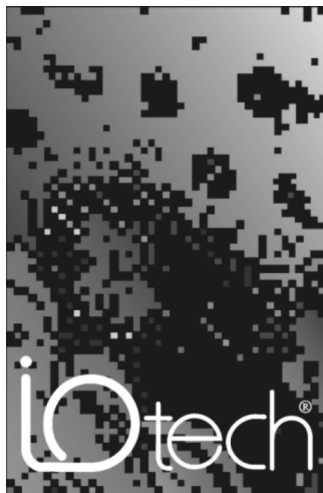


eZ-TOMAS

User's Manual

ZonicBook Software for Temporary Online Monitoring and Analysis



the smart approach to instrumentation™

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eZ-TOMAS User's Manual

*ZonicBook Software for
Temporary Online Monitoring and Analysis*

p/n 1086-0923, rev 5.0

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Many IOtech products carry the CE marker indicating they comply with the safety and emissions standards of the European Community. As applicable, we ship these products with a Declaration of Conformity stating which specifications and operating conditions apply.

Warnings, Cautions, Notes, and Tips



Refer all service to qualified personnel. This warns of possible personal injury or equipment damage under noted conditions. Follow all safety standards of professional practice and the recommendations in this manual. Using this equipment in ways other than described in this manual can present serious safety hazards or cause equipment damage.



This warning symbol is used in this manual or on the equipment to warn of possible injury or death from electrical shock under noted conditions.



Use proper ESD handling guidelines when handling equipment or components sensitive to damage from electrostatic discharge. Proper handling guidelines include the use of grounded anti-static mats and wrist straps, ESD-protective bags and cartons, and related procedures.



This symbol indicates the message is important, but is not of a Warning or Caution category. These notes can be of great benefit to the user, and should be read.



In this manual, the book symbol always precedes the words "Reference Note." This type of note identifies the location of additional information that may prove helpful. References may be made to other chapters or other documentation.



Tips provide advice that may save time during a procedure, or help to clarify an issue. Tips may include additional reference.

Specifications and Calibration

Specifications are subject to change without notice. Significant changes will be addressed in an addendum or revision to the manual. As applicable, IOtech calibrates its hardware to published specifications. Periodic hardware calibration is not covered under the warranty and must be performed by qualified personnel as specified in this manual. Improper calibration procedures may void the warranty.

Quality Notice



IOtech has maintained ISO 9001 certification since 1996. Prior to shipment, we thoroughly test our products and review our documentation to assure the highest quality in all aspects. In a spirit of continuous improvement, IOtech welcomes your suggestions.

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What is eZ-TOMAS 1

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Reference Note:

If necessary, refer to the *ZonicBook Getting Started User's Manual* for information regarding the following:

- Software Installation
- System Requirements
- Hardware Setup
- Driver Installation

What is eZ-TOMAS?

eZ-TOMAS (Temporary Online Monitoring and Analysis Software) is designed to collect vibration and process data from rotating machinery.

eZ-TOMAS can simultaneously monitor, acquire, store, and display data from the ZonicBook FFT analyzer. Typically, these signals are associated with a specific machine train. The analog inputs can be any combination of Proximity, Velocity, Accelerometer, Tach, or DC proportional voltage signals. Up to three tach signals are supported.

The data acquired by eZ-TOMAS and the supporting configuration information are stored in files defined by you. This allows you to move eZ-TOMAS from machine to machine. The acquired data is stored based on event changes defined by you. Defined events include time, overall, and rotating speed.

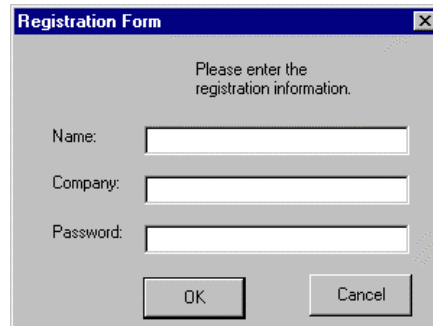
Acquisition, instrumentation, and storage configuration parameters are also definable. These parameters are stored over time. Configuration changes do not invalidate previously acquired data.

A basic graphical User Interface (UI) is provided. The UI consists of 8 instrument gauges. The gauge display can include any one of 10 spectral amplitudes or frequencies of interest. You can interactively display data in a variety of formats, including: Spectrum, Orbit, Polar, Time, Bode, Cascade/Waterfall and Strip Chart.

Start eZ-TOMAS

To run eZ-TOMAS, double-click the eZ-TOMAS icon or use your Windows desktop Start button to navigate to the program file.

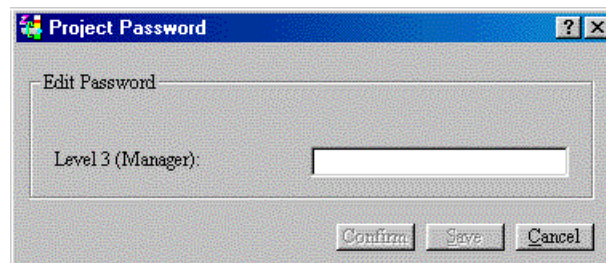
The first time you start eZ-TOMAS you will be prompted for your name, your company name, and a password. This password is the software key that will activate eZ-TOMAS for every day operations.

A dialog box titled "Registration Form" with a close button (X) in the top right corner. The text inside says "Please enter the registration information." Below this are three input fields labeled "Name:", "Company:", and "Password:". At the bottom are two buttons: "OK" and "Cancel".

Registration Form

If you are loading your software from a CD the password accompanies the CD. If you downloaded your software from the website, your password will be emailed to you within one business day.

You will next be prompted to set up your project's security password. When you click the <Save> button the *Password Confirm* window opens. Retype your security password and click the <Confirm> button.

A dialog box titled "Project Password" with a close button (X) and a help button (?) in the top right corner. The text inside says "Edit Password". Below this is a label "Level 3 (Manager):" followed by a single input field. At the bottom are three buttons: "Confirm", "Save", and "Cancel".

Password Form

After your password is accepted, you are returned to the Main window.

Connecting Signals



Reference Note:

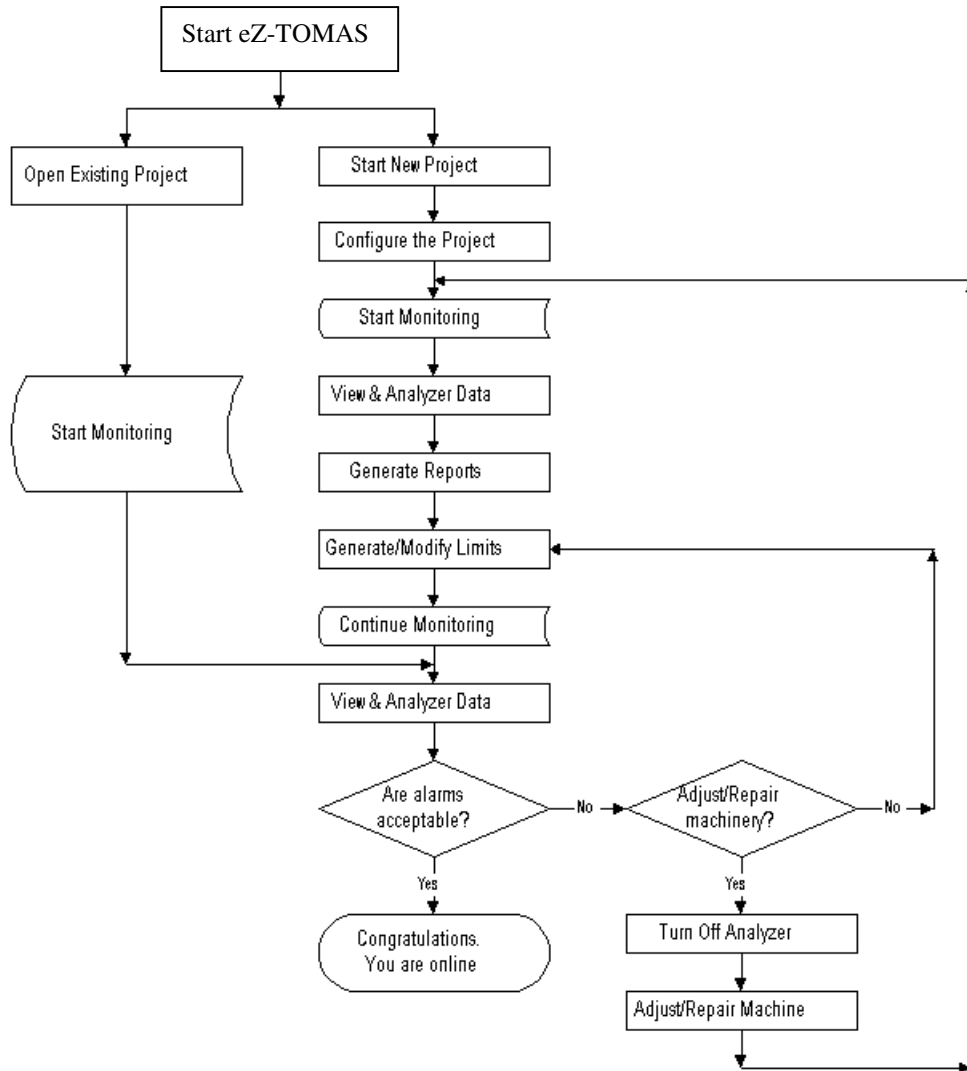
If necessary, refer to the *ZonicBook Getting Started User's Manual* for information regarding the following:

- Software Installation
- System Requirements
- Hardware Setup
- Driver Installation

Connect your analog signals to the ZonicBook's BNC inputs. Typically, proximity and DC proportional signals should be DC coupled; and Accelerometer, Velocity, and Tach signals should be AC coupled.

Prox:	SE(single ended)	DC	ICP off
Accel/Vel:	SE	AC	ICP on
Tach:	SE	AC	ICP off

Order of Operation



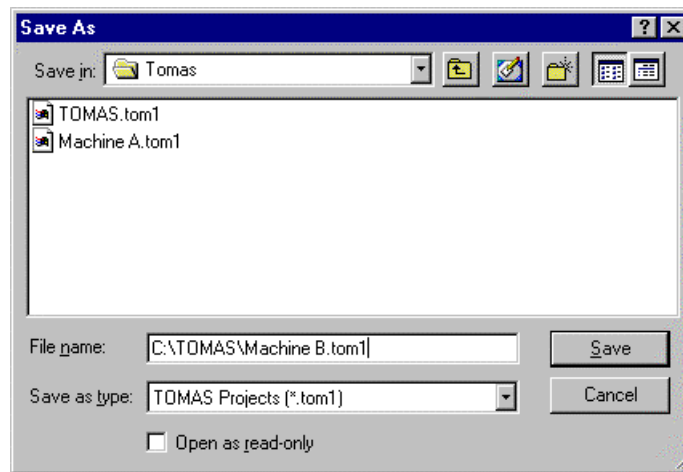


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An eZ-TOMAS Project contains eZ-TOMAS configuration and data files. You should logically equate an eZ-TOMAS Project with a specific machine that you wish to monitor.

1. On the File Menu, select New Project to open the Save As window.



New File

2. Select or create a Windows folder for the eZ-TOMAS Project.
3. Enter the name for this project.
4. Click the <Save> button to create the new project.

Configure the Project

A default configuration is automatically loaded. You may want to make some changes to the configuration. However, you can start monitoring immediately.

Configure the ZonicBook

On the Edit menu select ZonicBook to open the ZonicBook Configuration window. Make the necessary changes for each of the tabs and then click the <Save> button.



An in-depth explanation of eZ-TOMAS windows and menus is in the next chapter of this manual.

CAUTION

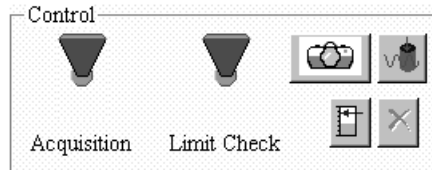


Clicking the Cancel button will cancel all the changes you've made since you opened this window.

- Acquisition Configuration sets up parameters for the ZonicBook FFT analyzer.
- Channels Configuration sets up the parameters for the input channels.
- In the Spectral Bands Configuration panel the first four Bands are predefined. You can modify Bands 5 through 10 for your specific application.
- Data storage configuration specifies the trigger events that will activate data storage. If any one event is triggered, data from all channels is stored. Data storage events are triggered when a change occurs within the range of your defined parameters.

Start Monitoring

After you configure your eZ-TOMAS Project, press the Acquisition Toggle Switch in the Control panel to start data acquisition.



Control Panel

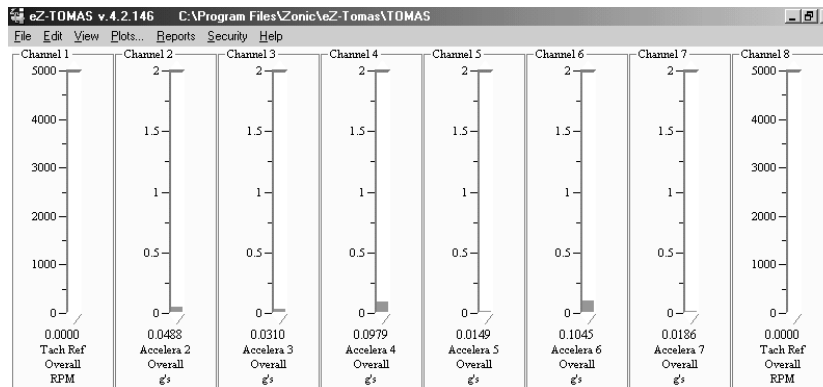
When acquisition is active, real time overall values are displayed in the instrument gauges. The toggle switch is green while data acquisition is active.

To stop data acquisition, click the switch toggling it down (red).

Allow eZ-TOMAS to monitor your machine for several hours, minimum. eZ-TOMAS needs to create a history file of the operating condition of the machine. If the operating condition is "right" the history file can be used to generate limits for you.

View Spectral Bands


You can monitor the different spectral bands by watching the gauges in the Main window. On the View menu select the band of interest to view gauge data.



