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SpectraPro ©

USER MANUAL

License Agreement

SOFTWARE PRODUCT: **SpectraPro**

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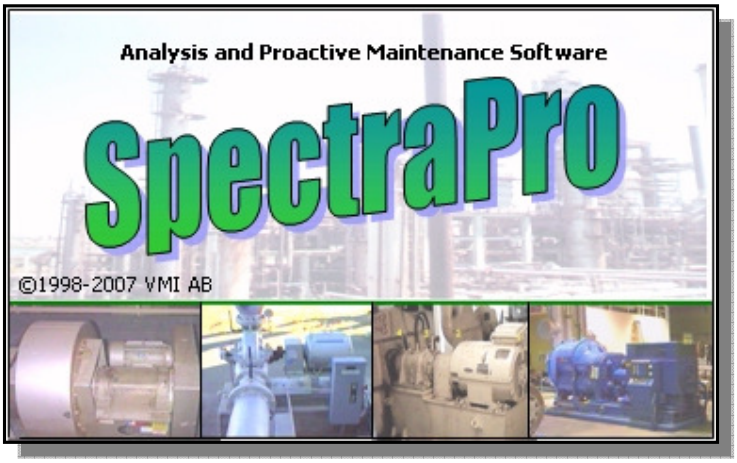
Contents



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Release notes	Date
First release	December 2007

I. Installing the software

This product has been developed to work on any properly configured version of Microsoft® Windows® XP, 2000, 2003, 98, ME, NT4 or VISTA operating systems or higher.

Due to the nature of the anti-piracy security technology built into this product, using illegal keys may lead to software failure or instability.

Before you run the setup file make sure that you close all other programs. This includes anti-virus software and any other programs that are running. If you do not follow this procedure it may interfere with the normal setup procedure.

From CD-ROM:
To start installing the software onto your computer you have to make sure that the CD-ROM is put into the CD-ROM player. Because of the 'Autorun' functionality, the installation program will start automatically. When this does not happen, go to 'My Computer' and double click the CD-ROM icon. Next: double click on the installer and follow the instruction displayed on screen.

Press **SpectraPro** label and follow the instruction displayed on screen.
If you accept the default location, SpectraPro will be installed on *C:\Program Files\SpectraPro* directory.

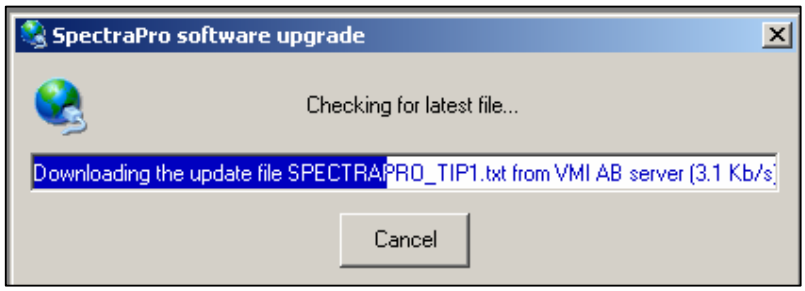
As Download:
When you have obtained the software as a digital file, e.g. downloaded it, there are two possible variants. A) You have a zipped file (.zip file) or B) you have the installer (.exe file).
When you have a zipped or stuffed file (recognizable by the compression icon) you need to have 'WinZip' or a different program that supports these compressed files.
If you have the Installer file you can proceed by double clicking this file. The installation will start and you will have to follow the instructions displayed on screen.

I.1. Installing the latest Service Pack

The latest available Service Pack is always onto the CD-ROM.
Before to run the Service Pack Installation file, first start the SpectraPro once.
With this occasion you can select the software language also.

I.2. Updating the software

SpectraPro software is equipped with an automatic software update check.
You can easily check if there is a free update available by selecting *Help > Check for Updates* from the menu bar.
An Internet connection is needed for this.



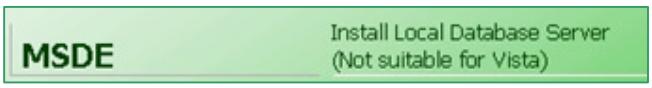
I.3. Installing MSDE Database Server (optionally)

MSDE is an *SQL Server* database server with the following differences:

1. Maximum size of the database is restricted to 2 GB.
2. MSDE server can be used in a network with maximum 5 users only.

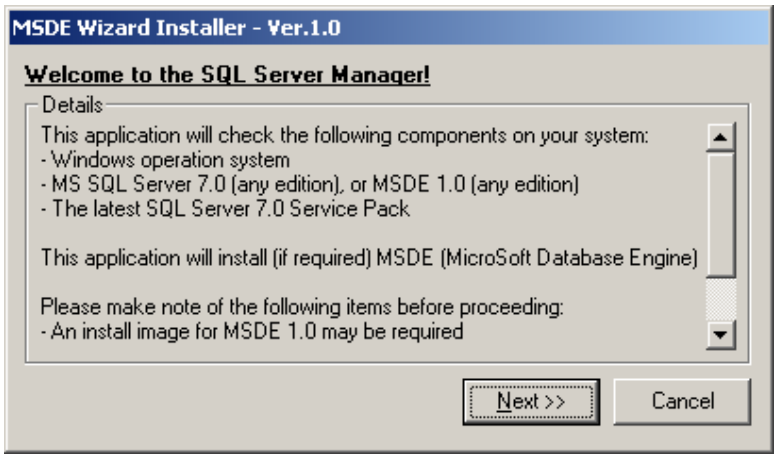
MSDE is free and can be installed in any workstation.

From the installation page press **MSDE** button.



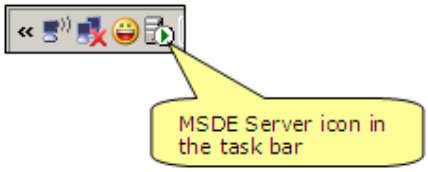
NOTE: MSDE is not suitable for VISTA operation system!
If your computer runs VISTA, please install instead SQL Server Express Edition with SP2.

Bellow is the welcome screen for MSDE installation:



Press NEXT and follow on screen instruction.

After the installation will be completed, in the computer task bar a small icon will indicate that the MSDE Server is running:



I.4. Installing protection key drivers

Where are two type of protection key: parallel and USB.

HASP USB protection key

Parallel HASP protection key not need any driver. For USB protection key you may need to install drivers. Normally, the drivers are installed together with the

SpectraPro application, but sometime, especially under VISTA, the drivers can't be installed automatically.

Before to start SpectraPro for the first time you can check if the USB protection key drivers are installed properly or not, running the external software:

Start > Programs > SpectraPro > Protection key test.

Be sure that the protection key is inserted in any USB hub and press **Test Key** button. If the protection key drivers are installed properly, the key type will be shown. Otherwise an error message will be displayed.

If this is the case, run Start > Programs > SpectraPro > Install HASP Drivers.

If still you have some problems with the HASP protection key, please visit:

http://www.aladdin.com.

I.5. Installing SQL Server Express (optionally)

SpectraPro application running under **Vista** Operating System can create machine databases also in a *SQL Server Express* database Server, installed on the local computer.

For details regarding how to install *SQL Server Express* on your computer and also License details visit:
http://msdn2.microsoft.com/en-us/express/bb410792.aspx

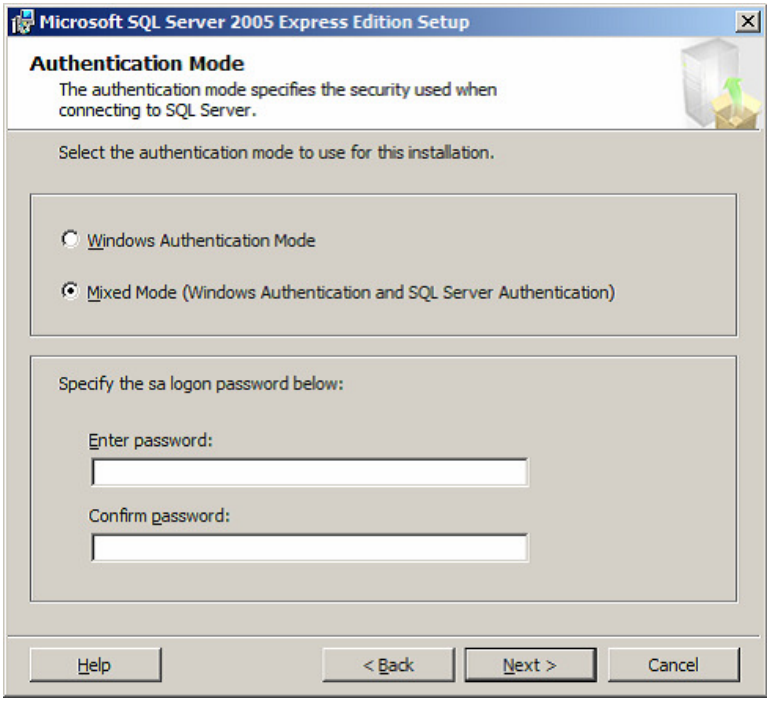
Before you complete a Microsoft SQL Server download and install any member of the SQL Server 2005 Express Edition family, you must install first .NET Framework 2.0:
http://www.microsoft.com/downloads/details.aspx?familyid=9655156b-356b-4a2c-857c-e62f50ae9a55&displaylang=en
Microsoft SQL Server 2005 Express Edition is the free, easy-to-use, lightweight version of SQL Server 2005.

The best choice is to download **SQL Server 2005 Express Edition SP2**.

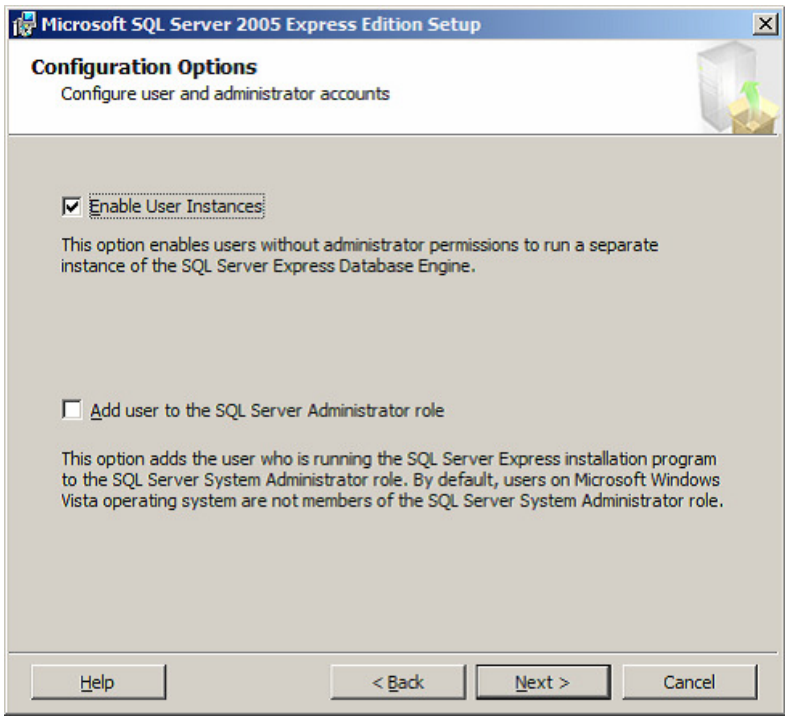
After software download, install the SQL 2005 Express following the instruction bellow.

Locate and run the SQL Server Express installation file *SQLEXPR32.exe*.
Follow on-screen instruction. Generally, press **NEXT** on each step.
During installation some settings are required, as follow:

When the bellow windows appear, select **Mixed Mode** and just press **Next**.



In the following windows, select **Enable User Interface** and press **Next.**



Complete the installation.

I.6. Using the help, menu and toolbars

If you experience any problems when using the software you can open the help file by clicking *Help* from the Toolbar or pressing *F1*. It provides basic information on how to use the software with both a step-by-step guide and a more detailed description of all the available functions.

The functionality of the software can be accessed from different locations. The main menu, of course, gives access to all the functions within the program, and the Toolbar provides the most commonly used functions. The Status bar, at the bottom of the program window, displays information about the opened database.

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1. SpectraPro© architecture

SpectraPro can work in conjunction with the following machine database types:

- MS Access
- MSDE (Microsoft® Database Engine) – not suitable for Windows® VISTA
- Microsoft® SQL Server 2005 Express Edition SP2
- Microsoft® SQL Server
- Oracle® 8.0 (or newer)

All of these have Client-Server architecture.

MSDE and SQL Server are very similar; in fact MSDE is an SQL Server server with the following differences:

3. Maximum size of the database is restricted to 2 GB.
4. MSDE server can be used in a network with 5 users only.

SpectraPro can create and manage also MS Access database type. The MS Access isn't a real database server, but has a database structure. A MS Access databases have the following advantages:

1. Small space required on the hard disk and low resources required from the host computer.
2. Easily transferred to other computers.
3. Easily to create backup file. Just copy the database file (with extension .sp3) onto a USB stick or somewhere in a network computer.

In the same time the MS Access database have also the following disadvantages:

1. Is not a safe database, especially for a large number of machines
2. Used in a network, this type of database will dramatically increase the network traffic and slow-down the communication speed.
3. It is not a solution for large enterprise integration.

For these reasons it is not recommended to use the MS Access database for company applications.

1.1. Client/Server Architecture

A **Database Server** is designed to work effectively in a number of environments:

- As a two-tier client/server database system
- As a desktop database system

1.1.1. Client/Server Database Systems

Client/server systems are constructed so that the database can reside on a central computer, known as a server and are shared among several users. Users access the server through the SpectraPro application.

