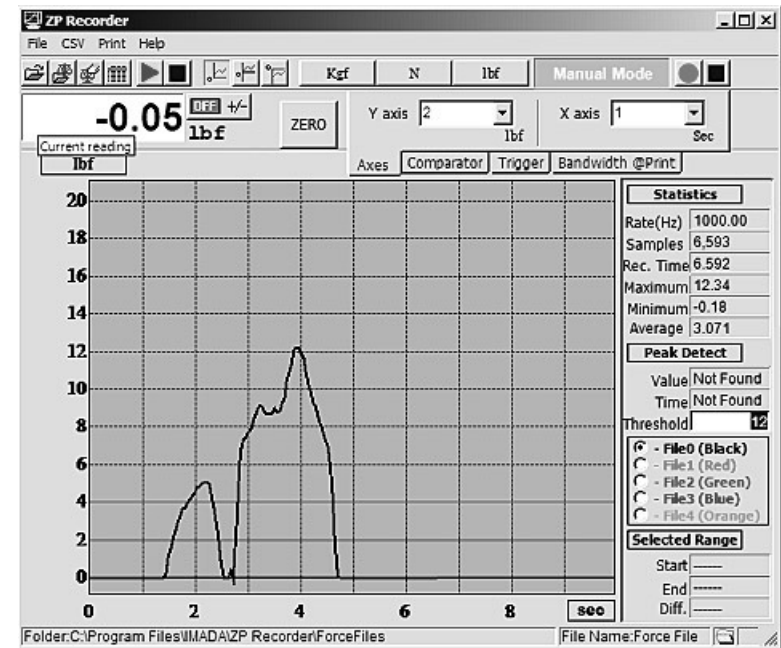


ZP Recorder

Force Data Analyzer



For Force Gauge Models: ZP, ZPH and ZPS

INSTRUCTION MANUAL

2 YEAR WARRANTY (RESTRICTIONS APPLY)

Imada, Inc. warrants its products to the original purchaser to be free from defects in workmanship and material under normal use and proper maintenance for two years (one year for adapters, attachments and cables) from original purchase. This warranty shall not be effective if the product has been subject to overload, shock load, misuse, negligence, accident or repairs attempted by others than Imada, Inc.

During the warranty period, we will, at our option, either repair or replace defective products. Please call our customer service department for a return authorization number and return the defective product to us with freight prepaid.

The foregoing warranty constitutes the **SOLE AND EXCLUSIVE WARRANTY**, and we hereby disclaim all other warranties, express, statutory or implied, applicable to the products and/or software, including but not limited to all implied warranties of merchantability, fitness, non-infringement, results, accuracy, security and freedom from computer virus. In no event shall Imada, Inc. and/or its affiliated companies be liable for any incidental, consequential or punitive damages in connection with the use of its products and/or software.

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What is ZP Recorder?

The ZP Recorder is force analysis software designed to interface with Imada Z Series (USB) force gauges. ZP Recorder records and processes 1,000 data per second (not just the peak) and generates a graph with statistics. Zoom into any part of the graph to see individual data points at intervals of 1mS. Mouse over data points to display their force value.

Further analysis can be done on the entire range or by selecting part of the graph to detect the first peak or generate statistics within that time interval. Compare and align multiple graphs. Save graphs or export data to CSV format.

ZP Recorder offers a new toolbox to analyze force data.

Hardware/Software Requirements

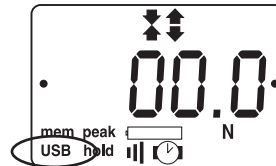
PC: Pentium II 400MHz or equivalent with USB port

Operating System: Microsoft Windows NT, 2000, XP

Gauge: Imada Force Gauge with USB port

Install USB driver:

1. Turn on the gauge and confirm the USB caption is visible on the gauge display (If you have already installed the USB Driver for ZP Logger you do not have to do it again).



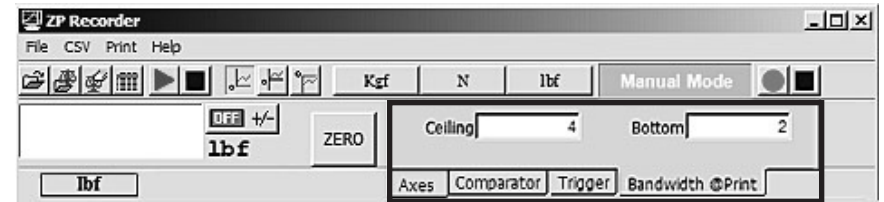
If the caption is not present turn off the gauge.

