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Software Reference Guide

Revision November 19th 2009

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Section 1: Overview of Ascent

The Ascent application complements the vbSeries® family of vibration analyzing instruments and devices. It provides all of the functionality needed to store and analyze vibration data taken with a vb portable or online instrument.

The software communicates with the vb instrument through the PC's serial, Ethernet or USB ports. Use the software to create machine lists and measurement setups then send them to the instrument.

Once your data has been collected use the software to view spectra, waveforms and trends; create envelope and band alarms; and generate reports, such as a detailed exception report, to summarize information in your database.

The Commtest Bearing archive is included with vbOnline, vb5, vb6, vb7 and vb8 packages, providing a large library of bearings and their associated fault frequencies. These fault frequencies can be overlaid on the spectra created in the Ascent software to help identify bearing problems.

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Installing the Software

System Requirements

Minimum system requirements for installing Ascent software are:

- Microsoft® Windows® XP® SP2, Server 2003®, Server 2008® or Vista® (32 or 64-bit) operating system
- 1 GHz 32-bit (x86) or 64-bit (x64) processor or faster
- 1 GB of system RAM
- 1 GB of available hard disk space
- A CD-ROM compatible optical drive
- Windows-compatible mouse, touchpad or other pointing device
- An unused COM, USB or Ethernet port for instrument communications
- Microsoft .NET Framework® Version 3.5 or higher
- An unused Parallel or USB port for Dongle communications (not required if using license keys)

Note that you must have Administrator rights to install Ascent software. If you are within a corporate or managed network you may need to contact your network administrator to request a group user policy that allows Windows registry changes and/or firewall access (to permit communication between the Ascent software and the external Commtest Licensing Server).

Upgrading from a Previous Version

The Ascent installer will search all directories under C:\Program Files\ for previous installations. It will automatically overwrite (upgrade) previous software instances if any are detected.

If there is more than one previous version of the Ascent software installed on your computer the installer will use the first version located as the upgrade path. Uninstall all other versions to prevent conflicts with the new Ascent installation.

If you are currently using a hardware dongle, please see the Upgrading a Legacy Dongle License (page 7) section for instructions on upgrading to a software license.

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Software Licensing

The Ascent software and its associated applications (AscentWatcher, AscentOPC and OnlineManager) must be licensed. The license file may reside either on an external hardware device (USB or Parallel dongle) attached to the host computer, or in a software file stored on the host computer. Without an appropriate license, imported data will be unusable and key software features disabled. A CLK (Commtest License Key) is used to activate and update your license file. A printed label bearing this 11-digit CLK is provided with CD-ROM installations. If installing software downloaded from the Commtest website, a CLK will be generated by Commtest Licensing via e-mail when requested.

The CLK software method, storing the license file on a single local PC rather than a hardware dongle, is the default and preferred means of licensing. Hardware dongles that allow a single license to be transported between several computers must be requested by customers and will incur a supply fee.

If you are currently using a hardware dongle and a license acquired prior to the release of Ascent 2008 software, you may upgrade your license then transfer the new license to your current dongle and continue using it as you have previously. During the upgrade process the license on your current dongle will be erased then, if you wish, replaced with the new upgraded license.

Note: Dongle devices can be used only for licensing purposes. If erased during a license transfer to a PC, USB dongles cannot be reused as USB memory devices.

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Install the Software Using a Software License

To install the software and activate your software license (i.e. install the Ascent software without a hardware dongle):

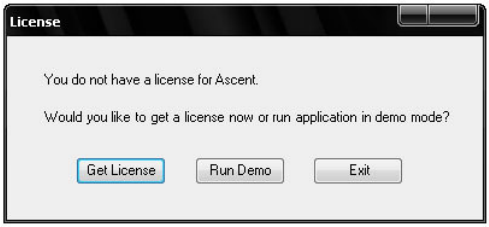
- Close all open programs on your PC.
- Insert the Ascent CD-ROM into the CD-ROM drive.
  - ➢ Wait for the Ascent installation program to start.

OR

  - ➢ Run the **AscentSetup(Version).exe** program located on the CD-ROM.

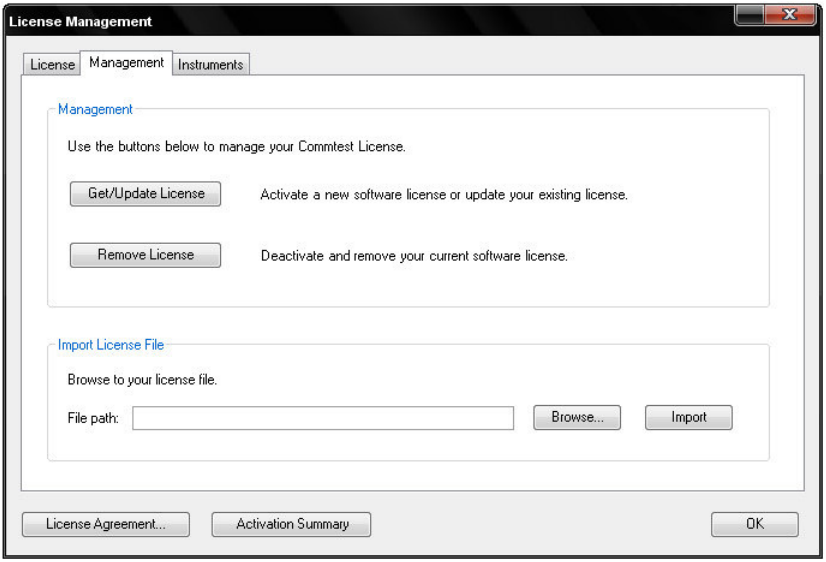
- Follow the on-screen instructions to complete the installation. Start the software when installation is completed.
- The 'License' window will appear. Click the **Get License** button. The 'Licence Management' window will open.

Note: This message will not appear if you are using a legacy hardware dongle. See Upgrading a Legacy Dongle License (page 7).



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- Click the **Get/Update License** button. If you are a legacy user, and you have a hardware dongle connected (that has been upgraded previously using the Upgrading a Legacy Dongle License (page 7) procedure), you may now select whether you wish to install a software (machine) license or a hardware (dongle) license. If you do not have a dongle (a more common user scenario) only one option, **Activate license on machine**, will be available to you.



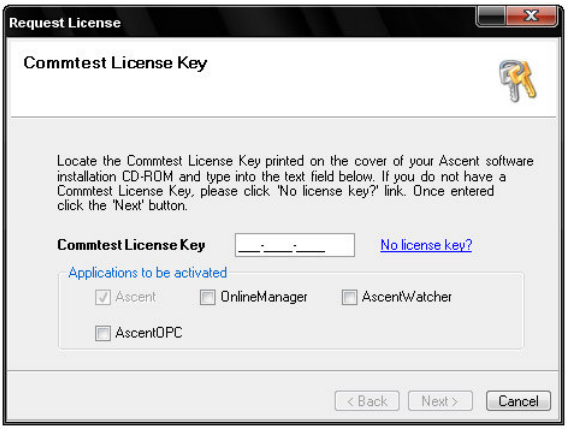
- Click the **Next >** button. The 'Request License' window will open.
- Type your license key into the 'Commtest License Key' field, then select the boxes beside the applications you wish to activate (only tick those applications you are licensed for; adding unlicensed features will cause the activation to fail).
- Click the **Next >** button.

Notes:

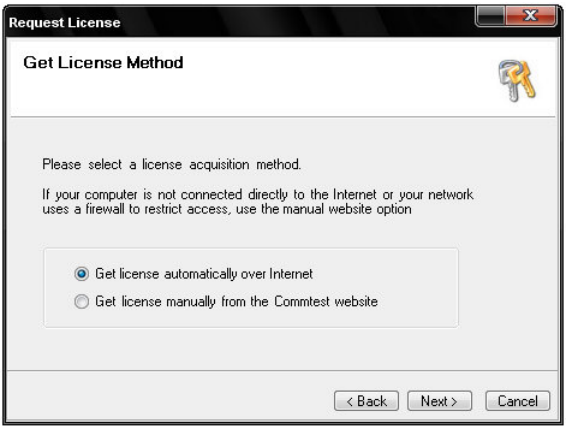
The license key is printed on a sticker attached to the inside cover of the CD-ROM installation disc case.

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The **Next >** button will only become active after an 11-character key has been entered into the 'Commtest License Key' field.



- Choose your preferred license acquisition method by selecting the appropriate checkbox. Click **Next >**.



If you selected **Get license automatically over Internet** the license will be obtained immediately over the Internet and installed. You may now move to the next topic, 'Adding Instrument to Your License (page 11)'.

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If you selected the **Get license manually from the Commtest website** option you will be presented with further instructions:

- Click the **Generate License Request File** button
- Save the text (.txt) file to your computer. Transfer the file to an Internet-connected computer
- Browse to https://licensing.commtest.co.nz on the Internet-connected computer
- Follow the instructions provided on the website to generate a license key file
- Save the key file on your computer and transfer this file to the Ascent host computer
- Click the **Browse** button in the License Manager under the **Management** tab and browse to the new key file. Import the key file by pressing the **Import** button

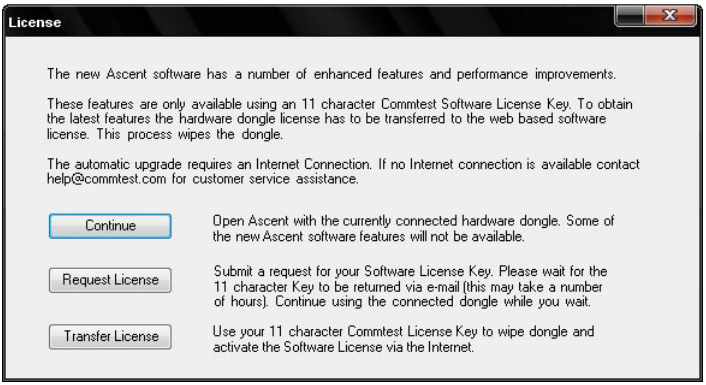
Upgrading a Legacy Dongle License

This procedure is for users currently using a legacy (Parallel or USB) hardware dongle wanting to upgrade their license. Upgrading allows access to newer Ascent features that cannot be accessed using an older license. The steps described below need to be performed only once. Once completed, the existing dongle license will be erased and an upgraded license installed on the host computer. If you wish to continue using a hardware dongle, the new license can be transferred to the dongle using the procedure described in Program Your Hardware Dongle (page 17).

Note: Ensure that your hardware dongle is connected to your computer's Parallel or USB port before proceeding. Your current license must be valid or the upgrade process will fail. Contact Commtest customer support if your current license has expired.

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- Start Ascent with your current hardware dongle attached to the computer. The following pop-up window will appear:



- Click **Continue** to operate Ascent using your current dongle license without upgrading. If you wish to upgrade your license (strongly recommended) click **Request License**. An e-mail will be generated containing your dongle details. You may also optionally provide your instrument serial number. Send the email and you will receive an email response containing a CLK (license key) from Commtest. This may take several business hours. Once you have sent the e-mail license request, close Ascent and wait for your license key, or click **Continue** to continue using the hardware dongle.

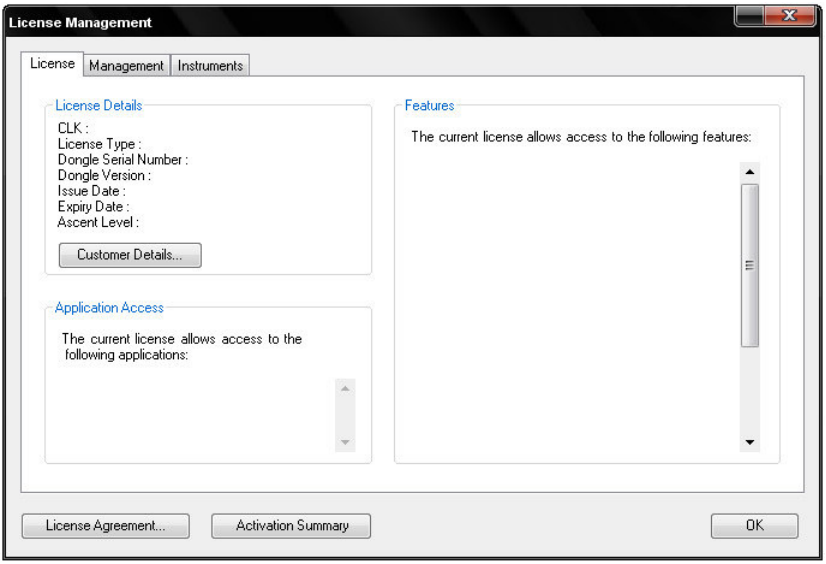
- Once you have received an email reply containing your CLK, ensure you have an active Internet connection and your dongle connected, re-start Ascent and click the **Transfer License** button. Enter your CLK and follow the onscreen instructions to upgrade your license. **Note that all data on your dongle will be erased during the upgrade process**. **The new software license can, however, be transferred back to the dongle once the upgrade process has completed.**

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Using the License Manager

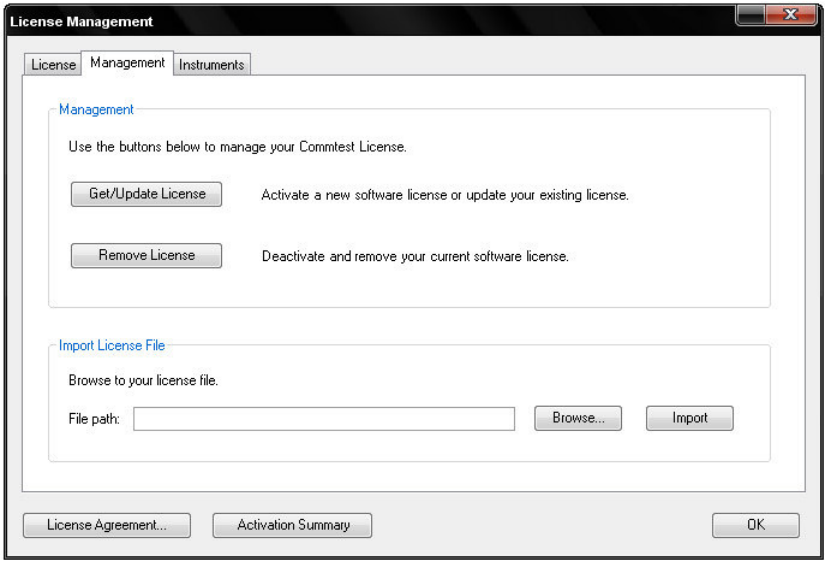
The License Manager is used to control all aspects of your software license. Use the Manager to add, update or remove your license, and to view the status and features permitted by your current license level.

License. Use this section of the Manager to view your license details including your license key, license expiration date and Ascent software level. Click the **Customer Details...** button to update your contact details (Internet connection required). Click **Activation Summary** to view your current license features and the number of used/available license seats.



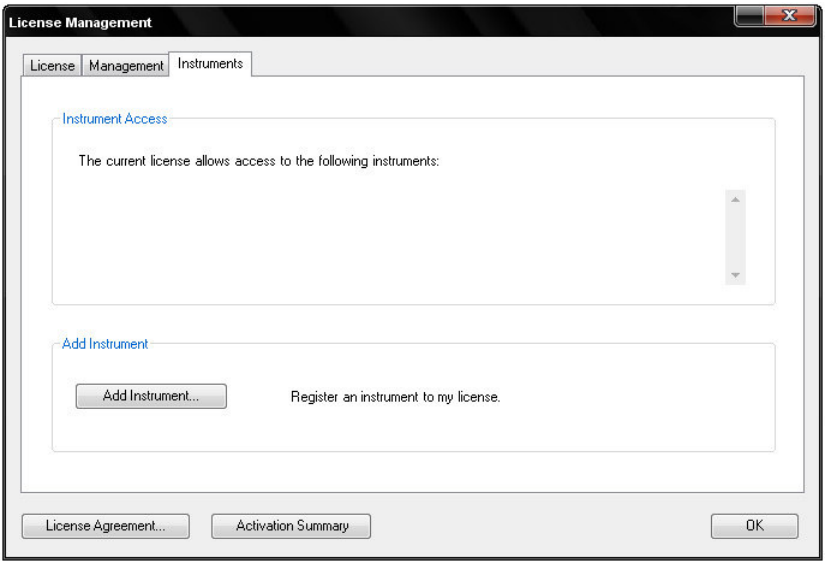
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Management. Use this section of the Manager to add a new license (page 4), remove your license from a dongle or computer (page 15) and to update your software license when manually using the Commtest License Server (for license updates without a direct Internet connection).



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Instruments. Use this section of the Manager to view the instruments you are able to access with your license and to add new instruments to your license (page 11).



Adding Instruments to Your License

Once your license has been activated you may add an instrument, or instruments, to it.

- Select **Help>License Management...**. The 'License Management' window will open.
- Click the **Instruments** tab then the **Add Instrument...** button. If you are using a hardware dongle and you have not upgraded your license, you may select whether you wish to upgrade your dongle license. If you do not have a hardware dongle attached and instead use a software license stored on the PC (a more typical user scenario) only one option, **Update license on machine**, will be available to you.

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- Click **Next >** and the 'Add new vb Instrument' window will appear.



- Type your instrument serial number into the **vb Serial Number** text field. The serial number is located on a label attached to the rear panel of the instrument and on the QA card supplied with the instrument.

- Type the instrument QA date into the **QA Date** field. This date is provided on the QA card supplied with the instrument. The date must be entered in YYYY-MM-DD format.

- Click the **Next >** button.

- Choose your preferred license acquisition method by clicking one of the two available checkboxes. If the computer does not have an Internet connection, or if your network is behind a firewall, use the second option; if it is connected to the Internet use the first.

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- Click the **Next >** button.



If you selected **Add instrument automatically over Internet** the license will be updated immediately over the Internet and installed.

If you selected the **Add instrument manually from the Commtest website** option you will be presented with a new window containing further instructions:

- Click the **Generate License Request File** button
- Save the text file to your computer. Transfer the file to an Internet-connected computer
- Browse to https://licensing.commtest.co.nz on the Internet-connected computer
- Follow the instructions provided on the website to generate a license key file ('Get/Update License')
- Save the CLK (key) file on your computer and transfer this file to the Ascent host computer
- Click **Browse** button in the License Manager under the **Management** tab and browse to the new key file
- Import the key file by pressing the **Import** button

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Upgrading or Editing a License

If you have purchased a license upgrade to access more software features or capabilities you must update your existing license. Doing so will activate any new software or hardware capabilities. Any new features will not be activated or available to you until Ascent has communicated with the License Server and your license's new capabilities programmed.

Follow the license installation procedure described in the topic Install the Software Using a Software License (page 4). Repeating this process will also update your license. If you are using a hardware dongle, see the Upgrading a Legacy Dongle License (page 7) and Program Your Hardware Dongle (page 17) procedures for the required dongle update steps.

Note: You must perform an update when your license expires and you have requested and received your free license extension. Doing so allows the Ascent software to communicate with the Commtest License Server, activating the extension and setting a new license expiration date.

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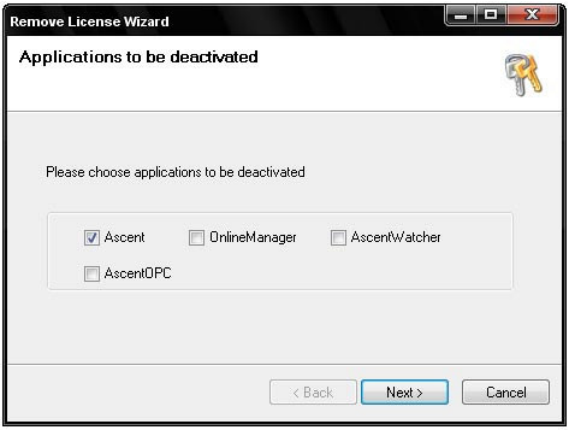
Uninstalling a Software License

If you wish to uninstall your software license in order to:

- Transfer the Ascent software to another computer
- Decommission or upgrade your PC hardware
- Indefinitely uninstall the Ascent software for storage
- Switch between a PC-based and dongle-based license

Follow the procedure below:

- Select **Help>License Management...**. The 'Licence Management' window will open.
- Click the **Management** tab then the **Remove License** button. If you have a hardware dongle connected, you may select whether you wish to remove a software (PC) license or a hardware (dongle) license. If you do not have a dongle connected (a more typical user scenario) only one option, **Remove license from machine**, will be available to you.
- Select the license components (applications) you wish to remove.
- Click the **Next >** button.



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- Choose your preferred license removal method by clicking one of the two checkboxes. If the computer does not have an Internet connection use the second option; if it is connected to the Internet choose the first.
- Click the **Next >** button.



If you selected **Remove license automatically over Internet** the license will be removed immediately over the Internet.

If you selected the **Remove license manually from the Commtest website** option you will be presented with a new window containing further instructions:

- Click the **Generate Remove License Request File** button
- Save the text file to your computer. Transfer the file to an Internet-connected computer
- Browse to https://licensing.commtest.co.nz on the Internet-connected computer
- Select the 'Remove License' option on the website
- Follow the instructions provided on the website to de-register your license

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Program Your Hardware Dongle

The following steps should be followed if you have upgraded your license but you wish to use a hardware dongle rather than a PC-based license file (i.e. you wish to transfer your license from your computer to a detachable hardware dongle for use with multiple computers).

Notes:

If you have a single license, you may use either a PC-based license **OR** a dongle license, not both. If you have previously installed your license on your PC you must uninstall it by selecting **Remove License** from the **Management** tab of the License Manager before transferring the license to a dongle device.

To access many of the Ascent software's newer software features, *you must upgrade to the new license*. In order to upgrade and continue using your dongle you must:

- Install a software license using a CLK or Upgrade your Legacy Dongle License (page 7). This will upgrade your license, transfer the new software license to your computer, and remove your old license from the dongle.
- Uninstall the software license (page 15) from your computer, then;
- Transfer the license to your hardware dongle, as described in the procedure below. You cannot upgrade older licenses contained on dongles directly to the new license type. You must first upgrade to a new software (machine) license, then uninstall the new license and transfer it to the hardware dongle.

You may transfer your upgraded license from the computer to the dongle and vice-versa as many times as you wish using the same 'Uninstall License, Add License' sequence and your CLK.

Note: These steps assume you have already uninstalled your software license from the computer. You must connect your dongle before starting this procedure.

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- Select **Help>License Management...**. The 'License Management' window will open.
- Click the **Management** tab then the **Get/Update License** button. The 'License Method' window will appear.
- Select the **Activate license on dongle** option and click the **Next >** button. The 'Request License' window will open.



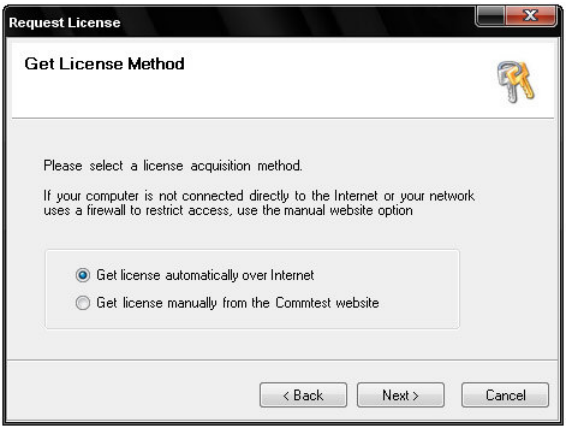
- Type your license key (located on the CD-ROM installation disc or provided by Commtest License Support) into the **Commtest License Key** field.

Note: If you do not have a license key, click the **No License key?** button and a license request e-mail will be generated. The e-mail contains your dongle serial number and any associated instrument serial numbers. Send the e-mail and you will receive a return e-mail from Commtest License Support containing your license key. This may take several business hours.

- Select the software applications you wish to activate on your license by ticking to appropriate checkboxes (only tick those applications you are licensed for; adding unlicensed features will cause the activation to fail).

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- Click the **Next >** button.



- Choose your preferred update method by clicking one of the two options. If the computer does not have an Internet connection use the second option; if it is connected to the Internet choose the first.

- Click the **Next >** button.

If you selected **Get license automatically over Internet** the license will be obtained immediately over the Internet and installed. Your dongle license is now installed.

If you selected the **Get license manually from the Commtest website** option you will be presented with further instructions:

- Click the **Generate License Request File** button
- Save the text (.txt) file to your computer, then transfer the file to an Internet-connected computer
- Browse to https://licensing.commtest.co.nz on the Internet-connected computer
- Follow the instructions provided on the website to generate a license update file ('Get/Update License')
- Save the CLK (key) file generated through the license website on your computer, then transfer this file to the Ascent host computer

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- Click the **Import License** button in the License Manager under the **Management** tab and browse to the new key file. Import the key file by pressing the **Import** button. Your dongle license will now be installed

Installing the Software Using a USB Security Dongle

Note: You must have administrator rights on your PC to install the Ascent software.

- Close all programs on your PC.
- Insert the Ascent CD-ROM into the CD-ROM drive.
  - Wait for the Ascent installation program to start.

OR

  - Run the Ascentsetup.exe program located on the CD-ROM.

Windows XP, Vista and Server 2003

- Once Ascent has been installed, connect the dongle to the PC's USB port.

After connecting the dongle, the 'Found New Hardware' wizard will activate and use the 'Aladdin Key' drivers from the Ascent installer.

- Start the Ascent software once the USB driver has been installed.
- Click **Continue** on the 'License' window to start the software using your existing dongle license. This completes the installation process.

Installing the Software Using a Parallel Port Security Dongle

If you have ordered a parallel port dongle in addition to your vb kit, install the Ascent software and connect the dongle when the program prompts you. The Windows operating system will automatically enable the dongle.

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Note: You must have administrator rights on your PC to install the Ascent software.

- Close all programs on your PC.
- Insert the Ascent CD-ROM into the CD-ROM drive.
  - Wait for the Ascent installation program to start.

OR

  - Run the Ascentsetup.exe program located on the CD-ROM.
- Follow the on-screen instructions to complete the installation.
- Start the Ascent software once the installation is completed.
- Click **Continue** on the 'License' window to start the software.

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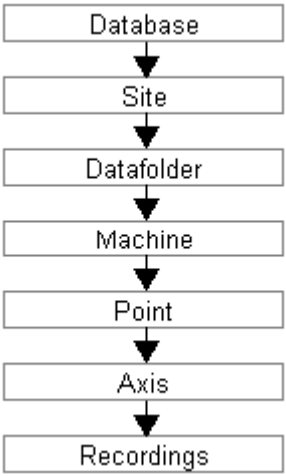
Data Structure and Storage Capacity

The data structure used in the Ascent software and vb instrument is hierarchical. At the highest level is the database. Every item of data in a database belongs to a particular site.

Each site within a database contains folders; each of which can hold up to 200 machines on a vbX000 instrument or an effectively unlimited number on a vbX instrument.

Each machine contains a number of points, and at each point recordings may be made at any of a fixed number of axes.

Folders are used to contain your machine information and are transferred between the software and the vb instrument using the Send and Receive functions.



Simplified data hierarchy

Storage capacity

We recommend that you archive and delete recordings from your Ascent database when it reaches 2 GB in size.

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Within the Ascent database you can create far larger data structures than can be stored in the instrument. You can create unlimited folders in the Ascent software, but some instruments will hold only a maximum of 30 folders at any one time (note that this does not include vbX instruments such as the vb5, vb6, vb7 and vb8 vibration analyzers, which can hold an effectively unlimited number of folders).

To make the best use of the database storage capacity you should set up as many machines in as many folders as you like, but only transfer across those that you will need during your next recording route or collection. In this manner you can transfer up to 30 folders to the instrument, collect the measurements, then send them back to the software. You can then erase the machines and recordings on the instrument and transfer another 30 folders across, repeating as often as required. Full details of the instrument's storage capacity are detailed in the *vbSeries Instrument Reference Guide*.

Where is my Data Stored?

The Ascent software stores information (machines, points etc) in a database. For computers using Windows XP or Server 2003 the database's default location is:

C:\Documents and Settings\All Users\Shared Documents or **C:\Program Files\Commtest\Ascent**

For computers running a Windows Vista operating system the database will be stored by default in:

C:\Users\Public\Documents

To access the Ascent software files

- From the main menu, choose **Options>Explore Settings Folder**. This will open Windows Explorer and display a list of all files and folders present in your Ascent installation.

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What is a…

Database

The Database is the top level of the Ascent hierarchy. A database holds the sites and machine structure set up by the software user (every item of data in the Ascent software is stored in a database.). Multiple databases can be used, but all sites must belong to the *same* database in order to share information between sites. Database files on your computer hard disk end with the extension '.FDB' (or, in the case of older legacy Interbase databases, '.GDB').

Site

 A Site contains folders which are used to store machine information. Every item of data in the database is contained within a folder and each folder belongs to a particular site.

To edit a site

- From the main menu, choose **Edit>Edit Site**. In the form's blank fields only the company and site names need to be entered. The rest of the information is optional.

Folder

 A Folder is used to hold a collection of machines. A folder represents the entire collection of information that is sent to, or received from, the instrument.

Machine

 A Machine represents an actual machine on the factory floor or within a facility. Machines hold a collection of points and are stored in folders.

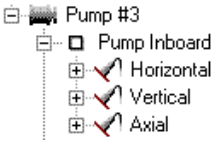
Point

 A Point represents a position/region on a particular machine where vibration measurements will be taken. Bearings and gears can be defined at each point so that fault frequency information is available for all measurement locations on the point.

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Measurement Location

A Measurement Location represents an *actual place* on the machine where you will place a sensor and take vibration measurements. The difference between different measurement locations at a point is the *orientation* of the sensor (the axes around the shaft on which the sensor is placed). There may be several measurement locations at a point, each using a different orientation/axis.



A machine with three measurement locations

Recording

30/09/2002 3:53:48 p.m. Vel Freq 60000 CPM @ 2487 RPM (GMT +1)

A Recording represents a single, or series of, recorded vibration measurements (in the case of spectrum+waveform or 6Pack recordings, for example) and is labeled with the time, date, and a description of the type of measurement(s) taken.

Schedule Entry

A Schedule Entry represents a vibration recording that is scheduled to be taken.

A schedule entry ties a *Parameter Set* to a *Measurement Location*. The parameter set defines a general set of measurement parameters and the schedule entry specifies how the measurement should be taken at a particular location (which sensor to use, what the default RPM is etc).

You may have more than one schedule entry at a measurement location. For example, you may take a velocity recording and then (without moving the accelerometer) an acceleration recording.

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Parameter Set

 A Parameter Set defines the general parameters to be used for taking a measurement (the measurement units to use, the number of averages to be taken etc). You can share your parameter sets between schedule entries in your database. Then, if your measurement requirements change, you can modify the parameter set and all the schedule entries that use it will be updated automatically.

Note: The parameter set and schedule entry icons are the same as they can be edited in the same window.

Route

 A Route is contained in a folder and is an ordered list of some or all of the measurement locations in that folder. A route *cannot* contain measurement locations from any other folder.

You may have more than one route in a folder. When a route is sent to the instrument, *all* of the machines, points and measurement locations in the folder will still be sent to the instrument, even if the route does not refer to them.

Note: A measurement location must contain at least one schedule entry for it to appear in a route. The instrument needs to know what type of measurement to take - this information is contained in the schedule entry.

Route Entry

 A Route Entry specifies where on the machine a measurement is to be taken and what the orientation of the sensor will be e.g. 'Motor drive end, horizontal'. The order of the route entries is the order in which the measurement locations will be visited when carrying out the route.

Envelope Alarm

 An Envelope Alarm defines an alarm region on the spectra. The alarm is triggered when any point in the spectrum exceeds the alarm threshold.

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Band Alarm

A Band Alarm defines a limited range of frequencies to monitor on a spectrum. A band alarm can be either Peak or Power based.

Peak Band Alarms detect when a spectral peak within the defined band goes above a certain value.

Power Band Alarms measure the overall RMS within the defined band and compare that against a threshold value.

Bearing

Bearing definitions can be added to points on your machines. Once the software knows the fault frequencies for a bearing, it can display fault frequency markers on spectra, allowing you to identify peaks related to that bearing.

Bearings can have notes attached and interchange information may also be available for them. The Ascent software comes with its own bearing database containing over 30 000 bearings.

Interchange Bearing

Where possible, the Commtest Bearing Archive will offer a list of bearings that are compatible with the bearing that is selected. This allows you to replace a bearing with a suitable alternative, should your chosen bearing be unavailable.

Disclaimer: While every effort has been made to ensure that bearing and bearing interchange information is valid and correct, no responsibility can be accepted for any damages caused as a result of the use of this information.

Gear

Gear definitions can be added to points on your machines. Once the software knows the fault frequencies for a gear, it can display fault frequency markers on spectra, allowing you to identify peaks related to that gear.

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Sensor

 A Sensor defines the name, type and sensitivity of a sensor used for data collection. You can store the calibration values and settling times of your sensors in both the software and the vb instrument.

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Section 2: Basic Operation

Starting the Software

When you install the software, program shortcuts will be created on the Desktop and in the Windows Start menu.

- From the Windows Start menu select **All Programs>Commtest>Ascent>Ascent**.

Creating a Database

If this is the first time you have created a database we recommend you accept the default name and storage location so that you can easily find the database if needed. The default name and storage location is listed in Where is my Data Stored (page 23).

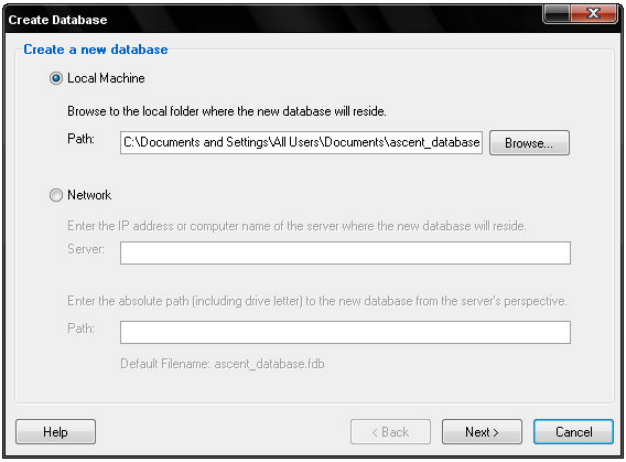
The factory default database contains all the necessary information to begin setting up your machines.

- Click **Database>Create Database>Create New** on the toolbar.



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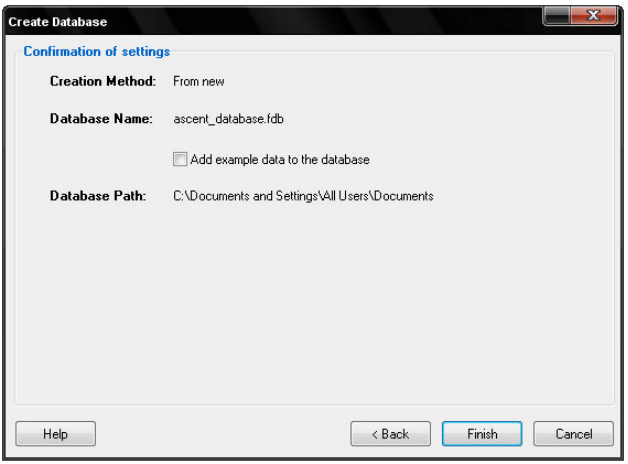
The following window will appear:



- To create a local database (i.e. a database on the computer on which Ascent is installed) select the **Local Machine** checkbox. Click **Browse...**. to choose an alternative location, if required, or to change the database's default name, then click **Next >**. If this is your first database, accept the default location. To create a new database on a server or other networked machine select the **Network** checkbox option and enter the server name or IP address (e.g. 'MyServer' or '192.168.1.1'. Note that the server address must have all leading and trailing back slashes removed; while 'MyServer' would function correctly, '\\MyServer\' would not) into the **Server:** field, then the path to the database in the **Path:** field.

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Note: The path must be an 'absolute' and include correct drive mapping from the server's perspective rather than be a virtual server address (for example, 'C:\MyDatabase\Database.fdb' would be acceptable, but '\\Server\MyDatabase\Database.fdb' would not).



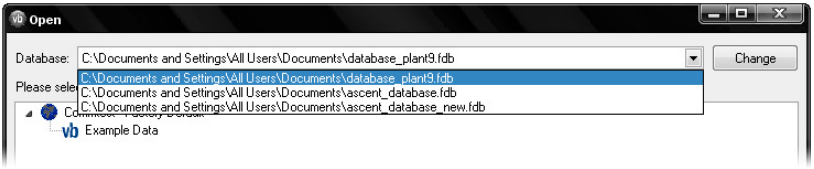
- Check that the database location and name listed are correct, then Click **Finish**.
- You will now be prompted to open the new database. Select a Site or Folder then click **OK** to open.

Selecting Another Database

The Ascent software keeps track of the databases you use and allows you to quickly switch between them. A list of previously accessed databases is available from the drop-down box on the Open window.

- Press **Open** on the Main Menu. The 'Open' panel will open.
- Select a database from the dropdown list, then select a Datafolder or Site from the lower selection area and click **OK**. If the database has not been opened previously, click **Change** and then **Browse.** Browse to the database (.FDB), select it then click **Open**. Select a Datafolder or site and click **OK** to open.

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Creating a Folder

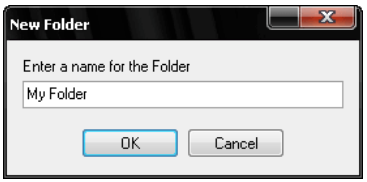
The rest of this section is presented as a tutorial to help familiarize you with the software. The instructions will guide you through some of the routine tasks you will perform when using the Ascent software and the vb portable instrument. You will learn how to set up machines, create routes and transfer data between your computer and the instrument.

Your first task is to create a folder. This will be used to hold a machine with four measurement locations that you will create shortly.

- Click the **Open** button on the toolbar, then the **New** button and choose 'Folder..'. OR right-click in the navigator panel and select **New>VB Datafolder**. Datafolders are used to store machines.



- Now enter a folder name (type over the default folder name).



- Click **OK** to create the folder.

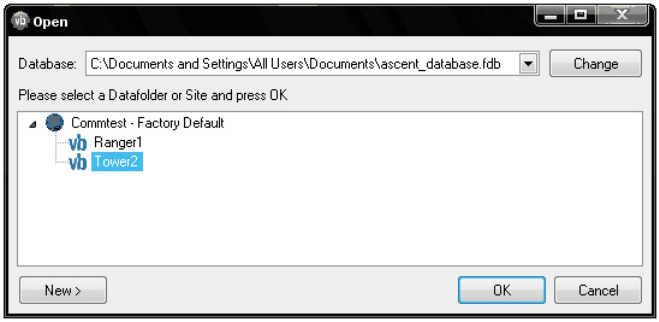
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Deleting a Folder

- To delete a folder left-click the folder with the mouse to select it.
- Press **Delete** on your keyboard. You will be prompted to confirm the deletion.
- Click **OK** to permanently delete the folder.

Opening a Folder

- Double-click a folder to open it. If you can't see any folders, click the (expand) icon beside one of the blue site icons.

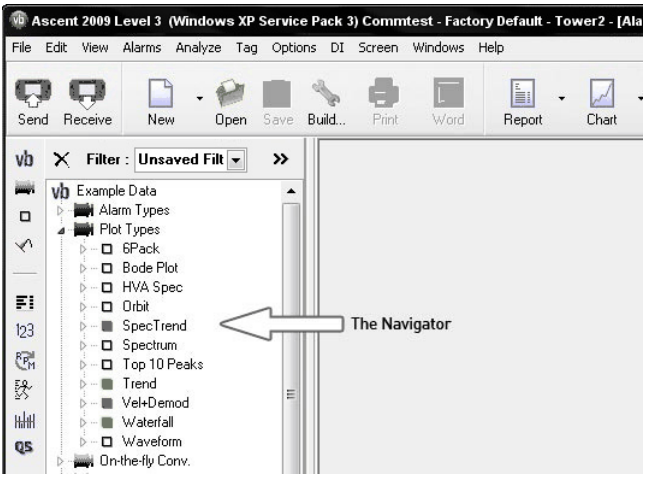


The folder will open and its contents will be displayed in the Ascent navigator.

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The Navigator

By default the navigator panel is located on the left of the Ascent screen. It allows you to visually navigate through the data in a database.



- The navigator can be placed on the top of the Ascent window by going to the main menu and choosing **Screen>Navigator on top**.

Displaying Toolbar Captions

If you are using a small monitor or running a non-English version of the Ascent software, some toolbar buttons may not fully display across the width of your screen. Turning off the toolbar captions will reduce the width of buttons so that they fit your screen better.

- To turn off button captions click **Screen** and deselect **Show Toolbar Captions**.



Button with caption and without caption

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Creating Machines Using Build Mode

Build Mode is what you will use to 'build' the structure of your machines. When you are in Build Mode, *placeholders* will appear in the navigator tree for you to create new machines, points, measurement locations and schedule entries. Left-click the placeholder to create the item.

When you click the **Build** button on the toolbar, you toggle Build Mode on and off.



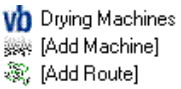
Your first task will be to create a machine with two points and two measurement locations at each point. Shortly you will learn how to copy parts of your machine structure to save time, add a photographic image for identification purposes and also create a parameter set and schedule entries to specify what types of measurement will be carried out at each machine location.

- Click **Build** on the toolbar to activate Build Mode.

If you are licensed to use The Proven Method this will open the Machine Builder Wizard, which is used for creating machines with pre-set alarms. Instructions for using the Wizard (page 302) are given later in the manual. For now, we are going to manually create our machines.

- If the Wizard is open, close it by clicking the Manual Build Mode link near the bottom of the screen.

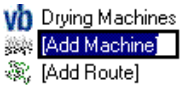
Your navigator will look like this:



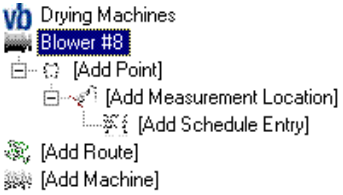
The currently open folder, Drying Machines, is at the top of the navigator tree. The *placeholders* beneath it are what you will use to create your machine structure.

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- Click [Add Machine] **once** with the left mouse button to select it. The placeholder will turn blue indicating that it can now be edited.



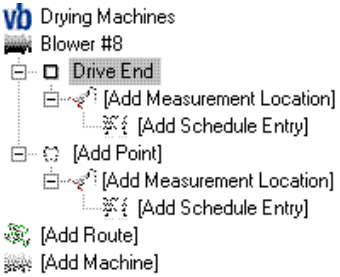
- Type 'Blower #8' and press **Enter** on your keyboard.



You have now created a machine called Blower #8. When you pressed **Enter**, the machine structure opened out to reveal placeholders for creating the points and measurement locations on this machine - we will add these next. A new [Add Machine] placeholder now appears at the bottom of your structure ready for you to create more machines in this folder.

Adding a Point

- Click the [Add Point] placeholder that belongs to Blower #8.
- Type 'Drive End' then press **Enter** to create this point. Several new placeholders now appear.

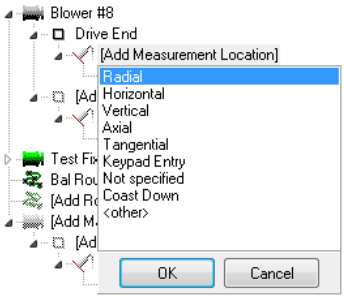


Next you will add two measurement locations to the Drive End point.

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Adding a Measurement Location

- Click the first [Add Measurement Location] and click Horizontal from the list that appears.



- Click **OK** to create a horizontal location at the Drive End point.
- Click the [Add Location] below the one you just made, choose Vertical and click **OK**.

Notes: You can define a new location name by selecting <other> from the drop-down list, clicking **OK** then entering a name. Defining new location names and editing existing ones is described in Customizing Axis Names (page 224).

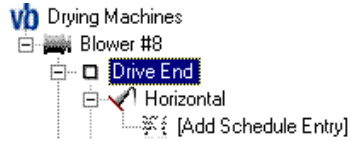
If taking a triaxial measurement at the location, right-click the new location and select **Edit**. In the 'Measurement Location' window select an axis from the 'Triax Axis' dropdown box. The measurement axis will be displayed beside the location in the navigator. For example, a measurement on the X axis on the location 'Vertical' will be displayed as 'Vertical[X]'.

Copying a Point

We are going to duplicate the Drive End point (along with its two locations) to make the 'Other End' point.

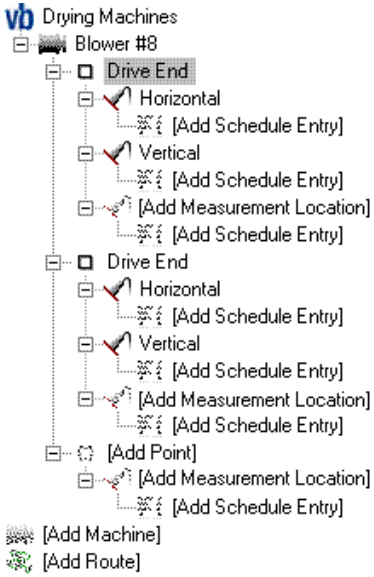
- Right-click the Drive End point and select **Copy Branch to Clipboard** from the shortcut menu.

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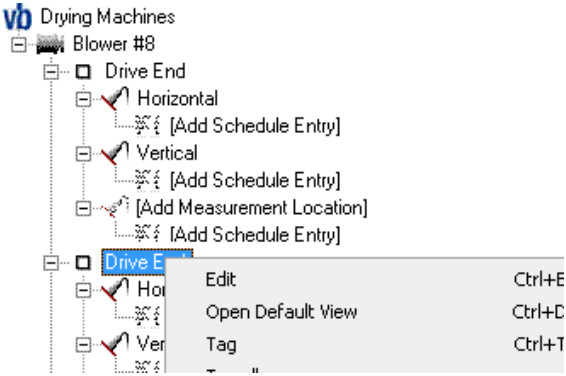
- Now right-click the Drive End point again and select **Paste**.

The new point appears in the navigator tree below the previously selected point. Your navigator will now look like this.

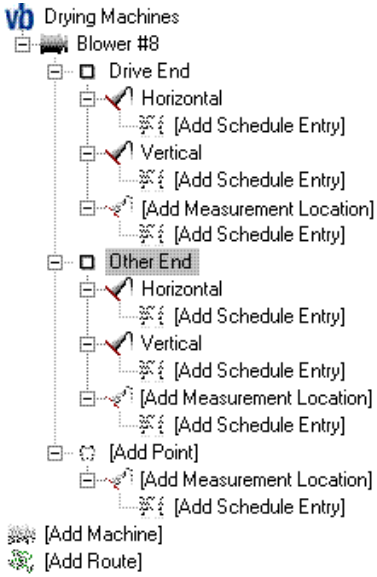


- Right-click the **second** Drive End and choose **Edit**. The Point Editor window will appear.

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- Type 'Other End' in the Point name field, and click **OK**. Your navigator tree will look like this.



You have now created a machine with four measurement locations on it. Next you will specify what vibration measurements are to be taken at these locations.

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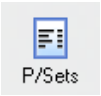
Creating Parameter Sets/Schedule Entries

A *Parameter Set* defines a 'set of parameters' that will be used to take a measurement. If you intend to take the same type of measurement at many machine locations, creating a single parameter set for that type of measurement will save you a lot of set up time. You specify the measurement parameters once, then re-use the parameter set in as many S*chedule Entries* as you like.

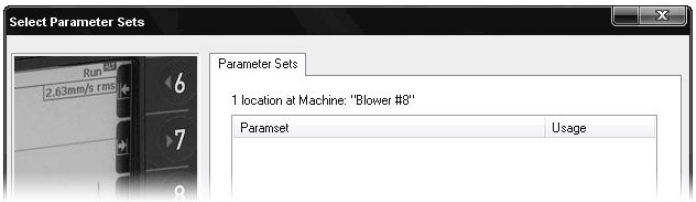
A S*chedule Entry* represents one measurement (or one multi-measurement type, such as a 6Pack measurement on vbSeries portables) that is scheduled to be taken. A single parameter set can be used to assign parameters to many schedule entries (individual measurements) and provides a quick way to set up those measurements.

We will create a single parameter set and then use this to create four schedule entries - one at each of the four locations on our machine.

- Click Blower #8 once with the left mouse button to select it.
- Click the **P/Sets** button on the toolbar.

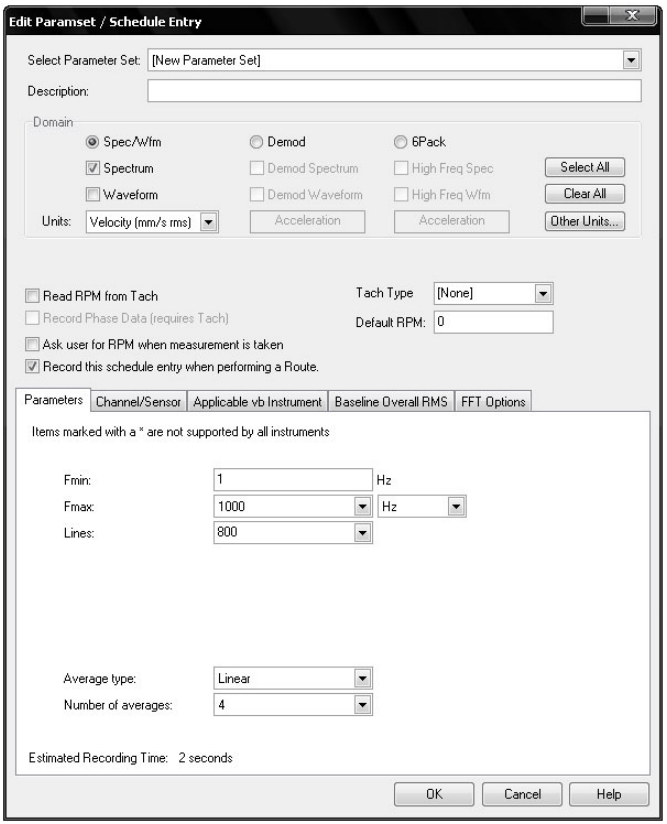


This opens the Select Parameter Sets window that summarizes the parameter sets that are currently defined on this machine. This window is empty because we have not yet defined any parameter sets.



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- Click the **Add** button to create a new parameter set/schedule entry combination. This opens the Edit Paramset / Schedule Entry editor. This editor gives you complete control over the measurement parameters that will be used by the instrument.



Before creating or editing Parameter Sets, we recommend you assign the instrument(s) being used to collect the recordings.

Note: Before assigning an instrument, it must first be added to the Ascent database. See the section Adding and Instrument to Ascent (page 64) for details.

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Some values, such as an Fmax below 100Hz, are not supported by all instruments. Assigning your instrument(s) will allow Ascent to warn you of unavailable values, if any. To assign your instrument to the Parameter Set:

- Click the **Applicable vb Instrument** tab.

Note: The Applicable vb Instruments panel can also be opened directly by right-clicking a parameter and clicking the Applicable vb Instruments option.

- Click **Edit**
- Select the **Applicable** column checkbox beside the instrument(s) you will be using to collect the recordings.
- Click **OK.** The instrument(s) you selected will now be listed in the **Instruments used to take recordings in this folder** field.

Once you have selected an instrument or instruments, any unsupported values will be indicated by a superscript star. 25*, for example, would indicates that this value (25) is not available for one or more of the instruments you are using to collect your recordings.

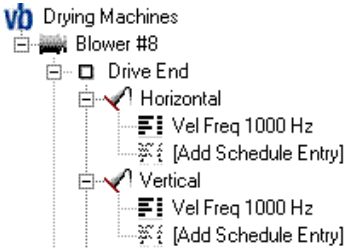
If you select an unavailable value, the background color of the active data field will change to the color orange; an alert icon will appear on the Applicable vb Instrument tab, and a warning will be displayed in orange text. Click the Applicable vb Instrument tab to view information about the conflict in the 'Settings that are not supported' field.

Note: Any Parameter Sets created using previous versions of the Ascent software will be assigned to all available instruments. That is, recording parameters that are not supported by all available instruments will be highlighted. Applicable Instruments apply at the folder level, not at the parameter set level. Any time you open a parameter set in a folder that does not have any applicable instruments assigned, all available instruments in the database will automatically be used as the applicable instrument for that folder.

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We will start by measuring the vibration according to the ISO 2372 standard. This specifies overall limits of vibration in the 10 Hz to 1000 Hz range of frequencies (600 to 60 000 CPM).

- Select an Fmax of 1000 Hz (60 000 CPM) from the drop-down box and leave the rest of the settings at their defaults. The estimated recording time is displayed near the bottom-left of the window.
- Click **OK** then click **Close** on the next window. The new schedule entries will appear underneath the four measurement locations on Blower #8.



- Now click the **Build** button to turn off Build Mode and all the placeholders will disappear leaving you with your completed structure.

The schedule entry labels describe the type of measurements to be taken (Vel Freq 1000 Hz). Any text you enter in the 'Description' field of the Edit Paramset / Schedule Entry Editor will be appended to the label.

These schedule entries can later be changed individually by selecting and editing them, or changed as a group by editing the associated parameter set. For more information on this subject, including instructions for creating orders-based parameter sets, see Parameter Sets/Schedule Entries (page 207).

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Note: To add a schedule entry to a single location, click the [Add Schedule Entry] placeholder underneath that location. This will open the Edit Paramset / Schedule Entry Editor. Enter the parameters to be used for taking this recording then click **OK** as described previously. Alternatively if you already have parameter sets defined you can select one of these from the 'Select Parameter Set' drop-down box at the top of the editor.

Notes on 6Pack Recordings

6Pack recordings allow up to six measurements to be taken simultaneously from a single data stream/channel. All standard condition monitoring data can be acquired in one step and in the time normally required to take a single conventional recording. This function is currently limited to the vbX range of instruments (vb5, vb6, vb7 and vb8).

A 6Pack recording may include some or all of the following measurement types for each recorded channel:

- High Frequency Spectrum
- High Frequency Waveform
- Low Frequency Spectrum
- Low Frequency Waveform
- Demodulation Spectrum
- Demodulation Waveform

When configuring a 6Pack recording, select the **6Pack** checkbox in the **Domain** area, then select the measurement types required using the checkboxes immediately below within the Domain area. Configure the measurement parameters using the **Parameters** tab as normal, bearing in mind the following limitations imposed on this recording type:

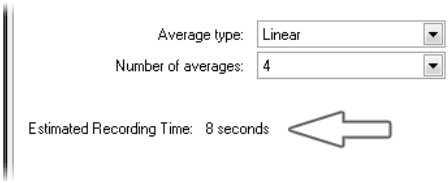
- The same sensor(s) must be used for all 6Pack measurement types.
- High Frequency and Demodulation measurements can be measured in Acceleration only.
- All spectra and waveforms must have the same resolution (maximum 800 lines, 2048 samples).
- High Frequency Fmax and Demod Bandwidth must be the same.

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- Averaging type, number and overlap must be the same for all spectra.
- Fmin and Demodulation Fmin must be the same.

Estimating the Measurement Recording Time

When you create your measurement setups the schedule entry editor displays an estimate of the time the measurement will take to record. The recording time is based on the values you enter in the Fmax, Lines, and Number of averages fields. It is also affected by which domain is selected (frequency, time or demodulation).



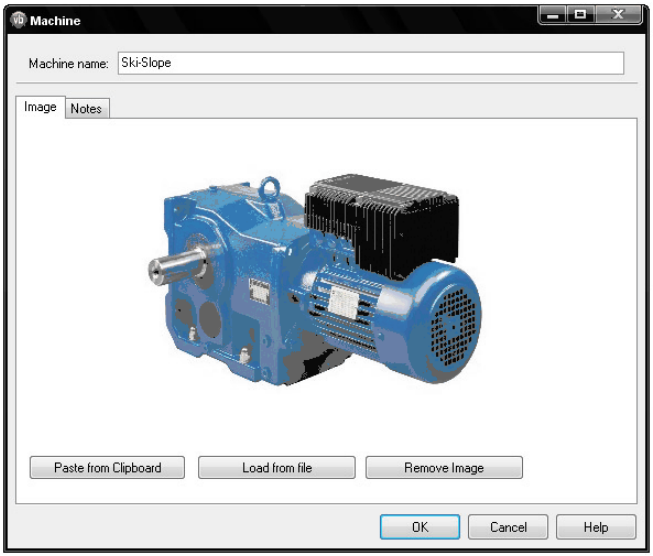
- To estimate how long various measurement setups may take, experiment with changing the settings in this window. (To re-open a schedule entry for editing, right-click its icon in the navigator and select **Edit**.)

Adding a Photo Image to a Machine

After creating your machine you can add a picture and/or some descriptive information to the machine definition.

- Re-open Blower #8 now by right-clicking it and choosing **Edit** from the shortcut menu.

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The example diagram shows a machine that already has a picture attached to it.

If you have a digital camera handy or a ready-made picture of your machine you can add it to the blank space by either copying and pasting it from the clipboard or loading it from file (these functions are standard Windows behaviors so are not explained here).

Adding a Note to a Machine

Notes can be added to machines, points, locations and individual recordings. When you plot data from an item containing a note, the note text will appear on the chart.

- To add a note to a machine, right-click the machine and choose **Edit** from the shortcut menu. The Machine window will open for editing.
- Click the 'Notes' tab to open this window.

The notes tab is used to add information which will then appear on all charts that show a recording from this machine.

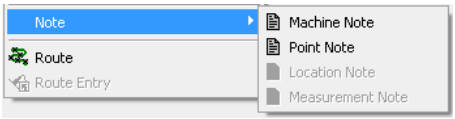
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- Click the **Add** button, type in your note then click **OK**. Click **OK** again to close the Machine window.

Notes can be added, edited or deleted by clicking the appropriate button.

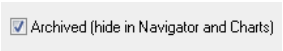


- To add a note to a point, location or recording, right-click the item in the navigator tree and choose **New>Note**, then select the type of note required.



Archiving a note

- If you want to keep a machine or measurement note but don't want it to appear on charts or in the navigator list, right-click the note in the navigator list, choose **Edit** then tick the **Archived** box.



Deleting a note

- In the navigator tree, select the item containing the note. The navigator list will display all items associated with your selection including any notes.

- Select the note and press the **Delete** key on the keyboard. Click **OK** to confirm the deletion.

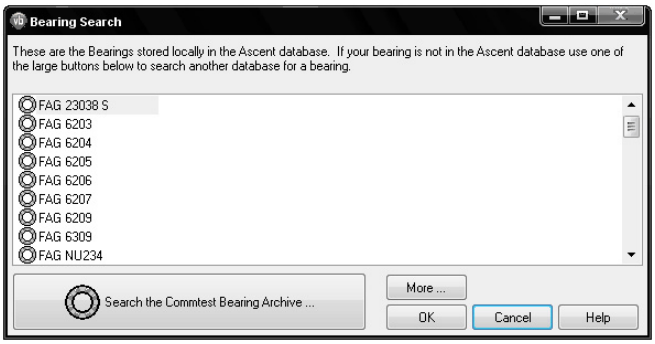
Adding a Bearing to a Point

Bearing and gear definitions are added to points on your machines. Once the software knows the fault frequencies for a bearing, it can automatically display fault frequency markers on spectra (provided that you have set the RPM).

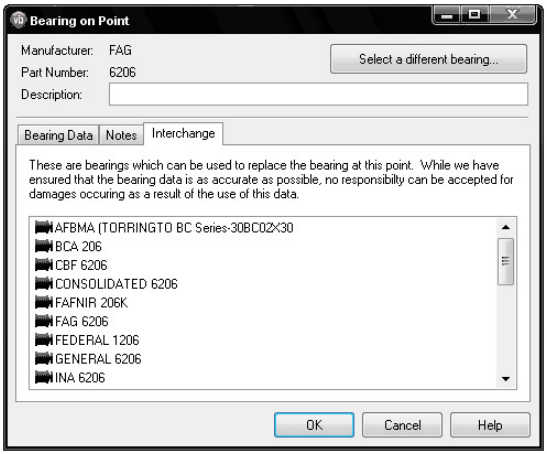
- Right-click a point in the navigator tree and choose **New>Bearing Definition**.

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You will see a list of bearings that are currently known to the software. More bearings are available in the Commtest Bearing Archive which can be accessed by clicking the large button on the bottom-left of the window. Details for using the bearing archive are described in Using the Bearing Database (page 185).



- Select a bearing from the list then click **OK**. You will see the Bearing on Point Editor that gives you tabs for 'Bearing Data', 'Notes' and 'Interchange'.



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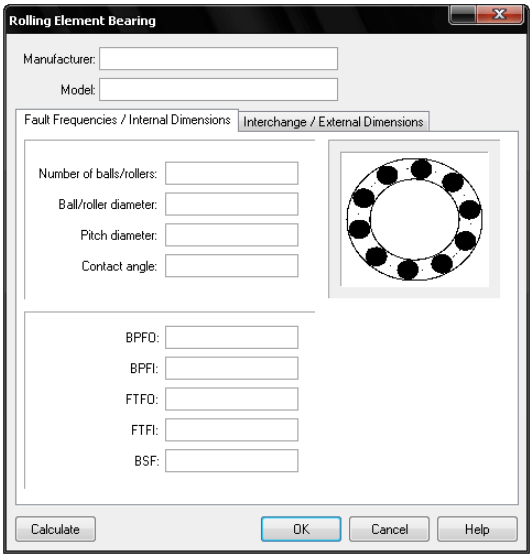
The 'Interchange' tab is open by default. This contains a list of alternative bearings (if any) that could be used to replace your chosen bearing when it wears out. The **Select a different bearing** button takes you back to the previous window so that you can choose a different bearing.

- Click the 'Bearing Data', and 'Notes' tabs to see what information they contain.
- Click **OK** to assign your chosen bearing to the point.

Defining Your Own Bearings

To create you own bearings you need to know either the *fault frequencies* of the bearing, or the *internal dimensions*.

- Right-click a point in the navigator tree and choose **New>Bearing Definition**.
- Right-click in the list of bearings and select **Add**.



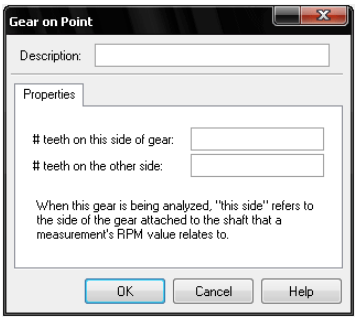
- Enter the required information into the blank fields (place the mouse cursor in a blank field to see a picture and description of the required information on the right of the screen).

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- If you enter the internal dimensions you can then click the **Calculate** button on the bottom left to calculate the bearing fault frequencies.
- Click **OK** to save the new bearing.

Adding a Gear to a Point

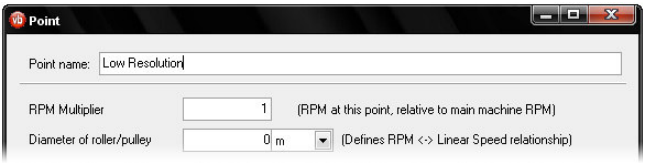
- Right-click a point in the navigator tree and choose **New>Gear Definition**. The Gear on Point window will appear.



- Enter a description and the number of teeth on your gear then click **OK** to assign your gear to the point.

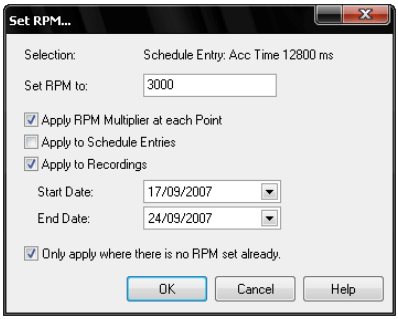
Applying Different Rotational Speeds Across a Machine

Various shafts in a machine may be rotating at different speeds due to gearboxes or pulley drives etc. Within the software you can adjust the RPM value of recordings taken at different points by applying a point-level RPM multiplier. The software will multiply the actual machine speed by your RPM Multiplier value to calculate the shaft speed at each point.



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1. First edit the point definition. Right-click a point and select **Edit**.
2. Enter an RPM Multiplier value and click **OK**. This value defines how much faster/slower the shaft is turning at this point compared to the machine speed. (The diameter field can be left blank as it is only used on linear speed machines, e.g. paper mills.)
3. Repeat this process from step 1 to change the rotational speed at additional points. Once you have defined the RPM Multiplier at each point you can update the RPM values on all recent recordings on an entire machine.
4. Right-click a machine and select **Set RPM**.
5. Enter the running speed of the machine then tick 'Apply RPM to Multiplier at each Point'.
6. Apply the RPM value by choosing options in the Set RPM editor then click **OK**. Each option is explained in detail in Setting RPMs for Multiple Recordings.



Copying Items to Multiple Locations

To speed up the process of building your machines, you can copy and re-use individual items, such as the point we copied earlier, or non-structural items such as alarms and routes.

A single item, such as an alarm, can be pasted to one place or automatically pasted to many places at once.

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Copying an item to one place only

- Right-click the item and select **Copy Branch to Clipboard**.
- Now right-click where you want to place it and select **Paste**. The item will be pasted into the navigator tree below the item you selected.

Note: The pasted item will be placed below the selected item *in relation to the machine hierarchy* e.g. if you paste a point, it will be placed below the locations and schedule entries of the point above.

Copying an item to multiple places

- Right-click an item, such as a schedule entry, and select **Copy Branch to Clipboard**.
- Now right-click a higher-level item such as a machine and select **Paste**.
- You will be prompted to paste the item to *all* the appropriate places that exist below the item you have selected. Click **Yes** to confirm.

It is also possible to copy entire machines and file them away in storage so that they can be retrieved, re-named and re-used as many times as you like. This process is explained in Storing Re-usable Components in the Library (page 227).

Deleting Items

- To delete any item in the navigator, right-click it and select **Delete** from the shortcut menu, or left-click the item and press **Delete** on your keyboard.
- A dialog box will appear asking you to confirm this action. Click **Yes** to delete the item.

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Edit Measurements

The Measurement Editor (**Edit>Edit Measurements...**) allows you to copy or 'clone' previously recorded measurements, or manually create new measurements.

To generate a new measurement simply enter a timestamp date and time, the units to be used on the X and Y scales, the X scale's start and end values, the values for each sample required, and any other values you wish to use for the new measurement.

To create a new measurement based on a previous recording:

- Click the existing recording in the navigator list,
- Press the **Load from Measurement** button. The recording's values will be displayed in the Measurement Editor.
- Alter the measurement values as required.
- Press the **Create at this location** button. A new measurement will be created and displayed in the navigator list.

Note: The Measurement Editor can not be used to alter the recorded values of an existing recording. The sampling rate of new measurements is calculated automatically based upon the number of samples entered into the samples field.

Using Auto Save

Auto Save Mode automatically saves each change you make. This allows you to carry out your work without having to remember to click **Save** after each change.

- Auto Save is turned on by default. To toggle this feature on/off, from the main menu select **Options>Auto Save**.

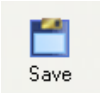
Notes:
Auto Save is recommended for use in multi-user networked environments where more than one user may be making changes to a database; in a single user environment there is no need to have Auto Save turned on.

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Turning on Auto Save will disable the Ascent program's Undo \ Revert function i.e. if you mistakenly delete an item you will need to manually re-create it. For this reason we recommend turning *off* Auto Save it you are deleting large numbers of items.

Saving and Undoing Changes

Whenever you make a change such as adding or deleting an item the **Save** button will become 'active'. Click this to save your changes.