Spectral Bands

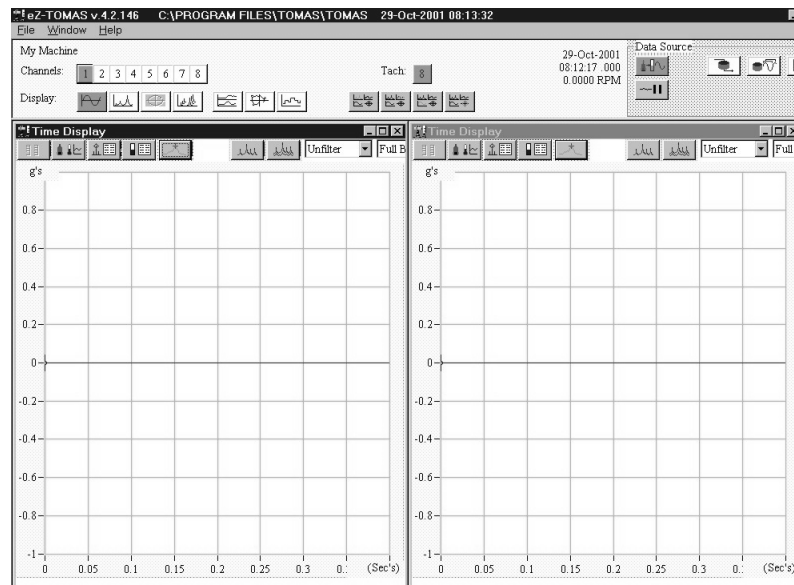
Plot Data

Click Plots on the Main menu to open the Data Display window, or double-click on a gauge to plot that gauge's data.

For Real Time displays you can **Halt and Resume** the display of data by using the Pause/Continue toggle button,  , or use the "P" key on the keyboard. When viewing historical data, you can use the five playback buttons and the slider to navigate through the data.

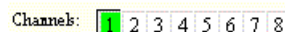
Multiple Plots

1. On the File menu of the Plots window, select *Open Plot Window*. This opens a second display window.
2. On the *Window* menu of the *Plots* window select either *Tile Vertically* or *Tile Horizontally*. All display windows will be displayed simultaneously, as shown below.



Plots Tiled Vertically

3. Select the Channel(s) and Display type for each window.

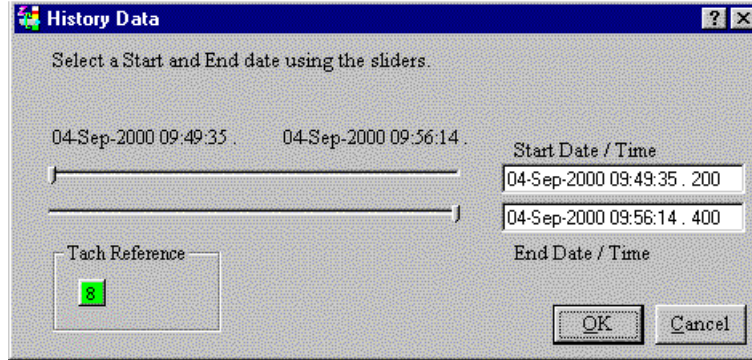


A **cursor** is provided with each display. To move the cursor, place your mouse icon over the cursor and drag it to the desired location on the trace. You can also use the comma (,) and period (.) keys to move the cursor. Cursor information is listed immediately to the left of the display.

Generate Limits

Statistical reports can and should be used to automatically generate limit values based on historical data. After your new project has been running for several hours, there is probably enough data in the history file to have eZ-TOMAS automatically generate limits. However, you will want to edit these limits if the machine is experiencing amplitude or frequency shifts.

1. On the Reports menu select Statistical; the History Data window will open



History Data Window

2. Drag the pointers across the scale to select the Start Date and Time, and the End Date and Time for the report. Click the OK button. The Report will then be displayed.

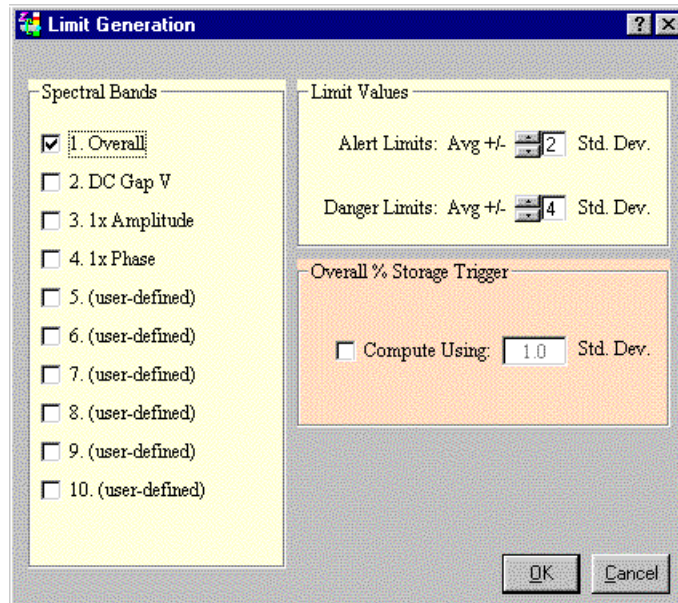
Chnl	Name	Units	Description	Minimum	Average	Maximum	Deviation
1	Gen OB Horz	g's	Overall	0.0497	0.2198	0.5399	0.1252
1	Gen OB Horz	Volts	DC Gap V	0.0044	0.0049	0.0053	0.0002
1	Gen OB Horz	g's	1x Amplitude	0.0436	0.2086	0.5407	0.1247
1	Gen OB Horz	Degrees	1x Phase	0.4392	183.5	357.5	93.06
1	Gen OB Horz	g's	0 - 167 Hz	0.0021	0.0093	0.0378	0.0057
1	Gen OB Horz	g's	167 - 333 Hz	0.1039	0.5267	0.9208	0.2305
1	Gen OB Horz	g's	333 - 500 Hz	0.0157	0.0541	0.1065	0.0271
1	Gen OB Horz	g's	500 - 667 Hz	1.396	1.566	2.000	0.2510
1	Gen OB Horz	g's	667 - 833 Hz	0.0030	0.0167	0.0616	0.0095
1	Gen OB Horz	g's	833 - 1000 Hz	0.0000	1.687	2.000	0.5607
2	Excite IB Vert	g's	Overall	0.0216	0.2721	0.6707	0.2589
2	Excite IB Vert	Volts	DC Gap V	0.0029	0.0033	0.0037	0.0002
2	Excite IB Vert	g's	1x Amplitude	0.0090	0.2559	0.6480	0.2587
2	Excite IB Vert	Degrees	1x Phase	61.97	181.8	285.9	81.20
2	Excite IB Vert	g's	0 - 167 Hz	0.0031	0.0082	0.0223	0.0032
2	Excite IB Vert	g's	167 - 333 Hz	0.1025	0.3770	0.9208	0.2219
2	Excite IB Vert	g's	333 - 500 Hz	0.0082	0.0556	0.1464	0.0425
2	Excite IB Vert	g's	500 - 667 Hz	1.027	1.889	2.000	0.2286
2	Excite IB Vert	g's	667 - 833 Hz	0.0033	0.0364	0.1175	0.0307
2	Excite IB Vert	g's	833 - 1000 Hz	0.0000	1.508	2.000	0.4886

Statistical Report



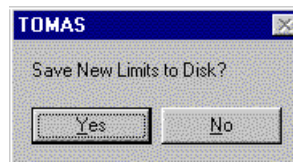
Limit values are not used if the HiHi limit value minus the LoLo limit value is less than 5% of the instrument scale OR the limit value is outside the instrument range.

3. In the *Statistical Report* window select Generate Limits on the File Menu; the *Limit Generation* window will open.



Limit Generation

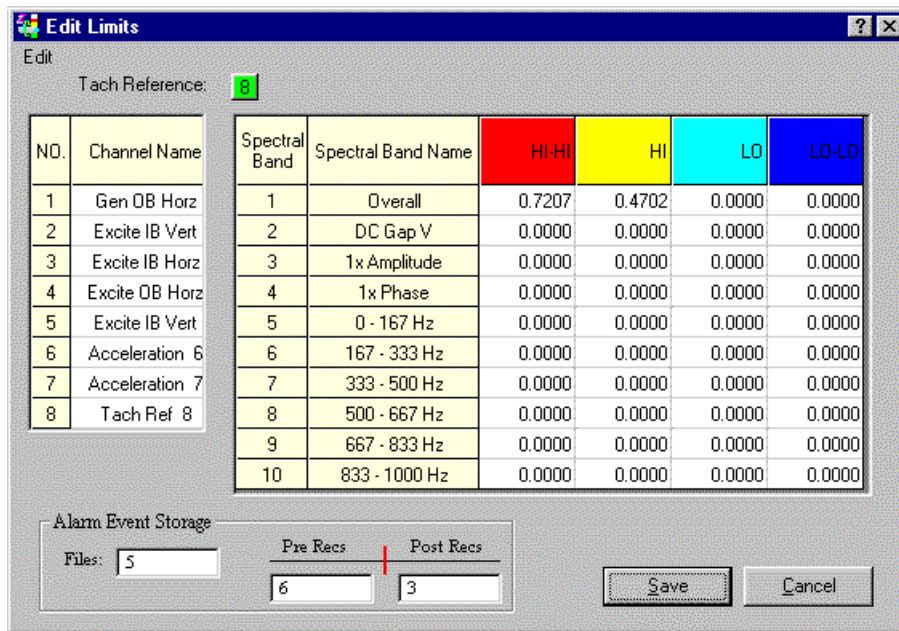
4. Select the Spectral Bands for which limits should be generated.
5. Specify the Standard Deviation to be used for Alerts and Alarms. Two High and two Low limits will be defined for each channel's operating condition.
6. If you want to change the Overall % Storage Trigger (set in the *ZonicBook Configuration* window under the Storage tab), click to place a checkmark in the Compute Using check box and enter the new standard deviation to be used.



Limit Prompt

7. Click the <OK> button. You will be asked if you want the Limits saved to disk. Click <Yes>.

The limits will be generated and can be reviewed/modified in the *Edit Limits* window, as shown below.



Edit Limits Window

You can also modify limits on the graphical gauge display in the main window by dragging the limit arrows.

Limit Status Color Code

Red	HIHI	(Danger)
Light Purple	LOLO	(Danger)
Cyan	LO	(Alert)
Yellow	HI	(Alert)
Green	OK	OK

Continue Monitoring

Now that the limits are set, you will be notified of Alerts and Alarms. When the instrument status changes (Alert or Danger), a single system beep is issued.

Are Alarms Acceptable?

You should periodically display the Alarm Log to see how many alerts and alarms you are getting in a specific time frame. If the machine appears to be running in a steady state, but you are getting a lot of alarms, you may have the limits set too “tight.” In this case you may want to modify/edit the limits.

On the other hand, if you are getting a lot of alerts and alarms, your machine may need to be adjusted or repaired.

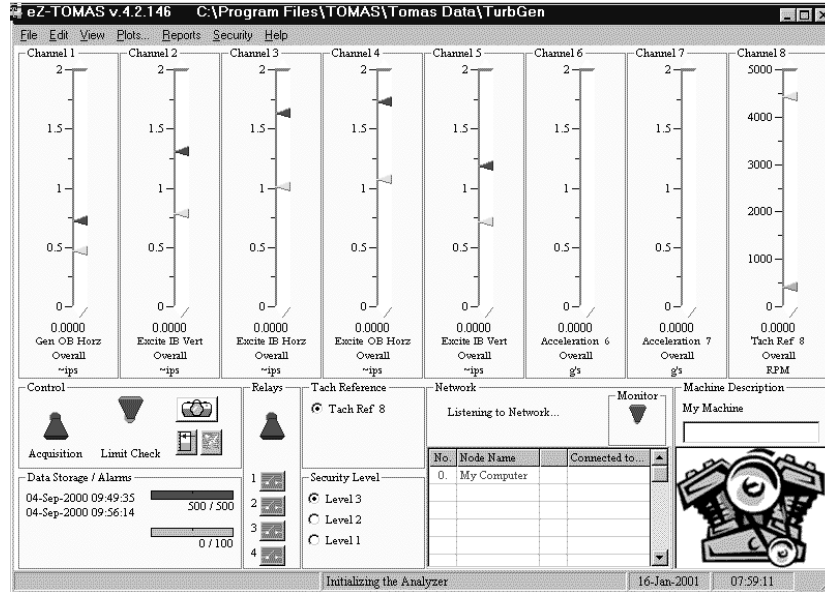
In either case, you are now monitoring your machine online. From now on you will need to continue to View and Analyze your data to help you determine if and when you should schedule a shut down for maintenance and repairs.

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Main Window



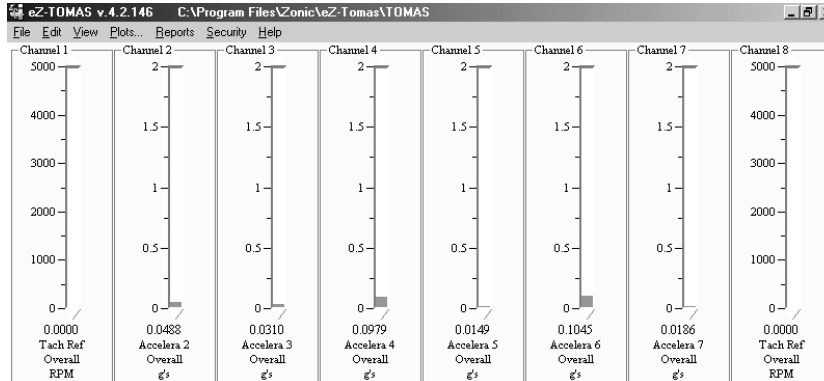
Main Window

Main Menu

File Edit View Plots... Reports Security Help

The main menu is laid out so that when you set up and monitor a typical project you can start with the File menu on the left and proceed to the right.

Instrument Gauges



Instrument Gauges Panel

Each instrument gauge includes the instrument range, the current value, limit indicators, peak hold gauge indicator, and the instrument name. The instrument gauges show one of 10 current acquisition values. On the *View* menu, select the spectral band of interest.