Press **ON/OFF** again while holding **ZERO**, CF9 flashes with solid m0.

Press **PEAK** or **ZERO** to cycle CF9m0, CF9m1, CF9m2, CF9m3 and CF9End. When CF9 m3 appears press **SEND** to select.

Then press **PEAK** or **ZERO** to cycle. 'USB': USB output or '232C': RS232 output. Press **SEND** to select 'USB', CF9End displays, press **SEND** to exit.

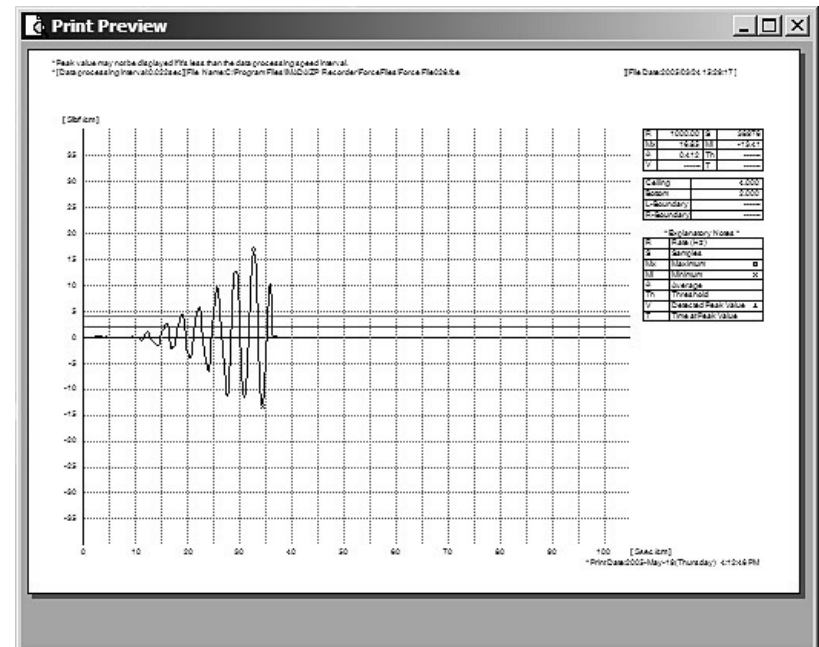
Bandwidth @Print Tab (Print Reference Lines)



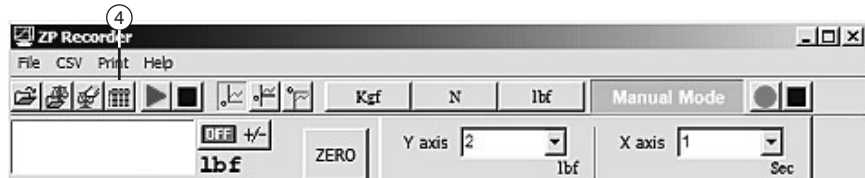
Print reference lines to illustrate the High/Low values or other parameters by entering them here. The red line on the printed graph is the high limit (Ceiling) and the blue line is the low limit (Bottom).


Print Preview

To display a graph as it will look when printed select Preview from the Print menu. Statistics, peaks, bandwidth, date, time and file path information are also included. Maximize or minimize the preview by continuously clicking the left or right mouse buttons while on the preview screen.



Statistics



After recording data, view statistics of the entire graph or selected range by clicking  (key ④), then click either the Entire range or the Selected range buttons. For Selected Range refer to page 16.

Entire range		Selected range			
File Name	Rate(Hz)	Samples	Maximum	Minimum	Average
Force File051.fce	1000.00	9,261	2.87	-2.63	0.070

Printing

Printing a Graph

Choose *Print* → *Print*.

Paper Size

Standard international paper sizes like ISO A4 are widely used. Many U.S. office suppliers are now stocking these dimensions. Refer to your printer's manual for paper size configurations.



A4 210 x 297mm (8 1/4" x 11 3/4") approx. letter size

B4 250 x 353mm (9 7/8" x 13 7/8") approx. legal size

A3 297 x 420mm (11 3/4" x 16 1/2") approx. tabloid size

2. Connect the ZP, ZPH or ZPS force gauge to computer with the USB cable provided. Welcome to the Found New Hardware Wizard should appear.
3. Insert the Driver CD-ROM (included with force gauge) and select "install software automatically." Click Next and follow onscreen instructions. When prompted to search the Web select "No not this time" and click Next.
4. If a Windows XP compatibility message appears, select "continue anyway."
5. After the ZP driver is installed select "Finish."
6. Eject the Driver CD-ROM.