- To undo the last save, select **File>Undo \ Revert**, from the main menu. This will undo *every change* back to the last save (you cannot undo a single action if you made several changes before clicking **Save**).

Note: There is only one level of Undo i.e. you cannot return to a state that was several saves ago.

Using the Navigator

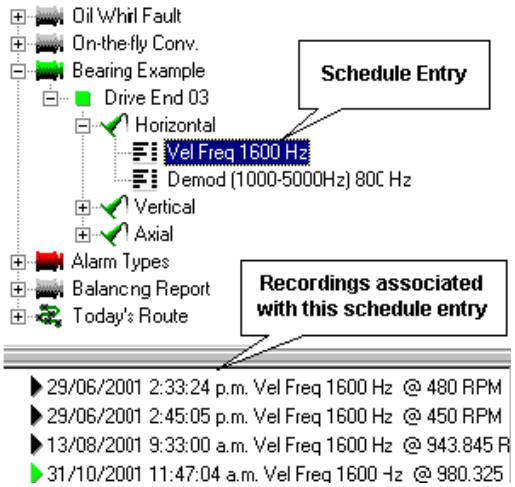
Now that you have created your first machine we can use it to examine how the navigator is used.

The Navigator List

- Select any item in the navigator tree by clicking on it.

The navigator list (the part of the screen beneath the navigator tree), will display any items that belong to your selection. For example, if you have a machine selected in the navigator tree, the navigator list will display the points that are defined at that machine, as well as any machine notes. Clicking a schedule entry in the navigator tree will cause the navigator list to display all recordings associated with that schedule entry.

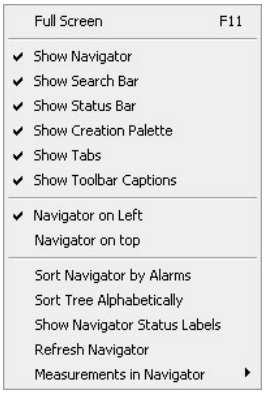
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As with the navigator tree, right-clicking in the navigator list opens a shortcut menu giving you easier access to commonly used commands.

Sorting the Navigator

You can sort the navigator tree by alarms, alphabetically or in default order. Access these options by ticking items in the Screen menu.



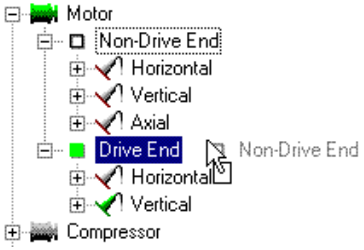
Sort Navigator by Alarms will make machines and points with the worst alarm condition appear at the top of the navigator.

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Sort Tree Alphabetically will order machines alphabetically by name.

You can also manually sort items by dragging and dropping them into new positions using the mouse. Use Drag and Drop to re-sort machines into any order and to change the order of points and measurement locations within a machine.

- To enable this feature choose **Edit>Enable Drag and Drop** from the main menu.
- To move an item, click and hold down the mouse button while dragging the item into a new position. The blue highlight indicates where the dragged item will be placed when the mouse is released.



Note: Turning on drag and drop will disable the alarm based and alphabetical sorting options. To re-enable them, un-tick **Enable Drag and Drop** in the **Edit** menu.

The navigator *list* (bottom half of the navigator panel) which is used to display your measurements can be sorted to make the measurements appear 'oldest first' or 'most recent first' (most recent is the default).

- From the main menu, choose **Screen>Measurements in Navigator**, then select either **Oldest first** or **Most Recent first**.

Using the Navigator Filter

The navigator search filter is used to narrow the machines, points, locations and recordings displayed in the navigator tree based upon user-defined search criteria.

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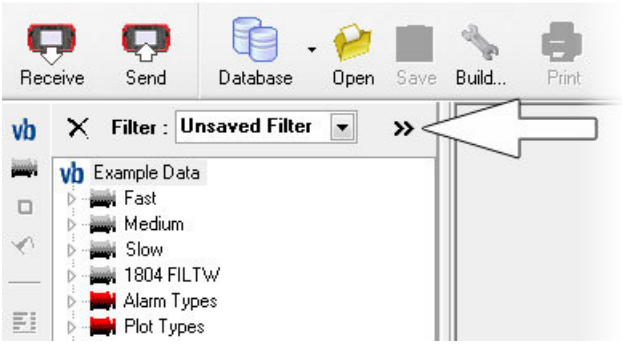
Navigator list items can be filtered by:

- Folder name
- Machine name
- Point name
- Axis

Recordings can be filtered by:

- RPM
- Date range

The navigator filter is located directly above the navigator list on the left-hand side of your screen. It can be toggled on/off using the **Screen>Show Search Bar** menu item.



To create a new filter or edit an existing filter:

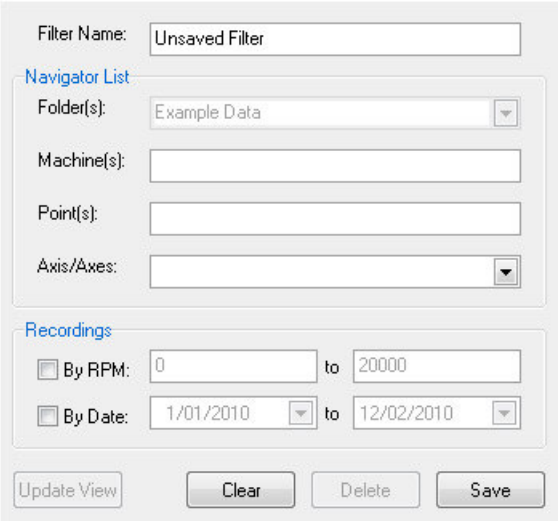
- Click the right-facing arrow button to expand the filter window.

Note: To use a previously defined filter, simply select it from the dropdown list. To disable to filter, select **No Filter** from the list: this is the filter's default state following installation.



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The filter window will open in the main graph window.



- Type a suitable name into the **Filter Name:** field, 'PM2 DE' for example.

Note: As you define the criteria to be used by your filter the navigator list will update in real time.

- Select a folder to search within from the **Folder(s)** dropdown list. This option will only be available if more than one folder is present in the navigator tree.
- Type the name of the machine you wish to search within, 'Dryer' for example into the **Machine(s)** field. Type either the full or partial machine name (containing the first few letters of the machine name).
- Type the points you wish to filter within into the **Point(s)** field.

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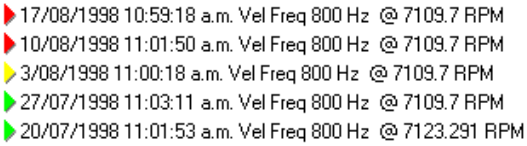
- Select an axis from the **Axis**/**Axes** dropdown list. Click the **Save** button to save your new filter, or **Clear** to reset the filter and start again. The delete an existing filter select it from the filter dropdown list, expand the filter window and press the **Delete** button.

Filter Recordings

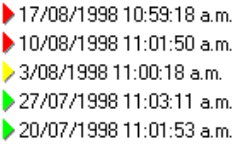
To filter recordings by RPM or date range, select the checkbox beside **By RPM:** or **By Date:** then type or select a date range using the text and date fields. Recordings outside the range(s) specified will be removed from the navigator list.

Hiding Detailed Recording Information

You can choose to display or hide the RPM and measurement type of recordings in the navigator. Hiding this information can improve performance slightly on very large databases.



Recordings with RPM and measurement type displayed



The same recordings showing only their timestamp

- To toggle this feature on or off, from the main menu select **Screen>Measurements in Navigator>Show RPM and Measurement Type**.

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Hiding Recordings in the Navigator

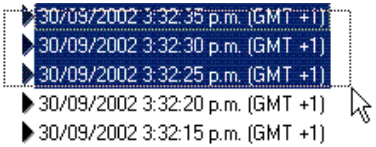
As you add more recordings to your database the speed at which the navigator list displays them may slow down, particularly when you have many hundreds of recordings. To speed up the response time you can limit the number of recordings displayed in the navigator list.

- Right-click in the navigator list (the lower half of the navigator) and select **Recordings Displayed** then select a number from the available options.

Selecting Multiple Items

You can select multiple sequential items in the navigator *list* by dragging a rectangle around them.

- To do this hold down the left mouse button and drag up or down to the last item you want to select.

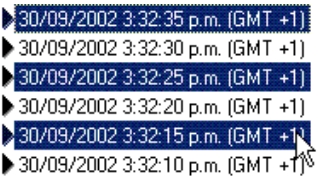


- Another method is to click the top-most item you want to select, hold down the **SHIFT** key and use the **down** arrow key to highlight and select sequential items.

- A third method is to click the first item, hold down the **SHIFT** key and click the last item you want to select.

Selecting non-sequential items

- To select multiple items that are not sequential, hold down the **CTRL** key while you click items in the navigator list.



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Archiving Recordings and Notes

Recordings, machine notes and measurement notes can be archived, meaning that they will be hidden from view (but not deleted). Archived items will not appear in the navigator list. Archived notes will not appear on charts.

- To archive a recording or note right-click it in the navigator list and choose **Edit** then tick the 'Archived' box on the editor.
- To re-display an archived item right-click in the navigator list area and tick **Show Archived items**.

The Creation Palette

The creation palette contains shortcut buttons for routine tasks such as creating a bearing or adding a note.



- If the creation palette is not visible, display it by selecting **Screen>Show Creation Palette**.
- Hover the cursor over each button to display an explanation of what the button does. Feel free to click the buttons - each will open a new window enabling you to perform different tasks. You can close each window by clicking **Cancel**.
- The creation palette can be hidden or displayed by choosing **Screen** from the main menu and ticking or un-ticking the **Show Creation Palette** option.

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Customizing Your Work Area

Screen elements, such as the navigator and creation palette, can be hidden or re-positioned to suit your preferences.

- From the main menu click **Screen**.

The full list of options is available from the drop-down menu. Hide, show or re-position screen elements by ticking or un-ticking options in the list.

Creating a Route

Note: Routes are created in the software then sent to the instrument; they cannot be created or edited in the instrument. Routes are not applicable to online instruments.

You could now send the Drying Machines folder to the instrument and collect data by selecting the machine, points and locations from the Record menu in the instrument then pressing Start. But first we will define a route which is an *ordered list* of measurement locations that you follow from start to finish when collecting data. This route can then be transferred to the instrument, which will prompt the operator to collect the measurements in the order listed.

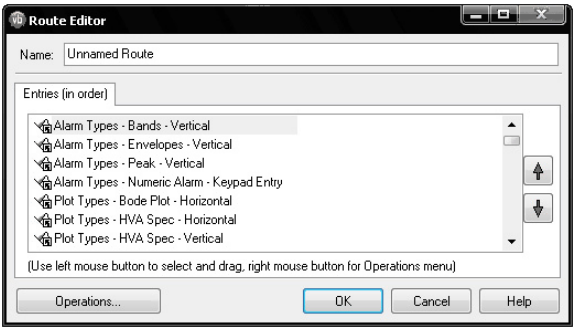
- If you are not already in Build Mode, click the **Build** button to activate this (remember to click the Manual Build Mode link if you are using the licensed Machine Builder Wizard).
- Now click the Create Route button (see diagram) on the Creation Palette at the left of the screen. Alternatively, right-click a blank area in the navigator and choose **New>Route**.



You will be asked if you want to begin by adding all the measurement locations to the route.

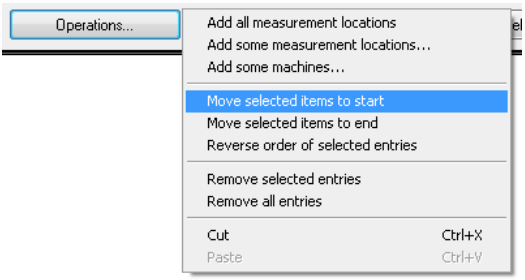
- Answer **Yes** to open the Route Editor. All the measurement locations are listed in the window - these are the *route entries* that will make up your route.

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Note: A measurement location must have at least one schedule entry defined for it to appear in a route. The instrument needs to know what type of measurement to take - this information is contained in the schedule entry.

- The default name is 'Unnamed Route'. Change this to 'Weekly Route' or enter a name of your choice (the name cannot be more than 16 characters in length).
- To change the order of the measurement locations, click and hold down the mouse button while dragging the selected location to a new position. Alternatively, click a location to select it then move it using the red up/down arrows. Hold down **CTRL** or **SHIFT** while you click items in the list to select more than one at a time.
- Right-click an item or click the **Operations** button to access a list of helpful operations.



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- When you are satisfied with the order of your route click **OK** to save it.
- Now turn off Build Mode (click the **Build** button) to see your completed folder, ready to be sent to the instrument.



Adding a vbX or vbOnline Instrument to Ascent

vbX series and vbOnline instruments must be added to the Ascent software's instrument database before data transfers can take place.

If you intend to transfer data via an external USB flash drive rather than directly to Ascent, you must first add at least one instrument to the Ascent software using the method below. The Ascent software will not allow you to create Parameter Sets if no instruments have been added to its instrument database.

- Connect the instrument and the PC using the supplied communications cable (USB or Ethernet for vbX instruments or Ethernet or Serial for vbOnline devices).
- Start the Ascent software on the PC.
- In the Ascent software, select **Edit>Manage>vb Instruments...** The **Manage Instruments** window will open.
- If the instrument is not listed click **Add** and select the instrument type to add.
- Check the right-hand panel of the **Add vbX** or **Add vbOnline** window. If your vbX instrument or vbOnline device is listed and highlighted, click the **Add vbX** or **Add vbOnline** button or double-click the instrument name.

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If the vbX instrument is not listed check that the IP address used by the instrument and the IP used by the software are the same (on a vbX instrument press 0 Options, then 3 Network to view the Ethernet and USB IP addresses used).

Note: Your instrument will only need to be added to the software on its first connection to the software. In future it will be detected automatically.

Setting a vbX Instrument's IP Address Automatically

When communicating with a vbX instrument using an Ethernet connection (via a switch for example) the instrument can be configured to accept an automatically assigned IP address from your network DHCP server as follows:

- Open the **Manage Instruments** window (**Edit>Manage>vb Instruments...)** and double-click your vbX instrument. The instrument's **vbX Properties** window will open.
- Within the **Ethernet** area of the **Setup** tab, check the box beside **Obtain an IP address automatically via DHCP**.
- Click **OK.**

In addition to Proflashing and network connection options, the **vbX Properties** window includes a **Tasks** tab. The options under this **Tasks** tab are as follows:

- **Instrument Details**. Displays hardware, firmware and network details of your instrument.
- **Copy Database**. Allows you to save a copy of the vbX's database (pbd) to an external source, if you wish to back up the database.
- **Overwrite Database.** Allows you to select a database backup file to copy to the instrument.
- **Synchronize Time.** Synchronizes the instrument's time and data stamps with your PC.
- **Screen Capture.** Displays and controls the screen of a connected vbX instrument via a pop-up window. Useful for capturing images of screens, measurements and reports.

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Transferring Folders to a vbSeries Portable Instrument

Note: The steps below assume you have already added your vbSeries portable instrument to the Ascent software's instrument database. The 'Send' and 'Receive' buttons are only used when communicating with a vbSeries portable instrument. They are not used for communications with vbOnline devices.

- Plug your powered instrument into the PC using the supplied communications cable.
- Click the **Send** button in Ascent. The 'Send' window will open.



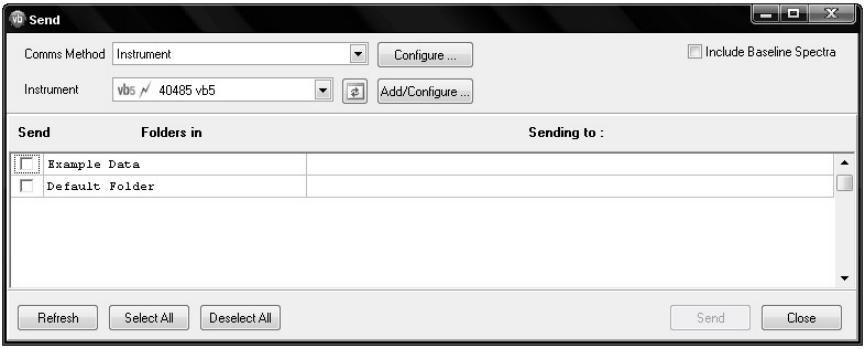
- Select **Instrument** from the 'Comms Method' dropdown list.

Note:
The Comms Method options **Read from File** and **Write to File** are available if you wish to import or export an XML recordings file from or to an external source.

vbX instruments

- Select your instrument from the 'Instrument' dropdown list, then tick the boxes beside the folders you wish to send to the instrument.

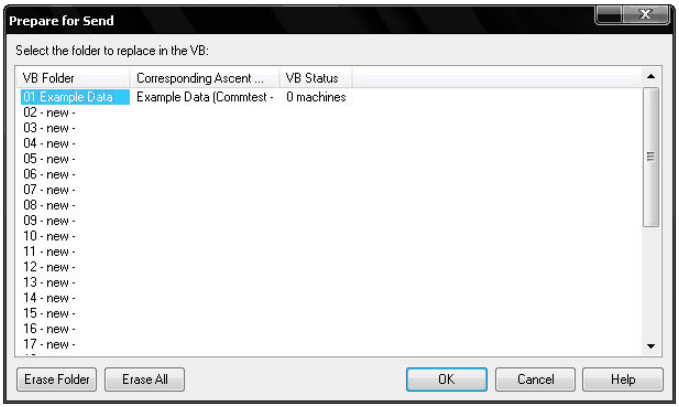
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- Select the folders you wish to transfer by ticking the checkboxes beside their names. Click **Send**. This will overwrite all stored information and delete all recordings (except baseline recordings) on the instrument.

vX000 instruments

- Select the option **vbX000 instrument** from the 'Instrument' dropdown list. Communications will begin with the instrument and the 'Prepare for Send' window will open. Select an existing folder to replace or an empty folder (click one of the '-new-' labels) then click **OK**. When the communications process is complete the instrument will display the Main Menu.



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Transferring Recordings to the Ascent Database

Note: The steps below assume you have already added your vbSeries instrument to the Ascent software's instrument database. The 'Send' and 'Receive' buttons are only used when communicating with a vbSeries portable instrument. They are not used for communications with vbOnline devices.

- Plug your powered instrument into the PC using the supplied communications cable.
- Click the **Receive** button to establish communication between the software and instrument. The 'Receive' window will open.



- Select **Instrument** from the 'Comms Method' dropdown list.

Note:
The Comms Method option **Read from File** is available if you wish to import an XML recordings file from an external source, such as a USB flash drive.

The Receive window displayed by the software varies depending on the instrument type you are connected to:

vbX instruments

- Select your instrument from the 'Instrument' dropdown list. The Folder list will update to display all folders located on the instrument.

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- Select the folders you wish to transfer by ticking the checkboxes beside their names. The instrument transfers recordings by sending entire storage folders to the PC.
- Click **Receive** near the bottom-right of the window to begin transferring recordings. When the transfer is complete click **Close**.

vbX000 instruments

- Select 'vbX000 instrument' from the 'Instrument' dropdown list. Communications will begin.

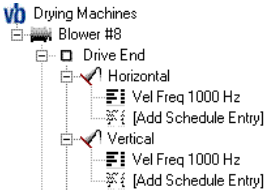
If you only have a single folder defined in the instrument the receive process will proceed automatically. If there are multiple folders in the instrument a window will display allowing you to select the folders to transfer.

- To transfer more than one folder at a time click the 'Receive multiple folders' box then tick the boxes beside each folder that you want to receive and click **OK**.

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The Navigator Tree

The top half of the navigator shows the *structure* of the machines in this folder.



The Drying Machines folder you have been working in is shown at the top of the navigator tree.

Machines contained within a folder are listed underneath the folder icon.

Points represent an area on a machine and are listed underneath the machine they belong to.

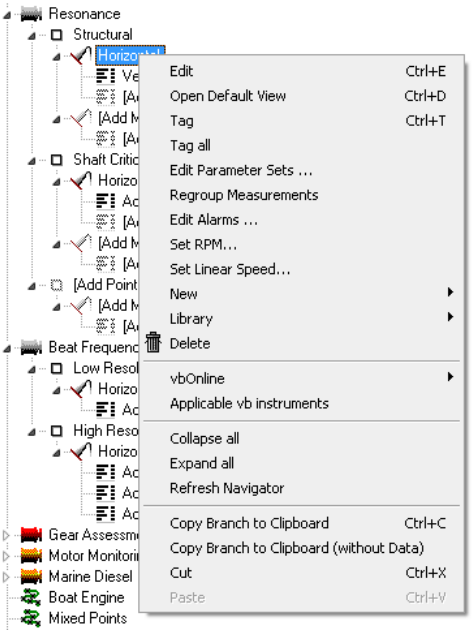
Measurement locations (horizontal, vertical etc.) represent the actual place on the machine where you will place a sensor to take vibration measurements.

Schedule entries represent a recording that is scheduled to be taken and are listed directly underneath the measurement locations that they apply to.

If there is a small symbol beside an item, it means that you can click it to expand it out and see what is beneath it in the hierarchy. Clicking the symbol will collapse that branch of the tree.

- Right-click an item in the navigator tree to display a shortcut menu of options. This menu gives you easier access to commands that are available from the toolbar buttons and main menu.

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Maintaining Data Integrity

Caution: The Ascent software identifies machines, points, axes and sensors by their names. If you rename these items in the instrument and then transfer data from the instrument to the Ascent software, the software will treat it as a new item. Furthermore, avoid having duplicate names in the instrument. They will be differentiated solely on the order that they appear in the instrument and the software.

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Using the Example Data

We will now explore some of the data display and analysis features of the software, such as generating reports and plotting data on charts. If you have not yet collected any data you can use the example machines and recordings included in the factory default database to experiment with.

- If you wish to use the example data click the **Open** button on the toolbar.
- Select a folder from the list (not the Drying Machines folder that you created earlier). If you can't see any folders, click the  icon beside one of the blue site icons.
- Click **OK** to open your chosen folder. The navigator will display the machines within this folder.
- Remember to click the  icons to open out the machine structures. Alternatively, right-click in the navigator tree and select **Expand all** to open all the machines at once.

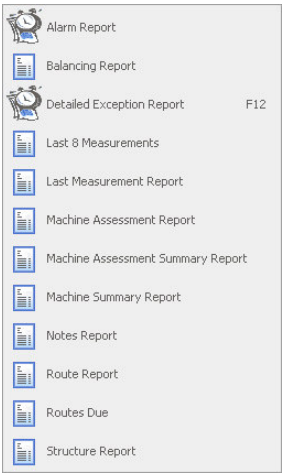
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Section 3: Reports

How to Generate Reports

The reporting system provides a valuable tool for analyzing your data. A variety of reports are available to help you summarize information and highlight areas of concern.

- Click the **Report** button to see the full list of available reports.



Note: The options on your report list may differ from those shown in the illustration above depending on your specific software version.

- To generate a report, select a machine or other item in the navigator then click **Report** and choose the report type from the list.

- Right-click on any displayed report to open the shortcut menu. Here you will find commands for changing the format of the report such as including or excluding certain data.

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You can generate a report on a single machine by selecting it in the navigator, or all machines in the folder by selecting the folder icon at the top of the navigator. For instructions on printing the report see Printing Charts and Reports (page 140).

Note: If you make any changes to the default settings you will be prompted to save these when you close the report.

If you want the changes to be permanent (until you change them again) click **OK**. Click **No** to discard the changes.

Alarm Report

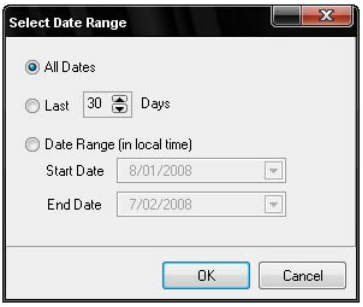
The Alarm Report details the current and previous two (by default) states of each alarm at the selected location on a machine.

Location	Schedule Entry	Type	Prev 2	Prev 1	Latest	Units	% change	Date
Alarm Types								
Bands - Vertical	Vel Freq 800 Hz	2X	0.209	0.206	**0.199**	mm/s rms	-3.16 %	17/08/1998
Bands - Vertical	Vel Freq 800 Hz	1X	3.879	7.458	**8.044**	mm/s rms	7.86 %	17/08/1998
Bands - Vertical	Vel Freq 800 Hz	Peak 1.154 Orders - 1.874 Orders	0.016	0.017	**0.018**	mm/s rms	4.83 %	17/08/1998
Bands - Vertical	Vel Freq 800 Hz	2.139 Orders - 2.915 Orders	0.008	0.009	**0.009**	mm/s rms	1.11 %	17/08/1998
Bands - Vertical	Vel Freq 800 Hz	Bearing Frequencies	0.178	0.186	**0.193**	mm/s rms	4.02 %	17/08/1998
Envelopes - Vertical	Vel Freq 200 Hz	Alarm Envelope, Danger, Velocity, 0.252 - 5.039 Orders	85.146	86.695	**94.732**	%	9.27 %	11/09/1998

- To change the number of previous recordings displayed, right-click the report and choose **Set History Count**.
- Enter a value then click **OK**. Note that the latest recording is *included* in this value i.e. if you set the value to '1' only the latest recording will be shown on the report.

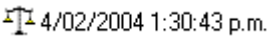
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Note: You may also select a date range or data type filter by right-clicking the report and selecting the **Date Range (All Dates)** and **Data Types...** filter parameters.



Balancing Report

After performing a balance job with the instrument, the process and results can be summarized in a Balancing Report. This report can also be generated by double-clicking the balance job icon in the navigator list.



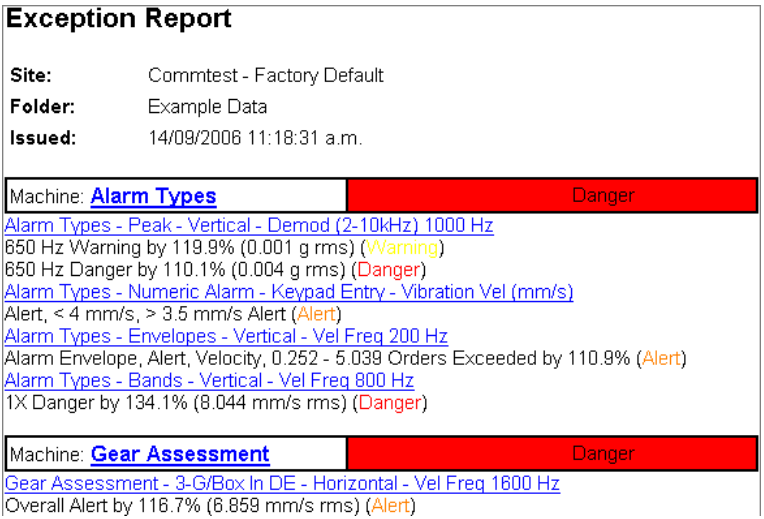
- Right-click on the report to open the shortcut menu. Here you will find commands for changing the format of the report. These options are also available from the main menu under **Options>Balancing Reports**.

Detailed Exception Report

The Exception Report is an overall summary of the condition of your machines. Each machine is listed with a colored horizontal bar showing its status (red = danger, green = OK etc.). The most critical machines are shown at the top of the report.

The machine names and locations are shown as blue underlined links. Clicking them will select that machine or location in the navigator tree.

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Exception Report

Site: Commtest - Factory Default
Folder: Example Data
Issued: 14/09/2006 11:18:31 a.m.

Machine: **Alarm Types**	Danger

Alarm Types - Peak - Vertical - Demod (2-10kHz) 1000 Hz
650 Hz Warning by 119.9% (0.001 g rms) (Warning)
650 Hz Danger by 110.1% (0.004 g rms) (Danger)
Alarm Types - Numeric Alarm - Keypad Entry - Vibration Vel (mm/s)
Alert, < 4 mm/s, > 3.5 mm/s Alert (Alert)
Alarm Types - Envelopes - Vertical - Vel Freq 200 Hz
Alarm Envelope, Alert, Velocity, 0.252 - 5.039 Orders Exceeded by 110.9% (Alert)
Alarm Types - Bands - Vertical - Vel Freq 800 Hz
1X Danger by 134.1% (8.044 mm/s rms) (Danger)

Machine: **Gear Assessment**	Danger

Gear Assessment - 3-G/Box In DE - Horizontal - Vel Freq 1600 Hz
Overall Alert by 116.7% (6.859 mm/s rms) (Alert)

The machines that are in the worst condition are listed at the top. If a machine does not have any alarms, its status will be listed as 'Unknown'. By default the Exception Report will display information for all the machines in a folder.

- To generate an Exception Report for a single machine, click **Report** and select **Detailed Exception Report**.
- Click the blue underlined link with the name of the machine you wish to generate the report on.
- Right-click the report and un-tick **Show All Machines**. This will hide the other machines and only display the machine you selected.

Last 8 Measurements

This is similar to the Last Measurement Report but includes the previous 7 measurements for comparison. This report does *not*, by default, show the percentage change between the latest measurement and the one before it. You can turn this option on using the right-click shortcut menu.

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Last Measurement Report

The Last Measurement Report displays the spectrum overall values of the latest measurements taken for each schedule entry at a selected machine. The report also includes the overall value of the previous recording for comparison and gives the percentage change between the previous and latest recordings.

- Right-click on the report to open the shortcut menu. Here you will find commands for hiding or showing different columns of data and for setting the number of previous recordings to include in the report.

Machine Assessment Reports

The Machine Assessment Report (MAR) system simplifies generation of PdM condition and status reports for third-party clients. Once route or machinery analysis has been completed by an analyst or service provider, this tool allows a report to be generated detailing specific recommendations and existing/upcoming fault conditions. Reports are printable or may be exported in standard HTML or XML format.

Note: Before creating a Machine Assessment Report you must first configure the Machine Assessment Report database (page 78). Until this is done, all reporting menu items will be grayed out and unavailable.

Machine Assessment Summary Reports

Each Machine Assessment Report is automatically associated with a Machine Assessment Summary (MAS) Report when it is created. The Machine Assessment Summary Report is generated and populated automatically using information entered into the Machine Assessment Reports. When you have finished creating individual Machine Assessment Reports, you may choose to publish these reports individually, or together with its companion Machine Assessment Summary Report.

The Machine Assessment Summary Report briefly summarizes the Machine Reports, providing clients with a simple 'one sheet' overview of the state of their plant equipment.

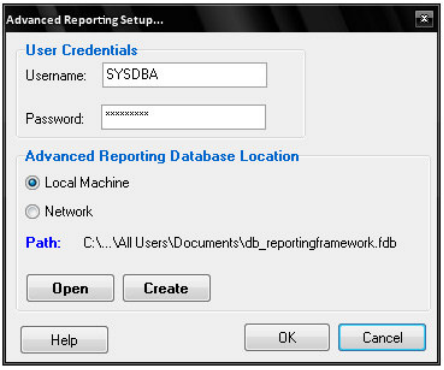
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Configure the Machine Assessment Report Database

Before using the Machine Assessment Report tool for the first time, you must create a Report database.

- From the Ascent software's main menu, select **Options>Configure Advanced Reporting...**. The 'Advanced Reporting Setup' panel will open.

Note: Do **NOT** change the username and password, or the default database name ('db_reportingframework.fdb').



- Select the **Local Machine** checkbox to create a database on your local PC, then click **Create** to choose a location where the database will be created and reside. To create a database on a networked drive, select the **Network** checkbox and press **Create**. Enter a server IP or name, and an absolute path to the database in the 'Network Settings' window that opens, then **OK**.

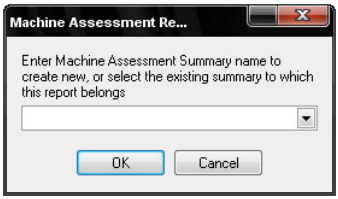
Note: If creating a network database, the network path must be an 'absolute' and include correct drive mapping from the server's perspective rather than a virtual server address (for example, 'P:\MyDatabase\Database.fdb' would be acceptable, but '\\Server\MyDatabase\Database.fdb' would not)

- Click **OK**. The database will be created. You can now create a Machine Assessment Report (see the following topic).

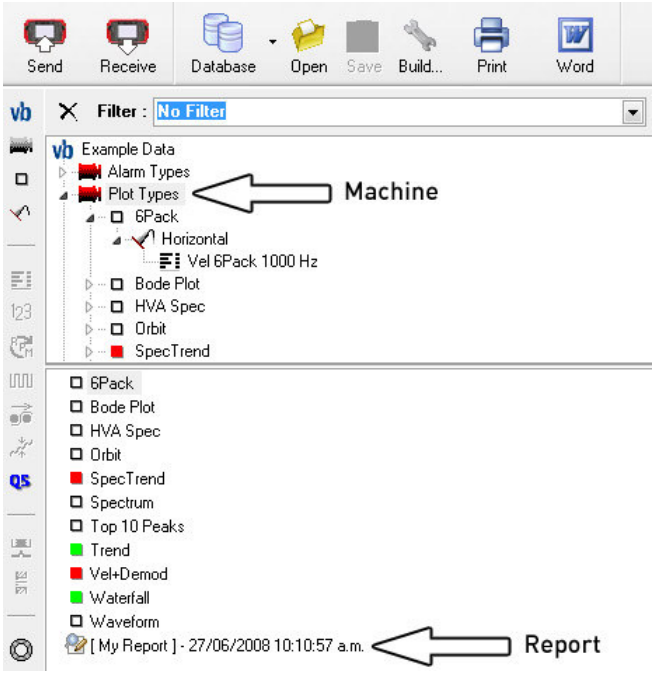
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Create a Machine Assessment Report

- Right-click a machine, point or location in the navigator tree and select **New>Report>Machine Assessment Report**. The 'Create Machine Assessment Report' interface will open.
- Type a report name into the field and click **OK**.



Note: New and existing Machine Assessment Reports are listed beneath the machine they were created for at the bottom of the navigator list. They can be opened or re-opened at any time by right-clicking and selecting **Edit**.

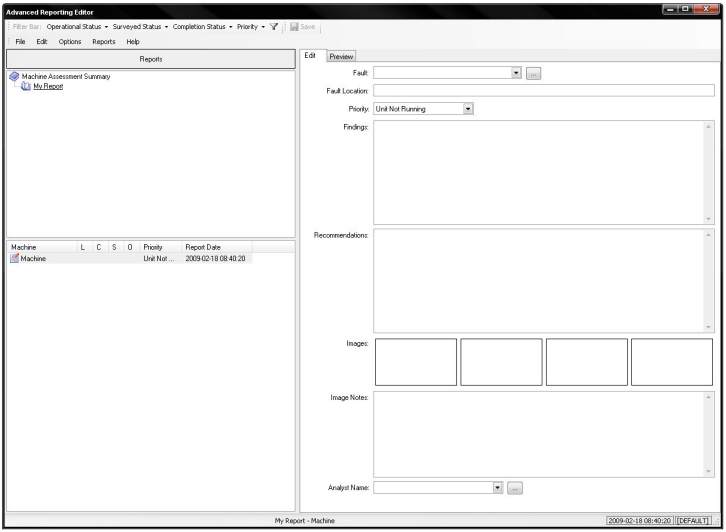


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- Right click the new report and select **Edit**. The 'Advanced Reporting Editor' interface will open.

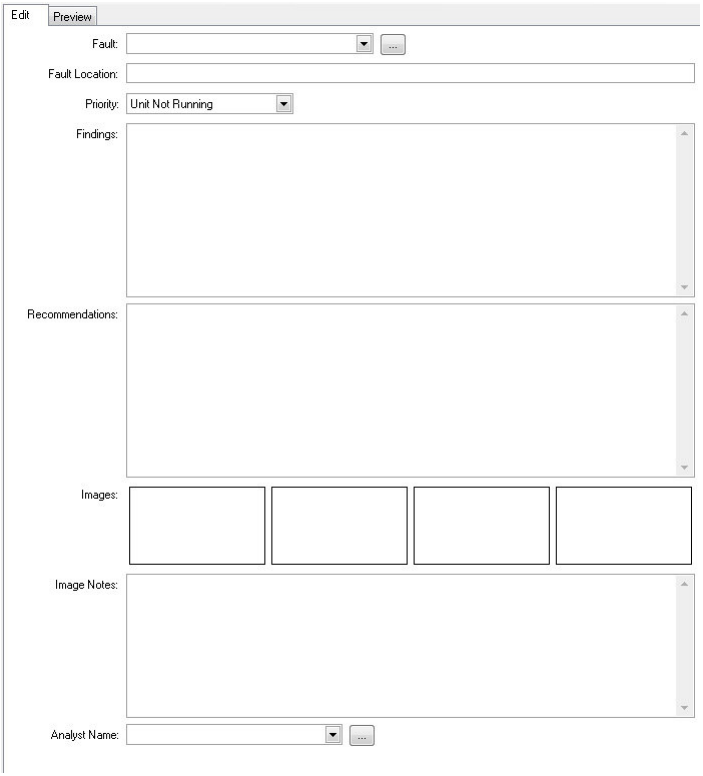
The Advanced Reporting Editor consists of three main panels:

- The **Summary Navigator Panel** (top-left). Lists all Machine Assessment Summary Reports available for the currently open Datafolder.
- The **Machine Report List** (bottom-left). Lists all Machine Assessment Reports within the selected Machine Assessment Summary Report.
- The **Report Editor Panel** (right) is where report details are entered and existing reports are viewed.



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- In the lower-left **Machine Report List** panel, click the machine name. The right-hand **Report Editor Panel** will now display a form if it is not already visible. Use this form to enter report details.



  - Select a fault type from the **Fault:** dropdown box or type a fault into the text field if the dropdown list doesn't contain a suitable fault description. After saving the report, the new description will be added to the dropdown list for future use. Press the Open (…) button to edit previously created fault type descriptions.
  - Type the location of the fault into the **Fault Location:** text field.

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- Select a priority rating from the **Priority:** dropdown box. The priority selected will be displayed beside the machine in the **Machine Report List** panel.
- Type the condition of the machine and the nature of the repairs required, if necessary, into the **Recommendations:** text area.
- Right-click within the image boxes and select **Capture View from Ascent** to load the current chart view into the image field, or **Load Image from File** to attach an image to the report. This might be a photograph of a damaged component, for example.
- Type a note explaining what the attached images illustrate into the **Image Notes:** text area (only necessary if you attached images to the report in the previous step).
- Select the VA analyst's name from the **Analyst Name:** dropdown box, or type a new name into the field. Press the Open () button to edit previously created analyst names.

- Click the **Save** button on the main menu.

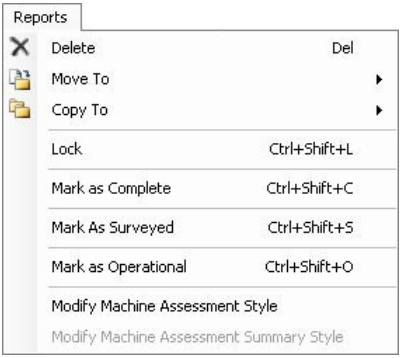


Note: Click the **Preview** tab at any time to preview the report in the **Report Editor Panel**. You will be prompted to save the report before it will be displayed.

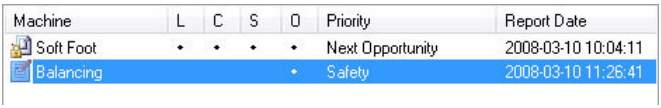
- Click **Reports** from the main Advanced Reporting Editor main menu and select the appropriate report status options.

  - **Lock** if the report is completed. The report will become read-only.
  - **Unlock** if the report was previously unlocked but you wish to change the report information.
  - **Mark as Complete** if the machine report is finished.
  - **Mark as Surveyed** if the machine recordings have been gathered.
  - **Mark as Operational** if the machine is still functioning

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The options you select will be reflected in the machine panel under the respective value columns:



- **L** Locked
- **C** Completed
- **S** Surveyed
- **O** Operational

Items displayed in the report can be filtered using these parameters. Filter options are located on the main menu bar.



Adding Machines to a Report

To add a machine or machines to your current Report, right click a machine and select **New>Report>Machine Assessment Report**. In the 'Create Machine Assessment Report' interface open the dropdown list and select the report you wish to add the machine to. Click **OK**. The machine will be added to the existing report, and listed in the **Machine Report List** when the report is re-opened.

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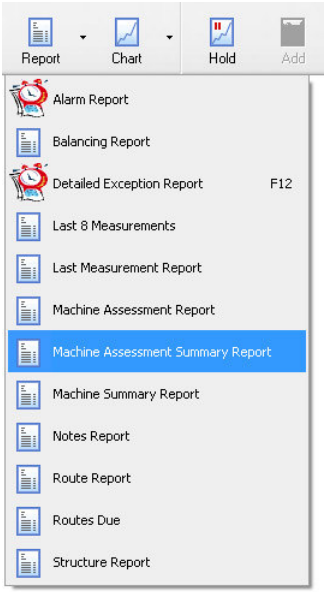
View a Machine Assessment Report

Existing Machine Assessment Reports can be viewed directly through the Ascent graph panel, or via the Advanced Reporting Editor.

View a Report in Ascent

- Press **Report>Machine Assessment Summary Report** or **Report>Machine Assessment Report** from the Main Menu then select a report from the navigator list.

Note: If the Machine Assessment Summary Report or Machine Assessment Report dropdown menu items are grayed out, and you are sure you have a license for this feature, see Configure the Machine Assessment Report Database (page 78). An assessment report database must be created before these menu items will be enabled.



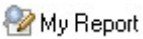
Alternatively:

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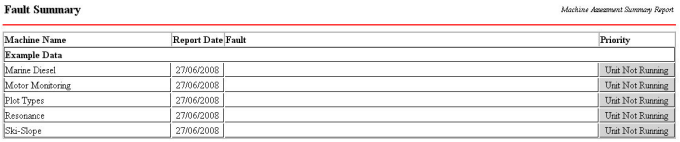
- Double-click a Machine Assessment Summary Report or Machine Assessment Report in the navigator list. The Machine Assessment Summary or Machine Assessment Report details will display in the right-hand graph panel.

Note: Machine Assessment Reports and Machine Assessment Summary Reports can be differentiated in the navigator list by looking for brackets around the report name and a timestamp:

A **Machine Assessment Summary Report** when viewed in the navigator list does not have a timestamp or brackets:



Double-click this item, then click it once, and the Machine Assessment Summary Report will be displayed in the graphs panel:

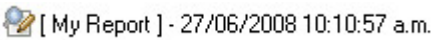


Fault Summary *Machine Assessment Summary Report*

Machine Name	Report Date	Fault	Priority
Example Data			
Marine Diesel	27/06/2008		Unit Not Running
Motor Monitoring	27/06/2008		Unit Not Running
Plot Types	27/06/2008		Unit Not Running
Resonance	27/06/2008		Unit Not Running
Ski-Slope	27/06/2008		Unit Not Running

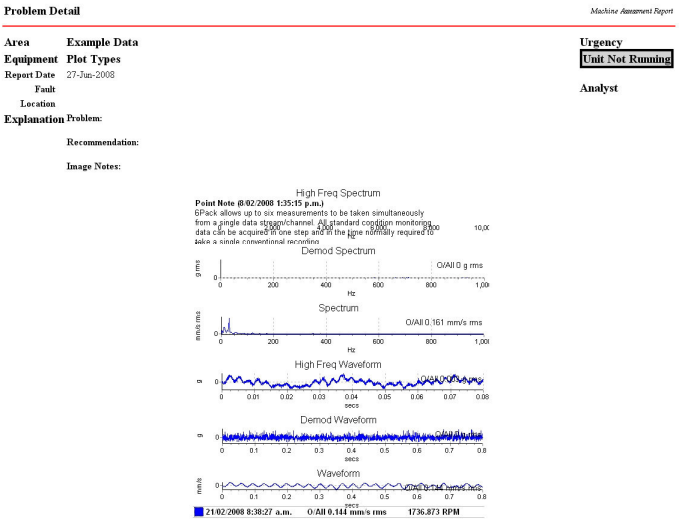
Machine Assessment Summary Report

A **Machine Assessment Report** when viewed in the navigator list has a timestamp. The report's name is also nested within brackets:



Double click this item and the Machine Assessment Report for its associated machine will be displayed in the graphs (right-hand) panel:

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Machine Assessment Report

View a Report in the Advanced Reporting Editor

- Right-click a Machine Assessment Summary Report or Machine Assessment Report in the Navigator List and select **Edit**. The 'Advanced Reporting Editor' interface will open.
- Either:
  - Select a Machine Summary Report from the top-left Summary Navigator Panel, or;
  - Select a Machine Assessment Report from the Machine Report List.

Note: To select more than one Machine Assessment Report, hold the CTRL or Shift keyboard keys while selecting multiple reports.

- Click the **Preview** tab in the right-hand Report Editor Panel and the report will be displayed.

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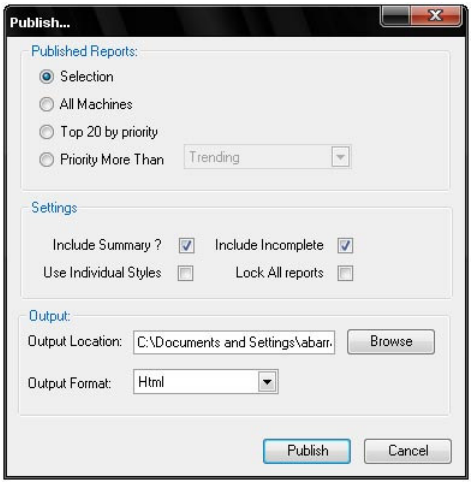
Publish a Machine Summary or Assessment Report

Machine reports can be exported in HTML or XML format and provided electronically to interested parties for review via a standard web browser.

Note: Reports can also be printed normally for hard copy delivery by selecting **File>Print**.

Publish a Machine Summary Report

- Click the Datafolder to list all machines and Machine Summary Reports in the navigator list.
- Right-click the target Machine Assessment Summary Report from the navigator list and select **Reports>Publish Machine Assessment Summary Report.** The 'Publish' panel will open.



- Select the reports you wish to output from **Published Reports** area.
  - **Selection**. Include the Machine Reports currently selected and highlighted.

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- **All Machines**. Include all machines in the selected Summary Report.

Note: As you selected the publish option from the Datafolder level, the first and second options will both select all available Machine Assessment Reports.

- **Top 20 by Priority**. Include the twenty highest priority reports in ascending rank. Highest priority is **Safety** and lowest **Non Operational**.
- **Priority More Than**. Include only reports with a priority higher than that specified in the dropdown list.

- Select the parameters of the published report from the **Settings** area.

  - **Include summary**. Tick if you wish to include the overall Machines Assessment Summary Report in addition to the individual Machine Assessment Reports (leave ticked).
  - **Include incomplete**. Include all reports that have a completion status of 'Not Completed' in addition to 'Completed' machine reports.
  - **Use individual styles**. Use individual styles for each Machine Report. If de-selected, all reports will use a single common style sheets (.xslt files).
  - **Lock All Reports**. Locks all reports after publication is completed.

- Click the **Browse** button to select the location on your computer you will publish the report to.

- Click the dropdown list beside 'Output Format:' and choose the publication format. Available formats are HTML and XML.

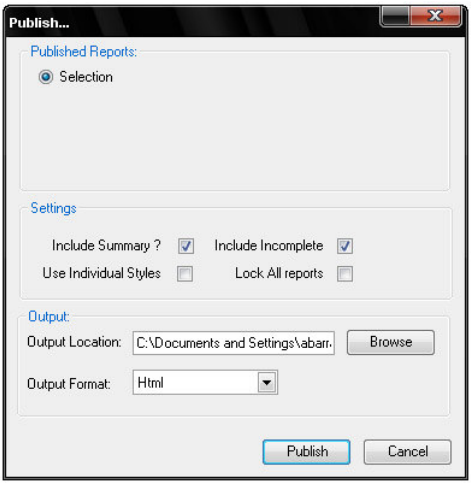
- Click the **Publish** button. The report will now be published and exported in HTML or XML together with any related style sheets, images or other related files.

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Note: The published files will consist of two HTML or XML files and a 'data' folder. One HTML/XML file will begin with 'MSR'. This file contains the Machine Assessment Summary of all reports generated. The second file will begin with 'MAS'. This file contains the individual Machine Assessment Reports for each machine.

Publish a Machine Assessment Report

- Right-click the target Machine Assessment Report under a machine in the navigator tree and select **Edit**. The 'Advanced Reporting Editor' interface will open.
- Select a machine from the bottom-left Machine Report List to select individual Machine Assessment Reports (CTRL-click to select multiple reports).
- Select **File>Publish** from the Advanced Reporting Editor main menu. The 'Publish' panel will open.



- De-select the **Include Summary?** checkbox.
- Select the parameters of the published report from the **Settings** area.

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- **Include summary**. Tick if you wish to include the overall Summary report in addition to the individual Machine reports (leave de-selected if publishing individual Machine Reports).
- **Include incomplete**. Include all reports that have a completion status of 'Not Completed' in addition to 'Completed' machine reports.
- **Use individual styles**. Use individual styles for each Machine Report. If de-selected, all reports will use a single common style sheets (.xslt files).
- **Lock All Reports**. Locks all reports after publication is completed.

- Click the **Browse** button. Navigate to a location on your computer where the published files will be generated.
- Click the dropdown list beside 'Output Format:' and choose the publication format. Available formats are HTML and XML.
- Click the **Publish** button. The report will now be published and exported in HTML or XML together with any related style sheets, images or other related files.

Note: The published files will consist of one HTML or XML file and a 'data' folder. The individual HTML/XML file contains reports for the machine(s) selected for publication.

Machine Summary Report

The Machine Summary Report lists the recordings status of Machine Points stored within a folder within a specified time range. Machines are placed below one of three possible tables according to their recordings status: **Not Recorded** (no expected recordings taken), **Partially Recorded** (some expected recordings taken) and **Recorded** (all expected recording taken).

Machine names are listed below the **Machine** column. Actual recordings taken relative to the expected numbers are listed below the **Fully Recorded**, **Partially Recorded** or **Not Recorded** column. The times and dates of the last recordings measured for each machine are listed under the **Last Recording Date** column.

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To select a report date range:

- Right-click within the report window.
- Select **Date Range (Range)**. The **Select Date Range** window will open.
- Enter the required date range.
- Click **OK**. The report will refresh using the date range specified.

Note: the date range you select will be used as the default when next opening the Machine Summary Report.

Notes Report

The Notes Report lists all notes stored within a Folder, ordered by Machine. Notes for individual Points and any associated measurements are displayed below each Machine listed.

To select a report date range:

- Right-click within the report window.
- Select **Date Range (Range)**. The **Select Date Range** window will open.
- Enter the required date range.
- Click **OK**.

Note: the date range you select will be used as the default when next opening the Notes Report.

Routes Due Report

The Routes Due Report produces a listing of all routes in the current folder that are due to be recorded 'today'.

- To change the date, for example to see which routes are due next week, right-click the background and choose **Setup Report**.

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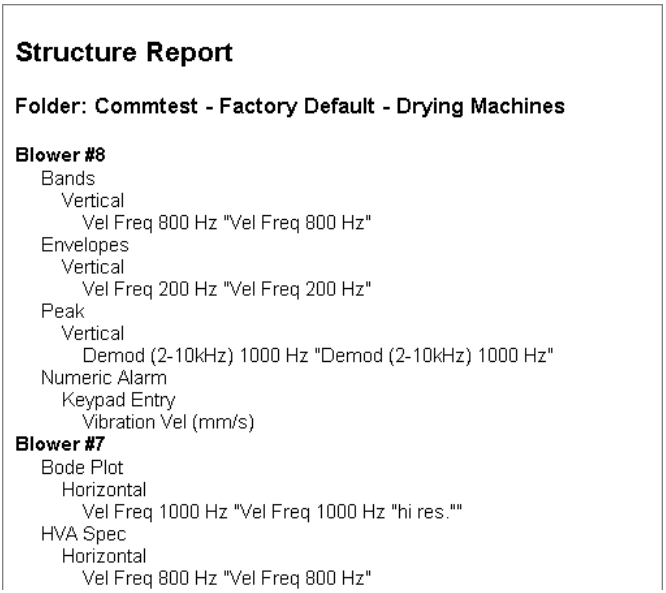
- Enter a new date and click **Continue**.

Structure and Route Reports

The Structure Report and Route Report generate text descriptions of the contents of your database.

The Structure Report lists all machines, points, measurement locations and schedule entries in the current selection.

- Click a machine then click **Reports** and select **Structure Report** from the list.



Structure Report

Folder: Commtest - Factory Default - Drying Machines

Blower #8
- Bands
  - Vertical
    - Vel Freq 800 Hz "Vel Freq 800 Hz"
- Envelopes
  - Vertical
    - Vel Freq 200 Hz "Vel Freq 200 Hz"
- Peak
  - Vertical
    - Demod (2-10kHz) 1000 Hz "Demod (2-10kHz) 1000 Hz"
- Numeric Alarm
  - Keypad Entry
    - Vibration Vel (mm/s)

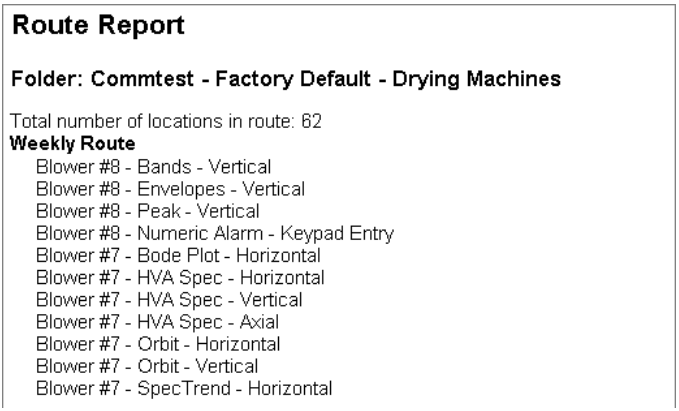
Blower #7
- Bode Plot
  - Horizontal
    - Vel Freq 1000 Hz "Vel Freq 1000 Hz "hi res.""
- HVA Spec
  - Horizontal
    - Vel Freq 800 Hz "Vel Freq 800 Hz"

- To include bearing part numbers in the report, right-click the background and choose **Setup Report**.
- Tick the box beside 'Include Bearing Part Numbers' then click **Click here to continue** to generate the report.

The Route Report creates a list of all route entries (the measurement locations on a route).

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- Click a route to produce a list of route entries or click a machine to generate a report for all routes that include this machine.
- Now click the **Report** button and select **Route Report**.



Route Report

Folder: Commtest - Factory Default - Drying Machines

Total number of locations in route: 62
Weekly Route
Blower #8 - Bands - Vertical
Blower #8 - Envelopes - Vertical
Blower #8 - Peak - Vertical
Blower #8 - Numeric Alarm - Keypad Entry
Blower #7 - Bode Plot - Horizontal
Blower #7 - HVA Spec - Horizontal
Blower #7 - HVA Spec - Vertical
Blower #7 - HVA Spec - Axial
Blower #7 - Orbit - Horizontal
Blower #7 - Orbit - Vertical
Blower #7 - SpecTrend - Horizontal

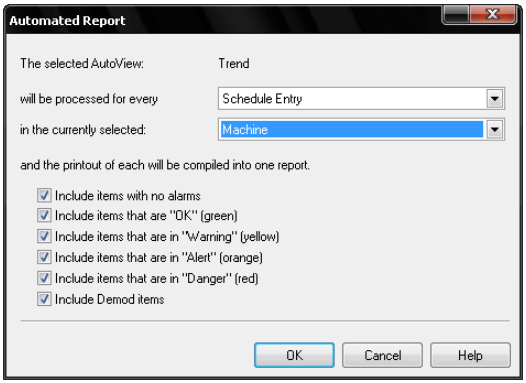
- To include schedule entries or remove them from the report, right-click the background and choose **Setup Report**.
- Tick or un-tick the **Include Schedule Entries** tick box, then click **Click here to continue** to generate the report.

Automated Reports

If you need to print a large number of charts or reports this process can be carried out very quickly using the software's Automated Report system. An automated report creates a printable multi-page output of the latest recordings using the chart or report of your choice. For example, you can create an alarm report of the latest recordings at every schedule entry on a machine and compile these into one printable report (1 alarm report per page).

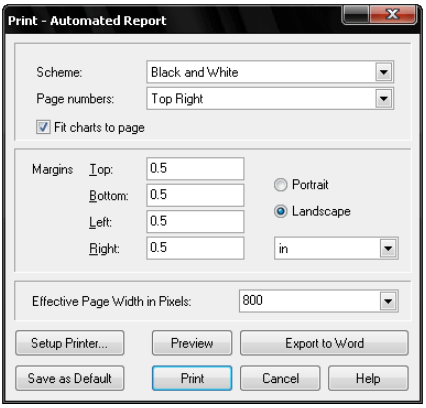
- To generate an automated report, open the chart or report you want to print, select an item in the navigator e.g. a machine then choose **View>Automated Report** from the main menu.

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- Use the drop-down boxes and tickboxes to select the items you would like the automated report to be generated for, then click **OK**. Nothing will be printed yet.

The displayed Print - Automated Report window lets you select the color scheme for the report, choose whether to show page numbers and also adjust the paper layout etc



- To preview the report before printing click **Preview**. This displays an on-screen preview of the report that will be produced. Click **Close** to close the preview window.

- Click **Print** to send this report to a printer.

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- If you wish to annotate the chart before printing click **Export to Word**. This will open the report as a Microsoft Word document so that you can add comments and highlight areas of interest etc.

If you want to selectively choose items to generate an automated report on, such as specific locations on several different machines, you can *tag* individual items and create a report of just those items. Tagging is a method of grouping selected items so that operations can be carried out on them collectively. For more information on tagging and how to create an automated report on tagged items see Tagging (page 225).

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Section 4: Plotting Data

Using Charts

This section will introduce you to plotting your data. We will also explore many of the features you can use to analyze your data, such as fault frequencies and baseline measurements.

- Click one of the schedule entries in the navigator tree. The navigator list will display the recordings that belong to this schedule entry.
- Double-click a recording (indicated by the triangle and date/time stamp) to plot it. Double-clicking a schedule entry will plot a spectrum if this is a frequency domain measurement or a time waveform if this is a time domain measurement.
- You can show or hide gridlines by right-clicking the chart and selecting **Chart Display>Horizontal Grid** (or Vertical Grid) from the shortcut menu.
- Right-click the chart and move the mouse to **Chart Legend**. This opens a sub-menu that lets you choose which data you want displayed on the bottom of the chart. For example, ticking **Show all info** makes the <set RPM> and <add note> labels visible. Click a label to perform that action.

Zooming and Panning

Zooming and panning allow you to take a closer look at a specific area of interest on a chart. Listed below are the zooming and panning methods available.

Panning
The chart can be dragged in any direction to display sections that are hidden from view.

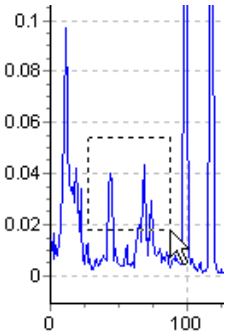
- To pan the chart, right-click and hold the mouse button then *drag* the chart to either side.

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- To return the chart to its original location, follow the instructions for unzooming.

Zoom in on a rectangle area

- Left-click a place on the left side of the chart section you wish to zoom.
- Hold down the mouse button while you drag a rectangle *across and down to the right*. This will create a dashed rectangle around the region of interest.
- Release the mouse button to perform the zoom.



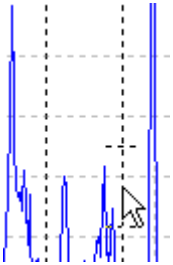
Zoom out

- To unzoom the chart, left-click and hold the mouse button, then *drag a rectangle up and to the left* on the chart. The zoom rectangle will appear with a large 'X' in it. When you release the mouse button the chart will return to its original size and location.

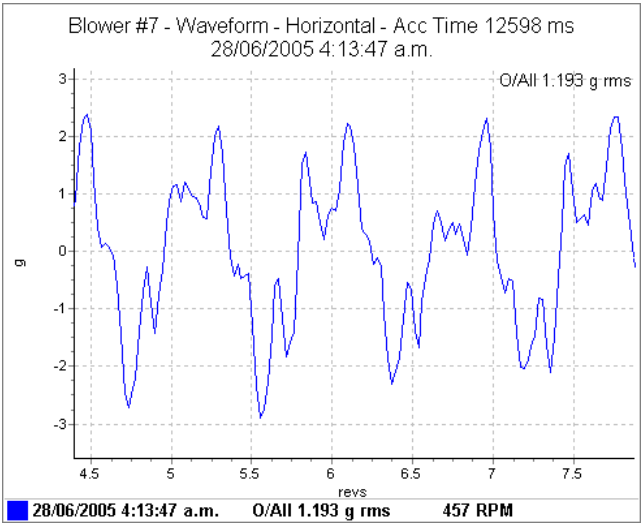
Zoom in horizontally

- To zoom horizontally, left-click on one side of the range you wish to zoom in on, and drag across to the right or left.

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- Release the mouse button to perform the zoom.



A waveform chart shown after horizontal zooming

If you start the horizontal zoom action to the left of the chart area, the zoom will start exactly on the left axis (i.e. from zero frequency). Click to the left of the left axis to make the chart zoom by 200% (you can do this repeatedly to make the chart zoom in 200% increments).

Zoom in vertically

- To zoom vertically, click the left mouse button above or below the range you wish to zoom in on, and *drag up or down* only to the other side of the range.

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Zooming functions using the mouse wheel

- If you have a mouse with a wheel, you can zoom vertically by moving the mouse cursor over the left axis of the chart and spinning the wheel.
- To zoom horizontally, hold the mouse cursor over the bottom axis of the chart and spin the wheel.

Using Cursors

Cursors are a valuable tool for analyzing your data. They can be used to show the amplitude and frequency of a peak, identify harmonics, and show the frequency difference between two peaks.

The software uses 'sync interpolation' to estimate the true value of the peak. This only applies to spectra that are not interpolated already, and not displayed in a dB scale.

There are two cursors available - one for each mouse button. Cursor A is assigned to the left mouse button while cursor B is assigned to the right mouse button.

To place a cursor on the chart

- Move the mouse cursor over a plot line - the mouse pointer will change to a cross hair.



- Left-click to place Cursor A on the chart.

Toggling between cursors

- Press the '**.**' (period) key on the keyboard to toggle between the two cursors. If the other cursor has not been activated yet it will be placed at the same location as the current active cursor.

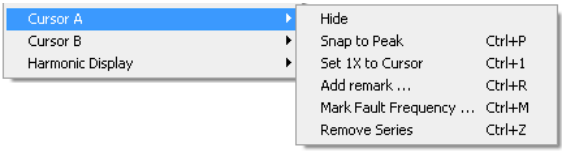
Moving cursors using the arrow keys

- Use the left and right arrow keys on the keyboard to move the cursor along the data points of the selected recording.

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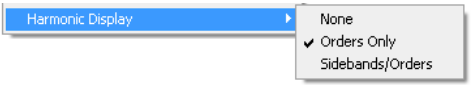
- Press **SHIFT** as you move left and right to move in 1 pixel increments only.
- Press **CTRL** as you move left and right to jump to the next peak and perform a peak search.

Note: You can access other cursor commands by right-clicking the chart background and selecting Cursor A or Cursor B.



Controlling Sideband/Orders display

- Right-click the chart and choose **Harmonic Display**. The sub-menu contains options enabling Orders and Sidebands.



If **Orders Only** is selected, markers will appear at multiples of the current cursor position's x value.

With **Sidebands/Orders** selected, if both cursors are active, the markers will be centered on the primary cursor (Cursor A) and located at intervals either side of this point at distances equal to the difference between the two cursors.

These options can also be activated by pressing the keyboard shortcut keys **H**, **O** and **S** when you have cursors active on a chart.

H = None (harmonics off)
O = Orders Only
S = Sidebands/Orders

Moving between plots on the chart

- Press the **up** and **down** arrow keys on the keyboard to move between plots on the chart.

If the chart is in Stacked Chart Mode, the cursor will move up and down between the plots on the stack.

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If the chart is in Waterfall Chart Mode, the cursor will move backwards and forwards between the plots.

If the chart is in Normal Chart Mode, the cursor will search up or down at the current position for another recording to jump to.

Removing the Cursors

- To turn the cursors off press **ESC**.

Snapping to a Peak

- Press **CTRL+P** to make the cursor snap to the top of the nearest peak. This will display the amplitude and frequency of this peak.
- To activate Cursor B, right-click anywhere on the plot line. The amplitude and frequency are displayed along with the difference in frequency between the two peaks.

You can also place a cursor by double-clicking the mouse button; the cursor will automatically snap to the top of the nearest peak.

Plotting Multiple Recordings on One Chart

By clicking the **Hold** button, you will prevent a chart from being cleared when new recordings are added. Use this with the **Add** button to plot several recordings together on one chart for easier comparison.



- With a chart displayed click **Hold**.
- Select another recording with the mouse then click **Add** to plot it on the same chart. Repeat to add other recordings.

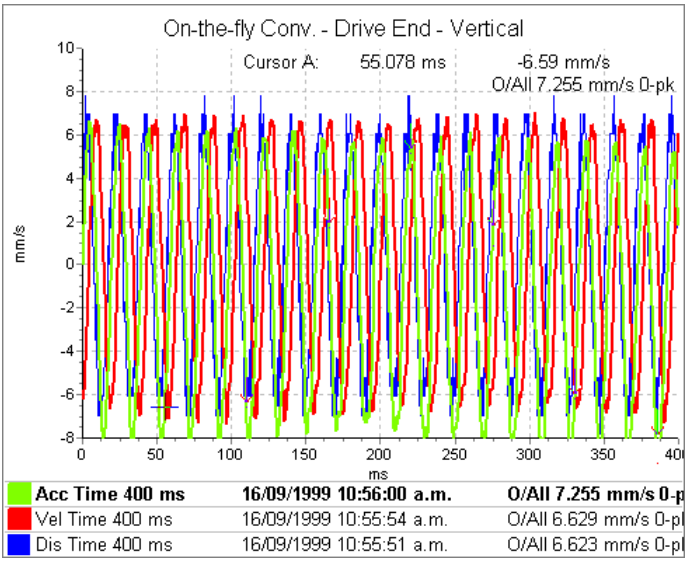


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- If you are plotting several recordings from a *single* schedule entry use the **CTRL** or **SHIFT** key to select more than one recording at a time.

Recordings do not need to be taken from the same measurement location or even the same machine. For example, you can select recordings from the same location on two identical machines and view the vibrations levels of both on one chart. You could also plot recordings from different points on the same machine to see how they compare.

The following waveform was created by selecting three recordings taken at one measurement location using velocity, acceleration and displacement measures.



Choosing Which Recordings to Display

You can choose which recordings are displayed on a chart by selecting items from the axis, units and domain sub-menus. For example, right-click the chart and choose **Restrict to axis>Horizontal**. This will force the chart to only display recordings taken on the horizontal axis.

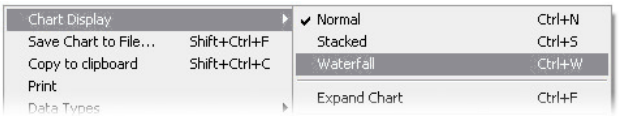
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Chart Modes

The Ascent software can display multiple recordings in Normal, Waterfall and Stacked chart mode.

- To switch between different chart modes, right-click a chart, highlight **Chart Display** and choose a mode from the shortcut menu.

