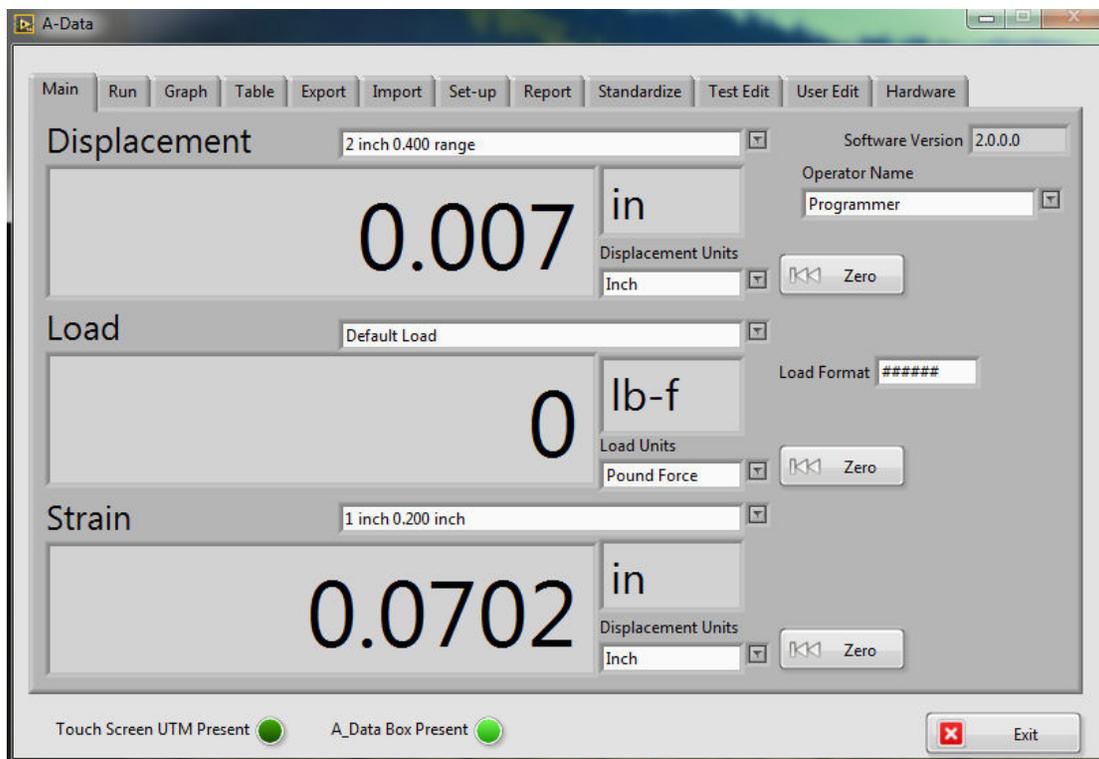


A-Data Solutions



This manual contains important operating and safety information. Carefully read and understand the contents of this manual prior to the operation of this equipment.

www.atspa.com

REVISED AUGUST 2018

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For assistance with set-up or operation, contact the ATS service department. Please have this manual and product serial number available when you call.

Telephone: +1-724-283-1212.

Manual Contents

A. Introduction	1
A.1 Unpacking.....	1
A.2 Warranty Information	1
A.3 After Sale Support	1
B. Safety	2
B.1 For Owners, Operators, and Maintenance Personnel	2
C. Software Overview	3
C.1 PC Requirements	3
C.2 Main Screen	3
C.3 Run Screen	5
Test Name	5
Show Diagram Button	5
Batch Name	5
Specimen Name	6
Material	6
Shape Selection	6
Effective Length Field.....	6
Thickness/Diameter and Width Fields	6
Gauge Length	6
Inter-Load Distance Field.....	6
Start Test Button.....	7
C.4 Graph Screen	7
X-AXIS	7
Y-AXIS.....	7
Test Name and Batch Name	7
Select Data Button	8
C.5 Table Screen.....	8
Test Name, Batch Name, and Specimen Name	8
Select Data Button	8
C.6 Export Screen.....	8
Data to Export	9
C.7 Import Screen.....	10
Converted Files	10
Import Button	11

Browse Button.....	11
C.8 Set-Up Screen.....	11
Browse Buttons.....	11
Configuration Path.....	11
Data Path.....	11
Report Path.....	12
Import/Export Path.....	12
Resource Path.....	12
C.9 Report Screen.....	12
Report Name.....	12
Report Description.....	13
Report Format.....	13
Built in Text.....	13
Text Template.....	13
Word Template.....	13
Excel Template.....	13
Report Template.....	13
Headers Button.....	13
Analysis Button.....	13
Evaluate with Respect To.....	14
Yield Point.....	14
Modulus.....	14
Report Parameters.....	14
Load Units & Displacement Units.....	14
Statistics Button.....	15
Remove Button.....	15
Save Button.....	15
C.10 Standardize Screen.....	15
Standardization Name.....	16
Last Standardized Field.....	16
Hardware Selection.....	16
Channel Type.....	16
Units.....	17
Remove Button.....	17
Save Button.....	17
Standardize Button.....	17
Point Count.....	17
Current Point.....	18
Current Point Voltage.....	18
Current Point Value.....	18
New Voltage.....	18

New Value	18
Add Button	18
Remove Button	18
Previous & Next Buttons	18
Done Button	18
C.11 Test Edit Screen.....	19
Test Name	19
Test Description	19
Type	19
Show Diagram Button	19
Break Detect Percentage Field	19
Break Threshold	20
Invert Sign Load	20
Invert Sign Displacement	20
System Channels	20
Load Channel.....	20
Displacement Channel	20
Strain Channel	20
Auxiliary Channels	20
Remove Button	21
Save Button	21
C.12 User Edit Screen	21
User Name	21
User Password.....	21
Privileges	21
Remove Button	22
Save Button	22
C.13 Hardware Screen	22
Touch Screen UTM	22
UTM IP Address	22
A-Data Box.....	22
Device	23
Analog 1-6.....	23
Reconnect Button	23
D. Operation.....	24
D.1 Operation Instructions	24
Appendix A: Warranty	25

Appendix B: Report Generation..... 26

- Overview 26
- ASCII Test Template..... 26
- Word Template 27
- Excel Template..... 27
- Replaceable Report Parameters..... 27

Appendix C: Calculations 43

Appendix D: Optional Fingerprint Reader..... 48

- User Name 48
- User Password..... 48
- Checkbox Selections 48
- Fingerprint Setup 48
- Remove Button 49
- Save Button 49

Appendix E: Image Glossary..... 50

A. Introduction

A.1 Unpacking

Retain all cartons and packing materials until the unit is operated and found to be in good condition. If damage has occurred during shipping, notify Applied Test Systems (ATS) and the carrier immediately. If it is necessary to file a damage claim, retain the packing materials for inspection by the carrier.

A.2 Warranty Information

All new ATS systems are shipped with a warranty. Units have a warranty against defective parts and workmanship for one full year from the date of shipment. Please see APPENDIX A of this manual for complete details on the warranty.

A.3 After Sale Support

If there are any questions concerning the operation of the unit or software, contact the ATS Service Department at +1-724-283-1212.

Before calling, please obtain the software revision number and the serial number from the unit's data tag. A sample data tag is illustrated below, and can be completed with the unit's information for easy reference. Please be prepared to give a complete description of the problem to the ATS Service Department.

 APPLIED TEST SYSTEMS www.atspa.com MADE IN USA	NO. <input type="text"/>
	<input type="text"/> AMP <input type="text"/> VAC
	<input type="text"/> PH <input type="text"/> HZ
	DWG <input type="text"/>
	<input type="text"/>
<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>	

Figure A.1: ATS Sample Data Tag

B. Safety

B.1 For Owners, Operators, and Maintenance Personnel

All Applied Test Systems equipment is designed to be operated with the highest level of safety. To maintain the safe operation of this tester, ATS endeavors to educate the operator about safety issues surrounding certain parts of the machinery. These safety issues are addressed through the use of labeling on the equipment. The following labels may appear on your test unit:



Burn Hazard



Hot Surface



Electrical Shock/Electrocution



Hand Crush



Force From Above



Protective Earth (Ground)



European Directive CE Mark



General Danger



No Access For Unauthorized Persons



Read Operator's Manual

In addition to the safety warnings listed above, cautions, warnings, and important notes are posted throughout the manual. Read and follow these important instructions. Failure to observe these instructions can result in permanent damage to the unit, significant property damage, personal injury, or death.

Read and understand all instructions and safety precautions listed in this manual before installing or operating your unit. If you have any questions regarding operation of the unit or instructions in this manual, contact our Service Department at +1-724-283-1212.

C. Software Overview

C.1 PC Requirements

To run the A-DATA software, you will need:

- Windows 7 or above
- USB 2.0 or above (required to attach to an ATS A-Data analog box)
- Ethernet (required to attach to an ATS Touch Screen UTM)

C.2 Main Screen

Figure C.1 illustrates the Main Screen, which is shown when A-Data is started. This screen allows users to setup, run, and view tests.

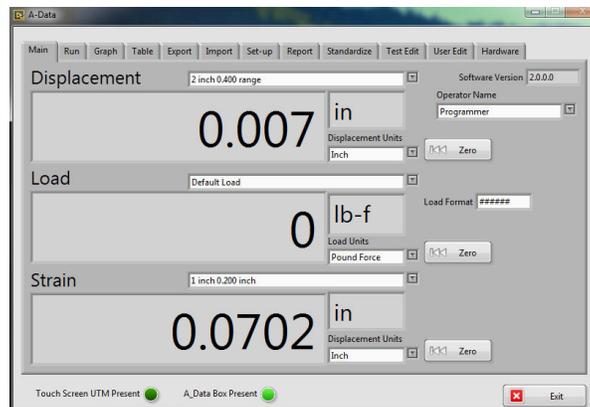


Figure C.1: Main Screen

Across the top of the screen are tabs that allow operators to switch between screens. Some tabs may be hidden depending on the current operator's permissions.

The top right corner of the screen shows the SOFTWARE VERSION NUMBER. If you need to contact the ATS Service Department for assistance, they will require your software version number.

Below the SOFTWARE VERSION NUMBER is the currently selected OPERATOR NAME. If you change to a new operator with password protected permissions, a pop-up screen will appear and prompt you to fill in the password. If an incorrect password is entered, the system will switch to the default operator.

The left side of the screen is split into three sections. The top section is for DISPLACEMENT. Just below the label is the CURRENT VALUE for displacement. To the right of the label is the CHANNEL SELECTION for displacement.



NOTE: This field will only display strain channels that are configured in the system and available when the software is running.