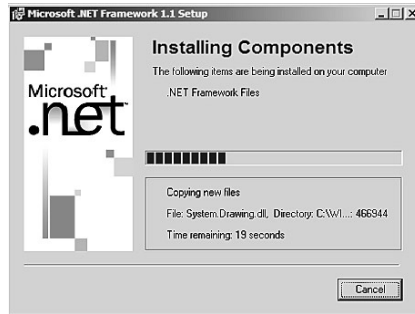
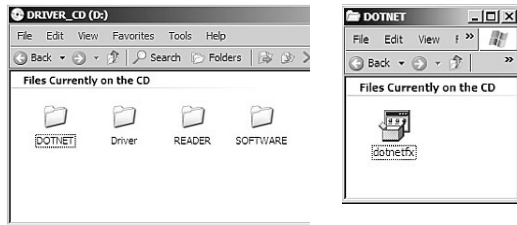


Installing Microsoft .NET Framework

Microsoft .NET Framework 1.1 or later must be installed prior to running ZP Recorder software. If Microsoft .NET Framework 1.0 has been previously installed it must be removed.

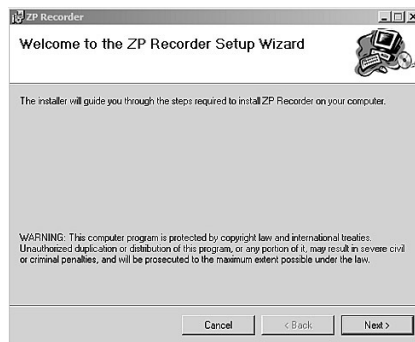
1. Check to see if you already have the .NET Framework installed by clicking Start on your Windows desktop, selecting Control Panel, and then double-clicking the Add or Remove Programs icon. When that window appears, scroll through the list of applications. Highlight and remove all .NET applications earlier than version 1.1. If you see Microsoft .NET Framework 1.1 listed, you do not need to install it again. Proceed to install ZP Recorder.

- Once you have removed versions earlier than 1.1 or if no Framework is installed, insert Driver CD-ROM included with your Imada force gauge. Double click the DOTNET folder and install the dotnetfx package by double-clicking the icon.
- Eject Driver CD-ROM and restart the computer.



Install ZP Recorder software:

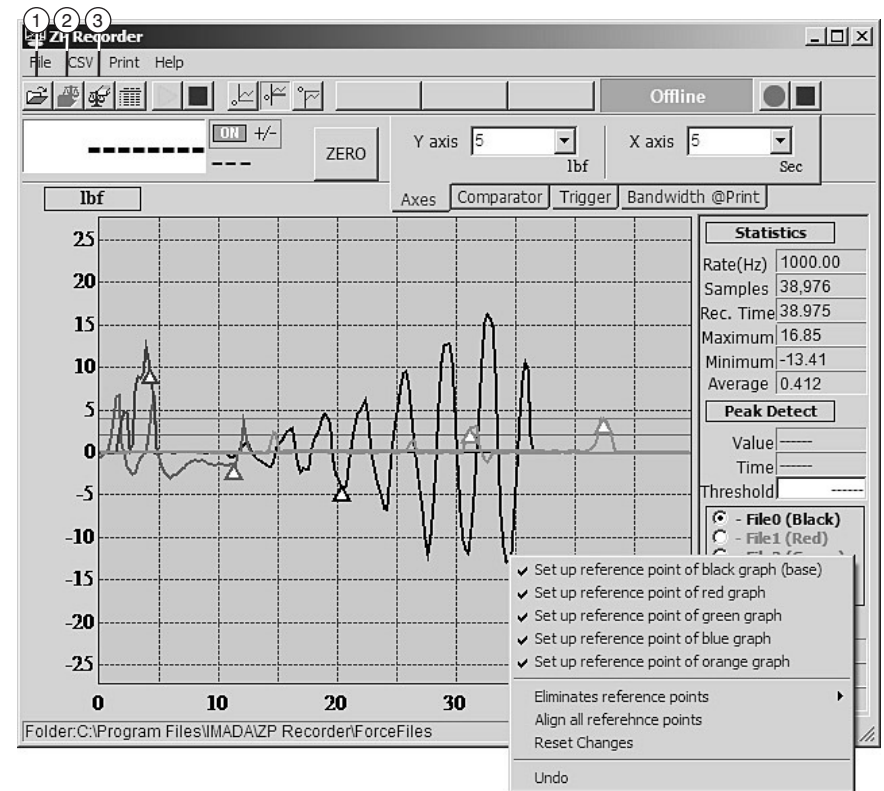
- Insert the ZP Recorder CD and open the ZPR folder. Double click the ZP Recorder icon.
- Follow the on screen instructions:
- Choose "close" when installation is complete.
- Eject ZP Recorder CD-ROM.