You can specify Spectral Bands 5 through 10 in the *ZonicBook Configuration* window (*Edit* Menu) under the *Spectral Bands* tab. The default definitions are shown below.

There are shortcut (Hot) keys (1 through 0) for each display type.

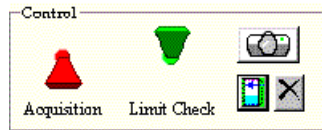
No.	Spectral Band		
1	Overall	6	2x Amp
2	DC Gap Voltage	7	3x Amp
3	1x Amplitude	8	4x Amp
4	First Order Phase	9	5x Amp
5	1/2 x Amp	10	6x Amp

Types 1 through 4 can not be modified. The Overall value is a time domain overall value.

Displacement probes are peak-to-peak, velocity probes are zero-to-peak, and accelerometer probes are zero-to-rms. Types 5 through 10 are user defined and can be modified at any time.

Peak hold values for all gauges can be displayed by positioning the mouse cursor over any gauge, and holding down the right mouse button. This will cause the peak value and the date and time that value was reached to appear below each gauge.

Control Panel



Control Panel

Acquisition indicates the ON/OFF status of data acquisition. Click this toggle switch to turn data acquisition ON (Up/Green) and OFF (Down/Red).

Limit Check indicates the ON/OFF status of the Limit Checking feature. Click this toggle switch to turn limit checking ON (Up/Green) and OFF (Down/Red).



Snap Shot

saves the current record and stores it in the history file.



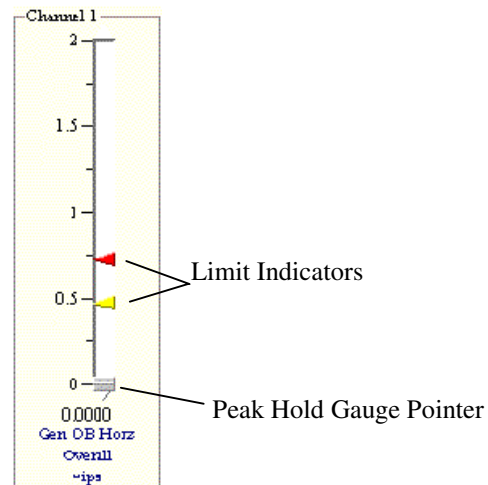
Show Peak Hold Gauge Pointers

displays the Peak Hold pointers on each gauge.



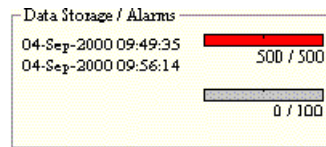
Reset Peak Hold Gauge Values

resets the Peak Hold Gauges to zero. This is momentarily reset because the current acquisition is immediately used.



Instrument Gauge

Data Storage Panel



Data Storage/Alarms Panel

The **upper bar** is the **data storage progress bar**. It graphically indicates how full the FIFO file is. Below the progress bar and to the right are two numbers. The first is the current record number; the second is the number of records which can be stored in the FIFO file. The date and time range of the stored data is displayed to the left. Double-clicking on the bar or the text opens the plot window.

The **lower bar** is the **Alarm Log progress bar**. It graphically indicates how full the Alarm File is. A single beep is issued when the current record number is within 5% of wrapping. This is your indication to backup the eZ-TOMAS Project. Double-clicking on the bar or the text opens the Alarm Log.

Below the two bars is a “paint chip” that displays the type and color of the last alarm. Double-clicking on the “paint chip” opens the Alarm Log.

Relays Panel



Relays Panel

The Relay Panel contains the Relay ON/OFF toggle switch and four relay icons. The icons indicate the current status of the relays. Each time you start eZ-TOMAS, the Relay switch is turned off. You must turn on this switch to send output to the relay channels.

If the relay toggle switch is turned on, relays will activate or deactivate depending on the configuration set in the Relay Outputs Configuration window (accessible under the **Edit** menu). Each of the four relays can also be manually activated by clicking on the relay button during an acquisition.

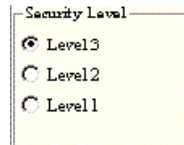
Tach Reference Panel



Tach Reference Panel

The **Tach Reference** panel displays the tach reference channels. The tach reference associated with the currently displayed data, when more than one tach is being used in the monitoring project.

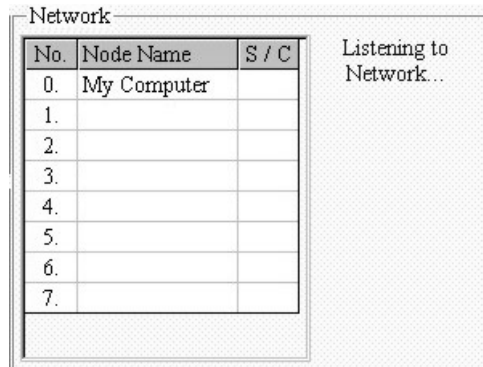
Security Level Panel



Security Level Panel

The enabled radio button indicates the **current security level**. Level 3 provides full screen and full access to all menus. Level 2 provides full screen with limited access to menus. Level 1 provides full screen with very limited access to additional screens and menus.

Network Panel



Network Panel

This feature requires multiple copies of eZ-TOMAS, one on each networked computer. Each networked computer must have eZ-TOMAS running in order to access the networking functions. When networked, a node is set as either a client or a server. A server must be connected to a ZonicBook, and can be monitored and controlled by a remote client; a client does not need to have a ZonicBook connected, but can effect the eZ-TOMAS settings on the server.

The **Network Panel** lists all nodes (computers) networked with this machine. An S indicates that a computer is acting as a Server; C indicates it is a Client to the Server; F or a blank space indicates that a computer is free, not a server nor a client.

To add new nodes, use the **Configure Network Nodes** window, accessible by selecting **Network...** under the **Edit** menu.

To the right of the list of network nodes, the current status of the network connection is displayed. The status messages apply only to the current network connection between a client and a server. There are four status messages which can be displayed:

- When not connected, the message "Listening to Network..." appears.
- While scanning for a ZonicBook, the message "Connecting to <computer name> on port <number>...". Port numbers will be searched until a ZonicBook is detected.
- If acting as a client which has connected to a server, the message will read "Received", followed by a series of code letters. Below this, the current time will be displayed.
- If acting as a server, and a client has connected, the message "Network Xfer. Delay: <number of seconds>" will appear, followed by a series of code letters.

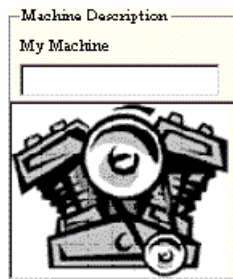
Once a network connection is established, a connection icon (two computers connected by an arrow) and a disconnect button (a large "X") will be displayed below the status message. The name of the computer connected to will also appear below the two buttons.

To connect to a network node, find the computer name you wish to connect to in the network node list, and left-click on it. eZ-TOMAS will establish the client/server relationship.

To disconnect to a network node, click on the disconnect button, which appears at the bottom of the network status window.

Machine Description Panel

In the below graphic “My Machine” is set up in the ZonicBook Configuration window (Edit Menu) under the Acquisition Tab. The text box allows further identifying information, such as the Serial Number of the Machine, or the Plant’s commonly used name for the machine. If you have a digital picture of the machine you can load that into this panel also.



Machine Description Panel

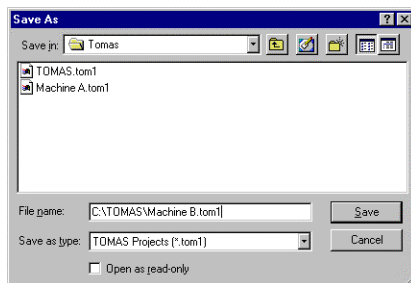
The Menu System

File Edit View Plots... Reports Security Help

File Menu

New Project

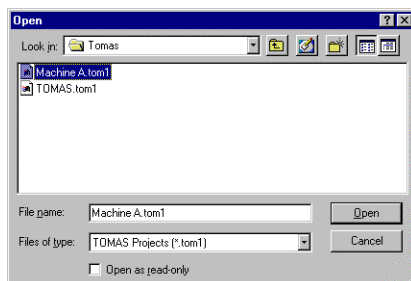
The New Project option opens the *Save As* window. Select or Create a Folder where the new project's files should be saved. Enter a project name, and click the <Save> button.



New Project Dialog

Open Project

The Open Project option opens an existing eZ-TOMAS project. The *Open* window is displayed. Select the project of interest, and click the <Open> button.



Open Project Dialog

Note: When eZ-TOMAS is started, it opens the last active project.

Save As

The **Save As** option allows you to backup history files in a binary file format, or export files in an ASCII file format. This command opens the Backup/Save Tomas Project window. The options in this window change as you make selections. You can backup and export full or partial files.

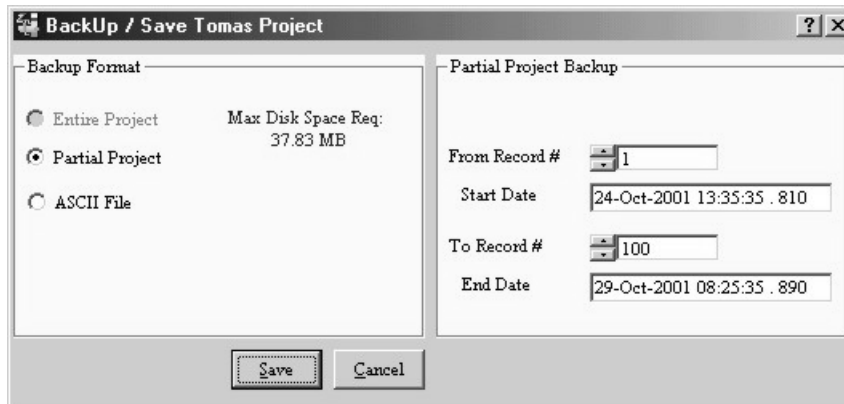
Note: The disk space required to backup the selected records is displayed on the left panel.

The **Entire Project** option is only available when data acquisition is turned off. Entire Project performs a file copy operation to the specified Windows Directory. This backup method is the fastest.



Save As... Entire Project

The **Partial Project** option can be used when data acquisition is active. This option copies data and the configuration setup to the designated folder for the date and time range specified in the panel on the right.



Save As... Partial Project

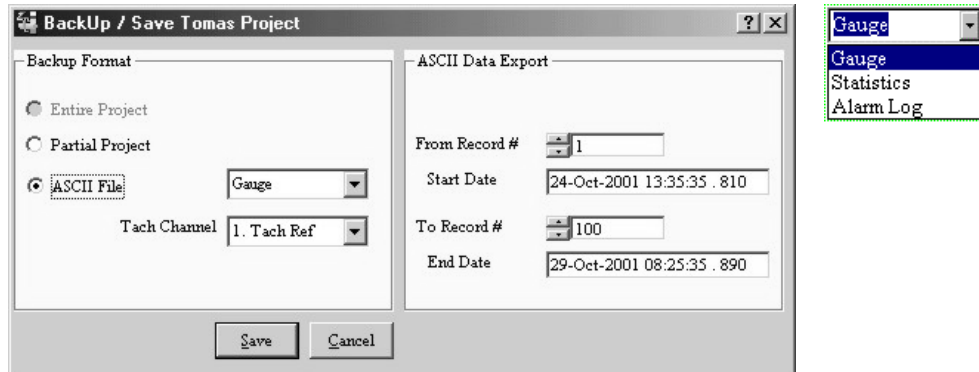
Select the first and last record numbers you want included in the backup. Click the <Save> button. The *Save As* window will open. Select the folder where the file is to be save, Enter a name, and click the <Save> button.

Partial Data Backup Panel

- From Record #:** The first record number of interest.
- Start Date/Time:** The first date and time of interest.
- To Record #:** The last record number of interest
- End Date/Time:** The last data and time of interest.
- Destination:** Where backup and exported files are stored.

Backup Format - ASCII

This option creates an exportable ASCII file for the selected data type. Select ASCII in the panel to the left. The panel on the right will activate, unless Alarm log is the pre-selected data type. Select the type of data you want exported in the drop down menu. If you select Gauge or Statistics, select the first and last records to be included in the exported file. The entire Alarm Log file is always exported.

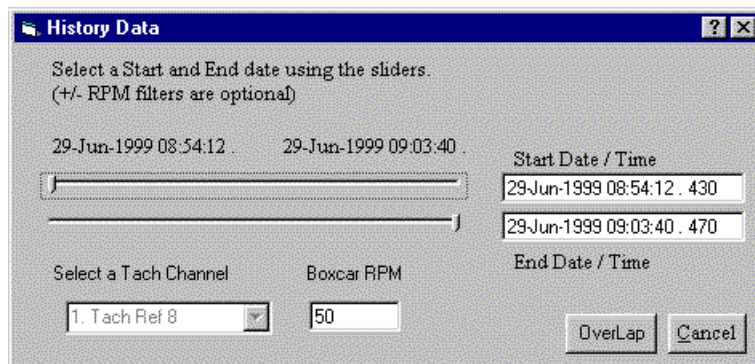


Save As... ASCII File

- Gauge:** exports the 10 bin values shown on the graphic instrument panel.
Statistics: exports the statistical report data. It opens the History Data Window.
Alarm Log: exports the Alarm Log file.

Overlap Data

Overlapped Data, also known as Consecutive Data Blocking, is used to analyze data from large machine transients. It creates better resolution for rapid machine acceleration rates (>100 rpm/sec). Overlap data uses the second part of a block of data and overlaps it with the first part of the next block of data to create a new block of data with an increased number of data points. When the overlapped data is displayed in a plot, the resolution is increased for better analysis.

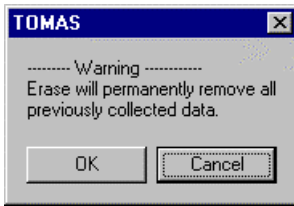


History Data Window

1. On the File Menu select Overlap Data to open the History Data window.
2. Select the start and ending time to be included in the overlap process.
3. Click the <Overlap> button to open the *Save As* window.
4. Select the destination folder, enter a name and click the <Save> button.