Below the CHANNEL SELECTION is the current unit's text. Below that is the UNIT SELECTOR. This will only show the strain units that are configured for the system and will set the units for displacement used in all the screens. To the right of the UNIT SELECTOR is a ZERO button that is used to reset the value to zero.



NOTE: This button is only shown for analog channels that come in through the A-Data analog box. It is not shown for Modbus channels that come from a UTM touch screen.

The middle section deals with LOAD. Below the label is the CURRENT VALUE for the load. To the right of the label is the CHANNEL SELECTION for load.



NOTE: This field will only display load channels that are configured in the system and available when the software is running.

Below the CHANNEL SELECTION for load is the current unit's text. Below that is the UNIT SELECTOR. This will only show the load units that are configured for the system and will set the units for load used in all the screens. To the right of the unit selector is a ZERO button that is used to reset the value to zero.



NOTE: This button is only shown for analog channels that come in through the A-Data analog box. It is not shown for Modbus channels that come from a UTM touch screen.

Above the RESET button is a LOAD DISPLAY FORMAT selection. This is only shown if there is no Touch Screen UTM present.

The bottom portion of the screen is used to display any channel value. The label will change depending on the channel selected (STRAIN, LOAD, or AUXILIARY). To the right of the label is the CHANNEL SELECTION.



NOTE: This field will only display channels that are configured in the system and available when the software is running.

Just below the CHANNEL SELECTION is the current unit's text. Below that is the UNIT SELECTOR. This will only show the units that are configured for the system and type of channel selected.



NOTE: If an auxiliary channel is selected the units cannot be changed.

To the right of the unit selector is a ZERO button that is used to reset the value to zero.



NOTE: This button is only shown for analog channels that come in through the A-Data analog box. It is not shown for Modbus channels that come from a UTM touch screen.

Finally, at the bottom of the screen there are two indicators. TOUCH SCREEN UTM PRESENT will be on if the system can connect to one of ATS's new UTMs with an Ethernet Modbus TCP connection. A-Data BOX PRESENT will be on if the software can connect to an ATS A-Data analog box. If one of the indicators is not on, any channel

configured for that device will not be available to use. If one of the indicators is not on and you think it should be, check the Hardware Screen. If you do not have permission to access that screen, alert someone who has been granted those permissions or contact the ATS Service Department at +1-724-283-1212.

Pressing the EXIT button on the bottom right will shut down the A-Data software.

C.3 Run Screen

Figure C.2 shows the Run Screen. It is shown when the RUN tab is pressed on the Main Screen. This screen is used to start a test that has been configured already.

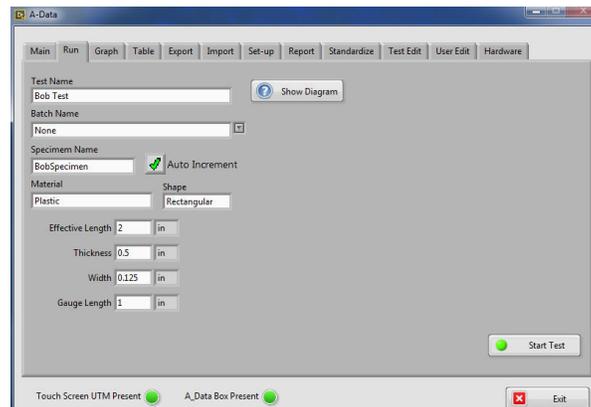


Figure C.2: Run Screen

Test Name

Used to select a preconfigured test.

Show Diagram Button

Will show a diagram of the type of test that has been selected. An example diagram can be seen in Figure AC.6 (p. 47). This diagram contains the specimen dimensions needed to populate the fields on the Run Screen.

Batch Name

Will react differently depending on the operator's permission to edit batches. If the operator has permission, then they can select, create, and edit the information for any batch. If not, then they can only select a pre-configured batch, or select NONE and have the ability to change specimen information.



NOTE: A batch name cannot have any of the following ASCII characters (. " @) .

Specimen Name

A name assigned to each specimen tested. Each name must be unique. If AUTO INCREMENT is checked, the system will automatically add an integer that increments each time a specimen is used with the same name. If auto increment is not checked and the same name as another sample is used, the system will ask if you want to overwrite the last one.



NOTE: A specimen name cannot have any of the following ASCII characters (. " @) .

Material

Allows the user to define the type of material that is used in the sample.

Shape Selection

Used to define how the calculation for the cross sectional area of the sample is determined.



NOTE: The units used for the rest of the fields are set by the DISPLACEMENT units on the Main Screen.

Effective Length Field

The length between the grips, plus additional small lengths within the grips. These small additional lengths within the grips and varying gripping techniques necessitate judgments in defining effective specimen length. When test specimens are made with a reduced cross sectional area in the middle of the specimen, the effective specimen length is the length of the reduced cross sectional area. In many tests this is of no consequence because the important information is the relative change between test specimens rather than specific data on a specimen. If specific data is required on a test specimen, an extensometer or similar gauging device should be used to acquire the most accurate information. This is used in reports that calculate with respect to displacement.

Thickness/Diameter and Width Fields

Used to calculate stress and strain of the sample.

Gauge Length

The starting length of a strain gauge used to determine sample elongation. This is used in reports that calculate with respect to strain.

Inter-Load Distance Field

Only used for 3-point and 4-point bend tests. It is used to calculate stress and strain of the sample.

Start Test Button

Will start A-Data in test mode while waiting for the attached UTM to start. Before pressing this button you should check the indicators at the bottom of the screen to make sure the correct devices are attached and connected with A-Data. If connected to a Touch Screen UTM, A-Data will wait for the start bit to come from the UTM to start collecting data. If connected to a UTM through the A-Data analog box the system will wait for a displacement increase of 1/1000 of the declared displacement range (or 0.01V) before starting to collect data.

C.4 Graph Screen

Figure C.3 shows the Graph Screen. It is used to show a graph of data from previously completed tests. This screen is only used for a quick look at the test data graph. If you wish to print the graph you will need to go to the Export Screen. Click on the sample test curve image next to the specimen name to edit the test curve.

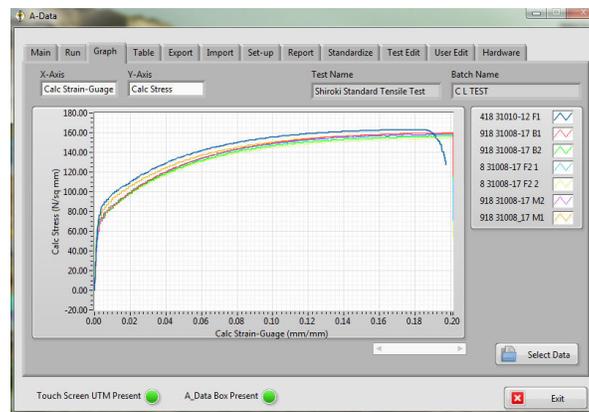


Figure C.3: Graph Screen



NOTE: The units used for the Graph Screen are the same as those selected on the Main Screen.

X-AXIS

Used to select which data is displayed on the X axis of the graph.

Y-AXIS

Used to select which data is displayed on the Y axis of the graph.

Test Name and Batch Name

Will show the test and batch names for the selected data sets.

Select Data Button

Will pop-up a dialog box to let you select a TEST, BATCH, and one or more samples from the test data that is stored on the computer. Up to 12 samples can be displayed on the graph.

C.5 Table Screen

Figure C.4 shows the Table Screen. It is used to show a table of data from a completed test. This screen is only used for a quick look at the test data. If you wish to print the data you will need to go to the Export Screen.

Time (s)	Displacement (in)	Load (lb-f)	Strain (in)	Calc Stress (lb-f/sq in)	Calc Strain Disp (in/in)	Calc Strain Gauge (in/in)
0.00000	0.00209	0.60363	0.00101	21.35628	0.00000	0.00000
0.50862	0.00876	1.08299	0.00118	38.31574	0.00333	0.00009
1.01723	0.02042	20.22156	0.00129	715.43368	0.00917	0.00014
1.52585	0.02542	30.74954	0.00129	1087.91110	0.01167	0.00014
2.03446	0.03542	39.51991	0.00142	1398.20467	0.01667	0.00021
2.54308	0.04376	51.77000	0.00156	1831.60964	0.02033	0.00025
3.05169	0.05209	63.75381	0.00179	2255.59401	0.02500	0.00039
3.56031	0.05876	85.53769	0.00224	3026.30209	0.02833	0.00062
4.06892	0.07759	237.58101	0.00288	8405.55681	0.03750	0.00094
4.57754	0.08543	345.13337	0.00374	12210.73258	0.04167	0.00137
5.08615	0.09376	473.68841	0.00479	16758.97778	0.04583	0.00189
5.59477	0.10209	618.86098	0.00608	21895.14709	0.05000	0.00254
6.10338	0.11042	766.40107	0.00758	27155.83841	0.05417	0.00329
6.61200	0.11042	766.40107	0.00974	27155.83841	0.05417	0.00437
7.12061	0.11876	907.71494	0.01416	32114.72838	0.05833	0.00658
7.62923	0.12709	974.65959	0.01993	34824.61279	0.06250	0.00946
8.13785	0.13542	988.56559	0.01993	34975.20415	0.06666	0.00946
8.64646	0.14376	945.73818	0.02585	35228.46660	0.07083	0.01242

Figure C.4: Table Screen



NOTE: The units used for the Table Screen are the same as those selected on the Main Screen.

Test Name, Batch Name, and Specimen Name

Will show the test, batch, and specimen names for the selected data set being displayed.

Select Data Button

Will pop-up a dialog box to let you select a TEST, BATCH, and a SPECIMEN from the test data stored on the computer. The table will only show the information for one sample at a time. If more than one sample is selected when you enter the table screen, the table will only show the first sample.

C.6 Export Screen

Figure C.5 shows the Export Screen. This screen is used to export information from A-Data. It can be put into different types of files, printed, viewed, or even copied to the clipboard to be pasted into other programs. Certain fields will be displayed depending on the type of data and what is to be done with it.

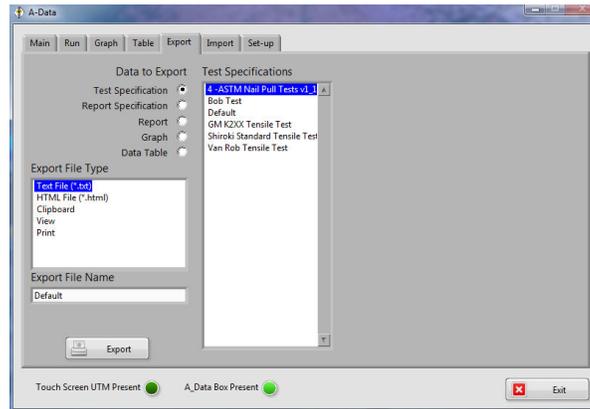


Figure C.5: Export Screen

Data to Export

The radio buttons select what type of data is to be exported. If a data type that requires test data to be selected is chosen, then the screen will look similar to the one shown in Figure C.6.