Having data stored and managed in a central location offers several advantages:

- Each data item is stored in a central location where all users can work with it.

Separate copies of the item are not stored on each client, which eliminates problems with users having to ensure they are all working with the same information.

- Security rules can be defined one time on the server and enforced equally among all users.
- A relational database server optimizes network traffic by returning only the data an application needs.

For example, if an application working with a file server needs to display a list of the names and machine descriptions, it must retrieve the entire Machine file. If the application is working with a relational database server, it sends this command:

```
SELECT Name, Description
FROM Machine
WHERE MachineID = 123
```

The relational database sends back only the *names* and *description* of the selected machine, not all the information about all machines.

- Hardware costs can be minimized.

Because the data is not stored on each client, clients do not have to dedicate disk space to store data. The clients also do not need the processing capacity to manage data locally, and the server does not need to dedicate processing power to displaying data.

The server can be configured to optimize the disk I/O capacities needed to retrieve data, and clients can be configured to optimize the formatting and displaying of data retrieved from the server.

The server can be stored in a relatively secure location and equipped with devices such as an Un-interruptible Power Supply (UPS) which is more economical than fully protecting each client.

- Maintenance tasks such as back-up and restoring data are simplified because they can focus on the central server.

In large client/server systems, many users may be connected to a Server installation at the same time.

The Server has full protection for these environments, with safeguards that prevent problems such as having multiple users trying to update the same piece of data at the same time.

The Server also allocates the available resources effectively, such as memory, network bandwidth, and disk I/O, among the multiple users.

Server applications can run on the same computer as Server. The application connects to the Server using Windows Inter-process Communications (IPC) components, such as shared memory, instead of a network. This allows the Server to be used on a small system where an application needs to store its data locally.

1.1.2. Desktop Database Systems

While **Database Server** works effectively as a server, it can also be used in applications that need stand-alone databases stored locally on the client. The Server can configure itself dynamically to run efficiently with the resources available on a client, without the need to dedicate a database administrator to each client. SpectraPro can also embed a MSDE Server as the data storage component for machine databases.

When clients use local **Database Server**, one copy of the **Database Server** engine runs on the client and manages all the databases. SpectraPro connects to the database engine in much the same way they connect across the network to a database engine running on a remote server.

2. Database architecture

The **Database Server** data is stored in databases. The data in a database is organized into the logical components visible to users. A database is also physically implemented as two or more files on disk, depending on the Server type.

When using a database, you work primarily with the logical components such as tables, views, procedures, and users. The physical implementation of files is largely transparent. Typically, only the database administrator needs to work with the physical implementation.

Each **Database Server** installation has multiple databases. Some organizations have only one user database, containing all the data for their organization. Some organizations have different databases for each group in their organization, and sometimes a database used by a single application, like SpectraPro.

For example, an organization could have one database for sales, one for payroll, one for a document management application, one for rotating machinery and so on. Sometimes an application uses only one database; other applications may access several databases.

It is not necessary to run multiple copies of **Database Server** to allow multiple users to access the databases on a server. **Database Server** is capable of handling thousands of users working in multiple databases on the same server at the same time. **Database Server** makes all databases on the server available to all users that connect to the server, subject to the defined security permissions.

When connecting to **Database Server**, your connection is associated with a particular database on the server. This database is called the current database. You are usually connected to a database defined as your default database by the system administrator, although you can use other connection options in the SpectraPro to specify another database. You can switch from one database to another with the *Change* command from SpectraPro application.

The SpectraPro allows you to create multiple machine databases, in the local Database Server (MSDE or SQL Server 2005 Express Edition SP2) or in a remote server (SQL Server or Oracle). Using the Database > *Exchange Machine* command you can copy machines from one **Database Server** to another.

3. SpectraPro Overview

SpectraPro software is mainly dedicated to implement a true *Proactive Maintenance Program.*

For every plant, you can create a database, which can have an unlimited number of machines, points and directions. The spectra are stored at the level of the measurement directions. If for a direction you store more then two spectra, then you can display a trend of the evolution in time of the Total Vibration or trend of the evolution in time for Bearing Condition Coefficient (BC). If Envelope measurement is done, also Envelope spectra are available for trending.
On the Machine level, Manual Entry point can be added. The Manual Entry points are not measured point, but values entered directly using the keyboard.
For **X-Viber** Instrument also Temperature and Speed points can be defined in the database.

Default, only the last 24 measurements are shown for that direction, but you can change this number using Settings > Optional settings command.

The program allows to copy, in **clipboard**, any displayed graph (spectra or trend) and later to copy this graphs in a text editor (e.g. WORD) or in the Notepad. Customized professional reports about the machines can be made in this way.

The machine Database store machinery measurement, unloaded from the **EasyBalancer**, **EasyViber** or **X-Viber** instruments.

The users can add, in the *Notepad*, information following the diagnosis procedure. Trough Database > Import command, external useful data can be added to the databases, regarding repair process, spare parts used, etc. This information can come directly from CMMS or prepared, in a special format by the maintenance teams.

In this way valuable, complete information can be added, in time, for each machine from the databases.

Analysing this information, periodically, you can act proactively, discovering the real causes of the failures.

Main purposes of using this software is to supply to the maintenance team a periodical report regarding the action to taken to maintain the machinery in good working condition. For this reason, SpectraPro can create a Job report.

In order to analyze the collected data you have on your choice many ways of viewing data:
- A collection of trends and spectrum selected by you (View > Show selected information).
- A **Quick View** session, in which you explore the machines, the trends and spectra associated with the selected direction (View > Quick View). If Bands are defined, also Band Trends are available.

- **Trends and spectra from whole machine** in which you can see at once, all this trends and spectra associated with the selected machine (View > Show spectra from whole machine).
- A **List View** in which you can see at once, all Total values (Vibration, Bearing Condition and Envelope) for the whole machine (View > List View). Also the Alarm status is indicating.
- A **Band View** in which you can see, at point level, all vibration total values and Band values (peak average for the band width). Alarm status for above is also indicated (View > Band View).
- **Graph View** is a specially mode of displaying the data. A **GraphView** protection key is required. The **GraphView** project can be customised using the external software provided in the SpectraPro Installation kit:
Start > Programs > SpectraPro >GraphView Editor.

In all these views, a *Notepad* is available on the machine level, to type all the observations in time of diagnosis process.

Finally, chose the Report > Job Report command and you can customise a report for the maintenance teams, using all the notes supplied. Once you customise a Job Report, the appearance of this will be saved, and next time the report can be create in a very short time.

Job Report can be transferred to a text editor. You can then preview, modify and finally print the Job Report. You can also preview and print directly the report to the system printer.

From time to time you will want to make a report regarding all the history of a selected machine.

Use Report > Machine History command to do this.

You can also customise the History report and then preview, modify and print it.

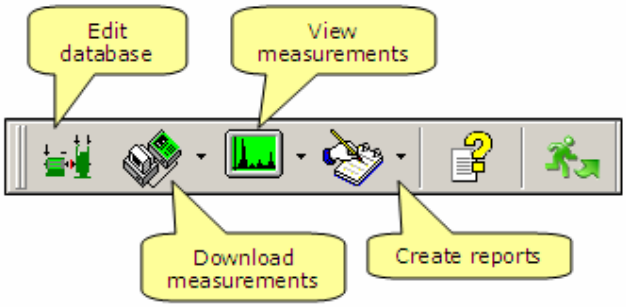
The previously mentioned reports have to distinct purpose:

- The **Job Report** is addressed mainly to the maintenance team.
- The **Machine History** is useful to take some proactive actions, before a failure of the machinery to occur.

The ***SpectraPro*** software is very flexible software and offers to you many commands to do same action in different way. Before to use the software, read carefully this document and using **DemoPro** databases provided in installation kit, try to learn how to use efficient this powerful program.

If you run this software for the first time, then you can use **DemoPro** databases which are included in the installation kit. In this way, you can learn how to work with the software and to evaluate the special performance of it.

On the screen, a list of **Menus** and a **Toolbar** are displayed. In the **Status Bar**, on the bottom of the screen, the active database is also displayed. On the first run, the active database is **DemoPro**. Although you can create, you're own database, on the beginning, use **DemoPro** database to display spectra and trends.



If you run the program for the first time, select Settings > Optional Settings command. Select the units (metric or imperial) and the measurement unit for frequency (Hz or CPM). For the moment, don't change the number of spectra in trends. You can do this later. Click **Save** to save this setting.

Choose from the **View** menu, **Show Selected information** command. A specific window will appear in the screen, which will allow you to choose the department, the machine, the point and the wished direction. Choosing is done selecting a certain direction, with the mouse, in the above-mentioned order. When the direction is selected, in the upper right side it appears a list with all collected measurements for that direction. Coloured small icons indicate also an alarm condition for the measurements. A check mark icon indicates the base line spectrum, if set. Now you can select a collection of trends and spectra to be shown. Just double – click to any trend or direction and the item will be move to the *show list*.

Instead of double – clicking, you can drag and drop any Direction or Spectrum to the *show list*.
If you want to not display some items from the *show list*, just double – click on that items and item will be remove from the list.

Finally, press **Show** button, and the entire list will be shown.

After you displayed some trends and spectra – set, the main window remain active and you can select other trends or spectra. Although it can display a large number of information's on a single screen, it is recommended to limit the number of simultaneously opened plots, because the plots will have smaller and smaller sizes and many details will be lost.

For details regarding an efficient way of using the spectrum and trends plot, see also:

- Spectrum plot
- Trend plot
- Time-signal plot
- Coast-down/Coast-up plot

Other ways for displaying data are:

- Quick view
- Show Spectra from whole machine
- List View
- Band View.

Try also these commands to see the differences, but first read the help associated with commands.

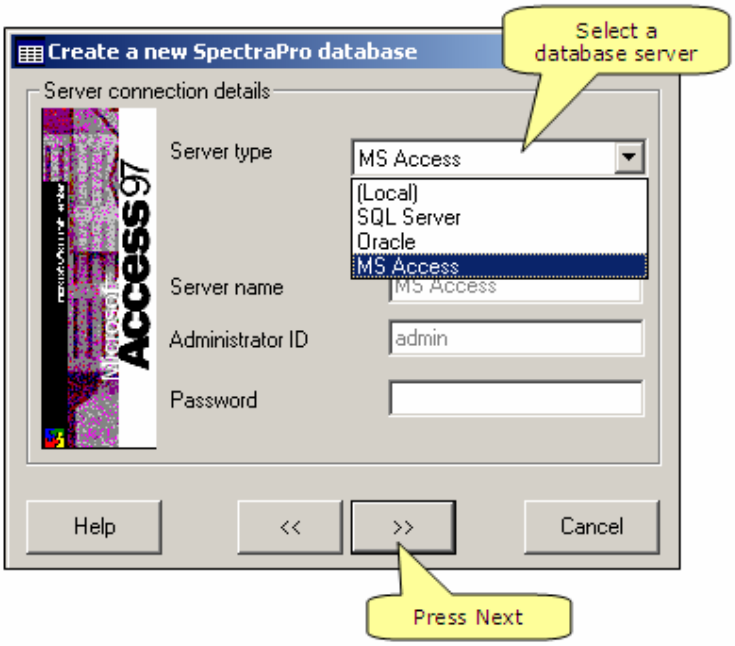
4. Creating, registering and editing databases

To make a functional program, every user has to create an edit its own database. For each part of a whole plant, it is recommended to create a separate database.

4.1. Create a new database

To create a new database use Database >Create command.

First select a database server where the database will be created:

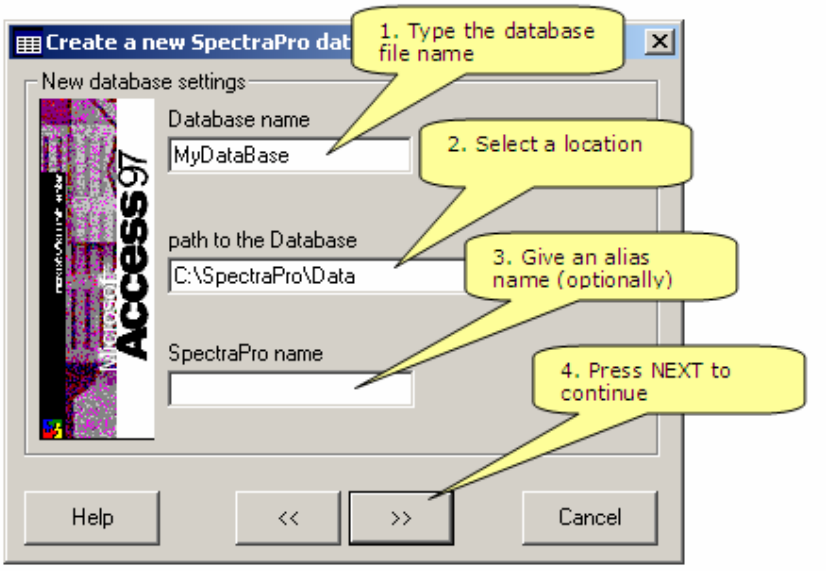


You can create machine database in the following database servers:

- MS Access
- MSDE (Microsoft® Database Engine) – *not suitable for Windows® VISTA*
- Microsoft® SQL Server 2005 Express Edition SP2
- Microsoft® SQL Server
- Oracle® 8.0 (or newer)

4.1.1. Creating a MS Access machine database.

First select the **Server type** to be **MS Access**. You not need any Administrator ID or password. Press NEXT.



