test files located in the **Test Data Folder** located on your computer's **C:** drive.

HELP

The "**Help**" button will open a **PDF** file of the machine manual. This manual contains operation instructions for both the test platform and the **EZ Lab** software. You must have Adobe Reader on your computer to open **PDF** manual file. If the Adobe program is not already installed on your computer, a copy of it is included on the **EZ Lab** disk.

The following instructions allow you compile test data from multiple files

In order to compile test data from multiple tests, you must first create a list of the test files you would like to compile. To create a list, highlight a test file and click the "**Add To List**" button. To delete a test file from the list, click the desired file on the list and then click the "**Remove From List"** button. The "**Clear List**" button will clear all the files from the list. There is no need to highlight the files first.
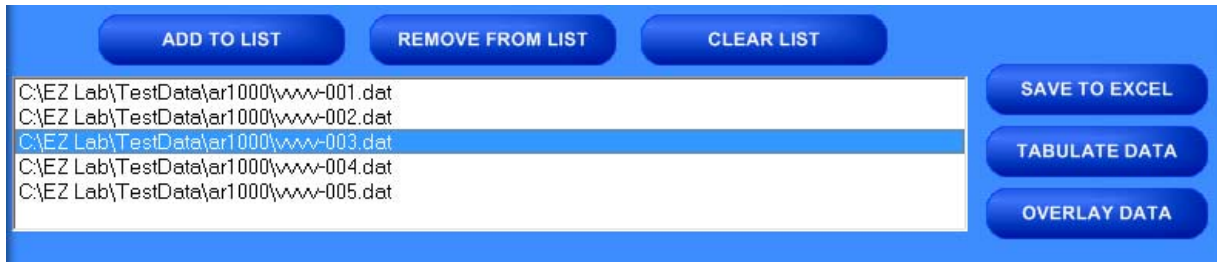
SAVE TO EXCEL

EZ Lab collects data throughout the entire test. This is done by collecting individual data points. These individual data points are used to display the Low, Average, and High values displayed from the test. The "**Save To Excel"** feature allows you to view a list of the individual data points from every test on the created list. The values will be displayed in the unit of measure selected on the "**Main Operating Screen**". Click the "**Save To Excel**" button. Follow the instructions on your screen to create a file name and save the file to the desired location on your computer.

TABULATE DATA

"**Tabulate Data"** will create a table of data from the files on the list created. Create a list of the desired test files and click the "**Tabulate Data**" button. The screen below will appear. The units of measure displayed will be the units selected on the "**Main Operating Screen**".

Data Tabulate - Unsaved Random Grouping

File Name	Avg	High	Low	StDev	Var	Work (joules)
C:\EZ Lab\TestData\ar1000\www-001.dat	11.5	127.7	0.0	28.1697	793.532	2.377268E-02
C:\EZ Lab\TestData\ar1000\www-002.dat	455.8	1174.5	0.0	452.8895	205108.9	.5676897
C:\EZ Lab\TestData\ar1000\www-003.dat	141.3	1169.7	0.0	320.9726	103023.4	.1454381
C:\EZ Lab\TestData\ar1000\www-004.dat	281.4	1585.0	0.0	497.5603	247566.3	.2313028
C:\EZ Lab\TestData\ar1000\www-005.dat	518.0	914.0	0.0	315.6199	99615.93	.2579064
Averages	281.6	994.2	0.0			0.2452219
Standard Deviations	189.1383	483.6318	0			.18166
Variances	35773.29	233899.7	0			.033

Units: Grams   SAVE LIST   SAVE TO EXCEL   PRINT

SAVE LIST

"**Save List**" will save table as a file on the **C:** drive of your computer. This will allow you to

recall the table at a later time. Click the "**Save List**" button. Follow the on screen prompts to

select a location to save and name the table. The table should be saved in the **Test Data folder**

for the AR-1000 located on your computers **C:** drive. You may save the file in another location,

but it must be moved into this folder in order to be recalled.

SAVE TO EXCEL

"**Save To Excel**" will save the table to the Microsoft Excel program in the same format

displayed on this screen. The unit of measure the data is reported in will be saved and displayed

in the upper right hand corner of the table. This allows you to use any of Excels feature to further

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analyze the test data. Click the "**Save To Excel**" button. Follow the on screen prompts to create a file name and save the table.