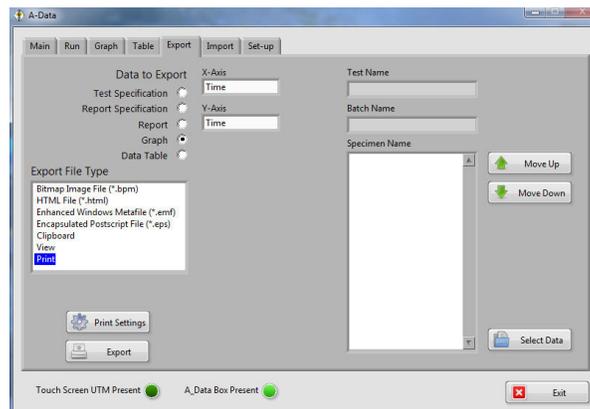


Figure C.6: Export Screen, Graph Test Data

If a data type of TEST SPECIFICATION, REPORT SPECIFICATION, or REPORT is selected, a center field that lists the names of all the correct specifications will be displayed. Only one specification can be selected and it must be chosen before pressing EXPORT.

If GRAPH is selected, the X and Y axis definitions must be specified before proceeding.

If REPORT, GRAPH, or DATA TABLE are chosen, a section will be displayed to allow selection of Test Data files.

The SELECT DATA button will pop-up a dialog box for selection of TEST, BATCH, and one or more samples from the test data that is stored on the computer. Multiple samples can be chosen, but a graph will only use the first 12 and a data table will only display the first one.

Once Test Data has been selected, the MOVE UP and MOVE DOWN buttons can be used to arrange the specimen names in the desired order prior to export.

Below the DATA TO EXPORT radio buttons is the EXPORT FILE TYPE field. It is used to tell the system how the

data is to be exported. The choices change depending on the type of data.

If certain types are selected, an EXPORT FILE NAME field is displayed to input the file name with no extension as this will be appended automatically. This file will be saved in the IMPORT EXPORT directory.

If Print is selected, a PRINT SETTINGS button is displayed to change printer and printer settings.

The EXPORT button will apply all of the above settings to export the information in the form selected.

C.7 Import Screen

Figure C.7 shows the Import Screen. This screen is used to import old A-Data files or TestVue32 Data files.

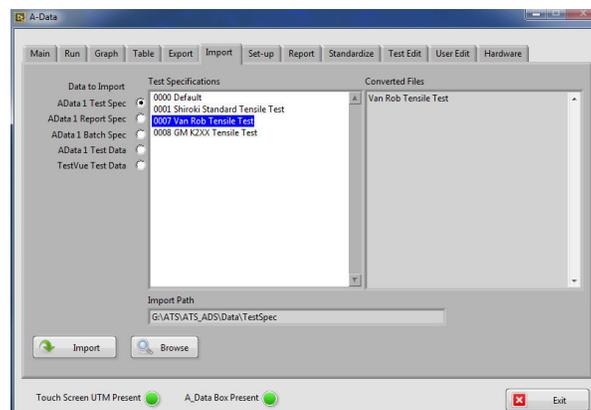


Figure C.7: Import Screen

The radio buttons on the left select which type of data to import. Be sure to check any specifications or data files after the import to verify that they are correct.



NOTE: You WILL need to define system channels for any tests that are imported. Otherwise the import will select default channels, as the old A-Data did not define the channels the same way the new one does.

The next field to the right will display the names of all the files with the correct file type in the current IMPORT PATH. More than one file can be selected for import.



NOTE: A file name cannot have any of the following ASCII characters (. " @). If the file name you wish to convert has any of these characters you will need to rename it before trying to import.

Converted Files

Will show the names of the imported files after they have been imported.

Import Button

Used to import all the selected files into the system. Test data files will be placed in the TEST DATA directory; all others will be placed in the CONFIGURE directory.

Browse Button

Can be used to define a new IMPORT PATH. It will start a Windows file dialog to define any path accessible from the computer.

C.8 Set-Up Screen

Figure C.8 shows the Set-up Screen. It is used to change the file paths that A-Data uses.

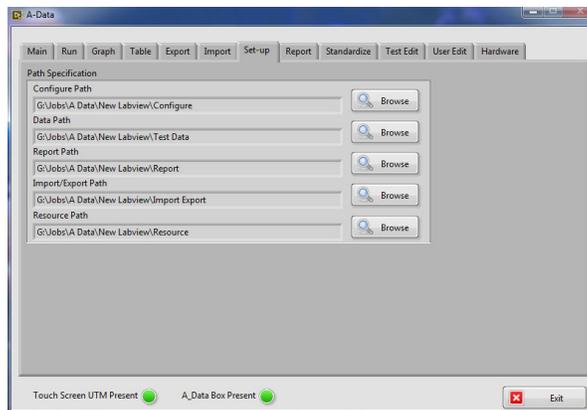


Figure C.8: Set-Up Screen



NOTE: Although these paths usually point to a directory under A-Data on the local computer, they can be anywhere, even on an attached company server.

Browse Buttons

Located to the right of each path, these buttons will pop-up a standard windows file dialog box to define each path.

Configuration Path

The path that A-Data uses to find all Test, Report, Batch, Standardization, Unit, and User configurations.

Data Path

The path that A-Data uses to read and write all test data files.

Report Path

The path that A-Data uses to save reports.

Import/Export Path

The path that A-Data uses to import from and export to. This would most often be used if exporting a graph or data table to a file type.

Resource Path

Where A-Data will look for the images it uses in the program. This path should not be changed.

C.9 Report Screen

Figure C.9 below shows the Report Screen. This screen is used to setup a report for the system.

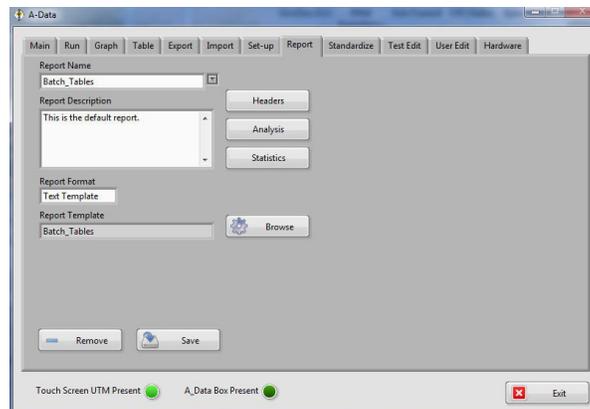


Figure C.9: Report Screen



NOTE: Except for YIELD POINT and MODULUS, all calculations are done every time regardless of what the report is asking for.

Report Name

Used to select or create a new report. To create a new report simply type the new report name into this field and save before leaving the screen.



NOTE: A report name cannot have any of the following ASCII characters (. " @).

Report Description

Used to enter a description of the report. Any ASCII text can be used.

Report Format

Will define which type of report you are going to use. The different types are listed below:

Built in Text

Creates a text report that is fixed by the program.

Text Template

Creates a text report from a text template that is user defined. This is the same template hat the old A-Data used.

Word Template

Creates a Word document from a Word template that is user defined.

Excel Template

Creates an Excel document from an Excel template that is user defined.

Report Template

Defines the report template to be used. It will only show up if a REPORT FORMAT that uses a template is selected. Use the BROWSE button beside it to open a windows file dialog to select this file. For more information on template files see Appendix B: Report Generation.

Headers Button

When pressed, the pop-up dialog shown in Figure C.10 will be displayed to enter text for all the headers of the report. Press the DONE button once all headers are entered to return to the report screen.

Analysis Button

When pressed, the pop-up dialog shown in Figure C.11 will be displayed to enter information about the report analysis.

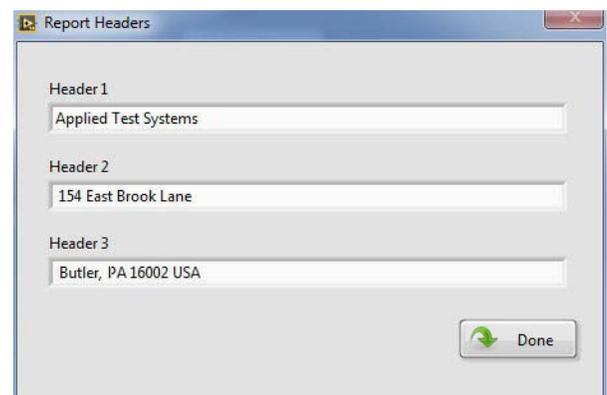


Figure C.10: Report Header Pop-Up

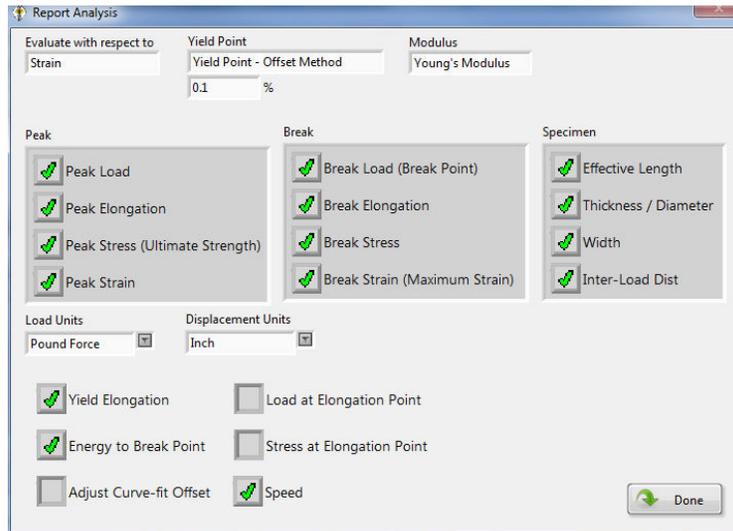


Figure C.11: Report Analysis

Evaluate with Respect To

Used to tell the report to do calculation with respect to the crosshead (Displacement) or with respect to a strain gauge (Strain).

Yield Point

Used to determine if yield is calculated and which method is used if it is. If OFFSET METHOD is used another field is shown to allow offset percentage to be entered.

Modulus

Used to determine if modulus is calculated and which method is used if it is. Depending on the method used, up to two more fields will be shown for information needed to calculate that particular method. The units for these fields will be the same as the report displacement units. Be aware that this number is just an entry field and does not convert if you change to different units for the report.