Display this data later by selecting Overlap as the data source in the *Plots* window.

Erase History File



Erase History Prompt

Use with caution. This menu item will erase the History File for this project. All data will be permanently removed. It is not recoverable.

Print

Prints the current screen.

Exit

Closes the eZ-TOMAS application.

Edit Menu

To modify the eZ-TOMAS Project configuration, select “Edit” on the menu bar.

- To configure the Analyzer select ZonicBook.
- To set up the lower and upper alert and alarms select Limits.

ZonicBook Configuration Window

This window has individual panels for configuring the ZonicBook. Click the appropriate Tab at the top of the window to view the “Acquisition,” “Channels,” “Spectral Bands,” and “Storage” panels. Make the necessary changes in each panel. Click the <Save> button to save all your changes and close the window.



Clicking the Cancel button will cancel all the changes you’ve made since you opened the window.

Acquisition Configuration Tab

This tab is used to configure how the ZonicBook will process acquired data.

Edit:

Acquisition Channels Spectral Bands Storage

Data Acquisition Must Be OFF to modify some parameters.

Block Size: 8192

Anal Freq (Hz): 5000

NOTE:
Valid RPM Range: 188 - 61440 RPM
Acquisition Time: 0.6400 Seconds
Freq. Resolution: 1.563 Hz

Number of Averages: 1

FFT Window: flat top

RT Display Buffer (Min): 2

No. of Waterfall Traces: 60

Low Freq Cutoff (Hz)

Single Integration: 5.000

Double Integration: 15.00

Machine Name: My Machine

Save Cancel

ZonicBook Acquisition Tab

- Block Size:** is the number samples per block of vibration data. For example, a 2048 Block size contains 2048 data samples and will produce an 800 line spectrum. A larger Block size provides greater data resolution. However, it takes longer to collect the data and more disk space to store it.
- Analysis Frequency:** is the maximum frequency of interest. The sampling rate will be 2.56 times the analysis frequency. Verify the maximum frequency response of your probes. For a Tach signal, your Analysis Frequency should be a higher multiple of the maximum rotating speed. Typically, this multiple is at least 10 times the rotating frequency.
- Low Frequency Cutoff:** Allows you to eliminate the lower frequencies from the full frequency range.
- Number of Averages:** The number of data blocks averaged before a block of data is accepted and displayed.
- FFT Window (Weighting window):** is typically either Hanning or Flat Top. Hanning provides better frequency resolution. Flat Top provides better amplitude resolution.
- RT Display Buffer:** This option is primarily for Strip Chart Displays. It controls the amount of time that is displayed across the x-axis. Your choices are up to 480 minutes. The longer times are especially useful when you are trying to see trending for a slow process.
- No. of Waterfall Traces:** This selection allows control over the number of traces that appear on a waterfall chart display, selectable in the Plots window. A high number of traces will increase the resolution of the chart, but a low number of traces may be preferable for plots which do not have clearly defined peaks.
- Machine Name:** Type a machine name in the data entry box. This name will appear in the lower right corner of the Main Window.



You must turn acquisition off and then on again for Acquisition Configuration changes to take effect.

Channels Configuration Tab

This tab is used to configure each channel for your project. The available setup options in this window are dependent on the instrument type selected.

Select a channel; then set the instrument type and set the value for each attribute. Repeat for each channel.



The parameters of one channel can be copied to another channel by using options on the Edit menu.

No.	Type	Name	Min	Max	Units	FSV	mV/EU	Int
1	Tach	Tach Ref	0.0000	5000.	RPM	20.00	1000.	
2	Accel	Accelera 2	0.0000	2.000	g's	20.00	100.0	
3	Accel	Accelera 3	0.0000	2.000	g's	20.00	100.0	
4	Accel	Accelera 4	0.0000	2.000	g's	20.00	100.0	
5	Accel	Accelera 5	0.0000	2.000	g's	20.00	100.0	
6	Accel	Accelera 6	0.0000	2.000	g's	20.00	100.0	
7	Accel	Accelera 7	0.0000	2.000	g's	20.00	100.0	
8	Tach	Tach Ref	0.0000	5000.	RPM	20.00	1000.	

ZonicBook Channels Tab



Configure the DipSwitches for each probe based on probe type. Refer to the ZonicBook Getting Started Manual for more information.

- No.:** is the channel. Selecting the channel number highlights all attributes for that channel.
- Type:** is the type of instrument attached to the channel. Your options are Accelerometer, Velocity, X Probe, Y Probe, Z Probe, Static and Tach. If the channel does not have an instrument attached, select Unused.
- Name:** is a Label you will use to identify the channel.
- Min, and Max:** represent the instrument range.
- Units:** is the Engineering Units you want to use. Your options are mils or microns.
- FSV (Full Scale Voltage):** is the maximum input voltage for the instrument. If you are unsure of the instrument's maximum voltage value, select a high voltage value.
- mVolt / EU:** is the instrument sensitivity. (Typical displacement probes: 200 milli-Volts per mil. Typical accelerometer probes: 100 milliVolts per G. For Tach probes enter 1000.) For static channels, this property represents the slope variable of a linear equation (the "m" of "y=mx+b").
- Integration:** Accelerometer and Velocity signals can be integrated. Select the desired integration value. If the signal is acceleration, then single integration results in velocity, and double integration results in displacement. If the signal is velocity, then single integration results in displacement.

Integration Units:	are g's/ips/mils, g's/ips/mils, g's/ips/in, and g's/mmmps/mm.
Angle:	is the physical angular location of a probe. Zero degrees is defined to be the top dead center. The angle value is measured in the counterclockwise (CCW) direction as viewed from the driver end. For example, if your proximity probe is located in the top dead center of the bearing housing, the Instrument Angle is 0 degrees. Orbit and Polar displays utilize Instrument Angle for data correction.
Gap Volt:	is the DC voltage value when the shaft is at rest. This value is used for Shaft Center Line displays.
1xAmpRef and 1xPhsRef:	are the slow roll values used for Runout Compensation on Bode or Polar displays.
Rotation:	is the shaft's rotation direction, either clockwise (CW) or counter-clockwise (CCW), as viewed from the driver end of the machine train.
Trig/Rev:	is the number of pulses per 360 degree revolution. (Default: 1)
Trig Dir:	is the "negative" or "positive" direction of the moving shaft.
Trig Volt:	define the Tach pulse for tach signals. A keyway will generate a Negative Tach pulse. Typical Tach signals will generate at least a 1 V pulse. You can check the voltage value using a TIME display. For Static channels, this column represents the offset variable of a linear equation (the "b" of "y=mx+b")
Paired To:	associates 2 probes on a bearing. Typically, probe pairs are located 90 degrees apart. Orbit displays require a Channel Pair. If you have a Tach signal or displacement probe, you also need to configure the Channel Pairs. [Default: No channels are paired.]
Bearing Clearance:	is measured in the instrument's engineering units. You can optionally overlay the bearing clearance circle onto an orbit display.

Spectral Bands Tab

Up to 10 Spectral Bands of interest can be defined for each dynamic channel. The first four Bands are predefined. You can modify Bands 5 through 10 for your specific application. Spectral Band values are displayed on the dynamic instrument gauges.

No.	Channel Name	Band	Spectral Band Name	Range Low	Range High	Units	Find
1	Tach Ref	1	Overall				
2	Accelera 2	2	DC Gap V				
3	Accelera 3	3	1x Amplitude				
4	Accelera 4	4	1x Phase				
5	Accelera 5	5	1/2 Order	0.4000	0.6000	Orders	Peak Value
6	Accelera 6	6	2nd Order	1.800	2.200	Orders	Peak Value
7	Accelera 7	7	3rd Order	2.800	3.200	Orders	Peak Value
8	Tach Ref	8	4th Order	3.800	4.200	Orders	Peak Value
9		9	5th Order	4.800	5.200	Orders	Peak Value
10		10	6th Order	5.800	6.200	Orders	Peak Value

ZonicBook Spectral Bands Tab

- Tach Reference:** is (are) the tach channels being used in the project. You must select the tach of interest.
- Channel Name:** is the name you assigned to the input channel in the Channels Panel.
- Band:** is the **Spectral Band Number** (5 through 10) of interest.
- Spectral Band Name:** is the name you assign to this Band. It is displayed on the dynamic instrument gauge in the main window.
- Range Low and Range High:** is the frequency or order range. Suggestion: Make sure the range is 2 to 4 spectral lines wider than the frequency of interest. This is due to the FFT window. For example, if your frequency of interest is the 3rd order. You should specify a range of 2.9 to 3.1 orders
- Units:** can be either Frequency or Orders. If you do not have a tach defined, the Orders option is not available.
- Find:** specifies Peak or Overall. Peak is the highest spectral amplitude within the specified range. Overall is the vibrational sum of each spectral amplitude within the specified range.

Storage Tab

The screenshot shows the 'Storage' configuration window. It includes the following elements:

- Time Change:** Radio buttons for sec (selected), min, hrs, days, none. Value: 600.0.
- Speed Change:** Radio buttons for rpm (selected), Kcpm, Hz, none. Value: 100.0.
- Overall Change:** A table with columns: Channel, % of FS, Enabled.

Channel	% of FS	Enabled
Tach Ref	5.000	True
Accelera 2	5.000	True
Accelera 3	5.000	True
Accelera 4	5.000	True
Accelera 5	5.000	True
Accelera 6	5.000	True
Accelera 7	5.000	True
Tach Ref	5.000	True
- RPM Range:** Minimum: 0.0000, Maximum: 5000.0. Data & Alarms dropdown.
- Data File Size:** History Records: 100, Alarm Records: 100. Disk Space: 37.86 MB.
- Continuous Storage (seconds):** 0.
- Buttons: Save, Cancel.

ZonicBook Storage Tab

Data storage is activated by trigger events. If any one event is triggered, data from all channels is stored. Data storage events are triggered when a change occurs within the range of your defined parameters. You can configure the system to store data every:

“N” seconds (Time Change), **and/or** every

“N” RPM (Speed Change), **and/or**

“N” % change in Full Scale Voltage (Overall Change).

For example, if your Overall Change trigger is set to 5% and the instrument scale is 0 to 5 mils, eZ-TOMAS will store time and spectral data for all channels when the overall value changes by 0.25 mils since the last trigger event. All event triggers are reset whenever any event trigger occurs.

Time Change: is a time-based storage trigger. Enter the number of seconds, minutes, hours, or days between desired storage events.

Speed Change: is an RPM based storage trigger. Data will be stored when the machine speed changes by the defined value in rpm, Kcpm, or Hz.

Overall Change: is an amplitude-based storage trigger that can be defined for each channel. Data is stored when the overall amplitude changes by the percentage of Full Scale specified. [Default: 5% of full scale]

This can be controlled on a channel-by-channel bases by selecting “True” or “False” in the Enabled column.

RPM Range: The range in which a one of the above changes must occur to trigger data storage. Storage options can be Data Only, Alarms Only, Data and Alarms, or Not Enabled. When Not Enabled is selected, any of the above changes can cause data to be stored regardless of the frequency range in which it occurs.

Data File Size: is the number of storage records and the number of Alarm Records in the History FIFO (First-In-First-Out) file. The amount of disk space needed, based on your configuration, is shown to the right

eZ-TOMAS maintains several data files, including Time and Gauge data. Gauge data can be displayed in the gauge display window. The history file is a FIFO file. You can define the depth of the history file; however, the amount of time needed to fill the file depends on the trigger event values. The smaller the trigger values, the faster the history file fills. The current data storage status is shown in the *Main* Window.

Limits

There are two ways to generate and modify limits. The global way is to use the statistical report. Statistical reports can and should be used to automatically generate limit values based on historical data. The Limits window is used when you want to modify specific limits. It is not an efficient way to generate limits.



For more details on setting limits refer to the section [Statistical Report](#)

NO.	Channel Name	Spectral Band	Spectral Band Name	HI-HI	HI	LO	LO-LO
1	Gen OB Horz	1	Overall	0.7207	0.4702	0.0000	0.0000
2	Excite IB Vert	2	DC Gap V	0.0000	0.0000	0.0000	0.0000
3	Excite IB Horz	3	1x Amplitude	0.0000	0.0000	0.0000	0.0000
4	Excite OB Horz	4	1x Phase	0.0000	0.0000	0.0000	0.0000
5	Excite IB Vert	5	0 - 167 Hz	0.0000	0.0000	0.0000	0.0000
6	Acceleration 6	6	167 - 333 Hz	0.0000	0.0000	0.0000	0.0000
7	Acceleration 7	7	333 - 500 Hz	0.0000	0.0000	0.0000	0.0000
8	Tach Ref 8	8	500 - 667 Hz	0.0000	0.0000	0.0000	0.0000
9		9	667 - 833 Hz	0.0000	0.0000	0.0000	0.0000
10		10	833 - 1000 Hz	0.0000	0.0000	0.0000	0.0000

Alarm Event Storage
Files: 5 Pre Recs: 6 Post Recs: 3

Save Cancel

Edit Limits

Up to two High and two Low limits can be defined for each channel's operating condition.

When the instrument status changes (Alert or Danger), a single system beep is issued.



Limit values are not used if the HiHi minus the LoLo limit value is less than 5% of instrument scale OR the limit value is outside the instrument range.



The limits from one channel can be copied to another channel using options on the Edit menu..