PRINT

"**Print**" will allow you to use any printing feature available to your computer. Highlight the desired printer and click the "**Print**" button. This will take you to your computers print menu. You may exit this screen by clicking either "**Cancel**" or the red "**X**" buttons.
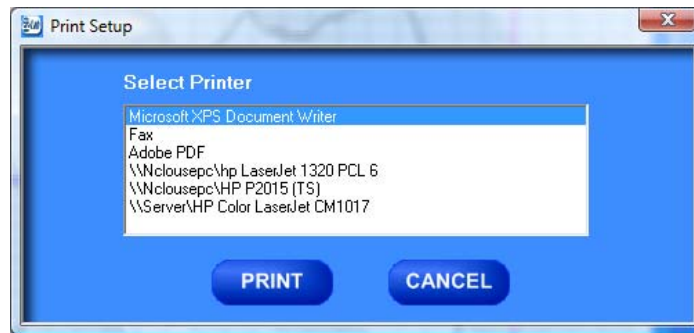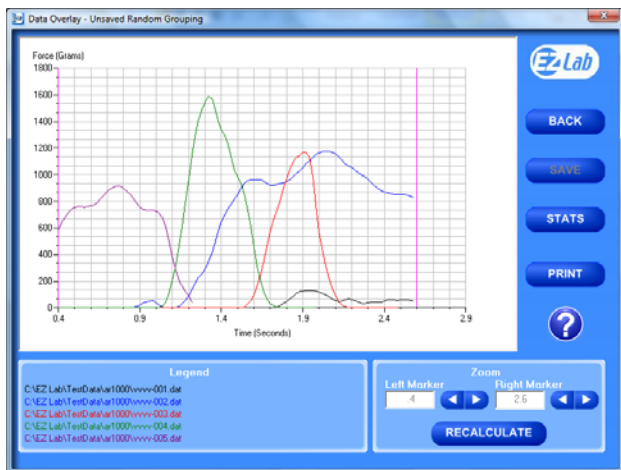

OVERLAY DATA

"**Overlay Data**" allows you to overlay graphs from up to five different tests. Create a list. Click the "**Overlay Data**" Button. The following screen will appear. The file names of the graphed tests will appear in the box labeled Legend. The file names are color coded to correspond with the colors of the graph.

CROPPING GRAPHS

The "**Overlay Screen**" provides a cropping feature. Notice the red vertical lines (markers) located at the left and right sides of the graph. These markers can be moved horizontally on the graph by using the arrows labeled "**Left Marker**" and "**Right Marker**". The field next to the arrows will indicate the position of the marker on the graph.

Note: Cropping a graph <u>will not</u> erase the data saved from the original test.

1. Using the arrows, move the left and right markers to the desired location.
2. Click the **"Recalculate"** button. This will change the data displayed on the graph page to reflect the area inside the markers. A graph can be recalculated up to 3 times.

3. After the **"Recalculate"** button has been selected, a **"Save Markers**, **Back**, and **Save**" buttons appear.

BACK

The "**Back**" button is used to undo changes made when cropping the graph. It will appear after the graph has been cropped by moving either of the markers and clicking the "**Recalculate**" button. "**Back**" will only undo the last recalculation done to the graph.
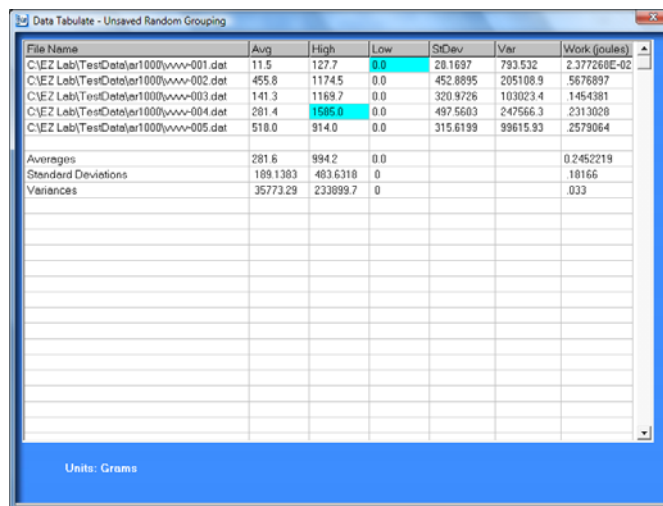
SAVE

      The "**Save**" button will save the cropped data as a new file with the same "**File Name**" as the original file but add the suffix "**-RevA**". (Example: Test-001 becomes Test-001-RevA) Only one "**-RevA**" file per original test can be saved at a time. Anytime you click the "**Save**" button, a "**-RevA**" file will be saved. If there is an existing file name with a "**-RevA**" file already, the existing "**-RevA**" file will be replaced.