Report Parameters

The rest of the check boxes on the screen are used to determine what values are displayed when tables are used in the report (both specimen and statistics). If a box is not checked that calculated value will not be displayed in the table. If you check LOAD AT ELONGATION POINT or STRESS AT ELONGATION POINT a field to the right will be displayed to allow entry of the specified elongation value. The units for these fields will be the same as the report displacement units. Be aware that this number is just an entry field and does not convert if you change to different units for the report.

Load Units & Displacement Units

Used to determine which units are used in the report.

Once all the analysis information has been entered, press the DONE BUTTON to return to the report screen.

Statistics Button

If pressed, a pop-up dialog as shown in Figure C.12 will be displayed, which allows information about the report statistics to be selected.

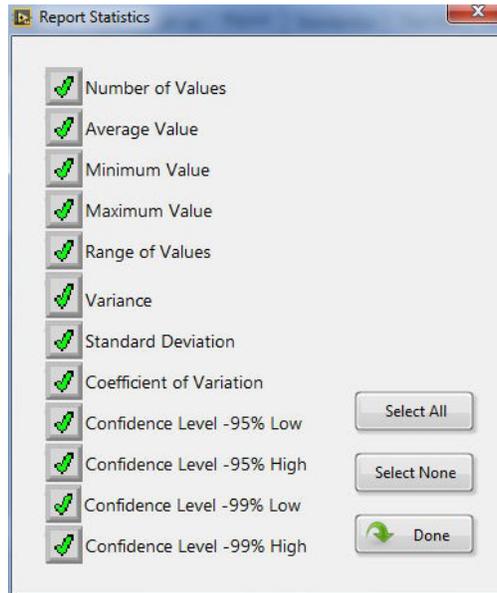


Figure C.12: Report Statistics

This dialog will allow you to check which statistics will be displayed in the statistics table of a report. Use the SELECT ALL or SELECT NONE buttons to affect all of the check boxes, or click on individual boxes to check and uncheck specific values. Press the DONE button once to return to the report screen.

Remove Button

Will delete the report file from the system and that report will no longer be able to be used.

Save Button

Will save any changes into the report file on the system. This must be done before leaving the screen or changes will be lost. Note, pop-up dialogs do not count as leaving the screen.

C.10 Standardize Screen

Figure E.13 below shows the Standardize Screen. It is shown when the STANDARDIZE TAB is pressed. This screen

is used to standardize analog channels or select default units for modbus channels.

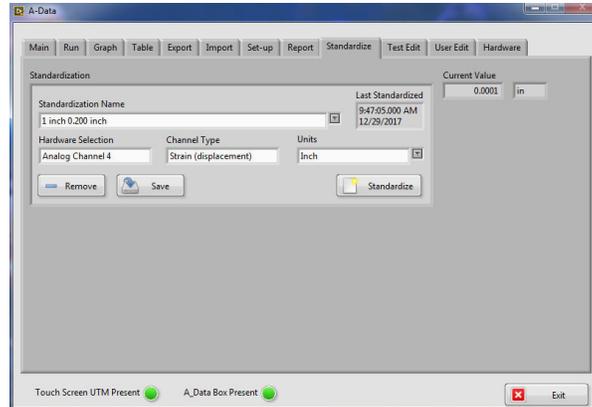


Figure C.13: Standardize Screen



CAUTION: Use caution when making changes in the screen as it could make future tests invalid if done incorrectly, or done without the proper calibrated equipment.



NOTE: A standardization should be redone anytime a sensor is moved to a new analog channel, a different analog box, or on a periodic schedule your company has decided upon (usually once a year).

Standardization Name

Used to select or create a new standardization. To create a new standardization simply type the new standardization name into this field and remember to save before leaving the screen.



NOTE: A standardization name cannot have any of the following ASCII characters (. " @).

Last Standardized Field

Shows the time and date that this standardization was last done.

Hardware Selection

Will select the hardware I/O connection. It will enable only the hardware that is connected to A-Data. If A-Data is talking to an analog box there will be 6 channels of input. If A-Data is connected to an ATS Touch Screen UTM there will be two Modbus channels.

Channel Type

Selects the type of channel this input will be. Will be disabled and the proper selection made for Modbus channels.

Units

Selects the default units for this channel. The units will be set by those put out by the sensor. If FORCE or STRAIN is selected for CHANNEL TYPE only those types of units are shown in the unit list to be selected from.

Remove Button

Will delete this standardization from the system.



CAUTION: Once you delete a file it cannot be recovered and the system will not be able to use it. Unless you have the proper calibrated equipment you will not be able to recreate it.

Save Button

Will save any changes made to the standardization file.



CAUTION: If anything unnecessary is saved then any tests using this standardization will be invalid.

Standardize Button

Will start a standardization and the screen in Figure C.14 will be displayed. This button will be hidden if a Modbus channel is selected because these channels are standardized on the UTM. Refer to the UTM manual for more information. There is not a set start and end point needed for a standardization, however you must go in order from lowest to highest when defining values in the standardization array.

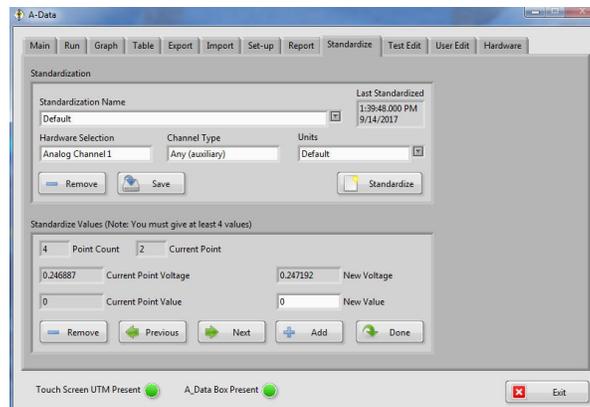


Figure C.14: Standardize Screen, Standardize Button Pressed

Point Count

Shows the total number of points in the standardization array.

Current Point

Shows the current point in the standardization array for which it's information is displayed.

Current Point Voltage

Displays the voltage for the current point in the standardization array.

Current Point Value

Displays the value for the current point in the standardization array.

New Voltage

The voltage that the system sees on the currently selected analog channel.

New Value

The value you read off the calibrated instrument and enter for this voltage.

Add Button

Used to add a new point to the standardization array. Until you have at least one point in the standardization array this is the only button shown. It will always add the new value to the end of the array no matter what point is currently being shown.

Remove Button

Will delete the current point from the standardization array. This may be needed if a value was entered in error.

Previous & Next Buttons

Move back and forth once two or more points have been entered in the standardization array.

Done Button

Used to finish the standardization. This button will not be displayed until there are at least 4 points in the standardization array.



NOTE: Only ATS Service Technicians should perform a standardization. If you have additional questions about standardization, please contact +1-724-283-1212.

C.11 Test Edit Screen

Figure C.15 below shows the Test Edit Screen. It is used to setup a test for the system.

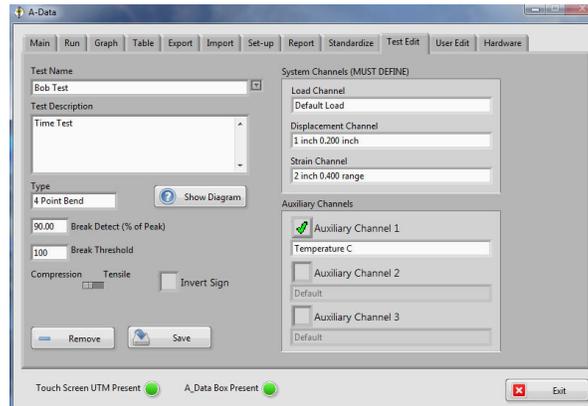


Figure C.15: Test Edit Screen

Test Name

Used to select or create a new test. To create a new test simply type the new test name into this field.



NOTE: A test name cannot have any of the following ASCII characters (. " @).

Test Description

Used to enter a description of the current test. Any ASCII text can be used.

Type

Will define one of three test types, Uniaxial, 3 Point Bend, or 4 Point Bend.

Show Diagram Button

Will show each test type and the dimensions needed for each. Refer to figure AC.6 (p. 47).

Break Detect Percentage Field

Will set the amount that the load has to drop off from the peak for the system to determine that a break has occurred. This value works with the Break Threshold. If you are attached to an ATS Touch Screen UTM and have Modbus Load selected for the load channel this field will be hidden as it is defined on the UTM Main Screen.

Break Threshold

The load value after which the system will start to check for a break detect. If you are attached to an ATS Touch Screen UTM and have Modbus Load selected for the load channel this field will be hidden as it is defined on the UTM Configuration screen.

Invert Sign Load

Used to determine the sign of the load for the test. If you are attached to an ATS Touch Screen UTM and have Modbus Load selected for the load channel this field will be hidden as it is defined on the UTM Configuration Screen.

Invert Sign Displacement

Used to reverse the sign of displacement coming into A-Data. If you are attached to an ATS Touch Screen UTM and have Modbus Strain selected for the displacement channel this field will be hidden as it is defined on the UTM Configuration Screen.

System Channels

MUST be defined as they tell A-Data where to get its information.

Load Channel

The channel A-Data gets its load values from during a test. If not set to Modbus Load remember to zero this on the main screen before starting a test.

Displacement Channel

The channel A-Data gets its displacement values from during a test. If not using Modbus Strain remember to zero this on the main screen before starting a test.

Strain Channel

The channel A-Data gets its strain values from during a test. If not using Modbus Strain remember to zero this on the main screen before starting a test. This can be used with a strain gauge or if using the crosshead for strain it must be defined here as well as displacement.

Auxiliary Channels

Three additional channels that you would like A-Data to log while a test is running. These channels do not have to be defined if you are not using them. They are not used in any calculations but may be displayed on graphs and tables.

To use any of the auxiliary channels simply check the box beside the name and select the correct channel below.

Remove Button

Will delete the current test specification from the system.

Save Button

Will save any changes to the specification file on the system. This must be done before leaving the screen or changes will be lost.

C.12 User Edit Screen

Figure C.16 show is the User Edit Screen. It is used to setup users for the system.

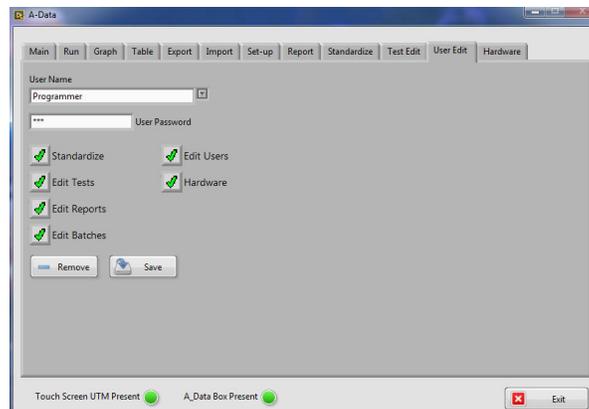


Figure C.16: User Edit Screen

User Name

Used to select or create a new user. To create a new user simply type the new user name into this field.