The *SpectraPro name* is optionally. If you don't type any name, the *SpectraPro name* will be the database file name.

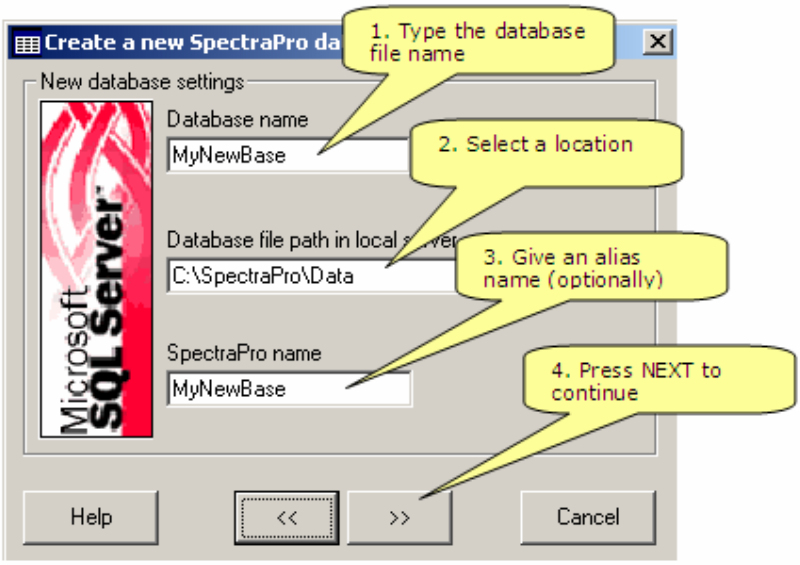
Press NEXT to continue.

A new MS Access database with the name MyDataBase.sp3 will be created in the C:\SpectraPro\Data directory.

> NOTE: To create a backup copy of your database, simply copy the .sp3 file in a safe location.

4.1.2. Creating machine database in MSDE Server.

First select the **Server type** to be **(Local)**. You not need any Administrator ID or password. Press NEXT.



The *SpectraPro name* is optionally. If you don't type any name, the *SpectraPro name* will be the database file name.

Press NEXT to continue.

A new database with the name MyNewBase will be created in the *C:\SpectraPro\Data* directory.
A MSDE database has several files, as follow:

```
MyNewBase_table.sp7
MyNewBase_index.sp7
MyNewBase_image.sp7
MyNewBase_log.sp7
```

NOTE: You can't make a backup of the database copying the above files! Please contact your IT Department to make periodic backup copy of your databases. Alternatively, use external software *DBManager.exe*.

4.1.3. Creating machine database in a SQL Server Express Database Server

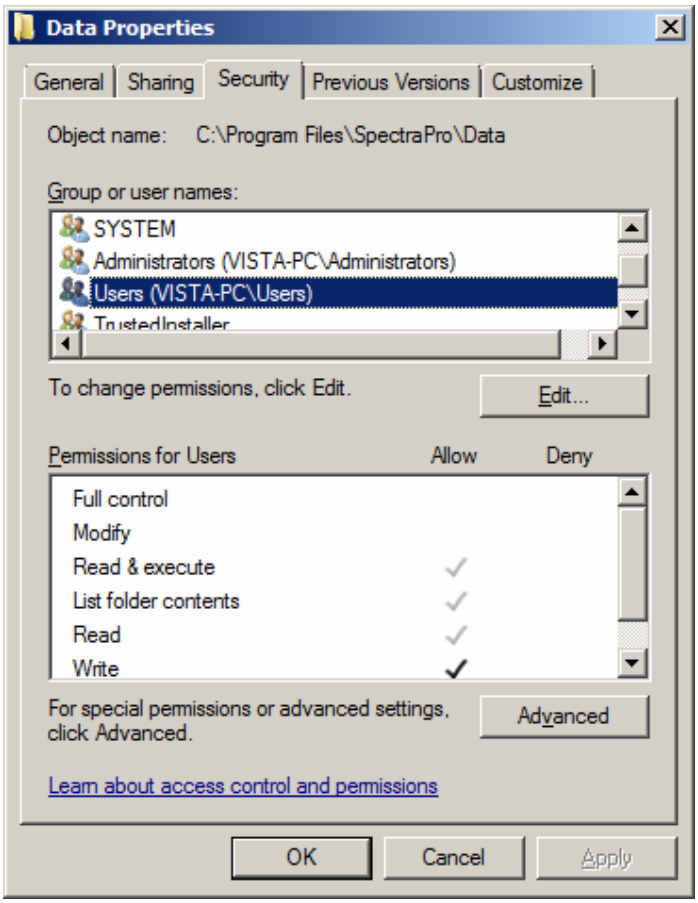
SpectraPro application running under **Vista** Operating System can create machine databases also in a *SQL Server Express* database Server, installed on the local computer.

If you are a normal user, you will be not able to create SpectraPro database because you don't have enough rights to do this.

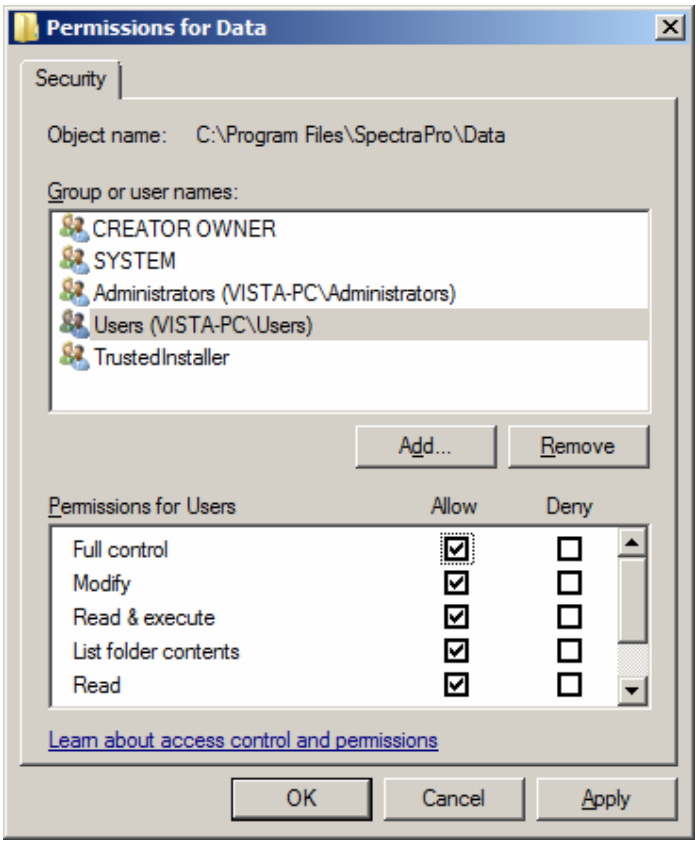
Bellow is explained, step-by-step, how you must configure the VISTA Operation System to allow a normal user to create SpectraPro database in a specific folder (directory).

Locate the Data folder (in a default SpectraPro installation is *C:\Program Files\SpectraPro\Data*).
Alternatively, you may create a new database folder.
Click right-mouse on the folder name and select **Properties**.

In the bellow windows, select **Security** tab.
From **Group or user names** select **Users (VISTA-PC\Users)** where VISTA-PC is your computer name.

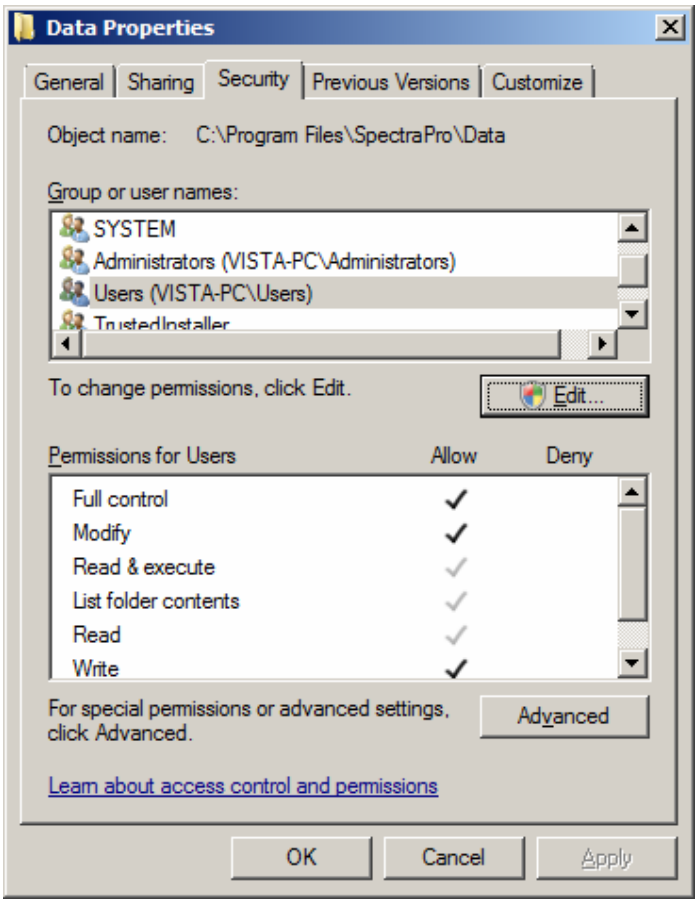


Press **Edit** button.
The following windows will appear.



From **Group or user names** select again **Users (VISTA-PC\Users).**
In the **Permission for Users** area, click on **Full control** check box in the **Allow** column.
Also the **Modify** item must be checked.
Press **Apply** button.
Press **OK** button to return.

Now the initial windows will look as follow:

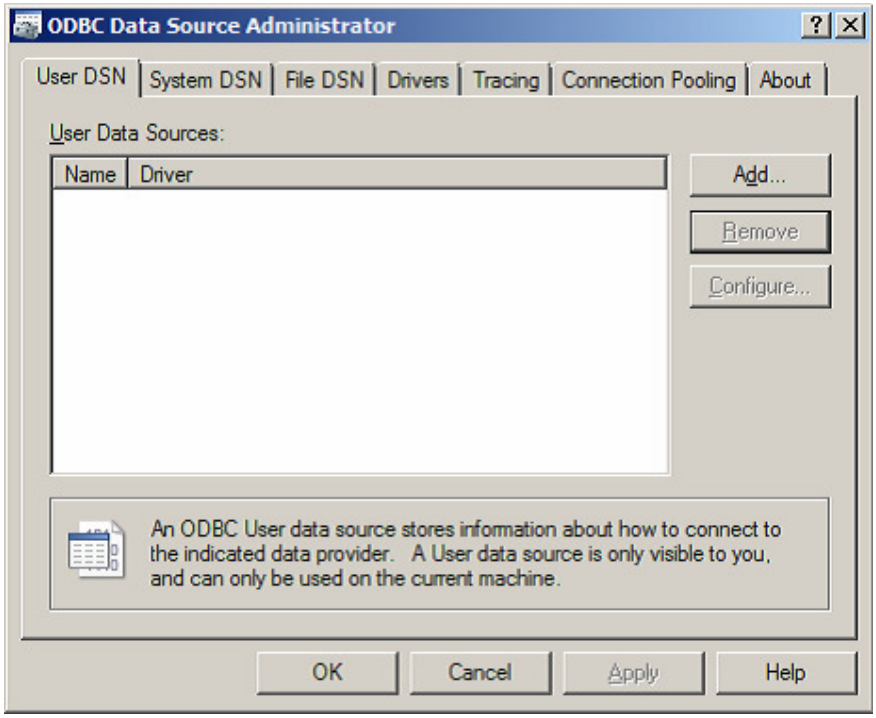


You can observe that for the **Users**, the **Full control** and also **Modify** items are checked.
Press **OK** to exit.
Now the SpectraPro will have permission to create new database, but only in the **Data** folder.
You can create more than a single folder to store SpectraPro databases using the *SQL Server Express*.

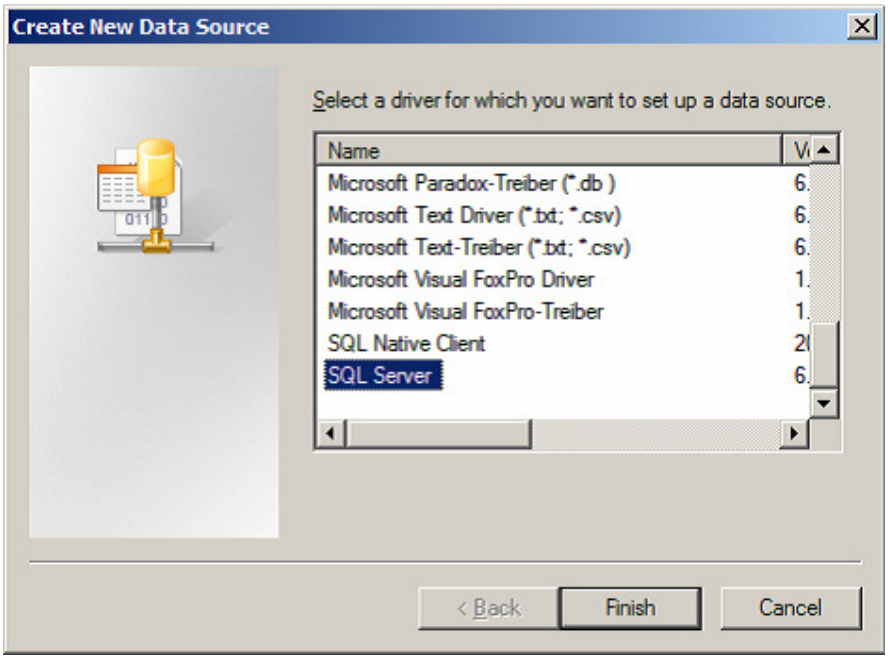
Before to create a new database, be sure that the SQL Server Express is installed on your computer.