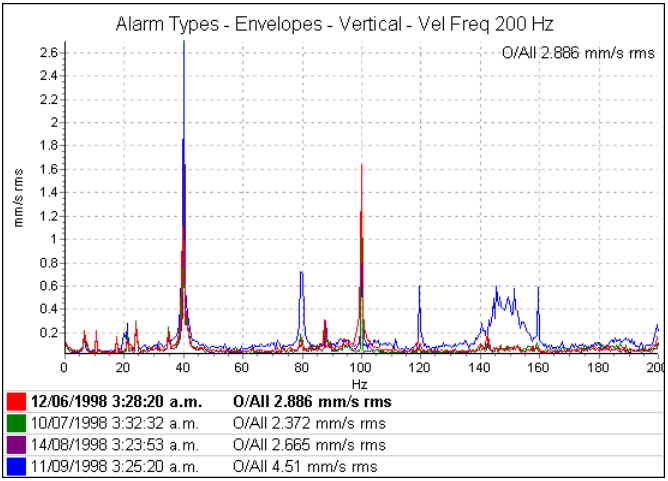


Note: The shortcut keys on the right of this menu provide the same functionality. Press these key combinations while viewing a chart to display a different chart mode.

The example charts that follow show four recordings plotted on one chart. Plotting multiple recordings can be done by selecting multiple recordings using the mouse or by using the **Hold** function, which is explained shortly.

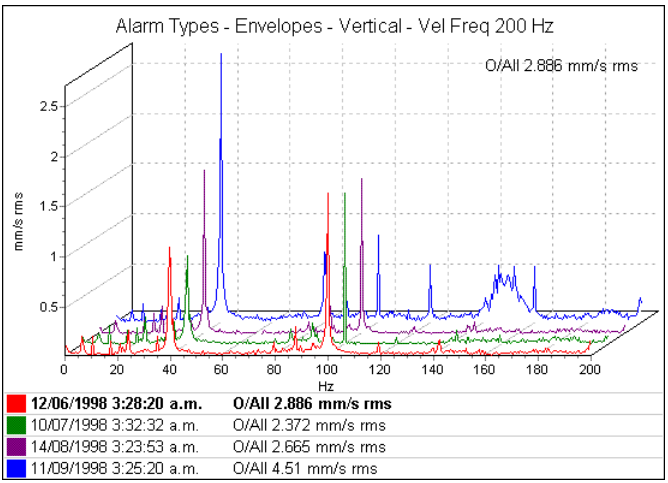
Normal Chart Mode
This mode displays all the plots on the same 2D axis. Use the right-click menu or **CTRL+N** to toggle this mode.

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Waterfall Chart Mode

This mode presents the plots in a 3D view. Use the right-click menu or **CTRL+W** to toggle this mode.



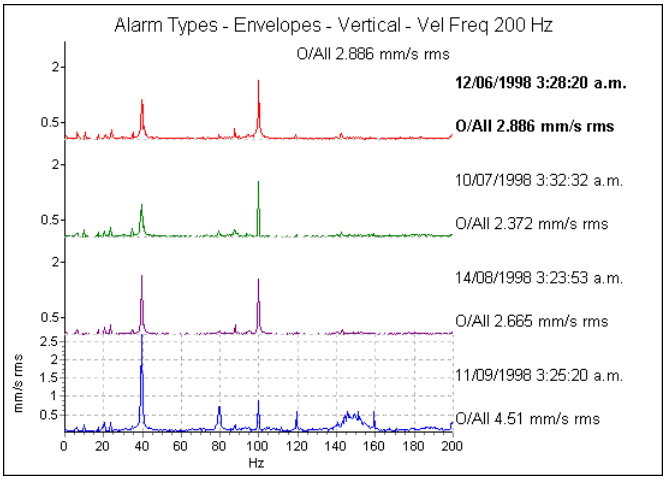
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- To adjust both the depth and orientation of the chart hold down the keyboard **CTRL** key and drag in any direction with the left mouse button. Alternatively you can control just the depth of the waterfall chart using **Options>Waterfall Depth** from the main menu.

- To display a filled waterfall chart, right-click the chart and select **Chart Display>Allow Filled Waterfall**. Selecting **Fill Waterfall in 3D** creates a 3D waterfall chart.

- To reverse the plot order of the waterfall (so that the most recent recording is moved to the front), right-click the chart and select **Reverse Plot Order**.

Stacked Chart Mode
This mode presents the plots one-above each other in a 2D view. Use the right-click menu or **CTRL+S** to toggle this mode.



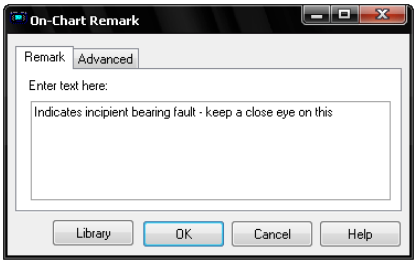
Selecting **Use Multi-Colored Legend** from the right-click **Chart Display** shortcut menu, applies different colors to each recording on the chart. If this option is not chosen, the default colors are used (blue for the selected recording, black for all others). You have complete control over the colors used to plot data using the Schemes system. See Changing Colors for Printer and Screen (page 144), for details on how to change the colors.

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Creating On-chart Remarks

On-Chart Remarks allow you to annotate your charts.

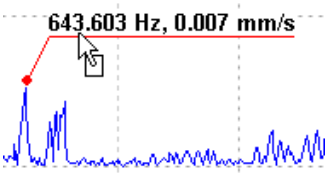
- To add an on-chart remark right-click on the chart where you want the remark to be placed and choose **On-Chart Remarks>Add**.
- Enter the text for the remark and click **OK**.
- To add a remark to the current cursor position right-click the chart and select **Cursor A** (or B) **>Add Remark**, or press **CTRL+R**.



You can maintain a library of frequently used on-chart remarks using the **Library** button. In this window you can add new remarks and edit existing ones. These remarks can be selected from the library list and re-used in any new charts you create.

Moving on-chart remarks

- Move the mouse cursor over the remark until a rectangle appears beneath it.



- Left-click and hold the mouse while dragging to move the on-chart remark.

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Clicking and dragging the text will 'stretch' the line that anchors the remark. Clicking and dragging the *line* allows you to move both the line and the text to a new position.

Spreading out overlapping remarks

- If your on-chart remarks are set too close together you can space them more evenly by right-clicking a remark and choosing **Spread out** from the shortcut menu.

Editing or deleting on-chart remarks

- Right-click the remark and choose **Edit text** or **Delete** from the shortcut menu.

Defining the RPM of a Recording

If you know the running speed of your machine you can enter this value directly.

- On the bottom chart legend click the <set RPM> label. If this is not visible, display it by right-clicking the chart and selecting **Chart Legend>Show all info**.

- Enter the RPM value then click **OK**.

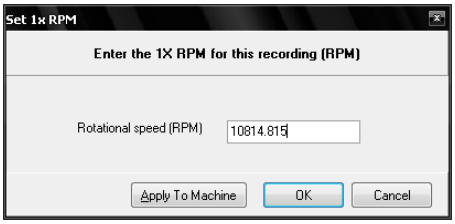
Using the software to calculate the RPM

To calculate the RPM of a recording using the software you need to identify the 1X peak.

- Move the mouse cursor until it is over the first big peak on the spectrum and double-click to place the cursor at the top of this peak. The cursor may appear to jump off the spectrum - this is because the true peak may lie between two FFT values.

- Press **CTRL+1** to open the Set 1X RPM window. The frequency of the current peak will be displayed.

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- Click **OK** to accept this value as the machine running speed.

To set the RPM values of all the recordings and/or schedule entries at a machine see Setting RPMs for Multiple Recordings (page 200).

Viewing Data in Orders or Revolutions

Once the 1X RPM is defined you can view the chart in Orders (for spectra) or Revs (for waveforms). The recording must have its 1X RPM set so that the software knows how long one revolution takes. Options on the shortcut menu that are not applicable will be grayed out.

To view a chart in orders

- Right-click the chart and select **Bottom Axis>Orders**.

To view a chart in revolutions

- With a waveform displayed, set the 1X RPM as follows: in the navigator list, right-click the recording used to plot this waveform and select **Set 1x RPM** from the shortcut menu.
- Enter the RPM value and click **OK**.
- Now right-click the chart and select **Bottom Axis>Revolutions**.

Displaying Fault Frequencies

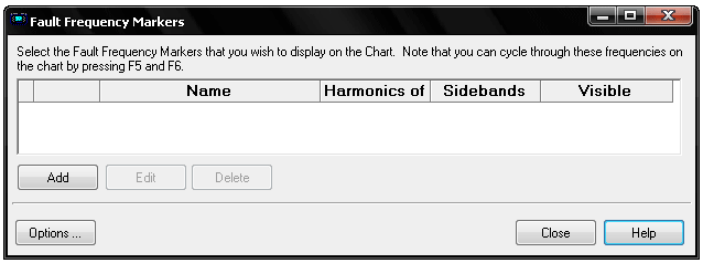
To display fault frequencies on a chart you need to define:

- The 1X RPM value for the recording so that Orders can be displayed. See Defining the RPM of a Recording (page 107).
- A bearing or gear at the point that contains these measurements.

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Note: If you want to display user-defined fault frequencies, you will *not* have to add a bearing or gear to this point. Defining your own fault frequencies is explained shortly.

- Right-click on a chart and select **Fault Frequency Markers>List**. (Alternatively left-click anywhere on the chart and press **CTRL+F5** to open a window that lists the fault frequencies available at this location.)
- Select the fault frequencies with the mouse to display them on the chart.



BPFO: Ball pass frequency outer. This indicates how many times a defect in the *outer* race of the bearing will be passed over by a ball or roller during one shaft revolution.

BPFI: Ball pass frequency inner. This indicates how many times a defect in the *inner* race of the bearing will be passed over by a ball or roller during one shaft revolution.

FTFO: Fundamental train frequency outer. This is the speed at which the rollers or balls will move around the bearing, relative to the *outer* race speed.

FTFI: Fundamental train frequency inner. This is the speed at which the rollers or balls will move around the bearing, relative to the *inner* race speed.

BSF: Ball spin frequency. This indicates how many times an individual ball or roller will rotate within the races during one shaft revolution.

- Click the **Options** button if you want to set the number of orders and sidebands to display, then click **OK**.

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- Click the **Close** button to close the list.
- Cycle through the fault frequencies on the chart by pressing **F5** (previous frequency) and **F6** (next frequency).

These functions are also available by right-clicking the chart and choosing **Fault Frequency Markers>Next** (or **Previous**).

Removing fault frequencies from a chart

- To remove a fault frequency and all its sidebands press **CTRL+F5**. Select the fault frequency in the list and click **Delete**.

Copying fault frequencies to additional points

- Select a point to display its associated fault frequencies in the navigator list.
- Right-click the fault frequency and select **Copy item to Clipboard**.
- Right-click the point where you want the fault frequency to be placed and select **Paste**. (You can also use **CTRL+C** and **CTRL+V** to copy and paste navigator list items to other levels in the navigator.)

Nudging Fault Frequencies

Bearing fault frequencies can vary slightly depending on wear, axial load and speed variations. The software lets you 'nudge' fault frequencies on the chart so that you can see if the frequencies would line up with just a little adjustment.

- When fault frequencies are displayed on the chart, you can nudge them up to 25% by clicking with the left button on the fault frequency label (i.e. the bearing part number) and dragging to the left and right with the mouse.

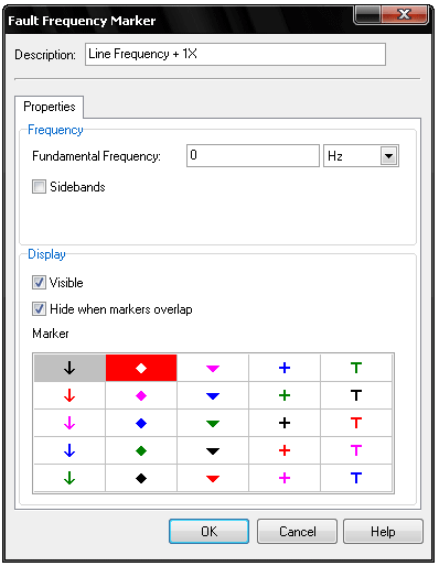
The keyboard shortcuts **SHIFT+F5** and **SHIFT+F6** will also nudge the currently displayed fault frequencies by a small amount.

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Defining your own Fault Frequencies

You can create user-defined fault frequencies which can then be displayed on a chart to highlight the frequencies of known problem sources e.g. electrical line frequency. These do not require you to add bearings or gears to a point as you will supply the frequency information yourself. User-defined fault frequencies are associated with points on a machine in the same manner as regular fault frequencies (clicking the point will display any existing user-defined fault frequencies in the navigator list).

- Right-click a point in the navigator tree and select **New>Fault Frequency**. (Alternatively you can double-click a specific peak to snap the cursor to the peak's apex then press **CTRL+M** to open the Fault Frequency editor. The frequency of your selected peak will be displayed in the 'Fundamental Frequency' field.)



- Enter a description for this fault frequency. A text label with this description will display above your fault frequency markers when they are plotted on the chart.

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- Enter the fundamental frequency and optional sideband frequency if desired (tick the 'Sidebands' box to display this option). These can be represented either in absolute frequency (Hz/CPM) or orders.

- If you want this fault frequency to be automatically displayed when one of the selected point's recordings is plotted tick 'Always Visible'. If this option is not selected the fault frequency will be hidden until you choose to display it by pressing **F5** or **F6**.

- You can hide overlapping markers of the same harmonic series by selecting 'Hide when markers overlap'. This will avoid clustering too many markers close together on charts. (You can find these hidden fault frequencies and any bearing or gear fault frequencies by stepping forward (**F6**) or backward (**F5**).)

- Select a marker with the mouse or accept the highlighted default, then click **OK**. The marker and text description label will sit above both the fundamental fault frequency and any orders/harmonics.

Sidebands are displayed as arrows the same color as your fault frequency marker. We recommend you use different colors for each fault frequency so that sidebands can be easily identified.

The fault frequencies you create can be displayed on a chart, listed, and nudged in the same way as the system-defined fault frequencies.

Adding/Editing/Deleting fault frequencies

- To open a list of *all* fault frequencies (both user and system-defined) on your displayed chart right-click and select **Fault Frequency Markers>List** (or press **CTRL+F5**). Use the **Edit** and **Delete** buttons to change/remove fault frequencies and **Add** to create additional ones.

- To edit a fault frequency directly on the chart double-click the fault frequency's text label.

Note: Only user-defined fault frequencies can be edited or deleted; system defined bearing and gear fault frequencies cannot be altered.

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Setting and Displaying Baselines

A baseline recording is a vibration measurement taken on a machine which is considered to be in good condition. The baseline is used as a comparison recording with which to observe changes in the vibration patterns.

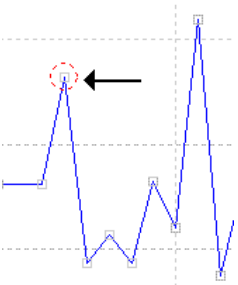
- Right-click a recording in the navigator list and choose **Set Baseline**. This will make the recording a 'baseline recording'.
- To include this baseline RMS value on a chart, right-click the chart and select **Include Baseline**.

When you close the chart you will be prompted to save changes.

- If you want to include baselines on this type of chart automatically in the future, click **Yes**.

If you select this option the chart will always attempt to load the latest baseline recording, even if the plot limit (the number of recordings that may be displayed) has already been satisfied. If you have set a plot limit of 6, then there may be 7 recordings on the chart if the baseline was not one of the 6 most recent recordings.

When you open a *trend* chart and plot the spectrum overalls, a red circular marker will appear around the baseline recording's data point so that the baseline can be easily identified.



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Displaying baseline RMS values on the vb instrument
When taking recordings on the instrument you can display the RMS value of the baseline recording so that it can be compared with the measurement you have just taken. See Baseline Recordings (page 205) for more information.

Waveform Analysis

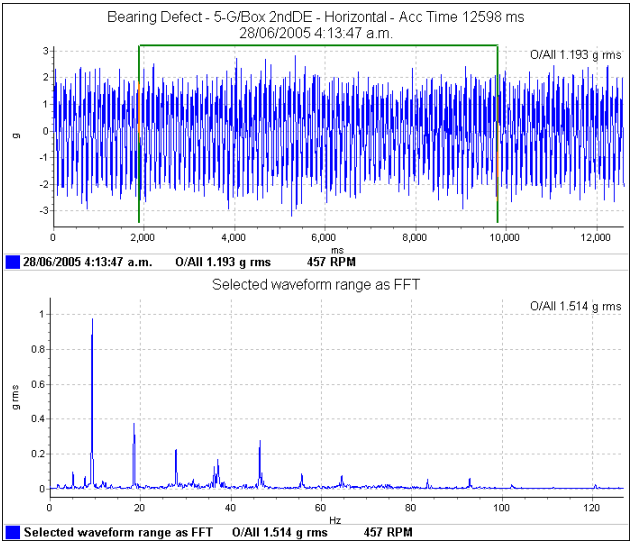
Note: This feature will only be available to you if it is included as part of your license agreement. If you wish to enable this feature please contact sales@commtest.com or your distributor for more information.

The Ascent software contains some special tools for viewing and analyzing time domain data.

- Select a time domain (waveform) recording in the navigator list.
- From the main menu, select **Analyze>Partial Waveform Analysis**.

The new chart that opens will display the waveform and an empty chart below it. **Partial Waveform Analysis** is a tool that lets you select a portion of the waveform and convert it into a spectrum.

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- Press and hold the **CTRL** key then click and hold down the mouse button as you drag the mouse to either side. A green line will follow the mouse, showing you how much of the waveform you have selected.

- Release the mouse and the spectrum will appear in the bottom chart. Repeat the process to zoom in on different areas of the waveform.

The spectral peaks will appear rounded if you have only selected a small amount of data. This is because the resolution of the spectrum is proportional to the number of samples selected in the time domain. You can zoom and pan both charts and right-click to display a shortcut menu where you can choose different chart display options.

The menu option **Analyze>Freq Based Waveform Analysis** plots a spectrum of the time domain data. Use the mouse to select a range of frequencies in the spectrum. The software will take these frequencies and display them as a waveform in the bottom chart.

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Waveform Audio Playback

Note: This feature will only be available to you if it is included as part of your license agreement. If you wish to enable this feature please contact sales@commtest.com or your distributor for more information.

Your computer must be equipped with a sound card and an appropriate playback device (headphones or speakers) to use this feature.

- Click a schedule entry  containing a recording in the navigator tree. The navigator list will display the recordings that belong to this schedule entry.
- Double-click a time domain recording (indicated by the triangle and date/time stamp).
- Right-click the waveform chart and select **Audio>Play Waveform** to hear the waveform recording. Select **Export Waveform** to save the audio file (.WAV format) to your PC.

Converting Waveforms to Spectra

The Ascent software can automatically convert a waveform to a spectrum by changing the chart axis from time to frequency.

- With a waveform displayed, right-click the chart and select **Bottom Axis>Frequency**.

You can control the parameters used to calculate the FFT (e.g. number of averages, overlap percentage and type of window to use.

- To see the full list of commands, from the main menu choose **Options>Automatic FFT Options**.
- Once you have made changes, if you have already plotted the spectrum, double-click the recording again in the navigator list to re-plot the spectrum using your new settings.

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Note: You can set alarm bands and envelopes on waveform data and the software will automatically perform the FFT to check the alarm. This is not, however, recommended as an FFT generated from a single waveform inherently has either less averaging or less resolution than a complete, averaged FFT. Processing times may also be long when dealing with significant quantities of data or if using an older or slower computer.

Long Time Waveforms

Note: This feature is only available in some vbSeries instruments - please refer to the specifications in your Instrument Reference Guide.

vbX instruments with this capability can take continuous recordings over a period of up to 229376 seconds, or 63.7 hours (for a single channel recording using an Fmax of 1500 CPM/25 Hz). Once these recordings are transferred, the Ascent software will store them within a single schedule entry.

Setting Measurement Unit Preferences

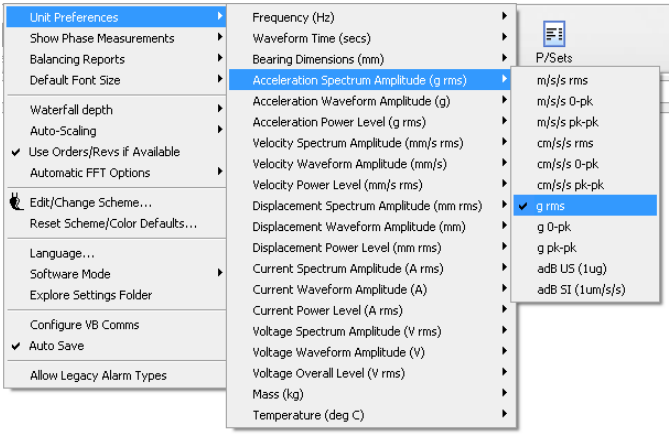
You can choose your preferred measurement display units for spectrum and waveform charts so that all recordings, regardless of what measurement units were used to record them, will be displayed in your chosen units. For example, you can choose to display all velocity recordings in mm/s by setting this preference in the Velocity Spectrum Amplitude menu. Once this setting has been chosen, all future velocity measurements will be displayed in mm/s until other units are selected.

You can set unit preferences for acceleration, velocity, displacement, current and temperature; overall values for waveforms and spectra and even specify bearing dimensions in imperial or metric units.

Note: Changing the units does not change recordings stored in the database, only how they are displayed

- From the main menu select **Options>Unit Preferences**.

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- Move the mouse cursor down the list of options to open sub-menus containing the available units.

Acceleration, velocity, displacement and current 'Spectrum Amplitude' refer to the left axis scale on spectra charts.

'Waveform Amplitude' refers to the left axis scale used by waveforms.

'Power Level' refers to spectrum and waveform overall values and power band alarms.

The overall vibration level displayed on the chart does not need to use the same units as the left axis. For example, you can scale the left axis in Ø-peak and the overall in rms.

Switching Between Hz and CPM

- To switch between Hz and CPM, from the main menu select **Options>Unit Preferences>Frequency** then select your preference.

Switching Between Velocity, Acceleration and Displacement

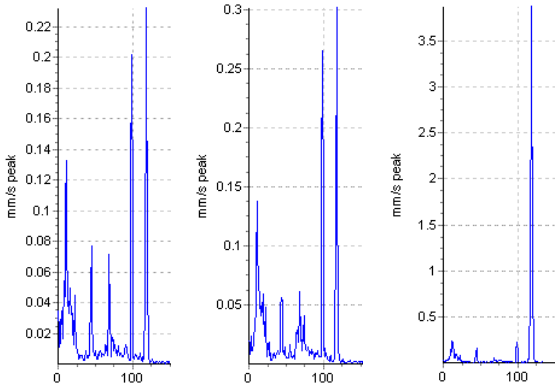
- Right-click on the chart, choose **Left Axis** from the shortcut menu then select your preference.

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Customizing the Scale of Charts

Left and bottom axis scaling

The left axis of a chart will scale automatically to accommodate the highest peak. The truncated diagrams below show how auto-scaling affects your chart display. The vibration level at this location increased each time recordings were taken so the top value of the left axis scale has gone from 0.22 mm/s to 0.3 mm/s to 3.5 mm/s to fit the data.



Left axis auto-scaling

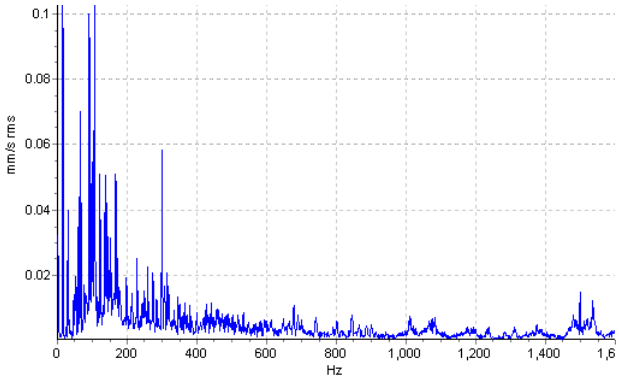
You can customize the default scaling of charts in several ways.

- To access these options choose **Options>Auto-Scaling**.

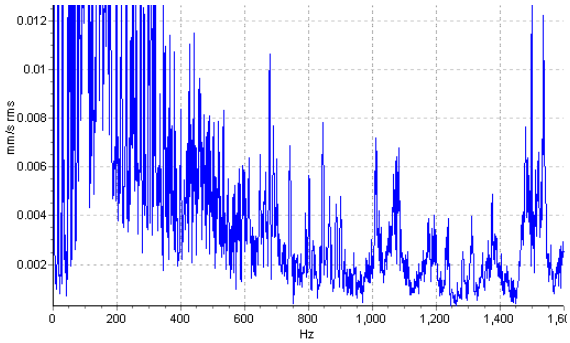
Ignore Hz Below

Enter a value in Hz below which data on spectra will be ignored for auto-scaling purposes. This will force the chart to enlarge lower amplitude peaks and is particularly useful for recordings with large 'ski-slopes', such as displacement recordings or recordings that have been converted from acceleration to velocity or displacement. The default value is 4 Hz (recommended).

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Original chart



Same chart with Ignore Hz Below (350) applied

Y-Margin Percentage

Enter a percentage value of extra space that will be left above and below plots.

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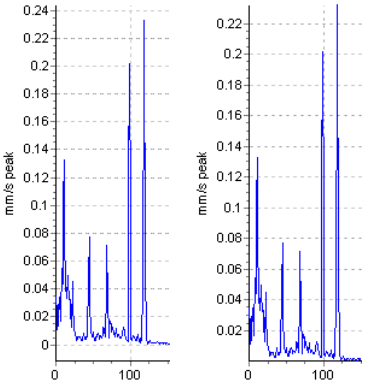


Chart with 5% Y-margin (left) and the same chart with no margin (right)

Note: These settings are saved and apply *globally* to all charts.

You can force your charts to temporarily use a fixed axis scale by setting minimum and maximum values for the left and bottom axes. The fixed axis setting will be applied to all recording plots that use this chart type until you close the chart or exit the software.

- To set left axis scaling, right-click the chart area and select **Chart Display>Left Axis Minimum** (or Maximum).
- Enter a value then click **OK**. The units used will be the same as those specified for the chart i.e. if your chart uses mm/s, entering a minimum value of 0 and a maximum of 5 will set the chart scale to start at 0 mm/s and finish at 5 mm/s.

Notes:
Bottom axis scaling options are available from the same menu and are set in the same way.

The left and bottom axis settings will override the 'Ignore Hz Below' and 'Y-Margin Percentage' settings.

Setting a fixed axis scale permanently
Left and bottom axis scaling can be permanently set for any type of chart (including all those available from the **Chart** button drop-down list). This change will be applied globally to all charts of this type.

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- To permanently set a fixed axis scale, set the values as described previously, then select **View>Save** from the main menu. This will save your changes.

Removing fixed axis scaling (re-setting auto-scaling)

- Right-click the chart area and select **Chart Display>Left Axis Minimum** (or Maximum).
- Delete the value from this field to turn auto-scaling back on.

This procedure will *temporarily* restore auto-scaling if you have permanently fixed the axis scale.

- To remove a fixed axis scale permanently, follow the steps above then select **View>Save** from the main menu.

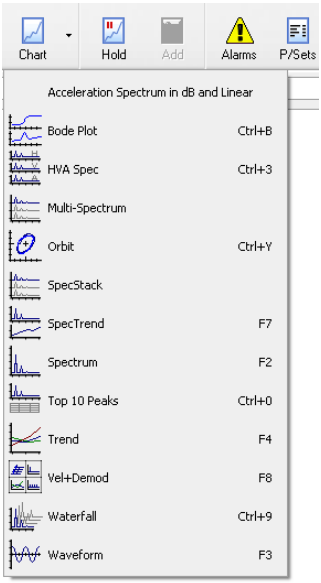
Using Views

A view is a customized report or chart that lets you define your own ways of browsing the data in the database i.e. what data is plotted and how it is displayed.

- To see the full list of pre-defined report views, click **Report**.
- To see the full list of pre-defined chart views, click **Chart**.

Note: The views shown here may differ from those on your PC as the software will only display features you are licensed to use.

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Note: You can also choose a view by using the shortcut keys, such as **F2**, as shown on the right-side of the menu.

Acceleration Spectrum in dB and Linear displays both adB (or vdB for velocity recordings) and linear spectrum charts of the selected recording(s).

Bode Plot displays two charts, one showing how amplitude varies with frequency and the other showing how phase varies with frequency. See Bode Plots (page 137) for more information.

HVA Spec displays three separate spectrum charts showing the last recorded horizontal, vertical and axial measurements of the currently selected point □

Multi-Spectrum displays a stacked spectrum chart of the latest recordings at the selected item e.g. the latest recordings for each location on a selected point or all the latest recordings on a selected machine. If a location has more than one schedule entry, the newest recording from the mostly recently recorded schedule entry will be shown.

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Orbit displays the physical path traveled by a shaft within a bearing. For information on collecting data to produce orbit plots see Orbit Plots (page 135).

SpecStack displays a stacked chart of the four most recent recordings at the selected schedule entry 

SpecTrend displays a spectrum of the currently selected recording and a trend of overall values for all recordings taken at that schedule entry. To display a spectrum, you must have either a recording or schedule entry selected.

Spectrum displays a spectrum of the selected recording.

Top 10 peaks displays the amplitude values of the 10 highest peaks in a spectrum and lists the frequencies they occurred at.

Trend displays a trend chart of overall vibration levels for a series of recordings associated with the currently selected machine/point/location/schedule entry.

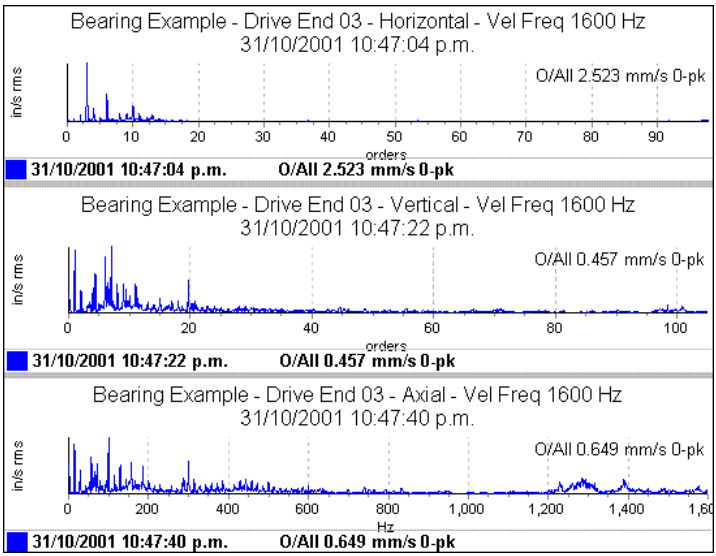
Vel+Demod displays four separate charts showing all recordings at the selected location . The charts displayed are: waterfall, spectrum, trend and demodulation (if a demodulation measurement has been taken - otherwise this section of the chart will be empty).

Waterfall displays a waterfall chart of all recordings at a selected schedule entry.

Waveform displays a waveform of the selected time domain recording.

Multiple recordings can be displayed simultaneously for easy comparison. For example, the HVA Spec view plots the most recent horizontal, vertical and axial measurements of the currently selected point and displays them simultaneously in three separate charts. Selecting another point in the navigator tree will apply the view to that point and update the chart display.

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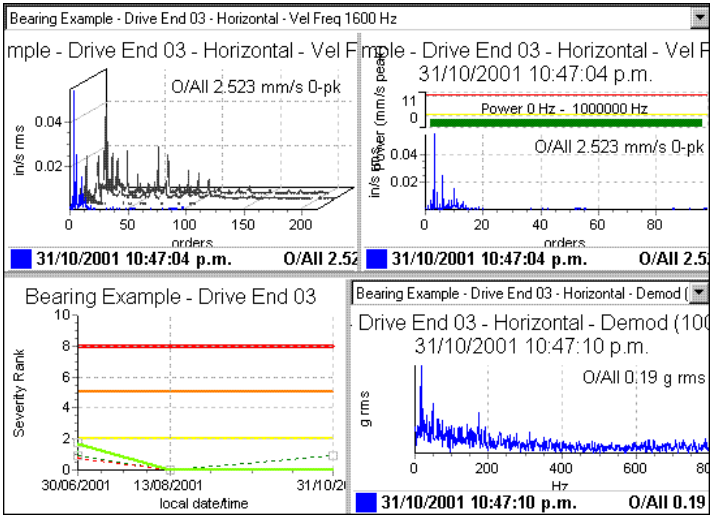


HVA Spec view

Highlighting and color coding are used to make each view as informative as possible. For example, when a chart is displaying multiple recordings, the currently selected recording is highlighted in the navigator list and also shown on the chart in a different color from other recordings to make identification easier.

Views such as SpecTrend or Vel+Demod display several types of chart together on one screen, enabling you to view an individual recording in different ways and also see how it compares with other recordings in a trend or waterfall chart.

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Vel+Demod view

With any view displayed, when you select a different recording in the navigator list, the view will update to display that recording. In the previous Vel+Demod example, the spectrum and demodulation charts on the right will update to display new spectra while the waterfall and trend charts will highlight the individual recording using coloring and cursors.

You can create your own customized charts and reports to display data however you wish. Once you have created a new view it will be added to the list under the **Chart** button and can be selected like any other view. See Walk-through: Creating your own Views (page 274), for more information.

How Views Work

Views are sensitive to the selection in the navigator and will plot data from the currently selected machine/point/location. For example, if you select a **Trend** view, clicking a machine in the navigator tree will trend overall vibration levels of recordings for all locations on that machine. Clicking a point will trend the recordings for all locations on that point and so on.

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A view will only display data if the view's data type matches the selected recording(s) e.g. to display a waveform you must select a time domain recording; to display a trend chart you must select multiple recordings (or an item that contains several recordings such as a point).

- To stop the chart from automatically showing whatever is selected in the navigator tree, click the **Hold** button.
- To display more than one recording on a chart, click **Hold** then use the **Add** button or double-click recordings to add them to the display. You can select multiple recordings simultaneously by clicking and dragging round them with the mouse. See Selecting Multiple Items on page 60, for more information).

You can have multiple views open at the same time. If you select a different view without closing the previous one, the new view will open over the top of the old view. Labeled tabs will appear at the edge of the chart to indicate which views are open.



- Click the tabs to toggle which view is displayed.

Turning an On-screen View into a Picture

Printing a view is one way of creating a paper copy but you can also save any view as a Word document so that you it can be annotated before printing. Views can also be saved as image files then inserted into a graphics program for further manipulation. Once the data has been saved in electronic format it can be e-mailed offsite.

- To open a Word document containing a picture of the view that is currently open, click **Word** on the toolbar. You can now resize the picture and add captions or other explanatory text. Add additional views to the document by creating more Word files to cut and paste from, or copy more views directly from the clipboard (see below).

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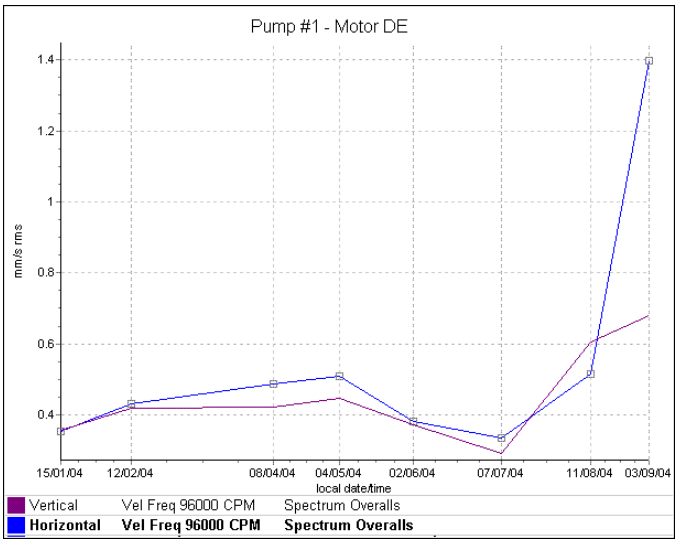
- Copy the current view to the clipboard by selecting **View>Copy to Clipboard** from the main menu. This picture can then be pasted into a suitable text editor or other program.
- If a view is made up of several charts e.g. the four-chart Vel+Demod view, you can copy an individual chart to the clipboard by right-clicking it and selecting **Copy to Clipboard**.
- To save a chart as an image file, right-click the chart and select **Save Chart to File**. You can then select the type of file to save as (jpeg, gif, bmp, emf or wmf).

Trending Data

While it may be possible to get a good indication of the presence of certain defects from a single measurement, it is more common practice to watch for *changes* in the measurements over time. To do this you *trend* a series of recordings and measure the changes in overall levels.

The following trend chart was created by selecting a point with two measurement locations. Each plot line shows a trend of the overall vibration level at one of the locations.

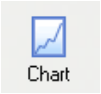
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The software can plot a trend chart of overall levels for any of the following:

- All recordings on a machine
- All recordings on a point
- All recordings at a location
- All recordings taken for a schedule entry

- Click any item in the navigator tree to select it then click the **Chart** button on the toolbar and choose **Trend** from the drop-down list.



The trend lines that are shown on the chart depend on two things:

- The Trend Types selected (spectrum overalls, alarm band levels etc). Right-click the chart and select **Data Types** to see the full list.
- The amplitude units selected for the left axis (only trend data that is compatible with the amplitude units on the left axis can be shown e.g. you cannot trend velocity data with the left axis set to acceleration).

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When left axis units are set to Default, the software will try to pick the best units for the left axis. Any trend data that cannot be shown because the left axis units are incompatible with the data will have 'Not shown - click here to view' written in the legend.

Note: Trending of alarms is discussed in more detail with chart examples in Trending Band Alarms (page 160), and Trending Envelope Alarms (page 171).

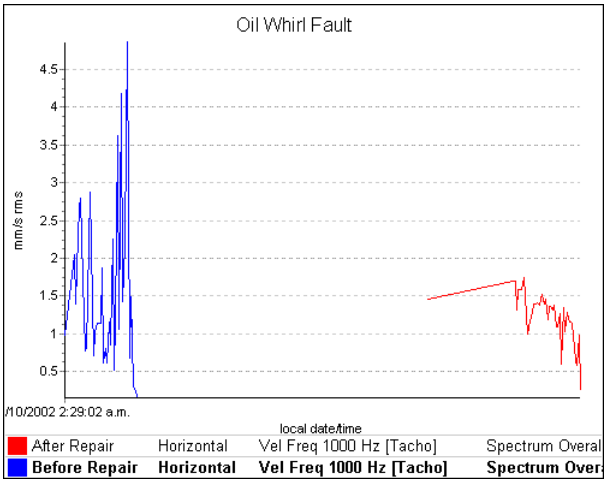
- To choose the data types the trend chart can display, right-click the chart and select **Data Types**, then tick or un-tick options from the Data Types panel.
- Right-click the chart and select **Set History Count** or **Date Range (All Dates)** if you wish to filter by date or count.
- To select a different amplitude scale for the left axis, right-click the chart and select **Left Axis**, then choose one of the options from the sub-menu. These options change according to the amplitude type of the recordings (velocity, acceleration, displacement). Demodulation will appear as acceleration.

The bottom axis of a chart can be displayed in time/date format or 'Index' (data points are plotted against a numbered, evenly-spaced axis). For most charts, time/date provides the most meaningful information as we are normally concerned with how the vibration looks/changes over time. However, in certain situations the 'Index' axis is more appropriate as it allows you to compare trends of recordings taken at different times. The example charts that follow show data trends from two schedule entries (see diagram).



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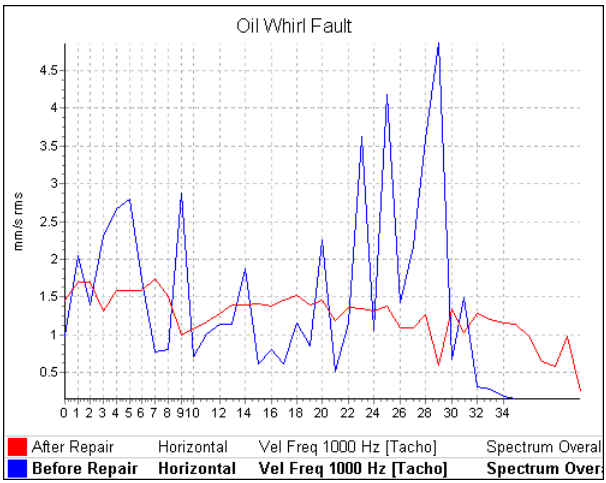
The first schedule entry contains recordings taken of a machine with a fault condition. The second schedule entry contains recordings of the same machine *after* the fault was repaired. These two schedule entries were then plotted on a trend chart to compare the before and after vibration levels. The first chart, using the time/date axis, puts a large gap between the two trends because the recordings are taken at different times.



Bottom axis set to date/time

The second chart, using the 'Index' axis, ignores the time/date-stamps and plots the recordings as a numbered series, making it easier to compare the levels of the two trends.

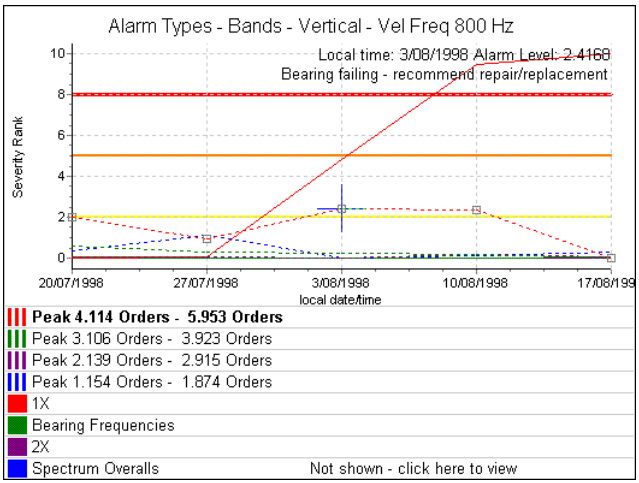
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Bottom axis set to index

Using cursors with trend charts

When the cursor is placed over a recording plot line on a trend chart, the amplitude of the cursor position is described on the top-right of the chart. Any notes that are assigned to that recording will be listed below the cursor readout.



Trend chart of alarm levels showing cursor readout at top-right

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The recordings in the navigator list are linked to the chart cursor. Selecting a recording in the navigator list will place a cursor corresponding to that recording on the trend chart. The reverse is also true - clicking a data point on the trend chart will highlight that recording in the navigator list (you will need to double-click the data point if no recording is currently highlighted).

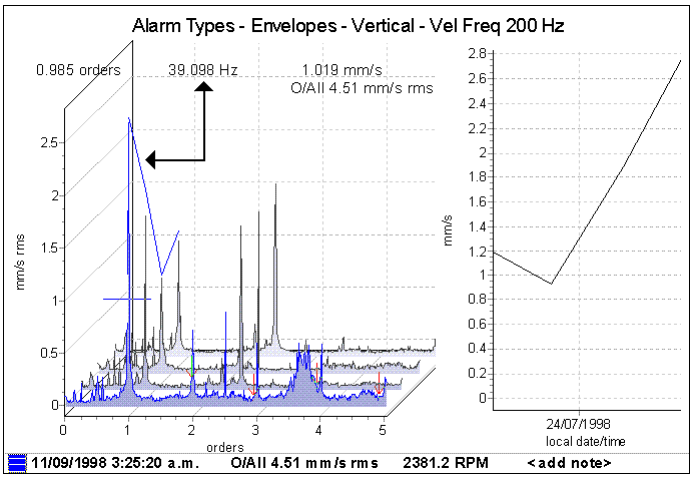
Once a cursor has been placed on a chart, double-clicking a data point will open the default view (waveform or spectrum) of the recording under the cursor.

If a recording has been set as baseline, a red circular marker will appear around its data point when a spectrum overall trend is plotted.

Single Frequency Trending

A single frequency trend plot is used to trend changes in vibration amplitude or phase at a particular frequency. For this type of chart it can help to use recordings taken with a tachometer and display the bottom axis in orders. This is so that speed variations will be compensated for if you are looking at a frequency that is relative to running speed.

The following diagram shows a single frequency trend chart created from a waterfall chart with four velocity recordings plotted.



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Note: The double headed arrow has been added to the diagram to indicate the frequency being trended (Hz value shown at top) and the actual line drawn across the frequency of interest.

- To plot a single frequency trend chart, first select the schedule entry that contains the recordings you wish to trend.
- Click the **Chart** button on the toolbar then select **Waterfall** from the list.
- Right-click the chart and select **Cursor Trend>Visible**.
- Move the cursor over the frequency of interest and left-click to place it on the chart. The chart of trended amplitude values will appear to the right of the original chart.
- Use the left and right keyboard arrow keys to move the cursor to different frequencies along the spectrum (the frequency and amplitude value are displayed at the top of the chart). The trend chart will update accordingly.
- To remove the trend chart, right-click on it and select **Visible**.

Other items on the sub-menu give you different options for displaying information contained in the trend chart.

Display Size
Selecting this option opens a dialog box where you can enter the display size for the trend chart. To make the trend chart fill half the chart area, enter 50 for the percentage value.

Amplitude
Creates a trend chart of amplitude values at a specified frequency (see previous chart diagram). This is the default action.

Phase
Creates a 'bode plot' style chart of trended phase values at a specified frequency. Recordings must be taken with a tachometer to gather phase information.

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Estimate True Peaks
When using the Hanning window with FFT data, the phase values of frequency bins around a peak can vary by up to 180 degrees. Estimate True Peaks counteracts this effect by calculating the true peak amplitude and phase.

Phase Zero Centered
If this option is ticked the vertical axis will use 0° phase as its mid-point. Otherwise the center will be 180° phase.

Note: The next three options relate to the horizontal axis display - you may need to increase the trend chart display size to show all frequency values.

Versus RPM
The horizontal axis will use RPM.

Versus Time
The timestamp of each recording is used to determine its position along the horizontal axis.

Versus Index
Recordings are evenly spaced along the horizontal axis (see previous topic for diagrams).

Cursor Width
Frequencies will vary slightly with each recording session. To counteract this variance, enter a value that determines how far the software will look either side of the actual cursor position for a peak. The default cursor width of 5 Hz is usually appropriate.

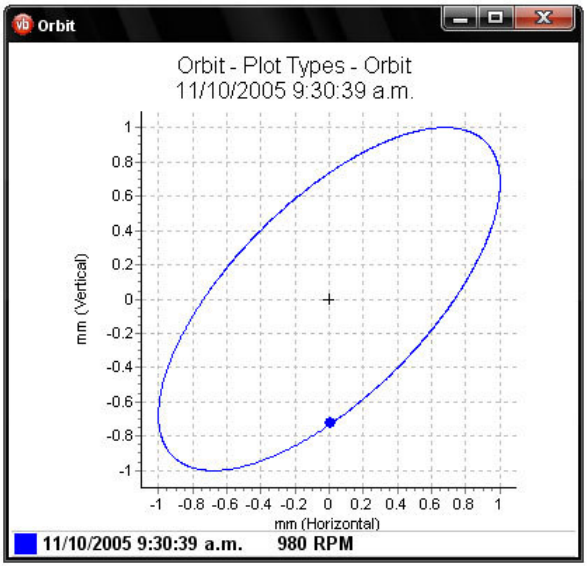
Other
This lets you access the main chart display options i.e. this is the same menu that you will see if you right-click on the waterfall chart.

Orbit Plots

Note: This feature is only available in Ascent Level 2 software and higher.

An orbit plot shows the motion of the center of mass of a shaft. By plotting a shaft's simultaneous vertical and horizontal vibration you get a trace of the motion of that shaft.

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A perfectly balanced shaft with no movement in any direction would produce a dot in the middle of the plot. The shaft movement will give you an indication of its cause e.g. if there is a lot of up/down movement it may be that the machine feet are not bolted down tightly enough.

To create an orbit plot you need to take a *dual channel simultaneous measurement* to capture data at the horizontal and vertical axes at the same time. The displacement sensors must be placed 90° apart from each other.

- Set up *identical* schedule entries at the horizontal and vertical axes with the following parameters:

Domain	Time Displacement
No. of Samples	1024 (recommended)
Duration	4-6 revolutions (recommended)

- If a tachometer is connected you can enable 'Read RPM from Tach' but you **must** ensure that 'Number of averages' is set to 1, otherwise much of the signal will be averaged out.

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- Click the 'Channel/Sensor' tab and select a displacement probe then click **OK** to close the window.

The sensors used to take the measurements should be displacement probes as we are measuring the physical movement of the shaft, not its speed. (You can take the readings with an accelerometer if no displacement probes are available but there will be a small loss of accuracy in the displayed plot when the signals are integrated.)

The number of samples and measurement duration that you choose determines the resolution and length of the orbit recording. We suggest 1024 samples and a duration that covers 4-6 revolutions of the machine being tested. For example, an 890 RPM system (14.8 Hz) has 1 revolution every 67 milliseconds (6 x 67ms = 402 ms). Choose 400 ms for the duration and you will just capture 6 revolutions of the machine.

Instructions for taking dual channel simultaneous measurements can be found in the other *Reference Guide* supplied with your kit.

Creating the orbit plot

- Once the recordings have been received into the software, select a recording from either location and choose **Chart>Orbit** (the recording at the other location is automatically selected for plotting when you choose the orbit plot option).

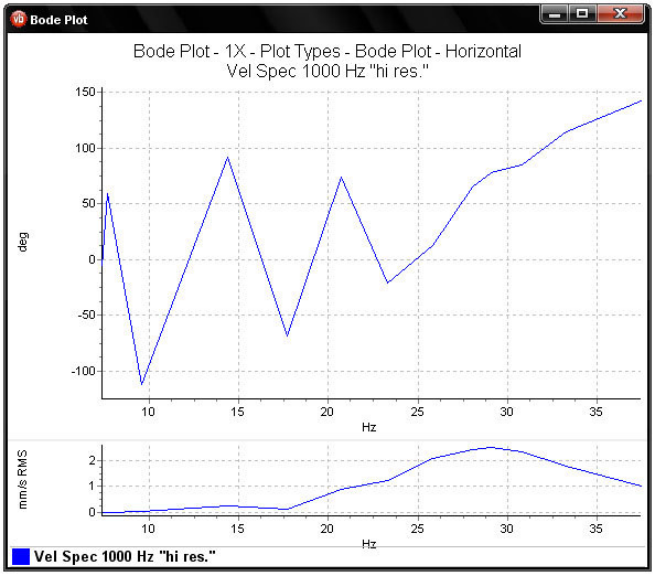
Bode Plots

Note: This feature will only be available to you if it is included as part of your license agreement. If you wish to enable this feature please contact sales@commtest.com or your distributor for more information.

Bode plots allow you to identify and confirm the presence of resonance in a machine or structure.

A Bode plot is made up of two charts: the top chart shows phase angle versus machine speed and the bottom chart shows signal amplitude versus machine speed. Analysis of the plot can determine at what speed(s) a resonance exists.

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Setting up the measurements

- Record a series of tachometer triggered spectra e.g. as you do for a coast-down or run-up test.

  The recordings **must** be taken with a tachometer so that phase information is available.

  The frequency of the tachometer must be below the Fmax of the recording i.e. 100 Hz Fmax recordings on a 7000 RPM machine will not plot on the Bode plot because 1X phase and amplitude is not available.

Creating a Bode plot

- Select the schedule entry that contains the series of spectra.
- Click **Chart** then select Bode Plot.

The software performs a peak search at the 1X frequency on *every* spectrum, extracting the peak frequency, amplitude and phase. All of these amplitude and phase values are then plotted against the frequency.

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Changing the size of a plot

- Place the cursor over the grey dividing line between the two charts until it changes to an up/down arrow then hold down the left mouse button and drag up or down.

Analyzing a Bode Plot

The bottom chart left axis shows the amplitude of the 1X for all the speeds of the machine. If you have a peak in the bottom chart this could be a resonance that is being excited by the running speed when the machine is operating at that frequency.

The top chart shows the phase of the corresponding peak. You should see a 180° change in phase across a resonance.

Selecting different harmonics
You can select different harmonics to analyze e.g. choose the 2X harmonic to see an analysis of the 2X vibration across all the recordings. If you have strong forcing vibrations at 2X (or 3X etc) this could also help identify resonance as the 2X vibration goes through the resonant frequencies.

- Right-click the chart and choose **Select Harmonic to Extract (1X)**.

- In the window that appears, enter the required harmonic to extract then click **OK**.

Note: When the harmonic is not 1X, the frequency on the bottom axis is the *frequency of the peak being analyzed*, matching the Hz (or CPM) value of the display on the top right (i.e. 2X the running speed). The RPM value of the cursor readout is *always* the RPM of the measurement from which the amplitude/phase/frequency was extracted.

Phase Zero Centered
If this option is ticked the vertical axis will use 0° phase as its mid-point. Otherwise the center will be 180° phase.

Cursor Width
Determines the width of the peak searches performed on the original spectra during creation of the bode plot.

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Using cursors

Clicking on any peak will display its amplitude, phase and frequency plus the RPM of the recording it was extracted from. The readout is displayed at the top right of the chart.

Zooming

Zooming is linked so that the bottom axis (Hz/CPM) stays synchronized with the top chart axis.

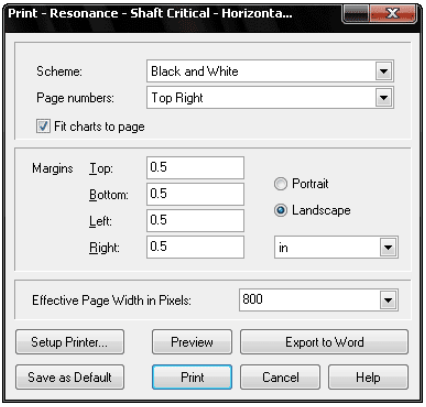
Printing Charts and Reports

- To print the chart or report that is currently displayed, click the **Print** button on the toolbar.



Note: Nothing will be sent to the printer immediately.

This will open the Print window. From here you can make changes to the way your printouts look.



Scheme: choose the color scheme to use for the printout. This option allows you to view your on-screen charts in color but print them in black and white using different line styles to differentiate between the plots.

Page numbers: select the position of page numbers on the printout.

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Fit charts to page: choose this option to make charts fill up the entire page. If this is not selected, charts will retain the aspect ratio that they have on the screen.

Margins: adjust the amount of space to be left between charts and the edge of the paper.

Portrait or **landscape:** selects the orientation of the printout.

Effective Page Width in Pixels: allows you to control the effective resolution of the printout. If you are finding that text is generally too big in printouts, increase this number. If you find that text is generally too small and hard to read in printouts, decrease this number.

Setup Printer: change your printer settings e.g. select the printer, choose what paper size to use etc.

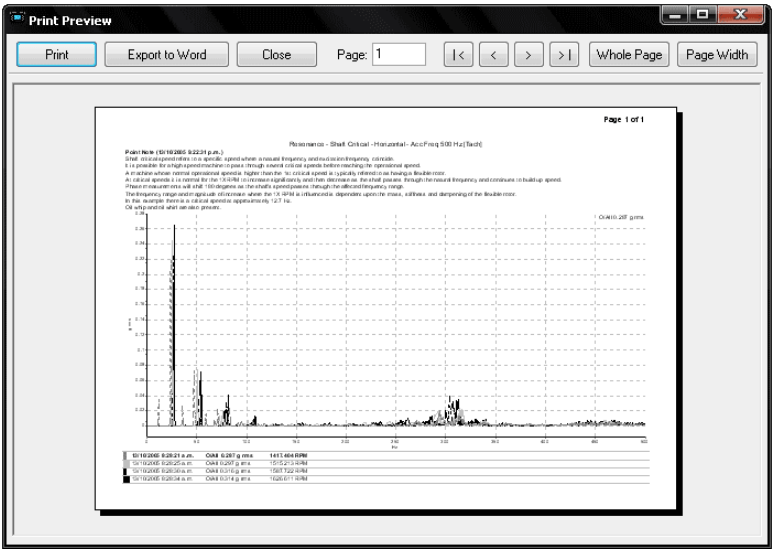
Export to Word: opens a Word document containing the currently displayed chart or report. The Word image will use the color scheme you specify in the Print window. This document can then be saved and e-mailed offsite.

If you change any settings, you can click **Save as Default** to make them the default settings from that point on.

The Black and White scheme is chosen for printouts by default. If you have a color printer you may want to change this to Color to use color for the plot lines. Click **Save as Default** to save any changes.

- Click the **Preview** button to see what the printout will look like.

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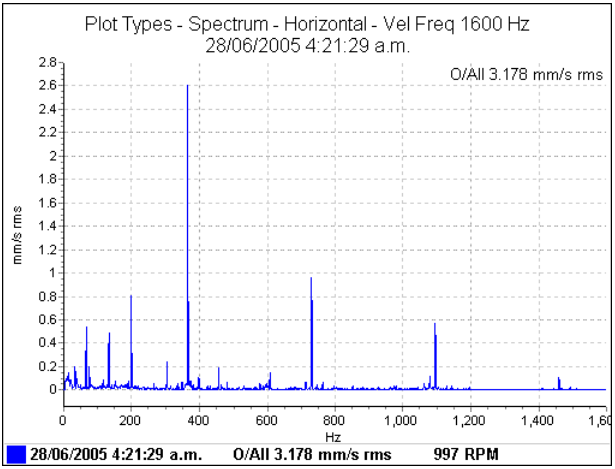
- Click **Print** to send the print job to the printer or **Cancel** to return to the chart.

Schemes

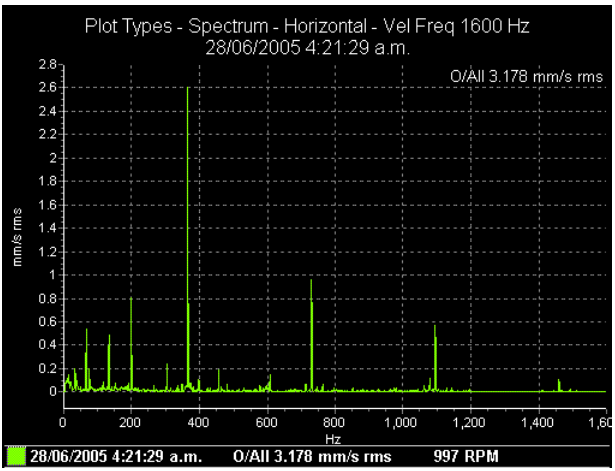
Schemes define the colors, line styles and fonts used on charts and reports. There are three factory default schemes to choose from; you can change these or create your own.

Color: White background with color text and lines. This is provided as an alternative to the High Contrast scheme.

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High Contrast: Black background with colored lines and text.



Black and White: This scheme is purely black and white and is intended for use when printing charts on a black and white printer.

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Changing Colors for Printer and Screen

Your on-screen charts and printed outputs can be customized to suit your requirements. Text labels can be increased or decreased in size to make them more visible and colors can be changed to highlight areas of interest. Feel free to experiment by editing the factory defaults - they can be quickly reset if you don't like the look of your changes.

- To change or edit a color scheme, from the main menu choose **Options>Edit/Change Scheme**. This will open the Schemes window.

- Change the current scheme by selecting a different one from the drop-down box at the top of the Schemes window.



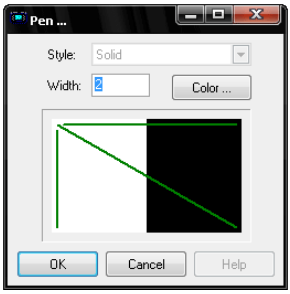
- Create new schemes or rename the default ones by clicking the **>** button at the top-right of the window.



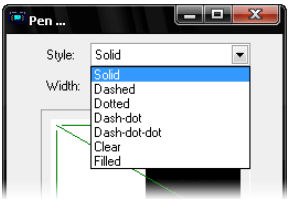
When creating a new scheme you will be asked to give it a name. This new scheme will appear in the drop-down box and can be applied to your charts. You can then choose the chart background and plot colors for your new scheme.

- To change a plot color, double-click it in the Schemes window to open the Pen Editor.

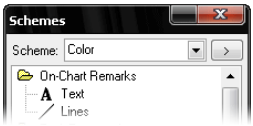
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- Click the **Color** button and select a color from the Color window then click **OK**.
- Use the other controls on the Pen Editor to change the line styles and widths of the plots e.g. click the 'Style' drop-down box to choose a different line style.



- To make the on-screen text larger or smaller, double-click a text label in the Schemes window. Use the settings in the Font window to resize text, make it bold or italicized, choose a different size and color, or even choose a different font.



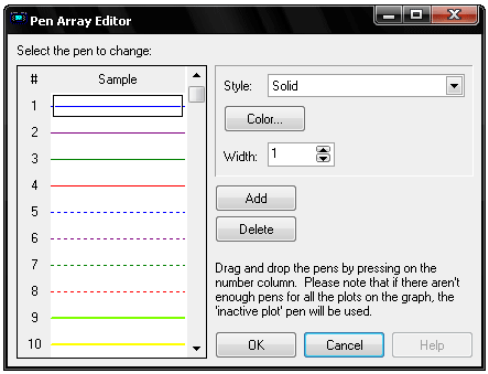
To restore the default schemes

- From the main menu, choose **Options>Reset Scheme/Color Defaults** to restore the factory default settings for the Color, High Contrast, and Black and White schemes.

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Changing Chart Plot Line Styles

The Pen Array Editor is used to edit to plot line colors, styles and widths used on multi-line graphs.



Edit or Delete an Existing Pen

To edit the size, color or appearance of an existing plot line pen:

- Click the pen in the left-hand column.
- Change the color, style (solid, dotted, dashed etc.) or width values in the right-hand panel. Changes made will be previewed in the left-hand column.
- Click the **OK** button and the changes will be saved. The graph plot's appearance will be updated automatically on any graphs currently being displayed.

To delete an existing pen:

- Click the pen in the left-hand column.
- Click the **Delete** button. The pen will be removed from the pens list.

Create a New Pen

To create a new plot line pen:

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- Click an existing pen in the left-hand column.
- Change the line color, style (solid, dotted, dashed etc.) or width values in the right-hand panel. Changes made will be previewed in the left-hand column.
- Click the **Add** button. The new pen will be created at the bottom of the pens list.

Change the Pen Display Order

To change the rank in which pens are ordered in the pens column, and therefore the order in which they will be used in graphs:

- Click the number to the left of a pen and hold the left mouse button. A thick line will appear above the pen you have selected.
- Drag the line up or down the pens column to a new position.
- Release the mouse button and the pen will be moved to the new location within the column.

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Keyboard Shortcut Keys

General

F11	Toggle Full Screen
F9	Receive from vb instrument
ALT+F9	Send to vb instrument
CTRL+SHIFT+S	Set shortcut
CTRL+O	Open file
CTRL+ALT+S	Open the online device setup wizard (online systems only)

Navigator

DEL	Delete
CTRL+E	Edit
CTRL+X	Cut
CTRL+C	Copy
CTRL+V	Paste
CTRL+ALT+R	Record now
CTRL+T	Tag
F10	Save data and refresh navigator
F12	Generate Exception Report

Chart

CTRL+N	Return to Normal view
CTRL+S	Toggle Stacked mode
CTRL+W	Toggle Waterfall mode
CTRL+F	Expand to Full Screen
CTRL+D	Open same chart in new window
CTRL+Z	Removes the selected plot line when multiple plots are displayed on a chart
CTRL+F5	List fault frequencies
SPACE	Go to next navigator item

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Arrow Keys [up/down]	Move up/down between plots on charts if in stacked/waterfall mode. Display next recording in navigator if in normal mode.
CTRL+SHIFT+C	Copy chart to clipboard
CTRL+Y	View Orbit
CTRL+B	View Bode
CTRL+9	View Waterfall
CTRL+F4	Close
CTRL+F10	View Record details
CTRL+3	View HVA
CTRL+SHIFT+F	Save chart to file
F2	View Spectrum
F3	View Waveform
F4	View Trend
F5, F6	Cycle through fault frequencies
F7	View SpecTrend
F8	View Vel. + Demod.

Cursors

ESC	Turn off cursors
S	Sidebands and orders
O	Orders only
N	No harmonics
Arrow Keys [left/right]	Nudge cursors
CTRL+[left/right]	Peak search
SHIFT+[left/right]	Move 1 pixel at a time
.	Switch between cursors
CTRL+M	Mark fault frequency
CTRL+P	Jump to peak
CTRL+1	Set RPM to cursor position
CTRL+R	Add remark at cursor position

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Section 5: Using Alarms

Individual alarms can be created for specific schedule entries or you can create *alarm templates* which allow you to apply the same alarm to multiple machines.

Using alarm templates makes it easier to manage your alarms as any change to the template will update every alarm that uses that template. For example, you could modify a template's alarm threshold or create additional thresholds within a band or envelope - this would in turn update the thresholds of all alarms associated with that template.

The software gives you the ability to manage alarms individually or as a group. Alarms that have been created from a template can still be edited individually without affecting the template.

Note: Some of the options shown on menus and forms will only be available if they are included as part of your license agreement. These options will be hidden or grayed out for users who are not licensed to use them. If you wish to license a new feature please contact sales@commtest.com or your distributor for more information.

Checking Alarm Status

The alarm status of machines, points etc is shown in the navigator tree using color highlighting.



The option **Screen>Show Navigator Status Labels** on the main menu controls whether text labels of the status are shown as well (see the <Danger> and <Warning> labels on the diagram).

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Alarm status coloring is hierarchical, meaning that an item in the navigator tree, such as a machine, will take on the color of the highest alarm level attained by one of its sub-elements. The example diagram shows a machine with three schedule entries, all of which have recordings that have triggered alarms. The dark red <Danger> alarm is a higher level alarm than <Warning> so the machine is colored dark red.

Alarm color status allows you to identify at a glance, which schedule entry has set off the <Danger> alarm. Alarm status is always determined by the most recent recording at the schedule entry - historical recordings do not affect alarm status.

To check alarms automatically when new recordings are received from the instrument

- From the main menu, choose **Alarms>Check Alarms after Receive**.

If you turn this option off (by repeating the above process) you can check the alarm status of new recordings at a time of your choosing.

- To check the alarm status of new recordings, choose **Alarms>Check all New Measurements for Alarms**.

Note: The software automatically re-checks the alarm status of recordings when an alarm threshold is edited or when you make changes to your data that may alter the alarm status (such as changing the RPM values of recordings).

Band Alarms

Band alarms can be either peak or power based and cover a limited range of frequencies as specified by you. When you click on a schedule entry, the navigator list will display all the alarms associated with that schedule entry.

Peak band alarms will detect when a peak on a spectrum goes above a certain value.

Power band alarms measure the overall RMS within a band of frequencies and compare that against a threshold value.

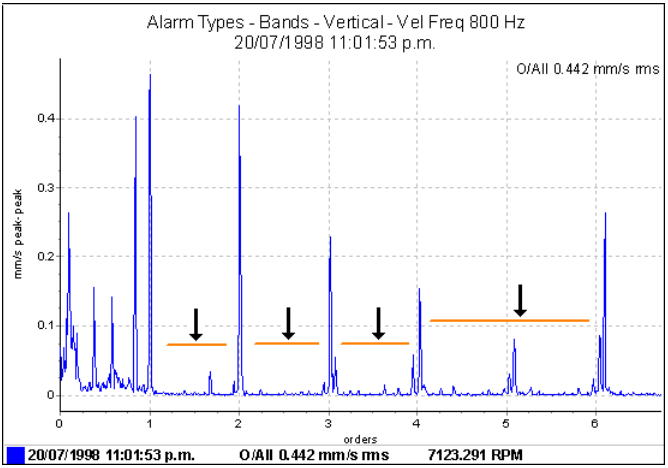
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Alarm status is always determined by the most recent recording at the schedule entry. When a recording triggers an alarm (by exceeding the alarm threshold), the alarm icon will change color to indicate the alarm status (Warning, Alert, Danger etc).