NOTE: A user name cannot have any of the following ASCII characters (. " @) .

User Password

The password required if this user is selected on the Main Screen. If left blank no password will be required to log in.

Privileges

(Standardize, Edit Tests, Edit Reports, Edit Batches, Edit Users, and Hardware)

Gives users the ability to perform specified tasks if selected. All of them except EDIT BATCHES will prevent access to areas of the software if not selected.

Remove Button

Will delete the user file from the system and that user will no longer be able to log in.

Save Button

Will save any changes to the user information into the user file on the system. This must be done before leaving the screen or changes will be lost.

C.13 Hardware Screen

Figure C.17 below shows the Hardware Screen. It is used to setup and see hardware information for the system.



Figure C.17: Hardware Screen

Touch Screen UTM

This section is for setting up options with the new ATS touch screen Universal Testing Machines (Series 900 and 1100 UTM's).

UTM IP Address

Used to set the Ethernet IP address for the specified test frame. This can be found on the Miscellaneous Screen of the UTM's display. If you wish to connect to a different UTM, change the IP address and press the RECONNECT button.

The rest of the items in this section are used to view what is being communicated to A-Data from the UTM. If A-Data is not attached and communicating to a TOUCH SCREEN UTM these items will be hidden.

A-Data Box

This section is for setting up options with the old A-Data analog box.

Device

Used to select which A-Data box to communicate with. Typically there will only be one attached and it will show up as “DT9816(00)” and be automatically selected. If there are more than one the others will show up as “DT9816(xx)”, where xx is the board number.



NOTE: If multiple analog boxes are used their names will need to be determined. This can be done by disconnecting them one at a time to see which name disappears.

Analog 1-6

The rest of the items in this section are used to view what is being communicated to A-Data from the A-Data analog box. The value shown for each channel is the voltage being seen by A-Data. If A-Data is not attached and communicating to an A-Data analog box these items will be hidden.

Reconnect Button

Pressing this will attempt to connect the touch screen UTM with the entered IP Address. It will also load any A-Data analog boxes attached to the computer into DEVICE to be selected.

D. Operation

D.1 Operation Instructions

1. Turn on the Universal Testing Machine (UTM). Follow directions in the UTM manual for startup.
2. Set-up UTM according to UTM manual and load sample.
3. Connect the computer to the UTM, either through an Ethernet cable (Touch Screen UTM), an A-Data analog box (older UTM's), or both.
4. Start the A-Data software.
5. Verify that the indicators at the bottom of the screen show that the software is talking to the attached devices. If not check the Hardware Screen.
6. Configure Test, Batch, and Report settings if necessary.
7. On the Main Screen zero any necessary devices and select the correct units.
8. Press the RUN tab to go to the Run Screen.
9. Select the preconfigured test and batch.
10. If needed, set specimen name and dimensions for the current specimen.
11. Check that the required devices are still talking to A-Data then press START TEST on the Run Screen.
12. Start the test on the UTM.

Appendix A: Warranty

Your Applied Test Systems product has been manufactured and inspected by experienced craftsmen. Applied Test Systems warrants, for the original purchaser, each product to be free from defects in material and workmanship for a period of thirteen (13) months from date of shipment or twelve (12) months from date of installation - whichever comes first. This warranty does not apply to failures caused by normal usage, misuse, or repair or service by unauthorized personnel, nor does it cover limited life electrical components which deteriorate with age such as tubes, lamps, fuses, and heaters. Load cells are covered for manufactured defects only - incidents of over load or other customer misuse are not covered under warranty. The warranty does not extend to products not manufactured or assembled by Applied Test Systems.

This warranty is expressly limited to the repair, replacement, or adjustment of the product at Applied Test Systems' option. The product must be returned to the Applied Test Systems factory or an authorized repair center. Applied Test Systems shall not be liable for any labor, transportation, or installation costs that may arise in connection with the product or return.

To obtain warranty service:

1. Applied Test Systems must be promptly notified in writing of the defect.
2. Upon receipt of written authorization, said defective equipment is returned as directed, with transportation charges prepaid by the buyer and –
3. Applied Test Systems examination of such equipment discloses to its satisfaction that the defect exists and was not caused by negligence, misuse, improper installation, accident, or unauthorized repair or alteration.

This warranty is in lieu of all other warranties, expressed or implied, including the implied warranty of merchantability or fitness for particular purpose. In no event shall Applied Test Systems be liable for direct, indirect, special, incidental, collateral, or consequential damages.

The aforementioned provisions do not extend the original warranty period of any article that has been either repaired or replaced by Applied Test Systems.

Applied Test Systems reserves the right to change published specifications.

Appendix B: Report Generation

Overview

A-Data 2 contains a report generation program that makes use of a built-in report or report templates. A report template is an ASCII text, Word, or an Excel file that contains labels for which the report generator searches while creating the report output. When a replaceable parameter label is encountered, the label is removed and replaced with the appropriate information. To differentiate the labels from other text, the labels are enclosed in brackets that are commonly referred to as curly braces.

For example, the label for peak load is {pl}. If A-Data 2 encounters a line in the report template such as “The peak load was {pl} pounds.”, and A-Data 2 calculated the actual peak load as 8234.15 pounds, then A-Data 2 will substitute the actual value for the label, and the corresponding line in the output report will read “The peak load was 8234.15 pounds.”

A-Data 2 looks for report templates in the directory “Configure” found directly below the directory in which the A-Data 2 program executable (“.exe”) resides. Some report templates are included for immediate use or to use as an example of how to create your own.

Single_Specimen.rtm	Text template for individual specimen reports.
Batch_Tables.rtm	Text template for multiple specimen reports.
Default.xlsx	Excel template for individual specimen reports.
Example.xlsx	Excel template that show many report functions.
Default.docx	Word template for individual specimen reports.

If the report generation runs into a label that it does not understand, it will repeat the label in curly braces on the report to let the user know that it does not understand that label.

When a report refers to individual analysis items, such as {pl}, and more than one specimen is submitted for analysis, the value substituted for {pl} will be for the first specimen in the list.

The labels are divided into seven categorical tables, and they are Page Format, Test Conditions, Analysis Results, Physical Units, Batch Results for Specimen, Batch Results for Statistics, and Special.

ASCII Test Template

To create columns that align vertically, suffix the Analysis Results labels with the letter J, and the numerical values will be right justified in a field of 15 blank spaces. So for the previous example, {pl} would be replaced by “8234.15” while {plj} would be replaced by “ 8234.15”. Which is, in this example, the value prefixed by 8 spaces.

Some of the labels are used to control page formatting. The labels {hbegin} and {hend} are used to define page headers. Similarly, the labels {fbegin} and {fend} are used to define page footers. Once a page header or footer is defined, it is used for each subsequent page until a null version is defined. To end or clear a header or footer definition merely define one that has no lines. If headers or footers are defined before any other text appears in the

report, they will be used for the first page because the first page does not begin until the first text of the report body is encountered.

If the report contains a reference to {pl(2)}, and more than one specimen was submitted for analysis, then the value substituted for {pl(2)} will be for the second specimen in the list. If this same report is used for a single specimen analysis, then the substitution for {pl(2)} will be the word “Unavailable”. Note, all values for multi-specimen labels will be right justified with a field width of 15 except {sid(...)} which will have a field width of 20.

Most of the text template labels are used in the example template file “Batch_Tables.rtm”.

Word Template

Most of the Word template labels are used in the example template file “Default.docx”.

Please note that you can change fonts and colors, add pictures, Shapes, WordArt, equations, or symbols. Most anything you can place in the Word file you can add to your report.

Excel Template

Most of the Excel template labels are used in the example template file “Example.xlsx”. It shows how you can change fonts, colors, and add graphics to your report. Each sheet also highlights some function.

“Sheet 1” shows how formulas can be used (area & volume).

“Sheet 2” shows how to make a data table.

“Sheet 3” shows how to display a graph.

“Sheet 4” shows how to create a specimen table.

“Sheet 5” shows how to show a statics table.

Replaceable Report Parameters

Label	Substitution Information
Page Format Labels - All Templates	
{h1}	Header text 1 defined in the report
{h2}	Header text 2 defined in the report
{h3}	Header text 3 defined in the report
Page Format Labels – Text Templates ONLY	

Label	Substitution Information
{hbegin}	Start of page header definition
{hend}	End of page header definition
{fbegin}	Start of page footer definition
{fend}	End of page footer definition
{page}	Page break (begin new page)
{page#}	Page number of the current page of the report
Test Condition Labels – All Templates	
{src}	Data Source, Program Name and Version
{tt}	Test Type
{tsid}	Test Specification ID Name
{td}	Test Specification Description
{dir}	Test Direction (Tensile or Compression)
{ptc}	Post Test Comment
{speed}	Crosshead Speed
{disprng}	Displacement Range Full Scale Value
{disprngc}	Displacement Range Channel and Range Percentage
{loadrng}	Load Range Full Scale Value
{loadrngc}	Load Range Channel and Range Percentage
{strarng}	Strain Range Full Scale Value
{strarngc}	Strain Range Channel and Range Percentage
{auxrng},{aux1rng}	Auxiliary 1 Range Full Scale Value
{aux2rng}	Auxiliary 2 Range Full Scale Value
{aux3rng}	Auxiliary 3 Range Full Scale Value
{auxrngc},{aux1rngc}	Auxiliary 1 Range Channel and Range Percentage
{aux2rngc}	Auxiliary 2 Range Channel and Range Percentage

Label	Substitution Information
{aux3rngc}	Auxiliary 3 Range Channel and Range Percentage
{bda}	Percentage Break Defined As
{bid}	Batch ID Name
{sid}	Specimen ID Name
{mat}	Specimen Material
{elen}	Specimen Effective Length
{thidia}	Specimen Thickness / Diameter
{width}	Specimen Width
{gl}	Specimen Gauge Length
{ild}	Specimen Inter-Load Distance
{shape}	Specimen Shape
{date}	Test Start Date
{rdate}	Date the report is printed
{time}	Test Start Time
{rtime}	Time the report is printed
{ao}	Analyzed on (Displacement or Strain)
{tf}	How the test finished
Analysis Results Labels – All Templates	
{pl}	Peak Load
{pe}	Peak Elongation
{pse}	Peak Stress
{psa}	Peak Strain
{bl}	Break Load
{be}	Break Elongation
{bse}	Break Stress