Limit Status Color Code

Red	HIHI	(Danger)
Light Purple	LOLO	(Danger)
Cyan	LO	(Alert)
Yellow	HI	(Alert)
Green	OK	(Within Limits)

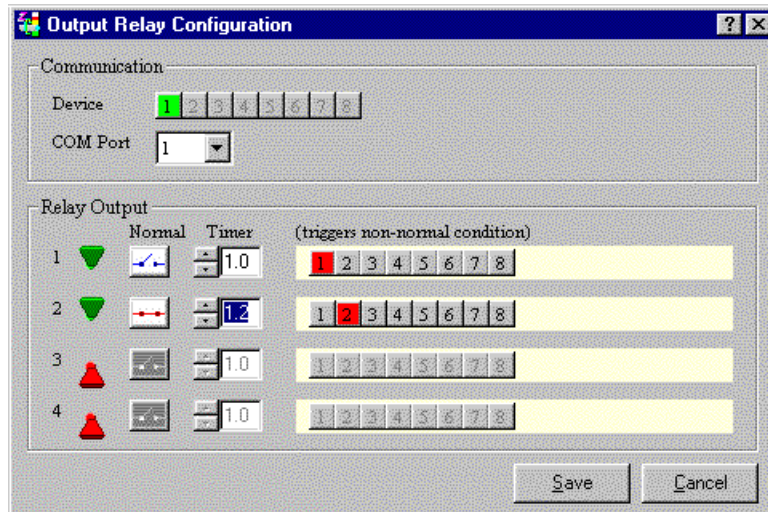
Tach	you may have up to three tachs per project.
Channel	Number of interest. The Instrument Name you assigned to the channel is automatically displayed.
Spectral Band	to which the limits should be applied. (i.e. Overall, DC Gap, 1xAmplitude, 1xPhase)
HIHI, HI, LO, LOLO	are Limits. Type limit values in the table.



You can modify limits on the graphical gauge display in the main window by dragging the limit arrows and then opening this window to save your changes.

Files	is the number of Alarm event files. When a Red Alarm occurs, eZ-TOMAS automatically saves data surrounding the event to an Alarm Event file.
Pre Recs	is the number of records prior to the alarm.
Post Recs	is the number of records after the alarm.

Relay Outputs



Output Relay Configuration

Use this panel to configure the responses of your output relays Automation Module. This device allows you to have relay switches open and closed based on limit/alarm status. You can use up to four relays.

The color of the response channel in the Relay Output panel indicates the limit/alarm status that will cause the relay to change status (open/close). Click on a channel number until the desired limit color is displayed. If the relay is normally open when monitored data causes the specified limit/alarm, the relay will change to close for the duration specified by the timer; and then it will reopen.

Additionally, you can have the system count the number of consecutive alarms and change the relay status when that number of alarms is reached.

Communication Panel



The following conditions must be met for proper output of each device.



Device: The Output Relay module (currently 1).

COM Port: Select the COM Port to which the output Relay module is connected.

Relay Output Panel

Relay button: The number of the relay. Up to 4 can be used. Click on this button to activate or deactivate the relay. Green = ON/activated, Red = OFF/deactivated.

  **buttons:** Sets the default state (normal operating state) of the relay.

 = Normally Open and  = Normally Closed.

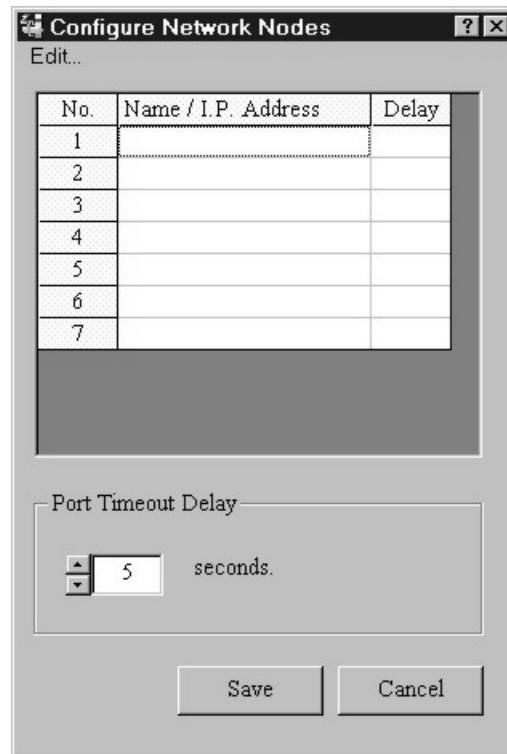
Timer: The amount of time required for a part to pass through the open gate.



When you click the Save button, any of the unchecked check boxes for relay channels will close and stay closed until the condition is met for that relay channel. If you have something that will actuate when the channel closes, it will do so as soon as you click the Save button.

Network

Networking requires your eZ-TOMAS monitoring system to be connected to a network with at least one other PC running an additional copy of the eZ-TOMAS.



Configure Network Nodes

This feature requires multiple copies of eZ-TOMAS. Each networked computer must have eZ-TOMAS running in order to access the networking functions. When networked, a node is set as either a client or a server. A server must be connected to a ZonicBook, and can be monitored and controlled by a remote client; a client does not need to have a ZonicBook connected, but can affect the eZ-TOMAS settings on the server.

The Configure Network Nodes window (accessible from the **Edit...Network** menu) allows you to add remote computers to the list of available network nodes. Computers which have been added are displayed in the network panel of the main eZ-TOMAS screen. To add a computer, complete the following fields in the Configure Network Nodes window:

Name / I.P. Address should be filled with either the computer's network name, or its IP address. Your network administrator should know both of these values.

The **Project password** is your security level password.

Delay is the rate in seconds that the client computer will be updated by the server computer.

Port Timeout Delay is the amount of time that eZ-TOMAS will scan a computer's port for a ZonicBook. If the timeout is reached, eZ-TOMAS will search the next port, until all ports have been scanned.

Networking eZ-TOMAS allows you to monitor and control acquisitions from a distance. For instance, if you are monitoring a fan with eZ-TOMAS somewhere in the plant and you also have a PC in your office with a second copy of eZ-TOMAS running, you can monitor the fan from your office. Add the node at the fan location to eZ-TOMAS, enter the desired delay time, and then left-click on the computer name in the Network panel of the eZ-TOMAS main screen. After connecting, you can see the Fan data at your desk by selecting the Fan's Node in the Main window. You can even reconfigure some aspects of eZ-TOMAS program at the remote site, such as the acquisition and channel configuration.

Copy Window

This command allows you to copy the currently selected window to the clipboard. You can then paste the copied window into another application, such as Microsoft Word or Excel.

Load Graphic Picture

This command places the selected graphic (.bmp or .jpg format) into the lower right corner of the *Main* Window.

Remove Graphic Picture

Removes the graphic from the *Main* window.

View Menu

The gauges in the Main Window display the real time data for the selected spectral band.

Plots Menu

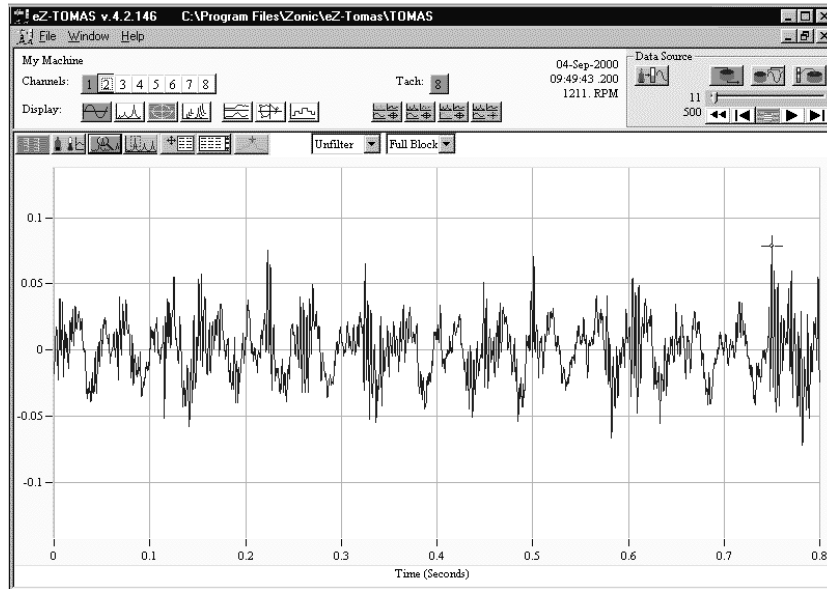
Click **Plots...** on the Main menu to open the Data Display window, or double-click on a gauge to plot that gauge's data.

For real-time displays, you can halt and resume the display of data by using the Pause/Continue toggle button, or use the "P" key on the keyboard. When viewing historical data, you can use the five playback buttons and the slider to navigate through the data.

You can view either real-time data or historical data via this menu option.

Select the channels to be displayed, the data display format, and the data source.

Data Display Window



Display Window

Channels, 1 2 3 4 5 6 7 8, are inputs channels. The number of channels that can be displayed is dependent on the plot display format. Multiple channels can be displayed on Time, Spectrum, and Strip Chart displays.

A single channel is shown on Waterfall, Polar and Bode displays. For Orbit displays, a channel pair (plotted coordinates) and tach channel (red arrow) are displayed.

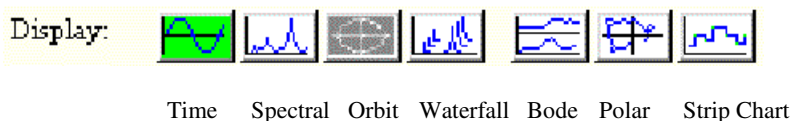
A green channel box is a channel that is currently displayed.

A white channel is an active channel not being displayed.

A dimmed channel number is not active, thus there is no data to display.

Tach channel(s) are displayed separately to the right of input channels.


Display formats



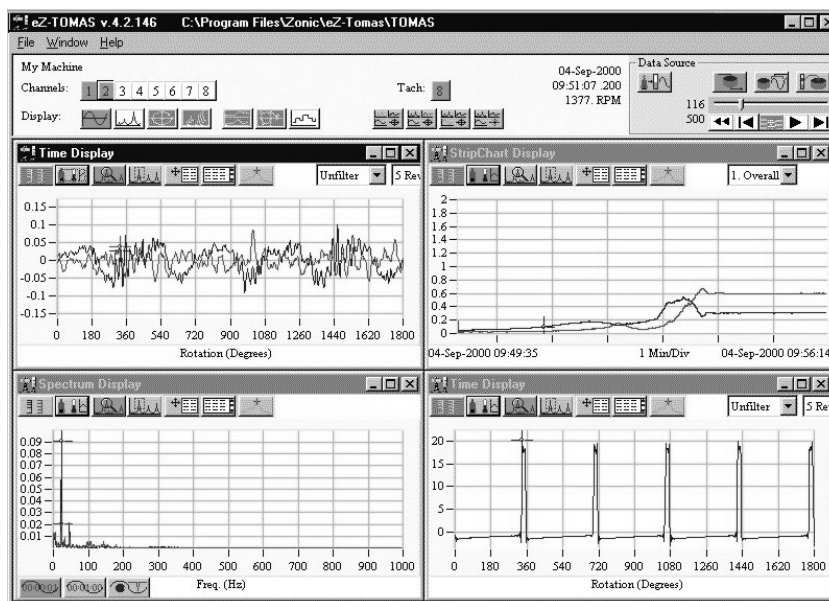
Recall Preferred Plot Setup



The **Recall Preferred Plot Setup** buttons recalls your preferred plot setups. A limit of four setups can be defined.

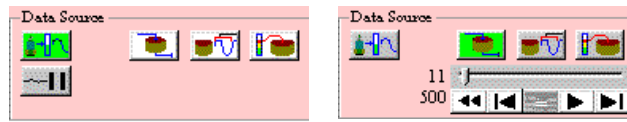
While viewing historical data, the **Save Baseline Data** button, , appears to the right of the Preferred Plot Setup buttons. The **Save Baseline Data** button can be used to record a snapshot of the data displayed on the screen. Then, while in Time or Spectrum modes, the recorded baseline can be superimposed on other displayed data. (While in Time mode, the baseline can also be summed with the currently displayed data, and the result is displayed.)

In the below example, a Time Display, a Strip Chart, and a Spectrum of Channels 1 and 2 are displayed with a fourth display showing the tach signal. This setup was saved via the File -- Save Plot Setup -- Plot 1 menu selects. It was then recalled by clicking on the 1st (left-most) icon above.








Plots Display Showing A Time Display, Strip Chart, Spectrum Display, and Tach Signal Display

Data Source:

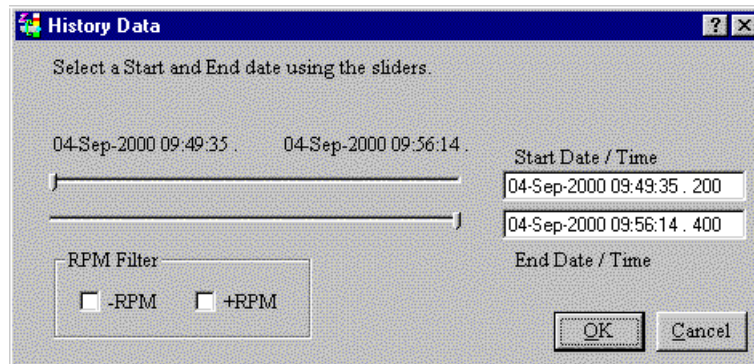


Data Source Panel Real Time (Left) and Historical (Right)

The default **data source** is Real Time . To pause realtime data display, click on the pause icon. 

Historical Data files include History , Overlap , and Alarm Event  files.

History Data is accumulated according to the parameters setup in the ZonicBook Storage Configuration (Edit Menu). Click on the History Icon to open the History Data window.





History Data Window

Enter the desired start and end dates. The default is the entire history file. Drag the Starting and Ending Sliders to change the dates in the data entry areas. Click OK. Then play back the file.

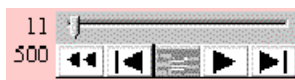


Historical Data is not available via Networking remote access.

Overlap, , processed data is only available if you have used the Overlap Data feature on the File menu to create an Overlapped file. Overlapped data is double sampled data that is used for better resolution.

Alarm Event, , opens a table of alarm events. Select an alarm event in the table to display the data surrounding the event.

Play Back History, Overlap, and Alarm Event files with the following icon set that is similar to a VCR.




In order, the controls are **Rewind, Step backward** one record, **Step, Play, and Step forward** one record. You can also drag the pointer to a specific area of the file before you start playing back the data.

Formatting Options


Each plot has its own set of additional formatting options.


The display formatting buttons are located below the display type buttons. Each plot has its own set of additional formatting options. Not all of the following buttons are available for each plot.