Each graph is assigned a color in the order of its selection.

- Graph 0 (Black) base graph
- Graph 1 (Red)
- Graph 2 (Green)
- Graph 3 (Blue)
- Graph 4 (Orange)

Note: All graphs must have the same force unit.

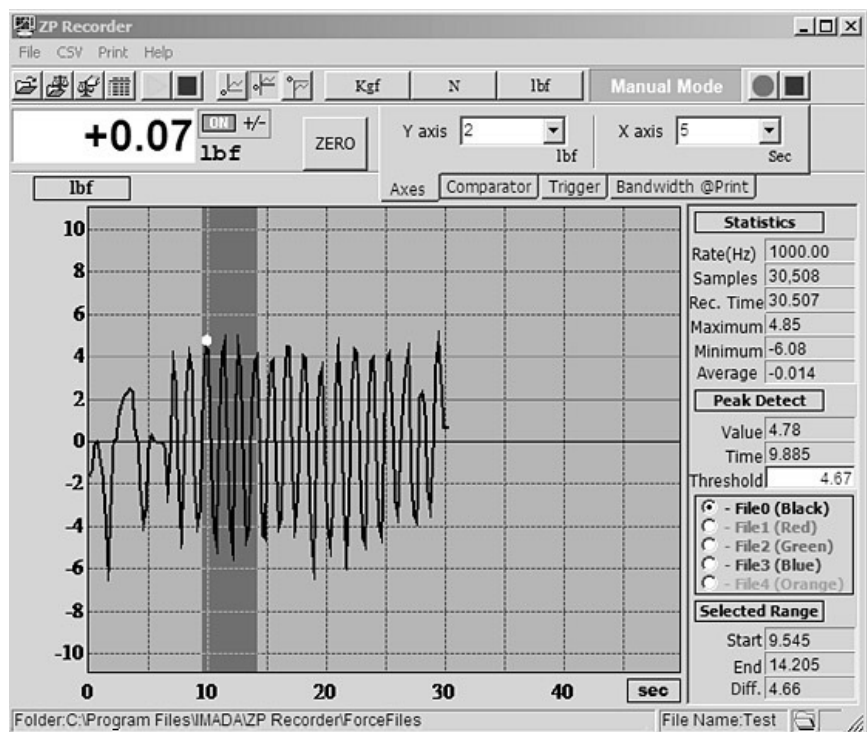


Aligning to the Base Graph

Right click any graph to set a reference point indicated by Δ . Graph one through four can be shifted to align with the base graph (black) by selecting *Align All Reference Points*. To return the graphs to their original positions, select *Reset Changes*.

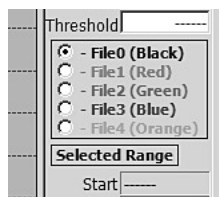
First Peak Detection and Selected Range

Use Selected Range with First Peak Detection to display the first peak value within a specific interval of time.



Viewing Multiple Graphs

Click (key ①) and select the base graph you wish to open.
 Click (key ②) to open a graph for comparing to the already open base graph. A maximum of five graphs can be open.
 View statistics of any graph by selecting the radio buttons located to the right of the graph.
 Any open graph (1-4) can be closed by selecting (key ③).



Working with ZP Recorder

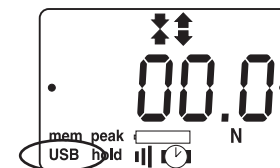
Using ZP-Recorder for the First Time

1. Click Start/Programs/Imada/ZP Recorder
2. When activating the program for the first time enter the product key printed on the CD case.