Label	Substitution Information
{bsa}	Break Strain
{cm}	Chord Modulus
{cme1}	Chord Modulus Elongation 1
{cme2}	Chord Modulus Elongation 2
{sm}	Secant Modulus
{sme}	Secant Modulus Elongation
{tm}	Tangent Modulus
{tme}	Tangent Modulus Elongation
{ym}	Young's Modulus
{yme1}	Young's Modulus Elongation 1
{yme2}	Young's Modulus Elongation 2
{ypoff}	Yield Point Offset
{ypoff%}	Yield Point Offset Percentage
{ypzero}	Yield Point, Zero Slope
{ye}	Yield Elongation
{eb}	Energy to Break Point
{late}	Load at Elongation
{latee}	Load at Elongation, Elongation of
{sate}	Stress at Elongation
{satee}	Stress at Elongation, Elongation of
Physical Unit Labels – All Templates	
{uaux}, {uaux1}	Auxiliary 1 Channel Units
{uaux2}	Auxiliary 2 Channel Units
{uaux3}	Auxiliary 3 Channel Units
{uenergy}	Energy

Label	Substitution Information
{ulength}	Length
{uforce}	Force
{uspeed}	Speed
{ustrain}	Strain
{ustress}	Stress
{uarea}	Area
{uvolume}	Volume
Batch Labels for Specimen – All Templates, (...) is sample #, 1 being list top sample	
{pl(...)}	Peak Load
{pe(...)}	Peak Elongation
{pse(...)}	Peak Stress
{psa(...)}	Peak Strain
{bl(...)}	Break Load
{be(...)}	Break Elongation
{bse(...)}	Break Stress
{bsa(...)}	Break Strain
{cm(...)}	Chord Modulus
{sm(...)}	Secant Modulus
{tm(...)}	Tangent Modulus
{ym(...)}	Young's Modulus
{ypoff(...)}	Yield Point Offset
{ypzero(...)}	Yield Point Zero Slope
{ye(...)}	Yield Elongation
{eb(...)}	Energy to Break Point
{late(...)}	Load at Elongation

Label	Substitution Information
{sate(...)}	Stress at Elongation
{sid(...)}	Specimen ID Name
{elen(...)}	Specimen Effective Length
{thidia(...)}	Specimen Thickness / Diameter
{width(...)}	Specimen Width
{ild(...)}	Specimen Inter-Load Distance
{speed(...)}	Crosshead Speed
Batch Labels for Statistics – All Templates	
{plcnt}	Peak Load statistics count
{pecnt}	Peak Elongation statistics count
{psecnt}	Peak Stress statistics count
{psacnt}	Peak Strain statistics count
{blcnt}	Break Load statistics count
{becnt}	Break Elongation statistics count
{bsecnt}	Break Stress statistics count
{bsacnt}	Break Strain statistics count
{cmcnt}	Chord Modulus statistics count
{smcnt}	Secant Modulus statistics count
{tmcnt}	Tangent Modulus statistics count
{ymcnt}	Young's Modulus statistics count
{ypoffcnt}	Yield Point Offset statistics count
{ypzerocnt}	Yield Point Zero Slope statistics count
{yecnt}	Yield Elongation statistics count
{ebcnt}	Energy to Break Point statistics count
{latecnt}	Load at Elongation statistics count

Label	Substitution Information
{satecnt}	Stress at Elongation statistics count
{plmen}	Peak Load statistics mean
{pemen}	Peak Elongation statistics mean
{psemen}	Peak Stress statistics mean
{psamen}	Peak Strain statistics mean
{blmen}	Break Load statistics mean
{bemen}	Break Elongation statistics mean
{bsemen}	Break Stress statistics mean
{bsamen}	Break Strain statistics mean
{cmmen}	Chord Modulus statistics mean
{smmen}	Secant Modulus statistics mean
{tmmen}	Tangent Modulus statistics mean
{ymmen}	Young's Modulus statistics mean
{ypoffmen}	Yield Point Offset statistics mean
{ypzeromen}	Yield Point Zero Slope statistics mean
{yemen}	Yield Elongation statistics mean
{ebmen}	Energy to Break Point statistics mean
{latemen}	Load at Elongation statistics mean
{satemen}	Stress at Elongation statistics mean
{plmin}	Peak Load statistics minimum
{pemin}	Peak Elongation statistics minimum
{psemin}	Peak Stress statistics minimum
{psamin}	Peak Strain statistics minimum
{blmin}	Break Load statistics minimum
{bemin}	Break Elongation statistics minimum

Label	Substitution Information
{bsemin}	Break Stress statistics minimum
{bsamin}	Break Strain statistics minimum
{cmmin}	Chord Modulus statistics minimum
{smmin}	Secant Modulus statistics minimum
{tmmin}	Tangent Modulus statistics minimum
{ymmin}	Young's Modulus statistics minimum
{ypoffmin}	Yield Point Offset statistics minimum
{ypzeromin}	Yield Point Zero Slope statistics minimum
{yemin}	Yield Elongation statistics minimum
{ebmin}	Energy to Break Point statistics minimum
{latemin}	Load at Elongation statistics minimum
{satemin}	Stress at Elongation statistics minimum
{plmax}	Peak Load statistics maximum
{pemax}	Peak Elongation statistics maximum
{psemax}	Peak Stress statistics maximum
{psamax}	Peak Strain statistics maximum
{blmax}	Break Load statistics maximum
{bemax}	Break Elongation statistics maximum
{bsemax}	Break Stress statistics maximum
{bsamax}	Break Strain statistics maximum
{cmmax}	Chord Modulus statistics maximum
{smmax}	Secant Modulus statistics maximum
{tmmax}	Tangent Modulus statistics maximum
{ymmax}	Young's Modulus statistics maximum
{ypoffmax}	Yield Point Offset statistics maximum

Label	Substitution Information
{ypzeromax}	Yield Point Zero Slope statistics maximum
{yemax}	Yield Elongation statistics maximum
{ebmax}	Energy to Break Point statistics maximum
{latemax}	Load at Elongation statistics maximum
{satemax}	Stress at Elongation statistics maximum
{plrng}	Peak Load statistics range
{perng}	Peak Elongation statistics range
{pserng}	Peak Stress statistics range
{psarnng}	Peak Strain statistics range
{blrng}	Break Load statistics range
{berng}	Break Elongation statistics range
{bserng}	Break Stress statistics range
{bsarnng}	Break Strain statistics range
{cmrng}	Chord Modulus statistics range
{smrng}	Secant Modulus statistics range
{tmrng}	Tangent Modulus statistics range
{ymrng}	Young's Modulus statistics range
{ypoffrng}	Yield Point Offset statistics range
{ypzerorng}	Yield Point Zero Slope statistics range
{yerng}	Yield Elongation statistics range
{ebrng}	Energy to Break Point statistics range
{laterng}	Load at Elongation statistics range
{saterng}	Stress at Elongation statistics range
{plvar}	Peak Load statistics variance
{pevar}	Peak Elongation statistics variance

Label	Substitution Information
{psevar}	Peak Stress statistics variance
{psavar}	Peak Strain statistics variance
{blvar}	Break Load statistics variance
{bevar}	Break Elongation statistics variance
{bsevar}	Break Stress statistics variance
{bsavar}	Break Strain statistics variance
{cmvar}	Chord Modulus statistics variance
{smvar}	Secant Modulus statistics variance
{tmvar}	Tangent Modulus statistics variance
{ymvar}	Young's Modulus statistics variance
{ypoffvar}	Yield Point Offset statistics variance
{ypzerovar}	Yield Point Zero Slope statistics variance
{yevar}	Yield Elongation statistics variance
{ebvar}	Energy to Break Point statistics variance
{latevar}	Load at Elongation statistics variance
{satevar}	Stress at Elongation statistics variance
{plstd}	Peak Load statistics standard deviation
{pestd}	Peak Elongation statistics standard deviation
{psestd}	Peak Stress statistics standard deviation
{psastd}	Peak Strain statistics standard deviation
{blstd}	Break Load statistics standard deviation
{bestd}	Break Elongation statistics standard deviation
{bsestd}	Break Stress statistics standard deviation
{bsastd}	Break Strain statistics standard deviation
{cmstd}	Chord Modulus statistics standard deviation

Label	Substitution Information
{smstd}	Secant Modulus statistics standard deviation
{tmstd}	Tangent Modulus statistics standard deviation
{ymstd}	Young's Modulus statistics standard deviation
{ypoffstd}	Yield Point Offset statistics standard deviation
{ypzerostd}	Yield Point Zero Slope statistics standard deviation
{yestd}	Yield Elongation statistics standard deviation
{ebstd}	Energy to Break Point statistics standard deviation
{latestd}	Load at Elongation statistics standard deviation
{satestd}	Stress at Elongation statistics standard deviation
{plcoef}	Peak Load statistics coefficient of variation
{pecoef}	Peak Elongation statistics coefficient of variation
{psecoef}	Peak Stress statistics coefficient of variation
{psacoef}	Peak Strain statistics coefficient of variation
{blcoef}	Break Load statistics coefficient of variation
{becoef}	Break Elongation statistics coefficient of variation
{bsecoef}	Break Stress statistics coefficient of variation
{bsacoef}	Break Strain statistics coefficient of variation
{cmcoef}	Chord Modulus statistics coefficient of variation
{smcoef}	Secant Modulus statistics coefficient of variation
{tmcoef}	Tangent Modulus statistics coefficient of variation
{ymcoef}	Young's Modulus statistics coefficient of variation
{ypoffcoef}	Yield Point Offset statistics coefficient of variation
{ypzerocoef}	Yield Point Zero Slope statistics coefficient of variation
{yecoef}	Yield Elongation statistics coefficient of variation
{ebcoef}	Energy to Break Point statistics coefficient of variation

Label	Substitution Information
{latecoef}	Load at Elongation statistics coefficient of variation
{satecoef}	Stress at Elongation statistics coefficient of variation
{pl95l}	Peak Load statistics 95% confidence interval low
{pe95l}	Peak Elongation statistics 95% confidence interval low
{pse95l}	Peak Stress statistics 95% confidence interval low
{psa95l}	Peak Strain statistics 95% confidence interval low
{bl95l}	Break Load statistics 95% confidence interval low
{be95l}	Break Elongation statistics 95% confidence interval low
{bse95l}	Break Stress statistics 95% confidence interval low
{bsa95l}	Break Strain statistics 95% confidence interval low
{cm95l}	Chord Modulus statistics 95% confidence interval low
{sm95l}	Secant Modulus statistics 95% confidence interval low
{tm95l}	Tangent Modulus statistics 95% confidence interval low
{ym95l}	Young's Modulus statistics 95% confidence interval low
{ypoff95l}	Yield Point Offset statistics 95% confidence interval low
{ypzero95l}	Yield Point Zero Slope statistics 95% confidence interval low
{ye95l}	Yield Elongation statistics 95% confidence interval low
{eb95l}	Energy to Break Point statistics 95% confidence interval low
{late95l}	Load at Elongation statistics 95% confidence interval low
{sate95l}	Stress at Elongation statistics 95% confidence interval low
{pl95h}	Peak Load statistics 95% confidence interval high
{pe95h}	Peak Elongation statistics 95% confidence interval high
{pse95h}	Peak Stress statistics 95% confidence interval high
{psa95h}	Peak Strain statistics 95% confidence interval high
{bl95h}	Break Load statistics 95% confidence interval high