Band alarms are grouped together by the range of frequencies they cover. One band can contain different alarm thresholds for different alarm levels e.g. Warning at 2 mm/s, Alert at 4 mm/s, Danger at 6 mm/s.

Peak Band Alarms

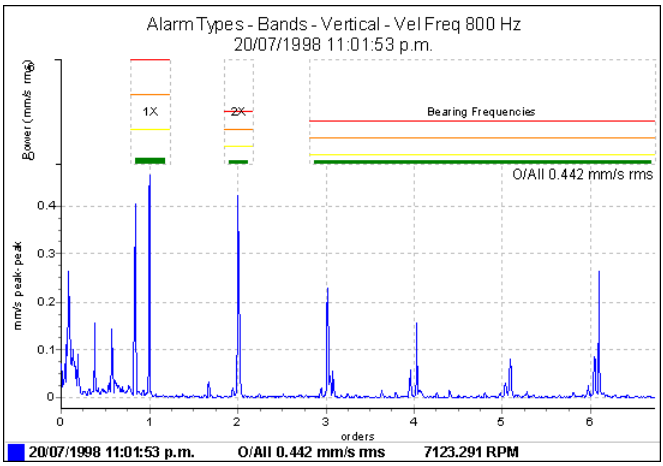
A peak band alarm defines a maximum threshold for any peak on a spectrum between two specific frequencies. For example, the following chart has four peak band alarms (indicated here with arrows) placed to raise an alarm if any large amplitude peaks develop between the running speed harmonics on the machine.



Power Band Alarms

A Power Band alarm defines a maximum threshold for the overall amount of vibration between two frequencies on a spectrum. Another way to describe it would be a 'limited frequency range overall alarm'. Power band alarms are displayed at the top of a spectrum as dotted rectangles.

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The frequency range covered by the alarm is indicated by the horizontal length and position of the rectangle. The alarm thresholds are indicated using colored lines across the alarm display region. The current power level (overall RMS level) within that band of frequencies is indicated using a bar that rises from the bottom of the alarm display region. When the power level within that band goes through an alarm threshold, the bar will change color to match the color chosen for that threshold e.g. red for Danger.

Note: The measurement units for the alarm display area can be different from those used on the chart (see left axes of previous diagram). For example, if the chart is plotted in acceleration and uses m/s/s for the left axis, you can use any acceleration units for the alarm display area such as g or cm/s/s. The spectrum overall value displayed to the bottom right of the band alarm will always use the same measurement units as the band (because they both measure power levels).

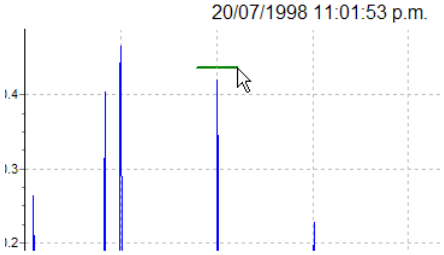
Drawing Individual Band Alarms on a Chart

Peak and power band alarms can be 'drawn' directly onto a chart using the mouse. This method lets you identify frequencies of interest on a vibration chart and add the bands directly above them.

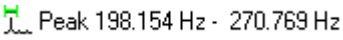
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- The band alarm will be drawn from left-to-right. To add a single band alarm manually, right-click on the chart at the exact frequency where you want the alarm to *begin*, and choose **Alarm Bands>Add**.

- Now move your mouse to the right. A new band will appear and it will follow the mouse until you left-click again on the chart to place it.



A *peak* alarm icon will now appear in the navigator list displaying the frequency range covered by this alarm. This default 'name' can be changed to something more meaningful if you require (editing of band alarm names, frequency ranges and amplitudes is described shortly).



Note: The band alarm will be configured to match the current chart display. This means that if the chart bottom axis is expressed in orders, the band alarm will have its start and stop frequencies defined in orders.

You can use the mouse cursor to manually adjust peak band alarms on the chart.

To change the alarm threshold

- Move the cursor over the top of the band until it changes to an up/down arrow then hold down the left mouse button and drag the alarm threshold up or down. Alternatively, use the Band Alarm Editor to enter precise threshold values (see Editing Individual Band Alarms on page 155).

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To change the start or stop frequency

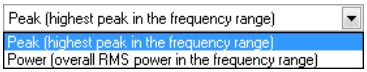
- Move the cursor over the left or right hand edge of the band until it changes to a left/right arrow and then hold down the left mouse button and drag the alarm to change the start or stop frequency. Alternatively, use the Band Alarm Editor to enter the new frequency values (see next topic).



Creating power band alarms

To create a power band alarm, first create a peak band alarm then use the Band Alarm Editor to change its properties.

- Create a peak band alarm on the chart (see previous instructions).
- Right-click on the peak band alarm and choose **Edit** to open the Band Alarm Editor.
- Select 'Power' from the drop-down box.

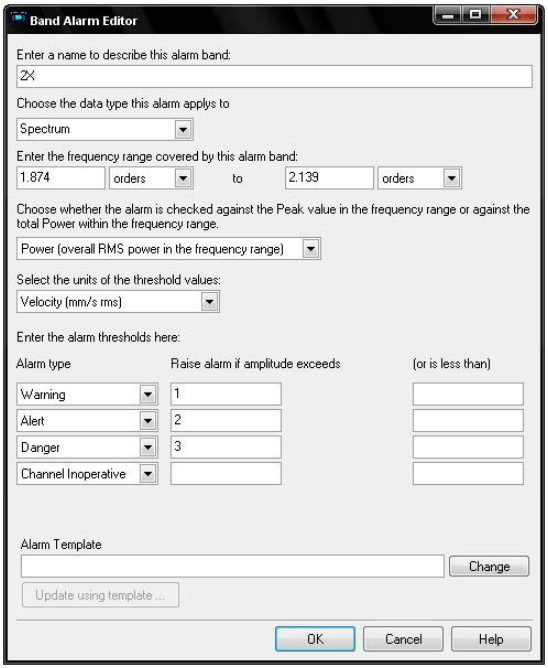


- Edit the thresholds and make any other changes as required.
- Click **OK** and the band alarm will now appear at the top of the chart.

Editing Individual Band Alarms

- Right-click the band alarm on a chart (or the alarm's icon in the navigator list) and choose **Edit** to open the Band Alarm Editor. (To display the entire list of alarms on a machine, select the machine in the navigator and click the toolbar **Alarms** button. You can then select an alarm from this list and click **Edit**.)

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Note: The lower Alarm Template section of this screen will be hidden if you are not licensed to use this feature.

It can be useful to enter a description for the alarm in this window so that when the alarm is broken this information will be included in the exception report. For example, when placing a peak band alarm over the 1X peak on a spectrum, give the alarm the description '1X' so that if the alarm is exceeded the exception report includes this information.

Use the fields in the Band Alarm Editor to adjust the frequency range, change the alarm band from peak to power (or vice versa) and create additional band alarms above or below the existing one (use the 'Alarm type' drop-down boxes to choose Alert, Danger etc).

Note: Select an option from the 'Data Type' dropdown box if using multi-measurement parameter sets such as 6Pack.

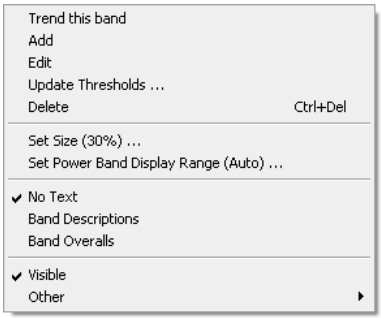
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Selecting the measurement units of the alarm
When you create the alarm, the alarm's measurement units will default to the same as those used on the chart e.g. if the chart left axis uses mm/s Ø-peak then the alarm will also use these same units.

The measurement units for the alarm can be different from those used for the chart e.g. if the chart is plotted in acceleration and uses m/s/s for the left axis, you can use any acceleration units for the alarm such as g or cm/s/s. Choose different units in the editor by selecting them from the drop-down box.

Note: Alarms will only be displayed if their amplitude units (velocity, displacement or acceleration) match those used by the chart e.g. if your alarms are using acceleration units and you change the left axis scale to velocity or displacement the alarms will not display.

- Right-click an alarm band to access the functions on the shortcut menu.



To hide or display band alarms

- Right-click the band and choose **Visible** from the shortcut menu (clicking it toggles visibility on or off).

To hide or display text descriptions on band alarms

- Right-click the band and choose **No Text** to hide the band alarm text. To display the name or the overall power in the band select **Band Descriptions** or **Band Overalls**.

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To remove a band alarm

- Right-click the band and choose **Delete**. Alternatively select the alarm icon in the navigator list and press the **Delete** key.

To resize the band alarm display area (for power bands)

- Right-click the band and choose **Set Size**. This allows you to set a percentage value of the amount of screen area you would like the alarm band to use. Alternatively, press and hold down the right mouse button on the power alarm plot area and drag the mouse up and down.

To re-scale band alarm display area (left axis scale)

- Press and hold down the right mouse button on the band alarm plot area and drag the mouse left or right. Alternatively right-click the band alarm and choose **Set Power Band Display Range**.

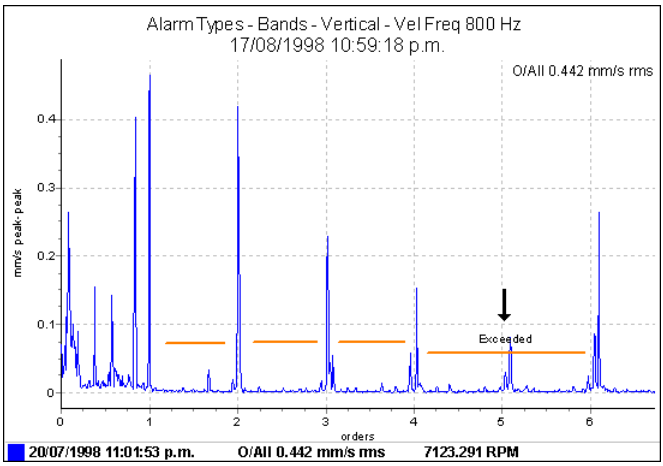
What Happens When a Band Alarm is Exceeded

In the navigator, both the alarm icon and the machine containing that alarm will change color to show the alarm status (Danger, Warning etc).

When you plot a spectrum chart, you will see the following:

Peak band alarm
The word 'Exceeded' will appear on the spectrum to indicate where the alarm has been broken.

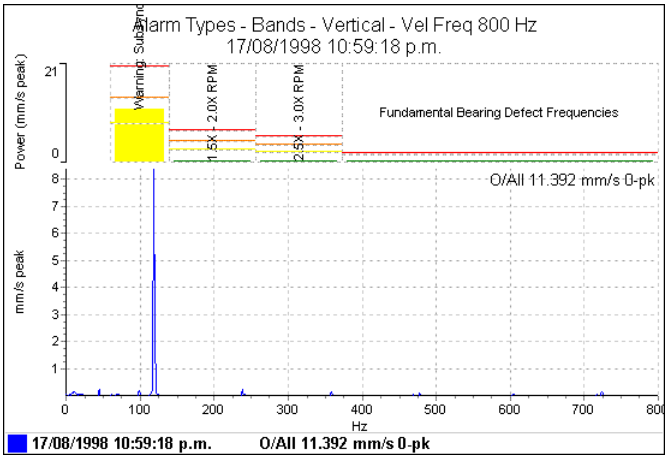
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Exceeded Peak band alarm

Power band alarm

The band alarm will change color to indicate the alarm level (e.g. red for Danger, yellow for Warning etc).



Exceeded Power band alarm

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The Exception Report will show the alarm name (or frequency range if it was unnamed) and the amount the alarm was exceeded by. It will also show the total amount of power in the band (for power band alarms) and the amplitude of the highest peak that broke the alarm (for peak band alarms).

Machine: **Alarm Types**	Warning

Alarm Types - Bands - Vertical - Vel Freq 800 Hz
Subsynchronous thru 1X RPM Warning by 132.7% (11.377 mm/s 0-pk)
(Warning)

The Alarm Report shows additional information, including the values of previous measurements and the percentage change from the last measurement.

Location	Schedule Entry	Type	Prev 2	Prev 1	Latest	Units	% change	Date
Alarm Types - Bands								
Vertical	Vel Freq 800 Hz	2X	0.296	0.291	**0.281**	mm/s 0-pk	-3.16 %	17/08/1998
Vertical	Vel Freq 800 Hz	1X	5.486	10.547	**11.377**	mm/s 0-pk	7.86 %	17/08/1998

Trending Band Alarms

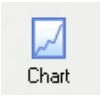
Alarm levels can be trended to help you predict when vibration levels are approaching, or will exceed, pre-set alarm limits.

- Right-click on a peak or power band alarm in a chart and select **Trend this band** to see a trend of the band value versus threshold for all recordings taken at this schedule entry. Alternatively you can double-click the alarm band icon (power , peak ) in the navigator list.

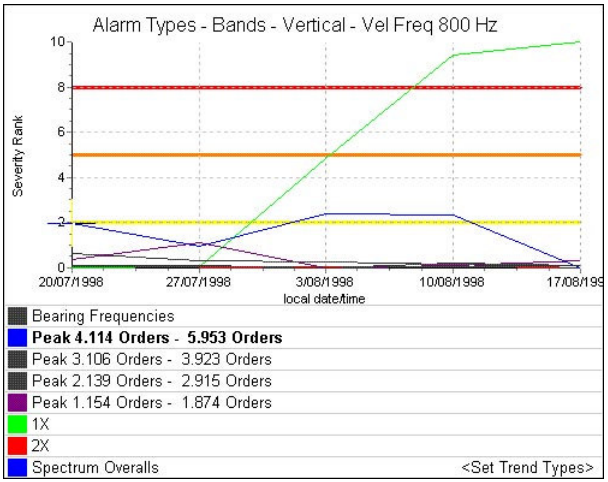
Multiple band alarms can be trended for quick comparison and analysis. On a single chart you can trend peak and power based alarms, alarms from different schedule entries (using the **Hold** and **Add** buttons) and even alarms that use different units (mm/s, in/s etc).

- Select a schedule entry containing some alarms you wish to trend then click the **Chart** button on the toolbar and select **Trend** from the drop-down list.

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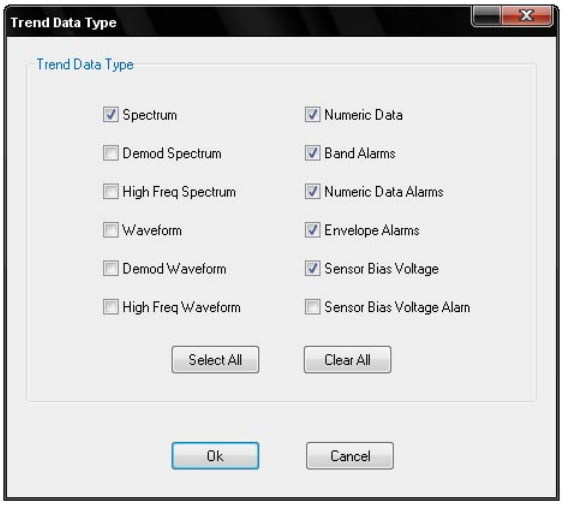
The software will plot trends of all the alarms at this schedule entry in the chart display area. The following diagram shows a trend plot of a schedule entry with seven alarms. The software automatically adds the spectrum overalls to the bottom of the list as these can also be trended (double-click the Spectrum Overalls label to plot the data).



Trend lines are color coded so that you can see which alarm they relate to. If several trend lines use the same color, you can identify a specific trend by clicking a trend line on the chart, which will highlight that alarm in the chart legend.

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Click the Trend Types text in the bottom right-hand corner to select the trend data types to be displayed.

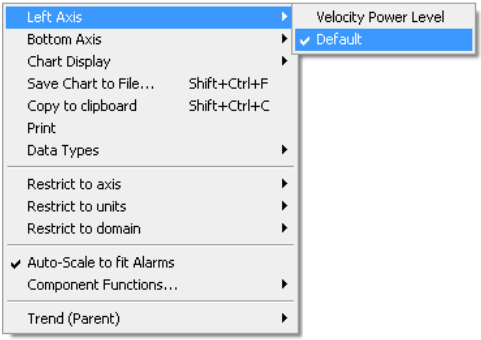


The alarm thresholds (Warning, Alert, Danger) are indicated by the colored bars running horizontally across the chart. If a single alarm trend is displayed, the left axis scale will use vibration units by default e.g. mm/s rms. If several alarm trends are displayed the left axis scale will use *severity rank* instead (see previous diagram). Severity rank shows how high each band alarm's vibration levels are relative to its own thresholds. The left axis is scaled from 0-10 and thresholds are shown using a fixed scale of severity (2 = Warning, 5 = Alert, 8 = Danger) rather than a specific measurement unit such as mm/s. This allows band alarms that have different thresholds or use different measurement units to be shown on the same chart.

If you change the left axis amplitude scale to a specific unit e.g. velocity, then only trends that are compatible with that unit will be shown.

- To select a different left axis scale, right-click the trend and select **Left Axis** then choose one of the options from the drop-down list. These options change according to the amplitude type of the recordings (velocity, acceleration, displacement). Demodulation will appear as acceleration.

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Power Level: The left axis scale will use vibration units e.g. mm/s rms. Only power bands and spectrum overalls will be displayed.

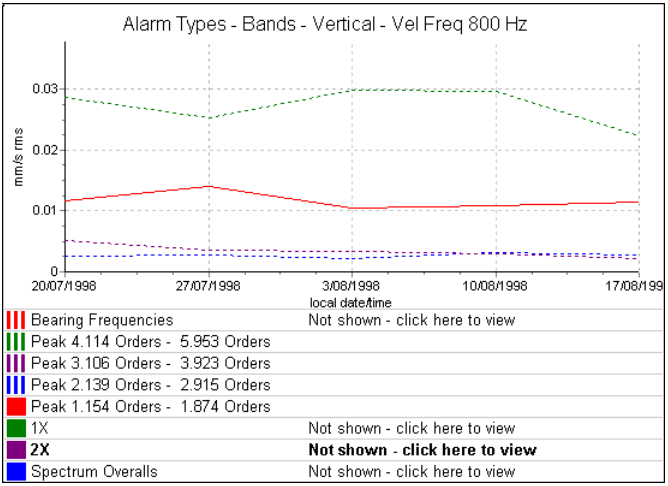
Alarm Level: The left axis scale will use severity rank. All alarm band and envelope trend lines will be displayed.

Spectrum Amplitude: The left axis scale will use vibration units e.g. mm/s rms. Only peak bands will be displayed.

Default: If one trend is shown, the left axis will use vibration units. If more than one alarm band or envelope trend is shown, the left axis will use severity rank.

The following diagram shows the same trend chart after the left axis scale was set to Velocity Spectrum Amplitude.

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You will notice that several of the trend plot lines have disappeared. The trend lines that can be shown on a chart will depend on what scale is used for the left axis. Because we are now shown Velocity Spectrum Amplitude i.e. peak band alarms, the Velocity Power Level alarms (spectrum overall and power band alarms) cannot be shown.

- You can toggle which trend plots are shown by clicking the 'Not shown - click here to view' labels. This changes the chart's left axis scale to something that ensures the series you clicked on can be shown.

In our chart example, clicking a 'Not shown' label would change the axis scale to rms. The spectrum overall and power band alarms would be displayed while the peak band alarms would disappear.

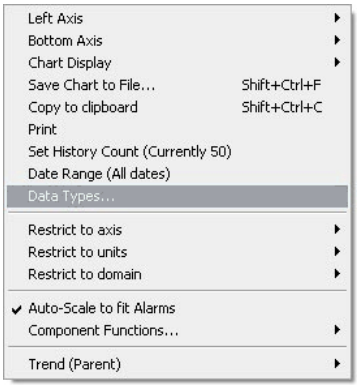
By default, left axis numbering begins at zero and scales to fit your data by adding additional space above and below the bottom and topmost plot lines. You can turn off this option off so that the axis number scale begins immediately below the bottom plot line (rather than zero) and finishes just above the topmost plot line.

- To re-scale the left axis numbering, right-click the chart and select **Auto-Scale to fit Alarms**.

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Different kinds of data can be shown or hidden on a trend plot depending on the trend types you select (spectrum overalls, alarm band levels etc). These will toggle the trend plots that can be shown in a similar manner to the Left Axis options.

- To restrict the alarm types the trend chart can display, right-click the chart and select **Data Types** then tick or un-tick options from the data types panel.

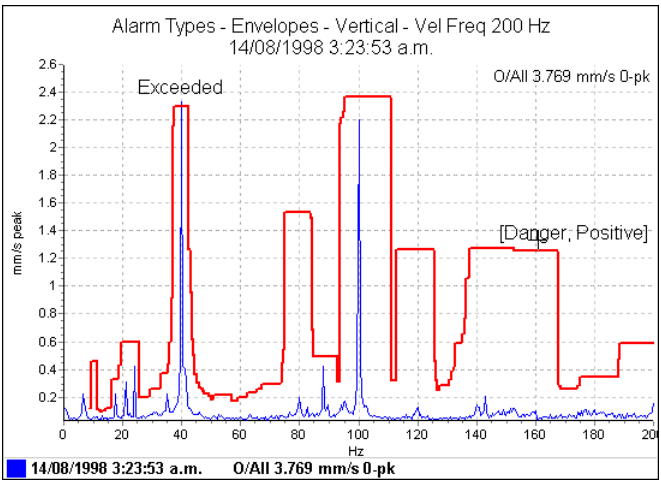


For more general information on trending, see Trending Data (page 128).

Envelope Alarms

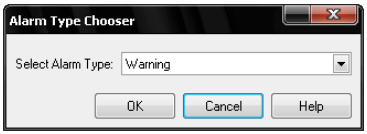
An envelope alarm is usually based on a reference spectrum that is ideal or 'normal' for the measurement point. It specifies the maximum allowable amplitude for *each* frequency value in a spectrum. If any part of the spectrum exceeds the envelope threshold an alarm is raised.

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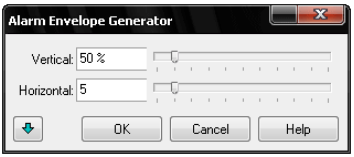
Adding Envelope Alarms to a Chart

- Right-click on the chart and choose **Alarm Envelopes>Add**.
- You will be asked for a severity rating for this alarm. 'Warning' is the default. Select an alarm type from the drop-down box and click **OK**.



Note: The 'Warning' envelope line is colored yellow by default. If you find this difficult to see you can change the color later. See Changing Colors for Printer and Screen (page 144) for more information.

An alarm envelope will be drawn on the chart and the Alarm Envelope Generator will appear at the top-right of your screen.

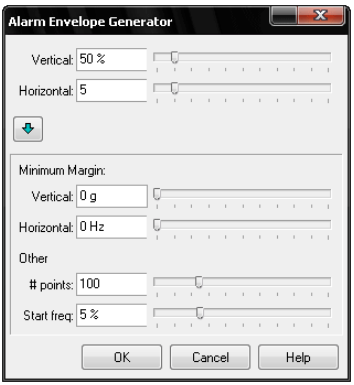


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The 'Vertical' and 'Horizontal' percentage margins define the relative vertical and horizontal distance between the envelope and the spectrum.

- Drag the sliders on the Alarm Envelope Generator to change the envelope margins. The alarm shape will change on the chart as you make adjustments to the settings.

- Press  to access advanced options.



The 'Minimum Margin' adjustments define absolute minimum amplitude and frequency margins between the envelope and the selected spectrum.

'# points' defines the resolution of the envelope.

'Start freq' allows you to exclude lower frequencies from the envelope alarm region (where 'ski slopes' may occur).

- Click **OK** when you are finished.

Editing Individual Envelope Alarms

- Right-click the envelope plot line to access the functions on the shortcut menu such as deleting and hiding/displaying the alarm.

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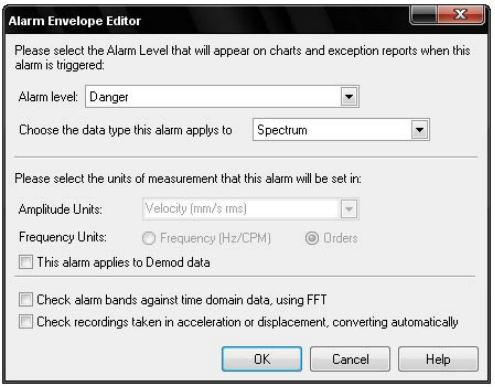
To re-adjust the envelope margins

- Right-click the envelope plot line and select **Adjust Margin**. This will open the Alarm Envelope Generator (see previous topic).

To change the alarm level

You can change the envelope alarm level (Danger, Warning etc) and adjust other properties using the Alarm Envelope Editor.

- To open the editor, right-click the envelope plot line and select **Edit Properties**. Alternatively right-click the alarm's icon in the navigator list and select **Edit**.



The 'Amplitude Units' and 'Frequency Units' settings cannot be changed once the alarm has been created. If you want an envelope that uses different units, delete the envelope and create a new one.

Note: Alarms will only be displayed if their amplitude units (velocity, displacement or acceleration) match those used by the chart e.g. if your alarms are using acceleration units and you change the left axis scale to velocity or displacement the alarms will not display.

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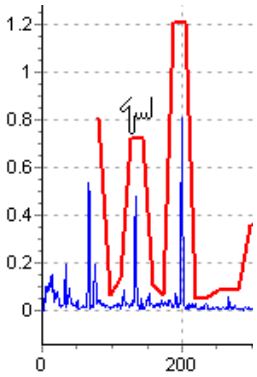
Manually editing the envelope on a chart

Envelope alarms can also be edited manually by using the mouse to push sections of the envelope up, down or across.

- To do this, click the envelope plot line to select it. The mouse cursor will change to a hand indicating that it can be used to 'push' the envelope.



- Click and hold the left mouse button down and *drag* the mouse cursor into the envelope plot line to push it.



- Release the mouse button when finished.

If you push the line down too far you can push it up again by moving the cursor below the envelope plot line and repeating this process.

- Press **Enter** to save the changes or **Esc** to discard changes (the mouse cursor will return to normal).

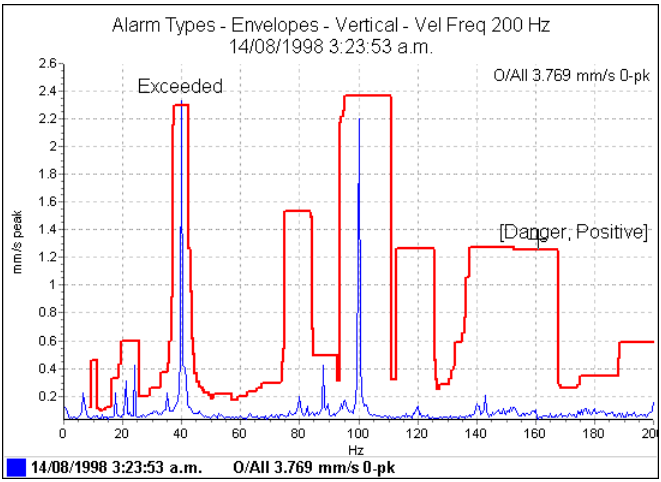
To add another envelope

- Right-click the envelope plot line and select **Add**, then follow the previous instructions for adding an envelope to a chart. For example, if you have an existing Warning envelope set at 50% above the reference (ideal) spectrum you can now add an Alert envelope at 150% above the reference.

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What Happens When an Envelope Alarm is Exceeded

The word 'Exceeded' will appear on the spectrum to indicate where the alarm has been broken.



The Exception Report will show the alarm type and the amount that the envelope was exceeded by. Note that the envelope may have been broken in more than one place, but only the highest exceeded value is shown on the exception report.

Machine: **Alarm Types**	Danger

Alarm Types - Envelopes - Vertical - Vel Freq 200 Hz
Alarm Envelope, Danger, Positive, Velocity, 8.48 - 200 Hz Exceeded by 101.4% (Danger)

The Alarm Report shows additional information, including the values of previous measurements and the percentage change from the last measurement.

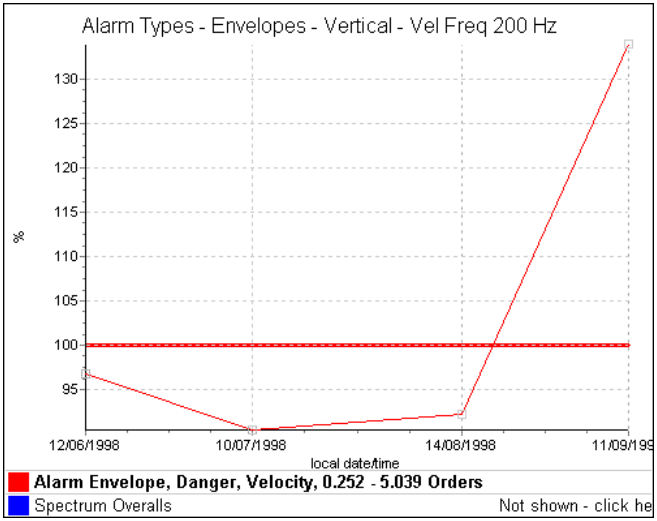
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Location	Schedule Entry	Type	Prev 2	Prev 1	Latest	Units	% change	Date
Alarm Types - Envelopes								
Vertical	Vel Freq 200 Hz	Alarm Envelope, Danger, Velocity, 0.252 - 5.039 Orders	85.146	86.695	**94.732**	%	9.27 %	11/09/1998
Vertical	Vel Freq 200 Hz	Alarm Envelope, Alert, Velocity, 0.252 - 5.039 Orders	90.5	92.221	**110.926**	%	20.28 %	11/09/1998

Trending Envelope Alarms

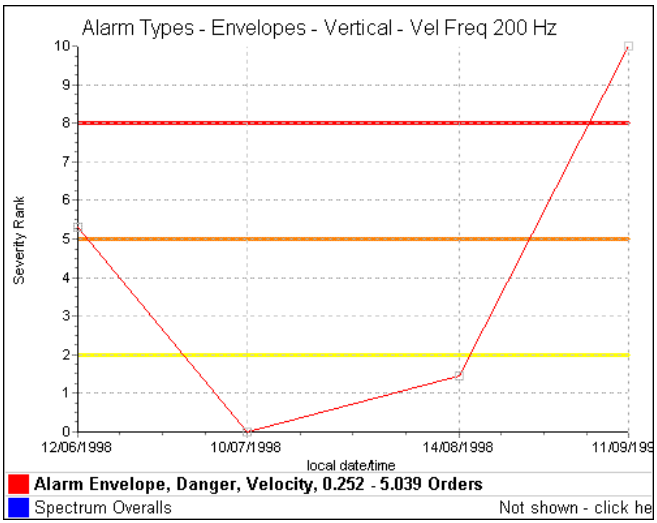
Envelope alarm trends are expressed by their 'percentage of threshold', which is the greatest 'percentage of alarm level' for any peak in the measurement. For example, a percentage of threshold of 110% for a measurement means that the peak that exceeded the alarm envelope the most, did so by 10%.

This example chart shows an envelope plotted against percentage.



The horizontal red line indicates the 100% alarm level of the envelope (i.e. when a peak touches any part of the envelope). Here is the same envelope plotted against alarm level.

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The data is scaled so that the minimum level occurs at '0' severity rank, the maximum occurs at '10' severity rank and the alarm crosses the appropriate alarm level line at the point at which the envelope was exceeded.

Overall RMS Alarms

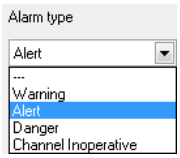
An overall RMS alarm defines a maximum threshold for the overall RMS vibration of a measurement. An overall RMS alarm is a special case of a power band alarm where the start and stop frequencies encompass the entire measurement.

- To create an overall RMS alarm, create a power band alarm with a start frequency of 0 Hz and a stop frequency of 1 000 000 Hz. See Adding Band Alarms to a Chart (page 153), for instructions on creating the band and editing the frequency range.
- Overall RMS alarms appear automatically on trend charts just like other alarm bands. You can also right-click on the overall RMS alarm band on a chart and select **Trend this Band**.

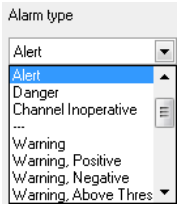
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Using More Detailed Alarm Thresholds

Basic Warning, Alert and Danger alarm thresholds are suitable for most applications. However, additional options are available if you need them.



Basic alarm thresholds



Additional threshold options

- Select **Options>Allow Legacy Alarm Types** from the main menu. When you create or edit an alarm these additional alarm thresholds will now be displayed in the Alarm type drop-down box. The thresholds can be applied to both envelope and band alarms.

Creating Alarm Templates

An alarm *template* such as an ISO standard band alarm is an alarm that is defined once then re-used many times on different machines. When you create a template you can use the alarm on many machines and if you later decide to change the template e.g. to update an alarm's threshold, this change will be applied to *all* alarms that use that template.

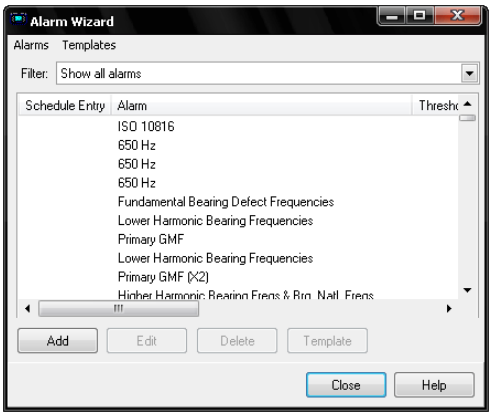
You can also modify an individual instance of an alarm without affecting the template, as editing an alarm removes its association with the template. This gives you the ability to apply 'general all purpose' alarms to many machines then customize the individual alarms later for more fine tuned monitoring of problem machines.

Alarm templates are of most use when you want to use the same alarm settings on many machines e.g. for monitoring specific fault frequencies such as a 1X running speed, bearing fault frequencies etc.

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Creating Peak and Power Band Templates

- To create an alarm template, select a navigator item that you wish to apply the alarm to, such as an entire machine, and click the **Alarms** button on the toolbar. This opens the Alarm Wizard that is used to create and manage individual alarms and alarm templates.

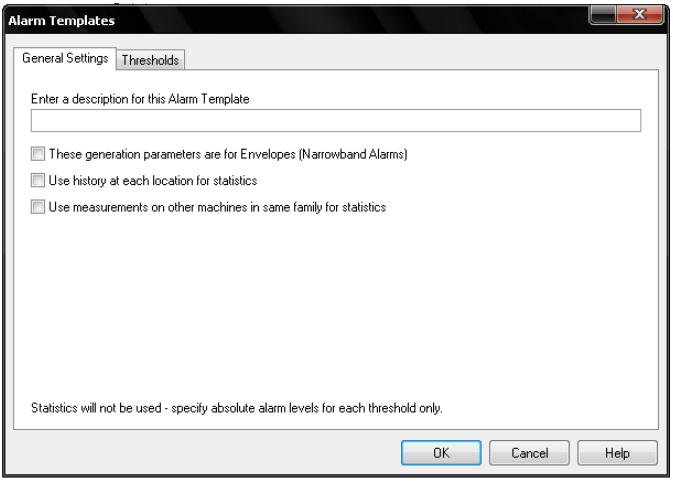


- Click **Add** then click the 'Alarm Band Frequency Range' tab and enter the start and stop frequency for this band.

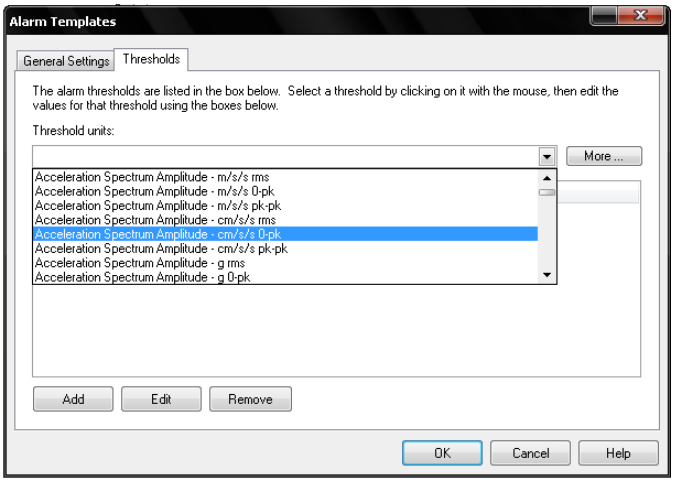
- Click the  button at the upper right to open the Alarm Templates window.

- Now you need to define the settings for this alarm template. Click **Add**.

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- Enter a descriptive name that describes the purpose of this alarm e.g. Gear Mesh Frequencies.
- Click the 'Thresholds' tab. This is where you define the threshold unit (acceleration, velocity etc), threshold type (warning, danger, alert) and threshold amplitude.



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- Select the threshold units for your alarm from the drop-down box. For peak bands select 'Spectrum Amplitude'. For power bands select 'Power Level'.

  If the units you require do not appear in the drop-down box click **More** then choose a unit from the list and click **OK**. If you select a unit that has no abbreviation you will be prompted to enter one now.

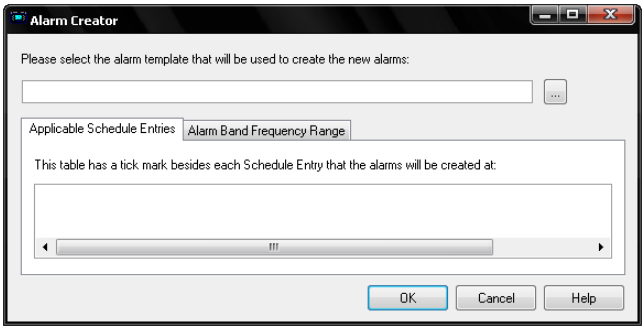
- Next you need to define the threshold amplitude and the alarm warning level (alert, danger etc). Click **Add**.

- Select the alarm level from the drop-down box and enter an amplitude value that, when exceeded, will trigger this alarm.

- Click **OK**. You can add additional thresholds to this alarm e.g. to create separate warning, alert and danger levels within a single band or envelope. To do this click **Add** again and define additional thresholds as required.

- Click **OK** to return to the Alarm Templates window. Your new alarm template will be highlighted.

- Click **Select** to apply the template to your machines. The Alarm Creator window will open and display each schedule entry at the currently selected navigator item (you may need to click the 'Applicable Schedule Entries' tab to see this). Schedule entries whose measurement units match those of your alarm e.g. velocity, will already be selected.

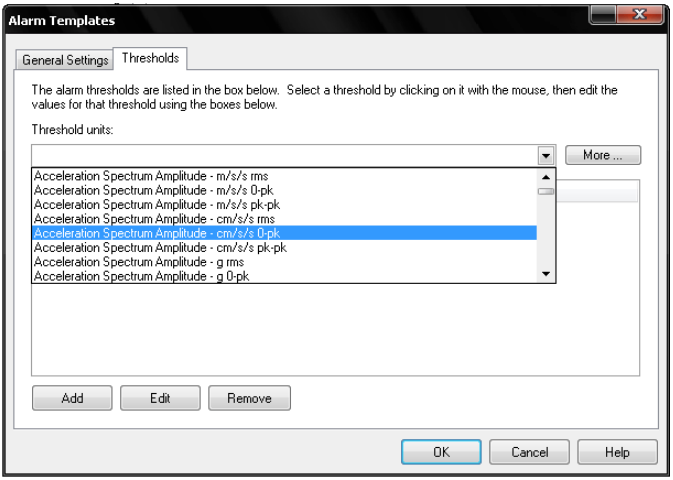


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- Tick/untick the boxes as required to select the schedule entries you wish to have alarms created for then click **OK**.
- Click **OK** again then **Close** to finish.

Creating Envelope Templates

- To create an alarm template, select a navigator item that you wish to apply the alarm to and click the **Alarms** button on the toolbar. This opens the Alarm Wizard that is used to create and manage individual alarms and alarm templates.
- Click **Add** then click the  button to open the Alarm Templates window.
- Now you need to define the settings for this alarm template. Click **Add**.
- Enter a descriptive name that describes the purpose of this alarm e.g. Gear Mesh Frequencies then tick the box.
- Click the 'Thresholds' tab. This is where you define the threshold unit (acceleration, velocity etc), threshold type (warning, danger, alert) and threshold amplitude.



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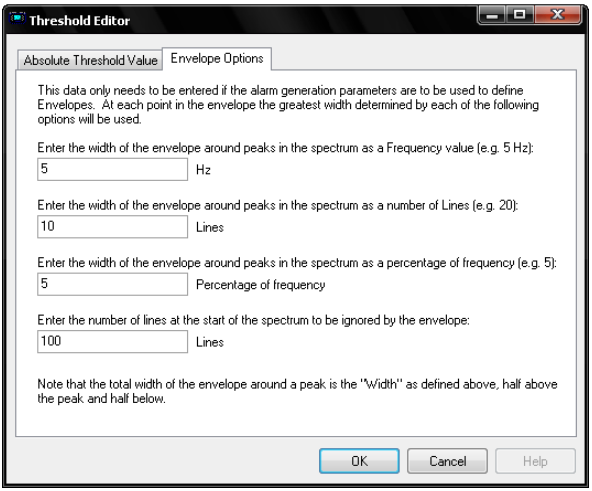
- Select the threshold units for your alarm from the drop-down box. (The words 'Spectrum Amplitude' and 'Power Level' refer to band alarms - you can choose either to create your envelope.)

  If the units you require do not appear in the drop-down box click **More** then choose a unit from the list and click **OK**. If you select a unit that has no abbreviation you will be prompted to enter one now.

- Next you need to define the threshold amplitude and the alarm warning level (alert, danger etc). Click **Add**.

- Select the alarm level from the drop-down box and enter an amplitude value that, when exceeded, will trigger this alarm.

- Click the 'Envelope Options' tab and specify the width of the envelope around peaks in the spectrum. You only need to enter a value into one of the first three fields but can use more than one if desired. If more than one of these options is selected, the greatest width determined by these options will be used at each point (spectral line) in the envelope. Each width option is explained in detail following the diagram below.



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Hz
This specifies a frequency that the envelope will be placed either side of a peak. For example, a value of 6 Hz will generate an envelope 3 Hz either side of each peak.

Lines
This specifies the number of spectral lines between the envelope and each peak in the spectrum. For example, a value of 10 will generate an envelope 5 lines either side of each peak. This option is recommended for machines that run at or near the same speed from one recording to the next.

Percentage of frequency
This specifies what frequency percentage the envelope will be placed either side of a peak. For example, a value of 10% around a peak at 2000 CPM will place the envelope 5% either side of the peak at 1900 CPM and 2100 CPM. At higher frequencies on the same spectrum the envelope will become much wider, for example at 60 000 CPM the envelope will extend 3000 CPM either side. This option is recommended for machines that run at variable speeds or whose RPM varies significantly from one recording to the next.

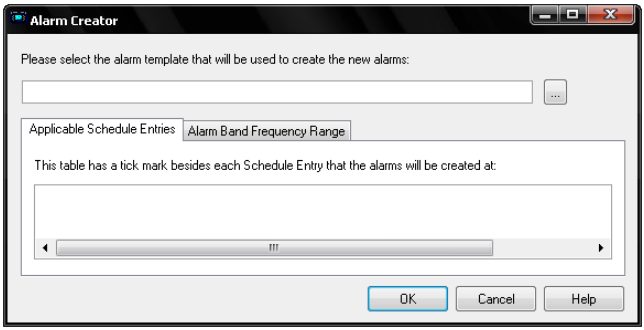
Lines (number to ignore)
This specifies the number of spectral lines that will be ignored at the beginning of the spectrum i.e. the envelope will be drawn around all frequencies except the first few lines. This helps to avoid false alarms caused by the 'ski slope' often found at the low frequency end of spectra.

- Click **OK**. You can add additional thresholds to this alarm e.g. to create separate warning, alert and danger levels within a single band or envelope. To do this click **Add** again and define additional thresholds as required.

- Click **OK** to return to the Alarm Templates window. Your new alarm template will be highlighted.

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- Click **Select** to apply the template to your machines. The Alarm Creator window will open and display each schedule entry at the currently selected navigator item. Schedule entries whose measurement units match those of your alarm e.g. velocity, will already be selected.



- Tick/untick the boxes as required to select the schedule entries you wish to have alarms created for then click **OK**.
- Click **OK** again then **Close** to finish.

Applying Alarm Templates to Additional Schedule Entries

After you have initially created and applied your alarm templates at selected schedule entries, you can apply these alarms to additional schedule entries at a later time.

- To apply the alarms, select a machine, point or location then click the **Alarms** button on the toolbar.
- Click **Add** then click  to open the Alarm Templates window.
- Click the alarm template you wish to apply to your machine then click **Select**.
- The Alarm Creator window will list the schedule entries on your machine. Tick the schedule entries you wish to apply the alarm to then click **OK** twice to apply the alarms.

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- Click **Close** to finish.

Modifying Existing Alarm Thresholds Using a Template

You can change the thresholds of existing alarms (those that were not created from a template) by applying an alarm template to them. Updating the thresholds will **not** change the frequency range of band alarms or the start frequency of envelope alarms.

- Select the machine containing the alarms you wish to update then click **Alarms**. The Alarm Wizard will display all the alarms at your selected machine. If you have many alarms of different types and units, filter the alarms displayed using the drop-down box at the top of the window.
- Select the alarms whose thresholds you wish to update (hold down the **SHIFT** or **CTRL** keys while clicking with the mouse to select more than one alarm in the list). Click the **Template** button or select **Templates>Edit template for selected alarm**.
- In the Alarm Templates window select the template you wish to apply to these alarms then click **Select**. The Alarm Summary window will display the new alarm information.
- Click **OK** then **Close** to finish.

Editing Alarms Globally

To update an alarm everywhere that it is used you need to modify the alarm template. Modifying the template automatically changes every alarm that uses that template.

Note: If you want to change alarm settings for a *single* instance of an alarm you will need to edit it individually (see Editing Individual Alarms on page 182).

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- Select the folder icon at the top of the navigator then click **Alarms**. The Alarm Wizard will display all the alarms at your selected machine. If you have many alarms of different types and units, filter the alarms displayed using the drop-down box at the top of the window.
- From the menu select **Templates>Edit all templates**. Alternatively click an alarm in the list that uses your template and select **Templates>Edit template for selected alarm**.
- In the Alarm Templates window select a template to modify then click **Edit**. Click **OK** to confirm that you wish to edit this template.
- Make your changes as necessary then click **OK**.
- You will be prompted to update any alarms that use this template. Click **OK** to confirm.
- Click **OK** twice then **Close** to close all windows.

Editing Individual Alarms

Any alarm that is based on a template can still be individually modified. Editing an individual alarm 'breaks' the relationship between the alarm and its template; changes to the individual alarm do not affect the template.

Subsequent changes made to the original template will no longer be passed onto your alarm. This gives you the ability to apply 'general all purpose' alarms to many machines using your templates then to customize the individual alarms later for more fine tuned monitoring of problem machines.

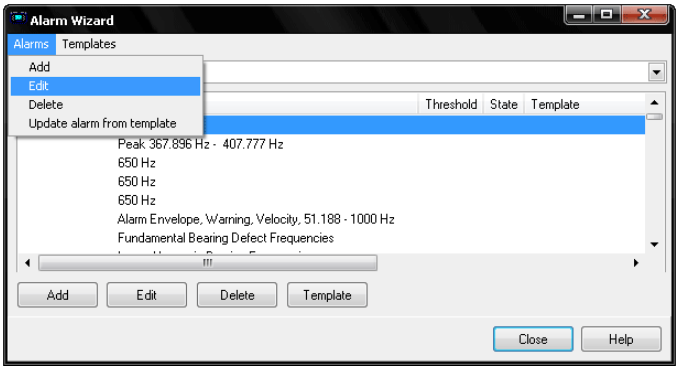
Note: Changing the frequency range of a band alarm will not break the relationship between the alarm and its template.

Alarms can be edited by plotting a recording and manipulating the alarm on the chart (see Editing Individual Band Alarms on page 155 or Editing Individual Envelope Alarms on page 167).

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If you are editing many alarms it is easier to do this from within the Alarm Wizard as this displays the full listing of all alarms on each machine.

- Click **Alarms** and if necessary use the scroll bars to locate the alarm you wish to edit.
- Select an alarm with the mouse. From this window's menu select **Alarms>Edit**.



- Edit the alarm as required - this will break the alarm's association with its template.
- Click **OK**. To edit additional alarms select them and repeat this process. Click **Close** when you are finished.

Deleting Alarm Templates and Alarms

Note: You cannot delete an alarm template if it is being used by any alarms. If you see the following message you will need to delete any alarms that are using the template before deleting the actual template (see sub-heading Deleting a template and its associated alarms).



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- Click **Alarms** then select **Templates>Edit all templates**.
- In the Alarm Templates window select the template you wish to remove then click **Delete** (if you see the error message mentioned previously follow the instructions for deleting a template and its associated alarms). Click **OK** to confirm the deletion.
- Click **OK** then **Close** to close all windows.

Deleting a template and its associated alarms
Deleting a template that is still being used by alarms is a two-stage process: first delete the alarms so that the template is not being referenced by any other objects then delete the template.

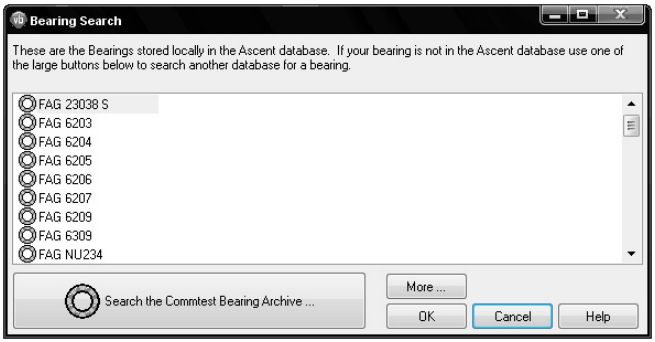
- Close the prompt window if you have not done so already by clicking **OK**.
- Click **Usage** to see which alarms are associated with your template then click **OK** when prompted to confirm.
- The Tagged Items window will list all alarms that are currently using your template. Use the **Operations** menu or button and select **Delete**. Click **Yes** to confirm.
- Click **OK** to close the Tagged Items window.
- Select the template you wish to remove then click **Delete**. Click **OK** to confirm the deletion.
- Click **OK** then **Close** to finish.

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Section 6: Using the Bearing Database

Finding a Bearing Using Quick Search

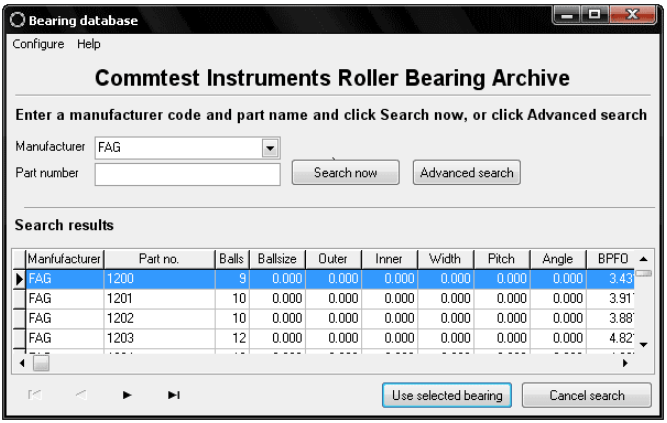
When you choose to add a bearing to a point, the Bearing Search window (pictured) gives you a short list of options to choose from. If the bearing you require is not listed you can look for it in the archive.



- Click **Search the Commtest Bearing Archive**.
- Select the bearing's manufacturer from the drop-down box and enter the bearing part number. If you know the manufacturer's name but not the part number (or vice versa), enter the information you do know.
- Click **Search now**.

The bearing archive will be searched and a list of the closest matches displayed. If you entered only the manufacturer's name or the part number, the list will show either all known bearings from that manufacturer or all bearings that match that part number. Scroll down the list if necessary to locate your bearing.

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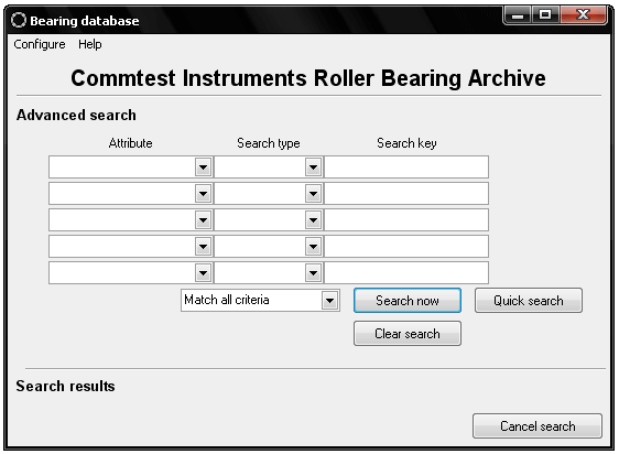
- To choose a bearing, highlight it by left-clicking with the mouse then click **Use selected bearing**. This will return you to the Bearing on Point Editor.
- Enter a name in the description field and click **OK** to add it to the selected point. A bearing icon will now appear in the navigator list whenever this point is selected.

Using Advanced Search

The advanced search option will help you to find the correct bearing in the archive even if you don't know the manufacturer and part number. Advanced search uses the information you provide to come up with a list of bearings that match your criteria.

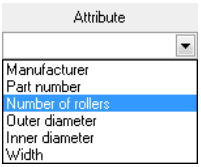
- Click **Search the Commtest Bearing Archive** then click **Advanced search**.

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Advanced search presents a range of search options that allow you to narrow down the archive's list of bearings.

- Click the arrow on the first 'Attribute' drop-down box and choose an attribute that you know the value of, e.g. if you know the outer diameter of the bearing you require, select 'Outer diameter'.



- In the 'Search type' drop-down box, choose the option that will be used to match your information with the archive e.g. for the 'Outer diameter' option, you might choose 'equals' or 'is greater than' the diameter you specify.
- In the 'Search key' field, type in the information that is known about the required bearing. For our example, you would now enter the outer diameter of your required bearing.

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- If you have other information that will aid the search, enter this in the lower boxes. Tick 'Match case' if you want the search to match the lower and upper case letters you typed in. The more information you provide to narrow down the search, the shorter the final list of bearings will be.
- Choose whether you want the search to match *all* or *any* criteria you specify then click **Search now**. The bearing archive will be searched and a list of the closest matches displayed.

You can now select a bearing from this list or add more information and start a fresh search to narrow down the list of possible bearings.

- To clear all information from the screen click **Clear search**.
- Click **Quick search** to return to the quick search window.

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Section 7: Other Functions and Features

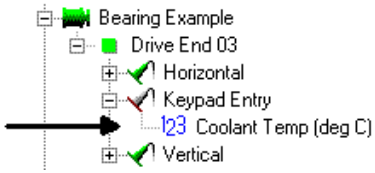
Keypad Schedule Entries

Special 'keypad schedule entries' can be created in the software that let you define additional machine information to collect e.g. machine temperature or motor current. When following a route, the user will be prompted by the instrument to enter this information using the keypad.

These prompts can also be used as reminders to perform additional checks e.g. to check the oil level. The person collecting the data can record whether the check has been carried out by entering a value of 1 for done or Ø for not done.

Note: Keypad schedule entries can only be created in the software. They cannot be created or edited in the vb instrument.

Folders containing keypad schedule entries will send/receive to the instrument as normal. When the data has been collected and the folder is received back into the software, the measurements will appear as date/time stamped records in the navigator list just as with spectra and waveforms. The keypad schedule entries will appear in the navigator tree like a normal schedule entry but are differentiated by their numeric icon (123).

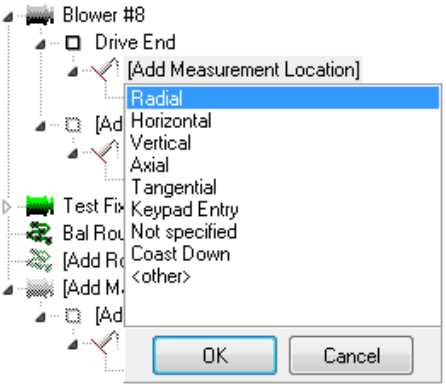


The collected data values can be trended in the same way as other recordings using the Trend view. See Trending Data (page 128), for more information.

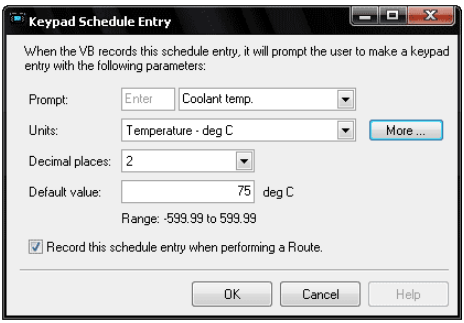
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- To create a keypad schedule entry first activate Build Mode (click the **Build** button on the toolbar and click the Manual Build Mode link).
- Select the [Add Location] placeholder in the navigator tree where you want the keypad schedule entry to be created.

The location 'Keypad Entry' in the [Add Location] drop-down list is provided as a suggested location for keypad schedule entries but they can be placed in any location. In the instrument the 'Keypad Entry' location will appear in the list of directions/axes when you select the machine location.



- From the main menu choose **Edit>New>Keypad Schedule Entry**. This will open the Keypad Schedule Entry Setup window.



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Note: There is a faster way to create keypad schedule entries that does not require you to activate Build Mode. Instead, right-click a location and select **New>Keypad Schedule Entry**. This will open the window shown in the previous diagram. If you use this method you will have to use an existing location (rather than the designated Keypad Entry location) as the placeholders only appear when Build Mode is activated.

- Enter a prompt that will appear on the instrument (maximum of 16 characters for vbX000 instruments and 50 for vbX instruments). This prompt will be preceded by the word 'Enter' when it is displayed on the instrument.

- The units for Temperature -deg C and -deg F can be selected directly from the 'Units' drop-down box. To select any other type of unit click **More** then choose a unit from the list and click **OK**. If you select a unit that has no abbreviation you will be prompted to enter one now.

Note: The abbreviations that you enter are stored in a file called 'units.ini' in the Ascent program folder.

- Set the number of decimal places to use. Note that this will affect the range of values that can be entered e.g. two decimal places allows you to enter values from -599.99 to +599.99; zero decimal places allows you to enter values from -59999 to +59999. Positive and negative values can be entered when collecting data with the instrument.

- Enter a default value that will appear on the vb screen (optional). The person collecting the data will not have to record this information unless the value changes.

- If you want this data to be recorded as part of a route, tick the box. The instrument will prompt the user for this data when they perform any route that includes the measurement location containing the keypad schedule entry.

Creating your own units

The list of engineering unit types in the unit selection window are based on the MIMOSA CRIS-v1 standard.

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- After clicking **More** to open the Units window, scroll down the list and select one of the 'User defined unit' slots (towards the end of the list).
- Click **Edit** then enter an abbreviation for this unit (maximum of 16 characters). This abbreviation will be used in the 'Units' and 'Default value' fields.
- Click **OK** twice to close the windows and apply your units.

Once defined, this new unit will remain in the list and can be selected like any of the default ones.

Editing Values After Collection

If the value of a keypad schedule entry has been entered incorrectly this can be altered after it has been transferred to the Ascent software.

- To edit the value right-click the recording in the navigator list and select **Edit**.
- Change the value as required then click **OK**.

Attached File Schedule Entries

Attached file schedule entries are similar to keypad schedule entries. However, rather than entered via a portable instrument, they are entered directly into the Ascent software. Files of any type including images, audio files, report documents etc., may also be attached to this type of schedule entry measurement for later reference and use. This functionality would be appropriate for attaching files associated with an oil analysis report to a single location, for example.

Typically the data associated with this function are alarm states. However, like keypad schedule entries, attached file schedule entries could also be used to collect measurements such as machine temperature or motor current, as well as arbitrary user-defined measurement values.

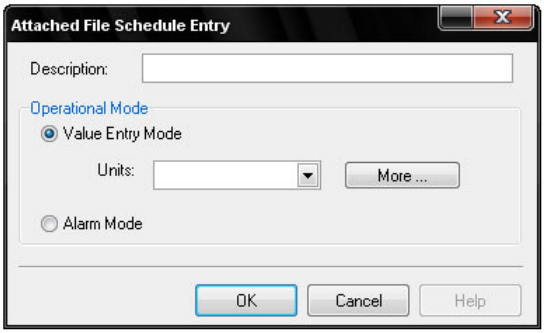
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Create an Attached File Schedule Entry

- Right-click a point or location and select **New>Attached File Schedule Entry,** or press the **Attached File Schedule Entry** button on the creation palette. The 'Attached Files Schedule Entry' window will open.



Creation Palette Button



Attached File Schedule Entry Window

- Type a schedule entry name into the **Description** field.
- Select an appropriate operational mode from the radio boxes available:
  - **Value Entry Mode** is used when you wish to manually enter numeric measurement values, such as RPM or output current, as a schedule entry recording.
  - **Alarm Mode** is used if you wish to manually enter alarm states (OK, Warning, Alert, Danger, Inoperative) as a schedule entry recording.
- If you selected **Alarm Mode** proceed to the next step. If you selected **Value Entry Mode**, select a measurement unit from the dropdown list or click **More...** to select a standard unit or to create a user-defined unit. Any previously selected user-defined or standard units will be listed in the Attached File Schedule Entry dropdown list.

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- Click **OK**. The schedule entry will now be created. The attached file schedule entry will appear in the navigator tree and can be identified by its icon ().

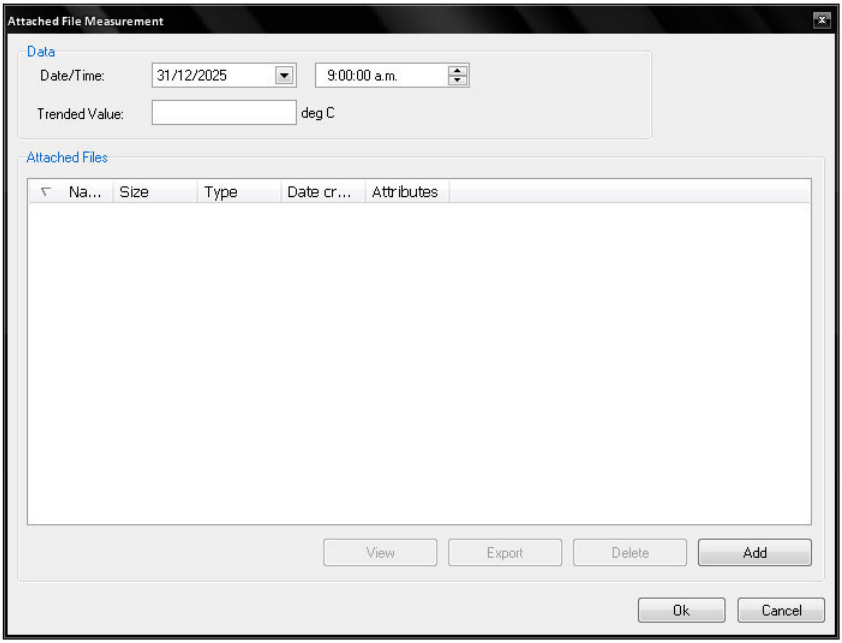
Notes: attached file schedule entries will not be transferred when a folder is sent to a portable instrument.

To edit an existing attached file schedule entry, right-click it from the navigator tree or list and select **Edit** (or press **CTRL** + **E**).

Create an Attached File Measurement

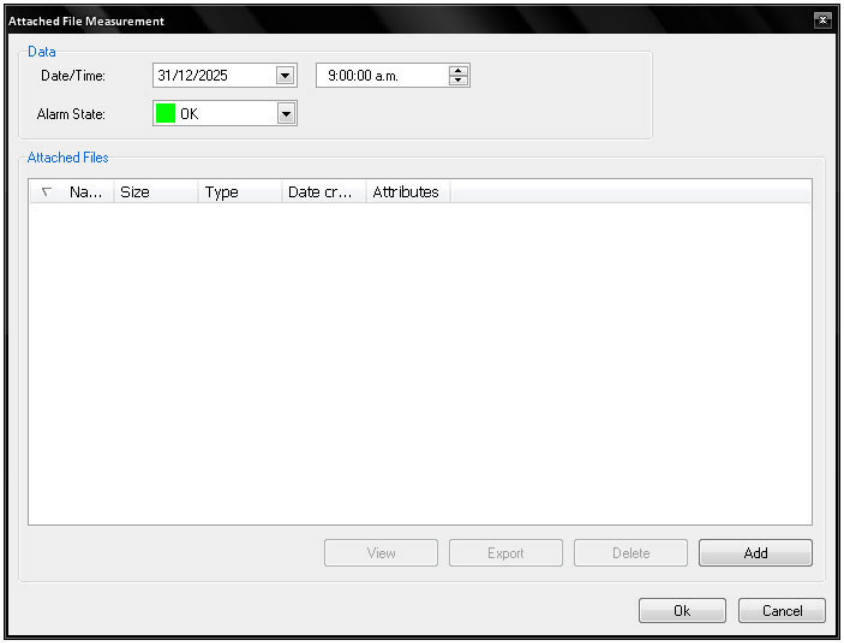
Right-click an Attached File Schedule Entry and select **New>Attached File Measurement**. Alternatively, click an Attached File Schedule Entry and press the **Create an attached file measurement** button () from the creation palette. The 'Attached File Measurement' panel will open. The panel configuration displayed will vary according to the mode you selected (Value Entry Mode or Alarm Mode) when creating the schedule entry.

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Attached File Measurement Panel - Value Entry Mode

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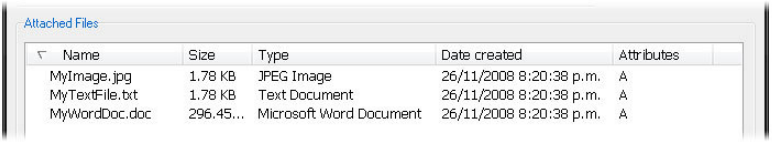


Attached File Measurement Panel - Alarm Mode

- If entering a value entry, type a numeric value into the **Trended Value** text field. If entering an alarm state, select a state from the **Alarm State** dropdown list. To manually change the timestamp of the entry, adjust the **Date/Time** fields.

- Click **Add** if you wish to attach a file to the measurement. A standard Windows selection window will open allowing you to select the file(s) to be attached. You may select any file recognized by the Windows operating system. Any attached files will be listed in the 'Attached Files' area once selected.

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Attached Files

- Click **OK** once you have entered a numeric value or alarm state, and attached any files you wish to associate with the entry.

To edit an existing attached file measurement entry, right-click it from the navigator list and select **Edit** (or press **CTRL** + **E**).

Note: once you have recorded several measurements, they can be trended using the Ascent software's normal trending tools such as reports and the 'Trend' chart. See Trending Data (page 128) and Section 3: Reports.

Managing Attached Files

From the Attached File Measurement Panel you may view, delete or export files attached to a measurement.



Attached File Management

View a File

- To view a file, select it from the file list and press the **View** button. You may also preview a file by double-clicking it.

Delete a File

- To delete a file, select it from the file list and press the **Delete** button.