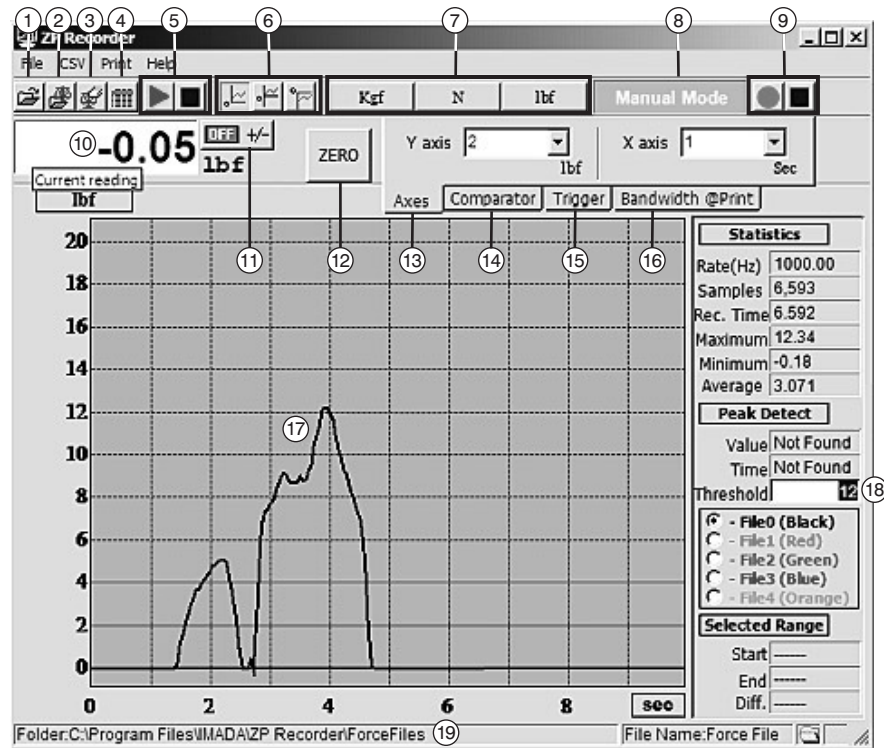
DO NOT LOSE THIS NUMBER!

Note: Enter 4 digits into the first field and the remaining 8 digits into the second field. The program does not automatically advance between the fields. If your product key doesn't work, uninstall and reinstall ZP Recorder and try again.

1. Turn on the gauge and confirm the USB caption is visible on the gauge display.
 2. Connect the ZP, ZPH or ZPS force gauge to computer with the USB cable provided.
 3. Turn on the gauge. The ZP Recorder status indicator should change from gray to green (Manual mode).
- If status indicator doesn't change to green, check:
- USB cable
 - USB driver installation
 - Microsoft.NET Framework 1.1 installation.
- If **ZP Logger** software (included on Driver CD-ROM) is running, it should be closed.