Label	Substitution Information
{be95h}	Break Elongation statistics 95% confidence interval high
{bse95h}	Break Stress statistics 95% confidence interval high
{bsa95h}	Break Strain statistics 95% confidence interval high
{cm95h}	Chord Modulus statistics 95% confidence interval high
{sm95h}	Secant Modulus statistics 95% confidence interval high
{tm95h}	Tangent Modulus statistics 95% confidence interval high
{ym95h}	Young's Modulus statistics 95% confidence interval high
{ypoff95h}	Yield Point Offset statistics 95% confidence interval high
{ypzero95h}	Yield Point Zero Slope statistics 95% confidence interval high
{ye95h}	Yield Elongation statistics 95% confidence interval high
{eb95h}	Energy to Break Point statistics 95% confidence interval high
{late95h}	Load at Elongation statistics 95% confidence interval high
{sate95h}	Stress at Elongation statistics 95% confidence interval high
{pl99l}	Peak Load statistics 99% confidence interval low
{pe99l}	Peak Elongation statistics 99% confidence interval low
{pse99l}	Peak Stress statistics 99% confidence interval low
{psa99l}	Peak Strain statistics 99% confidence interval low
{bl99l}	Break Load statistics 99% confidence interval low
{be99l}	Break Elongation statistics 99% confidence interval low
{bse99l}	Break Stress statistics 99% confidence interval low
{bsa99l}	Break Strain statistics 99% confidence interval low
{cm99l}	Chord Modulus statistics 99% confidence interval low
{sm99l}	Secant Modulus statistics 99% confidence interval low
{tm99l}	Tangent Modulus statistics 99% confidence interval low
{ym99l}	Young's Modulus statistics 99% confidence interval low

Label	Substitution Information
{ypoff99l}	Yield Point Offset statistics 99% confidence interval low
{ypzero99l}	Yield Point Zero Slope statistics 99% confidence interval low
{ye99l}	Yield Elongation statistics 99% confidence interval low
{eb99l}	Energy to Break Point statistics 99% confidence interval low
{late99l}	Load at Elongation statistics 99% confidence interval low
{sate99l}	Stress at Elongation statistics 99% confidence interval low
{pl99h}	Peak Load statistics 99% confidence interval high
{pe99h}	Peak Elongation statistics 99% confidence interval high
{pse99h}	Peak Stress statistics 99% confidence interval high
{psa99h}	Peak Strain statistics 99% confidence interval high
{bl99h}	Break Load statistics 99% confidence interval high
{be99h}	Break Elongation statistics 99% confidence interval high
{bse99h}	Break Stress statistics 99% confidence interval high
{bsa99h}	Break Strain statistics 99% confidence interval high
{cm99h}	Chord Modulus statistics 99% confidence interval high
{sm99h}	Secant Modulus statistics 99% confidence interval high
{tm99h}	Tangent Modulus statistics 99% confidence interval high
{ym99h}	Young's Modulus statistics 99% confidence interval high
{ypoff99h}	Yield Point Offset statistics 99% confidence interval high
{ypzero99h}	Yield Point Zero Slope statistics 99% confidence interval high
{ye99h}	Yield Elongation statistics 99% confidence interval high
{eb99h}	Energy to Break Point statistics 99% confidence interval high
{late99h}	Load at Elongation statistics 99% confidence interval high
{sate99h}	Stress at Elongation statistics 99% confidence interval high
Special Labels – Text Templates ONLY (see “Batch-Tables.rtm” for help)	

Label	Substitution Information
{table(specimen)}	User selected specimen analysis results
{table(statistics)}	User selected statistics for an analysis set of multiple specimens

Special Labels - Excel Templates ONLY (see "Example.xlsx" for help)		
Label	Cell	Information
{table(specimen)}	1	User selected specimen analysis results
	2	Number of cell across the sheet to use
{table(statistics)}	1	User selected statistics for an analysis set of multiple specimens
	2	Number of cell across the sheet to use
{table(data)}	1	Table of data for a single specimen
	2 - 11	Data to be displayed, the following are the options: time - test time displacement - position reading load - load reading strain - strain gauge reading aux1 - Auxiliary channel 1 reading aux2 - Auxiliary channel 2 reading aux3 - Auxiliary channel 3 reading calcstress - Calculated sample stress calcstraindisp - Calculated sample strain, from displacement calcstaringauge - Calculated sample strain, from strain gauge
{graph}	1	Graph of data for a single specimen. Using this label will add a new sheet to the workbook for each graph for data.
	2, 3	Data to be used. Cell 2 is the x-axis, while cell 3 is the y-axis. The following are the options: time - test time displacement - position reading load - load reading strain - strain gauge reading aux1 - Auxiliary channel 1 reading aux2 - Auxiliary channel 2 reading aux3 - Auxiliary channel 3 reading calcstress - Calculated sample stress calcstraindisp - Calculated sample strain, from displacement calcstaringauge - Calculated sample strain, from strain gauge

Special Labels - Excel Templates ONLY (see "Example.xlsx" for help)		
Label	Cell	Information
	4	Number of columns for graph
	5	Number of rows for graph
	6	Title for graph. If more than 1 graph is used, you MUST provide a different title for each graph used.

Appendix C: Calculations

A. Peak Load is the maximum load experienced by the specimen during a test as illustrated by point A in Figure AC.1.

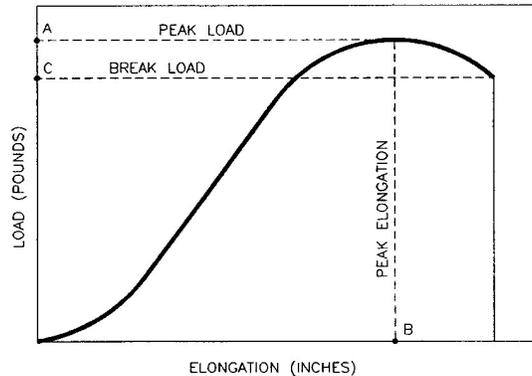


Figure AC.1: Load/Elongation Values

B. Break Load is either the recorded load at the point just before the specimen breaks or the recorded load where the break is defined as a percentage of Peak Load. Break Load is illustrated as point C on Figure AC.1.

C. Elongation is the change in length of a specimen as measured by a gauging device attached to the specimen, such as an extensometer, or by the movement of the crosshead. Analysis can be made utilizing an elongation number from either source, but the software must be told which source is to be used for analysis. The word “elongation” in this Appendix will mean a change in length of the specimen as measured from either source. Elongation as measured by a gauge will be designated by “elongation-gauge” and elongation as measured by crosshead movement will be designated by “elongation-crosshead.”

D. Elongation-Gauge is the change in length of a specimen as measured by an extensometer or similar measuring device attached to the specimen as a load or a force is applied to the specimen. The distance between contact points of the measuring device attached to the specimen establishes the gauge length. An extensometer or similar measuring device attached directly to the specimen should be utilized to acquire accurate information regarding the stretching of the specimen under load. Peak Elongation is the elongation at Peak Load as illustrated by point B on Figure AC.1.

E. Elongation-crosshead is the change in length of the specimen as measured by the movement of the crosshead as a load is applied to the specimen. This gives similar information to elongation-gauge above. The elongation-crosshead number will be larger than the elongation-gauge number for the same test due to recording the stretching of more of the specimen and recording movements of the crosshead caused by slippages of the specimen grips. When elongation-crosshead is used, the individual performing the test has to use judgment relative to defining the effective specimen length.

F. Effective Specimen Length is the length between the grips plus additional small lengths within the grips. These small additional lengths within the grips and varying gripping techniques necessitate judgments in defining effective specimen length. When test specimens are made with a reduced cross sectional area in the middle of the specimen, the effective specimen length is the length of the reduced cross sectional area. In many tests this is of no consequence because the important information is the relative change between test specimens rather than specific

data on a specimen. If specific data is required on a test specimen, an extensometer or similar gauging device should be used to acquire the most accurate information.

G. Break Elongation is the recorded elongation at the Break Load Point. Break Elongation is illustrated by point C on Figure AC.1.

H. Stress is the Load or Force applied to a specimen divided by the original cross sectional area for uniaxial tests. Peak Stress or Ultimate Strength is the Peak Load divided by the original cross sectional area of the specimen. Peak Stress is illustrated by point C in Figure AC.2.

I. Break Stress is the stress at the break point illustrated as point D in Figure AC.2.

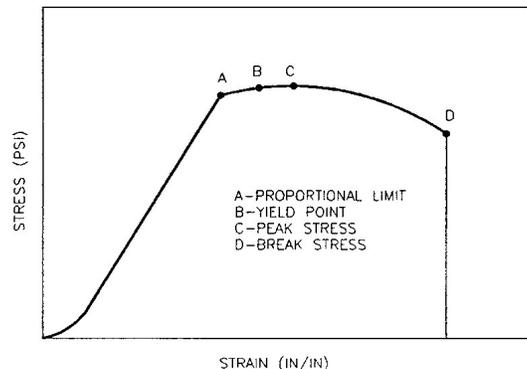


Figure AC.2: Stress/Strain Values

J. Strain is either the elongation divided by the gauge length or the effective length of the specimen as defined above. Peak Strain is the elongation at the break point divided by the gauge length or the effective length. Peak Strain is illustrated by point D on Figure AC.2.

K. Break Strain is the strain at the break point and is illustrated by point D in Figure AC.2.

L. Yield Point is a point on the Stress-Strain curve where Strain increases without any additional Stress or Load. This point is determined by the Zero Slope Method or the Offset Method.

M. Yield Point (Zero Slope Method) – The yield point is determined by finding the first section of the curve where the slope of a least squares line fit of five consecutive data points is zero or negative. The point of maximum load or stress is selected from these five data points and the stress is reported as Yield Point. This point is illustrated on Figure AC.3.

N. Yield Point (Offset Method) – The yield point is determined by:

1. Extending the constant slope portion of the stress curve through the X axis. Young's modulus is normally used to determine the slope of this line.
2. Constructing a parallel line to 1. above offset by a percentage of strain. Offset for metals is usually specified as 0.2% and the offset for plastics is usually 2.0%. The intersection of the offset line and the stress strain curve determines the Yield Point. It is also referred to as Yield Strength. This point is illustrated on Figure AC.3.