Export a File

- To export a file, select it from the file list and press the **Export** button. A Windows file browser panel will open.
- Select the location the file will be extracted to and press **OK**.

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Add a file

You may add a new file to any existing attached file schedule entry measurement.

- Open an existing attached file measurement and press the **Add** button.
- Select any files to be added to the measurement and press **Open.**

Demodulation

Demodulation is a useful process for extracting very low amplitude, high frequency signals associated with impulse or impact events. Demodulation is also useful as an early warning device as it detects bearing tones before they are visible in a normal spectrum.

The process works by passing the data through filters to eliminate high amplitude/low frequency data, extracting the 'envelope' around the remaining signal, and displaying the results in a frequency/acceleration spectrum.

Demodulation Setup

The high frequency signals that demodulation aims to extract are very localized, therefore extra care must be taken to ensure the accelerometer is mounted correctly.

Make sure that:

- The accelerometer is mounted close to the vibration source.
- The accelerometer is well coupled, using either stud mounting or a very strong magnet on bare metal. A handheld probe or stinger is not recommended.
- The accelerometer mounting is consistent between visits.

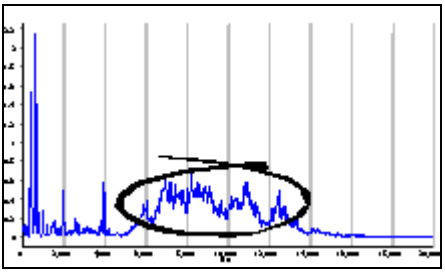
The bandwidth determines which range of frequencies the demodulation process will use. The following procedure can be followed to determine an appropriate bandwidth.

- Take a measurement using the following parameters:

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Domain Type: Freq
Quantity: Accel
Fmax value: 20 kHz (1200 kCPM)

- Examine the chart for a region of broadband high frequency noise or 'haystack'. Such a haystack might look like the one below.



- Examine where the haystack begins and ends, and choose a corresponding Hz (or kCPM) range/bandwidth. For example, a range of 4 kHz to 20 kHz (240 to 1200) kCPM is best for the above chart, as most unwanted low frequency noise falls below 4 kHz (240 kCPM).

It is very important that all the large amplitude/low frequency peaks are rejected. If there are no significant haystacks displayed, a standard bandwidth of 2 kHz to 10 kHz (120 to 600) kCPM) is recommended.

For low-speed machines, the Demod bandwidth lower limit can be reduced, but keep it at least 100X running speed. e.g. for a machine which runs at 600rpm (10 Hz), a 1-10 kHz band should be appropriate.

Analyzing Demodulation Data

Measuring, recording and viewing demodulation data is exactly the same as for a frequency/acceleration spectrum. The demodulation spectra can be transferred to the software and analyzed using all the same techniques which are available for normal spectra e.g. trend plots, alarms, fault frequencies, bearings and gears.

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The following are points to keep in mind when analyzing demodulation data.

- As a bearing deteriorates, the baseline noise level increases and bearing tones develop running speed sidebands.
- In the final stages of bearing wear, the bearing tones may become less prominent as cracks and pits become more rounded and distributed over the race.
- A raised noise floor can often point to a lubrication problem.

Setting/Updating RPMs for Multiple Recordings

There are a number of ways to control how RPM values are applied to schedule entries and/or recordings. The range of affected recordings may be restricted by date range; recordings with RPM values already set may be ignored; and RPM multipliers can be used to take account of gearbox ratios and other point variances. (To set an individual recording's RPM value see Defining the RPM of a Recording on page 107.)

Defining the RPM Value

You can apply an RPM value directly from the 1X peak of a chart or type in a value then apply this to your chosen recordings.

First, set your RPM value using one of the following methods then follow the instructions in the next topic to apply this value.

Note: Regardless of which method you use the RPM value will not propagate to any recordings until you choose options for where you want it to be applied (see next topic).

1. Using the 1X peak
This method has the advantage of allowing you to enter an RPM value without knowing the running speed of your machine. Place a cursor on the 1X peak and the software will calculate the running speed for you.

- Open a chart and double-click the first big peak.

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- Press **CTRL+1** to display the value in the Set 1X RPM window and click **Apply to Machine**. Go to next topic, Applying the RPM value.

2. Manually entering an RPM value
This method is of benefit when you already know the RPM value but want to manually select a date range of recordings to apply this to.

- Select a machine/point/location/schedule entry then choose **Edit>Set RPM** from the main menu or select this same option from the navigator right-click shortcut menu.
- Enter an RPM value in the Set RPM window. Go to next topic, Applying the RPM value.

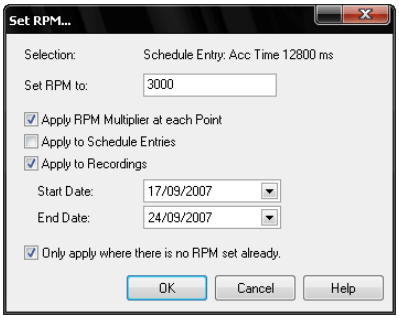
3. Manual entry with a pre-determined date range
This method has the advantage of pre-selecting a date range over which to apply an RPM value. This will be of benefit where you want to use the same recording date range on other locations at the same machine.

- In the navigator list, select recordings across your desired date range. You can multi-select recordings by clicking the first recording then holding down the **SHIFT** key and clicking the last recording.
- Right-click to open the Set 1X RPM window and enter an RPM value.
- Click **Apply to Machine**. Go to next topic, Applying the RPM value.

Applying the RPM Value

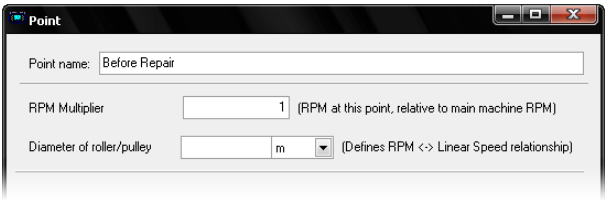
You can apply the RPM value to a range of recordings and schedule entries by choosing the appropriate option(s). The RPM value will be applied to recordings/schedule entries on your current navigator selection e.g. if a single point is selected you can only apply the RPM value to recordings/schedule entries at that point.

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Set RPM to
This is the RPM value that will be assigned to schedule entries and/or recordings.

Apply RPM Multiplier at each Point
This will apply a point-level RPM Multiplier to all recordings on the selected machine points. The Point RPM Multiplier will typically be used on linear speed machines where the rotational speed may vary between points. (You can set the RPM Multiplier by right-clicking a point and selecting **Edit**.)



Apply to Schedule Entries
This RPM value will be assigned as the default RPM setting for all schedule entries at your selected locations.

Apply to Recordings
The RPM value will be assigned to all recordings at your selected locations.

Start Date/End Date:
Use the drop-down boxes to apply the RPM value to all recordings/schedule entries within your specified date range.

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Only apply where there is no RPM set already
This will apply your RPM value to all recordings and/or schedule entries that do not have an RPM value. Recordings/schedule entries with existing RPM values will not be affected.

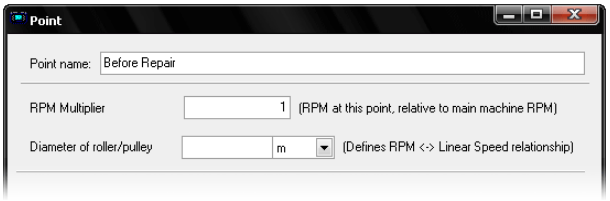
Linear Speed Support

On linear speed machines (e.g. a paper machine) the rotational speed of individual machine components depends on the diameter of the roller or pulley at each point. If those diameters are entered into the Ascent software, and you enter the linear speed when the recordings were taken, the software can calculate the RPM value on each point.

Some of your measurement locations are likely to be on non-roller parts of the machine, such as roll drive motors. The software can calculate the appropriate RPM values for these points provided you supply the ratio of the motor RPM compared to the roll RPM. For example if the drive motor gearbox has a reduction ratio of 0.333 (the motor is turning 3 times faster than the roll) enter 3 into the RPM Multiplier field.

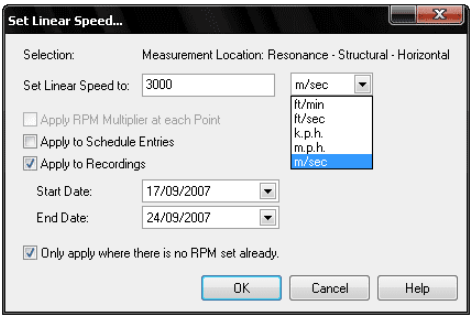
Note: If the diameter for a point is not defined the linear speed setter will have no effect.

- Right-click a point and select **Edit**.
- Enter an RPM Multiplier value or leave this field blank if you don't want to use the multiplier.
- Enter the diameter of the roller or pulley then click **OK**.



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- Select the machine for which you want to set the linear speed then from the main menu choose **Edit>Set Linear Speed**. Alternatively you can right-click a machine and select this option from the shortcut menu.



- Enter the linear speed of the machine and select your desired units from the drop-down box.
- The other options on this window are fully described in the previous topic, Applying the RPM Value. Please refer to this topic to learn how to apply the various settings.
- When you have finished selecting options click **OK**.

Collecting the RPM Value During Measuring

If the machine RPM is available at the time of recording, for example from an installed rev counter or a hand held tachometer, the person collecting the data can be instructed to enter the RPM via the vb portable instrument keypad.

- To use this feature right-click a schedule entry and select **Edit**.
- Select 'Ask user for RPM when measurement is taken'. The person collecting the data will be prompted to enter the RPM value when the measurement is taken.

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- Enter a value into the 'Default RPM' field. This default value will display on the instrument screen so that the user can simply press the instrument's ENTER key to continue.



The entered RPM value is saved with the recording and automatically transferred to the Ascent software during the next Receive operation.

You can enable 'Ask user for RPM' on every schedule entry on a machine; the instrument will **not** re-prompt the user when new measurements are collected. Instead the instrument remembers the RPM value last entered on that machine and automatically re-uses it for subsequent recordings. If you would like the user to be re-prompted at a certain part of the machine (for example after a gearbox) then change the Default RPM for those schedule entries. See Setting/Updating RPMs for Multiple Recordings (page 200) for details of how to set the default RPM for all schedule entries on a machine.

Baseline Recordings

A baseline recording is a vibration measurement taken on a machine which is considered to be in good condition. The baseline is used as a comparison recording with which to observe changes in the vibration patterns.

- You can set recordings as being baseline recordings by right-clicking them and selecting **Set Baseline**. When this recording is plotted, the label 'Baseline' will appear at the top of the chart and in the chart legend.

The baseline overall RMS value is shown in the Parameter Set/Schedule Entry Editor's 'Baseline Overall RMS' window and can be edited here (see next topic).

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Displaying the baseline value on the instrument
After taking a recording on the instrument you can display the RMS value of the baseline recording so that it can be compared with the measurement you have just taken.

- Select **Alarms>Update Baselines in this Folder** then send the folder to the instrument. The baseline RMS value will display at the top-right of the screen after a measurement is taken.

- Enable **Halt after recording** in the vb Options menu if you wish to make the instrument pause at this stage.

Tip: If you intend to update your baselines intermittently you should select **Alarms>Update Baselines Before Send**. Every time you set a new recording as baseline this will be transferred to the vb automatically upon Send.

Displaying the last measurement's value instead of a baseline value
As an alternative to using baselines, you have the option of displaying the measurement values from your last recording session.

- To display the previous measurement's RMS value select **Alarms>Use Last Measurement if no Baseline**. This value will labeled as baseline on the instrument.

Removing a baseline from the instrument display

- In the software, right-click the schedule entry that contains the baseline recording and select **Edit**.

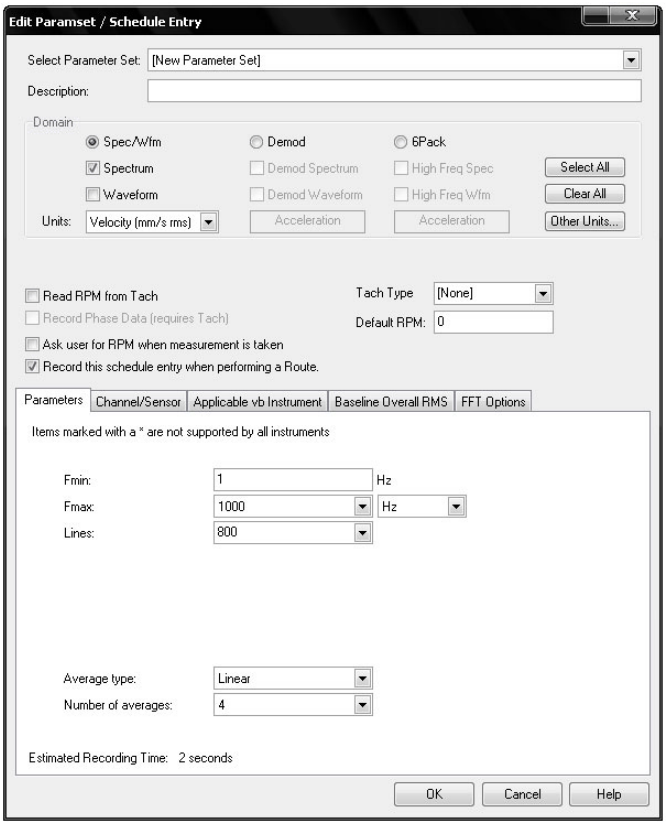
- In the Edit Paramset/Schedule Entry editor, click the 'Baseline Overall RMS' tab.

- Click **Clear** then **OK**. When you next send this folder to the instrument the baseline value will no longer be displayed.

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How to Use Parameter Sets/Schedule Entries

The Parameter Set / Schedule Entry Editor gives you control over the measurement parameters that will be used by the instrument.



To edit an existing schedule entry

- Right-click the schedule entry and select **Edit**. This will open the Parameter Set / Schedule Entry Editor.

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To create a new schedule entry

- Right-click a location and select **New>Schedule Entry**. Alternatively, activate Build Mode (click the **Build** button on the toolbar and click the Manual Build Mode link if you are using the licensed Machine Builder Wizard) then click one of the [Add Schedule Entry] placeholders.

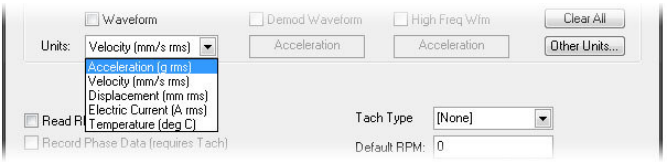
Reminder

A parameter set defines the actual parameters that will be used to take a recording (the measurement units, measurement domain etc) and can be re-used as many times as you like. A schedule entry represents a recording that will be taken at a measurement location. A schedule entry gets its parameters from the parameter set assigned to it.

In the editor, invalid options are indicated with red highlighting. If an option appears red, please check the value you entered.

The 'Parameters' tab window (shown in the previous diagram), allows you to set individual parameters such as the Fmax and number of averages to use. The 'Domain' area allows you to choose a measurement type or a combination of measurements (on instruments that support these functions) including multi-measurement 6Packs, Demod spectrum and waveform, and standard spectrum and waveform recordings. Simultaneous multi-measurement types are only available on vbX instrument models, not vbX000 instruments such as the vb1000 or vb3000.

The instrument can support a wide range of sensor types and their corresponding measurement units (depending on the version of vb firmware you are using - contact your local reseller or Commtest Instruments if you are unsure). To choose a different type of unit or to define your own, click Other Units... to open the unit selection window. Full instructions for selecting or creating new units are found in Keypad Schedule Entries (page 189), under the sub-heading 'Creating your own units'.



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- Click the labeled tabs to select a different tab.



The 'Channel/Sensor' tab window allows you to specify a channel and/or sensor other than the default for a particular instrument. Clicking the **Sensors** button on this tab allows you to define new sensors and edit existing ones (their sensitivity and settling times etc). The sensor assigned to any schedule entry must match the type of signal being measured.

The 'Applicable vb Instrument' tab window allows you to choose the vb instrument that these parameters are to be sent to. This allows the software to indicate which settings are valid for that instrument (see the notes at the end of this topic).

The 'Baseline Overall RMS' tab window allows you to enter a baseline value that will appear in the instrument when this schedule entry is being recorded. See Baseline Recordings (page 205) for more information.

The 'FFT Options' tab window allows you to set the window type (Hanning or Rectangular) and overlap percentage.

You can choose from parameter sets already in use using the drop-down box at the top of the window labeled 'Select Parameter Set'.

Notes:
Switching between the Time, Frequency and Demodulation domains will enable different options on the Edit Paramset / Schedule Entry editor.

The editor will also change depending on which instrument you are designing the parameter set for. Newer versions of the vb firmware have additional features that will only be visible when that instrument is selected in the 'Applicable vb Instrument' tab window.

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Fmin

The instrument can be instructed to 'zero out' frequencies in a spectrum below a particular Hz value. This allows you to remove ski-slopes or to create special measurements that exclude low frequencies from the overall value.

The Fmin setting is available in the editor, when a demodulation or frequency domain parameter set is being edited.

Note: The frequency resolution of the spectrum will not be affected by the Fmin setting. If the Fmin value is 100 Hz, and the Fmax value is 125 Hz, and the Lines setting is 400 lines then 400 lines of data will be taken from 0 Hz to 125 Hz, and the lines corresponding to frequencies below 100 Hz will be set to zero.

Orders-based Parameter Sets

You can specify the Fmax of a frequency-based vibration measurement in Orders instead of Hz. This means that no matter what the actual running speed of the machine is, you can specify that the measurement should have a frequency range of 'n' orders of the running speed.

To create an orders-based parameter set

- Create a new schedule entry by right-clicking a location in the navigator tree and choose **New>Schedule Entry**.
- Select Orders instead of Hz for the Fmax units.



The Ascent software must know the running speed (RPM) of a machine to be able to display orders. Select one of the following options to set the RPM:

- Tick 'Read RPM from Tach' if a tachometer will be used to take the measurements.

OR

- Enter a default RPM value in the 'Default RPM' field.

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OR

- Tick 'Ask user for RPM when measurement is taken' if you would like the instrument to prompt the user to enter the RPM before the measurement is taken.



- Fill in the rest of the form as you would normally.

The instrument will select an Fmax from the normal available Fmaxes that give at least the specified number of orders of frequency. For this reason, the recording will appear in the navigator with an Fmax value in Hz/CPM and the range on the bottom axis will probably be slightly higher than the requested number of orders.

For example, if you choose 20 orders, and an RPM of 1100:

- The running frequency in Hz is 1100 / 60 = 18.33 Hz
- 20 times 18.33 = 366.6
- The smallest Fmax that will give a frequency range of 366.6 Hz is 400 Hz
- When plotted, the number of orders shown on the bottom axis will actually be 400 / 18.33 = 21.8 orders.

If the tachometer is being used to trigger the measurement, the RPM will be determined automatically.

As well as setting frequency domain measurements in orders, you can also set demodulation domain measurements in orders, and time domain measurements in revolutions.

Editing Parameter Sets

The Schedule Entry and Parameter Set Editors are integrated into one screen (the Edit Paramset / Schedule Entry Editor).

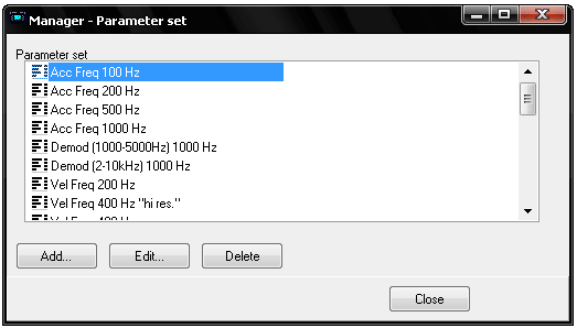
You can edit a single schedule entry by changing its settings in the Edit Paramset / Schedule Entry Editor.

- To do this, right-click the schedule entry and choose **Edit**, then make the required changes.

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If several schedule entries use the same parameter set, you can edit them collectively by modifying the parameter set assigned to them.

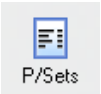
- From the main menu, select **Edit>Manage>Parameter Sets**. This opens the Manager - Parameter set window that lists all the parameter sets in the entire *site* (the site contains all your folders, which in turn contain all your machines).



- Select a parameter set then click **Edit** to open the Edit Paramset / Schedule Entry Editor. Because you are editing the parameter set, rather than an individual schedule entry, the options on the editor that relate to schedule entries will be hidden and any changes you make will be applied to *all* schedule entries that use that parameter set.

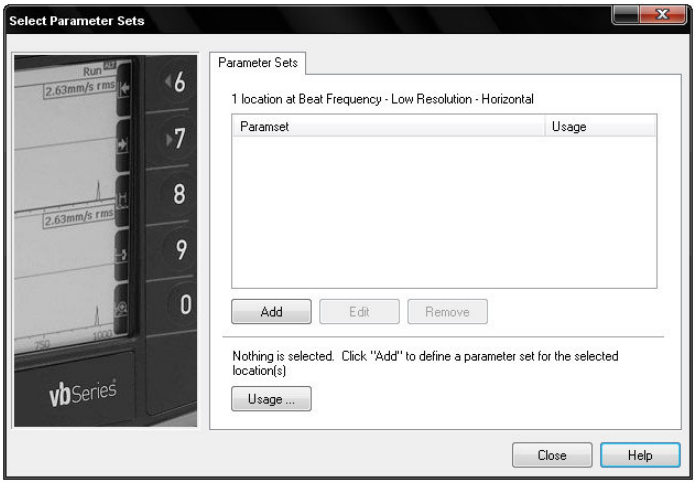
Working with Parameter Sets/Schedule Entries on a Single Folder, Machine, Point or Location

The **P/Sets** button opens the Select Parameter Sets window that allows you to perform tasks such as adding, editing or deleting multiple schedule entries in a single folder/machine/point/location.



- Select the navigator item that contains the schedule entries you wish to work with and click the **P/Sets** button on the toolbar.

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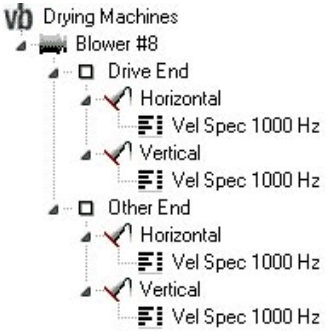
Add opens the Edit Paramset / Schedule Entry Editor so that you can create a new parameter set. When you click **OK**, schedule entries will be created using this parameter set and will be added to *all* the selected item's sub-items e.g. if you have a machine selected, schedule entries will be added to all locations; if you have a point selected schedule entries will be added to all locations on that point.

Edit opens the Edit Paramset / Schedule Entry Editor so that you can edit any parameter sets being used by the schedule entries in this folder/machine/point/location.

- Select a parameter set from the Select Parameter Sets window and click **Edit**. Any changes you make to this parameter set will *only* be applied to schedule entries that are sub-items of the currently selected item. **Edit** actually creates a *new* parameter set and assigns this to the schedule entries you are working with (while leaving the original parameter set and the schedule entries that use it untouched).

Example
You have the following machine structure: A machine with two points and two locations at each point (four locations in total). The schedule entries at each location all use the same parameter set.

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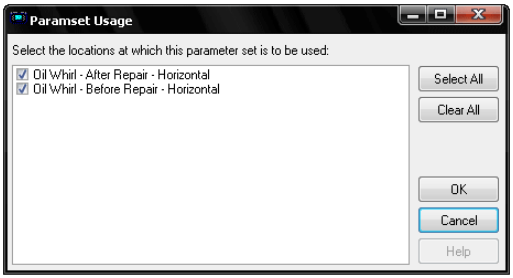
You want to edit the parameters for the two drive end schedule entries but don't want to change the parameters of the other schedule entries. Select the point labeled 'Drive End' and click the **P/Sets** button to open the Select Parameter Sets window. Select the parameter set (there will be only one displayed) and click **Edit** to make your changes. When you click **OK** a new parameter set will be created and assigned to both drive end schedule entries. The other two schedule entries will use the old (unchanged) parameter set.

Remove will remove all schedule entries that use this parameter set from the selected folder/machine/point location. This is the same as right-clicking individual schedule entries and selecting **Delete**. Removing the parameter set does not delete it from the database - it will still appear in the Edit Paramset / Schedule Entry Editor's 'Select Parameter Set' drop-down list.

Usage shows you how many locations in this folder/machine etc use the selected parameter set.

- Select a parameter set and click **Usage**. Use the tick boxes to add the parameter set to, or remove it from, multiple locations.

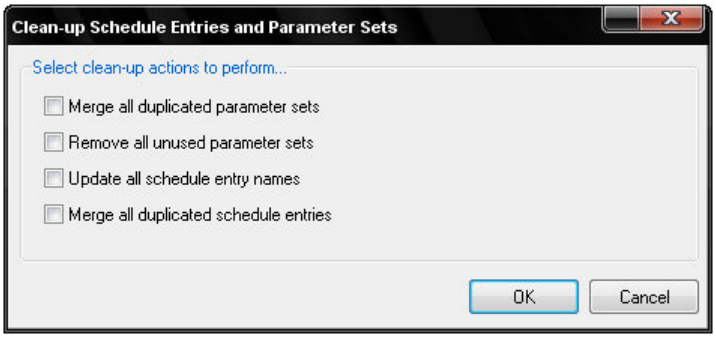
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Clean-up Parameter Sets and Schedule Entries

If you have many parameter sets or schedule entries and not all of them are being used, the Select Parameter Set drop-down box (when you create/edit a schedule entry) will contain unwanted duplicate entries. The schedule entry and parameter set clean-up utility can find and remove those entries that are not being used, and merge any duplicate entries into a single item.

- From the main menu select **Database>Utilities>Clean-up Schedule Entries and Parameter Sets**. The 'Clean-up Schedule Entries and Parameter Sets' panel will open.



Clean-up Utilities Panel

The Clean-up Schedule Entries and Parameter Sets panel contains several different options. These are:

Merge all duplicated parameter sets. This option will consolidate any duplicate parameter sets using the same configuration into a single parameter set.

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Remove all unused parameter sets. This option will delete any parameter sets not currently in use in the navigator (that is, any parameter sets not actively being used for measurements).

Update all schedule entry names. Use this option to update the names of your schedule entries. This option is useful if you have changed default measurement units, or if you changed the software's interface language after creating a schedule entry.

Merge all duplicated schedule entries. This option will consolidate duplicate schedule entries at the same measurement location. Consolidation is most likely to be successful when duplication follows the import of folders or machines from older Ascent databases.

- Select a checkbox item or items from the 'Clean-up Schedule Entries and Parameter Sets' panel. Click **OK** then **Yes** to confirm the action. The clean-up process may take some time to complete.

Order Tracking

Note: this feature applies only to vbOnline16 devices.

If Machine speed varies significantly while a recording is being taken, the resulting spectral peaks may appear as smeared bumps instead of sharp peaks. Subtle spectral features that indicate early bearing or mechanical defects may no longer be clearly resolved in the spectrum.

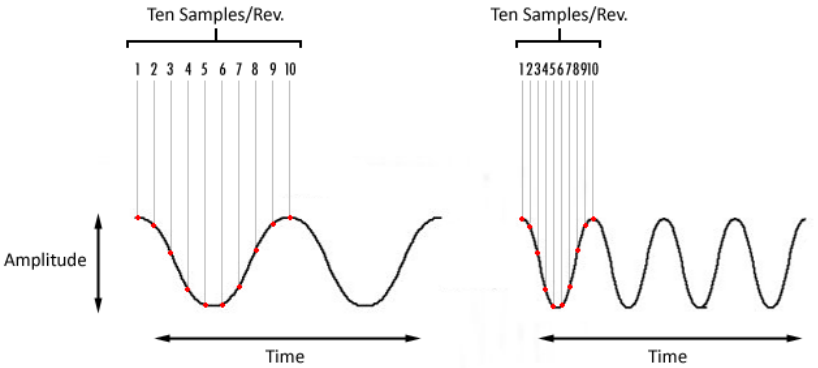
This problem does not apply to normal constant-speed machines, but relates to variable-speed machines, and is of particular concern on low speed machines. Low speed measurements tend to be very long in duration, allowing time for the machine’s speed to change significantly while a recording is taken.

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The number of Orders being recorded is also a significant factor that must be understood in relation to this peak 'smearing'. Consider a wind turbine that experiences a gust-induced speed increase of 2% during a recording. This speed variation will have relatively little impact on the first Order running speed peak. However, at 50 Orders the impact will be significant. The peak will be smeared from its original location all the way to the original location of the 51st order (2% x 50 Orders = 100% of an Order).

The Order Tracking system prevents this smearing of spectral peaks by automatically adjusting the data sampling rate to obtain a constant number of samples per revolution of the Machine. To provide the precise timing information required, a tachometer sensor must be installed. This tachometer should be positioned on the highest speed shaft if the machine uses a gearbox, as this will provide the most frequent timing information to the Order Tracking system.

To achieve Order Tracking the vbOnline16 device digitally re-samples data during acquisition at the required samples-per-rev rate. The digital processing techniques employed ensure very high signal quality and are able to tolerate significant speed variations of between half and twice the Machine speed at the start of recording.



Automatic Sample Rate Adjustment Over Varying Speeds

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Enable Order Tracking

- Open or create a Parameter Set by pressing the **P/Sets** button on the main menu and pressing **Add**, or by pressing the Schedule Entry icon () on the creation palette. The **Edit Paramset/Schedule Entry** panel will open.
- Click the **Parameters** tab on the lower half of the **Edit Paramset/Schedule Entry** panel if it is not already selected.
- Set the tachometer type from the **Tach Type** dropdown box.
- Within the **Parameters** tab select the second dropdown box beside **Fmax:**. Click the **Orders** option for spectrum measurements. The **Order Tracked** checkbox will appear to the right of the dropdown box.



The Order Tracking Checkbox

- Tick the **Order Tracked** checkbox.
- Type a numeric value into the **Fmax** text field. This value is the number of orders that will be tracked, and must be between 0 and 3000.
- Type a value into the **Default RPM** value text field. This is the approximate speed of the rotating equipment. The default RPM is used only as an initial starting check, as explained below, and not recorded; only the actual RPM measured from the tachometer will be stored in the recording. (The RPM is measured throughout the recording and then averaged to get a final weighted RPM.)
- Select the number of lines of resolution from the **Lines** dropdown. Order tracked recordings are limited to 6400 lines of resolution for single, and 3200 lines for dual channel recordings.

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It is important to understand the relationship between Orders and default RPM when configuring Order Tracking. The Order Tracking system operates effectively only at frequencies below 6 kHz (360 kCPM). The combination (i.e. multiplication of) of RPM and Orders should not exceed this frequency ceiling.

For example, a default RPM of 1000 up to 20 orders will result in a maximum frequency of 20 kCPM (1000 x 20). This is well within the range of Order Tracking frequencies.

A higher speed shaft at 4000 RPM can have Order Tracking applied at up to 80 Orders (4000 x 80 = 320 kCPM). If the actual Machine speed increases such that Order x Speed exceeds the 360 kCPM limit, Order Tracking will be maintained but data above the 360 kCPM limit will be attenuated. For typical applications this can be avoided easily as these high frequency recordings are recorded very quickly. The Machine speed is unlikely to change significantly during the recording, so Order Tracking is not required. To be sure, Dynamic Criteria can be applied to automatically reject any recordings which do experience speed variations.

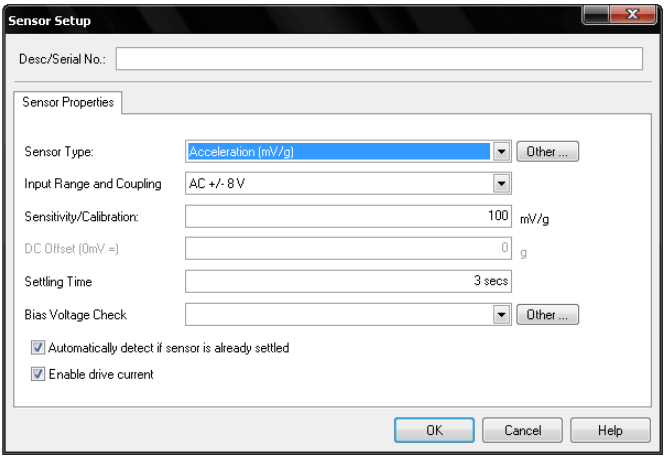
The Order Tracking feature is now configured. If you are creating a new schedule entry rather than editing an existing item you must now specify a schedule entry name, measurement Fmin, lines of resolution and all other relevant measurement parameters. See How to Use Parameter Sets/Schedule Entries (page 207) for more details.

Defining Sensor Settings

If you use more than one accelerometer for data collection, you can store each sensor's sensitivity and settling time in the software. When setting up schedule entries, you can select different sensors for taking the measurements.

- From the main menu choose **Edit>Manage>Sensors**.
- Use the **Add** and **Edit** buttons to enter or change the details of your sensor.

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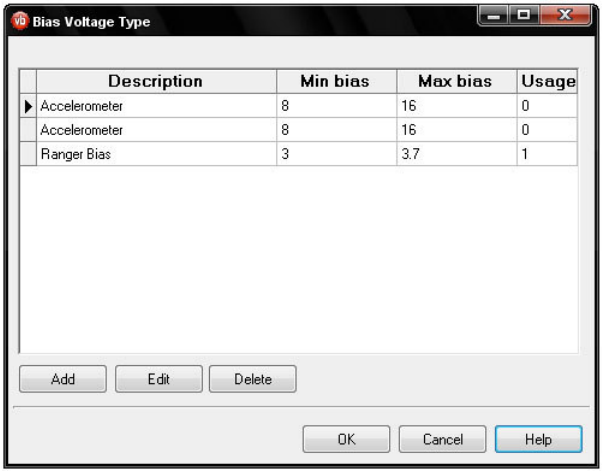


Note: When transferring sensors from the instrument to the software or the software to the instrument, they will be compared by name only - if you change the settings of the sensor it will not be transferred unless you first delete it in the software.

Bias Voltage Type

The Bias Voltage Type check allows Ascent to warn operators of errors or fault conditions such as short-circuits, faulty sensors or open-circuits by comparing the actual sensor bias voltage with the expected voltage range.

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Bias Voltage Type

Most accelerometers have an output voltage centered on 12 V DC. The default bias voltage range offered by the software is therefore 8 V to 16 V (providing 4 Volts of headroom above and below the typical output value).

Some sensors may utilize a lower or higher bias voltage. If using such a sensor, review the manufacturer's documentation and create a new bias voltage range to suit. To create a new Bias Voltage setting:

- Press the **Add** button. The new bias value window will open.



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- Type a name for the new bias value range entry into the 'Description' text field.
- Enter the required minimum bias voltage value into the 'Min Bias' field. This value should typically be 2-5 Volts *below* the anticipated minimum output voltage used by the sensor.
- Enter the required maximum bias voltage value into the 'Max Bias' field. This value should typically be 2-5 Volts *above* the anticipated minimum output voltage used by the sensor.
- Press **OK** to save the new entry.

Note: to edit an existing bias voltage record, select it from the Bias Voltage Type list and click the **Edit** button.

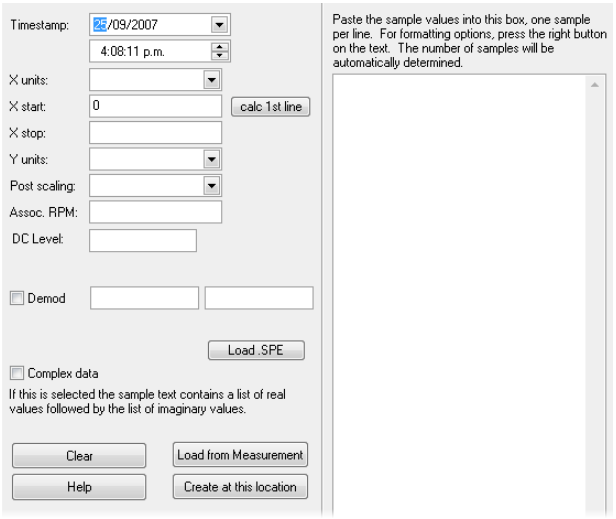
Manually Entering Vibration Data

Note: This feature will only be available to you if it is included as part of your license agreement. If you wish to enable this feature please contact sales@commtest.com or your distributor for more information.

Vibration data that has been previously collected and stored either on paper or in a spreadsheet program can be manually entered into the Ascent database.

- To manually enter these measurements choose **Edit>Edit Measurements...** from the main menu.

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- Fill in the information for the timestamp, units, x values and sample data and click the **Create at this location** button to add the measurement to the current location.

Timestamp: the date/time of the recording.

X units:

for waveform: secs, ms
for spectra: Hz, CPM

X start and **X stop:** the range of x axis values.

calc 1st line: sets **X start** to (**X stop** ÷ number of samples).

Y units: the left axis amplitude values (g, adB, mm/s, vdB SI, mm).

Post scaling: (spectrum only) the amplitude values (peak, RMS, peak-peak).

Assoc. RPM: the RPM of the recording.

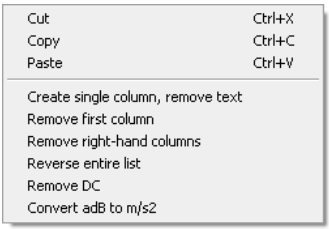
Demod: (demod spectra only) tick this option if this is a demod recording and enter the demod bandwidth in the two blank fields.

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Complex Data: if ticked, 'real' amplitude values must be given followed by all the 'imaginary' values. For each frequency bin in the spectrum there is a 'real' and an 'imaginary' amplitude that together define a 2d vector - from this vector the amplitude and phase for that frequency is calculated by the software.

The amplitude values must be pasted into the blank text area on the right. The number of samples will be determined automatically (by counting the number of lines) when you click **Create at this location**.

- You can also fill the form in using the currently selected measurement by clicking **Load from Measurement**.
- Right-click on the sample value text area to access some useful options that allow you to manipulate your data.



Create single column, remove text: removes all text, leaving only numeric values.

Remove first column: removes the first column of data if there is more than one.

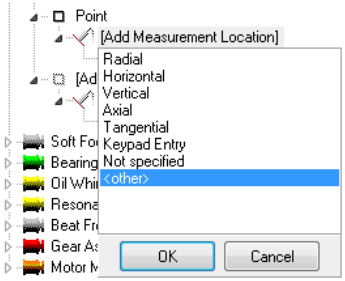
Remove right-hand columns: removes any columns to the right, keeping only the first.

Customizing Axis Names

When in Build Mode, you can define new axis/location names as you create your machines.

- Click **Build** on the toolbar to activate Build Mode then click an [Add Measurement Location] placeholder and select <other> from the list.

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- Click **OK**, enter a name for this location then click **OK** again to assign it. This new location will now appear in the drop-down list and can be assigned to other locations.

Editing, adding or deleting existing location names
Any location name that you define (and some of the defaults) can be edited. The first five default names in the list cannot be edited.

- To change an existing location name, from the main menu choose **Edit>Manage>Axis Names**.

- The Manager - Axis Name window contains options for adding, editing or deleting measurement locations. To edit or delete a location, select it from the list then click the appropriate button.

Note: The Ascent software prevents you from accidentally deleting a location name if it is being used by a machine.

Tagging

Tagging is a method of grouping selected items so that operations can be carried out on them collectively. Any data item can be tagged.

Operations that you can do with your list of tagged items include:

- Delete all tagged items (**Delete**).
- Change the RPM value of all tagged items (**Update RPMs**)
- Export all tagged items and their contents to a .vb file (**Export Tagged to File**).
- Generate an automated report of all tagged items (**Automated Report**).

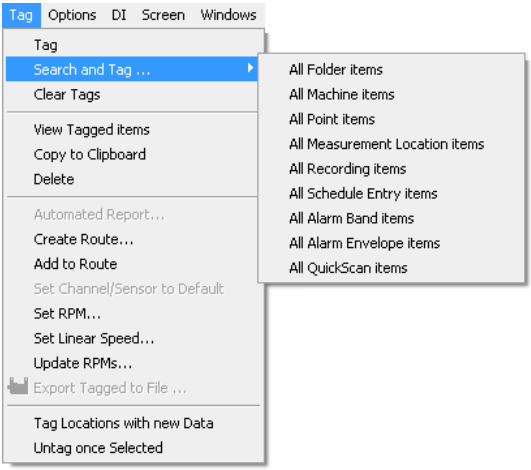
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- Reset all tagged schedule entries' channel and sensor settings to default (**Set Channel/Sensor to Default**).
- Create a route from all tagged measurement locations (**Create Route**).

All these operations can be accessed by choosing **Tag** from the main menu, or from the **Operations** menu of the Tagged Items window (choose **Options>View Tagged Items**).

- To manually tag items select them in the navigator and press **CTRL+T**. To un-tag, repeat the process.

- To automatically tag items choose **Tag>Search and Tag** to search the database for data that matches specific criteria.



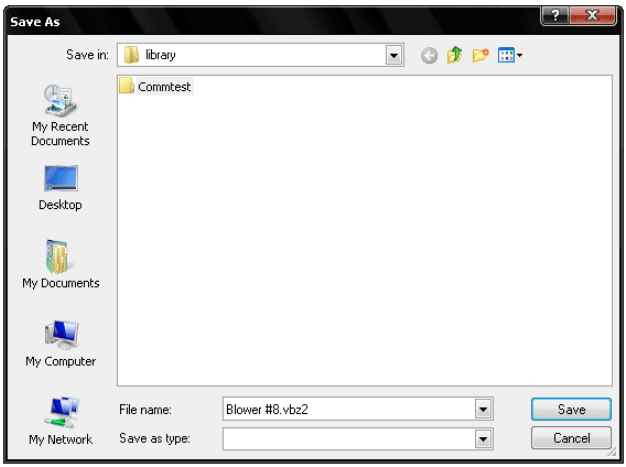
If you have a large number of items to tag it may be quicker to use the **Search and Tag** option and un-tag individual items. For example, to add all but a few measurement locations to a route you could tag all locations at once then un-tag the ones that are not needed.

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Storing Re-usable Components in the Library

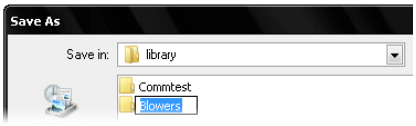
New machines can be created by either building them from re-usable components or by copying and re-naming entire machines. You can save a lot of set up time by storing commonly used components in the Ascent library e.g. alarm bands and envelopes, user-defined bearings, gears and machines etc. These components can be used as templates to build new machines. Having one central storage area saves you having to search through your folders to find the components you wish to copy. One way to set this up is to create folders within the library to hold different types of machine, and other folders for each type of component.

- To add an item, such as a machine to the library, right-click the item and choose **Library>Add Selection to Library**. The Save As window will appear, showing a list of the folders currently in your library.

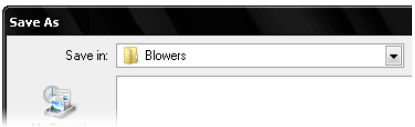


- If you don't have any folders set up you can create them at this time by clicking the Create New Folder button  on the top section of this window. A 'New Folder' icon will appear in the list. Re-name this to whatever you want and click away from the folder to save this name.

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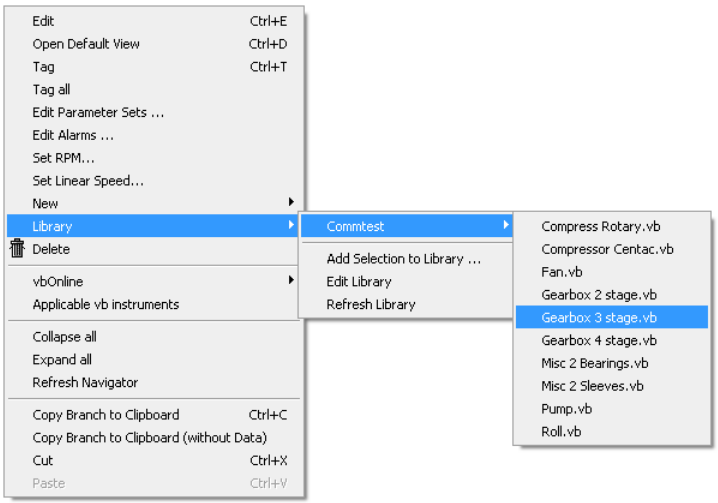
- Double-click the folder you wish to store your component in so that it appears in the top drop-down box then click **Save**.



Retrieving items from the library

To re-use a component stored in the library you need to import it.

- Right-click in the navigator area, choose **Library>Commtest** (or the folder you saved the component in) then select your required template file. This will be called <name of component>**.vb**.



- When the window appears asking you to name this new component, type in an appropriate name and click **OK**.

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Your new component will now appear in the navigator tree. Any changes made to this new component will *not* affect the template stored in the library as this component is a *copy* of the template.

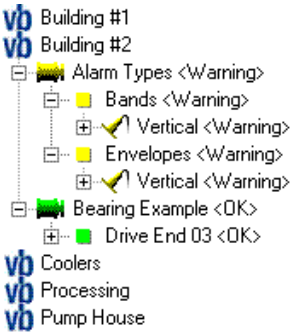
The Commtest supplied library templates use orders-based parameter sets. After importing a machine from these templates, select the machine (or point in the case of a gearbox) and choose **Edit>Set RPM**. Enter the running speed of the machine and deselect the option 'Only apply where there is no RPM set already'.

To edit the library
You can edit the library to delete unused templates or change the names of template files etc.

- Choose **Library>Edit Library**. You will be given an explorer style view of the library that you can use to copy, move or rename the library files and folders.

Opening an Entire Site

If you work with a large number of folders and spend a lot of time switching between them you can open the entire site. This will list all the site's folders in the navigator tree so that you can access the machines within them more quickly.



Navigator tree displaying all folders in a site

- Click the **Open** button on the toolbar. The displayed window contains all your sites and folders.
- Click the site you wish to open then click **OK**.

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- In the navigator tree, double-click any folder to open it.

Expanding and collapsing folders
To display the full contents of each folder (each machine and its points, locations etc) use the **Expand all** command. To close all the folders so that only the folder icon is showing, use the **Collapse all** command.

- Right-click anywhere in the navigator tree and choose **Expand all** to display the machine structures or **Collapse all** to hide the machines.

Switching Between Ascent Level 2 and Level 1

If you are using Ascent Level 2, you can switch between this and Ascent Level 1.

- From the main menu select **Options>Software Mode>Switch to Ascent Level 1**.

- To switch back to Ascent Level 2 again you must re-start Ascent.

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Section 8: Transferring Data

Importing and Exporting Data

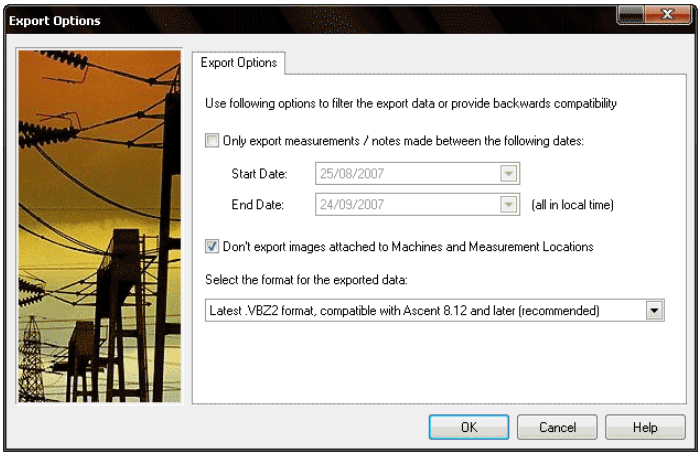
Information can be transferred to and from an Ascent database using the **Import** and **Export** functions. Folders, machines and even individual recordings can be transferred using the **Export** command to create .vbz files. These files can then be attached to an e-mail and transferred to a PC running the software at the other end using the **Import** command.

When you import data you must first select the place in the navigator tree at which you would like the data to be inserted. For example if you have tagged and exported a *measurement location* you must select a *point* in the navigator tree when you import it.

Exporting

- To export the current folder to a .vbz file open the folder then choose **File>Export Folder to File** from the main menu.
- To export an individual item such as a machine to a file, tag it first, then choose **Tag>Export Tagged to File**. This is a good way to build a set of machine templates. Remember to un-tag any existing items first using **Tag>Clear Tags**.
- To create a .vbz file that contains recordings from a specific date range only, choose **File>Export Folder to File**.

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- Select the first tick box to restrict data to a specific date range then use the drop-down boxes to choose the start and end dates.

- Select the second tick box if you want to exclude image files. (If you have many attached images, selecting this option will significantly reduce the size of the export file.)

- Select a format for exporting the data using the drop-down box then click **OK**.

Importing

- To import data from a .vbz file or a .vb file (from earlier versions of the software), choose **File>Import File** from the main menu. Locate the .vbz file and click **Open**. The data will then be transferred into the current folder.

- To import only new data from a .vbz file, choose **File>Import File as Update**. Any data that you already have in your database will not be duplicated.

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Import/Export as XML

Folders and their associated routes and schedule entries can be exported from an Ascent database as XML format files. XML files containing measurement data can also be exported from a vbSeries portable instrument equipped with a USB host port (found on vbSeries instruments with serial numbers above 40800) and imported into the Ascent software. This process provides a means of transferring data between the Ascent database and an instrument without a direct, real-time connection.

This feature could be used to generate an XML file containing a route and all associated machines and schedule entries. This file could then be emailed to an instrument operator in the field, and imported using an instrument's USB host port (no Ascent software required). The route would then be collected as normal and the measurements exported via the USB host port as XML once acquired. When returned via email, the instrument XML file can be imported into the Ascent software for normal measurement/route analysis.

Exporting

- To export the current folder to a .xml file click **Send** from the main menu.
- Select the 'Write to File' drop down box option beside 'Comms Method'.
- Click  and browse to the location the .xml file will be exported to.
- Check the tickbox beside the folder(s) you want to export then click **Send.** The XML file may now be imported into an instrument.

Importing

- To import an .xml file exported from an instrument, click **Receive** from the main menu.
- Select the 'Write from File' drop down box option beside 'Comms Method'.

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- Click  and browse to the import .xml file (on a USB flash memory drive, for example).
- Click **Receive.**

Note: A file exported from the Ascent software cannot be directly imported back into Ascent. The file must be imported into an instrument, then exported from that instrument. The file exported from the instrument may then be imported into Ascent. Only files exported from instruments included on your CLK can be imported into the Ascent software.

OPC Import

Note: the OPC Import feature currently supports only versions 2 and 3 of the OPC protocol.

OPC stands for 'OLE for Process Control'. It is a series of open standards based on Microsoft's OLE technology and used to support the movement of real time data from process hardware such PLCs, DCSs and other control devices to HMI (Human Machine Interface) display clients.

Ascent's OPC Import function allows process parameters exported from OPC-compatible devices to be recorded in the Ascent database. Wind turbines, drives, refrigeration units or other hardware equipped with internal sensors and monitoring equipment that is able to provide OPC-compatible output values can be added to the OnlineManager's schedule of measurements, alongside standard vibration and process measurements taken via vbOnline devices. This ability allows Ascent to trend values from existing data sources, and customers to use any compatible measurement device, including those from manufacturers other than Commtest Instruments.

These process control parameters can be trended and alarmed in Ascent, or even used to control the scheduling of other recordings.

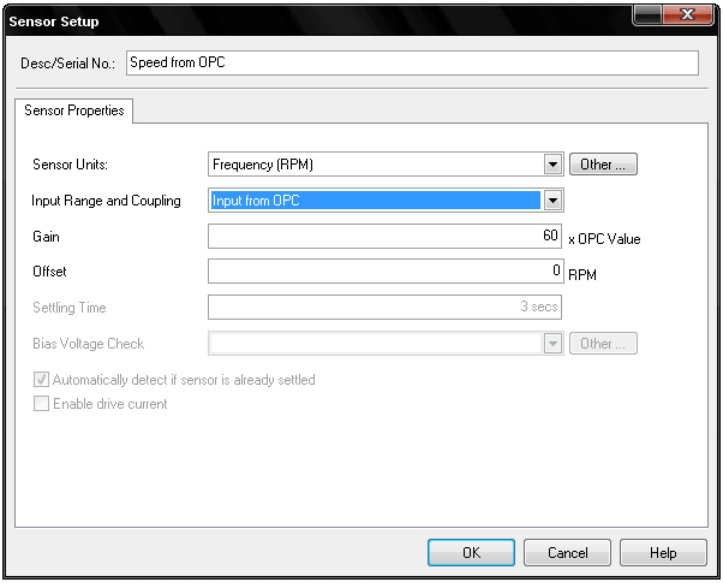
Within Ascent, OPC schedule entries define which OPC server to read the data from; which data source to record; how to scale the raw data obtained, and what engineering units to save data as. OPC schedule entry set-up is explained in the steps below.

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Configure Engineering Units and Scaling

This is achieved by setting up a special 'virtual sensor' within the Ascent software.

- From the Ascent main menu select **Edit>Manage>Sensors..**. The Sensor Manager will open.
- Click **Add..** then **Standard Sensor**.
- Select **Input from OPC** from the **Input Range and Coupling** dropdown list.



- Enter a description for this OPC sensor such as its signal type or OPC source ('WTG RPM from OPC', for example) into the **Desc/Serial No.** text field.

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- Choose a sensor unit from the **Sensor Units** dropdown list or click **Other...** if the signal type you wish to assign to the OPC value is not listed. **Other** opens the **Units** window where you can select the unit that your sensor will measure. (You can also define your own units by selecting a unit type that has no abbreviation listed in the right-hand column then clicking the **Edit** button and entering an abbreviation for your new unit).

- Enter a numeric value into the **Gain** text field. This value specifies the multiplier that will be applied to the raw data from the OPC input sensor. The default value is 100, but you may choose any value, including 1 to record a raw, unaltered, input value.

- Enter a numeric value into the **Offset** text field to directly alter the OPC input following gain adjustment. The offset addition/subtraction and gain multiplier work together to allow basic mathematical manipulation of the OPC input value. This ability can be useful for converting between units or adjusting output trims. For example, to convert an OPC value of Kelvin into Fahrenheit, select a Sensor Unit of Fahrenheit then set a gain value of **1.8** and an offset of **-459.72**. 1 OPC unit (in Kelvin) x 1.8 (Gain) - 459.72 (Offset) = Fahrenheit conversion.

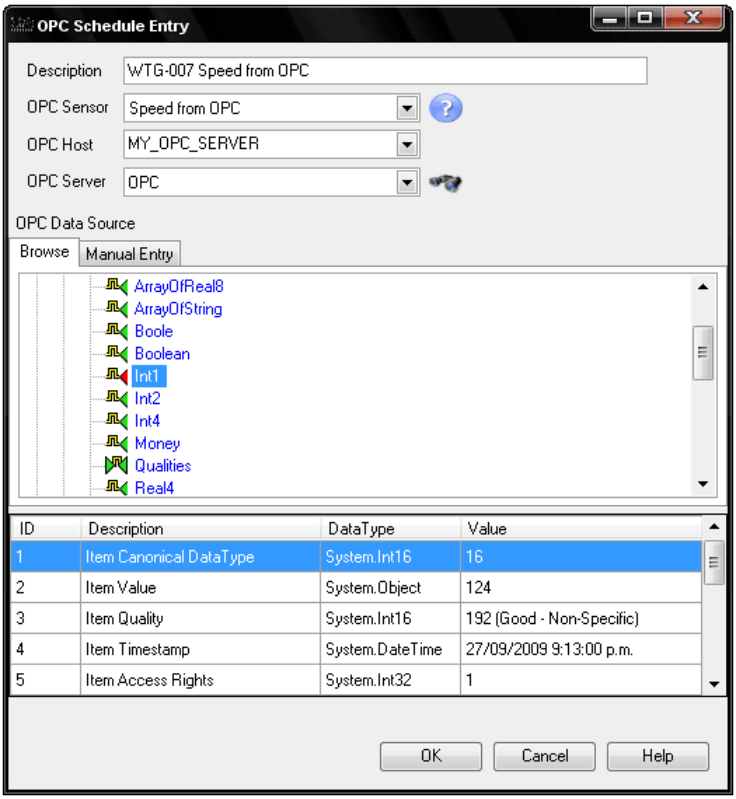
- Click **OK** to finish defining the sensor. The new sensor is now ready to be assigned to an OPC schedule entry.

Create an OPC Schedule Entry

Note: Before an OPC schedule entry can be configured, an OPC server must be running and available for connection. Contact your network administrator if you require the OPC server's IP address and host server.

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- From the Ascent Creation Palette press the **Add OPC Schedule** button ( ). Alternatively, right-click a Point or Location and select **New>Add OPC Schedule Entry**. The OPC Schedule Entry panel will open.



- Type a name for the new schedule entry into the **Description** text field.

- Select the OPC sensor configured above from the **OPC Sensor** dropdown list. If no sensor is selected, the raw OPC values will be stored in Ascent without scaling or engineering units.

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- Type the IP address or host name of the OPC server host computer into the **OPC Host** text field. An IP address will normally come in the form of '192.168.1.X' or '172.168.1.X' where X is a number between 1 and 256. The exact number sequence will vary in each network situation. Contact your network administrator if you require assistance.

- Select an OPC server from the **OPC Server** drop-down list. Servers will only be listed if the **OPC Host** field was correctly completed in the previous step, allowing the AscentOPC application to successfully connect the Ascent software to the OPC server.

- Select an OPC data source from the **OPC Data Source** field and click **OK**. The schedule entry will be displayed beside an OPC icon in the navigator list (under the measurement Location).

If the OPC tag entries are not displayed in the Browse window (that is, they are not being openly broadcast), click the **Manual Entry** tab and manually type the tag names of the OPC data items you wish to import. You may need to contact your IT department or to access the OPC server control panel for these details. The source you select should correspond with the process signal output you wish to record.

See Taking Recordings Manually to perform a simple test of the new OPC schedule entry to confirm that it is working as expected.

Once you have configured the OPC sensor and OPC schedule entry, an appropriate interval can be assigned to the schedule entry using the steps detailed in Step 4: Configure Recording Intervals. These recordings can also be used as criteria to control the acquisition of other recordings. For example, you may only want to take vibration readings when OPC informs Ascent that the Machine is running. This is explained in Criteria and Conditional Monitoring.

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Serial Data Input

Note: this feature applies only to vbOnline16 devices.

The vbOnline16 device's SDI (Serial Data Input) feature facilitates communications with external Serial-connected devices using standard protocols such as MODBUS RTU (Remote Terminal Unit). This feature allows data polling between the Ascent software and compatible hardware devices, including PLC controllers and oil analyzers.

Ascent software communicates with external MODBUS sources using a standard vbOnline16 device as an intermediary. The Ascent software and the vbOnline16 device communicate over a standard Ethernet connection, while the vbOnline16 device and the MODBUS device communicate using a standard Serial (RS232 RJ12) connection.

Note: The RS232 communication rate for SDI MODBUS communications is fixed at 19200 baud. The MODBUS server must be configured accordingly.

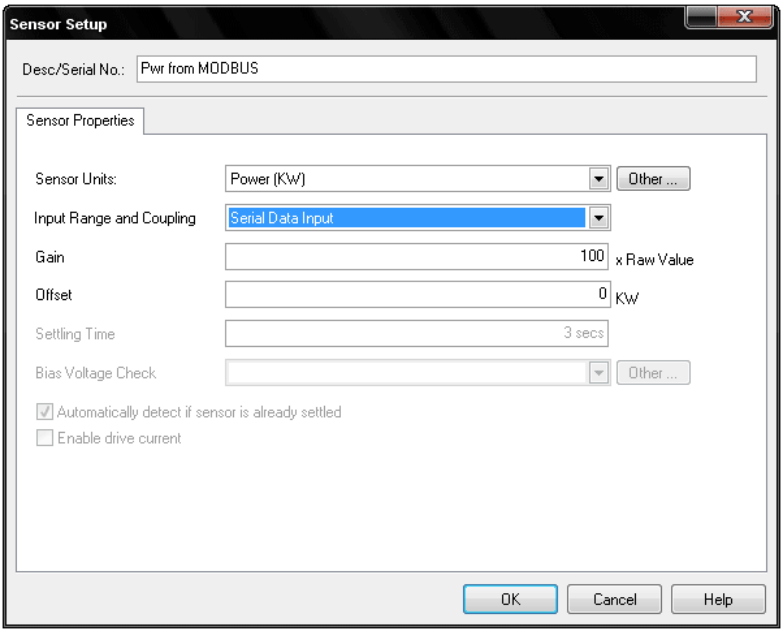
This reference guide details the configuration steps required within the Ascent software. It does not detail the configuration required in the source device, PLC or oil analyzers. See the device's documentation for this information before proceeding. The steps detailed below assume that the MODBUS source is already installed and configured.

Configure Engineering Units and Scaling

This is achieved by setting up a special 'sensor' in the Ascent software.

- From the Ascent main menu select **Edit>Manage>Sensors...**. The **Sensor Manager** will open.
- Click **Add...** then **Standard Sensor**.
- Select the **Serial Data Input** option from the **Input Range and Coupling** drop-down list.

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Assigning Engineering Units and Scaling

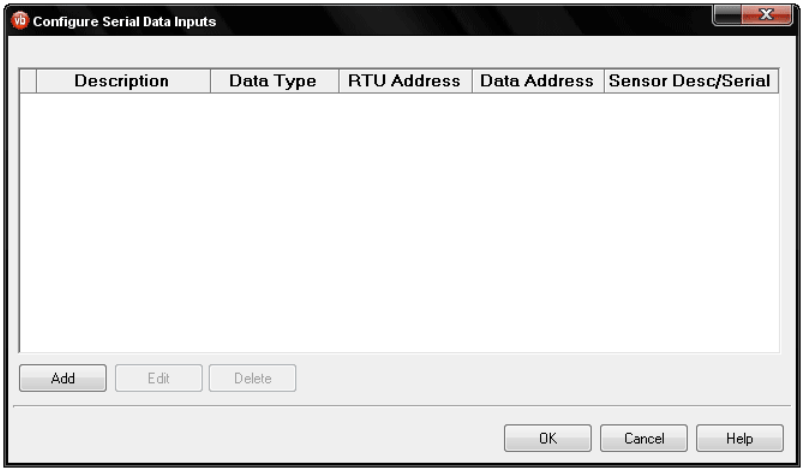
- Select the engineering units for the final scaled values. The **Other...** button provides an extensive list of options.
- Enter a numeric value into the **Gain** text field. This value specifies the multiplier that will be applied to the raw data from the Serial Data Input. The default value is 100, but you may choose any value, including 1 to record a raw, unaltered, Serial input value.
- Enter a numeric value into the **Offset** text field to directly alter the Serial input following gain adjustment. The offset addition/subtraction and gain multiplier work together to allow basic mathematical manipulation of the input value.
- Enter a description for this Serial Data scaling into the **Desc/Serial No.** text field.
- Click **OK** then **Apply**. The Serial data sensor is now created, and can be selected when creating an SDI schedule entry.

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Configure an SDI Schedule Entry

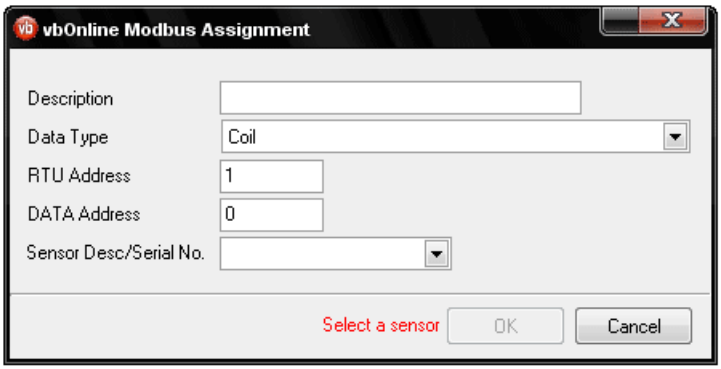
Notes: SDI schedule entries can only be created for vbOnline16 devices. A vbOnline16 device must be present in the Ascent database to proceed. To add a device do so now by pressing **CTL+ALT+S** then selecting **Add** then **Online Device**.

- From the Ascent main menu select **Edit>Manage>SDI Modbus...** The **Configure Serial Data Inputs** panel will open.



- Press the **Add** button. The **vbOnline Modbus Assignment** panel will open. Use this panel to configure your schedule entry.

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MODBUS Setup Interface

- Type a name for the schedule entry in the **Description** text field.
- Select a protocol value from the **Data Type** dropdown box. This controls the type of data to be read. For example, Coils and Inputs are simple on/off values, and Registers are typically 16- or 32-bit integers

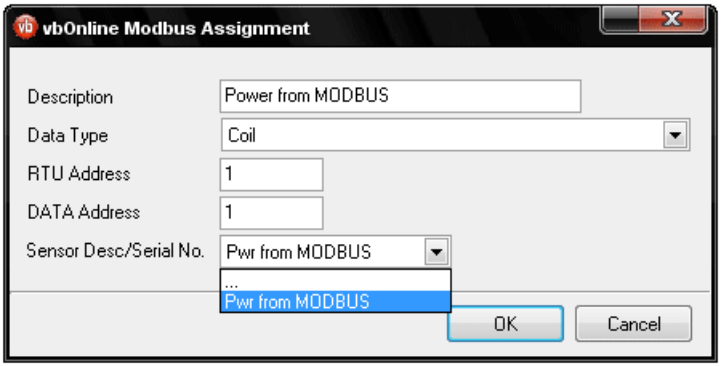
Note: Consult your MODBUS source's documentation to determine the type suitable for the attached equipment.

- Enter an address into the **RTU Address** text field. This address may be any value between 1 and 247. Consult your source device for address details.
- Enter a 1-5 digit address into the **DATA Address** field. This address may be any value between 1 and 10000 and will vary depending on the Protocol selected earlier and the MODBUS source device configuration. Available address ranges are as follows:

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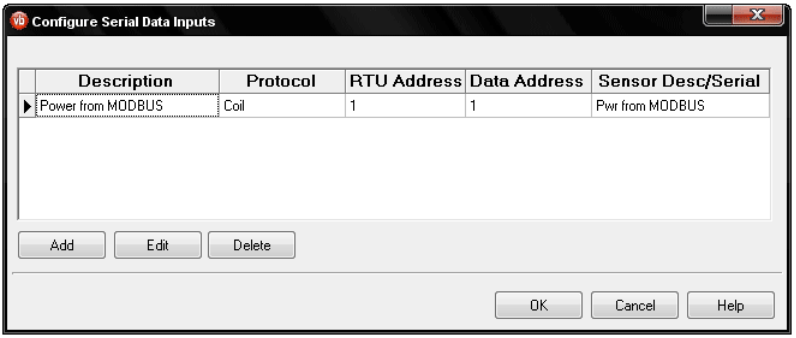
RTU Protocol	Name	Starting Address
Coil	Bits, binary values, flags	00001
Digital Input	Binary inputs	10001
Analog Input	Binary inputs	30001
Register	Analog values, variables	40001

- Select an SDI sensor from the **Sensor Desc/Serial No.** dropdown box. This will define the engineering units and scaling of the values. Any SDI sensors created using the steps described in **Configure the Engineering Units and Scaling** above will be listed.



- Click **OK**. The SDI configuration will be saved, and listed on the **Configure Serial Data Inputs** panel. Select an item and press **Edit** to make any changes needed or click **OK** to close this panel.