To test the connection with your SQL Server Express, proceed as follow:

In the Start > Control Panel >Administrative Tools > DataSources (ODBC) select **UserDSN** tab and press **Add.**



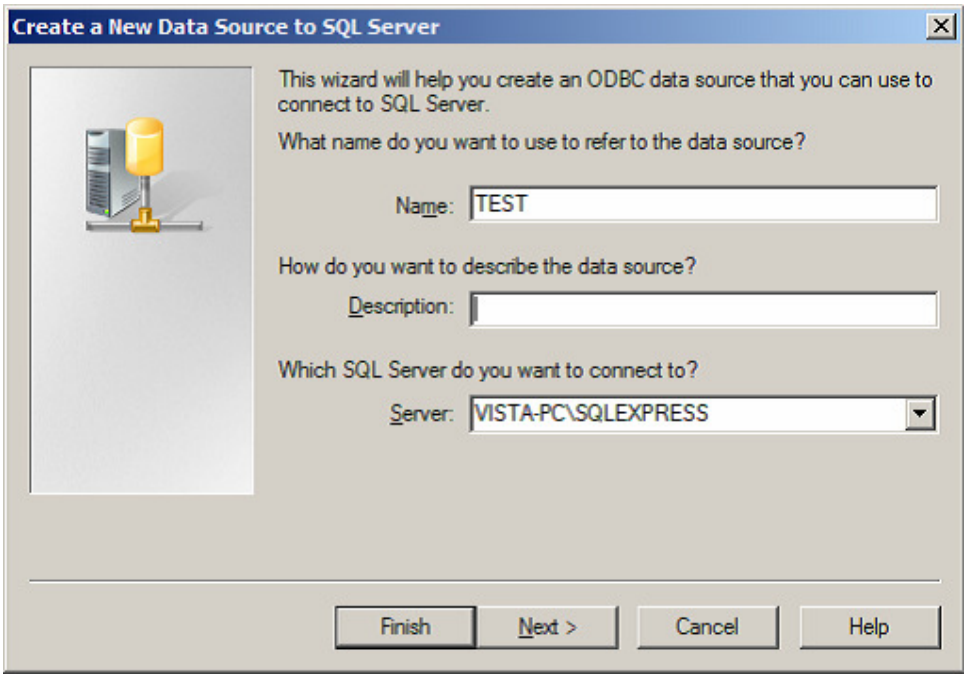
From the list select **SQL Server** and press **Finish** button



In the **Create a New Data Source to SQL Server** windows type a name in the **Name** text box.

In the **Server** combo box, select **VISTA-PC\SQLEXPRESS** item, where VISTA-

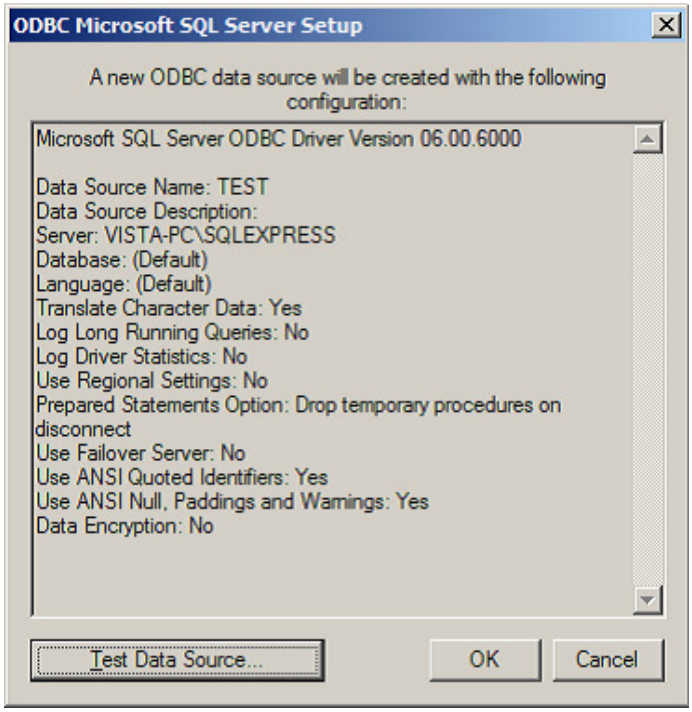
PC is your computer name.



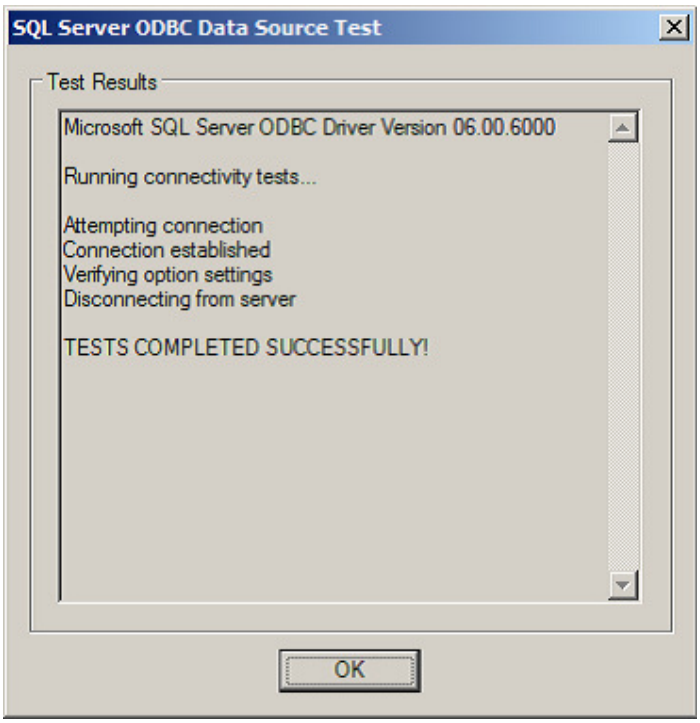
Press **Finish** button.

Now you can test the connection with the database Server:

Press **Test Data Source** button.



If the connection is successfully established, the following message will appear:



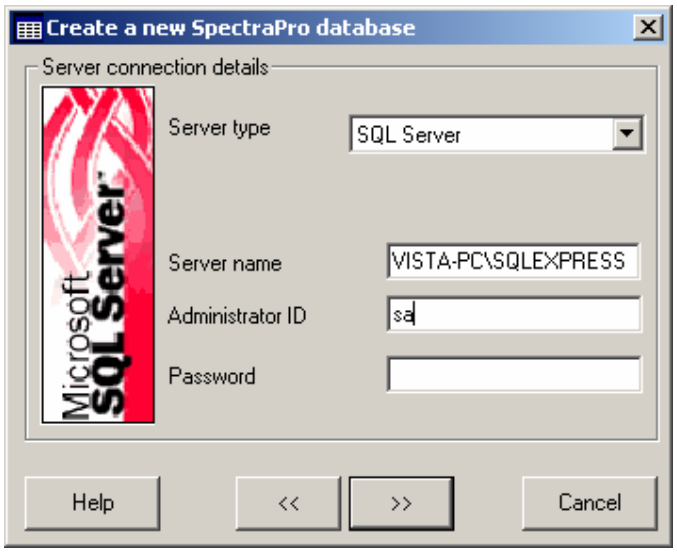
Now you are ready to create your own databases.

OPTION 1

Select **Server type** to be *(Local)* and follow instruction on-screen.

OPTION 2

Select **Server type** to be *SQL Server*.



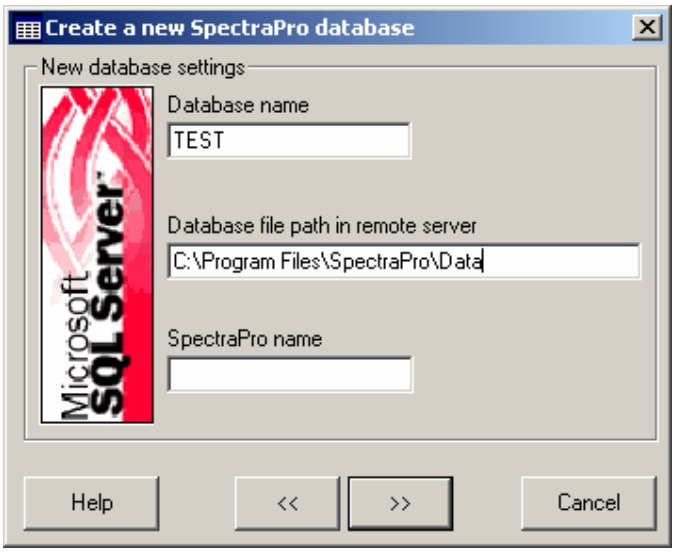
Type the **Server Name**. In above example the server name is *VISTA-PC\SQLEXPRESS*.

You must replace the *VISTA-PC* with your computer name.

Type the **Administrator ID** and **Password**. In a default installation of the **SQL Server Express**, the **Administrator ID** is "*sa*" and is no password.

Press NEXT button to continue.

In the next windows type a name for your database and type the location

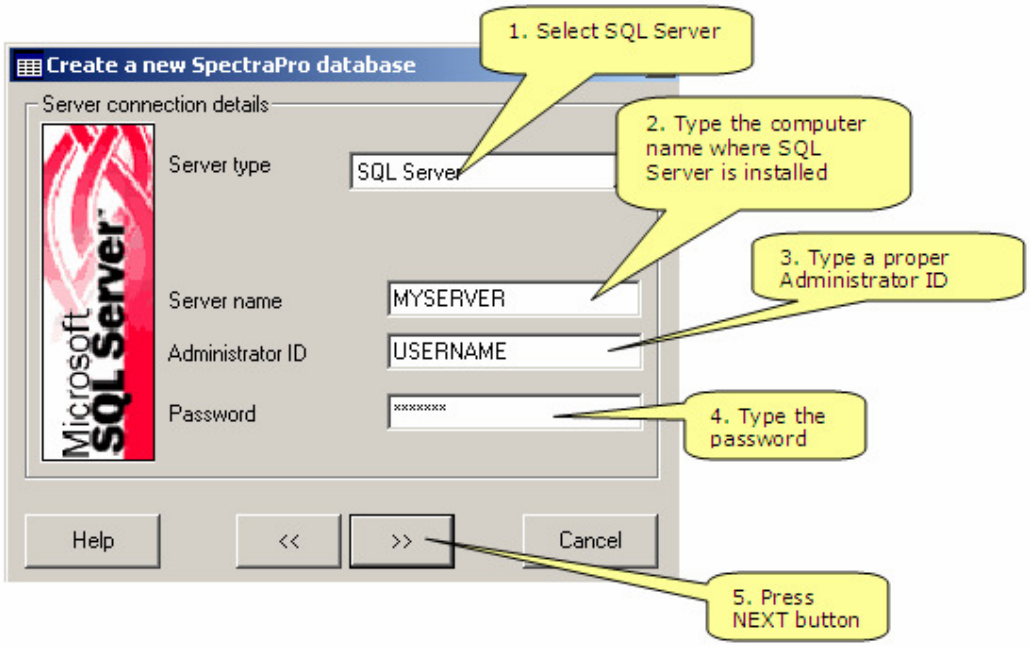


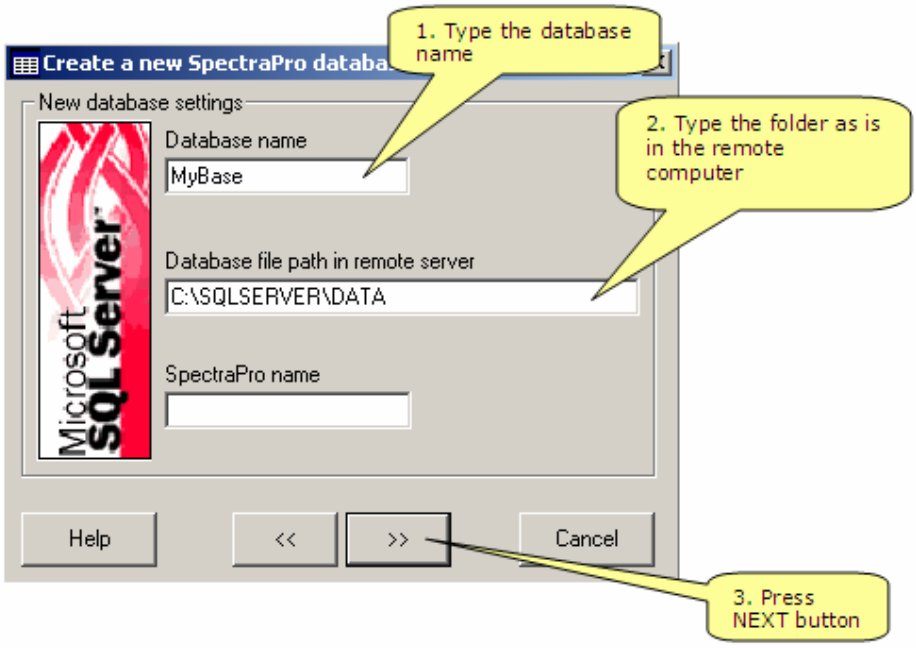
Press NEXT twice to continue.
The database will be creating in the named folder.