O. Yield Elongation is the Strain recorded at either of the Yield points above. The yield elongation is illustrated in Figure AC.3.

P. Modulus of Elasticity is the rate of change of stress as a function of strain and is represented by the slope of the stress strain curve. This is a numerical value to quantify a measurement of the elasticity of the material. This modulus is shown by several definitions such as Young's Modulus, Chord modulus, Secant modulus, and Tangent modulus.

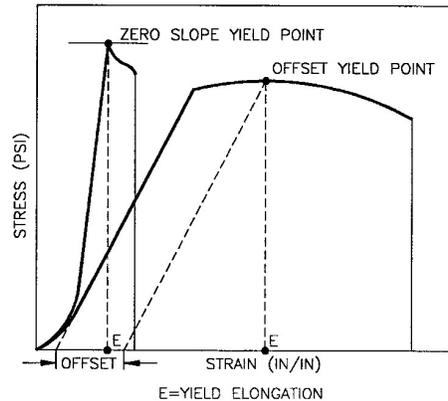


Figure AC.3: Yield Elongation

Q. Young's Modulus is determined by:

1. Performing a linear least squares fit of the stress strain curve between 10-25% of the peak load or strain.
2. Add data points to 1. above first on the low end (below 10%) and then on the high end (above 25%) until the coefficient of determination (which is an indicator of quality of fit) decreases by 0.001. The number representing the slope of this line is Young's Modulus. This line is extended through the x-axis which establishes the curve-foot-offset. Young's Modulus is illustrated as points E and F in Figure AC.4.

R. Tangent Modulus is the slope of any tangent line at any point on the stress strain curve. It is illustrated as point D in Figure AC.4.

S. Secant Modulus is normally the ratio of Stress to Strain at any point on the stress strain curve. This definition is changed slightly to remove data of the foot or starting section of the curve where seating of grips, etc. occurs. The x-axis intercept point of Young's modulus line is used as an anchor point for one end of the secant line instead of

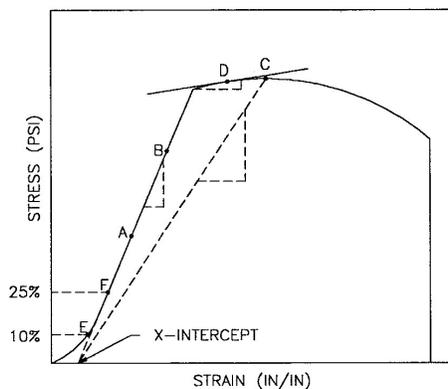


Figure AC.4: Stress/Strain Moduli

using the zero point on the graph. The other end of the secant line can be any point on the stress strain curve. This is illustrated by the dashed line between the x-intercept and point C on Figure AC.4.

T. Chord Modulus is the slope of a line drawn between any two points of the stress strain curve.

U. Energy to Break Point is determined by the area under the stress strain curve up to the Yield Point. This value is commonly referred to as the toughness of the material and its units are expressed in inch-pounds per cubic inch or pounds per square inch. See Figure AC.5.

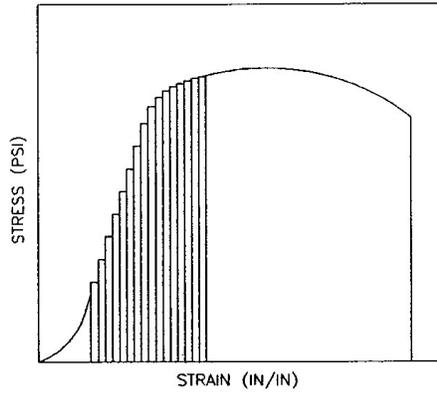
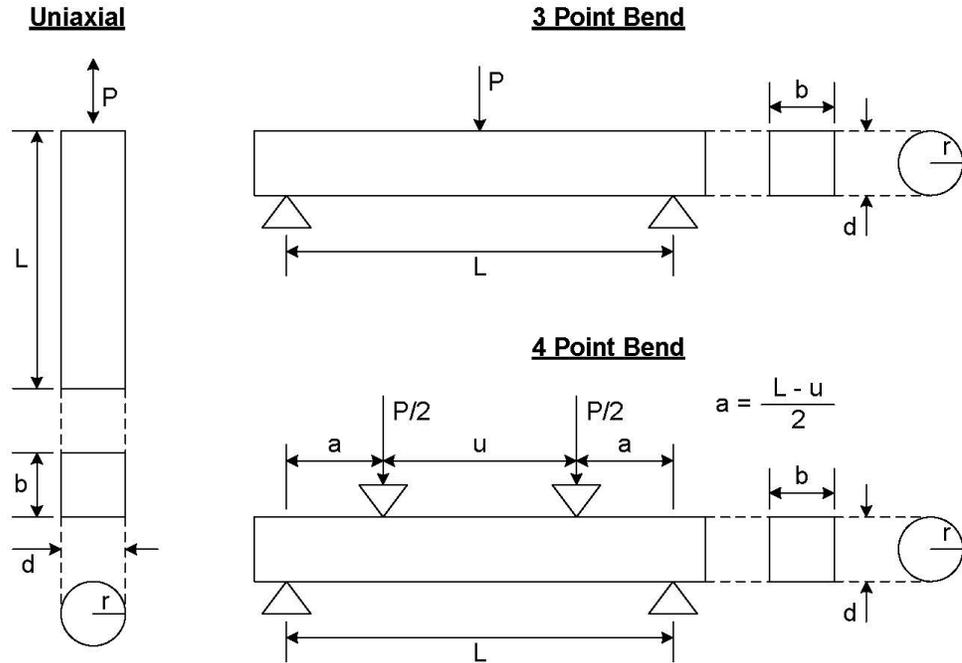


Figure AC.5: Energy to Break Point



P=Force
 L= Effective Length
 b=Width

measured
 given
 given

d=Thickness given
 r=Radius given
 u=Inter Load Distance given

Specimen Geometry	Area (A)	Moment (I)
Rectangular	$b \cdot d$	$\frac{b \cdot d^3}{12}$
Cylindrical	$\pi \cdot r^2$	$\frac{\pi \cdot d^4}{64}$

Test Geometry	Strain Factor (K_ϵ)	Stress Factor (K_σ)
Uniaxial	$\frac{1}{L}$	$\frac{1}{A}$
3 Point Bend	$\frac{6 \cdot d}{L^2}$	$\frac{d \cdot L}{8 \cdot I}$
4 Point Bend	$\frac{12 \cdot d}{3 \cdot L^2 - 4 \cdot a^2}$	$\frac{a \cdot d}{4 \cdot I}$

ϵ = Strain = $K_\epsilon \cdot \Delta L$
 σ = Stress = $K_\sigma \cdot P$
 E = Modulus = $\frac{\Delta \sigma}{\Delta \epsilon}$

Figure AC.6: Specimen Geometry and Calculations

Appendix D: Optional Fingerprint Reader

Figure AD.1 below shows what the User Screen will look like if you have the optional fingerprint reader option. It is used to setup users for the system.

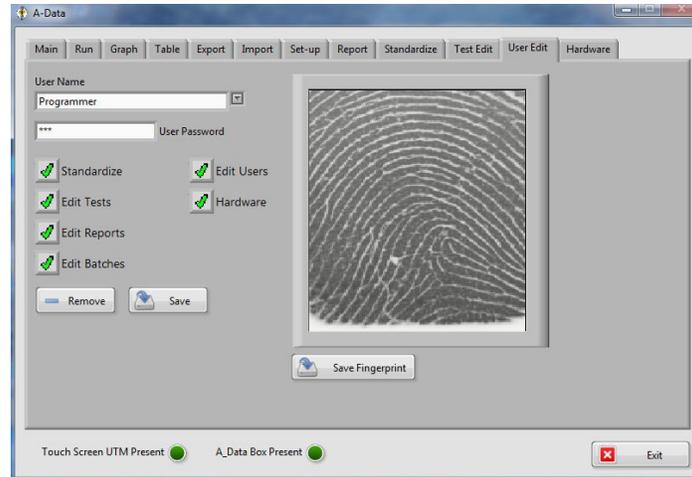


Figure AD.1: User Screen Fingerprint Option

User Name

Used to select or create a new user. If you wish to create a new user simply type the new user name into this field and remember to save before leaving the screen. Note, a user name cannot have any of the following ASCII characters (. " @).

User Password

Password required if this user is selected on the main screen. If left blank then no password will be required to log in.

Checkbox Selections

The selections STANDARDIZE, EDIT TESTS, EDIT REPORTS, EDIT BATCHES, EDIT USERS, and HARDWARE allow this user if selected in the main screen to do the selected tasks. All of them except EDIT BATCHES will hide tabs if not selected.

Fingerprint Setup

If a fingerprint is to be used to log in, have the person place their finger on the reader and press the SAVE FINGERPRINT button to save it. The fingerprint image is white until a finger is placed on the reader. Once a fingerprint is saved the user can log in at any time by placing their finger on the reader.



NOTE: ATS does not recommend that this be done when the system is running a test as the system is busy doing time critical tasks at that time. Also saving a fingerprint image can be done as many times as you want. For example, if the person cuts their finger and needs to change

the saved image to a different finger just have them place it on the reader and press SAVE FINGERPRINT and the new image will be used.

Remove Button

Deletes the user file from the system. That user will no longer be able to log in.

Save Button

Saves any changes to the user information into the user file on the system. This must be done before leaving the screen if changes were made that you wish to keep.

Appendix E: Image Glossary

Figure A.1: ATS Sample Data Tag	1
Figure C.1: Main Screen.....	3
Figure C.2: Run Screen.....	5
Figure C.3: Graph Screen	7
Figure C.4: Table Screen.....	8
Figure C.5: Export Screen.....	9
Figure C.6: Export Screen, Graph Test Data.....	9
Figure C.7: Import Screen	10
Figure C.8: Set-Up Screen	11
Figure C.9: Report Screen.....	12
Figure C.10: Report Header Pop-Up.....	13
Figure C.11: Report Analysis	14
Figure C.12: Report Statistics.....	15
Figure C.13: Standardize Screen	16
Figure C.14: Standardize Screen, Standardize Button Pressed	17
Figure C.15: Test Edit Screen.....	19
Figure C.16: User Edit Screen.....	21
Figure C.17: Hardware Screen.....	22
Figure AC.1: Load/Elongation Values.....	43
Figure AC.2: Stress/Strain Values	44
Figure AC.3: Yield Elongation	45
Figure AC.4: Stress/Strain Moduli	45
Figure AC.5: Energy to Break Point.....	46
Figure AC.6: Specimen Geometry and Calculations	47
Figure AD.1: User Screen Fingerprint Option.....	48