STATS

      The "**Stats**" button will open a new window and display the **Low**, **Average**, **High Variance**, **Standard Deviation**, and **Work (joules)** of the data displayed on the graph.

PRINT

"**Print**" will allow you to use any printing feature available to your computer. Highlight the desired printer and click the "**Print**" button. This will take you to your computers print menu. You may exit this screen by clicking either "**Cancel**" or the red "**X**" buttons.


HELP

The help button will open a **PDF** file of the machine manual. This manual contains operation instructions for both the test platform and the **EZ Lab** software. You must have Adobe Reader on your computer to open **PDF** manual file. If the Adobe program is not already installed on your computer, a copy of it is included on the **EZ Lab** disk.

CHANGING DIRECTORIES

EZ Lab allows you to store your test data in multiple locations. Files can be stored in any location connected to your computer. This is accomplished on the "**Data Set Information screen**". To change directories, click the drop down menu bar located on the top of the "**Review Data screen**".
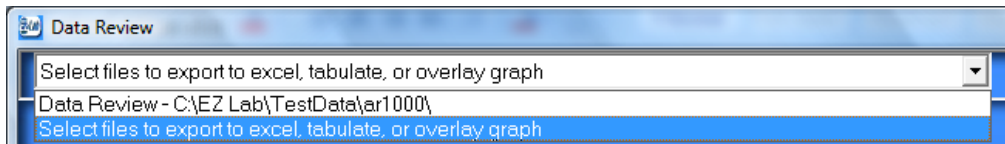
Click "**Select files to export to excel, tabulate, or overlay graph**" (above). This will bring you
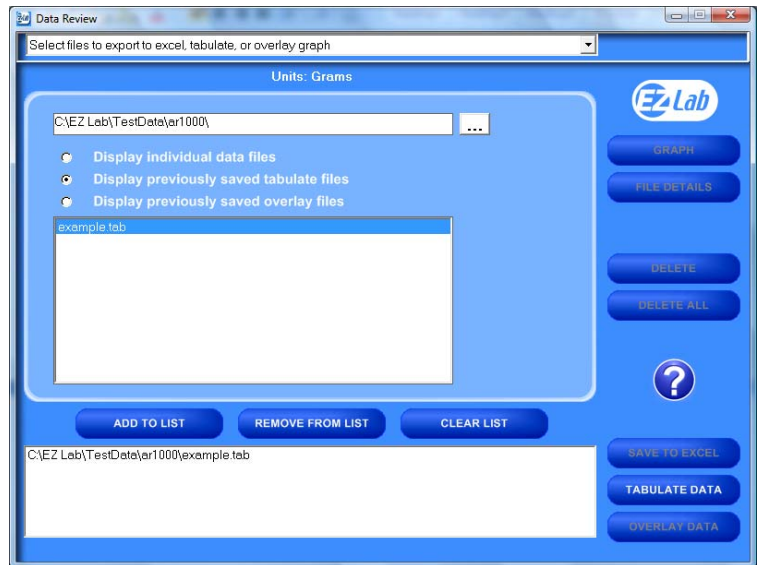
to the following screen.
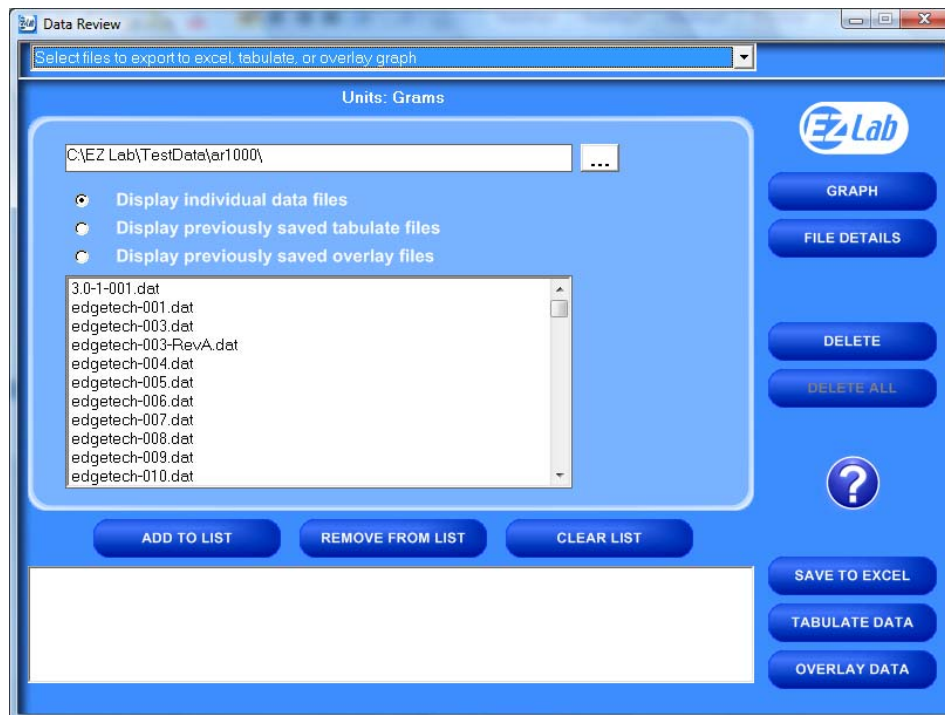
This screen will display all the test files located in the on your computer under the directory