4.1.4. Creating a SQL Server machine database.

Before to create a database in a remote SQL Server, be sure that your computer is connected with the computer where SQL Server is installed.
SpectraPro can create database in any SQL Server, after SQL Server 7.

First select the **Server type** to be **SQL Server**. You may need Administrator ID and a valid password. Ask for help if is required.





If the Administrator ID and the password are correct the new database will be create. Otherwise, an error message will be shown.

A SQL Server database has several files, as follow:

```
MyBase_table.sp7
MyBase_index.sp7
MyBase_image.sp7
MyBase_log.sp7
```

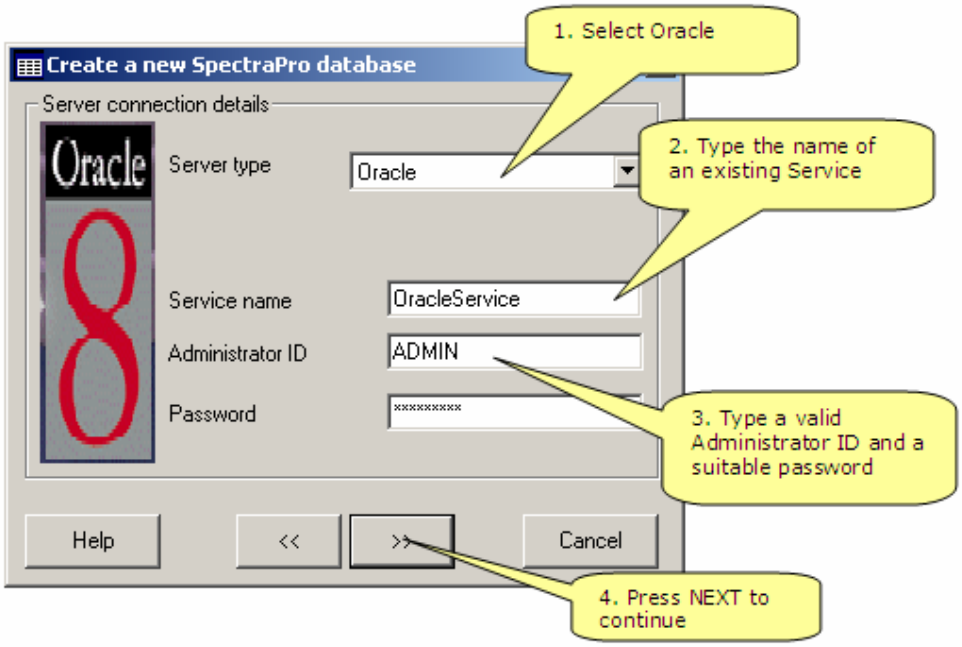
NOTE: You can't make a backup of the database copying the above files! Please contact your IT Department to make periodic backup copy of your databases. This action must be done regularly in the Server computer.

4.1.5. Creating an Oracle machine database.

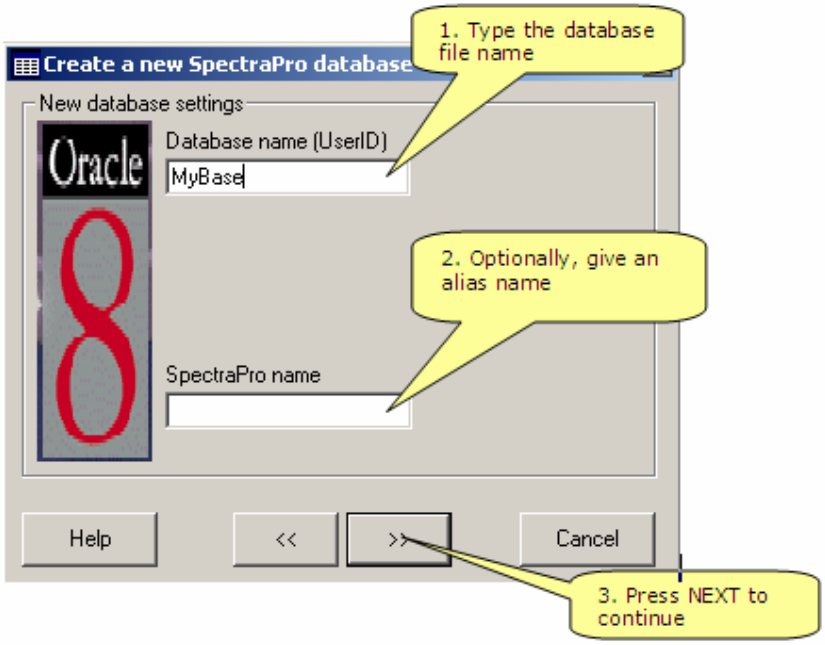
Before to create an Oracle database please check:
- If an Oracle database server exist and run in your network;
- If a Service to connect your computer with Oracle database server exists in your computer.

For more details please contact your IT Department**.**

First select the **Server type** to be **Oracle.**



Now type the database file name.



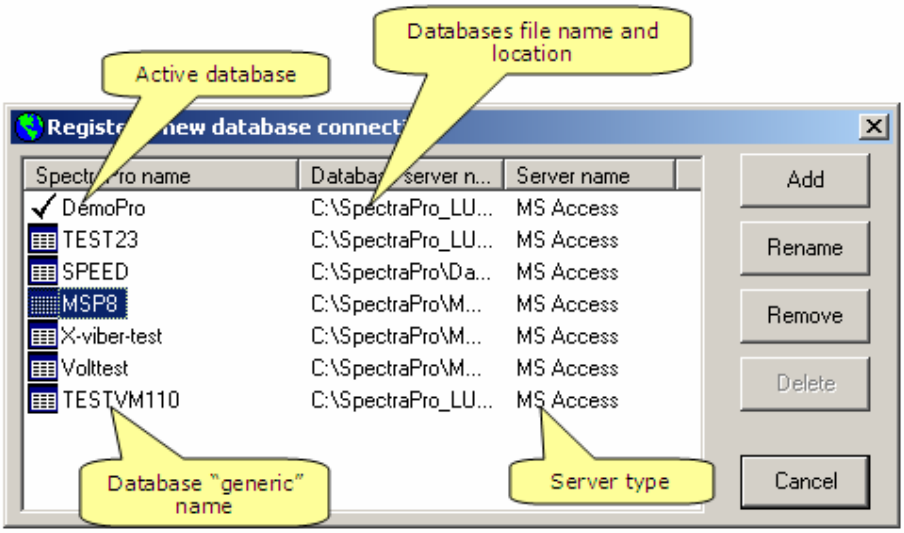
In Oracle database server, the database name is the UserID name.
If the connection with your Oracle database server is OK, the new database will be create.

4.2. Database registration

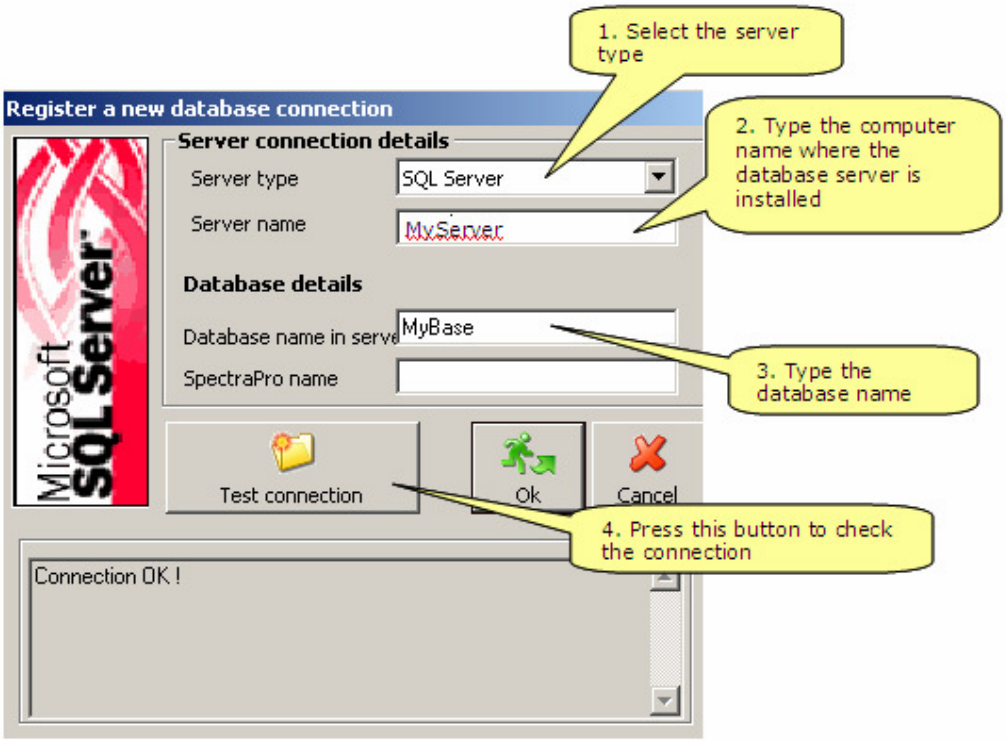
Before to use any ***SpectraPro*** database, you must register it.

Use Database > Registration command to add an existing database to your registration list.

If you create you're own database, the database will be self-registered. To have access to the other ***SpectraPro*** database from the network, you must register them first.



Click to **Add** button and select a valid ***SpectraPro*** database.

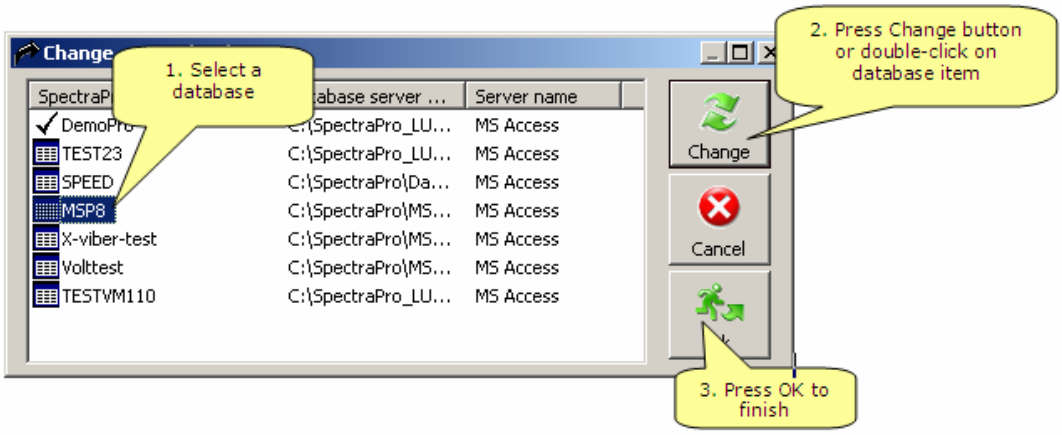


In above example a remote SQL Server database is selected.
You can add any type of SpectraPro database.
Only registered databases can be activated in the SpectraPro software.
If the SpectraPro is installed in a network, each user can have his own database collection.

The databases will be added in the registered list of databases. You can any time **Remove** a egistered database. This not means that you delete the selected database, just remove it from the list. In addition, you can rename the "generic" name of the database.
Finally, click **Cancel** to terminate the command.

4.3. Database change

SpectraPro can manage many databases, but not in same time. This means that you must make a particularly database (from the registered database list) active. Use Database > Change command to do this:



Double-click on the item in the list or select with a click the database, and after press **Change** button. To conclude, press **OK** button. The name of the file selected will appear in the status bar.

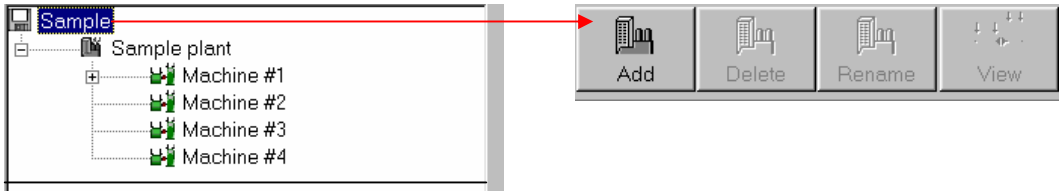
4.4. Database Edit

Use Database > Edit command to edit a database. To do this, select this command from the main menu or press the dedicated button from the toolbar:

This command is used to edit the active database (add, delete, rename items) and for database maintenance.
In accordance with the selected item from the hierarchy tree, you can add machine, point or direction.