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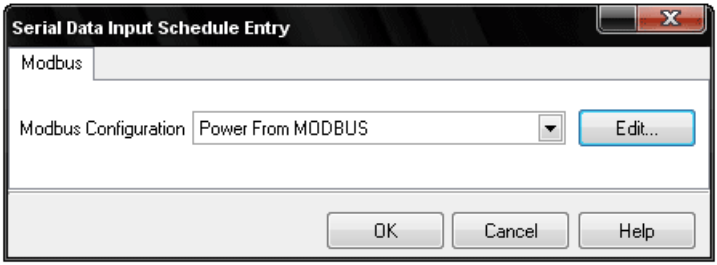


New SDI MODBUS Input

Apply an SDI Schedule Entry

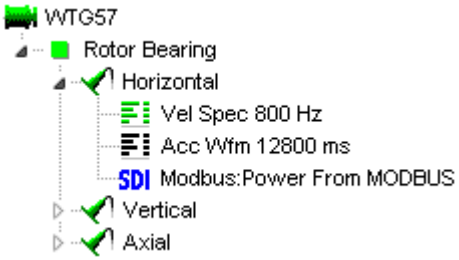
- Select a Point, Location or Schedule Entry from the left-hand navigator list, or create them as required. Select the Location.

- Press the SDI button (SDI) from the Creation Palette, or right-click the item and select **New>SDI Schedule Entry**. The **SDI Schedule Entry** panel will open.



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- Select an SDI Schedule Entry item from the dropdown list and click **OK**. The schedule entry will be displayed beside an SDI icon in the navigator list (under the measurement Location).



SDI schedule entry items are treated as conventional vbOnline schedule entries by Ascent and the OnlineManager. Open the Online Device Setup Wizard (**Edit>Online Device Setup**) to assign recording intervals or to use SDI measurements as criteria (via the **Intervals and Criteria** option in the Wizard). SDI measurements are acquired as specified in the Ascent software by the OnlineManager application. See Criteria and Conditional Monitoring and Step 4: Configure Recording Intervals for more information.

SDI measurements can be charted and trended using the main menu **Chart** options, or Numeric Data Alarms applied.

Offline Recordings with a vbOnline16 Device

Note: this feature applies only to vbOnline16 devices.

In the event of a network communications failure between the vbOnline16 device and the OnlineManager software, vbOnline16 devices can be programmed to store measurement data for, typically, 40 days*. Data is stored in an 8 MB memory block allocated to offline recordings. This memory acts as a simple circular buffer with new recordings added at regular intervals. Older recordings are overwritten by newer recordings when the device's internal memory capacity is reached.

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Once network communications are re-established, all stored measurement data are automatically transferred from the instrument to the appropriate Ascent database via the OnlineManager application. This feature ensures that trendable recordings are available even after extended network or server outages.

The Offline Recording Configuration panel includes options for specifying the recording interval to be used in the event of a network failure (for example, every 12 hours) until network communications are restored; for clearing the measurements stored in a vbOnline16 device, and for sending all individual offline recording configurations to their respective vbOnline16 devices within a database simultaneously (one-click updating).

Note: The offline recording feature is designed to act as a measurement repository in the event of a temporary network outage. To avoid data loss as a result of a power outage, an external battery capable of supplying power to the vbOnline16 device may be installed.

Initial Criteria are not applied to Offline Mode, instead the recordings are always taken irrespective of the criteria state. This is because Initial Criteria decisions are made in the OnlineManager, not in the vbOnline device. The required information may not be available on the device. If criteria are essential for your application, then Dynamic Criteria can be considered as they are evaluated onboard the vbOnline device.

*Based upon 8 channels recording, 3 recording types per channel, 2 sets of recordings per day at 1600 line resolution.

Configure Offline Recording Intervals

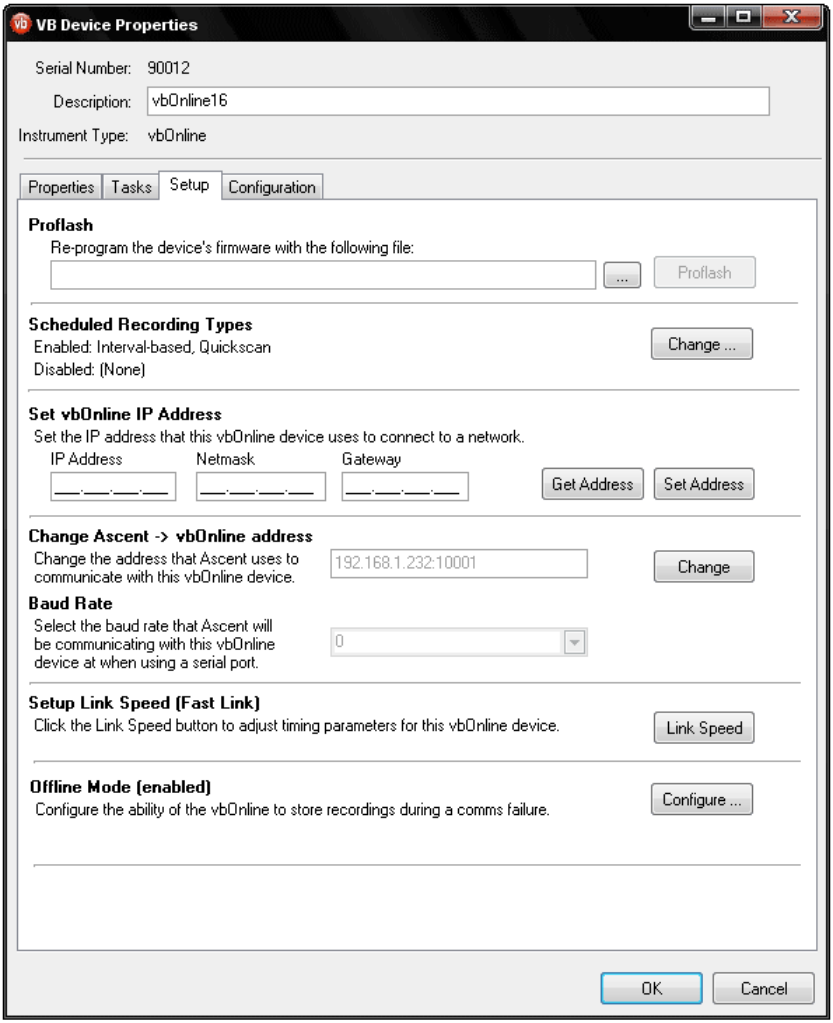
- From the Ascent software's main menu select **Edit>Online Device Setup** to open the **Online Device Setup** panel (or press **CTRL-ALT-S**).

- Select the vbOnline16 device from the selection window and press the **Edit** button. The **vb Device Properties** panel will open.

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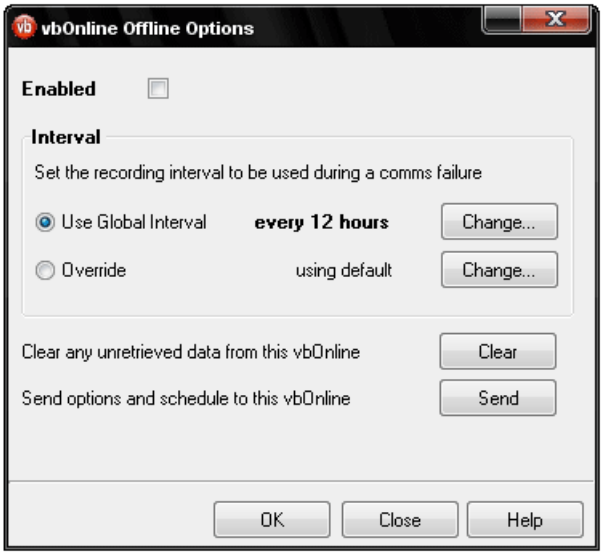
Note: This step assumes you have already added the vbOnline16 device to the Ascent database. If you have not, press **Add>Online Device** and double-click the device to add it.

- Click the **Setup** tab. Note the Offline Mode section near the bottom of the panel.



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- Click the **Configure…** button in the Offline Mode section. The **vbOnline Offline Options** panel will open.



vbOnline Offline Options Panel

- Click the **Enabled** checkbox to activate the offline recordings feature.

- Within the Interval area select a radio button. To use the default recording interval press the top option **Use Global Interval**. To specify a recording interval select the bottom option **Override**. Click the **Change** button beside the **Override** option to specify a recording interval, or beside the **Use Global Interval** option to change the default measurement interval. An interval of 12 hours is suitable for typical applications. Click **Accept**.

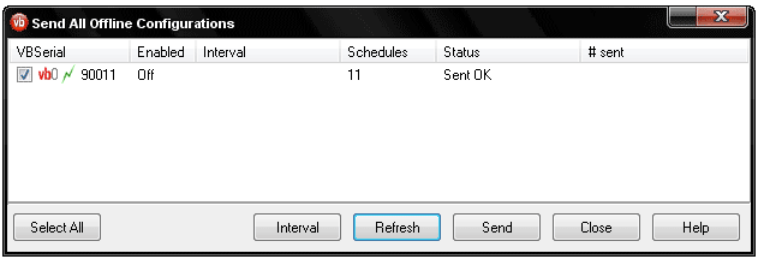
- Click **Send** then **OK** if you wish to apply to recording interval to the selected instrument.

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The **Send** button will send this interval value to the vbOnline device along with the details of **all** the conventional scheduled recordings. The steps required for configuring conventional online recordings are described at the beginning of this section (Creating Machines and Measurement Setups (page 35)). Once all conventional schedule entries have been set, the sensors specified and the recording intervals configured, the offline configuration should be sent by pressing the **Send** button.

Alternatively, to update the configurations on many vbOnline16 devices simultaneously:

- Select **Edit>Offline Configurations...** from the Ascent main menu. The **Send All Offline Configurations** panel will open.
- Click the checkbox beside each vbOnline device you wish to update, or **Select All** to select all listed instruments, then press the **Send** button.



Change Offline Measurement Global Interval

- Select **Edit>Offline Configurations...** from the Ascent main menu. The **Send All Offline Configurations** panel will open.

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- Press **Interval**. The **Change Offline Recording Interval** panel will open, displaying the current global default recording interval.



- Edit the interval period and unit then click **Accept**.
- Click **Refresh** on the **Send All Configurations** panel to update the panel with the new interval. Press **Send** to update the affected vbOnline instruments.

Note: Ensure the relevant vbOnline instrument checkboxes have been selected before sending.

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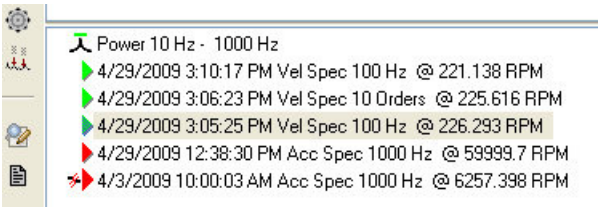
Clear Offline Recordings from a vbOnline16

To clear any unretrieved measurement data from a vbOnline16 device, press the **Clear** button on the vbOnline Offline Options panel.



Identify Offline Measurements in the Ascent Software

In the event of a network outage, measurements retrieved from a vbOnline device will be identified in the Ascent navigator panel with an offline measurement icon, as illustrated by the bottom recording below.



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Template Machines

Note: This feature will only be available to you if it is included as part of your license agreement. If you wish to enable this feature please contact sales@commtest.com or your distributor for more information.

The Template Machines system allows any new or existing collection of tree items within Ascent to be specified as a Template. These templates, which consist of an entire Machine and all of its associated Point, Location and Schedule Entries, can then be then deployed and used to generate or update any number of duplicated 'Child' Machines. This function is useful if your site includes many instances of common hardware components (such as drive motors, fans or turbines).

The ability to deploy Templates greatly simplifies the setup and maintenance time required for larger site installations. Each master Template Machine, including its Point, Location and Schedule Entry configuration may also be altered using the master Ascent software, and these changes then simultaneously propagated to all associated Child machines.

Template and Child Machines can be identified in the Ascent software by their status tags. Template Machines and associated items are displayed in the navigator list with a **[T]** label beside them. Child items are labeled with **[C]**.

Templates can also be changed and deployed in the AscentView Enterprise web-application, and the Templates associated with Child entries determined

Note: The ability to set templates and to apply templates are two individually licensed features. Under normal circumstances only a single 'master' Ascent instance will be licensed to create and edit Template Machines. All other associated instances will be allowed to apply these Template Machines to update or generate Child Machines, but cannot change existing Template Machines or create new Template Machines. If the Template Machines feature is used on a single Ascent installation in a closed-loop environment both license capabilities should be applied to the same Ascent installation.

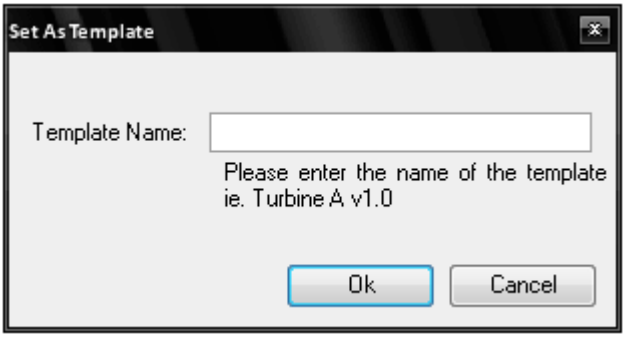
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Create a Template Machine

To create a Machine Template:

- Configure a Machine containing the required number of points, locations and schedule entries, or select an existing Machine. Any schedule entry types may be configured. It is not necessary to assign a vbOnline device to schedule entry recordings if the file Template file will be exported then imported to another Ascent software instance (at another location, for example) as the instrument must be assigned locally.

- Right-click the Machine name in the navigator panel and select **Template>Set As Template**. The **Set Template** panel will open

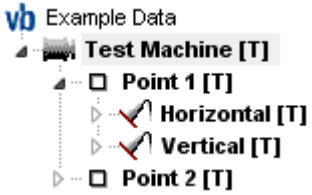


Template Name Form

- Type a name into the **Template Name** text field. We recommend that you enter a version number as part of the Template name. Doing so will allow you to track Template versions as modifications are made over time then propagated to Child Machines.

- Click **OK**. The Template will be created and a confirmation message will be displayed. The Machine name and elements listed in the navigator list will be displayed in bold text, and all element names will be labeled with a **[T]**.

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Template Machine

Note: The Template Name will be used as the default name for exported Template files (see Export or Import a Template File (page 254)). The Template Name can be edited by right-clicking a Template Machine and selecting Edit. The version number of the Template should be updated whenever it is edited to ensure each version is tracked.

Export or Import a Template File

Once a Template Machine has been configured and created, the Template information can be exported as a vb Template (.vbt) file. This file can then be sent to another copy of Ascent (via email, form example) and imported. Any number of Child Machines can be created using the Template file, each a copy of the Template. Child Machine created previously using older Template files can also be updated with newer Template files.

To export a vb Template file:

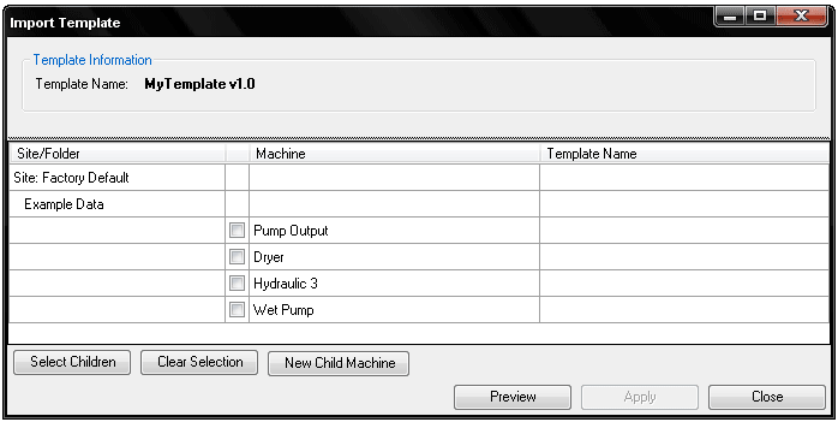
- Right-click a Template Machine in the navigator list and select **Template>Export Template File**. The Save window will open. Navigate to an appropriate location and save. The default file name will be the Template name.

Note: While it is possible to change the name and version number of the exported file at this point, we recommend that you update only the Template name to avoid confusion (right-click Template Machine in the navigator list and select **Edit**). When the .vbt file is imported, the Template name will be displayed regardless of the vb Template file name. Leaving the vbt file with its default name will ensure the Template name and exported file names match one another.

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To import a vb Template file:

- Right-click the Folder icon and select **Template>Import Template File**. A selection window will open.
- Choose a vb Template (.vbt) file and click **OK**. The **Import Template** window will open.



Import Template

The Import Template panel can be used to:

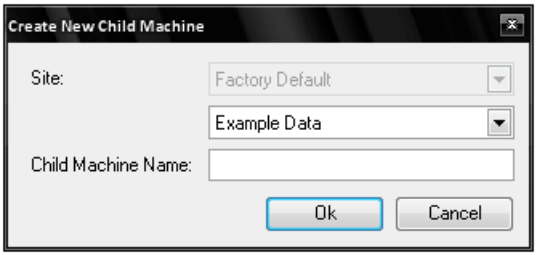
- Create new Child Machines using a vb Template file (see Create a Child Machine)
- Update existing Child Machines with a newer vb Template file (see Update a Child Machine))
- Preview changes made to vb Template files (see Preview Template Changes)

Create a Child Machine

- Right-click the Folder icon and select **Template>Import Template File**. A selection window will open.
- Choose a vb Template (.vbt) file and click **OK**. The **Import Template** window will open.

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- Press **New Child Machine**. The **Create New Child Machine** panel will open.



Create Child Machine

- Select the Folder you wish to create the new Child Machine within, and enter a Machine name in the **Child Machine Name** text field.
- Click **OK**.

Update a Child Machine

To apply an updated Template file to existing Child Machines:

- Right-click the Folder icon and select **Template>Import Template File**. A selection window will open.
- Choose a vb Template (.vbt) file and click **OK**. The **Import Template** window will open.
- Select the checkboxes beside the Child Machine(s), or press **Select Children** to select all Child items, then click **Apply**. The selected Child Machine(s) will be updated.

Apply a Machine Template to an Existing Machine

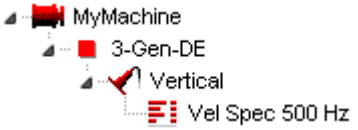
An existing Machine Template can be applied to any existing Machine within a database.

- Right-click the existing Machine name in the navigator list and select **Template>Import Template File**. A selection window will open.
- Choose a vb Template (.vbt) file and click **OK**. The **Import Template** window will open.

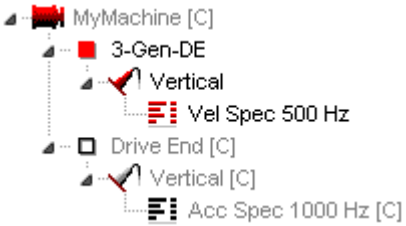
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- Click **Apply**.

The Template Machine will be applied to the existing Machine. Any new points, locations and schedule entries contained in the Template Machine will be overlaid onto the existing Machine. Any points, locations and schedule entries already contained in the existing Machine will be retained as independent 'free' items.



Machine before Template applied



Machine after Template applied

In the example above, note that the '3-Gen-E' point, 'Vertical' location and velocity spectrum schedule entry are retained as free items when the Template Machine is applied. These items can all be edited normally. The Template Machine's 'Drive End' point, 'Vertical' location and acceleration spectrum schedule entry are added as new Child items. The Machine itself is also converted to a Child of the Machine Template.

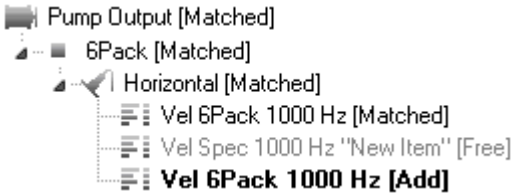
Preview Template Changes

- Right-click the Folder icon and select **Template>Import Template File**. A selection window will open.
- Choose a vb Template (.vbt) file and click **OK**. The **Import Template** window will open.
- Select a Machine to compare the new vb Template against.
- Press **Preview**. The **Preview Report** panel will open.

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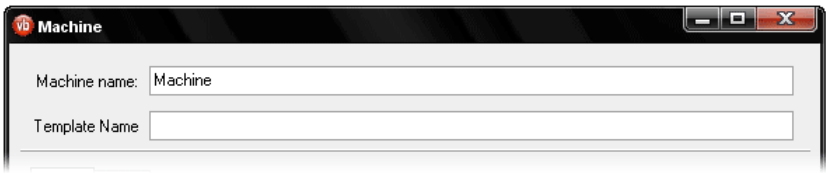
The Preview Report panel displays the selected Machine as it would appear with the selected Template applied. New items that would be added to the Machine by the new Template file are listed with an **[Add]** tag. Items that have not changed *name* in the new Template Machine file configuration are listed as **[Matched]** (although the included schedule entries may have been modified).

If the vb Template file is applied to a Child Machine with independently created point, locations or schedule entries, these will be tagged as **[Free]**. These items will be left untouched if the vb Template file is applied (applying a vb Template does not delete or alter 'Free' category items).



Edit or View Template Name

- Right-click a Machine in the navigator list and select **Edit**. The **Machine Editor** panel will open.



The Template name is listed in the **Template Name** field. To edit, type a new name into the text field and click **OK**.

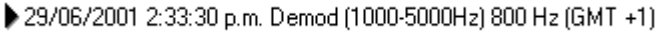
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Release a Child or Template Machine

- Right-click a Child Machine (identifiable by its **[C]** tag) or a Template Machine (identifiable by its **[T]** tag) and select **Template>Free Template**. The machine will be released and converted to a Free item. To re-apply a vb Template file see the Apply a Machine Template to an Existing Machine (page 256) section.

GMT Handling and Time Zones

If recordings are taken in a time zone different to that of the local PC the GMT offset will be shown in brackets alongside the recording in the navigator.



- To change the date/time of the recording to its equivalent local time right click on it and select **Change to local time**.

All recordings are internally stored in Greenwich Mean Time (GMT). The local time offset is also stored with each recording and this value is used to show the correct date/time for a recording in the *local* time of the instrument that recorded it.

Viewing/Editing a recording's local time offset

- Right-click the recording in the navigator and select **Edit** then change the GMT offset in the top-right of the window.

Viewing/Editing an instrument' GMT time offset

- To see the instrument's time zone setting select **Edit>Manage>vb Instruments** from the main menu and double-click on the vb instrument of interest.

- In the 'Properties' tab window you will see a 'Time Zone' field. In here you can enter a GMT offset that will be used for recordings received from this instrument. The default setting is 'Same as PC' which means that the system time zone will be used.

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Editing the Windows system time zone

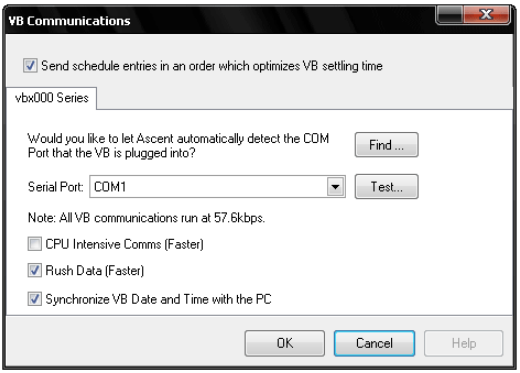
- The Windows system time zone can be changed by double-clicking on the clock in the bottom-right of the Windows taskbar and selecting the 'Time Zone' tab window.

Configuring vbX000 Instrument Communications

Note: This topic applies only to vbX000 instruments such as the vb3000 and vb2000 analyzers.

If the software cannot detect the instrument when you attempt to **Send** or **Receive** you can change the COM port being used.

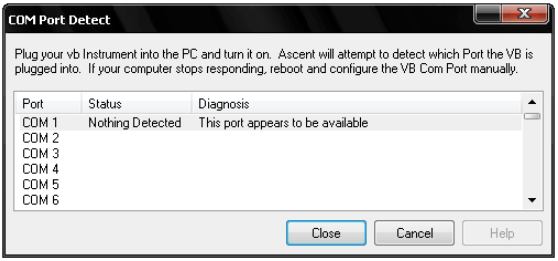
- Select **Options>Configure VB Comms** from the main menu.
- Select the COM port from the drop-down box or click **Find** to let the software automatically detect this for you.



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Connect an Instrument via Serial COMs

With a vbX000 instrument connected to your computer by serial cable, press **Find**. The COM Port Detect widow will open and Ascent will begin scanning your computer's COM ports.



If an instrument is found it will be connected automatically and the window will close. If an instrument is not found, Ascent will continue scanning ports until the **Close** or **Cancel** buttons are pressed.

To manually select a serial port, click the Serial Port dropdown list on the VB Communications panel and choose the port your instrument is connected to, then click Test.

Reducing Settling Time

When 'Send schedule entries in an order which optimizes settling time' is ticked the Ascent program will re-order the schedule entries when sending a folder to the instrument. This ensures that measurements that are at the same location are taken in the most efficient order e.g. acceleration measurements first, followed by velocity then displacement (which has the longest settling time of all). The re-ordering of measurements will reduce your data collection time.

- To set this option select **Options>Configure VB Comms** from the main menu and tick the appropriate box.

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CPU Intensive Comms

When this mode is enabled the PC will use 100% CPU time while communicating with the instrument. If you are using a laptop and want to keep battery consumption to a minimum you can disable this option. It will make a difference of 0% to 10% of the download times depending on the speed of the PC. If Rush Data is turned on this option will make minimal difference.

Rush Data

Note: This option is available with vbX000 firmware 2.15 and higher.

When this mode is enabled the PC will attempt to download data from the instrument in much larger chunks. This will greatly improve the download times, usually by a factor of about 3x compared to when Rush Data is not turned on.

If the serial communications line is error-prone, there is the possibility that Rush Data will slow down significantly. This has not been observed on any known systems; however, we provide the option to turn Rush Data off just in case.

Synchronizing the Instrument Date/Time with Your PC

The date/time of your PC may differ from that of the vb instrument, particularly if you are receiving recordings taken in a different country or time zone. You can synchronize the time clock of the instrument with your PC by automatically updating the instrument's date/time each time a **Send** or **Receive** function is carried out.

- To set this option select **Options>Configure VB Comms** from the main menu and tick 'Synchronize VB Date and Time with the PC'. Once activated this feature remains on and will continue to update the instrument's time clock every time you do a **Send** or **Receive**.

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Troubleshooting vbX Network Communications

Note: This topic only applies to vbX series instruments such as the vb7 and vb8 analyzers. Before changing your network configuration, ensure a firewall is not responsible for your communication difficulty by temporarily disabling any active firewalls (Windows Firewall, for example) and checking that the Commtest application 'masvb32.exe' has been given permission to access your network (i.e. it has an 'exception' rule applied to it, if using a firewall).

Changing the Ethernet network address
vbX series instruments and the Ascent program use a default network address to communicate. This address should not need to be changed unless the default network settings conflict with those of your current network. You can test this by observing if other network connections are lost while the instrument is connected to your computer, and are restored when you unplug the instrument. To fix this problem you can change the network settings in the instrument and Ascent program.

Notes:
Your changes will only take effect once the instrument hardware is reset.

If you change the network address you must change it in both the instrument and software so that they can communicate (this does not apply if you are only changing the last digit of the IP address).

- Power on your instrument and plug it into the network using an Ethernet cable.
- In the Ascent program select **Edit>Manage>vb Instruments...**
- When the **Manage Instruments** window appears, select your instrument with the mouse then click **Edit**.
- In the **Ethernet** field of the 'Setup' tab enter a new IP address.

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- Click **Apply**. A message will appear informing you that the IP address has changed and the vbX screen will display a message asking you to reset the instrument. Press 5 +  to perform the reset.
- Click **OK** twice to close the Ascent windows.

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Section 9: Managing Your Data Storage Effectively

Once you have set up a program for collecting and storing machine information you will potentially store many hundreds or even thousands of recordings in your Ascent database. If a database is allowed to become very large it will eventually slow down the software's data retrieval and display times.

While it is important to collect enough historical data to be able to trend a machine's condition over time, it is not necessary to keep every recording ever taken on each machine.

To reduce the size of your Ascent database you will need to reduce the number of recordings stored within it. There are several approaches you can take to do this:

1. Periodically thin your database by deleting old recordings e.g. those that are more than a year old.
2. Backup your database regularly (every few months or so) and store these old recordings separately on your hard drive or on CD-ROM then delete all recordings from the 'active' copy of your database. If you use the software's Data Thinning function you can selectively delete all recordings excluding baselines (see Data Thinning on page 266 for more information).
3. Use the software's database optimization tools to compact the database and reclaim lost space, which will help to speed up the software if the program is getting noticeably slower. See Database Optimization (page 272) for more information on backing up your database and using the database optimization tools.

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Data Thinning

Data thinning allows you to 'thin out' your recordings by removing unneeded historical data. This can significantly reduce the size of your database thereby improving the speed of data retrieval and display. A thinned out database will also take up less room on your hard drive.

Note: Databases must be backed up and restored after thinning before hard drive space will be reclaimed.

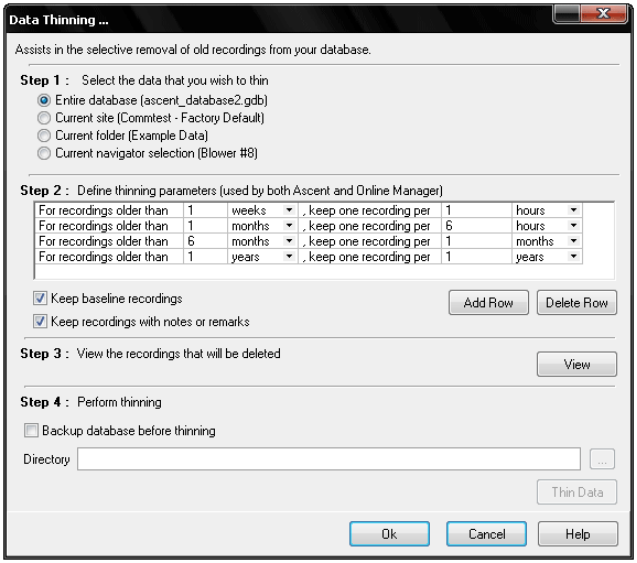
You can use the data thinning feature to keep different numbers of recordings for different time periods e.g. to keep most new recordings but only keep a few recordings from 6 months ago and even fewer recordings from 1 year ago. To help avoid accidental deletions you are required to view the recordings before deleting them. You also have the option of creating a backup file that can be used to restore the deleted data.

Note: If you are using a vbOnline device rather than a vb portable you can configure the OnlineManager program to automatically run the thinning process regularly. See the *vbOnline Reference Guide* for more information.

Data thinning lets you selectively remove recordings from a database, site, folder, individual machines, points, locations or schedule entries by selecting them in the navigator.

- Select a level in the navigator from which you wish to remove recordings (e.g. select the entire folder or an individual machine or location) then from the main menu select **Database>Data Thinning**.

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- **Step1:** Select an option for removing recordings (e.g. the currently selected navigator item).

  Step 2: Choose how many recordings you want to keep over a specified period. Use the drop-down boxes and type numbers into the blank fields to complete this sentence: "For recordings older than X days/months..., keep one recording per X minutes/hours...".

  Example: "For recordings older than 2 days, keep one recording per 6 hours".

  You can specify additional periods by clicking **Add Row**. Any additional rows must have a time defined *further* in the past than the preceding rows.

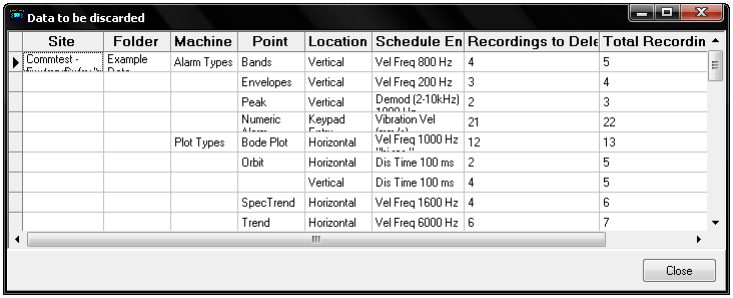
  Example:
  "For recordings older than 2 days, keep one recording per 6 hours"
  "For recordings older than 2 weeks..."
  "For recordings older than 2 months..."

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Note: Add Row and **Delete Row** will always add or delete the bottom row.

- To keep all baseline recordings or those that have notes or remarks associated with them, tick the 'Keep baseline recordings' of 'Keep recordings with notes or remarks' checkboxes.

- **Step 3:** Click **View** to see the specific schedule entries and number of recordings that will be deleted, and the total number of recordings that exist for that schedule entry. (The **Thin Data** button will not become active until you view the records.)



- Click **Close** to close this window then make any changes to your thinning criteria if necessary.

- **Step 4:** If you wish to backup your database before removing recordings, tick the box and specify where the backup should be stored by either entering the file path or using the  button to navigate to a backup folder. When you are ready click **Thin Data**.

Notes:
If you make a mistake you can use **Database>Restore>Restore from Backup** to restore the data using the backup file you made in the last step.

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If a recording that has a corresponding multi channel recording is marked to be kept then these recordings will be kept. This does not guarantee that orbit plots will be preserved. Orbit plots may only contain an x axis or a y axis after thinning.

Backing up a Database

A backup of your database provides a 'known good point' to revert back to should your database ever become corrupted. The entire database of information should be backed up regularly to avoid the risk of data loss.

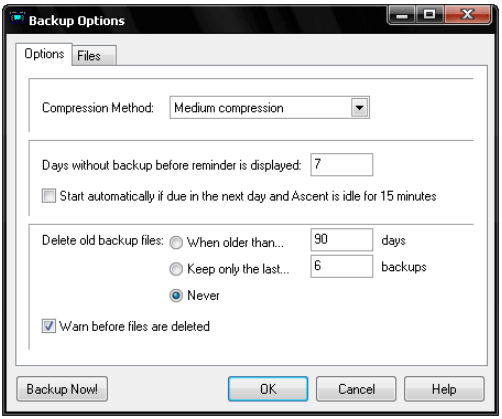
- To back up the database choose **Database>Backup Now!** from the main menu.

Backup files are automatically named with the date and time that the backup was performed, and include the name of the database that the backup file was taken from.

Note: We recommend that you save copies of your backup files onto a network server or to CD-ROM, in case of computer hard disk failure.

Carrying out automatic periodic backups

The Backup Options window is where you can set options for creating and deleting backup files automatically and also restore a database from a backup file.



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- To access this window choose **Database>Backup Options**.
- Select a compression method from the drop-down box and choose other options as required.

Setting the 'Days without backup before reminder is displayed' option to a value less than two and enabling the 'Start automatically' option will cause backups to be taken every 15 minutes when the software is idle (not recommended).

- Click **Backup Now!** if you want to backup the database immediately then click **OK** when you are finished.

Changing your Backup Directory

The backup files are stored by default in a folder named 'Backup' in the directory that the software was installed into.

- To change this path choose **Database>Backup Options...** then click the 'Files' tab.
- Type your new path into the 'Backup Directory' field or click **Browse** and navigate to the location you would like your backups stored.

Backing up Files to a Shared Network Folder

To specify a shared network folder for backups, follow the instructions in the previous topic for changing the backup folder and enter the network path using the following format:

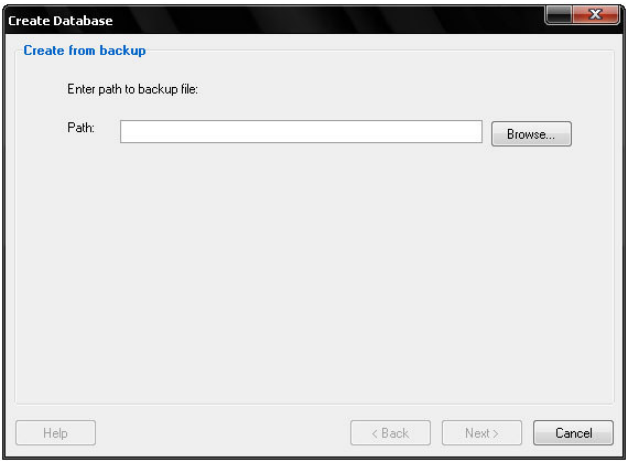
\\ServerName\share_name\file_path

Restoring a Database

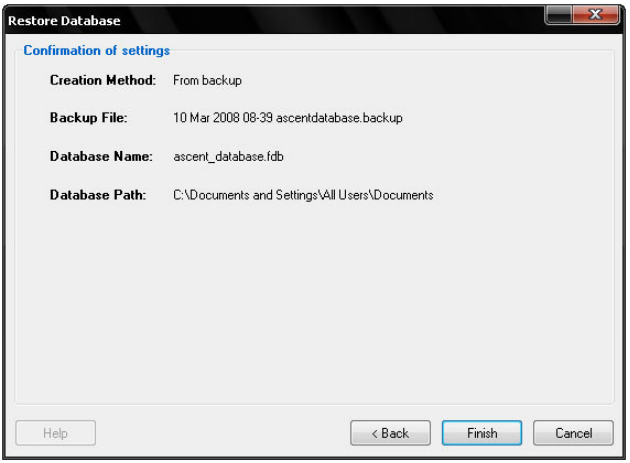
If your computer's hard disk fails or your database becomes corrupted you will need to select your latest backup file and restore the Ascent database.

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- From the main menu select **Database>Restore>Restore from Backup** or, to create a new factory default database, **Database>Restore>Restore from Factory Default**.



- If you selected **Restore from Backup** click **Browse** to navigate to a specific backup file then click **Open** then **Next >**. You will not be asked to select a database if you chose **Restore from Factory Default**.



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- Check that the backup file chosen is correct, then click **Finish**. The restore process will now proceed; some windows and progress bars will appear.

Note: The backup will overwrite your active database. Any recordings that have been taken since the last backup will not be in this file and will therefore be lost.

Database Optimization

The database engine used by the software stores the entire database in a .GDB or .FDB file (database file). This section describes how to ensure that the .GDB or .FDB file is being used efficiently.

Where to store the .GDB/.FDB files
The database file must be stored on a hard disk local to the computer that is running the database server. On Windows XP and Vista systems there is a feature called 'System Restore' that will track modifications to your system setup by monitoring changes to files in non-document folders. If the .GDB or .FDB file is not stored in a document folder System Restore will log all changes to that file, causing the software to slow down during database access. A document folder is any folder that belongs to the Documents and Settings folder on the hard disk. Any other folder, such as a folder within the Program Files folder, will be subject to System Restore.

To get around the System Restore problem, save your database file (.GDB or .FDB file) in a folder within the My Documents folder, rather than in Program Files.

Example:

- Start the software.
- Backup the database.
- On the toolbar click **Database>Create Database>Create from Backup**.

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- Click **Browse** then browse to a a backup to restore from. Ensure the newest is used. Click **Next >** then **Browse**. Navigate to your My Documents folder and save the database there with a name of your choice. Go to My Documents by clicking the drop-down box at the top of the screen.

- Click **Next** and check that the file paths specified are correct. Click **Finish**.

The original database file will still remain in the original position for you to manage (delete or save after the change).

It is worth following the above instructions to re-locate the database for optimal performance.

Reducing Database Size

Backing up and restoring a database can help reduce the size of the database and increase its speed. Unused space in the database file is reclaimed and the data is de-fragmented.

- Create a backup of the database by selecting **Database>Backup Now!**

- Now create a new database. On the toolbar click **Database>Create Database>Create from Backup**.

- Select the new backup file you created before and save this over the top of the existing one.

Rebuilding a Database

Rebuilding a database re-indexes the tables and re-orders items so that database accessing is more efficient. After many records have been added or deleted from the database you may be able to get a slight improvement in database speed by rebuilding the database indexes.

- From the main menu select **Database>Rebuild Database** to perform this operation.

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Section 10: Handling Large Amounts of Data with Views

Walk-through: Creating Your Own Views

The Ascent software lets you create your own customized views to display data in any combination of ways. For example, you can create a view that plots a stacked chart of the last 4 velocity spectra on the left of the screen, and a trend of the last 50 overall RMS measurements on the right of the screen. You can specify whether you want alarms, notes and chart remarks to be visible on your custom view and set axes to use the units of your choice. You can even specify a 'target' to apply your custom view to e.g. to plot data from an entire machine or individual points, locations etc on a selected machine.

Note: If you have any trouble creating a specific view for your needs, please contact help@commtest.com with details of the kind of view you are trying to build. We will be happy to assist you.

The process for creating a view can be summarized as follows:

- Create an empty view.
- Create a layout for that view by splitting the screen into segments if desired.
- Add components such as a report or chart to the view.
- Set a 'target' for the view (if desired) so that it can be applied to a specific navigator item. The default target for a view is the schedule entry but you can change this so that your view can be applied at the machine, point or location level.
- Further customize the view if desired by including/excluding details such as notes, and restrict the amount or type of data that can be displayed (set the number of recordings to plot, only display velocity data etc).

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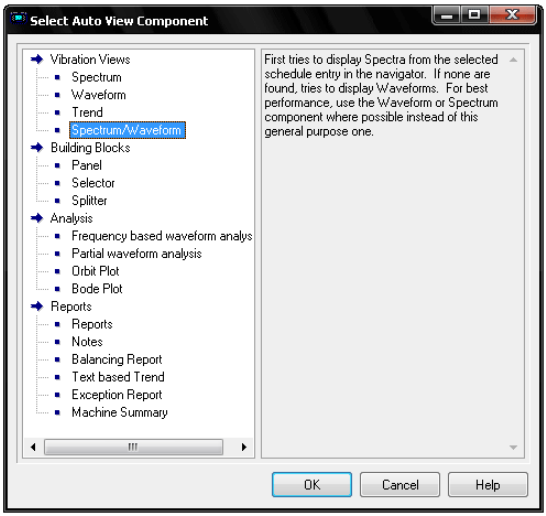
Note: Another good way to make a view is to start with a view that already exists then use **View>Save View As** to give it a new name and build on it from there. This technique is explained shortly in Saving Changes to a View (page 286).

You can design as many views as you want. The following walk-through will guide you through the basic steps of setting up a combined Waterfall and Trend view. The waterfall chart will plot the last 6 recordings only, while the trend chart will plot all available recordings. When this task is complete, we will explore some of the more detailed features that can be included in a view.

- First, open a folder containing some recordings so that you will have some data to plot as you create the view.
- From the main menu, choose **View>Create new View**.
- Enter the title 'Waterfall Trend' for this new view then click **OK**. This title, without spaces, is also used by default as the file name (WaterfallTrend.av) for this view in the Autoview folder.

You will now have an empty view (a blank chart or report) that is ready to accept components. The Select Auto View Component window will be open in the middle of the screen.

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Note: The components shown in this window may differ from those on your PC as the software will only display the features you are licensed to use.

The Select Auto View Component window contains all the basic components for building your views. Selecting an item will display a description of it in the right-hand pane of the window. Select some components now and read their descriptions so that you can learn more about what can be displayed in a view.

The first component we will add to our view is a splitter so that we can 'split' the screen into two parts. We will put the trend chart on top and the waterfall on the bottom.

- From the Select Auto View Component window, choose **Splitter** then click **OK**. The label 'Click here to add a component to this splitter' will be displayed in the middle of the screen.

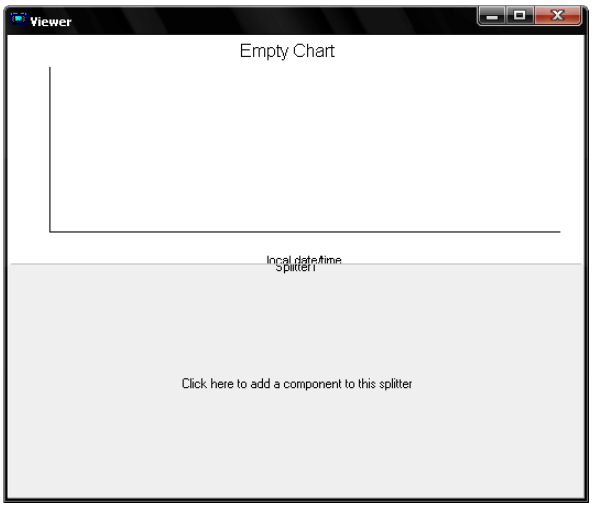
Now we need to tell the splitter how we want the screen to be split - this can be top to bottom or left to right.

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- Right-click the chart and select **Layout Top-Bottom**. This will split the screen into two halves so that we can add our trend and waterfall charts. (The split will not become visible until we add a component.)

Now we will add our first chart to the view.

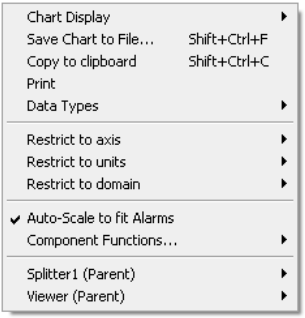
- Right-click anywhere in the empty view and choose **Set Top Component**.
- From the Select Auto View Component window choose **Trend** (under Vibration Views) then click **OK**. This will place a trend chart at the top of our view.



The trend chart is empty because we haven't selected any data to plot. You can test your view now if you want by *single-clicking* a schedule entry (double-clicking the schedule entry will plot the latest recording).

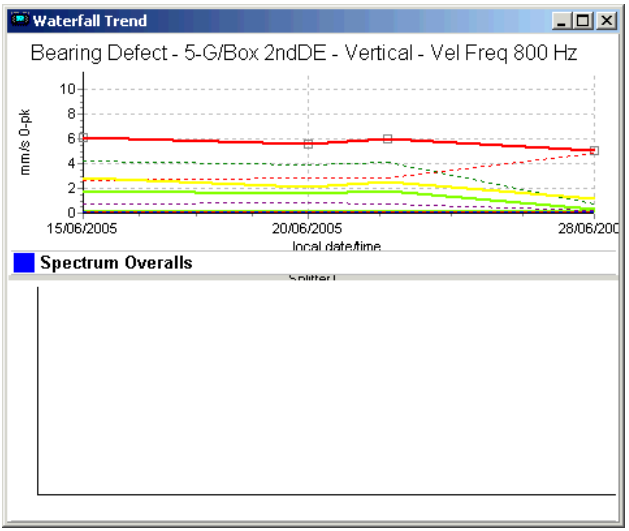
If you right-click within the trend chart, the shortcut menu will display a list of options for further customizing this view - but we won't apply any of these just yet!

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When you are ready we will add the waterfall chart to our view.

- Click the empty bottom half of the screen to open the Select Auto View Component window.
- Choose **Spectrum** then click **OK**.



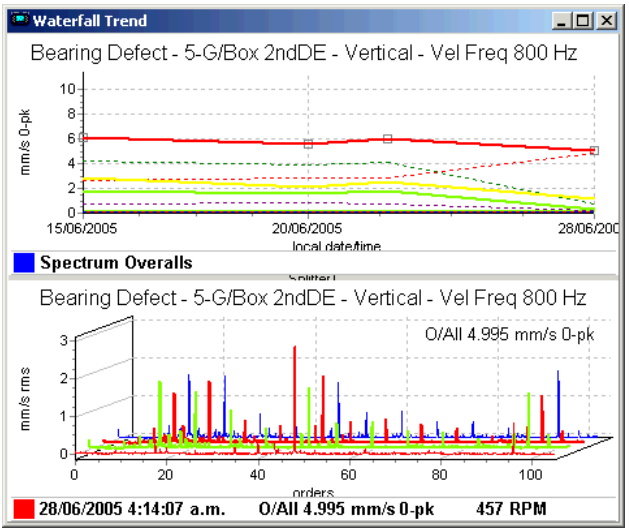
We will now modify this spectrum to turn it into a waterfall chart.

- Right-click the empty spectrum and choose **Chart Display>Waterfall**.

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- Right-click the empty spectrum again and choose **Set plot limit**.
- Enter a value of 6 then click **OK**. This will restrict our waterfall chart to displaying only 6 recordings.
- Now test your view again. Right-click the empty spectrum and select **Waterfall Trend (Parent)>Update**. (Alternatively select a *different* schedule entry - make sure it has recordings - as this will also update the view).

Your view should look something like this.



- Now that we know it is working correctly we will save this view. From the main menu choose **View>Save**.

We are almost finished but there is one final step, which is to add our new view to the appropriate view list. If you click the **Report** button on the toolbar, you will find your Waterfall Trend view listed there. Because our view is a chart, it would be better to place the Waterfall Trend view under the **Chart** button.

- From the main menu, choose **View>Category>Charts**. This moves the view to the **Chart** button.

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- From the main menu choose **View>Save**.
- Now click the **Chart** button. You will see your view listed there.

With our first view complete, we can now look at some of the other ways that the view can be customized.

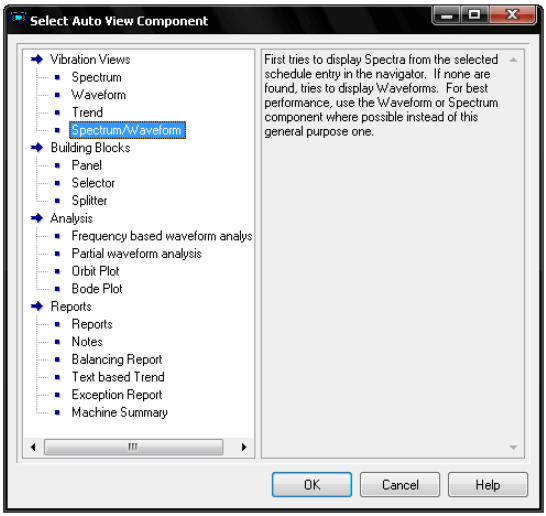
Tips

- To make the view fill the entire screen press **F11** on your keyboard. Press the same key to resize the view.
- To rename the view, open it by selecting it from the **Chart** drop-down list, then choose **View>Save View As**, and enter a new name.
- To move a view from **Report** to the **Chart** button (or vice versa), open the view then choose **View>Category** and make the appropriate selection. Choose **View>Save** to save the view in this location.
- If you want to delete the new view, open it then choose **View>Delete**.

Definitions of AutoView Components

The Ascent AutoView components are all fully customizable. Once you have added one to your view you can use the right-click shortcut menus to select options and make adjustments. In the next few pages we will take a closer look at the AutoView components, explaining what they are and how you can customize them.

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Building Blocks

Building blocks are used to divide your screen up into sections so that you can place displayable components where you want e.g. side by side or stacked on top of each other.

Panel
May contain any number of other components (including more panels). Use panels to help arrange the AutoView components. (Do this by dividing the panels into sections using a splitter.)

Splitter
Contains up to two components side by side or one on top of the other.

Selector
Provides a drop-down box for selecting a 'target' navigator item e.g. a machine, location or schedule entry. Also used as a filtering mechanism to restrict the data that is displayed. You can filter the data by axis e.g. only show recordings taken on the horizontal axis; by measurement type e.g. only show recordings taken in acceleration; or by domain e.g. only show demodulation recordings.

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Vibration Views

Vibration views are the 'normal' vibration charts such as spectra and waveforms. Once added to a view they can be further customized by setting plot limits, choosing a chart mode (stacked, waterfall) or adjusting the axes etc.

Spectrum
Displays the most recent spectra from the selected schedule entry.

Waveform
Displays the most recent waveform from the selected schedule entry.

Trend
Displays a trends of overall values, alarm levels, numeric data etc. The data displayed is user-selectable. (Select a data type by right-clicking the chart and selecting **Data Types**.)

Spectrum/Waveform
First tries to display spectra from the selected schedule entry in the navigator. If none are found, tries to display waveforms. For best performance use the Waveform or Spectrum component where possible instead of this general purpose one.

Reports

Reports
This option is provided for advanced SQL users only. This is a completely configurable HTML report based on SQL queries on the database. To create the SQL report right-click the blank report and select **Edit Report Definition**.

Notes:
Displays machine, point, location, and measurement notes applicable to the current selection, looking back a maximum specified number of days. To set the number of days, right-click the report and enter the required number of days into the dialog box.

Balancing Report
Displays the latest balancing report for the selected machine.

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Text Based Trend
Displays a table of trend values e.g. alarm band levels, spectrum overalls etc. This report has a similar structure to the Last 8 Measurements report.

Exception Report
Displays a summary of alarms at each machine.

Analysis

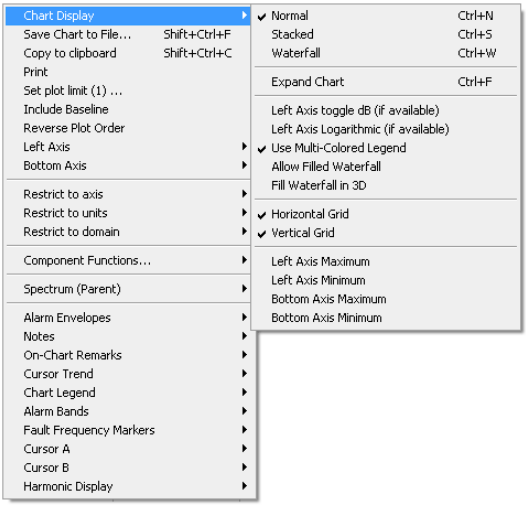
Frequency Based Waveform Analysis
A two-section chart used to analyze waveforms. The chart displays a time waveform in the lower half and plots a spectrum of this recording in the upper half. Use the mouse to click and drag a range of frequencies in the spectrum and the software will filter out only those frequencies in the waveform and display the filtered waveform underneath.

Partial Waveform Analysis
A two-section chart that lets you select a portion of a time waveform and convert it into a spectrum. The chart displays a time waveform in the upper half and plots a spectrum of this recording in the lower half. Use the mouse to click and drag a range of samples and the spectrum of that section will be shown in the bottom chart.

Customizing Your View Further

The displayable components of a chart or report can be fully customized in the same way as a regular chart or report. For example, on a chart you can set the axis units, choose to display a stacked or waterfall chart, make the alarm bands and envelopes visible, and display baseline RMS values etc. Many of these shortcut menu options are explained in Using Charts (page 96).

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Main chart display menu

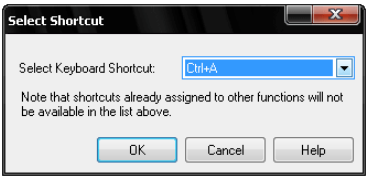
Shortcut menus are sensitive to selection, meaning that when you right-click an item the shortcut menu will contain commands that are applicable to that item. Right-clicking a chart in a view will open the main chart display menu. If you right-click on a special part of a chart, such as an alarm band, this will open a sub-menu containing commands specific to alarm bands. The bottom of this sub-menu will have an option called **Other**, which allows you to access the main chart display menu again.

Assigning Keyboard Shortcuts

Some of the default views have shortcut keys assigned to them e.g. pressing the **F7** key opens the SpecTrend view. You can assign shortcuts to your own views so that they can be opened from the keyboard as well as accessed from the **Chart** button.

- With your view open, select **View>Set Shortcut**, from the main menu. This opens the Select Shortcut window, which contains a list of available key combinations that can be assigned to your view.

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- Select a keyboard shortcut from the drop-down list and click **OK**.
- Now close the view by pressing the top-right close button. Click **Yes** when you are prompted to save changes.
- Test the shortcut by pressing your chosen key combination to open the view.

Tip: If you forget the shortcut keys for a view, click the **Chart** button to see the list of views and their assigned shortcuts.

Re-using Part of an Existing View

Re-using components from existing views can save setup time, especially if a component has been extensively customized. You can copy and re-use a component within the same view, so that further adjustments can be made to the copied item, or you can copy a component from an existing view and re-use it in a new view.

- Open both the view you want to copy the component from and the view you wish to copy the component to. Ensure that you have an empty space to place the copied component (split the panel to create a space).
- Right-click the component you wish to copy and choose **Component Functions>Copy Component**. This saves the component temporarily in memory so that you can retrieve it later.
- If necessary, click the view tab at the bottom-left corner of the navigator to display the view where you will paste this component. Right-click the empty panel and choose the appropriate **Set Component** option (left, right, top or bottom).

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A dialog box will appear asking 'Would you like to use the Control that is on the clipboard?'

- Click **OK** to paste the copied component into the view.

Saving Changes to a View

Because the software does not save changes to any view until you tell it to, you can make *temporary* changes to any view (including the system-defined ones) to change the way your data displays on a chart or report. This might only be a small change such as changing the left axis units or hiding alarm bands to increase the size of your display area. When you close the view, the software will ask you if you want to save the changes - click **No** to discard all changes.

Alternatively, if you have made a lot of adjustments you might decide that it is worthwhile keeping this view intact, but you also want to keep the original view too. This can be achieved using **Save View As**. This option allows you to make as many changes to a view as you like and then save the new view under a different name.

- To do this, choose **View>Save View As** then enter a name for the new view.

Save View As allows you to use any of the system-defined default views or any of your own views as a starting point to create new ones. For example, you could plot a spectrum, then use **View>Component Functions>Split Left-Right**, to create a new blank panel on the right of the screen. You could then add components to the blank panel and further customize the layout before saving the view under a different name.

Restoring the system default views

- If you save changes to one of the system defined views, these can be undone at any time by choosing **View>Reset Default Views**.

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This will restore any system defined views to their original format. When you click **Yes** to confirm, if you have any user-defined views, you will be asked whether you want to delete these as part of the restore process.

- Choose **No** to keep any user-defined views or **Yes** to delete these.

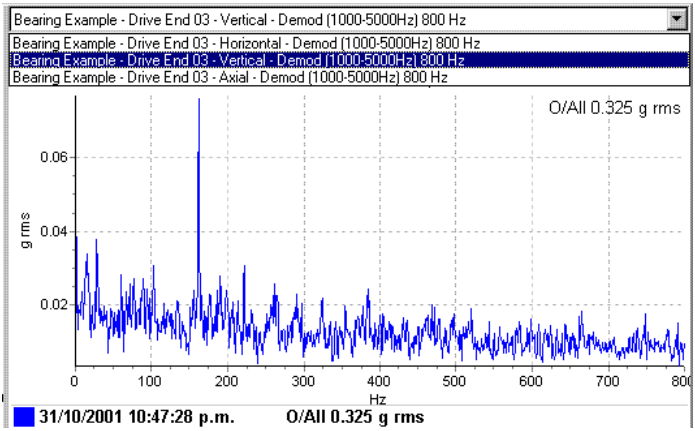
Changing the file name
When you name a view, the .av file (view file) that is created in the Autoview folder (by default) uses the same name as the view, minus any spaces and special characters. The .av file can be renamed independently of the view so that the file uses a different name from the one that appears in the **Chart** drop-down list.

- To rename the .av file, open your view and select **View>Set ID**.
- Enter a new name then click **OK**.

Using a Selector

When you open a view to plot data, often there will be more than one set of data that could be displayed on a chart, so the software will choose one by default. A Selector is a drop-down list at the top of a chart that allows you to *select* the data you want to display in that chart. The list contains measurements, (or locations, schedule entries etc) that match the criteria that you specify. This could be something like 'include in the selector list, all locations that have demodulation data'. When you select an item in the navigator tree the selector will create a list similar to the one below.

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To see an example of how selectors are used, choose a point that has several measurement locations (or select an entire machine or folder) then open the Vel+Demod view (**Chart>Vel+Demod**). Because this view 'targets' measurement locations (axes) to decide what data to plot, the selectors will appear because there is more than one location to choose from. Now select a schedule entry. The selectors will disappear because there is only one 'target' to choose from (the location that contains this schedule entry).

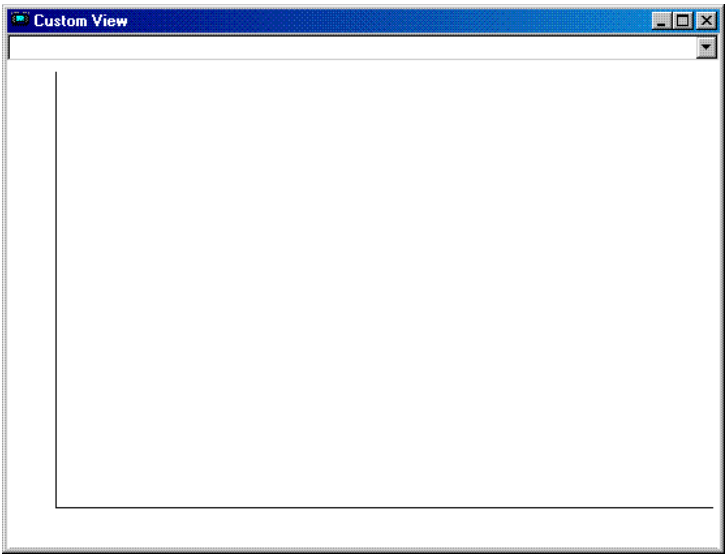
To include a selector in a view, you must add the selector *before* adding the component that it is attached to. You cannot add a selector directly to an existing report or chart. However, there are several ways of working around this and these solutions are described at the end of this topic.

The following method describes how to add a selector to either an empty view, or an empty panel (i.e. a panel that does not already contain a component).

- With your view open, choose **Selector** from the Select Auto View Component window. If this is not currently open, you will need to right-click and use one of the **Set Component** commands.

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- Now choose the type of component that will display the data listed in the selector e.g. a chart. Right-click the empty panel, choose **Create child component** then select a component from the list. Alternatively, click the grey panel to open the Select Auto View Component window then select a component.



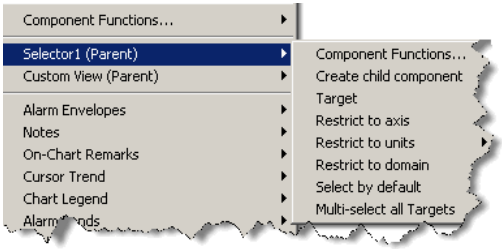
Selector with a chart child component

The next step is to tell the selector *what type of data* to look for and *where to look for it*. These options are contained within the selector shortcut menu.

Note: The menu item 'Selector1' is the default name chosen for the first selector. If a selector has been created previously (by you or someone else) this name will be different e.g. 'Selector2'.

- Right-click the component and move the mouse to **Selector1 (Parent)**.

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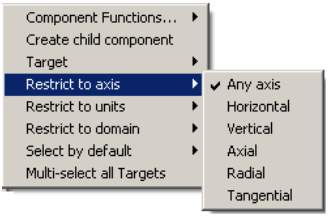


The sub-menu attached to **Selector1 (Parent)** gives you options for choosing what the selector will 'select'. Move the mouse over each sub-menu item in turn, from **Target** downwards, to get an idea of how these options are used.

- First, choose a 'target' for this part of the view. The target is the navigator item that you want the selector to 'select' e.g. machine, point, schedule entry etc. When you click a navigator item, the selector will list all the targets under this item.

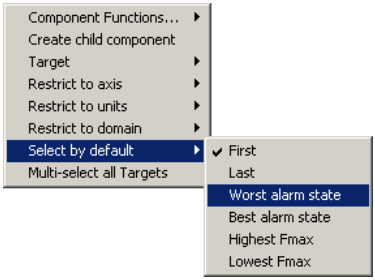
For example, if you choose 'location' as your target, clicking a point will cause the selector to list all the locations at this point that contain the data that you have chosen to display in your chart or report. If you click a machine, the selector will list all locations on this machine. Clicking a folder will list all locations in this folder.

You can restrict the data listed in the selector by choosing items in the axis, units and domain sub-menus. For example, right-click and choose **Selector1 (Parent)>Restrict to units>Acceleration**. This will force the selector to only list schedule entries that specify acceleration data.



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The final step is to set the 'default' data for this component. The default specifies which data from all the available targets is displayed in your chart or report (until you make a selection in the selector). These options are listed in the Select by default sub-menu.



- To set a default selection, right-click and choose **Selector1 (Parent)>Select by default** then choose one of the menu items. The default item becomes the first item listed in the selector.

An example is to set the target to schedule entry, and the default to 'Worst alarm state'. When you select a folder/machine/point/location, all schedule entries that belong to it will be listed in the selector but the schedule entry with the worst alarm state will be selected by default (i.e. this schedule entry is listed first in the selector, and the displayed chart or report will show data from this schedule entry).

- When your selector is complete, test it by selecting an item in the navigator. Press the keyboard spacebar to jump from one target to the next in navigator tree (or use the **Previous** and **Next** buttons).

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Note: The 'natural order' that machines and points appear in the navigator tree is the order in which they are created (this is also the order in which they are sent to the instrument). You can change this 'natural' order using **Screen>Sort Navigator by Alarms** or **Screen>Sort Tree Alphabetically**. When choosing the default target for the selector, the 'first' and 'last' default target options refer to the position of the target in its 'natural' order (its position when first created). If the navigator tree has been re-ordered the position of the 'first' and 'last' targets may change from their original creation order, so the selector may choose different 'first' or 'last' targets to those you expect.

Adding a selector to an existing chart or report

To add a selector to an existing view, you can split the view, thereby creating an empty space for the selector and component to be placed. Alternatively, if you don't want to change the layout of your view, you can use the **copy** and **paste** functions to remove and then replace a component after adding a selector. **Copy** holds the component in memory so that you can delete it from a view without permanently removing it. After adding a selector, **paste** puts the component back into its original place. This technique is recommended if you have spent a lot of time customizing a chart or report and don't wish to re-create it from the beginning.

- With your view open, right-click the component you wish to add a selector to and choose **Component Functions>Copy Component**. This saves the component temporarily in memory so that you can retrieve it later.

- Now delete the component. Right-click the component and choose **Component Functions>Delete**.

If the view contained only one component, e.g. a single chart, you will now have an empty view. If there was more than one component, the remaining components will now expand to fill the whole screen. In this case you will have to re-split the view to create space for the selector.

- If you have to split the screen, do this now. Right-click and choose **Component Functions>Split Top-Bottom** (or Left-Right).

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- Add the selector to the empty panel. Right-click and choose one of the **Set Component** options (top, bottom, left or right) then choose **Selector** from the Select Auto View Component window.

- With your selector in place, you can now paste the deleted component back into position. Right-click the panel under the selector and choose **Component Functions>Paste Component**.

The selector can now be customized as described earlier in this topic.

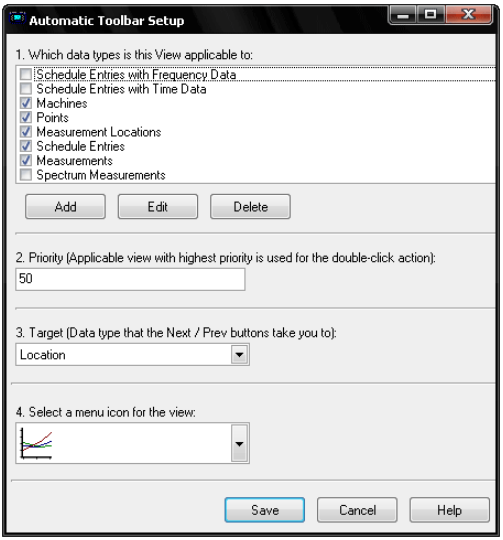
Assigning the Priority and Target

When you create a view you have control over its behavior in the view system. For example, you can specify what data types the view is applicable to and whether your view will be opened as the default action when you double-click an item to plot data.

The views that appear in the **Chart** drop-down list are each assigned a 'priority' value. When you double-click an item in the navigator, if several views could be used to plot the data, the view with the highest priority will be used by default. For example, double-clicking a frequency domain measurement will open a spectrum by default (rather than the SpecTrend or SpecStack views) as this view has the highest priority for frequency data.

- With your custom view open, from the main menu choose **View>Icon and Target**.