Available buttons are as follows:


The **Lin/Log** button  allows you to switch between Linear and Log Y-axis scaling. If you expand the data plot this feature is disabled until the plot is returned to its original scale with the Autoscale scale button.

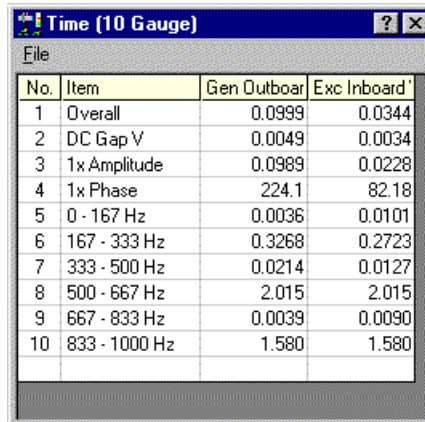
The **Instrument Scale/Autoscale/User Scale** button toggles between the three modes as follows:

The **Instrument Scale** button  displays the data based on the instrument's Engineering Units range. This is the default display format.

The **Autoscale** icon  toggles between original scale and autoscale. Autoscale will scale the axes based on the data being displayed. Autoscale uses the standard 1, 2, 5 type scaling.


The **User Scale** button  displays the data based on your selections.

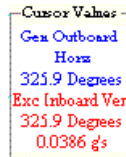
The **Display Gauge Values** button  opens a floating table of gauge values.



No.	Item	Gen Outboard	Exc Inboard
1	Overall	0.0999	0.0344
2	DC Gap V	0.0049	0.0034
3	1x Amplitude	0.0989	0.0228
4	1x Phase	224.1	82.18
5	0 - 167 Hz	0.0036	0.0101
6	167 - 333 Hz	0.3268	0.2723
7	333 - 500 Hz	0.0214	0.0127
8	500 - 667 Hz	2.015	2.015
9	667 - 833 Hz	0.0039	0.0090
10	833 - 1000 Hz	1.580	1.580


Gauge Information Table


The **Display Cursor** button  opens a floating table of cursor values.

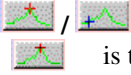






Cursor Value	
Gen Outboard	Horz
	325.9 Degrees
Exc Inboard Vert	325.9 Degrees
	0.0386 g's

Cursor Value Table




The **Show Limits** button  superimposes limits onto the displayed data.

The **Show List** Table button  opens a table of gauge information. The "L" key on the keyboard can be used to open the list.

- Peak Cursor button, Peak Cursor**  is the default for this toggle button. During data display the cursor always finds the peak amplitude in a record.
- No Peak Cursor**  ignores the peak and remains at the same frequency during data display. In this case you must first drag the cursor to the desired frequency.
- The **Display Limits** button  superimposes limits onto the displayed data.
- The **Show Baseline** button  superimposes a pre-recorded baseline on top of display data. This option is only available in the Time or Spectrum plots.
- The **Apply Baseline** button  sums the pre-recorded baseline and the currently displayed data. This option is only available in the Time plot.





The **Frequency Axis Mode** button cycles through three different x-axis scales:

This option is only available in the Spectrum and Waterfall plots.

- Freq. Axis Hz**  (measured in Hz)
- Freq. Axis kCPM**  (measured in kCPM)
- Freq Axis Orders**  (measured in orders)




The **Cursor Mode** button cycles through four different cursor modes:



This option is only available in the Spectrum and Waterfall plots.

- Normal Cursors** 
- Harmonic Cursors** 
- Sideband Cursors** 
- Peak List Cursors** 

The **Orbit Plot Mode** button cycles through the type of orbit plot formats:

This option is only available for Orbit plots.

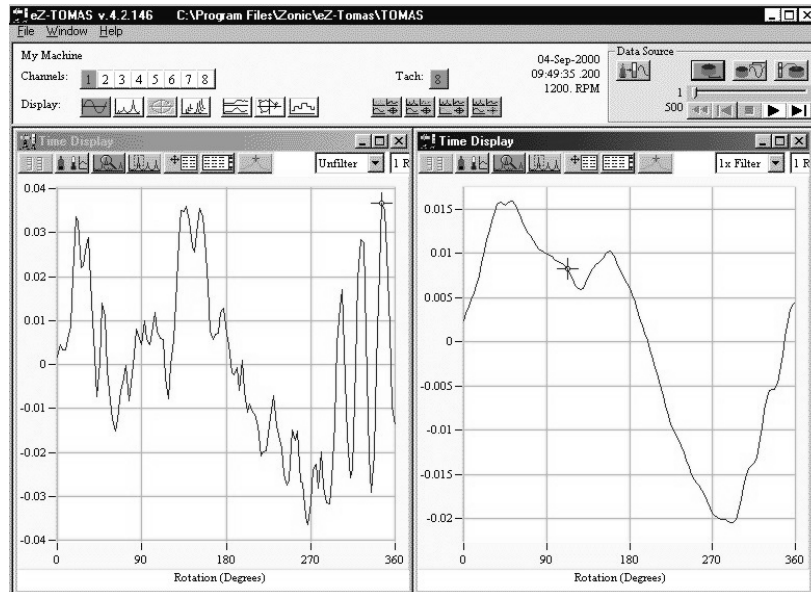
- Orbit with SCL** format 
- Orbit without SCL** format 
- Orbit with Brg Circle** (an orbit plot including the bearing circle). 

- The **Overall Trace** button  displays the overall trace. This option is only available for Bode plots.
- The **RunOut Compensation** button  displays a graph of the RunOut compensated values. RunOut compensation is a vector math operation in which the referenced first-order amplitude and phase vector is subtracted from the displayed first order vector. This option is only available for Bode and Polar plots.

Filtering Data

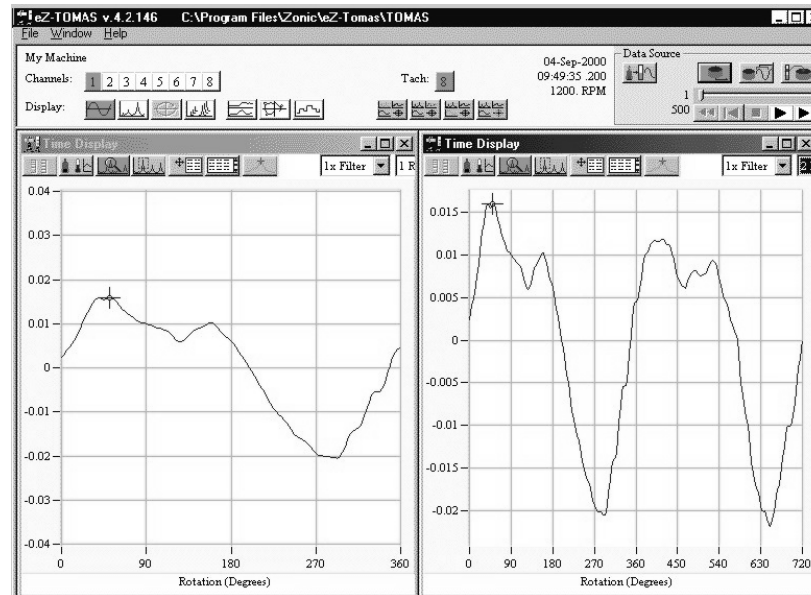


In the example below, the plot on the left is 1 rev of unfiltered data; the plot on the right is using a 1x filter on 1 rev of data.



Plots Showing Unfiltered (left) and Filtered Data (right)

The below example is showing 1 rev of 1x filtered data on the left and 2 rev of 1x filter on the right.



Plots Showing 1 Rev Filtered (left) and 2 Rev Filtered (right)


Expand Areas on the Graph

X-axis: Hold down the Ctrl key while you click and drag the mouse across the area of interest.

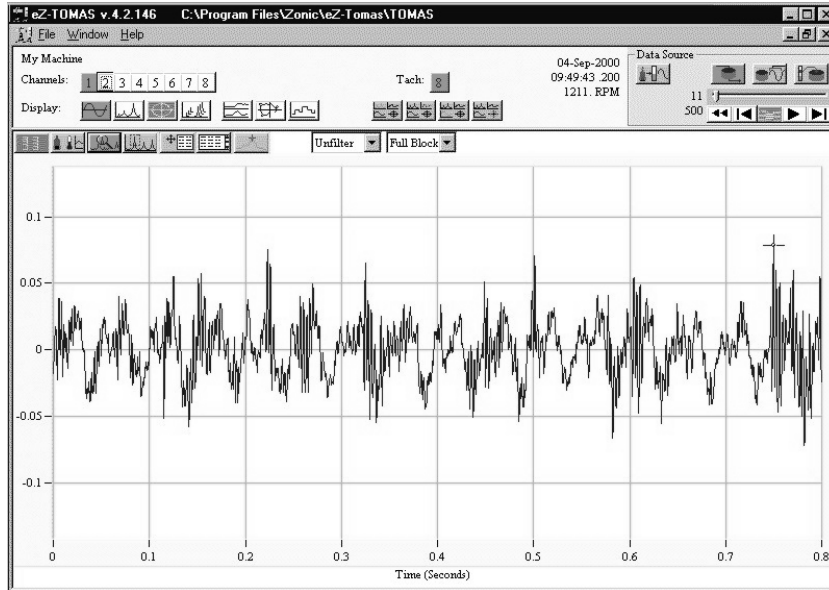
Y-axis: Hold down the Alt key while you click and drag the mouse across the area of interest.

Both axes: Hold down the Ctrl and Alt keys while you click and drag the mouse around the area of interest.


Examples of Displays

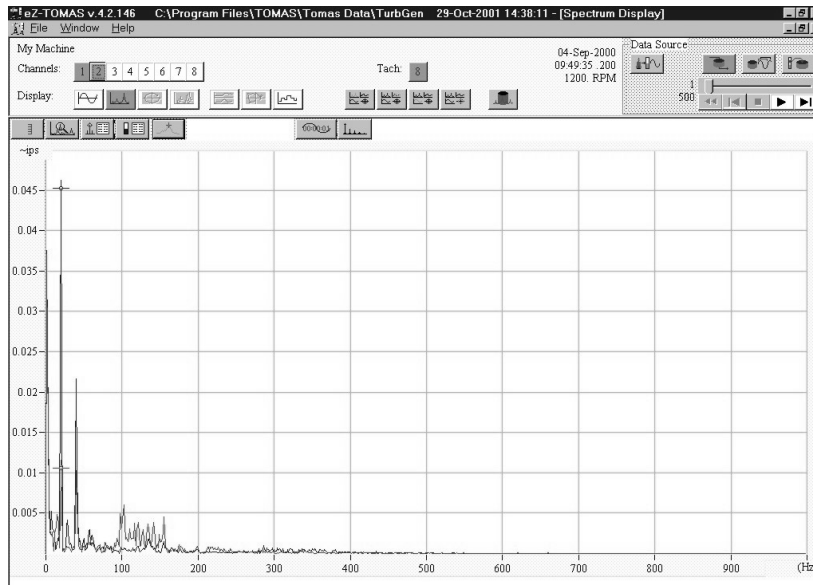
Time Display, , shows vibration amplitude as a function of either time or rotation for a block of time data. The default X axis is time “Full Block.” If the rotating speed is greater than 0 RPM, the X axis can be specified as “N” Shaft Revolutions. Where “N” is 1, 2, 5, or 10. One shaft revolution equals 360 degrees of rotation.

Multiple channels can be shown on the Time Display.






Time Display Plot

Spectrum Displays, , show vibration amplitude as a function of frequency. The frequency units can be either Hertz (Hz), cycles per minute (kCPM) or orders.



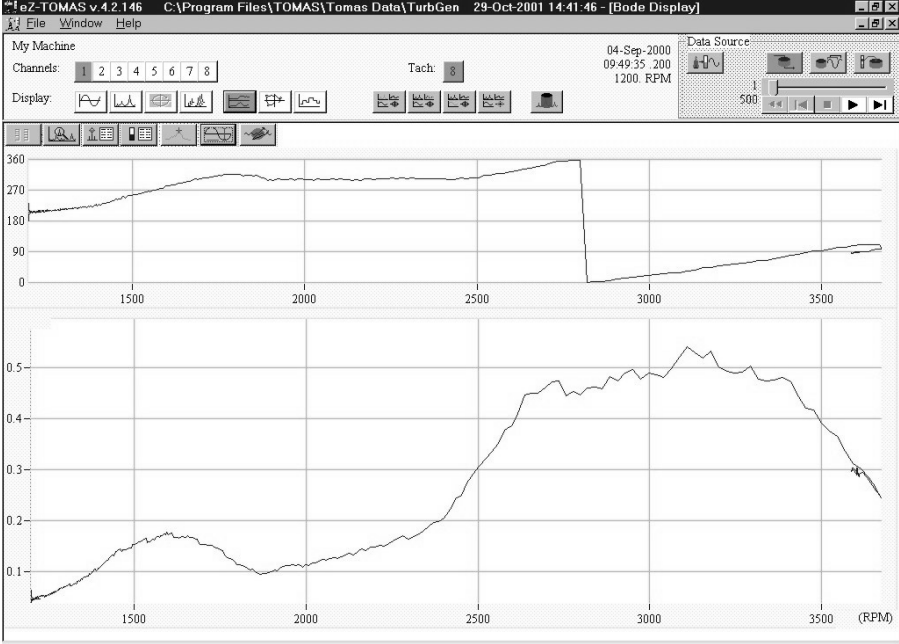
Spectrum Display

Multiple channels can be shown on the Spectrum Display.