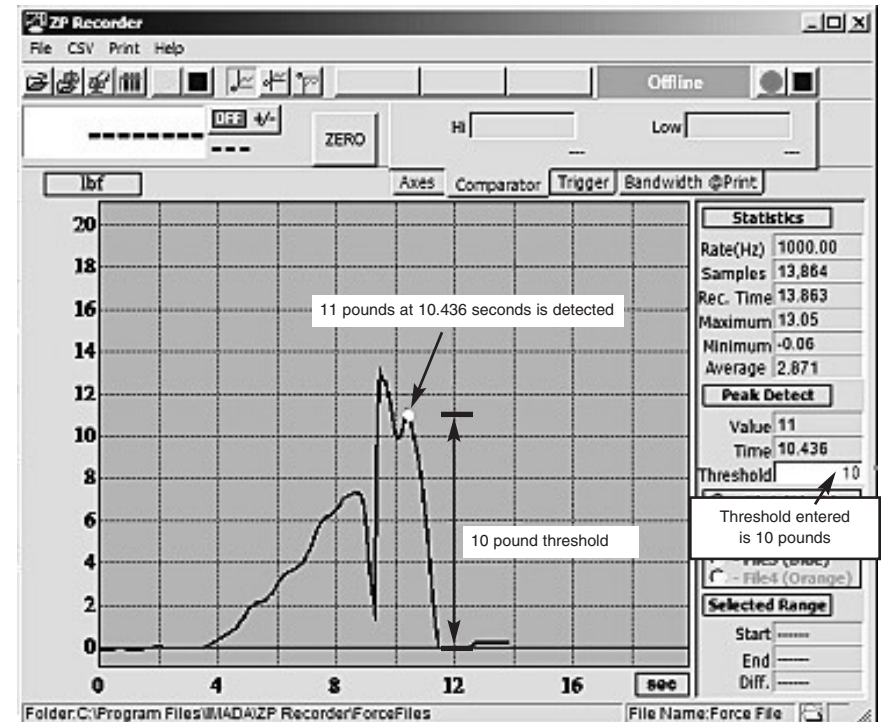
Main Screen Keys






- | | |
|------------------------------|------------------------|
| ① Open Base Graph (black) | ⑪ Sign Complement |
| ② Open graphs for comparison | ⑫ Zero (Tare) button |
| ③ Close graphs | ⑬ Axes Tab |
| ④ Statistics | ⑭ Comparator Tab |
| ⑤ Preview Mode Start/Stop | ⑮ Trigger Tab |
| ⑥ Quadrants | ⑯ Bandwidth @Print Tab |
| ⑦ Units | ⑰ Force/Time graph |
| ⑧ Status Indicator | ⑱ Threshold Input |
| ⑨ Start/Stop Recording | ⑲ Data file path |
| ⑩ Digital readout | |

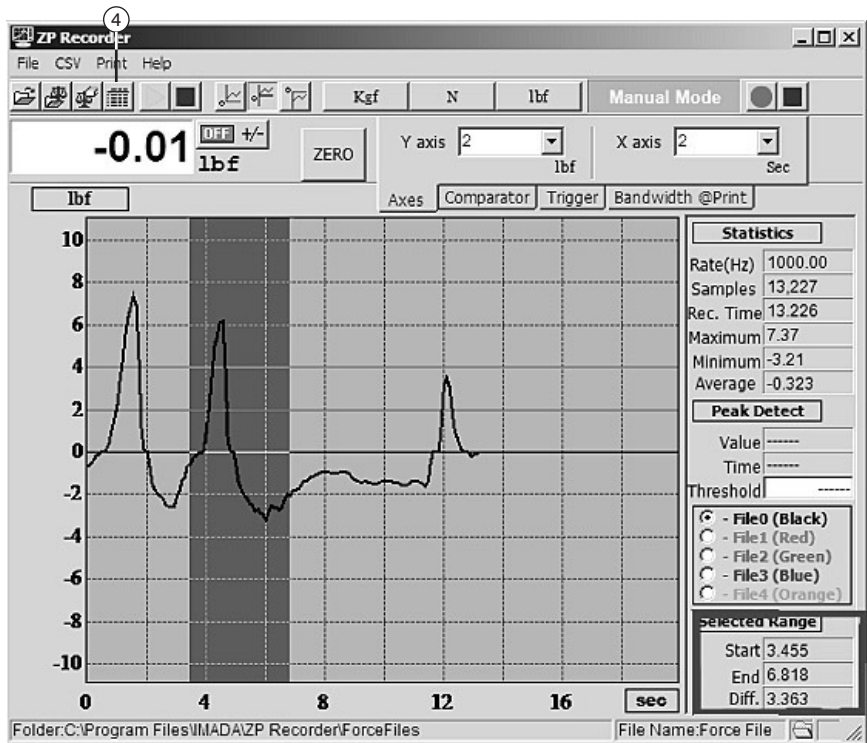
First Peak Detection

After data is recorded, detect the first peak followed by a specific force reduction. Enter a specific reduction of force into the Threshold input box. The first peak for this specific threshold (following the graph from left to right) will be detected automatically. For the illustration below, a 10 pound threshold is entered and a peak of 11 pounds at 10.436 seconds is detected.



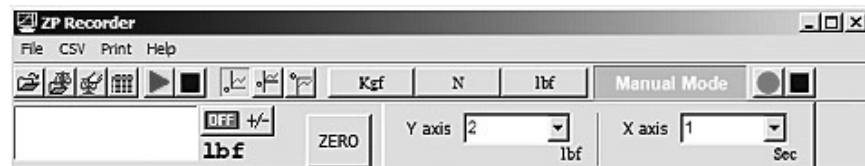
Selected Range

Any portion of the graph can be selected for statistics and analysis. To select a part of the graph, click the selected range button  from the navigation palette. Click a point on the graph to form the left boundary. While pressing the shift key, click a point to the right of the left boundary to form the right boundary. For statistics click  (key ④) and choose selected range. To deactivate the selected range, click the  button from the navigation palette. (See page 18 to use selected range with first peak detection).






Basic Configuration

Setup quadrants, units and axes for proper operation. High and low limits are optional.



1. Quadrant* (required key ⑥)

Imada gauges measure tension as a negative value. If you want to graph tension as a positive value turn the Sign Complement to ON.




-  1st quadrant (positive side)
-  1st & 4th quadrant (entire graph)
-  4th quadrant (negative side)

Sign Complement Button (key ⑪)

OFF: Force tension data is graphed as a negative value and compression as a positive value.