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- Select the data types that are applicable to this view (i.e. time or frequency domain data) and also the navigator item(s), such as schedule entries, that will open this view when double-clicked.
- Assign a priority value to this view. This can be any integer value e.g. 20 or 150.
- Select a 'target' for this view. The target is the item the navigator will jump to when you use the **Previous** and **Next** buttons. For example, if you select Measurement Locations as the data type, clicking **Next** will take you to the next location in the navigator and plot the data at that location.
- Select a menu icon that will appear in the **Chart** drop-down menu.
- Click **Save** to finish.

Tip: To get a better idea of how to set the behavior of your view, open one of the factory default views and choose **View>Icon and Target**. This will display the data types, priority and target for that view.

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- If you plot data using a view other than the default, you can open the default view by right-clicking the assigned target and selecting **Open Default View**.

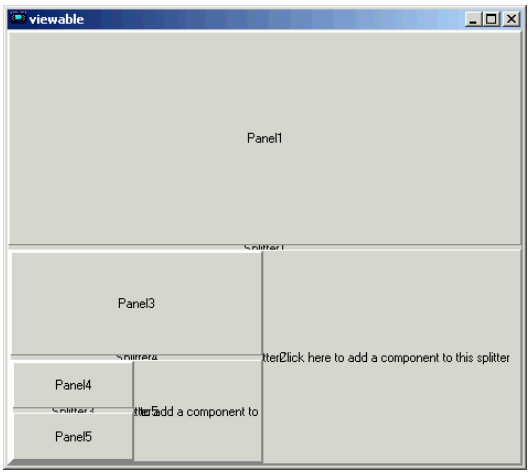
Note: The **Add**, **Edit**, and **Delete** buttons are not currently used and are included for future compatibility.

Designing a View Layout

A view may consist of a single chart or report or it can be made up of many parts. When you create views that consist of more than one component, you will need to define a layout so that the software knows where you want your components to be placed. To create a layout you need to use *Panels* and *Splitters* as building blocks to divide the view into parts.

A panel can be thought of as a blank canvas that you place displayable components, such as charts and reports, onto. A splitter is used to 'split' the panels into halves so that more than one component can be displayed. The 'Waterfall Trend' chart created in the walk-through consisted of only a single panel split in two, but you can create views with as many parts as you like.

The following diagram demonstrates how a view can be built up by splitting a panel in two, adding a panel to each half then splitting those panels in turn and repeating the process.



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Empty view showing multiple split panels

You can split a panel left-to-right or top-to-bottom to organize the components of a view in any manner you like. You may find it useful when creating multi-part views, to first sketch out on paper where you would like the parts to be, and then use panels and splitters to create the view layout.

The process for creating a multi-part layout is as follows:

- With your empty view open, add your first component to the view, e.g. a chart. By default this will fill the whole screen. An empty view already has a panel as its base so that components can be placed directly onto it.

- Now create a space to add other components. You will need to choose whether to split the base panel from left to right or top to bottom e.g. right-click and choose **Component Functions>Split Left-Right**.

Your first component will fill half the screen while the other half remains blank until a component is added to it. Nothing will be displayed yet as no data is selected.

- Set a component for the empty part of the screen i.e. click anywhere in the empty half to open the Select Auto View Component window, then select a component of your choice. This can be a displayable component such as a report, note or chart, or another panel so that you can split the layout again.

You can further sub-divide the view by adding and splitting panels to create a four-part view or split just one panel to make a three-part view. The view can be as complex or simple as you want it to be.

Because components can be stacked on top of each other, e.g. a base panel containing several components, if you delete the bottom panel this will also delete all the components on top of it.

- To delete a component, right-click on that component and choose **Component Functions>Delete**.

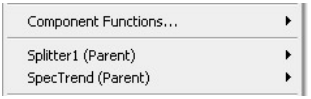
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How Parts of a View Fit Together

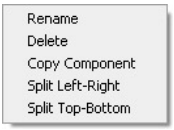
Before we explore the options for manipulating a layout, let's take a closer look at how the parts of a view fit together.

- Click the **Chart** button and open the SpecTrend view.
- Right-click the spectrum, taking care not to click a special item such as an alarm band or note (we are trying to open the chart shortcut menu, not one of the special item menus).

Halfway down you will see these menu items.



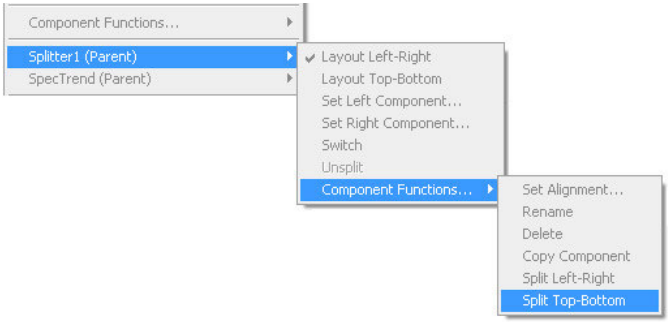
The 'Component Functions' menu item contains a sub-menu of options for working directly with a component. Right-clicking a component in a view will access this menu directly.



Splitter1 (Parent) contains two 'child' components (the spectrum chart and the trend chart). Its sub-menu contains commands for placing child components within the splitter. The **Splitter1 (Parent)** sub-menu contains its own **Component Functions** item for working with the splitter component e.g. copy, rename or delete the splitter. Splitting a splitter component will re-size it to only fill half of the space. This creates an empty area for you to add new components.

- Try splitting a splitter now so that you can see the effect. From this menu choose **Splitter1 (Parent)>Component Functions>Split Left-Right**. You will be able to undo this split when you close the view by clicking **No** when prompted to save changes to the view.

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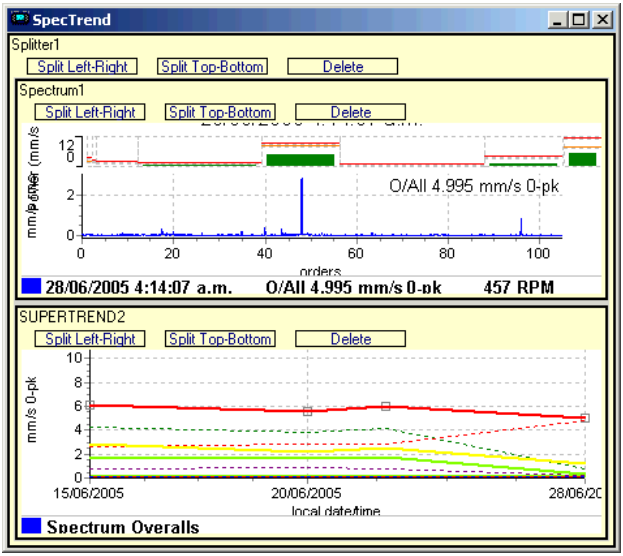


Note: If you delete a splitter, any child components will also be deleted as they are contained *within* the splitter.

SpecTrend (Parent) is the name of the view. All the components (the trend chart, the spectrum and the splitter) are contained within this 'parent'. Its sub-menu contains commands for working with the view as a whole, such as setting its target, updating and saving the view. The **SpecTrend (Parent)** sub-menu contains its own **Component Functions** item so that you can rename the view or add more components.

- From this sub-menu, select **Design**.

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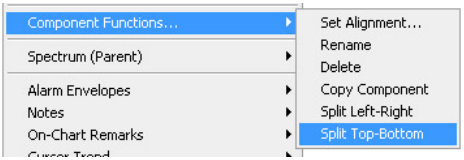


Design mode shows you the underlying structure of a view. You can create your views in Design mode if you prefer, as all the right-click menus are available here. Design mode is useful if you are making changes to a complex view as it shows you how the view has been put together (what components are contained within others).

- Turn off Design mode. Right-click the spectrum and select **SpecTrend (Parent)>Design**.

Changing a Layout

The commands for manipulating a component, e.g. delete, copy, split etc can all be accessed by clicking that component, and choosing **Component Functions**.



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When you add components to a view, the software assigns them a default name e.g. Splitter1, Selector1, Panel1 etc. The instructions in this topic will use the default names but be aware that these may differ from what you see on your computer.

Note: Several items in the **Component Functions** sub-menu are included for the purpose of backward compatibility and will only be visible when other options are selected first. In previous versions of the software the options **Set Alignment**, **Set Size** and **Set Position** were used to create the layout of a view. Splitters are now used in place of these positioning options.

Adding a new component
To add a new component to a view, you must first split the view to create an empty space to place your component in.

- Right-click the component that will be split and choose **Component Functions>Split Left-Right** (or Top-Bottom).
- Right-click the empty panel, choose the appropriate **Set Component** option (left, right, top or bottom) then select a component to add.

Swapping the positions of two components
When two components are sitting on the same split panel, e.g. two charts stacked one above the other, you can swap their positions around.

- Right-click one of the components and choose **Splitter1 (Parent)>Switch**.

The reason that you cannot select a component directly and use the switch command is because both components are contained *within* 'Splitter1'. Therefore they must be accessed *through* this component.

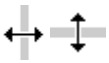
Renaming a component
If you are building multi-part views that contain many panels, splitters and selectors etc, it can be useful to rename these components so they can be more easily identified. After renaming, when you right-click a component the new name will appear in the menu instead of the default.

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- Right-click a component and choose **Component Functions>Rename**, then enter a new name and click **OK**.

Resizing a component

- Resize sections of a multi-part view by moving the cursor over a separating border until the cursor turns to a double-headed arrow, then drag up-down or left-right.



Unsplitting a view (deleting components)

If you have split a panel but not yet added any components you can unsplit it. If components have already been added, remove the one you don't want. Deleting a component removes the split and the remaining component will expand to fill the space.

- To unsplit a panel, right-click the empty part (the grey area) and choose **Unsplit**.
- To delete a component, right-click it and choose **Component Functions>Delete**.

Deleting a View

- To delete any view, open the view and select **View>Delete** from the main menu.

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Section 11: Using the Machine Builder Wizard

Note: This feature will only be available to you if it is included as part of your license agreement. If you wish to enable this feature please contact sales@commtest.com or your distributor for more information.

Introduction

The Machine Builder Wizard automates the process of building machines by stepping you through the machine setup process and creating appropriate points, locations, schedule entries and alarms based on the information you supply.

The Wizard implements several ISO standard alarms for assessing overall RMS levels, and also The Proven Method from Technical Associates of Charlotte, P.C. The Proven Method defines up to six power band alarms per point for your machine, based on the machine classification and information such as rotational speed, number of gear teeth and blades etc.

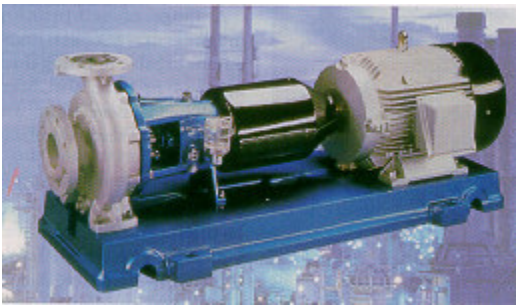
Whichever alarm standard you use, the process is essentially the same. You will specify the type of machine to build, then the alarms will be built for you. The ISO standards require less detailed information; however the alarm bands generated are 'overall' alarm bands only. The Proven Method requires more detailed information about the machine and generates correspondingly more detailed alarm bands targeted at specific components of the machine.

The rest of this section is presented as a walk-through of how to use the Machine Builder Wizard. We will use The Proven Method to create power band alarms that will be used to monitor a direct-coupled pump.

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Walk-through: The Proven Method

This is the direct-coupled pump we will be monitoring.



- Click the **Build** button on the toolbar. Alternatively select **Alarms>TA & ISO Alarm Creator** from the main menu.

The Machine Builder Wizard is presented in the form of HTML-style documents. Clicking the blue underlined ISO standard or Proven Method links will walk you through the setup process for creating machines with pre-defined alarms and alarm thresholds.

Machine Builder Wizard

This wizard helps you build your database - please choose a standard to use:

The Proven Method 4th Edition (Technical Associates)
Based on TA's vast experience with vibration analysis, this standard defines up to 6 alarm bands for your machine, based on a machine classification and information such as rotational speed, number of gear teeth, number of blades, etc...
© Copyright 2000 Technical Associates Of Charlotte, P.C.

ISO 2372 / BS 4675
First released in 1974 and revised in 1985, this standard gives a simple overall velocity rms limit requiring minimal amount of knowledge about the machine configuration.

ISO 10816 / BS 7854
A more recent standard (1995/96), this also specifies a simple overall velocity (and in some cases a displacement) rms limit. The machine categories are a little more specific - The kind of information that you need is typically machine size (power) and rotational speed.

Manual Build Mode
Click the link above to enter Ascent Level 1 style manual build mode.

Set Wizard Units

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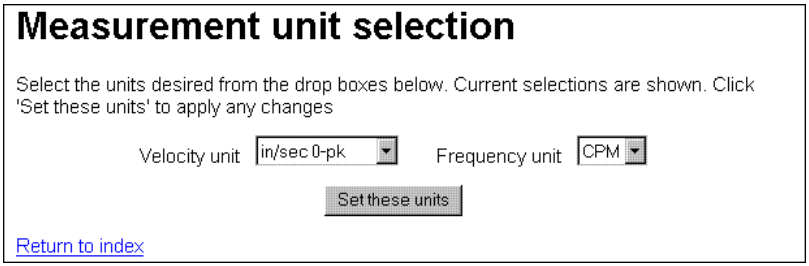
- If you want to create your own machines and alarms, click Manual Build Mode to exit the Machine Builder Wizard. This will open a machine placeholder structure in the navigator tree so you can manually set up your machines, points and locations etc as described in Creating Machines Using Build Mode (page 35).

First you need to select the measurements units to use.

- Click the Set Wizard Units link at the bottom of the screen.

For this walk-through we will use in/sec Ø-pk and CPM.

- If you want to choose other units, select these from the drop-down boxes then click **Set these units**.



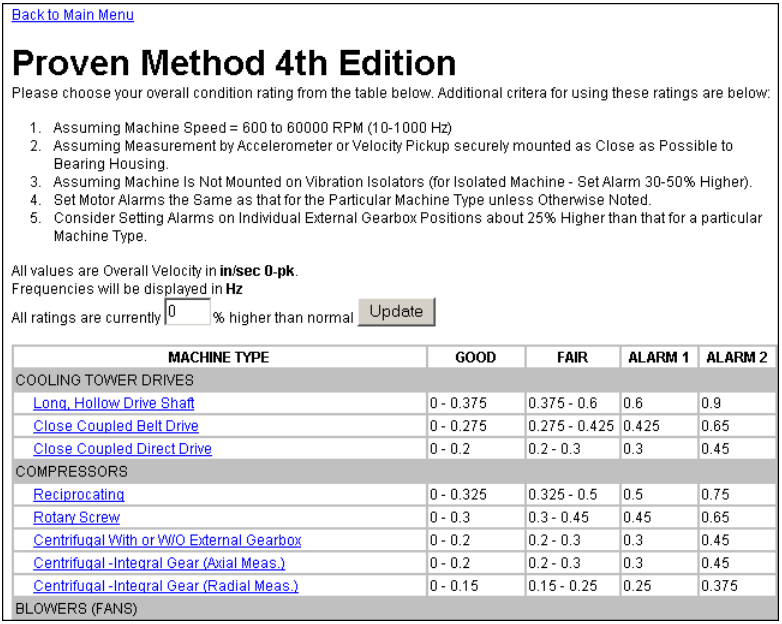
- Click the Return to index link to re-display the Machine Builder Wizard screen.
- Click The Proven Method 4th Edition link to continue.

Overall Condition Rating

The first step in The Proven Method is to determine an *overall condition rating* for the machine. This gives overall vibration levels for GOOD, FAIR and ALARM operation that will be broken down into individual alarm bands in the next section.

- To make the forms fill the entire screen, press **F11** to toggle full-screen mode. (To return the screen to normal size press **F11** again).

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Back to Main Menu

Proven Method 4th Edition

Please choose your overall condition rating from the table below. Additional critera for using these ratings are below:

1. Assuming Machine Speed = 600 to 60000 RPM (10-1000 Hz)
2. Assuming Measurement by Accelerometer or Velocity Pickup securely mounted as Close as Possible to Bearing Housing.
3. Assuming Machine Is Not Mounted on Vibration Isolators (for Isolated Machine - Set Alarm 30-50% Higher).
4. Set Motor Alarms the Same as that for the Particular Machine Type unless Otherwise Noted.
5. Consider Setting Alarms on Individual External Gearbox Positions about 25% Higher than that for a particular Machine Type.

All values are Overall Velocity in **in/sec 0-pk**.
Frequencies will be displayed in **Hz**

All ratings are currently 0 % higher than normal Update

MACHINE TYPE	GOOD	FAIR	ALARM 1	ALARM 2
COOLING TOWER DRIVES				
Long, Hollow Drive Shaft	0 - 0.375	0.375 - 0.6	0.6	0.9
Close Coupled Belt Drive	0 - 0.275	0.275 - 0.425	0.425	0.65
Close Coupled Direct Drive	0 - 0.2	0.2 - 0.3	0.3	0.45
COMPRESSORS				
Reciprocating	0 - 0.325	0.325 - 0.5	0.5	0.75
Rotary Screw	0 - 0.3	0.3 - 0.45	0.45	0.65
Centrifugal With or W/O External Gearbox	0 - 0.2	0.2 - 0.3	0.3	0.45
Centrifugal -Integral Gear (Axial Meas.)	0 - 0.2	0.2 - 0.3	0.3	0.45
Centrifugal -Integral Gear (Radial Meas.)	0 - 0.15	0.15 - 0.25	0.25	0.375
BLOWERS (FANS)				

To select an overall condition rating, first examine the list of machine types to find one that best describes your machine. Next look at the GOOD, FAIR and ALARM thresholds listed for this machine. If these thresholds seem suitable for the machine you are monitoring, select this machine and continue. Otherwise, you can adjust these thresholds now.

- To adjust the alarm thresholds to use higher (or lower) values, enter a value in 'All ratings are currently % higher than normal', then click **Update**. This will re-set every value in the table.

If you cannot find a machine type that matches yours, you can set the overall condition manually.

- To set manual thresholds, enter your values into the Manual Entry fields at the bottom of the page then click **GO**.

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Note that no matter which overall condition rating you select, the remaining steps in The Proven Method will be the same. The machine type you select specifies numerical values that are substituted into behind-the-scenes equations in the next stage.

The selection that best describes our machine is General Purpose Horizontal Pump – Direct Coupled (under Centrifugal Pumps in the machine list).

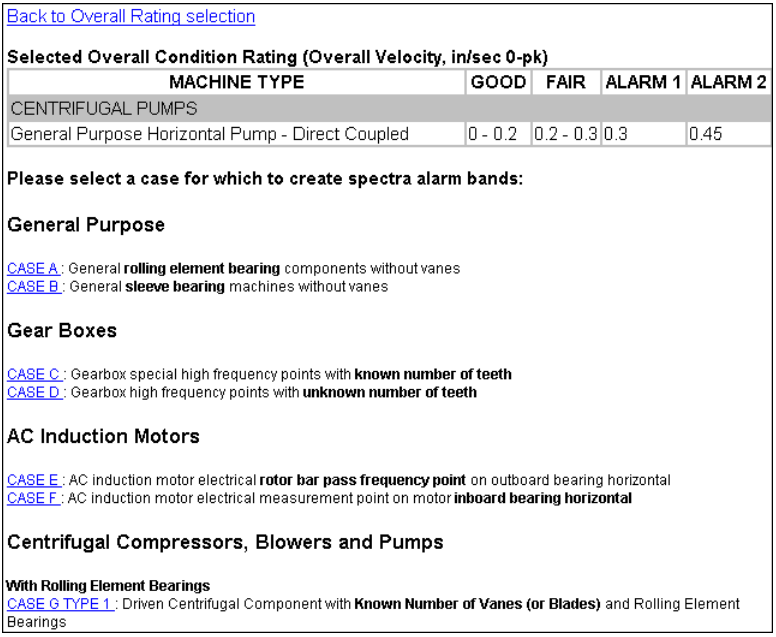
- Click on this link to continue.

LARGE TURBINE/GENERATORS				
3600 RPM Turbine/Generators	0 - 0.175	0.175 - 0.275	0.275	0.4
1800 RPM Turbine Generators	0 - 0.15	0.15 - 0.225	0.225	0.35
CENTRIFUGAL PUMPS				
Vertical Pumps 12-20 ft (4.0-6.6 m) in height	0 - 0.325	0.325 - 0.5	0.5	0.75
Vertical Pumps 8-12 ft (2.4-4.0 m) in height	0 - 0.275	0.275 - 0.425	0.425	0.65
Vertical Pumps 5-8 ft (1.5-2.4 m) in height	0 - 0.225	0.225 - 0.35	0.35	0.525
Vertical Pumps 0-5 ft (0.0-1.5 m) in height	0 - 0.2	0.2 - 0.3	0.3	0.45
General Purpose Horizontal Pump - Direct Coupled	0 - 0.2	0.2 - 0.3	0.3	0.45
Boiler Feed Pumps - Horizontal Orientation	0 - 0.2	0.2 - 0.3	0.3	0.45
Piston Type Hydraulic Pumps - Horizontal Orientation (under load)	0 - 0.15	0.15 - 0.25	0.25	0.375

Selecting Cases

The machine you selected, along with its alarm thresholds, is displayed at the top of the screen. At this stage you are given a selection of 'Cases'. Each of these cases will create different alarm band setups suited to the machine component that they describe. Almost all machines will have either Case A or Case B measurements on the bearing housings. The remaining cases are for more specialized measurements.

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Back to Overall Rating selection

Selected Overall Condition Rating (Overall Velocity, in/sec 0-pk)

MACHINE TYPE	GOOD	FAIR	ALARM 1	ALARM 2
CENTRIFUGAL PUMPS				
General Purpose Horizontal Pump - Direct Coupled	0 - 0.2	0.2 - 0.3	0.3	0.45

Please select a case for which to create spectra alarm bands:

General Purpose

CASE A : General **rolling element bearing** components without vanes
CASE B : General **sleeve bearing** machines without vanes

Gear Boxes

CASE C : Gearbox special high frequency points with **known number of teeth**
CASE D : Gearbox high frequency points with **unknown number of teeth**

AC Induction Motors

CASE E : AC induction motor electrical **rotor bar pass frequency point** on outboard bearing horizontal
CASE F : AC induction motor electrical measurement point on motor **inboard bearing horizontal**

Centrifugal Compressors, Blowers and Pumps

With Rolling Element Bearings
CASE G TYPE 1 : Driven Centrifugal Component with **Known Number of Vanes (or Blades)** and Rolling Element Bearings

We know the *number of vanes* on the pump (8), so you will use **CASE G TYPE 1** on the pump bearings.

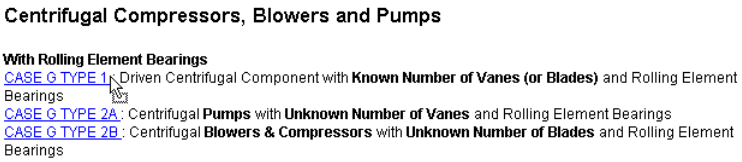
The motor is an *AC Induction Motor* so you will use cases **E** and **F** on the motor itself.

If we wanted to monitor a simple bearing point, we would use Case A or B. Case G incorporates information for the bearing, so we will not need to use Case A or B in this example.

Case G Type 1: Driven Centrifugal Component with Known Number of Vanes (or Blades) and Rolling Element Bearings

- Click on the link for CASE G type 1.

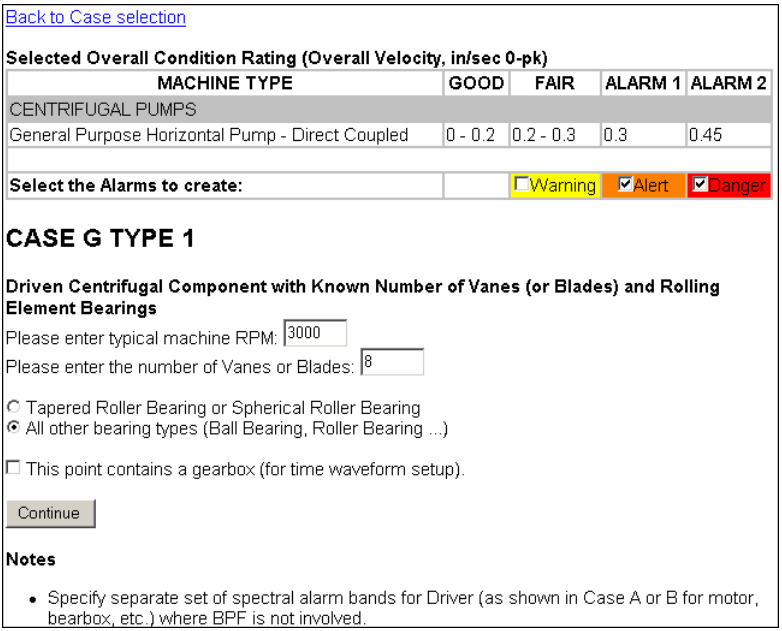
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- The tick boxes on the top-right of the form allow you to choose which alarm levels to apply. Tick all the boxes.

Enter the following information into the form.

- Typical machine RPM is 3000.
- Number of blades is 8.
- The bearings are ball bearings (All other bearing types). Click the radio box to select this option.



- Click **Continue**.

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The software now performs all of the calculations defined in the Proven Method to give you specific alarm bands for this measurement point. This step would normally take several minutes to complete if you were using The Proven Method document manually (you would need a pencil, a calculator and time).

The results of the calculations are summarized in a table at the bottom of the screen (you will need to scroll down to see this).

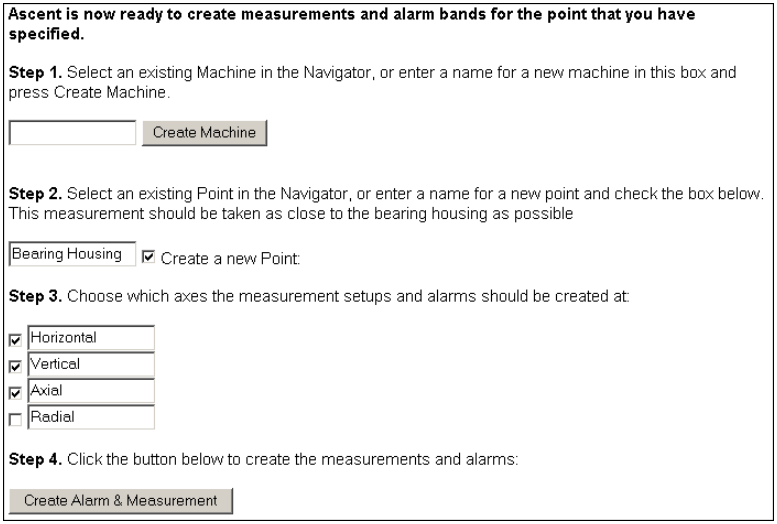
The table below summarizes the alarm bands that will be created

The Proven Method - CENTRIFUGAL PUMPS - General Purpose Horizontal Pump - Direct Coupled CASE G TYPE 1. Driven Centrifugal Component with Known Number of Vanes (or Blades) and Rolling Element Bearings

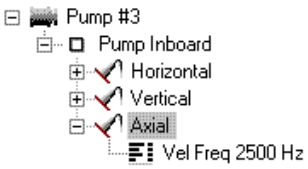
ITEM	BAND 1	BAND 2	BAND 3	BAND 4	BAND 5	BAND 6	BAND 7
BAND LOWER FREQ.	20 Hz	60 Hz	110 Hz	340 Hz	460 Hz	1250 Hz	0 Hz
BAND UPPER FREQ.	60 Hz	110 Hz	340 Hz	460 Hz	1250 Hz	2500 Hz	100000 Hz
Alert	0.27 in/sec 0-pk	0.09 in/sec 0-pk	0.105 in/sec 0-pk	0.18 in/sec 0-pk	0.105 in/sec 0-pk	0.06 in/sec 0-pk	0.3 in/sec 0-pk
Danger	0.405 in/sec 0-pk	0.135 in/sec 0-pk	0.12 in/sec 0-pk	0.24 in/sec 0-pk	0.12 in/sec 0-pk	0.07 in/sec 0-pk	0.45 in/sec 0-pk
DESCRIPTION	**Subsynchronous thru 1X RPM**	**1.5X - 2.0X RPM**	**2.5X - Funda. Bearing Defect Frequencies**	**BPF +/- 1X Sidebands**	**Lower Harmonic Bearing Freq. & BPF Harmonics**	**Higher Harmonic Bearing Freqs. & Brg. Natl. Freqs.**	**Overall**

At this stage you have the choice of applying the alarm bands to an existing machine, or creating a new machine and point. To use a point on an existing machine you would need to select it in the navigator before filling out the form. For this walk-through you will create a new machine for the alarm bands to apply to. You may need to use the scroll bar on the right of your screen to see the lower part of the form.

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- Type 'Pump #3' in the first blank field then click **Create Machine**. This machine will now appear in the navigator tree.
- The default point name is 'Bearing Housing'. Change this to 'Pump Inboard' and leave the tick box ticked to create this new point.
- Leave the tick boxes ticked for Step 3 on the form to create horizontal, vertical and axial locations at this point.
- Click **Create Alarm & Measurement**. Your navigator tree will now look like this.

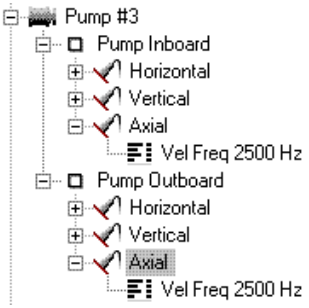


We will now create a second point that uses the same settings.

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- In the Machine Builder Wizard, change the point name to 'Pump Outboard' and click **Create Alarm & Measurement** again.

Your navigator tree will now look like this.

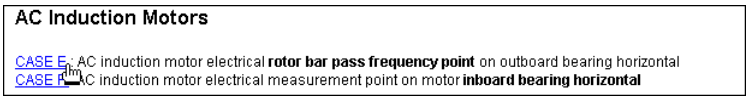


Cases E and F: AC Induction Motor

These two cases will define special measurements to detect problems specific to AC induction motors.

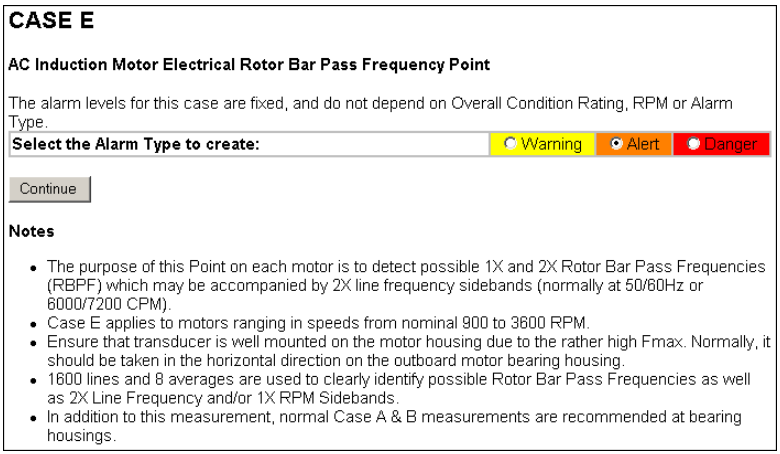
- Click the Return to Case selection link at the bottom of the Machine Builder Wizard form to return to the Case Selection screen.

- Under 'AC Induction Motors', click the CASE E link.



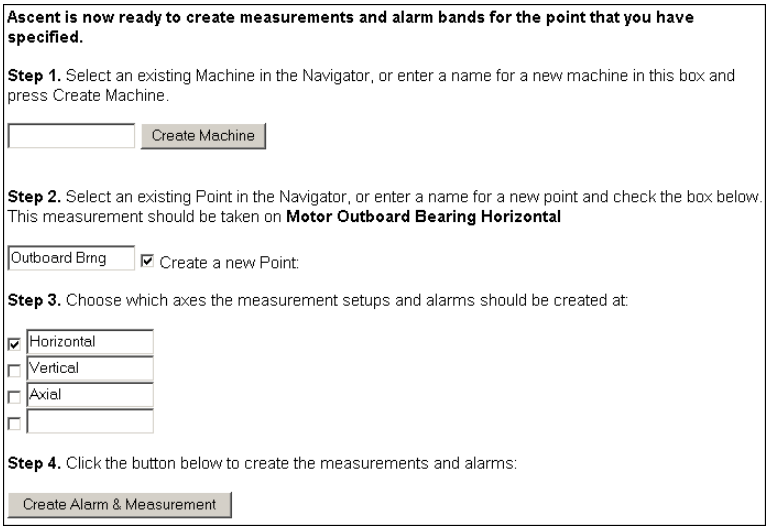
Case E requires no specific information in order to create its alarm bands. The alarm level choice does not affect the alarm thresholds themselves, it only determines what kind of alarm (Warning, Alert or Danger) is raised when these fixed thresholds are exceeded.

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- Leave the Alarm Type as 'Alert' and click **Continue**.

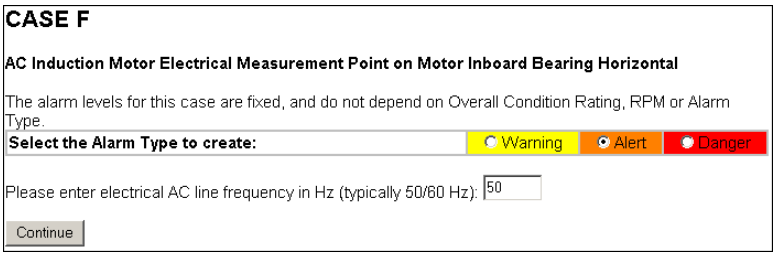
The Machine Builder Wizard is now ready to create alarm bands and schedule entries on your machine. This measurement should be taken on the Outboard Bearing, Horizontal point, as indicated on the form.



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- You are going to add these alarm bands to the same machine so select 'Pump #3' in the navigator.
- For Step 2, Change the point name to 'Motor Outboard' and click **Create Alarm & Measurement**. This will create a new point for 'Pump #3' called 'Motor Outboard'.
- Click the Return to Case Selection link.
- Under 'AC Induction Motors' click CASE F.

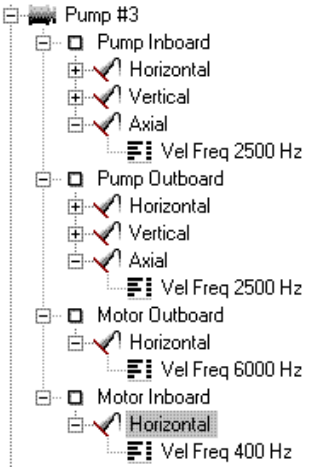
You are now asked to enter information to create alarms for the inboard bearing.



- Enter the electrical AC line frequency as 50 Hz and leave the Alarm Type as 'Alert'.
- Click **Continue**. The software is now ready to generate alarm bands and measurements.
- You are going to add these alarm bands to the same machine so select 'Pump #3' in the navigator.
- Change the point name to 'Motor Inboard' and click **Create Alarm & Measurement**.

Your navigator tree will now look like this.

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- Click the Return to Case selection link at the bottom of the Machine Builder Wizard form to return to the Case Selection screen.

Case A: General Rolling Element Bearing Components Without Vanes

The Case E and F measurements do not look for bearing problems. For this we will use Case A.

- Under 'General Purpose', click the CASE A link.

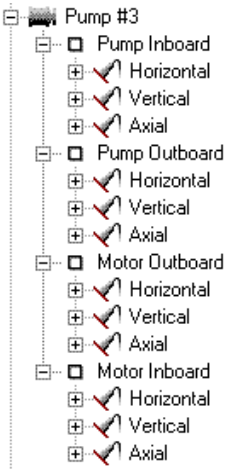
You are going to add these alarm bands and schedule entries to the 'Motor Inboard' and 'Motor Outboard' points that have already been created.

- Leave the bearing type as ball bearing and click **Continue**.
- Un-tick 'Create a new Point' and select the 'Motor Inboard' point in the navigator tree.
- Leave all settings as they are and click **Create Alarm & Measurement**. Now select the 'Motor Outboard' point and click this button again.

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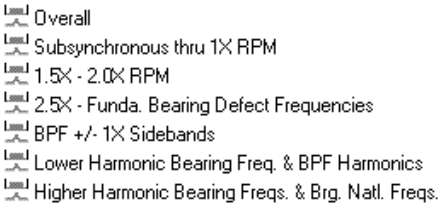
- Close the Machine Builder Wizard by clicking the ✕ button in the top-right corner.

Your final machine structure will look like this.



Note: In the example, the schedule entries are hidden to make the structure clearer.

- Select one of the schedule entries in the navigator tree. The associated alarm icons will display in the navigator list.



With the machine structure complete, you can now create a route and send this folder to the instrument for data collection.

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Tip: If this is a common machine type, it is a good idea at this stage to right-click on the machine and add it to the library so that this template can be retrieved and re-used in the future. See Storing Re-usable Components in the Library (page 227), for more information.

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Section 12: Using Statistical Alarms

Note: This feature will only be available to you if it is included as part of your license agreement. If you wish to enable this feature please contact sales@commtest.com or your distributor for more information.

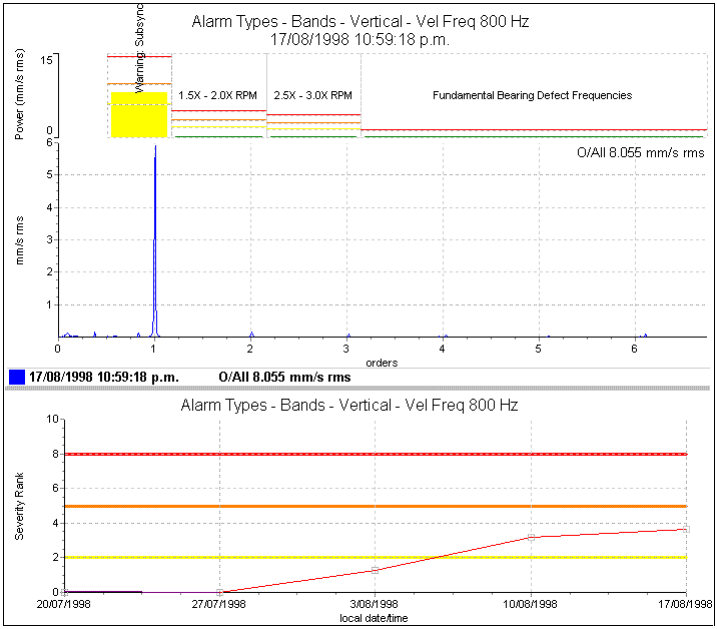
Statistical Alarm Overview

ISO standards and The Proven Method provide excellent starting points for setting alarm thresholds - The Proven Method in particular is very good. However, once you have a history of data for your machines, or data on many similar machines, you can use statistical analysis of that data to generate new alarm thresholds that are tailored specifically for those machines.

Statistically derived alarms take into account the specific vibratory characteristics of your machines and will give you more reliable and accurate alarms that will trigger when (and only when) a machine is vibrating more than 'normal'. Statistical alarms can be generated for envelopes, peak bands and power bands. After you have collected a reasonable amount of data (6-12 surveys) you can fine tune your existing alarm thresholds using statistical analysis. You can use a history of data to generate some statistics, or you can do statistics across a family of similar machines. Machine families are discussed in depth later in this manual, see Machine Families (page 349).

The following example illustrates how statistically derived alarms can be used to fine tune existing alarm thresholds on a machine. This machine uses a number of power band alarms created with The Proven Method. The chart shows a combined spectrum and trend chart of the machine *before* statistics were applied.

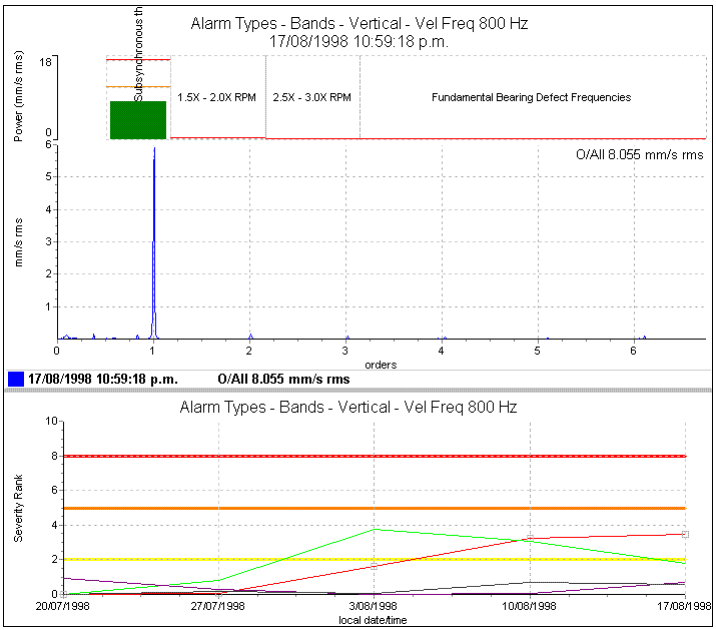
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The bottom trend plot suggests that all but one of the alarms have thresholds that are set too high - the alarm trends are sitting on the zero axis and cannot be seen without zooming. The one visible alarm possibly has its thresholds set too low as this alarm has already reached Warning level.

Here is the same machine *after* statistics were used.

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The alarm thresholds have been re-set to levels that are more accurate for this machine i.e. the alarms will now trigger if there is any significant increase in vibration.

The Ascent software comes with a number of pre-defined statistical alarms that can be applied to your data. Users who want to make use of the pre-defined statistical alarms, and who do not intend to create their own, do not need to read the entire section. The following list of topics is the minimum amount of reading necessary to get you started (we recommend that you read the rest of the section once you are comfortable with using the pre-defined statistical alarms).

- What are Generation Parameters (page 320) - explains how the software creates statistical alarms
- Applying Pre-defined Alarms (page 321) - step-by-step instructions for applying the pre-defined alarms to your machines
- Re-defining Thresholds for Existing Alarms (page 325) - step-by-step instructions for generating new thresholds for existing alarms

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- Updating Alarm Thresholds (page 329) - explains how to create more accurate and reliable alarm thresholds

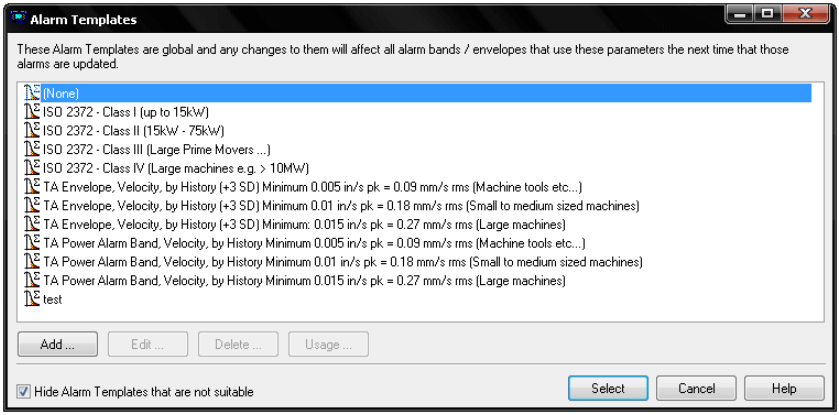
If you intend to create your own statistical alarms, or make adjustments to the pre-defined ones, you will need to read the entire section - this will give you a thorough understanding of:

- how alarm thresholds are created and adjusted
- the mathematical processes involved
- what data is needed to make statistical threshold calculations

What are Generation Parameters

When you create statistical alarms, the software needs to know what type of alarm to create (envelope or band) and at what amplitudes to set the alarm thresholds. This information is supplied in the *Generation Parameters* used to create the alarm. Generation parameters are statistical alarm *templates* that specify what settings will be used to generate statistical alarms for your machines.

For example, a set of generation parameters may specify that the alarm created will be a band alarm, that the alarm thresholds will be calculated using a history of collected data, and that thresholds will be set for Warning, Alert and Danger.



Window showing a selection of pre-defined generation parameters

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The system-defined generation parameters included in the software are based on standards from ISO and Technical Associates of Charlotte, P.C. These will provide excellent starting points for setting up your statistical alarms. You can use them to create alarms for machines that do not yet have alarms set up, or to re-define thresholds for your existing alarms to make them more accurate - these methods are explained next.

Applying Pre-defined Alarms

Before statistical alarm *thresholds* can be calculated for your data, you must first create some alarms. If you have a machine with no alarms or a machine with alarms that aren't working effectively, you can create entirely new alarms using the Alarm Wizard.

The Alarm Wizard is an alarm management tool that will create statistically derived alarms for you with just a few clicks of the mouse. The process can be described as follows:

- Select a machine to create the alarms for.
- Choose a set of pre-defined generation parameters to apply. These specify the alarm type (band or envelope) and alarm thresholds to create.
- Choose which schedule entries will have the alarm applied to them.
- Specify a frequency range (for band alarms).

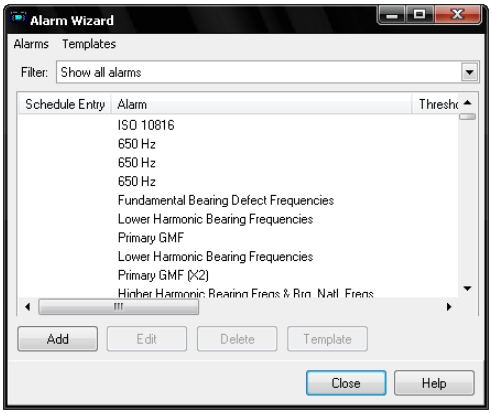
When you click **OK**, the Wizard will analyze your data and build the alarms at each schedule entry that you choose.

If you are going to use the Alarm Wizard to build new alarms, envelope alarms are the most effective type to create. If you want more detailed *band* alarms with pre-defined frequency ranges use The Proven Method to create appropriate bands before re-defining their thresholds using statistics (see Re-defining Thresholds for Existing Alarms on page 325).

To create and apply the alarms

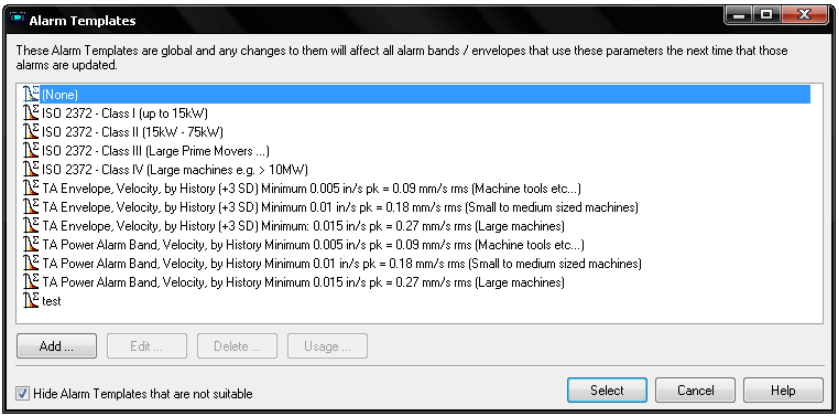
- Select the machine that you want to build alarms on.
- Click the **Alarms** button to open the Alarm Wizard. Any existing alarms will be displayed in this window.

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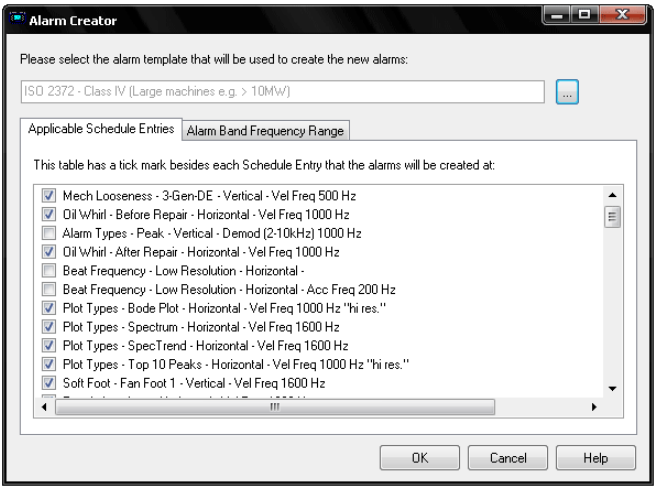
- If you wish to delete any existing alarms select them from the list and click **Delete**. Click **OK** to confirm this action then click the 'Tasks' tab to return to the main screen.

- To create your new alarms click **Add** then click the  button to open the Alarm Templates window.



- Highlight the generation parameter set you wish to assign to these alarms then click **Select** (the descriptive names should help you to decide which generation parameters are most suitable). This will open the Alarm Creator window.

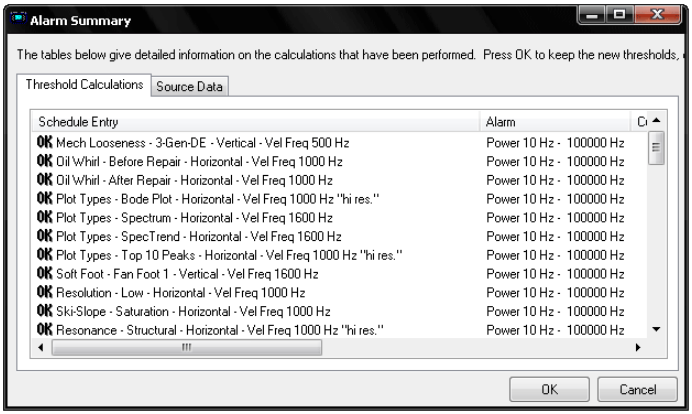
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- Tick the schedule entries you wish to apply the alarms to.
- If you are creating peak or power band alarms you will need to manually set the frequency range for these alarms. Click the 'Alarm Band Frequency Range' tab and enter the start and stop frequency values.
- Click **OK** to create the new alarms.

Your data will be analyzed and the generation parameters you selected will be used to create the thresholds for these new alarms. The Alarm Summary window will display the results of the generation process.

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'OK' means that new thresholds were generated.

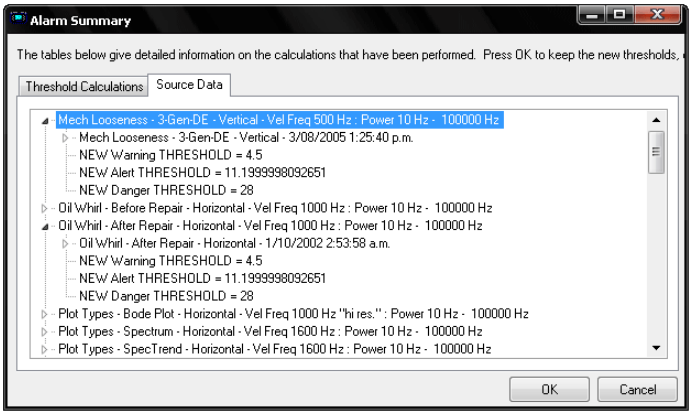
A black '!' exclamation mark means that thresholds were generated, however a minimal amount of data was used (the 'Warn if less than' value hasn't been reached). The 'Warn if less than' value refers to the number of vibration recordings used as source data for statistical calculations.

A red '!' exclamation mark means that thresholds were not generated - either there wasn't enough data or some other error occurred.

The furthest right-hand column contains more information on the generation process such as how many outliers were rejected and if there were any suspicious recordings (outliers and suspicious recordings are explained shortly).

- Click the 'Source Data' tab to see a more detailed breakdown of the data values used in the generation process.

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- Click **OK** if you wish to save these new thresholds. The software will create the alarms and write the new thresholds to the database.

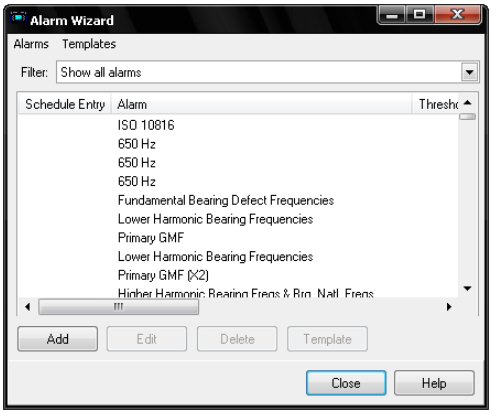
If you click **Cancel** the alarms will not be changed and you can try selecting a different set of generation parameters to fine tune the thresholds before generating them.

Re-defining Thresholds for Existing Alarms

When you apply generation parameters to existing alarms, their thresholds are re-calculated using statistical analysis of your collected data. The generation parameters you select determine *how* the thresholds are calculated.

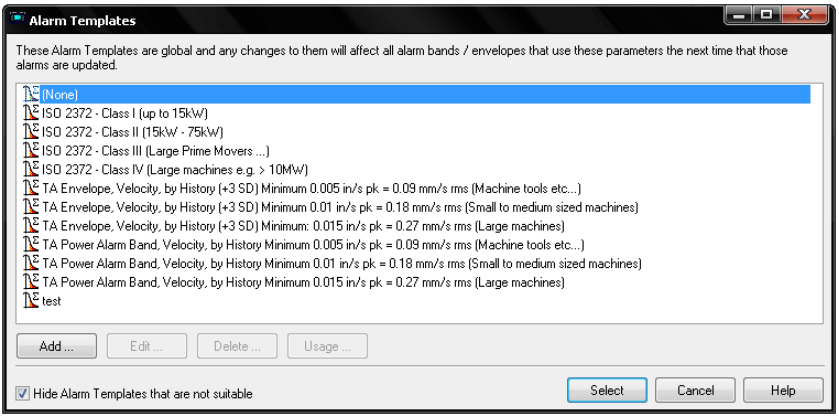
- Select the folder, machine, point, location or schedule entry that contains the alarms.
- Click the **Alarms** button on the toolbar. This will open the Alarm Wizard that allows you to perform actions such as creating, updating and generating alarm thresholds on all the selected alarms at once.

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- Select the alarms whose thresholds you wish to update (hold down the **SHIFT** or **CTRL** keys while clicking with the mouse to select more than one alarm in the list).

- Click the **Template** button to open the Alarm Templates window. The Alarm Templates window contains a list of currently defined alarm generation parameters that can be applied to this alarm and will later include any that you define yourself. If there are no suitable alarm generation parameters for these alarms 'None' will be displayed.

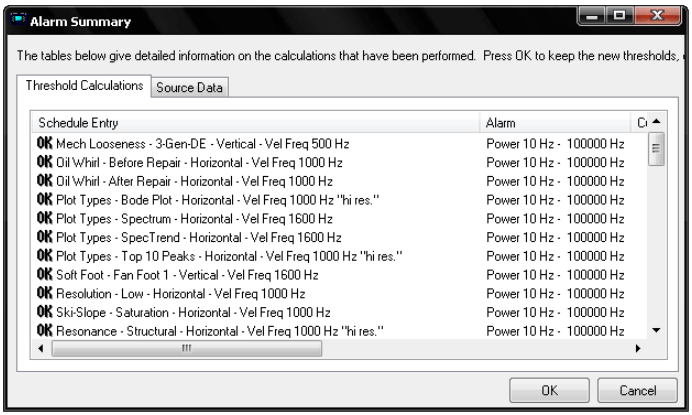


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- Highlight the appropriate generation parameter set then click **Select** (the descriptive names should help you to decide which generation parameters are most appropriate).

Note: The suitability of generation parameters is based on the type of alarm e.g. if you have a band alarm selected, envelope generation parameters will be hidden.

The Alarm Summary window will display the new alarm information. An icon besides each row in the threshold summary shows whether new thresholds were generated successfully for each alarm.



'OK' means that new thresholds were generated.

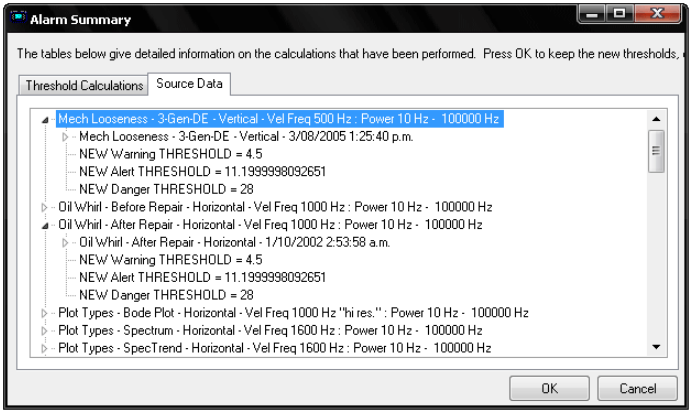
A black '!' exclamation mark means that thresholds were generated, however a minimal amount of data was used (the 'Warn if less than' value hasn't been reached). The 'Warn if less than' value refers to the number of vibration recordings used as source data for statistical calculations.

A red '!' exclamation mark means that thresholds were not generated - either there wasn't enough data or some other error occurred.

The furthest right-hand column contains more information on the generation process such as how many outliers were rejected and if there were any suspicious recordings (outliers and suspicious recordings are explained shortly).

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- Click the 'Source Data' tab to see a more detailed breakdown of the data values used in the generation process.



- Click **OK** if you wish to save these new thresholds. The software will write the new thresholds to the database.

If you click **Cancel** the alarms will not be changed and you can try selecting a different set of generation parameters to fine tune the thresholds before generating them.

Re-defining thresholds for a single alarm

- If you wish to update a single alarm using statistics, double-click a recording to display the alarm on a chart.
- Right-click the alarm on the chart and choose **Update Thresholds**.
- Highlight the appropriate generation parameter set then click **Select**.
- Click **OK** to save the new thresholds or **Cancel** to discard them.

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Updating Alarm Thresholds

The accuracy of statistically generated alarm thresholds is determined largely by the number of recordings used. A larger number of recordings will give a more accurate estimate of the mean and standard deviation. As you collect a history of data it is recommended that you update your alarms periodically (e.g. every 6-12 surveys) so that reliable alarm thresholds can be established. Whenever thresholds are updated, statistical outliers will be rejected during the update.

When you update alarms the software will use all recordings available at that time to generate statistics then perform calculations on these to determine new thresholds. The number of recordings used and the locations from which they are sourced will be determined by the settings of the alarm generation parameters that you selected when you created the alarms.

You can update multiple alarms simultaneously - this will generate new thresholds based on the generation parameters assigned to each alarm.

- Click **Alarms** to open the Alarm Wizard.
- From this window's menu select the alarms you wish to update (hold down the **SHIFT** or **CTRL** keys while clicking with the mouse to select more than one alarm in the list).
- From this window's menu select **Alarms>Update alarm from template**.

The Alarm Summary window will display showing you whether the new thresholds were generated successfully for each alarm and what the new thresholds are.

- Click **OK** if you wish to save these new thresholds.

If you press **Cancel** the alarms will not be changed and you can try editing the generation parameters to fine tune the thresholds before updating again.

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Updating thresholds for a single alarm

- If you wish to update a single alarm, double-click a recording to display the alarm on a chart.
- Right-click the alarm on the chart and choose **Update Thresholds**.
- When the Alarm Summary window opens click **OK** if you wish to save the new thresholds.

How are Statistics Applied to Alarms

To generate statistical alarms, the software applies statistical calculations to your data (vibration recordings) and uses the end results to set the alarm thresholds. The process can be described as follows:

- Given a set of data, the software calculates the *mean* and *standard deviation* values.
- The software then sets alarm levels at mean plus a number of standard deviations above the 'averaged spectrum' so that only outlying data values (higher than 'normal' amplitudes) will trigger an alarm.

For envelope alarms, this involves calculating the mean and standard deviation of each frequency within each spectrum.

For peak and power alarms, this involves calculating the mean and standard deviation of the Peak or Power value within the alarm's frequency range for each recording.

When calculating the mean for a sample of recordings:
For envelope alarms, mean = the average value of each frequency.
For power band alarms, mean = the average value of the power in that band.
For peak band alarms, mean = the average value of the highest amplitude in that band.

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Note: If there are less than 25 vibration recordings in your sample, the software will use the (n -1) denominator in the standard deviation calculation – this provides a standard deviation estimate of the population, from a sample. This is the standard employed by the American Society of Quality Control. If there are 25 or more vibration recordings, the (n) denominator is used.

From a statistical point of view, if the measurements are distributed normally along a bell curve, 99% of the data values will fall within mean plus or minus 3 standard deviations, this being regarded as the 'normal' or acceptable level of vibration.

If you set your alarm levels at mean plus 3 standard deviations, you would expect less than 1% of 'normal' data to trigger an alarm, but unusually large data values (those that are higher than mean plus 3 standard deviations) will trigger the alarm.

Statistical outliers
Statistical outliers are data values that are much larger or smaller than the mean value (spectral points that exhibit unusually high or low levels of vibration would be classed as outliers). The software will detect any statistical outliers in your data and exclude them from its calculations thereby reducing the likelihood of false or non-triggered alarms.

Outlier Detection and Suspicious Recordings

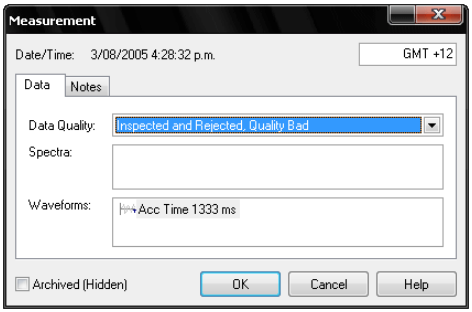
The Ascent software uses the MAD (Median Absolute Deviation) method to automatically identify statistical outliers. Values that are more than 3.5 estimated standard deviations from the estimated mean are rejected from the calculations. For peak and power bands, this means that the entire recording is rejected (because each recording only produces one value).

You can change the default value of 3.5 estimated standard deviations to control how much outlier removal is used (this option is found on the 'Statistics Option' tab window, described shortly).

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Suspicious recordings (Envelopes only)
When generating envelope alarms, a data point that is an outlier does *not* lead to the entire measurement being rejected. If the software finds that more than 25% of the data points from a recording have been rejected, it then declares that recording to be 'suspicious'. This is just a flag on the recording and processing is not affected. You should consider marking this recording as 'bad' quality if it is indeed an unsuitable measurement so that all of its values are excluded from statistics.

- To flag a recording's data quality as bad, right-click the recording in the navigator list and choose **Edit**.
- From the 'Data Quality' drop-down box, select 'Inspected and Rejected, Quality Bad', then click **OK**.



Outlier measurements are shown on Trend charts using **X** markers. The default colors for these **X** markers are as follows:

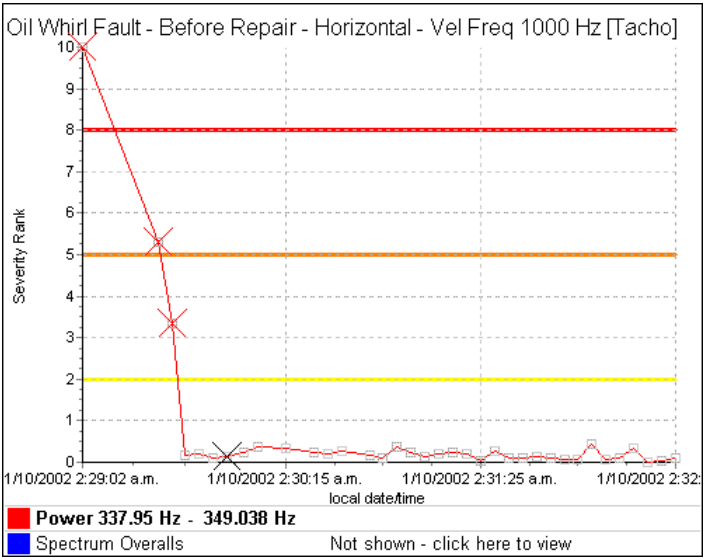
Black: The measurement wasn't included in statistics because its data quality is set to Bad or the measurement didn't meet criteria (RPM out of range, not a baseline, data doesn't match etc) if you are using Statistics by History.

Red: (alarm band trending only) The measurement was identified as an outlier.

Fuchsia (dark pink): (envelope trending only) This indicates that more than 25% of the points on the envelope were rejected, so the recording is 'suspicious'.

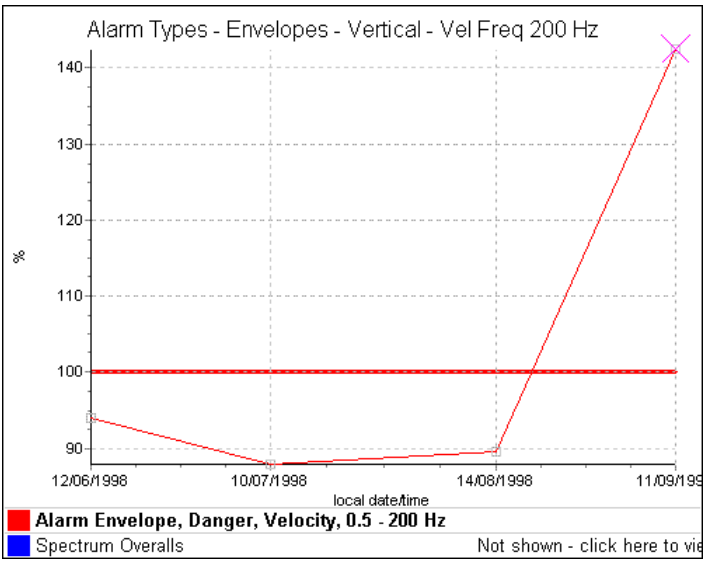
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The following example shows an alarm band that has been updated using statistics. Red crosses mark three measurements that were rejected as outliers, and a black cross marks one measurement that was rejected because its 'data quality' flag was set to bad.

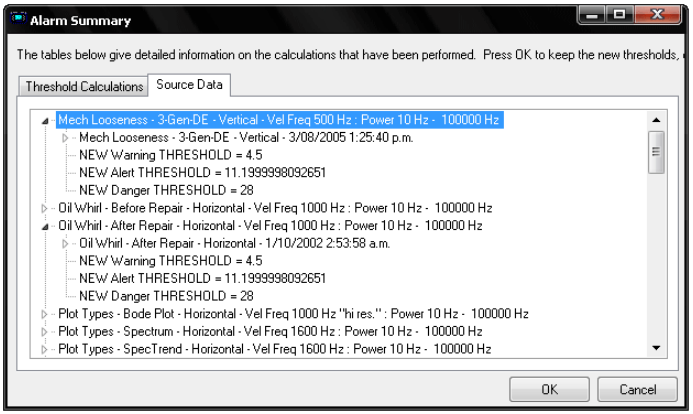


Here is an example of an envelope trend, where the last measurement was considered suspicious because more than 25% of its values were rejected.

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After statistics have been generated you can get this information in detail from the 'Source Data' tab window of the Alarm Summary window.



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Statistical Alarm Setup

Statistical alarm thresholds are created by defining 'generation parameters' - setup information that the software uses in its statistical calculations.

The generation parameters used with an alarm are associated with that alarm permanently and the alarm can be updated at any stage using the same parameters (but using any new data that may be available). Note that, as with parameter sets, a single set of generation parameters can be used on many machines (define once, use many times).