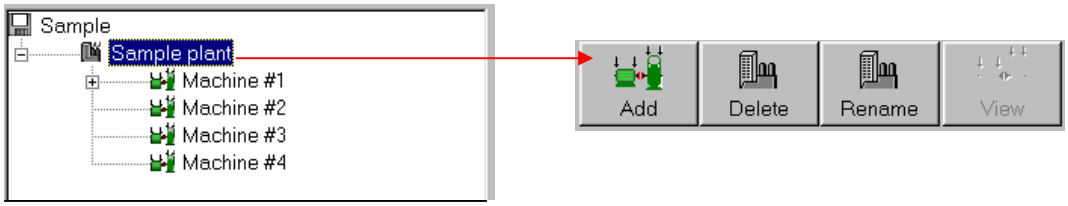
4.4.1. Database Level

On the Database level you only can add Departments (or plants):



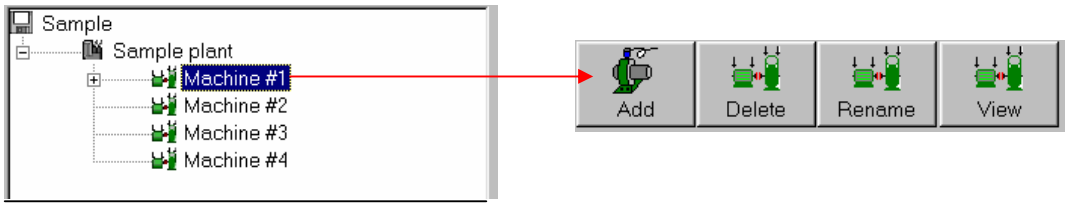
4.4.2. Departments Level

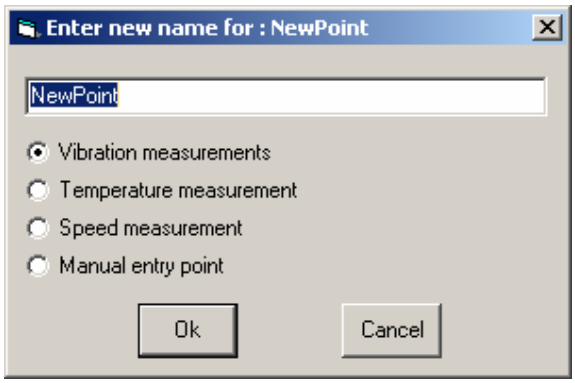
On the Departments level you can add Machines and also you can delete or rename Departments:



4.4.3. Machine Level

On the Machine level you can add Points. You can delete or rename the selected Machine. Also you can view the structure of the database:



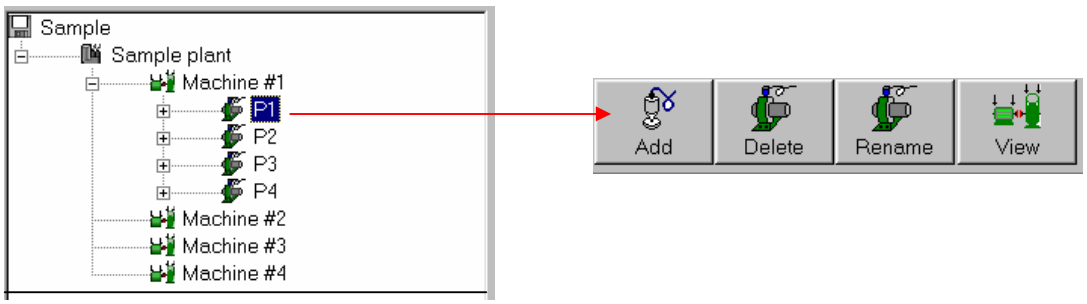


The following point's type can be added:
-Vibration point
-Temperature point (only for XVIBER)
- Speed point (only for XVIBER)
- Manual entry point

Only vibration points has Directions.

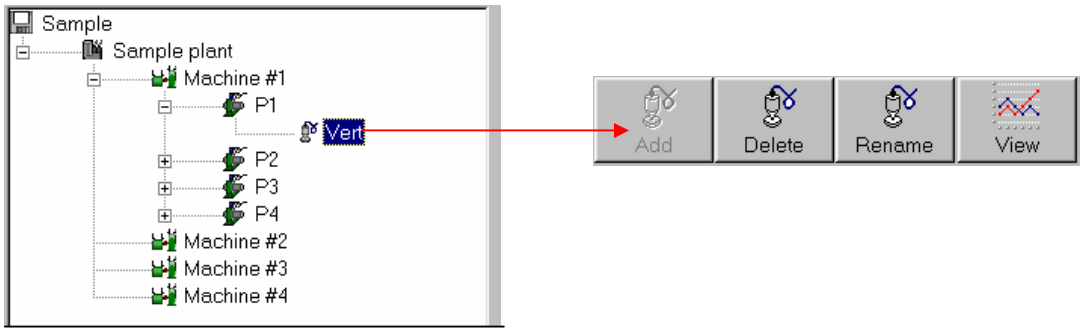
4.4.4. Point Level

On the Point level you can add a Direction. You can delete or rename the selected Direction. Also you can view the structure of the database:



4.4.5. Direction Level

On the Directions level you can delete or rename selected Direction. Also you can view the Trend plot (if any):



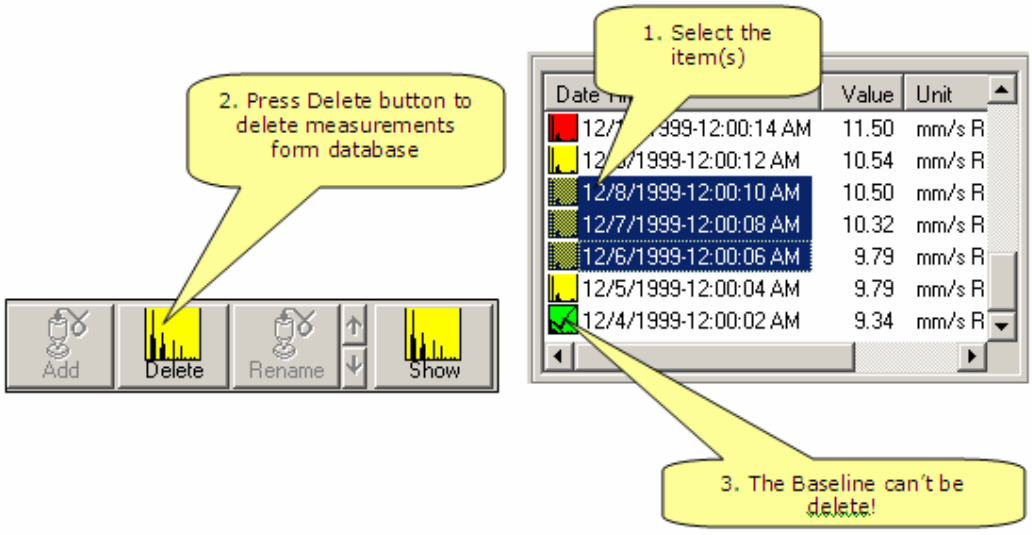
After adding a new item in the database, any selected item can be renamed. The new items are added with a default name, which can be changed any time. To do these, select the item of which wants to change and press **Rename** button. Then change the name using the keyboard and finish with **OK**. An empty name is not allowed.

For deleting an item, select the item and press **Delete** button.

If the item is not the last one in the hierarchy tree or in that particular direction is already stored measurements then the item can't be deleted. As a general rule of deleting is one that a deleting procedure must be made in the following order:

- measurement
- direction
- point
- machine
- plant (department)

The spectra deletion can be done by selecting one or more spectra and then pressing the **Delete** button or keyboard **Delete** key.



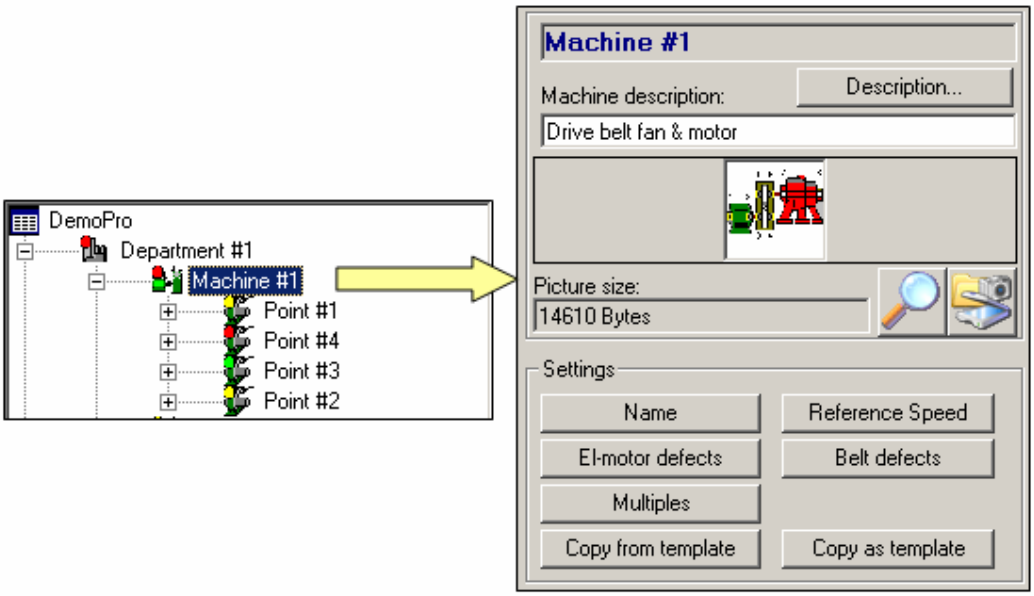
The **baseline** spectrum can't be deleted. First double-click on item to transform **baseline** spectrum in **normal** spectrum and after that you can delete it.
After you finish machine definition (plant, machine, point and direction) on each level of the hierarchy you can edit fault frequencies, very helpful later.

4.4.6. Editing on machine level

On **machine level** you can edit:

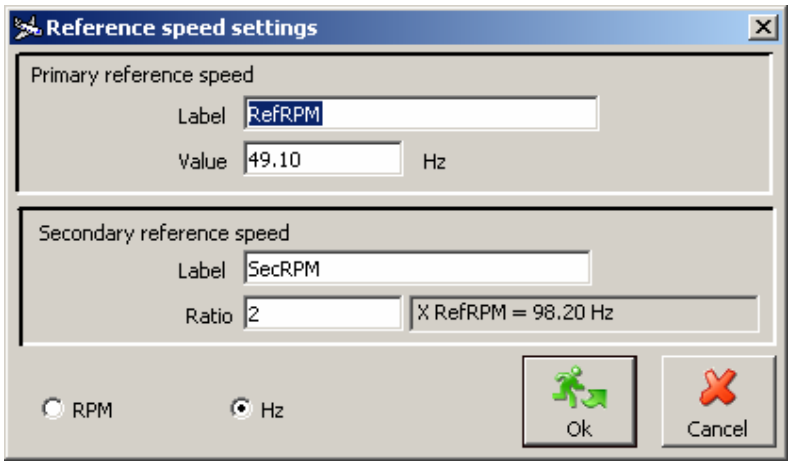
- A short description - a 30 – 40 char length, description of the machine. This description can be use in reports.
- A machine description - clicking on **Description** button a text editor appear. For each machine you can fill here as much information you want. You can use different type of colour, letter size and alignment. You can import the contents of some external file (text or RTF file) or picture. The contents of machine description can be printing with Report > Machine Description Report.

- Machine picture. For each machine you can add a picture from the existing collection provided in the installation kit. The picture must be in a picture file format. Of course, you can make your own picture with a digital camera. To add a picture to a machine click **Browse** button and select any picture file.



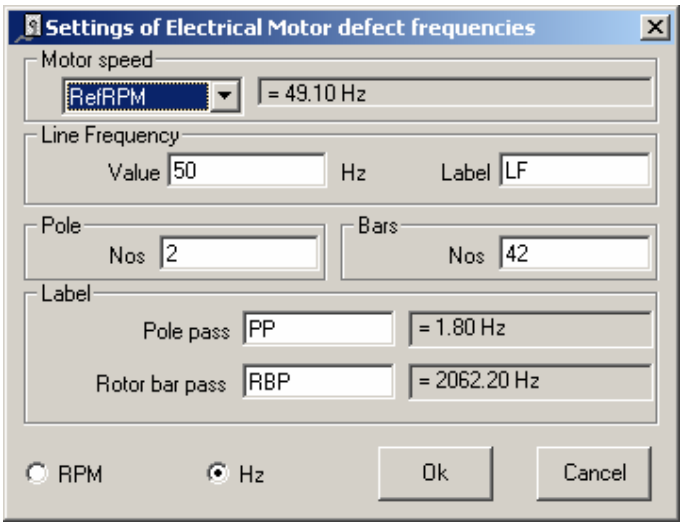
- Reference speed. For each machine you can define 2 reference rotational speeds. First is primary rotational speed, and other one in the secondary reference speed, related with first one. These speeds will be useful later, on shaft speed definition for each point. In this respect you can label these two speeds for easiest recognition in future.

For variable speed machine define the primary rotational speed to be zero. The software will determine the real shaft speed using the latest measurement.



For more details see **Speeds setting**

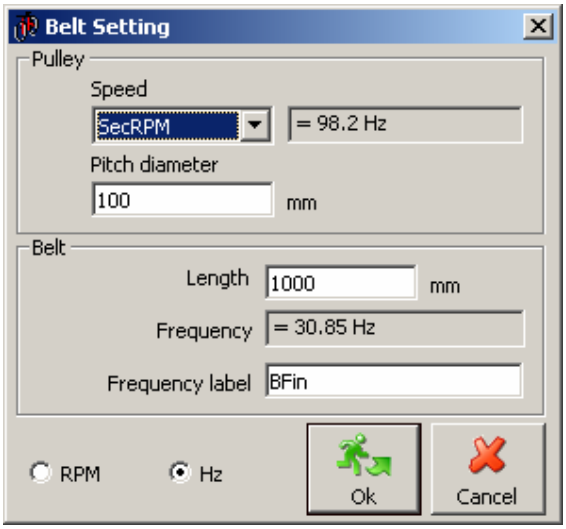
- Electrical motor fault frequencies.