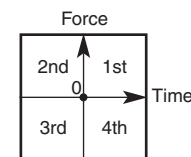
ON: Force tension data is graphed as a positive value and compression as a negative value; tension data is displayed in the first quadrant.

2. Measuring units (required key ⑦)

-  Set gauge and graph units to kilograms(grams)
 -  Set gauge and graph units to Newtons
 -  Set gauge and graph units to pounds(ounces)
- Selected units appear to the right of the digital readout.

*What is a quadrant?

Quadrants are the four sections of a plane formed by the intersection of two perpendicular lines. The point of intersection represents 0, the vertical axis force and the horizontal axis time. ZP-Recorder limits all graphs to the first and fourth quadrants.



3. Axes Tab (required key ⑬)



Enter data or use the drop down list when entering axis values.

X-Axis: (Seconds) 0.5 – 10,000


Y-Axis: (Units) 0.001 – 2,000

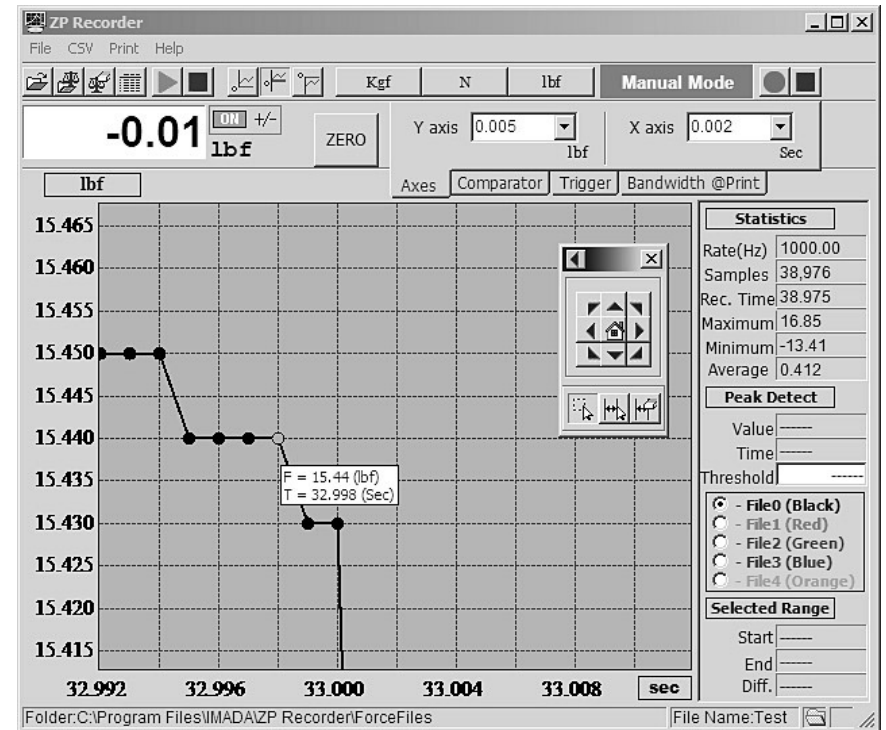
4. Comparator Tab (optional key ⑭)



The Comparator allows you to enter high/low force limits when recording. High value equals red line; low value equals blue line on the graph. These values correspond to Go/NoGo LEDs on the force gauge when testing.

5. Preview Mode (key ⑮)

 Use these start and stop controls to quickly view force profiles or confirm basic configuration parameters. Statistics or file saving are not enabled when using preview mode.



Mouse Over Graph

The value for any data point (sample) on the graph can be displayed by positioning the mouse pointer over that specific point.

Saving the Selected Range of a Graph as a New CSV File


Highlight any portion of a graph to determine its selected range (see page 16 for details). With the range of the graph highlighted, choose *CSV → Save as selected range CSV file...* Enter the file name and if desired modify the file path. Note: If no selected range is defined the entire graph will be saved.


Adding the Selected Range of a Graph to an existing CSV file


Highlight any portion of a graph to determine its selected range. See page 16 for details. With the range of the graph highlighted, choose *CSV → Save existing range CSV file...* Select a CSV file you wish to modify and click open. The next available column in the CSV file selected will be populated with data. Note: If no selected range is defined the entire graph will be added to the file.

Analyzing Saved Data

Zoom and Navigation Palette

After data is recorded the zoom and navigation palette appears. Use the arrow keys to shift the graph in the viewing window. Click  to return to the original view.