Before statistical alarm thresholds can be calculated for your data, you must first create some alarms. There are several ways to create new alarms:

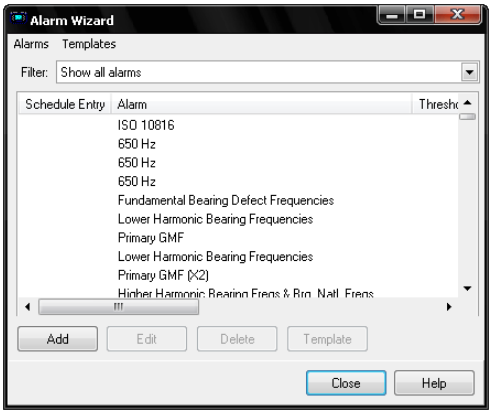
- Manually create alarms directly on charts as discussed in Using Alarms (page 150).
- Use the Machine Builder Wizard (page 302) to define the alarms and measurements using The Proven Method or an ISO standard.
- Use the Alarm Wizard (page 321) to create the alarms, select generation parameters and generate thresholds for these new alarms all in one process.

Using the Alarm Wizard

The Alarm Wizard allows you to perform actions such as creating, updating and generating alarm thresholds on all the selected items at once.

- Click the **Alarms** button to open the Alarm Wizard.

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From the initial screen you can carry out the following actions:

Add
Opens the Alarm Creator window where you can set the alarm frequency range and access alarm templates and generation parameters.

Edit
Allows you to edit and update individually selected alarms.

Delete
Deletes the selected alarm(s).

Template
Opens the Alarm Templates window where you can add or edit the generation parameters associated with the selected alarms.

The next few topics will walk you through each of the alarm setup screens and describe the settings and information you need to supply so that the software can generate alarms for you.

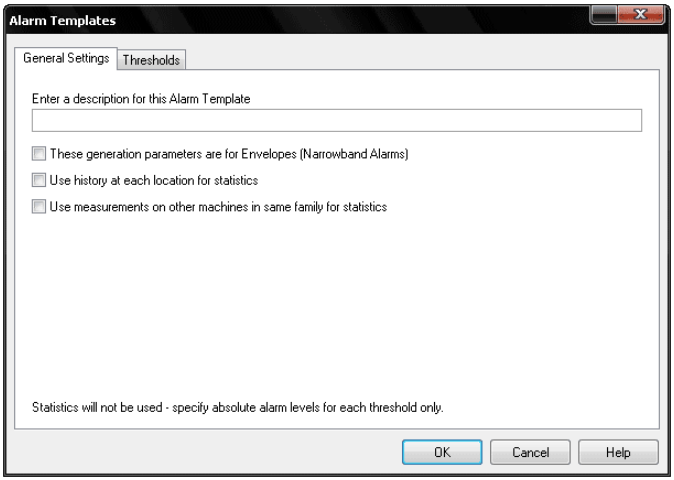
Note: As you explore the Alarm Wizard some parts of the screens will be hidden and will only become visible when you select options or enter information. The instructions will tell you when you need to perform an action.

General Settings

- If the Alarm Wizard is not open click **Alarms**.

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- In this window's menu select **Templates>Edit all templates**.
- Click **Add**. This will display the 'General Settings' tab window where you will specify the basic information for your alarm generation parameters.



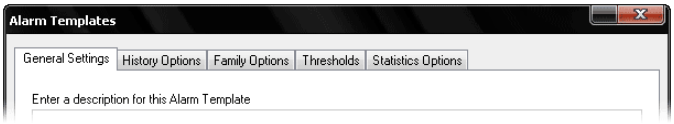
Description
This is a unique name that you supply for this set of generation parameters.

- Before you proceed, type a name into this field (you will be prompted for a name later if you do not enter one now).

These generation parameters are for Envelopes (Narrowband Alarms)
Ticking this option specifies that you are creating an envelope alarm. It also causes the 'Envelope Options' tab to appear in the Threshold Editor (the Envelope Options settings will be explained shortly).

Use history at each location for statistics
This means that historical data at each measurement location will be used to generate mean and standard deviation values. Ticking this option causes the 'History Options' tab to appear (the History Options settings will be explained shortly).

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Select options to make relevant information 'tabs' appear

Use measurements on other machines in same family for statistics
This means that measurements at other machines in the same family will be used for statistics as well. Note that both historical *and* family measurements can be used for statistics if desired. Ticking this option causes a 'Family Options' tab to appear (the Family Options settings will be explained shortly).

- Tick both of the previous options to make the 'History Options' and 'Family Options' tabs appear. This will also make several extra setup items visible.

If statistics are not being used (neither the history nor family is selected for statistics) you can specify absolute alarm levels only (e.g. for ISO 2372 alarm bands).

Maximum RPM difference
When you are creating a new alarm (or updating the thresholds) the software will find the RPM of the most recent measurement. Then, when looking through the history and family for more measurements it will only use measurements that are within this number of RPM from the most recent value. This RPM value is static and will not change until you update the alarm.

Only consider baseline measurements
Ticking this option allows some special case scenarios to be set up:

Used in conjunction with 'Use history at each location for statistics':
If the history limit is set to 1 (on the 'History Options' tab window) you can base the alarms on the *most recent* baseline at each location.

Used in conjunction with 'Use measurements on other machines in same family for statistics':
If this option is also selected, then the statistics will be generated using the baseline *measurements* across the machine family.

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With only one data value (the most recent baseline), the standard deviation will be calculated to be zero, however you can use the other threshold defining attributes, such as 'Percentage offset from Mean' and the 'Minimum and Maximum' values to allow alarms to be specified at a relative or absolute level based on the baseline at each location.

History Options

The 'History Options' tab appears when you select 'Use history at each location for statistics' (select this now on the 'General Settings' tab window if 'History Options' is not visible).

- Click the 'History Options' tab at the top of the window.

Maximum number of historical measurements to use (at each Schedule Entry)
This allows you to specify a limit on how many historical recordings will be used. If this is set to 1, the statistics will be based on the most recent recording at each location or the baseline recording if 'Only consider Baseline measurements' is selected on the 'General Settings' tab window.

- Before you proceed, enter a value into this field (you will be prompted for a value later if you do not enter one now).

Only consider history since most recent baseline
This option instructs the software to only go as far back in the history as the most recent baseline recording.

Family Options

The 'Family Options' tab appears when you select 'Use measurements on other machines in same family for statistics' (select this now on the 'General Settings' tab window if 'Family Options' is not visible).

- Click the 'Family Options' tab at the top of the window.

Group data by axis
Selecting this option will generate alarms using data gathered from axes of the same name in a machine family e.g. all recordings taken on the horizontal axis.

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Group data by point
Selecting this option will generate alarms using data gathered from points in a machine family that have the same name e.g. all recordings taken on the 'Drive End' point.

Selecting *both* options means that when collecting data for statistical analysis of a particular point on a family of machines, the recordings from axes and points with the same names will be grouped together i.e. with both these options ticked, all machines in the family will have their 'Drive End – horizontal' alarms created/updated based on the 'Drive End – horizontal' readings of all the other machines in that family only.

The following table summarizes how the software gathers data depending on the options selected. In this example, the alarm threshold is being generated for 'Point 1 - horizontal' on Machine 1.

	History	**Family**	**Family** group by point	**Family** group by axis	**Family** group by point and axis
Machine 1					
Point 1					
(alarm) H	X	X	X	X	X
V		X	X		
Point 2					
H		X		X	
V		X			
Machine 2					
Point 1					
H		X	X	X	X
V		X	X		
Point 2					
H		X		X	
V		X			

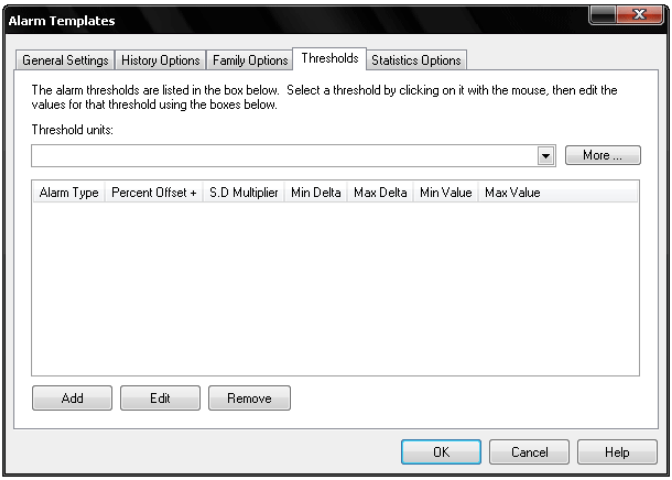
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For information on how to categorize machines into families and how to create machine families, see Machine Families (page 349).

Thresholds

The 'Thresholds' tab window is where the settings that define your threshold levels are listed for each alarm.

- Click the 'Thresholds' tab at the top of the window.

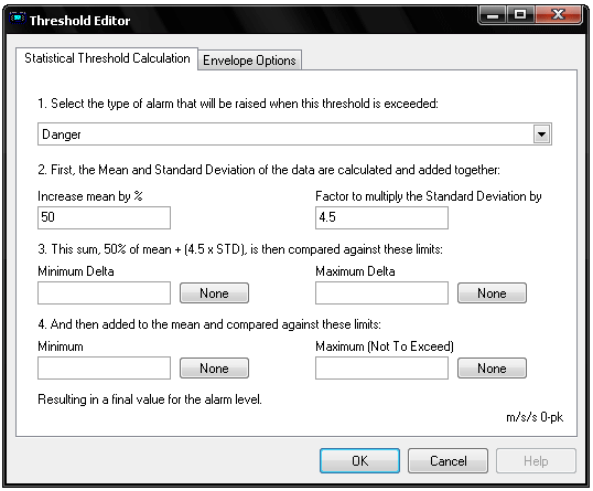


The values that will be displayed here are entered using the Threshold Editor.

- From the 'Threshold units' drop-down box, select the type of alarm band to create from the list of amplitude units, measurement units and scaling type (Ø-pk, pk-pk, rms). The amplitude units chosen must match that of the alarm you are updating/creating but the measurement units and scaling type do not have to match.

- Click **Add** to open the Threshold Editor. This is where you will enter the values that are displayed on the 'Thresholds' tab window (see previous diagram).

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The Threshold Editor

Alarm Type	Percent Offset +	S.D Multiplier	Min Delta	Max Delta	Min Value	Max Value
Danger	50	4.5			0.005	
Alert	25	3			0.005	

The Thresholds window after values have been entered in the editor

If statistics are not being used the Threshold Editor will contain fields that allow you to specify absolute alarm thresholds. Only the Alarm Type and Min Value will need to be entered (see the following list of definitions).

If statistics are being used (history or family is selected for statistics on the 'General Settings' tab window), this window will contain fields that allow a statistical threshold calculation to be made. This alarm threshold calculation is:

mean + (a number of standard deviations + percentage of mean)

As an example, typically when generating alarm envelopes, one would use mean + 3 standard deviations.

For peak and power band alarms, some typical formulae are:

A level 1 alarm (Alert) = mean + 2 standard deviations.

A level 2 alarm (Danger) = 1.5 times the level 1 setting (50% above mean + 3 standard deviations)

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The threshold determined by the software can be limited by specifying min/max values. Min/max *delta* puts limits on the part of the calculation within the brackets. Min/max *value* puts bounds on the final result (add the mean to the delta). The min/max options are explained more fully below.

Note that some fields on this screen are optional.

Select the type of alarm that will be raised (required)
This is the type of alarm that will be raised when this threshold is exceeded (warning, alert etc). The alarm type chosen must match that of the alarm you are updating/creating.

Increase Mean by % (optional - set to zero if not needed)
This specifies the percent amplitude the alarm threshold will be placed above the 'average' spectrum (or average peak/power for band alarms). Negative percentages can also be specified for those special cases where they may be needed. This value will be displayed in the **Percent Offset +** field on the 'Thresholds' tab window.

Factor to multiply the Standard Deviation by
(optional - set to zero if not needed)
This specifies the number of standard deviations to use. For example, entering 2 will multiply the standard deviation by 2 and add it to the mean. This value will be displayed in the **S.D Multiplier** field on the 'Thresholds' tab window.

Minimum Delta (optional - leave blank if not needed)
This specifies the *minimum difference* between the mean and the alarm threshold. For example, if the Min Delta is set to 1 mm/s, if the number of standard deviations + the percentage of mean value is less than 1 mm/s, it is increased to 1mm/s before it is added to the mean to get the threshold value.

Maximum Delta (optional - leave blank if not needed)
This specifies the *maximum difference* between the mean and the alarm threshold. For example, if the Max Delta is set to 1 mm/s, if the number of standard deviations + the percentage of mean value is more than 1 mm/s, it is reduced to 1mm/s before it is added to the mean to get the threshold value.

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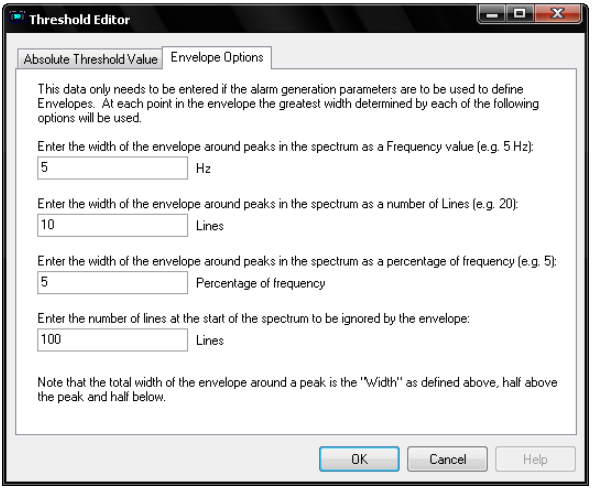
Minimum (optional - leave blank if not needed)
This specifies a minimum amplitude for this alarm threshold to ensure that it will not be set to a very low value (thereby causing false alarms). If the final threshold value calculated by the software is lower than the minimum value, the threshold will be set equal to this value. This value will be displayed in the **Min Value** field on the 'Thresholds' tab window.

Maximum (Not To Exceed) (optional - leave blank if not needed)
This specifies a maximum amplitude for this alarm threshold to ensure that it will not be set to a very high value. If the final threshold value calculated by the software is higher than this value, the threshold will be set equal to this value. This value will be displayed in the **Max Value** field on the 'Thresholds' tab window.

Envelope Options

The 'Envelope Options' tab appears in the Threshold Editor when you select 'These generation parameters can be used for Envelopes' (select this now on the 'General Settings' tab window if 'Envelope Options' is not visible).

- Click the 'Envelope Options' tab.



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The following options allow you to specify the width of the envelope around peaks in the statistically averaged spectrum. If more than one of these options is selected, the greatest width determined by these options will be used at each point (spectral line) in the envelope.

Hz
This specifies a frequency that the envelope will be placed either side of a peak. For example, a value of 6 Hz will generate an envelope 3 Hz either side of each peak.

Lines
This specifies the number of spectral lines between the envelope and each peak in the spectrum. For example, a value of 10 will generate an envelope 5 lines either side of each peak. This option is recommended for machines that run at or near the same speed from one recording to the next.

Percentage of frequency
This specifies what frequency percentage the envelope will be placed either side of a peak. For example, a value of 10% around a peak at 2000 CPM will place the envelope 5% either side of the peak at 1900 CPM and 2100 CPM. At higher frequencies on the same spectrum the envelope will become much wider, for example at 60 000 CPM the envelope will extend 3000 CPM either side. This option is recommended for machines that run at variable speeds or whose RPM varies significantly from one recording to the next.

Lines (number to ignore)
This specifies the number of spectral lines that will be ignored at the beginning of the spectrum i.e. the envelope will be drawn around all frequencies except the first few lines. This helps to avoid false alarms caused by the 'ski slope' often found at the low frequency end of spectra.

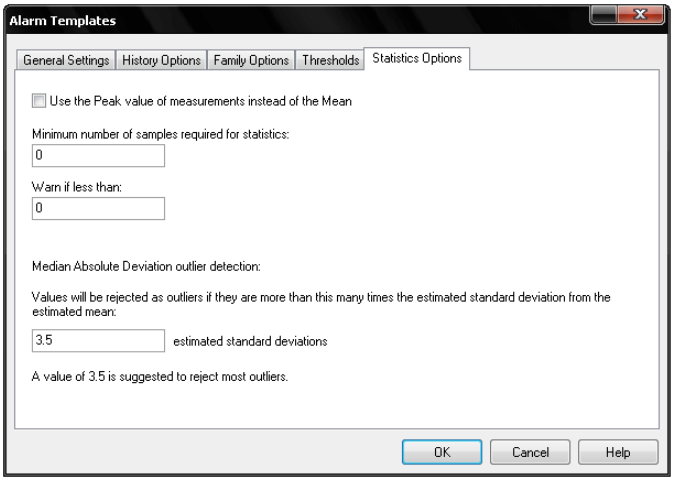
- Before you proceed, type a value into the first three fields (you will be prompted for a value later if you do not enter something now).
- Click **OK** and you will be returned to the 'Thresholds' tab window.

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Statistics Options

The 'Statistics Options' tab appears when you select 'Use history at each location for statistics' and/or 'Use measurements on other machines in same family for statistics' (select one of these now on the 'General Settings' tab window if 'Statistics Options' is not visible).

- Click the 'Statistics Options' tab at the top of the window.



Use the Peak value of measurements instead of the Mean
Selecting this option means that the software will use the peak value of the data instead of the mean for all calculations. Using the peak (highest amplitude value) instead of the mean (average value) will result in a higher threshold being set. This option would typically be used for envelope alarms.

Minimum number of samples required for statistics
If this number of samples is not available new thresholds will not be generated.

Warn if less than
A black '!' exclamation mark will appear on the Alarm Summary window after generating thresholds, to indicate that the 'Warn if less than' value hasn't been reached. When you save the thresholds the software will give you a warning that there was a 'minimal amount of data' used.

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Estimated standard deviations
The Ascent software uses the MAD (Median Absolute Deviation) method to identify outliers automatically. By default, values that are more than 3.5 'estimated standard deviations' from the 'estimated mean' are rejected. This outlier rejection value can be adjusted here.

- Now that you have explored each tab window of the Alarm Wizard close it by clicking **Cancel** twice then click **Close**.

Creating Statistical Alarm Templates

- Click **Alarms**. From this window's menu select **Templates>Edit all templates**.
- Click **Add**. With the 'General Settings' tab window open, enter a name for this alarm template then tick the boxes and fill in the fields as necessary.

Note: Please refer to the appropriate topics for descriptions of the information fields on each tab window.

- Click the 'Thresholds' tab to open this window and select the appropriate threshold units from the drop-down list.
- Click **Add** and fill in the information fields in the Threshold Editor to define the first alarm threshold.
- Click **OK** when you have finished. You can define additional thresholds (Alert, Warning etc) by clicking **Add** and repeating this process.
- Click on the other tabs as required and fill in the necessary information. Click **OK** when you are finished. Your new template will be highlighted in the Alarm Templates window.
- Click **OK** to finish creating the template and close this window.
- To apply the new template to your alarms select them in the Alarm Wizard window (hold down the **SHIFT** or **CTRL** keys while clicking with the mouse to select more than one alarm in the list).

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- From this window's menu select **Alarms>Add**.
- Select your new template from the Alarm Templates window then click **Select**.
- Tick the schedule entries you wish to apply the alarms to.
- Click **OK** to apply the template to your alarms. The Alarm Summary window will display the details of the threshold calculations.
- Click **OK** then **Close** to finish.

Editing Statistical Alarm Templates

Any changes made to the generation parameters of a statistical alarm template will affect *all* alarms that use those parameters (when those alarms are next updated). If you only wish to make changes to a few alarms that share the same alarm template, you can edit them individually or create a new set of generation parameters and apply those to your selected alarms (see previous topic for details).

Note: You cannot change the *frequency range* of an alarm by changing its generation parameters. For information on modifying frequency, see topics in Section 5 on editing alarms.

- On the toolbar click **Alarms**.
- From this window's menu select **Templates>Edit all templates**.
- Highlight the alarm template you wish to change then click **Edit**. Click **OK** to confirm.
- When you have finished making changes click **OK**.
- You will be prompted to 'update' the alarms. Click **OK** to confirm. The Alarm Summary window will display the new details of your alarm template.
- Click **OK** to accept or **Cancel** to discard these changes. Cancelling allows you to try out different settings to see the effect these will have on your alarm thresholds.

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- Click **OK** then **Close** to finish.

Machine Families

Similar machines can be expected to exhibit similar vibration patterns. By comparing the vibration patterns of similar machines, it becomes possible to learn more about how the machines are 'expected' to vibrate. This makes it easier to detect when they are vibrating abnormally.

A *machine family* can be described as a *user-defined group of machines* that have similar characteristics and are used for the same purpose. For example, if you have several identical blowers made by the same manufacturer and all operating under similar loads in similar environments, these can be classified as belonging to the same machine family.

The Ascent software lets you define machine families so that spectra from all machines in that family can be compared and used to generate suitable alarm thresholds.

Note: Statistics by *history* is the recommended practice for setting up statistically generated alarms. Statistics by family is useful if you have no history of machine data as it allows statistics to be used after only a single survey.

The following criteria must be considered when grouping machines into families:

Machine type:
Blowers can be grouped with other blowers that perform the same task, pumps with other pumps etc. Note that you should not group machines of the same type if they operate differently (e.g. horizontal pumps and vertical pumps) as their vibratory patterns will be very different.

Size/capacity:
Machines must be of a similar size/capacity to each other. They must also operate under a similar load.

Installation/mounting:
Machines must have similar supporting framework and be mounted in similar fashion (same base material etc).

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Age of the machine:
An old machine may exhibit a very different vibratory pattern than a newer machine due to regular wear and tear rather than fault conditions. Close comparison of spectral patterns should be made before including old and newer machines in the same family.

Location:
Machines must be spaced a similar distance from other sources of vibration that may affect their vibration levels.

Environment:
The temperature and humidity of the machines' operating environments must be similar.

Physical properties:
Machines must have similar mass, rotor stiffness, damping etc and exhibit similar 'sensitivity' to load changes.

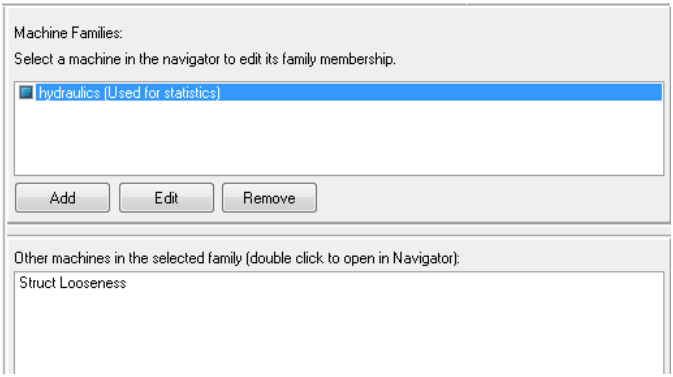
Note: This list is not exhaustive. You can, and should, use your own knowledge of the machines being studied to look for points of similarity that can be used to group machines into families.

How to Create Machine Families

Machines must be in the same database to be grouped together as a family but they do not need to be in the same site or folder. A machine can be a member of more than one family at the same time.

To create a machine family

- From the main menu, choose **Edit>Edit Machine Families**.



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The top half of the Machine Family Editor shows all the machine families in the database. When you select a machine family, the bottom half of the screen will show all the machines that belong to that family. Double-clicking one of these will select that machine in the navigator.

- Click the **Add** button and enter a name for the new machine family.
- Tick 'Machines in this family are used for statistics' if you want to use this family for statistical alarm generation.
- Click **OK** and your new family will appear in the upper half of the screen.

To edit a machine family

- Select the family and click **Edit**.
- Edit the family as required then click **OK**.

To delete a machine family

- Select the family and click **Remove**.
- Click **OK** to confirm the deletion.

Adding/Removing Machines from a Family

- To add a machine to a family, select the machine in the navigator.
- Place a tick beside any machine families that you want the machine to belong to.

To remove a machine from a family

- Select the machine in the navigator.

In the Machine Family Editor, any families this machine belongs to will have a tick beside them.

- Un-tick a box to remove the machine from this family.

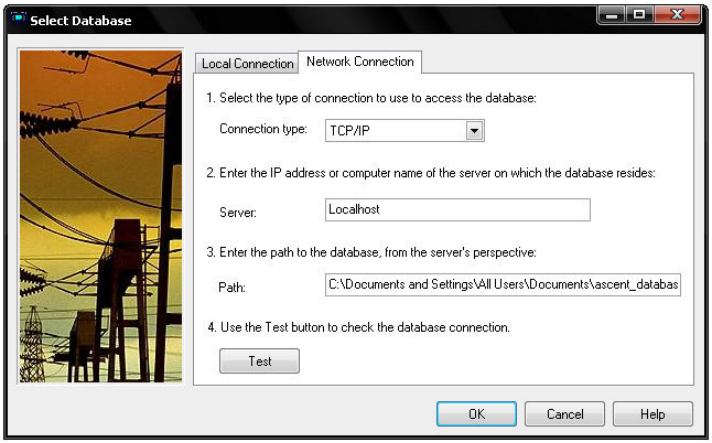
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Section 13: Using a Network

Note: This feature will only be available to you if it is included as part of your license agreement. If you wish to enable this feature please contact sales@commtest.com or your distributor for more information.

Connecting to a Network Database

- On the toolbar click **Open**.
- Click the **Change** button and in the 'Select Database' window click the 'Network Connection' tab.



- In the 'Connection type' drop-down box ensure TCP/IP is selected.
- In the 'Server' field, enter either the server name, IP address or DNS name of the computer that holds the database.
- In the 'Path' field, enter the path to the database *from the server's perspective*.
- Use the **Test** button to check if the database can be accessed.

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- Click **OK** to connect.

Managing Multi-user Access

On a network, multiple users can access and make changes to the same database simultaneously. Whenever you make a change, such as adding or deleting an item, the **Save** button will become 'active'. Clicking **Save** commits your changes to the database.



- To undo a save select **File>Undo** \ **Revert...**, from the main menu.

Note: There is only one level of Undo, i.e. you cannot return to a state that was several saves ago.

When you click **Save**, if a second user is working with the same database elsewhere on the network the **Refresh** button will appear in their toolbar. This indicates that changes have been made to the database.

When the second user clicks **Refresh** their view of the database is synchronized with yours and they will be able to see the changes you have made.

Deadlock/Conflict/Overwrite protection
The Ascent software prevents deadlocking and database conflicts by not allowing users to change the *same* piece of data at the same time. If one user makes changes to the database that conflict with what a second user is doing, they will receive a message advising them that the second user needs to save their changes. Once the second user has committed their changes to the database using **Save**, the first user can **Refresh** then make their changes again.

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Section 14: Viewing Data via a Web Browser

Note: This feature will only be available to you if it is included as part of your license agreement. If you wish to enable this feature please contact sales@commtest.com or your distributor for more information.

The AscentView program allows users to monitor Ascent databases on the company intranet or LAN via a web browser. Any organization that is using the Ascent program to collect and store condition monitoring data can benefit from AscentView by being able to share this data with other users without requiring the Ascent software to be installed on every computer.

Note: The AscentView application currently supports only Microsoft's Internet Explorer version 5.5 web browser and later.

Registering Your Software

The AscentView program comes with 3 user licenses that can be used for 30 days after installation. If you wish to use it beyond the 30 day grace period you must register the program by logging on and clicking the Upgrade link. You can register your copy of the AscentView program at any time even after the initial 30 day trial period has expired.

Increasing the Number of User Licenses

If you wish to increase your number of user licenses please contact sales@commtest.com.

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Setting Up the System

Before installing the AscentView program you will need to first install the following components on your computer:

- IIS web server
- Microsoft® .NET Framework 3.5 or later.

The person performing the installation should be a network administrator or possess a high degree of computer or network experience. IT-related technical knowledge is required to configure the system. This is particularly important if the AscentView system is to be accessible from outside the company network. The system is designed to allow controlled access to its web pages and attached databases. However, granting public access to any part of a private network can present risks and should be considered as part of an overall security policy.

Please ensure that the computer the AscentView website is to be installed on (the 'web server') is running Windows Windows XP Professional, Windows 2003 server or Windows Vista, has the latest Microsoft security patches for the chosen operating system and has at least Internet Information Services (IIS) version 5.1 installed. IIS should be the only web server service operating on the computer.

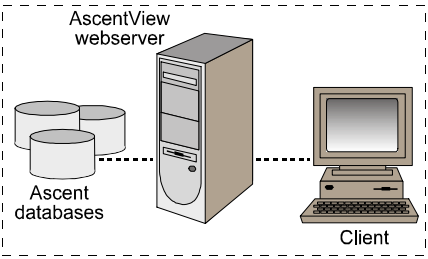
Any firewall present on the network must allow the appropriate port requests through to the AscentView website. The port number used by the Ascent database server **must** be opened on all PCs used to store accessible Ascent databases. Public access to the AscentView website, secure or otherwise, is beyond the scope of this document as configuration is entirely dependent on company and network policy.

Finally, AscentView cannot create databases - it relies on the existence of Ascent databases on the network. Therefore there must be at least one copy of the Ascent program and a corresponding machine database for AscentView to provide meaningful information.

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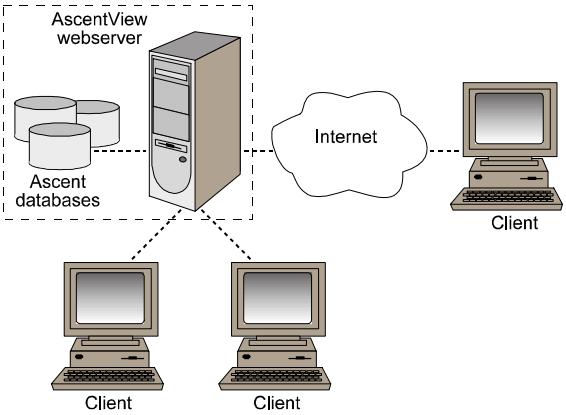
AscentView System Configurations

Your AscentView system can be configured in many ways; several examples are illustrated below.



All installed locally

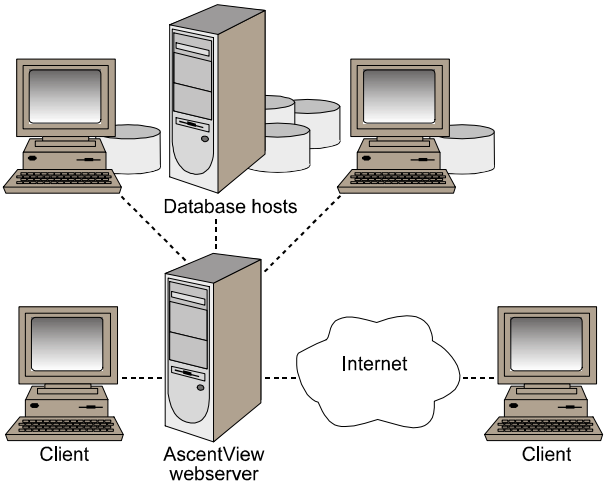
In this configuration the Ascent database(s), AscentView website and a browser are running on a single computer not attached to a network. No other computers can access the system other than the localhost (the computer the AscentView website is installed on). You might use this configuration to test the system before fully deploying it elsewhere. (There is no benefit to using this configuration in a 'live' situation as you can view your data more quickly using the Ascent program directly, rather than via a browser using the AscentView website).



Client/server setup

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The client/server configuration is the most common configuration for the system. The AscentView website is installed on a computer that also stores the Ascent database(s). Clients can use a web browser to browse the databases served by the AscentView website via a LAN or through the Internet.



Distributed client/server setup

This is an alternative to the previous configuration. The Ascent databases are stored on computers/servers other than the one the AscentView website is installed on.

Step 1: Installation

The AscentView application is an ASP.NET application that uses Microsoft® Internet Information Services (IIS) and the Microsoft .NET Framework to serve representations of your Ascent database content to a compatible web browser.

Note: At present this is limited to Microsoft Internet Explorer versions 5.5 and above.

- Close all programs on your PC.
- Insert the AscentView CD-ROM into the CD-ROM drive.

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- Wait for the installation program to automatically start.
- Follow the on-screen instructions to install the AscentView website as an application beneath the default website (most likely known as localhost).

Step 2: Logging On

- Open a web browser and navigate to **http://localhost/AscentView**. (If you have configured your web server to serve HTTP content over a port other than the default 80 you will need to enter something like **http://locahost:8080/AscentView** where 8080 is your chosen HTTP port number). If you are connecting to another computer within a simple network, replace 'localhost' with the AscentView server PC's name; for example, **http://PC_Name/AscentView**.

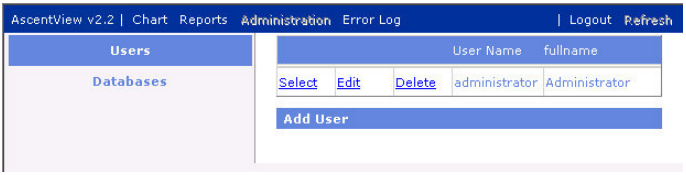


- Enter the system default username and password (these are case sensitive).

  User Name: administrator
  Password: password

- Click Logon.
- On the main window tool bar click **Administration**.
- On the left-hand menu click **Users**.

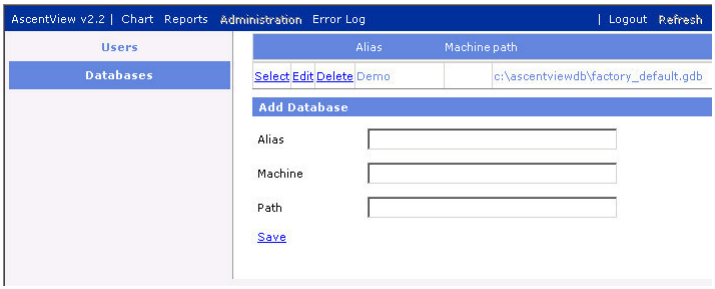
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- Click Select next to the administrator item then click **Change Password**.
- Enter 'password' as the current password then enter a new password and click Update.

Step 3: Adding Databases

- On the left-hand menu click **Databases** then click **Add Database**.



- Fill in the fields as follows:

Alias The alias is a label used to easily identify an existing database (once assigned, this name cannot be changed). When a user browses to the AscentView website this alias will appear in the list of databases that this user can access.

Machine This is the host name of the computer that the database is stored on.

Path This is the absolute path to the database file including the file name. This path must be written from the *host computer's* perspective.

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- Click Save. The new connection will be verified after a few seconds then the newly defined database will appear in the list. To define additional databases repeat the steps in this topic.

Step 4: Adding Users

Anyone who wishes to use the AscentView website must have their own user account.

Notes for setting up user accounts

- Fields are case sensitive.
- Each User Name must be unique and must not contain any spaces.
- Each User Name is used as the *logon name* for one account and **cannot** be changed once assigned. If you need to change a logon name for any reason you must delete the user and re-create them with a different User Name.

Adding a new user

- If you are not already in the Admin window click **Administration**.
- On the left-hand menu click **Users** then click **Add User**.
- Fill out the user's details including a unique User Name, which must **not** contain any spaces (for example, 'John Smith' must be entered as 'JohnSmith').
- Click Save to finish. The new user will be given a default low-privilege 'User' role. This window will remain open so that you can re-define this user's role or continue to add new users.

Defining a user's role

If a user is only being given permission to view selected databases the next step is to specify which databases they are allowed to view - see Step 5: Managing Database Permissions (page 361). To grant additional permissions continue reading to the end of this topic.

Users can be assigned any of the following roles:

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User	Can only view databases for which they have been given access permissions.
Manager	Can view all databases but does not have the ability to maintain links to Ascent databases or maintain website users and their roles.
Administrator	Is able to view and create/modify databases and users.

- To assign or change a user's role click Select beside that user's name.
- Click **Roles** to display the list of options.



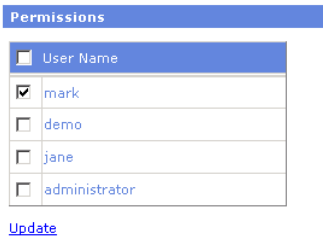
- Select the role you wish to assign to this user then click Update.
- To return to the database view window, on the toolbar click either **Reports** or **Chart**.

Step 5: Managing Database Permissions

Once a user is defined they are able to logon to the AscentView website. They will not be able to view any recordings until they are given database access permissions.

- If you are not already in the Admin window click **Administration** and in the left-hand menu click **Databases**.
- In the database list locate the database you want to assign permissions for. Click Select then click **Permissions**. This will display the list of currently defined users.

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- Tick the boxes to grant users permission to view this database. Click Update when you have finished.
- To return to the database view window, on the toolbar click either **Reports** or **Chart**.

Editing or Deleting Users

- On the main window toolbar click **Administration**.
- Click **Users** to display the list of currently defined users.
- When you have finished the edit/deletion you can return to the main database view window by clicking **Chart** or **Reports** on the main window toolbar.

To change a user's name

- In the list locate the user you wish to edit then click Edit.
- Change the 'Name' field as required then click Update.

Note: The *Name* field is the name that you know this user by (whereas the *User Name* field is used to logon to an account). The *Name* field is editable but the *User Name* field **cannot** be changed once assigned. If you need to change a logon name for any reason you must delete the user and re-create them with a different User Name.

To change a user's password or role

- In the list locate the user you wish to edit then click Select.
- Click Change Password or Roles.
- Change the details as required then click Update.

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To change a user's access permissions
Access permissions are managed via the Database window - see Editing or Deleting Databases (page 363).

To delete a user

- In the list locate the user then click Delete.

Editing or Deleting Databases

- On the main window toolbar click **Administration**.
- On the left-hand menu click **Databases**.
- When you have finished the edit/deletion you can return to the main database view window by clicking **Chart** or **Reports** on the main window toolbar.

To change the filepath or server name

- In the list locate the database you wish to edit then click Edit.
- Change the details as required then click Update.

To change access permissions for a user

- In the list locate the database you wish to edit then click Select.
- Click **Permissions**.
- Tick or untick the box beside the user's name then click Update.

To delete a database

- In the list locate the database then click Delete.

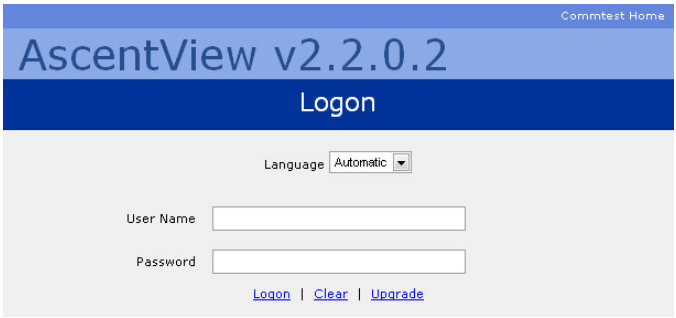
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Using the AscentView Website

Connecting to the Website

Open your web browser and enter the AscentView web address. The AscentView logon page will display.

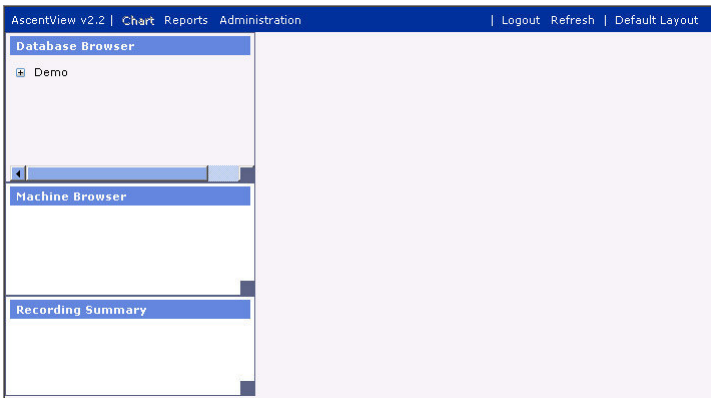
Note: The AscentView application currently supports only Microsoft's Internet Explorer version 5.5 web browser and later.



- Enter your logon name and password then click Logon.

Exploring the AscentView Interface

After logon the AscentView main window will open to display your databases.



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The toolbar at the top of the main window contains commonly used commands such as displaying charts and reports.

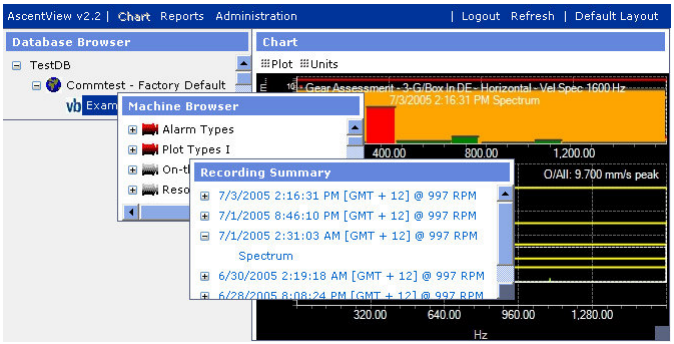
The navigator window on the left of the screen displays the structure of your machine databases.

- Click the plus signs at each level to open a database structure. This will display your sites and machine folders.
- Select a folder. This will cause the Machine Browser window to display all machines contained within the folder.
- Click the plus signs at each level on the machine to open the points, locations and schedule entries.
- Select a schedule entry to display the individual recordings in the Recording Summary window.

Resizing and Repositioning Windows

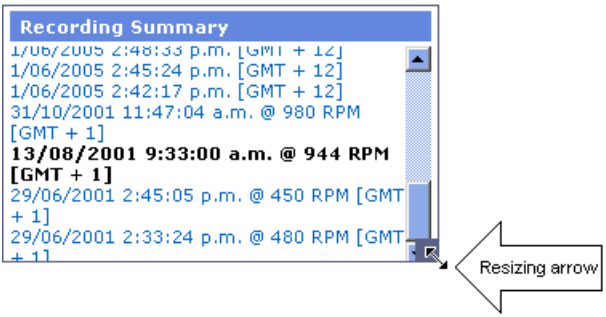
The individual navigator windows float on top of the main window and can be resized and placed anywhere on your screen.

- To reposition a window click the blue bar at the top of the window and hold the mouse button down as you drag it to a new position. Release the mouse to 'drop' the window in place.



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- To change a window's size, place the mouse cursor over the grey square in the bottom right corner of any window until it changes to a double-headed arrow then drag the mouse in any direction.

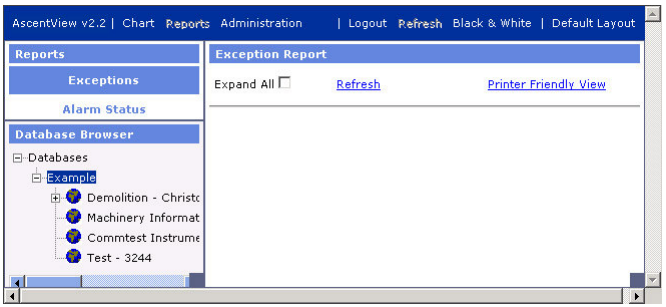


Restoring the default size/position

- To restore all windows to their original size/position click **Default Layout** on the main window toolbar.

Viewing Reports

- To display a report select a site or folder in the Database Browser window then click **Reports** on the main window toolbar.



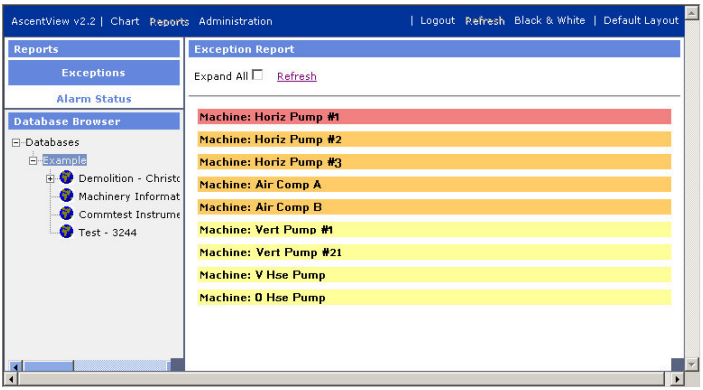
In the Reports window you can select either the Exceptions or Alarm Status report. Reports can be resized and re-positioned in the same manner as navigator windows.

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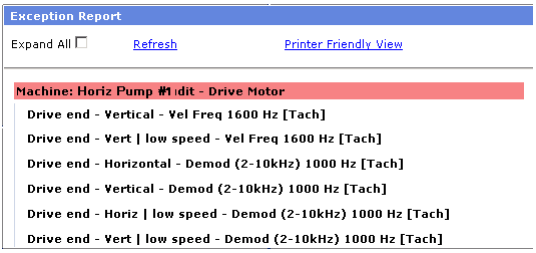
Exception Report

The Exception report displays an overall condition summary of each machine in the selected site or folder. Only machines that have exceeded their Warning, Alert or Danger threshold will be shown. Machines in the worst alarm condition will be shown at the top.

- In the Reports window click **Exceptions**.
- When the report first opens it will be empty. Click Refresh to populate the report with machines.

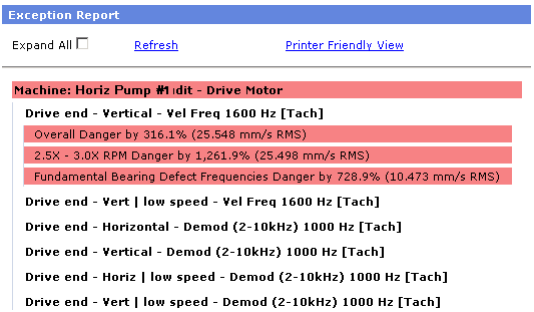


- Only the machine names are shown by default. To see which location(s) triggered an alarm click a machine name. This will expand its structure to show the point, location and schedule entry details. Click the machine name again to hide these details.



- Click the schedule entries to display the alarm details. Click again to hide alarm details.

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- To see the expanded structure of all machines tick **Expand All** then click Refresh.
- To create this report for a different site or folder, select the item in the navigator and click Refresh.

Alarm Status Report

The Alarm Status report displays the current state of each alarm in the selected folder or machine along with its previous state for comparison. Alarms are color coded to indicate their severity. You can change the number of previous states shown and also choose to show/hide alarms that are within their 'OK' threshold.

- In the Reports window click **Alarm Status**.
- When the report first opens it will be empty. Click Refresh to populate the report with machines.



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- Only machines that have exceeded their Warning, Alert or Danger threshold will be shown by default. To display all alarms on every machine, tick **Show All Alarms** then click Refresh.
- To change the number of previous states shown enter a value in the **No. Measurements** field then click Refresh. The entered value must be between 2 (min.) and 8 (max.).
- To create this report for a different folder or machine, select the item in the navigator and click Refresh.

Printing Reports

By default, reports are displayed in color for on-screen viewing. Clicking **Black & White** on the main toolbar will display a report as plain text using Danger, Alert and Warning icons to indicate alarm status. We recommend you use this option when printing your reports to a black and white printer.

- To print the displayed report click Printer Friendly View at the top right of the report. Nothing will be sent to the printer yet.
- If required, change your printer settings using **File>Page Setup** then click **Print**.

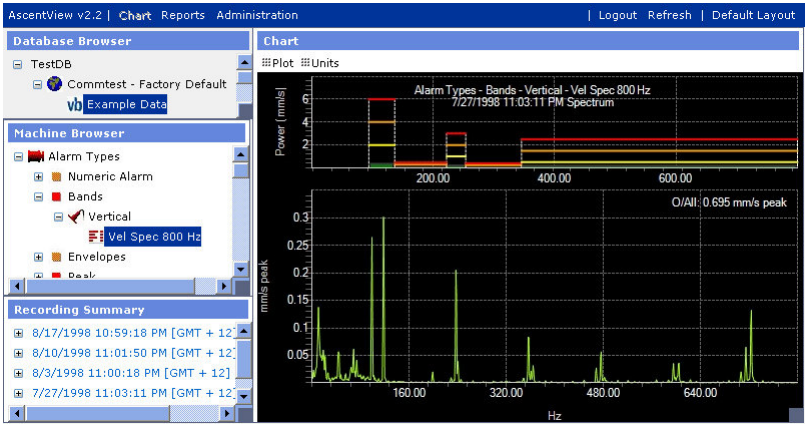
Note: The Exception report will be printed in full i.e. showing all location and alarm details even if you do not have **Expand All** selected.

Viewing Charts

To view a chart (and associated alarm levels, if any) you must have a schedule entry selected in the navigator. If you cannot see the Machine Browser window (because you have a report open) click **Chart**.

- Select a schedule entry. This will plot a chart of the newest recording for this schedule entry.

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- The Recording Summary window lists the recordings at this schedule entry. To plot a different recording select it in this window.



Charts can be resized and re-positioned in the same manner as all other windows. Changing the size of a chart causes it to re-scale. The AscentView window will go blank momentarily while the chart is re-drawn to the correct scale.

Note: To print the current chart, right-click the chart and select the print option from your browser's shortcut menu.

Displaying Spectra and Trend Charts

- With a frequency schedule entry selected, at the top-left of the chart window click or move your mouse over the **Plot** button. The drop-down box list displays options for plotting spectra and trend charts.

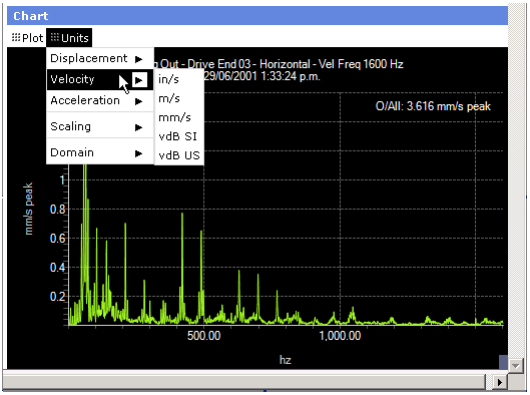
- To display a trend chart select **Trend**. This chart will trend all the recordings at your selected schedule entry.

- To display spectra again click **Plot** and select **Spectrum**.

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Selecting Different Amplitude Units

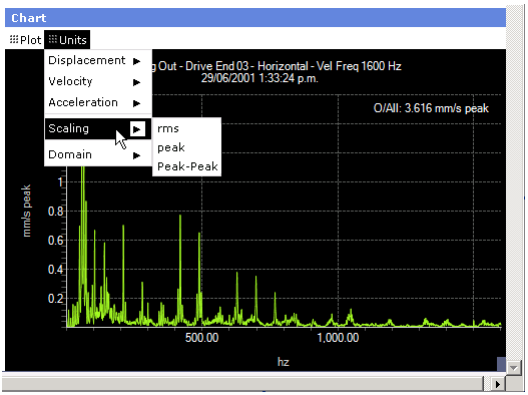
- At the top-left of the chart window click or move your mouse over **Units**. The drop-down box list displays options for selecting different measurement units, scaling type and domain.



- Move the mouse cursor down the list of options to open sub-menus of available units. To choose a measurement unit select it with the mouse.

Changing the Chart Scaling

- At the top-left of the chart window click the **Units** button. The drop-down box list displays the different chart scaling options.



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- Move the mouse cursor down the list of options to open the **Scaling** sub-menu. To choose a scaling type select it with the mouse.

Switching Between Hz, CPM and RPM

- For spectra, to switch between Hz, CPM and RPM, at the top-left of the chart window click the **Units** button.
- Select **Domain>Frequency**. To select your preference select it with the mouse.

Switching Between ms and secs

- For time waveforms, to switch between ms and secs, at the top-left of the chart window click the **Units** button.
- Select **Domain>Time**. To select your preference choose it with the mouse.

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Section 15: Administrative Tasks

Setting Up the Software for Access by Non-Administrators

The Ascent software can be run without an administrator account, but doing so requires changes to Windows security permissions. As administrator permissions are required to perform this task you may need to ask your IT support staff to make these changes on your behalf.

- Log into Windows using an administrator level account.
- Browse to **C:\Program Files\Commtest** using Windows Explorer (Right-click the **Start** button and select **Explore**).
- Right-click the **Ascent** folder and select **Properties**.
- Press the **Security** tab.

Note: if the **Security** tab is not visible you must disable **Simple file sharing** in Windows Explorer. From the main Windows Explorer menu select **Tools>Folder Options..** then click the **Views** tab. Scroll to the bottom of the **Advanced settings** list and deselect **Use simple file sharing (Recommended)**.

- Click **Users** from the **Group or user names:** list
- Under the **Permissions for Users** list check the **Allow** checkbox beside **Full Control**. Click **OK**. If you are asked if you wish to propagate the new permissions to all sub-folders, do so.
- Open the Windows Registry Editor (**Start>Run...>REGEDIT**)
- Navigate to **HKEY_LOCAL_MACHINE\Software\Microsoft\CLLC**
- Right-click the **CLLC** folder and select **Permissions**.

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- Select **Users** and tick **Full Control - Allow**.
- Click **OK**.

The Ascent software will now function correctly under a non-administrator Windows account.

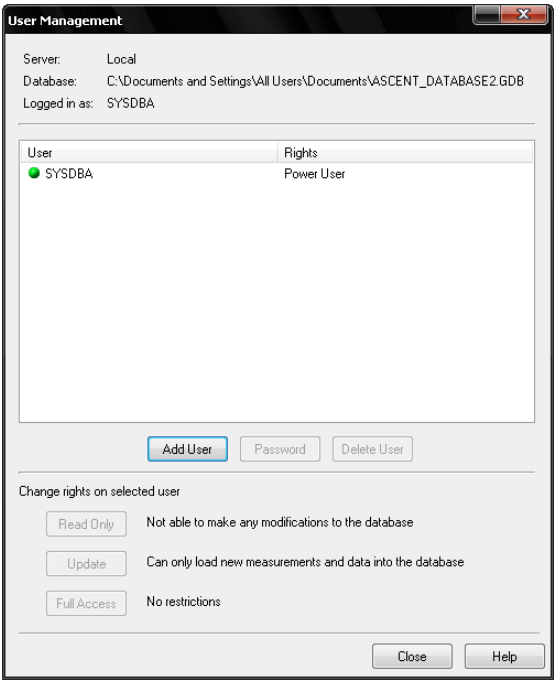
Creating and Managing User Accounts

Note: This feature will only be available to you if it is included as part of your license agreement. If you wish to enable this feature please contact sales@commtest.com or your distributor for more information.

System administrators can create user accounts that are password enabled and have different levels of access to the Ascent database. Only the person logged in as system administrator can create user accounts. As system administrator, you can change your password but not the default login name (SYSDBA). You cannot change the rights of, or delete SYSDBA. This is to prevent you accidentally locking yourself out of the software.

- To create user accounts, choose **Database>User Management**.

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- Click **Add User** and fill in the name and password fields. You will need to verify the password by re-typing it into the 'Verify Password' field.

- Choose the 'Rights' this user will be allowed to have then click **OK**.

There are three kinds of user:

Read Only allows the user to view data in the database but not modify it.

Update gives Read Only access but also allows the user to load new data from the vb instrument into the software.

Full Access (power user) has full control over the database.

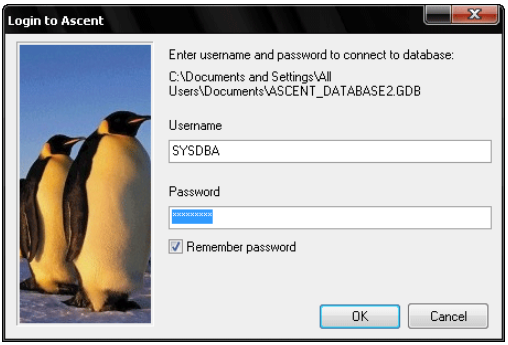
Once a user has been created the system administrator can change that user's password, change their access rights or delete the user.

- To carry out any of these functions, first select the user then click the appropriately labeled button to perform that action.

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Enabling Logins
To enable the login system, the system administrator must first logoff.

- Choose **Database>Log off**.
- Now re-start the software. The following screen will appear.



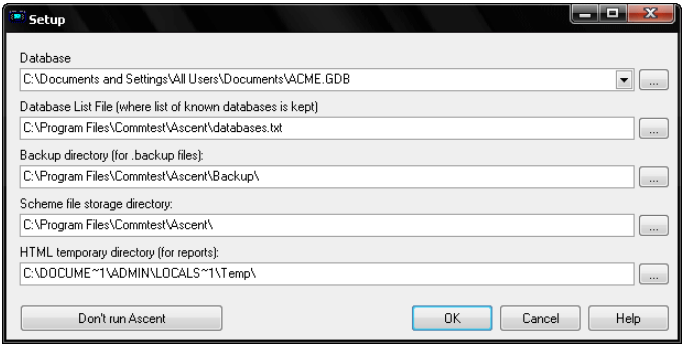
- Un-tick the 'Remember password' field then click **OK** to login. The next time the software is run, all users will have to enter their username and password.

Configuring Ascent Directories

The Setup window is where you can manage/change the paths of the Ascent directories.

- This window will appear when you start the Ascent setup program. It can also be accessed by holding down **CTRL** while the software is loading.

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From here you can change the location of your database directory, backup files etc. If you want to make changes but don't want to open the software at this time, click the **Don't run Ascent** button.

Database Directory

This is the file where the actual Firebird database is to be stored. This is the same as your site database.

Database List File Directory

This is where the list of known databases is stored.

Note: If you are the system administrator you can maintain a master copy of the database list file in a read only location on the network. You can then control the list of databases that appears in the drop-down box on all client computers in a multi-user environment.

Backup Directory

This is where the '.backup' files are stored when performing a database backup. See Backing up a Database (page 269) for more information.

Scheme File Storage Directory

This is where the .scheme files are stored. These files contain the information for the various schemes. The three system-defined schemes are stored in the Ascent program itself - if you delete them they will automatically return to their default states.

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You can send .scheme files to other users of the software and if they place the file in their scheme file storage directory it will become available the next time that they start the software. See Schemes (page 142), for more information about what schemes are used for.

HTML Temporary Directory

This is where temporary HTML files are stored when reports are generated.

.vbz Files

These are used by the Import and Export functions. They usually contain an entire folder of information, however you can export individual items in the navigator tree by tagging them first.

When you double-click a .vb or .vbz file, the software will ask you if you want to import the file into the database.

Exported files are compressed by default (.vbz extension) to reduce file size. However, you can export un-compressed files (.vb extension) by selecting this option from the drop-down box during the export process.

.fdb Files

These are Firebird database files, and the default format used when creating a new database.

.scheme Files

These store the settings for your color schemes, such as 'Black and White' or 'High Contrast'. See Schemes (page 142), for more information on the usage of schemes.

When you double-click a .scheme file, it is installed and selected within the Ascent program.

.av Files

The views that appear on the **Chart** and **Report** buttons are stored in .av files.

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When you double-click an .av file, the software will install that view and open it.

.hex Files

These store update files for the firmware in instruments (not including vbX models: see .mdf).

When you double-click a .hex file, the software will prepare to send this update file into the instrument. This is equivalent to using the standard Proflash function.

.mpf Files

These store firmware update files for vbX instruments such as the vb5, vb7 and vbBalancer devices.

Upgrading an Instrument Using Proflash

From time to time Commtest will release new versions of instrument firmware. These firmware upgrades allow you to take advantage of product enhancements and new features that were created after your instrument was purchased. To re-program an instrument with newer firmware you must *PROFLASH* the instrument with a new firmware file.

Warning:
PROFLASHING will restore the instrument to the factory default state and delete all stored information. This includes folders, routes, machines, parameter sets, recordings and balance jobs. If you wish to save any of this information, please transfer all folders to the software before *PROFLASHING* your instrument.

- To check if a newer firmware version is available, visit our website at www.commtest.com and check the Software Updates section of the Downloads page. You will need to register your instrument before you can download the latest firmware file.

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- Compare the website firmware file's version number with your current instrument firmware to see if it is newer. Power up the instrument so that the Main Menu displays. In the middle of the screen look for the text 'Firmware vX.xx' (where X.xx is the current firmware version number). If the instrument firmware number is lower than the website firmware number it means the website file is newer; download the file and proceed with the PROFLASH.

Proflash a vbSeries Portable Instrument

- With the instrument powered on, connect and turn on the battery charger.
- Connect the instrument and the PC using the supplied communications cable. If you want to save any information that is still stored in the instrument you should transfer this now.
- Start the Ascent software on the PC.
- In the Ascent software, select **Edit>Manage>vb Instruments...** The **Manage Instruments** window will open.
- Double-click your instrument (identifiable by its serial number) in the new window. The instrument properties window will open.

Note: if your vbX series instrument is not listed, it has not yet been added to the Ascent software. See the Adding an Instrument to Ascent (page 64) topic.

- If Proflashing a vbX instrument click the **Proflash** button in the vbX Properties window's **Setup** tab. If Proflashing a vbX000 instrument click the **Proflash** button under the **Tasks** tab. The **Proflash** window will appear, listing the available firmware version(s) stored on your PC.

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Note:
If Ascent locates more than one firmware file within the selected folder, it will list all versions present. The recommended vbX version will be highlighted at the top of the list. The text **Recommended** will also be displayed beside the recommended firmware revision under the **Suitability** column. You must select the recommended/suitable vbX000 update manually.

- With the recommended firmware version highlighted, click **Proflash** (or **Proflash now!** for vbX000 instruments). PROFLASHING the instrument takes approximately one to two minutes. The instrument will display a series of progress messages then prompt you to reset the instrument. Do **not** interrupt the PROFLASH process as this will damage the instrument.

Bulk Tasks

The Bulk Tasks feature is used to perform tasks on multiple instruments in a single step, such as Proflashing all instruments within a database simultaneously. This feature is useful in environments containing large numbers of Online devices.

- From the main menu select **Edit>Manage>Manage vb Instruments...**. The **Manage Instruments** panel will open.
- Select all devices you wish to update of modify from the device list. Select multiple instruments by holding the **CTRL** key on your keyboard and clicking the instruments with your mouse.

Note: The number of selected devices will be appended to the **Configure** button as they are selected or de-selected.



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- Press the **Configure** button. The Bulk Tasks will begin its configuration sequence, adding any selected instruments that have not already been added to the Ascent database. This process may take several seconds depending on the number of devices selected. The **Bulk Tasks** panel will then open.



- Select a task from the selection list and press the **Start** button. The required task will be performed for all instruments selected. If Proflashing devices, you will be asked for the Proflash file's location.

Setting the Language

The Ascent software interface can be viewed in several languages. Languages are license-controlled according to the software's region of purchase or destination. The following regional language packs are currently supported:

- English
- Americas
- Europe
- China (Simplified Chinese)
- Russia

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If your language of choice is not available in your Ascent software installation, contact sales@commtest.com to purchase language licenses. Language usage may in some cases be restricted to specific regions.

Change the Software Interface Language

To change software interface language:

- In the Ascent software, select **Options>Select Language..>From compatible languages only...** The 'Select Language' window will open.

Note: selecting **From compatible languages only...** will display only those languages that are supported by your current Windows operating system configuration. If your preferred interface language is not displayed in the **From compatible languages only...** list of languages, but it *is* displayed when selecting **From any available languages...,** you must change your Windows locale setting.



Select Language

- Select the language you require from the list of available languages. Although all interface languages available will be displayed, only those languages that are included in your current CLK license configuration can be activated.

- Click **OK**. The software interface will update and a notification will be displayed stating that the language has changed.

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Change your Windows Locale Setting

If you wish to view Ascent in a non-Roman character set language such as Russian or Chinese you must also change your Windows locale setting. See your Windows operating system documentation for further details or use the quick guide instructions below.

Windows XP Quick Guide

- Select **Start>Control Panel**.
- Double-click the **Regional and Language Options** icon.
- Select your location from the **Locations** dropdown list at the bottom of the **Regional Options** tab.
- Click the **Advanced** tab and select your preferred language from the **Language for non-Unicode programs** dropdown list.
- Click **OK**. You will be asked to restart the computer.

Windows Vista Quick Guide

- Select **Start>Control Panel**.
- Double-click the **Regional and Language Options** icon.
- Click the **Location** tab and select your location from the dropdown list.
- Click the **Keyboards and Languages** tab and select your preferred language from the **Choose a Display Language** dropdown list.
- Click the **Administrative** tab, then the **Change System Locale** button. Select your geographic location. Apply the change then click the **Restart now** button.

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What is a Site Database

Every piece of data in the database must be identified with a universally unique combination of numbers. This is accomplished with folders, machines, points and measurement locations by including the site identification number in the internal identifier for the item.

For data such as parameter sets, axis names and other non-structural data an additional identifier is included to identify the particular database within the site that this data was created in. This will allow for multiple installations of the software at a particular site to share data types without risk of conflicting identifiers.

This combination of a site number and a site database number is called a Site Database. You can have more than one site database.

DUNS Numbers

DUNS numbers in Ascent are assigned automatically. They are used as primary database keys, and cannot be changed manually.

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Section 16: Troubleshooting

Troubleshooting USB Communications

You may occasionally experience difficulty communicating with a vbSeries portable instrument when using a USB connection and version of Ascent and instrument firmware released prior to 2009. This usually indicates a communications conflict or firewall activation. We recommend upgrading to the latest release of Ascent, which includes a 'Plug and Play' USB driver that will prevent these issues. If this is not possible, the steps below may resolve the conflict

- Connect the powered instrument to the PC using the supplied USB cable.
- In the Ascent software, select **Edit>Manage>vb Instruments...** The **Manage Instruments** window will open.
- Double-click your instrument (identifiable by its serial number) in the new window. The instrument properties window will open.

Note: if your vbX series instrument is not listed, it has not yet been added to the Ascent software's instrument database. See the topic Adding an Instrument to Ascent (page 64).

- Check the instrument's IP address in the **IP address:** field.
- On the vbX instrument press 0 Options, then 3 Network. Check that the IP listed beside the 2 USB button matches the IP in the Ascent software. If the IP addresses do not match, change the address in the software Properties window to match the instrument IP, then restart the instrument (press and hold 5 then press ⏻). Close the Properties window and attempt to connect to the instrument once again.

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- If you are still unable to communicate with your instrument, temporarily disable any firewalls and check whether doing so resolves the problem. If communication is restored, add a firewall exception for the Ascent application 'masvb32.exe' (in the Program Files\Commtest\Ascent folder on your PC) or open port 13000.

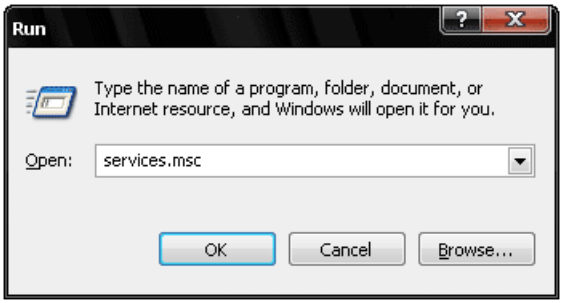
Upgrading a Database Generates an ISC Error

When upgrading a Firebird database during a new Ascent software installation, an error message may be displayed if more than one person is currently connected to the database. To upgrade the database normally, close all local or network Ascent instances communicating with the database. Alternatively, restart the Firebird database server and attempt the upgrade again. To restart the Firebird server in Windows XP:

Note: close the Ascent software if it is still running.

- Select **Start>Run...** from the Windows menu, or press the **Start** (the Windows flag key) and **R** keys on the keyboard simultaneously. The **Run** Windows interface will open.
- Type **services.msc** into the **Open:** text field and click **OK**. The **Services** panel will open.

Note: The **Services** panel can also be accessed through the Windows Control Panel's **Administrative Tools** option.



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- Scroll down to **Firebird Server**, right-click and select **Restart**. When Firebird restarts, start Ascent and proceed with the database upgrade process.

Contacting Technical Support

If you have any problems please contact Commtest support staff directly for assistance. Our e-mail address is help@commtest.com.

We also provide a searchable knowledge base of frequently asked questions (FAQ) on our website.

- The knowledge base can be found at www.commtest.com. Click the Frequently Asked Questions link under the Support menu to access the knowledge base.

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