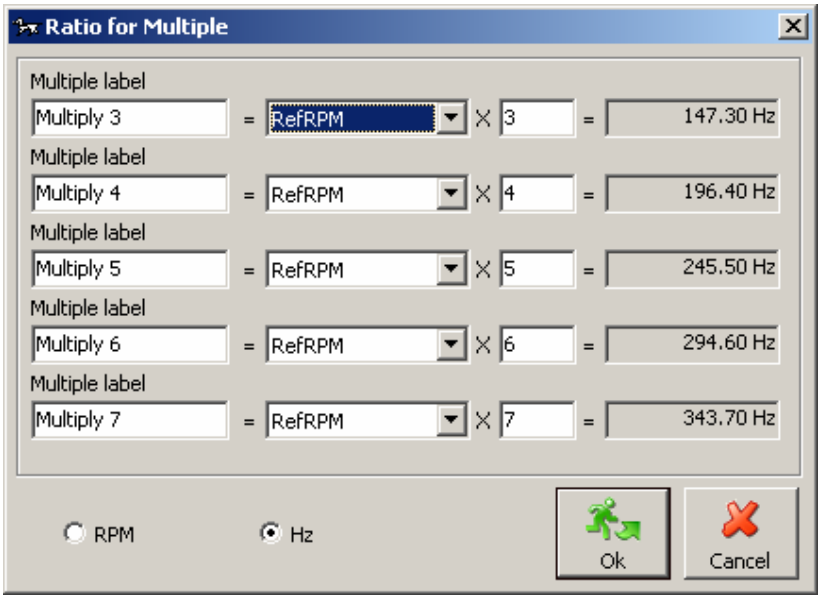
You can define the followings fault frequencies:

- Line frequency (LF)
- Pole pass frequency (PP)
- Rotor bar pass frequency (RBP)

- Belt fault frequencies.



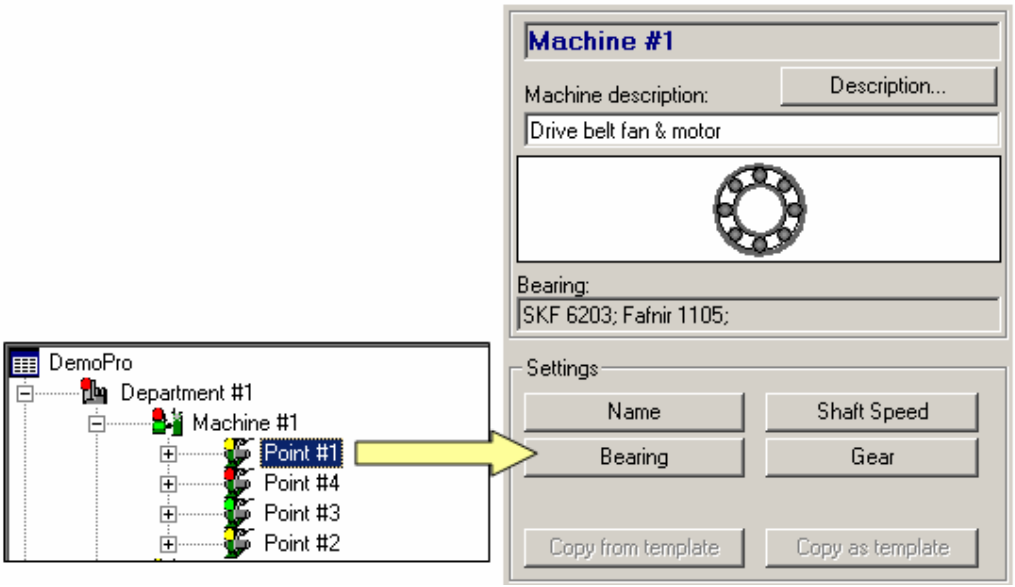
- Multiply fault frequencies.
  You can define five multiply fault frequencies for each machine:



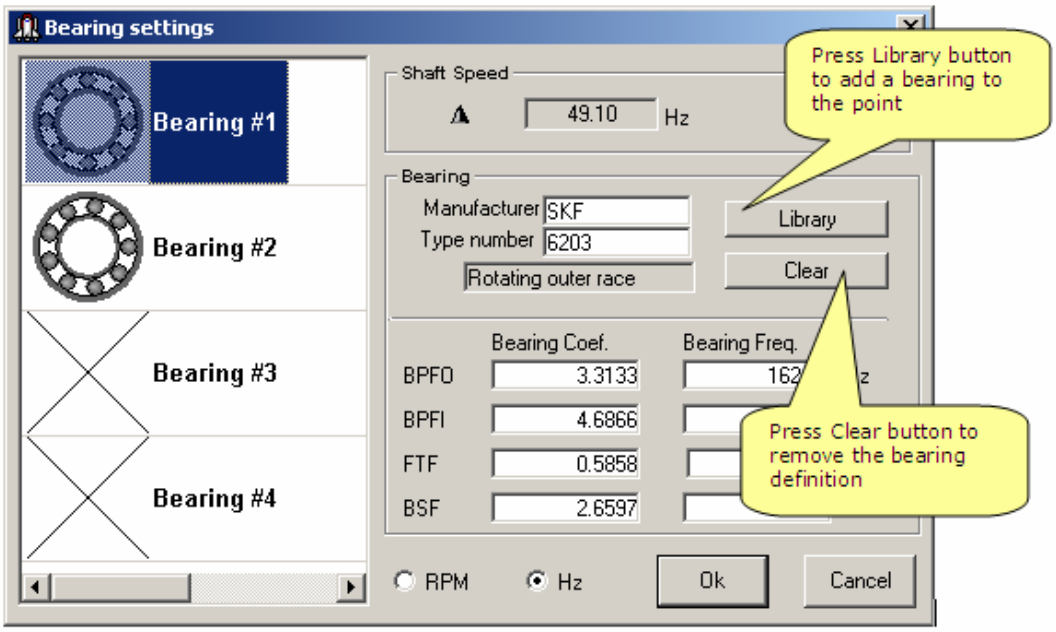
4.4.7. Editing on point level

On **point level** you can select or define a bearing, and a shaft speed. The shaft speed can be one previously defined or other related with main reference speed or secondary reference speed.

Also you can edit the specific data for a gearbox.
To select a bearing push **Bearing** button and after that press **Library** button.

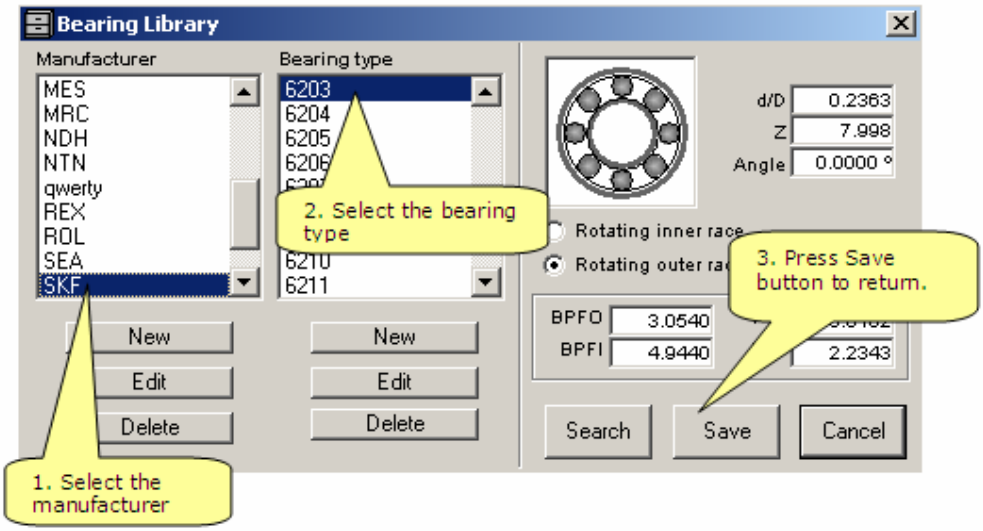


On each point you can add up to 4 bearings:



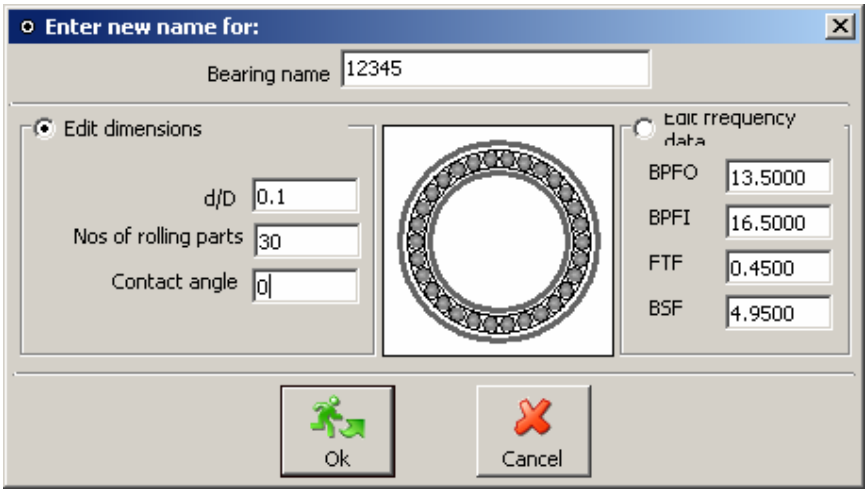
If **Library** button is selected, the Bearing Library window will appear.
In the library exist more than 6000 bearing definitions. The user can also add some new bearing definitions in the Bearing Library Database.

The bearing library window appears as follow:



To add a new bearing in the Library, proceed as follow:

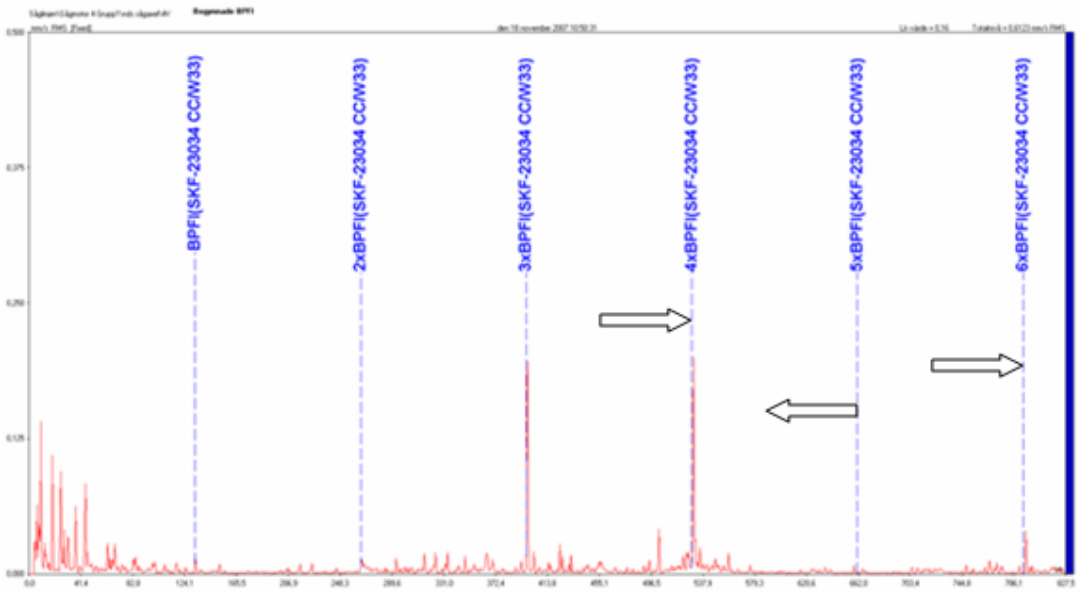
- Press **New** to add a new Manufacturer in the list
- Press **New** to add a new bearing



If you know the fault coefficients, select option **Edit frequency data**.
If you know only the bearing dimensions, select option **Edit dimensions**.
Finally, press **OK** to save the bearing definition.

4.4.8. Automatic adjustment of the pre-calculated bearing fault frequencies.

The bearing fault frequency can be displayed in any spectra plot.

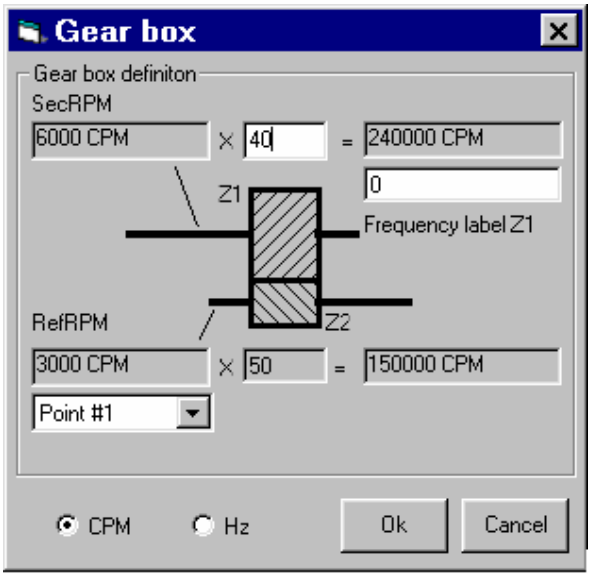


A typical spectrum from a bearing with faults is shown above. In most cases the calculated and the measured frequencies will be separated with a small margin.