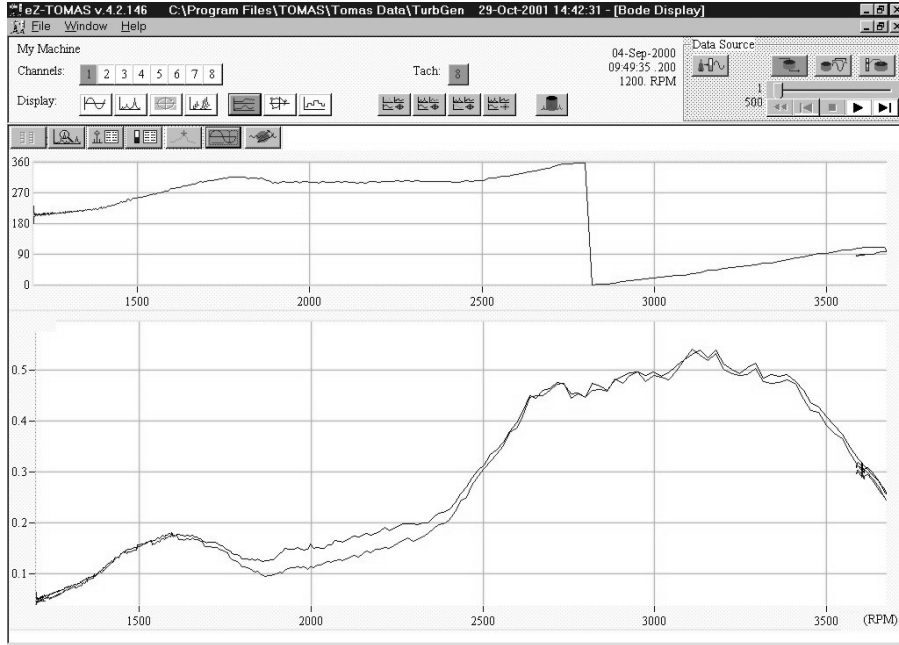
Bode Displays, , show vibration amplitude and phase as a function of rotating speed. The blue trace is the first order amplitude values. The black trace displays the overall values . You can optionally display the Run Out compensation values  on the same plot as a red trace. Compensation values are specified for each channel in the Configuration.

Run Out Compensation is a vector math operation. The referenced first order amplitude and phase vector is subtracted from the displayed first order vector.

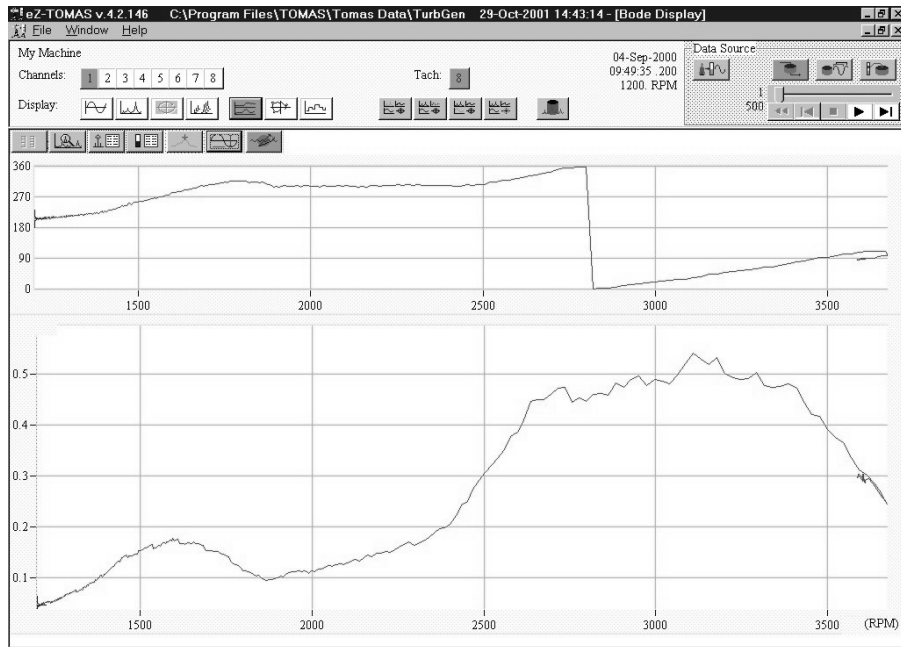
Bode displays only one channel.




Bode Display



Bode Plot with Overall Trace



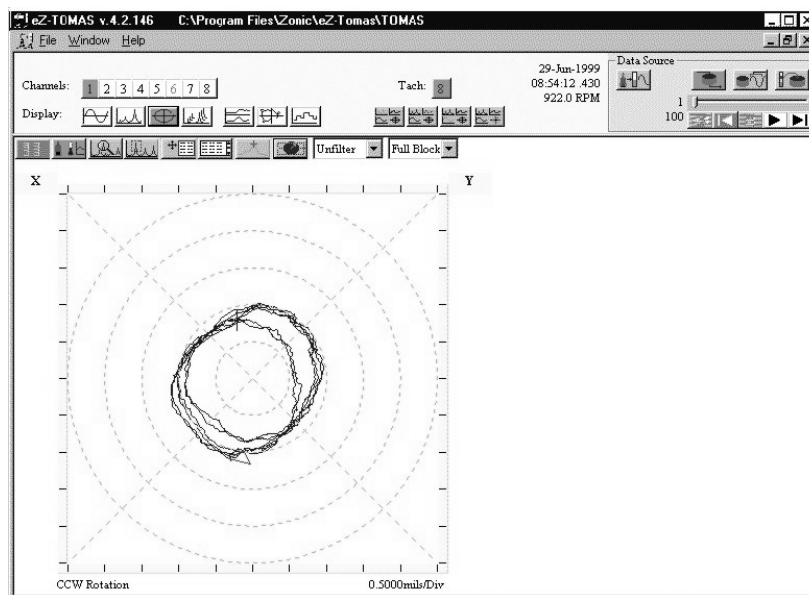
Bode Display with Runout Compensation

Orbit Displays, , show simultaneous time domain vibration amplitude for a X-Y probe pair.

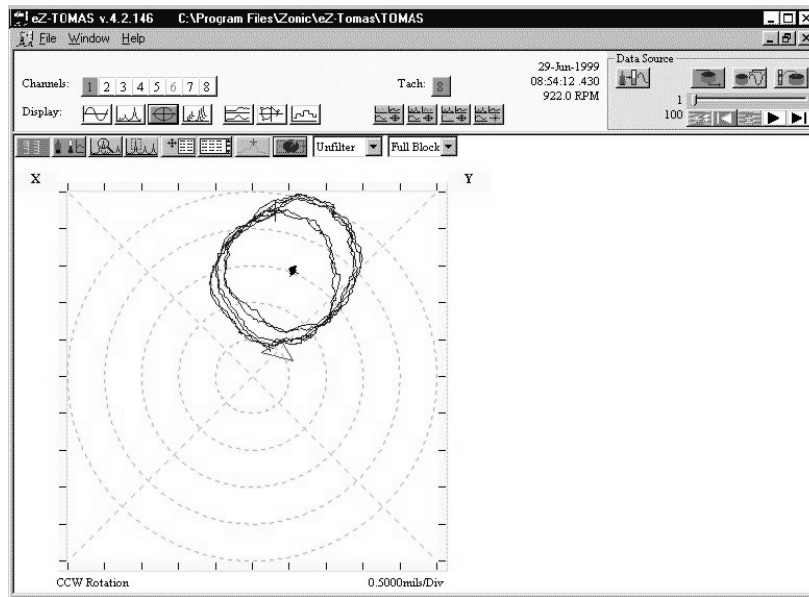
The red arrow displays the tach reference marker and indicates the direction of the time signal. The default display is “Full Block” of time data. A limited number of Shaft Revolutions can be displayed (1, 2, 5, or 10). The orbit display is corrected for probe location.

You can optionally overlay the orbit onto a shaft center line display by clicking the **Orbit w/ SCL** button. The center of the orbit trace in SCL computes the difference between the current gap voltage and the reference gap voltage. Click the button again to display **Orbit w/o SCL**. Click once more to display the **Orbit w/ Brg Circle**.--the bearing circle clearance is then also shown.


Only one probe pair can be shown on the Orbit Display.



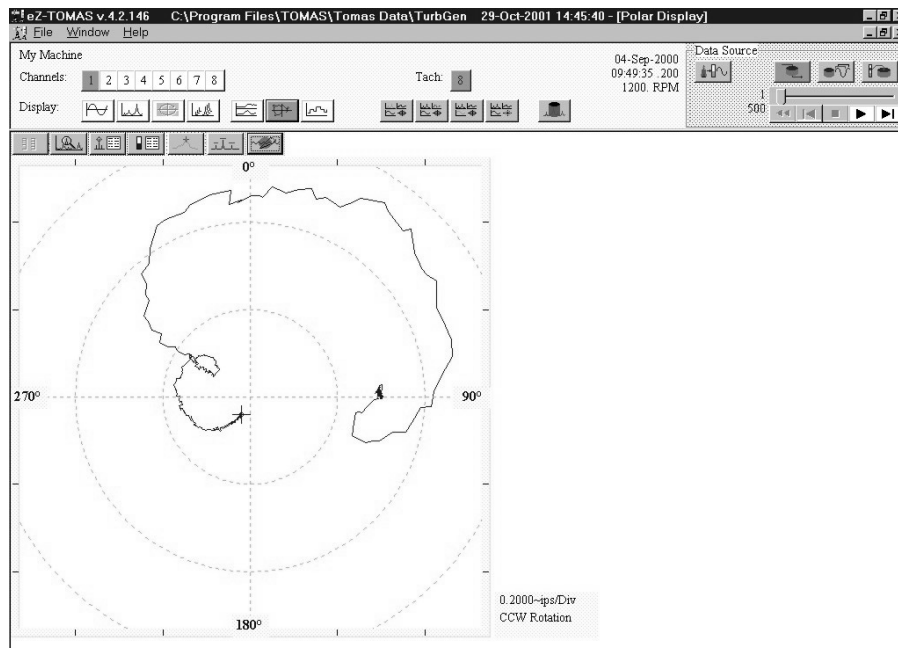
Orbit Display




Orbit Display with Shaft Center Line (SCL)

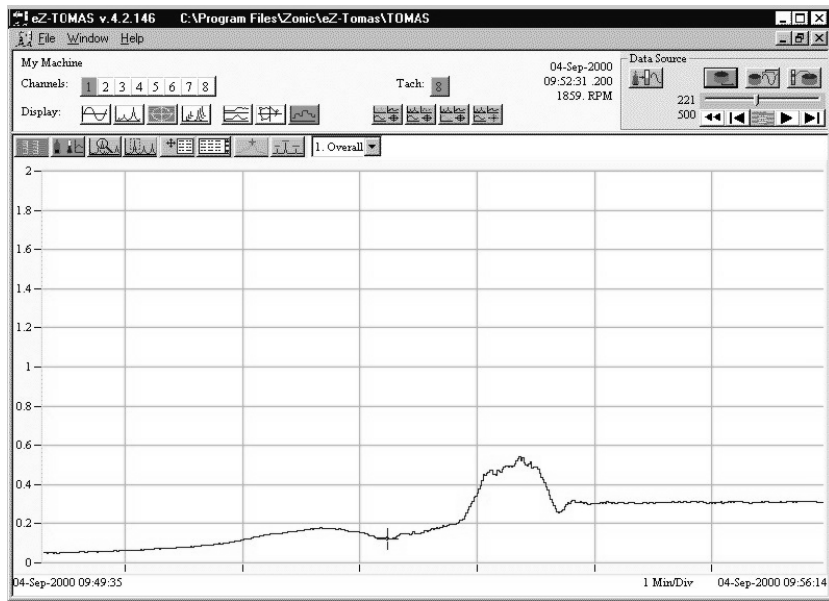
Polar Displays, , show vibration amplitude and phase lag on a polar plot format. The data is corrected for probe location. Phase lag is opposite the direction of rotation. You can optionally display the “Run Out” compensated values (shown as a black trace) by selecting the “Show Compensated” check box. The compensation values are specified for each channel in the ZonicBook configuration. Run Out Compensation is a vector math operation. The referenced first order amplitude and phase vector is subtracted from the displayed first order vector.

Only one channel can be shown on a Polar Display.



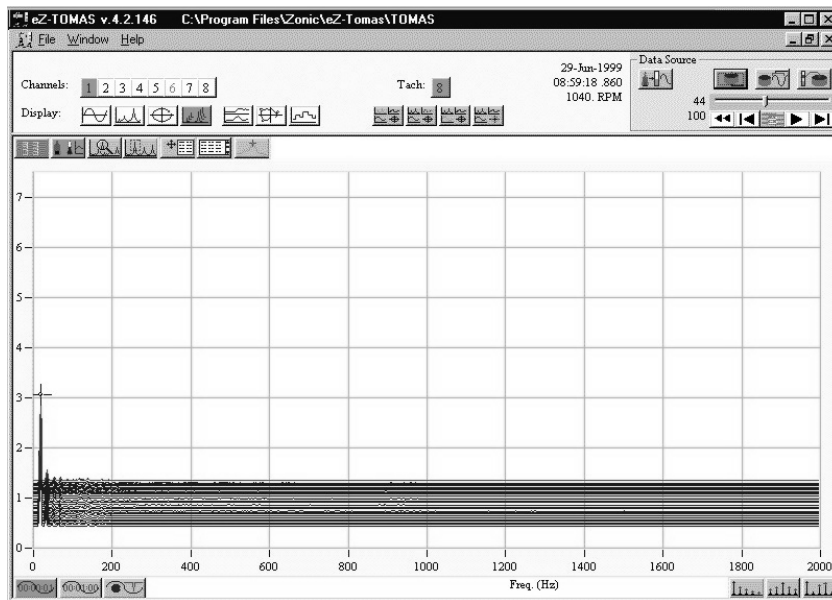
Polar Display

Strip Chart Displays, , show selected instrument gauge values as a function of date and time.



Strip Chart Display

Waterfall Displays, , show rpm data in 3D.



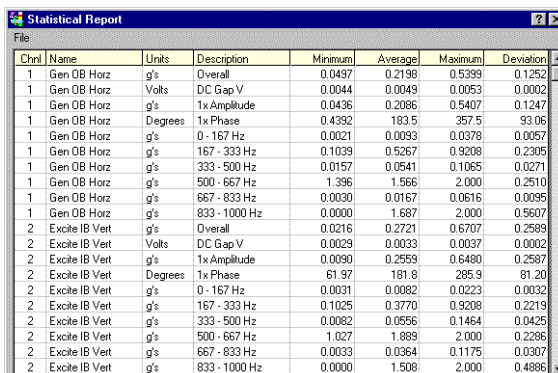
Waterfall Display

Reports Menu

eZ-TOMAS has two types of reports – Statistical and Alarm Log.