Use the zoom tool  to magnify any part of your graph. Click and hold the mouse button while dragging the mouse over a selected part of the graph to create a rectangle.

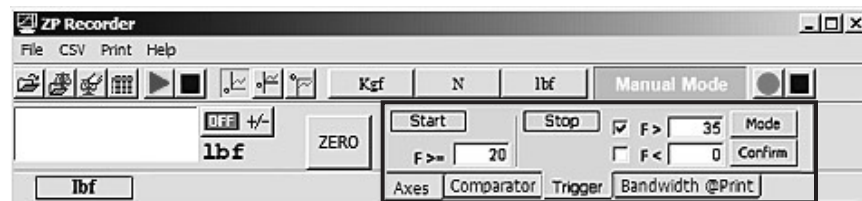
Release the mouse button to magnify the area within the rectangle. You may repeat the process and magnify the graph so individual data points at intervals of 1mS are visible. Click  to return to the original view.

The zoom tool may be used in combination with Selected Area, First Peak Detection, or Viewing Multiple Graphs.





Recording Data

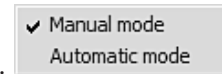
Recording can be configured in two modes: Manual or Automatic.



Manual Mode

1. Click the trigger tab and then click **Mode**.
2. Check Manual mode. Status indicator is green.
3. Press Zero **ZERO** to tare weight of the attachment on the gauge.
4. Click the red button  to begin recording. Click the black button  to stop recording.


(See File Saving section for an explanation on system archiving.)




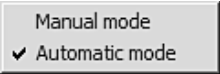





Automatic Mode

Can be configured to capture and save data for both destructive and nondestructive testing (See the chart below).



Start parameter **A** is required. Stop parameters **B** and **C** are optional. Stop parameter **B** sets the high limit and **C** stops testing if force drops below the start value. Stop recording at any time by clicking black button .

	STOP VALUE C	START VALUE A	STOP VALUE B
Destructive Tests	X	X	
Non-Destructive Tests		X	X
Non-Destructive Tests with Safety Stop	X	X	X

1. Click the trigger tab and then click .
2. Check Automatic mode. Status indicator is yellow. 
3. Enter start parameter (A) into the F>= input box. Press the Return key.
4. Enter stop parameters (B) F> and/or (C) F< into their respective input boxes. Press the Return key. Select the corresponding check boxes to activate these parameters.
5. Press Zero  to tare weight of the attachment on the gauge.
6. Click red button  to enable recording. The status indicator displays yellow  until the start parameter (A) is met, and then changes to red . Recording stops, when the value of either stop parameter (B) or (C) is reached, or the black button  is pressed. (See File Saving section for an explanation on system archiving.)

File Saving (System Archiving)

While recording, the system automatically saves file(s) with a fce extension. The first file saved is Force File001. The next file saved is incremented to Force File002. The default file path is C:\Program Files \ Imada \ ZP recorder \ ForceFiles. To modify the file name and file path choose *File* → *Setting* → *Save as...*

Gauge Memory Download

Use ZP Logger to download gauge memory to your computer. ZP Logger is included with the gauge on the USB Driver CD-ROM. ZP Recorder must be closed when using ZP Logger.

Saving Files

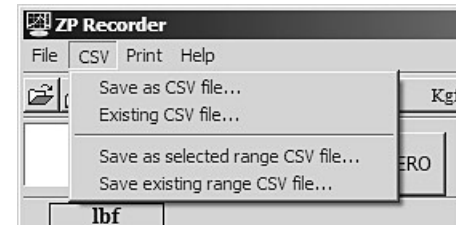
Data Directory

Choose *File* → *Setting* → *Save as...* to modify the name and path of the data files saved in the recording mode. By default, files are saved at C:\Program Files \ Imada \ ZP recorder \ ForceFiles.



Data Export

All recorded files with less than 65,536 data points (samples) can be saved as a CSV file. A CSV (comma separated values) file contains the values in a table as a series of ASCII text lines arranged so that a comma separates each column. Many applications like Microsoft Excel or Microsoft Access can read CSV files. When exporting, the ZP recorder designates the first five rows of CSV information as statistics.



Saving a New CSV File

With a file open, go to the file menu and choose *CSV* → *Save as CSV file*. Enter the file name and if desired modify the file path.

Adding a Column to an existing CSV file

With a file open, go to the file menu and choose *CSV* → *Existing CSV file*. Select a CSV file you wish to modify and click open. The next available column in the CSV file selected will be populated with data.