C:\EZ Lab\TestData\ar1000. To change directories, click the button located to the right of the

directory address bar. Scrolling over the button will pop up a window "**Press this to change**

directories". Follow the on screen prompts to select files from a different directory.

This screen allows you all of the same features as the "**Review Data screen**". It also allows you

the ability to display previously saved tabulate files and overlay graphs.
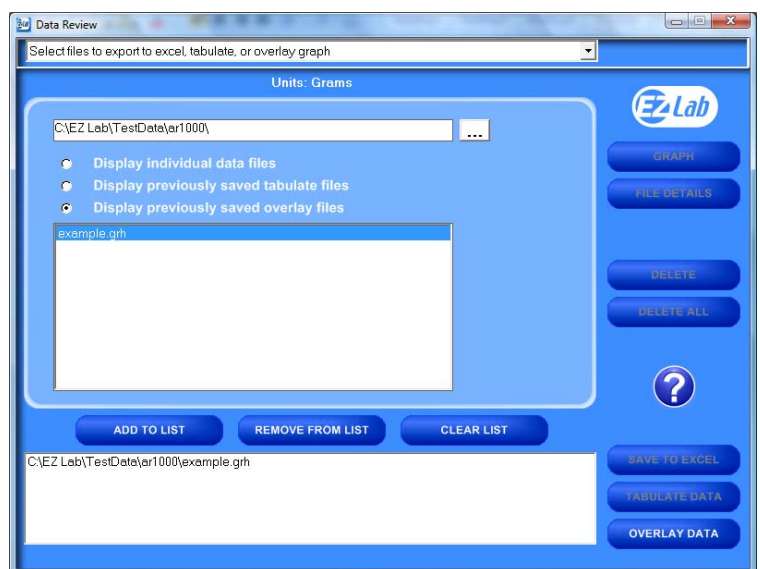
PREVIOUSLY SAVED TABULATE FILES

To recall previously saved tabulated files, click the bullet next to "**Display previously saved tabulate files**". You will notice all previously saved tabulate files stored under this directory will appear in the box. Highlight the desired file and click "**Add to List**". Click "**Tabulate Data**" to display the previously saved tabulate file. To remove an item from the list, highlight the item on the list and click the "**Remove From List**" button. The "**Clear List**" button will automatically clear the list, there is no need to highlight the file first. You can only display one previously saved **Tabulate** file at a time.

PREVIOUSLY SAVED OVERLAY GRAPHS

To recall previously saved overlay files, click the bullet next to "**Display previously saved overlay files**". You will notice all previously saved overlay files stored under this directory will appear in the box. Highlight the desired file and

click "**Add to List**". Click "**Overlay Data**" to display the previously saved tabulate file. To remove an item from the list, highlight the item on the list and click the "**Remove From List**" button. The "**Clear List**" button will automatically clear the list; there is no need to highlight the file first. You can only display one previously saved overlay file at a time.

The Display previously saved overlay files screen will bring up the "**Overlay Graph**" screen. To operate this screen, see "**Overlay Data**".