Statistical Report

The Statistical Report lists the historical spectral band data. It includes the instrument, the engineering units, the minimum value, the mean average value, the maximum value, and the standard deviation by channel.



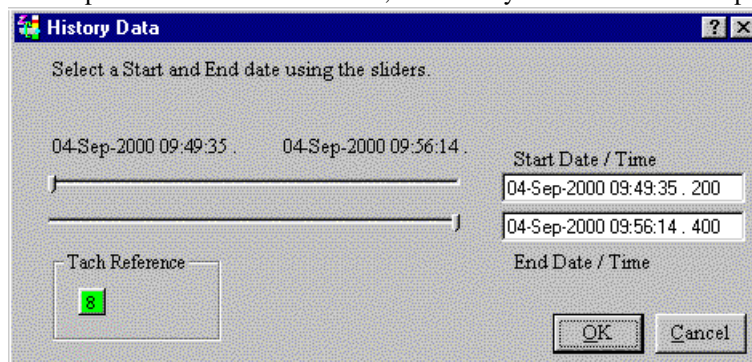
Chnl	Name	Units	Description	Minimum	Average	Maximum	Deviation
1	Gen OB Horz	g/s	Overall	0.0497	0.2198	0.5399	0.1252
1	Gen OB Horz	Volts	DC Gap V	0.0044	0.0049	0.0053	0.0002
1	Gen OB Horz	g/s	1x Amplitude	0.0436	0.2086	0.5407	0.1247
1	Gen OB Horz	Degrees	1x Phase	0.4392	183.5	357.5	93.06
1	Gen OB Horz	g/s	0 - 167 Hz	0.0021	0.0093	0.0378	0.0057
1	Gen OB Horz	g/s	167 - 333 Hz	0.1039	0.5267	0.9208	0.2305
1	Gen OB Horz	g/s	333 - 500 Hz	0.0157	0.0541	0.1065	0.0271
1	Gen OB Horz	g/s	500 - 667 Hz	1.396	1.966	2.000	0.2510
1	Gen OB Horz	g/s	667 - 833 Hz	0.0030	0.0167	0.0616	0.0095
1	Gen OB Horz	g/s	833 - 1000 Hz	0.0000	1.887	2.000	0.5607
2	Excite IB Vert	g/s	Overall	0.0216	0.2721	0.6707	0.2589
2	Excite IB Vert	Volts	DC Gap V	0.0029	0.0033	0.0037	0.0002
2	Excite IB Vert	g/s	1x Amplitude	0.0090	0.2559	0.6490	0.2387
2	Excite IB Vert	Degrees	1x Phase	51.97	181.8	285.9	81.20
2	Excite IB Vert	g/s	0 - 167 Hz	0.0031	0.0082	0.0223	0.0032
2	Excite IB Vert	g/s	167 - 333 Hz	0.1025	0.3770	0.9208	0.2219
2	Excite IB Vert	g/s	333 - 500 Hz	0.0082	0.0556	0.1464	0.0425
2	Excite IB Vert	g/s	500 - 667 Hz	1.027	1.889	2.000	0.2286
2	Excite IB Vert	g/s	667 - 833 Hz	0.0033	0.0364	0.1175	0.0307
2	Excite IB Vert	g/s	833 - 1000 Hz	0.0000	1.508	2.000	0.4886

Statistical Report

The report can be saved as an ASCII text file for further use.

This data can be used to generate or fine tune limits. You can have eZ-TOMAS automatically compute limit values by selecting Generate Limits on the File menu. You can view and modify the limit by selecting Limits on the Configuration menu.

1. On the Reports menu select Statistical, the History Data window will open.



History Data Window

2. Drag the pointers across the scale to select the Start Date and Time, and the End Date and Time for the report. Click the OK button. The Report will then be displayed.
3. Save the Statistical Report as an ASCII text file by selecting Save the Report on the File menu in this window.

Generate Limits

Statistical reports can and should be used to automatically generate limit values based on historical data. After your project has been running for several hours, there is probably enough data in the history file to have eZ-TOMAS automatically generate limits. However, you probably will want to edit these limits if the machine is experiencing amplitude or frequency shifts.



This feature can be used at any time during the life of a project.

1. On the Reports menu select Statistical; the History Data window will open

History Data Window

2. Drag the pointers across the scale to select the Start Date and Time, and the End Date and Time for the report. Click the OK button. The Report will then be displayed.

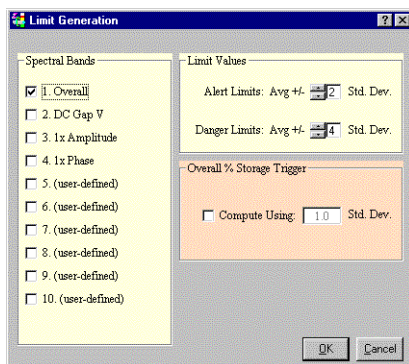
Chnl	Name	Units	Description	Minimum	Average	Maximum	Deviation
1	Gen OB Horz	g's	Overall	0.0497	0.2198	0.5399	0.1252
1	Gen OB Horz	Volts	DC Gap V	0.0044	0.0049	0.0053	0.0002
1	Gen OB Horz	g's	1x Amplitude	0.0436	0.2086	0.5407	0.1247
1	Gen OB Horz	Degrees	1x Phase	0.4392	183.5	357.5	93.06
1	Gen OB Horz	g's	0 - 167 Hz	0.0021	0.0093	0.0378	0.0057
1	Gen OB Horz	g's	167 - 333 Hz	0.1039	0.5267	0.9208	0.2305
1	Gen OB Horz	g's	333 - 500 Hz	0.0157	0.0541	0.1065	0.0271
1	Gen OB Horz	g's	500 - 667 Hz	1.396	1.966	2.000	0.2510
1	Gen OB Horz	g's	667 - 833 Hz	0.0030	0.0167	0.0616	0.0095
1	Gen OB Horz	g's	833 - 1000 Hz	0.0000	1.687	2.000	0.5607
2	Excite IB Vert	g's	Overall	0.0216	0.2721	0.6707	0.2589
2	Excite IB Vert	Volts	DC Gap V	0.0029	0.0033	0.0037	0.0002
2	Excite IB Vert	g's	1x Amplitude	0.0090	0.2559	0.6480	0.2587
2	Excite IB Vert	Degrees	1x Phase	61.97	181.8	285.9	81.20
2	Excite IB Vert	g's	0 - 167 Hz	0.0031	0.0082	0.0223	0.0032
2	Excite IB Vert	g's	167 - 333 Hz	0.1025	0.3770	0.9208	0.2219
2	Excite IB Vert	g's	333 - 500 Hz	0.0082	0.0556	0.1464	0.0425
2	Excite IB Vert	g's	500 - 667 Hz	1.027	1.889	2.000	0.2286
2	Excite IB Vert	g's	667 - 833 Hz	0.0033	0.0364	0.1175	0.0307
2	Excite IB Vert	g's	833 - 1000 Hz	0.0000	1.508	2.000	0.4886

Statistical Report Window



Limit values are not used if the HiHi limit value minus the LoLo limit value is less than 5% of the instrument scale OR the limit value is outside the instrument range.

- In the Statistical Report window select Generate Limits on the File Menu; the Limit Generation window will open.



Limit Generation Window

- Select the Spectral Bands for which limits should be generated.
- Specify the Standard Deviation to be used for Alerts and Alarms. Two High and two Low limits will be defined for each channel's operating condition.
- If you want to change the Overall % Storage Trigger (set in the ZonicBook Configuration window under the Storage tab), click to place a checkmark in the Compute Using check box and enter the new standard deviation to be used.
- Click the OK button. You will be asked if you want the Limits saved to disk. Click Yes.

The limits will be generated and can be reviewed/modified in the Edit Limits window, as shown below.

Alarm Log Report

The Alarm Log contains the last “N” number of alarms. The number of alarms was specified in the ZonicBook Configuration window under the Storage Tab. The Alarm Log displays, in a grid format, the Channel, its name, the date and time of the alarm, the type of alarm, and the value of the signal at that time.

Chnl	Tach	Name	Time	Description	Alarm	Value
D 1	-	Acceleration 1	11-Sep-2000 14:08:48 .290	Overall	HI	1.561
D 1	-	Acceleration 1	11-Sep-2000 14:09:46 .670	Overall	HI	1.321

Alarm Log Report

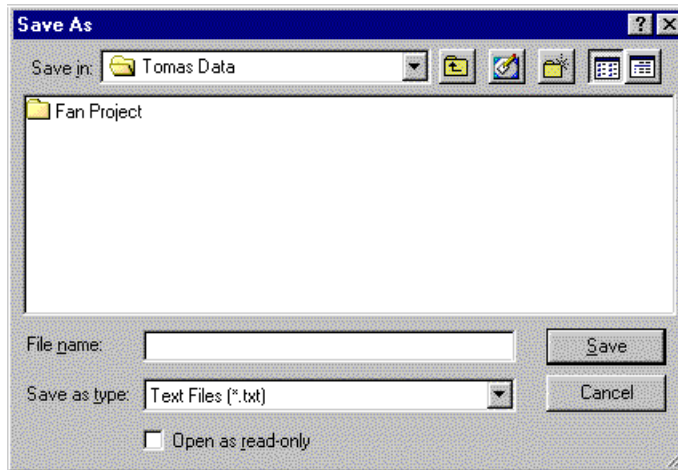
HiHi / LoLo (Danger) limit values = average +/- (4 * standard deviation), unless you changed the standard deviation in the Limits Configuration window.

Hi / Lo (Alert) limit values = average +/- (2 * standard deviation), unless you changed the standard deviation in the Limits Configuration window. To save this report, select Save the Report on the File Menu at the top of this window.

To export this data to an ASCII file, select Backup/Export on the File menu in the Main window.

ZonicBook Configuration

The option creates a text file that contains the details of the current projects configuration.



```
TOMAS tom1.txt - Notepad
File Edit Search Help
eZ-TOMAS v.4.2.146
Project Path: C:\Program Files\Zonic\eZ-Tomas\TOMAS
Config. Settings: 29-Oct-2001 09:14:14
Machine: My Machine

ZonicBook CONFIGURATION -----

Analysis Rate: 5000 Hz
Blocksize: 8192
Averages: 1
Single Integration: 5 Hz
Double Integration: 15 Hz
FFT Window: Flat Top
FIFO File Size: 100 Records
Malfunction Files: 5
Pre/Post Alarm: 6 / 3 Records
Alarm File Size: 100 Records
Picture File:
Channel Count: 8
Password: LEVEL3
```

ZonicBook Configuration Report

Security Menu

eZ-TOMAS has 3 Security Levels.

Level 1 has very limited privileges – Exit, Print, Generate Alarm Log Report, and View Gauge data in the Main menu.

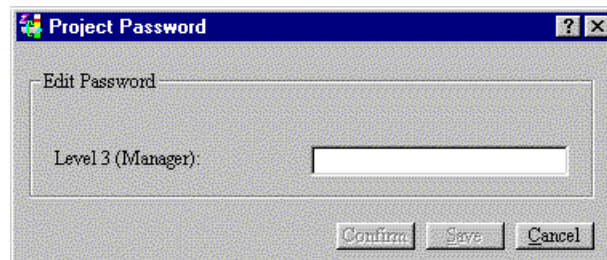
Level 2 has only a few limitations. The Level 2 operator cannot start a new project, Erase the History file, or change the security password.

Level 3 has full privileges. Level 3 is password protected.

No password is required to go from Level 3 down to Level 2 or Level 1. However, the project password is required to move from Level 1 or Level 2 to a higher level.

Change Password

This command opens the Project Password window.



Edit Password Window

Type a password that you can remember and press the <Save> button. The window will then clear your typing. Retype your password and press the <Confirm> button. The new password is immediately accepted.

Glossary

Several terms and acronyms are used throughout the following discussion, including:

Blocksize: The number of data samples used in the FFT process.

Data Block (Block of Data): An array of data samples used in the FFT process. The Data Block array size is the “Blocksize” value.

Spectral Resolution: The Analysis Frequency divided by (the Blocksize divided by 2.56).

The **Sampling Rate** is 2.56 times the Analysis Frequency.

For example,

Given an **analysis frequency** of 1000 Hz and a **blocksize** of 2048,

The **sampling rate** would be 2560 samples per second for each channel, or 2.56 times the Analysis Frequency

The **Time Data Block** consists of 2048 values.

The **Spectral Data Block** consists of 800 values.

The **Spectral Resolution** would be 1.25 Hz per spectral line.

Additional Notes

Here is a list of common suggestions for you to use eZ-TOMAS more effectively.

1. Make sure your ZonicBook Dip Switches are configured correctly. (Typically: Single Ended, AC coupled, and ICP ON.)
2. Use a standard channel location convention. (Typically: A single Tach is channel 8.)
3. **If for some reason, you have an error where eZ-TOMAS does not boot up**, you can work around the problem by deleting the file, “tomas.ini,” located in the executable’s directory. This file identifies the last Project opened. You can delete this file without affecting your data. Try reopening the last project.
4. If you still experience an error. Please send an email to productsupport@iotech.com

Function Keys can be programmed to perform a series of key strokes. These are kept in a separate file “tomasfkeys.ini.” Below is the sample file included with the software distribution. Please note that the first 4 characters must be Fnn=, where nn is the two digits of the Function Key of interest.

F01=HELP	
F02=ACQ	Turn acquisition On/Off
F03=LC	Turns Limit Check On/Off
F04=SAVE	Saves Snap Shot file
F05=pathfilename.tom1(all lowercase)	Opens the user defined project
F06=c:\program files\data\motor.tom1	Opens the “motor” project
F09=PRINT	Opens the Print window

Customize tomasfkeys.ini file

Open the file in notepad or a similar text editor.

Type the definitions for the function keys you want to use. The key words must be as listed above.

Acceptable	Acceptable	Not Acceptable
F01=HELP	F02=ACQ	F10=HELP
F02=ACQ	F03=LC	F02=ACQ
F03=LC	F10=HELP	F03=LC