In the SpectraPro software is implemented a function where the basic fault frequency lines with multiples are moved to the nearest peak if some exist within the selected gap. If in this interval more than one peak exists, the fault frequency line will be moved to the highest peak found.

If the basic fault frequency is moved, also the side bands will move with the same distance. Because the distance between the measured and the calculated frequency can vary slightly from multiple to multiple this adjustment is done on each basic bearing fault frequency separately.

4.4.9. Editing gear box fault frequency



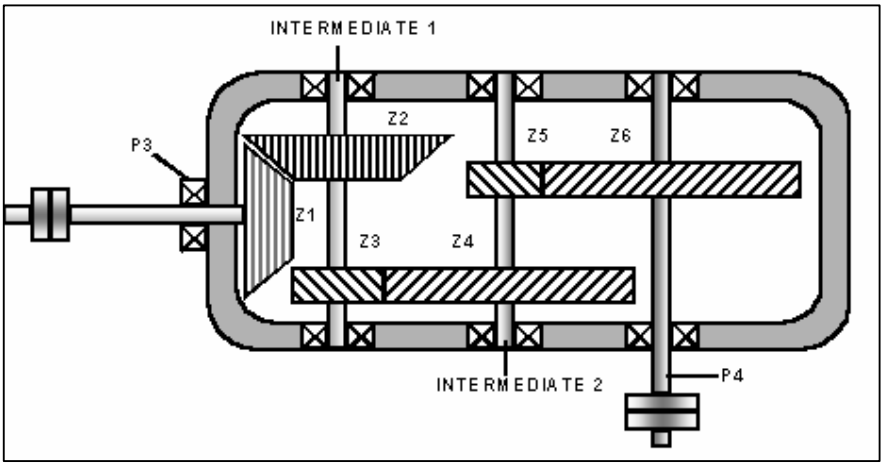
To define the fault frequencies for a gear box proceed as follow:

Press **Gear** button. The following window will appear:

Before to set the gear frequencies, set for each point of the machine the proper calculate speed.
For the selected point, type the number of the gear teeth and select the conjugate point. If the conjugate point was correctly selected, the number of conjugate

gear teeth will be an integer and the **OK** button will be activate. Otherwise you can not save the settings.
Before to save the setting, type a label name for the gear mesh frequency.
To understand better the gear box settings please analyze the following example.

The gear box has the following characteristics:



Type: FLENDER Model KZN 280
Z1=16 teeth
Z2=26 teeth
Z3=17 teeth
Z4=47 teeth
Z5=14 teeth
Z6=45 teeth

On machine level set the main reference speed to 3000 RPM and label it as "MotorSpeed".
Set the secondary reference speed to the output shaft (P4): 207.7467 RPM with the label "RollSpeed"
For the input shaft (P3) set the shaft speed to be 1XMotorSpeed
For the Intermediate1 shaft set the speed to 0.61538XMotorSpeed=1846.1538 RPM
For the Intermediate2 shaft set the speed to 0.22258XMotorSpeed=667.75 RPM
For the output shaft (P4) set the speed to 1XRollSpeed=207.7467 RPM
Press **Gear** button for the point P3 and make the settings:
Number of teeth to 16 and label "GM1/2". Select the conjugate point to be Intermediate1 (26 teeth for conjugate point will appear).
Press **Gear** button for the point Intermediate1 and make the settings:
Number of teeth to 17 and label "GM3/4". Select the conjugate point to be Intermediate2 (47 teeth for conjugate point will appear).

Press **Gear** button for the point Intermediate2:
Number of teeth to 14 and label "GM5/6". Select the conjugate point to be point P4 (45 teeth for conjugate point will appear).
Press **Gear** button for the point P4:
Number of teeth to 45 and label "GM5/6". Select the conjugate point to be point

P4 (14 teeth for conjugate point will appear).

Now the setting is complete.

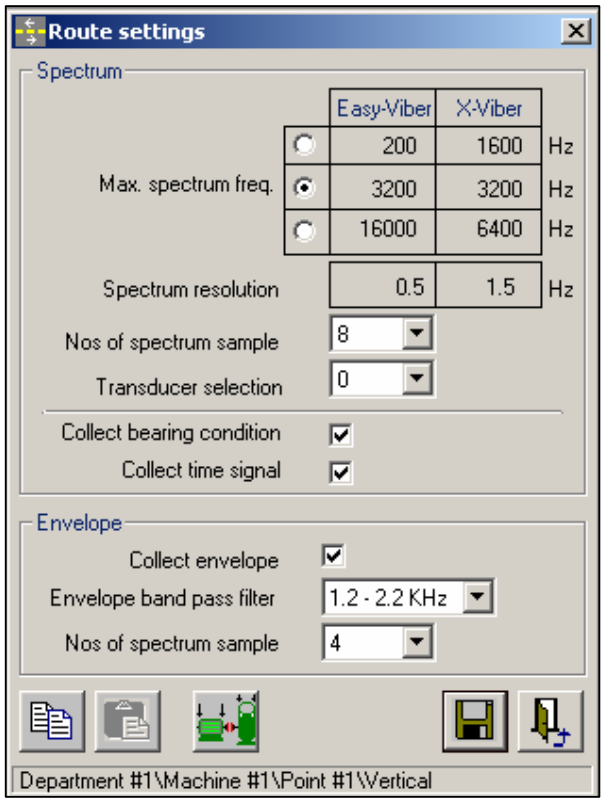
4.4.10. Editing on direction level

On the **direction level** you can edit the alarm limit for total vibration values of the measurements and also to define the Route settings.

Click **Alarm settings** button and you can edit two alarm levels for each overall vibration, BC and Envelope values. Two tables, ISO 2372 diagram and Bearing Condition Coefficient diagram is on your disposition to select proper value for alarms. Select the unit for total vibration values and also the average type.

Note: If on directions Level is already stored some measurements, you can declare, for each direction, one of them to be **Baseline**. To do this, just double-click on that measurement. Only one measurement can be **Baseline**. All other measurements are considered to be **Normal** measurements.

Click **Route settings** to set some parameters for route measurements:



In the Route settings you can select the followings:

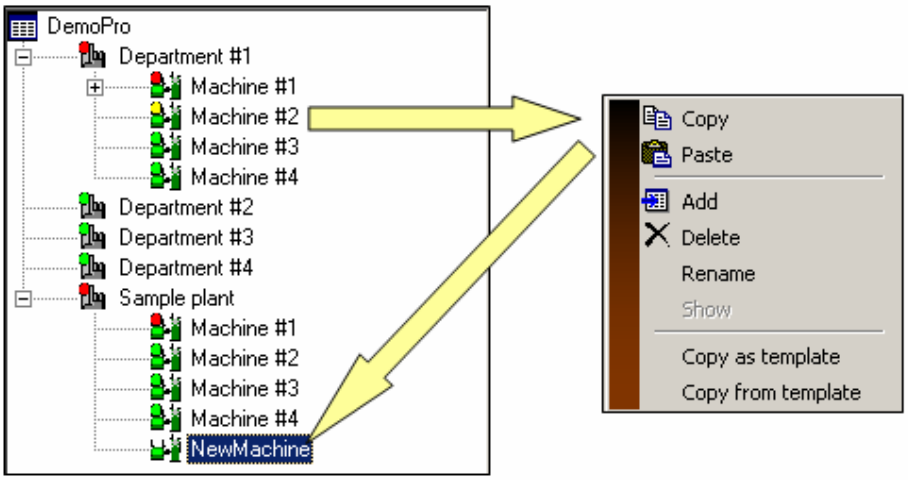
- Maximum spectrum frequency
- Number of sample n time of data collection (normally 2 or 4).
- Transducer selection (only for **Easy Viber** Data Collector).
- Collect BC or/and Time signal together with the spectrum.
- Envelope collection.
- Envelope band pass filter
- Number of sample for Envelope collection.

Finally, Press SAVE button.

You can copy the settings and paste to any other direction or to ALL direction of the machine.

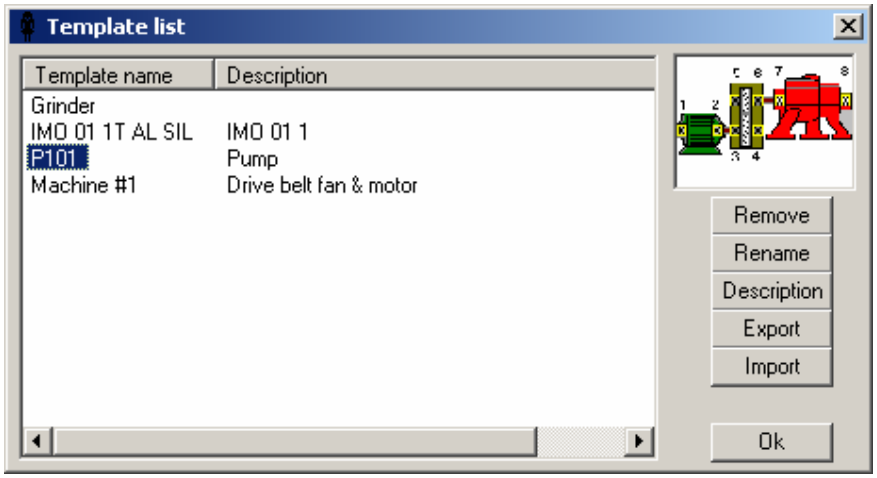
4.4.11. Editing machine in batch

If in your database is more then one identical machine, edit only one machine and after that you can copy and paste this machine many times.



Before to copy, the new machine must exist (only as name, the machine hierarchy can be empty)

You can save a just created machine in a **template** database, or use the **template** database to copy a pre-defined machine in your database.
When the SpectraPro start for the first time, a file with the name: *Template.tp7* is created as default. The template file is empty. In this file you can add as many machines you want. From the template file you can export some machine template in other template files. Or from any template file you can import in your template file a series of machines.



In above window you can:

- Rename the machine (name, description and machine picture)
- Remove the machine from the Template file
- Export the machine in another Template file (the file can be created if don't exist)
- Import a machine form any Template file (the file must exist)

5. Off-route transfer

From **Easy Balancer** or **Easy Viber** Analyzers you can transfer the following type of off-route data:

- Spectral data (including time-signal)
- Envelope spectra
- Coast –down/Coast-up plots
- Balancing data

Data can be transferred from these Instruments in two ways:

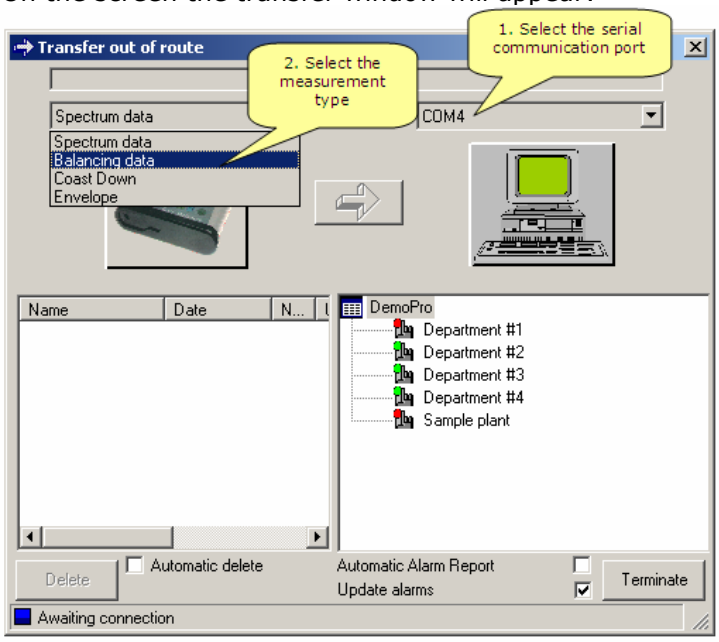
- ***Direct*.** If the machine database is available you can transfer each file from Analyzer in the proper location.
- ***Indirect***. In this case the data will be transferred first in a ***Transfer file*** and after that, from the file in the machine database.

5.1. Direct transfer

Direct transfer can be done using the *Transfer* > *Off- route* command or pressing the specific button from the toolbar. Before to execute this command check:

- If the serial cable is properly connect on both Analyzer and computer ports.
- If the Analyzer is switched on and on the Analyzer screen the *Communication* menu item is selected.

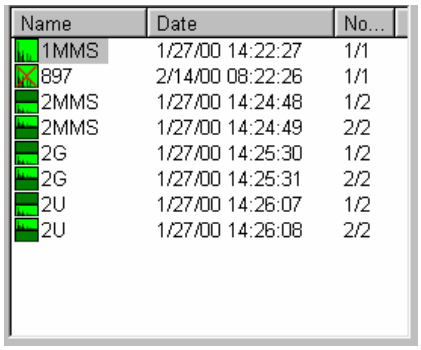
On the screen the transfer window will appear:



In the Status bar the "Awaiting connection" message will appear.

Select the proper serial communication port (e.g. COM4), and the data type, on your choice (e.g. Spectrum data).
Now you must select from the Analyzer menu the *Print-out/Communication* command and press "Enter" key.

Depending on your selection in the directory area a list of existing file in Analyzer will appear:



The Status bar will display “Ready to transfer" message.
For both Spectra and Coast-down data two type of files can be shown:

- Single data files (e.g. 1/1)
- Double data files. These files are displayed as two items (e.g. 1/2 and 2/2), having same name and same date (1 sec. more for the second file).

Each item has a specific icon:

 Single spectrum file

 First spectrum from a double spectra file

 Second spectrum from a double spectra file

 Single Coast-down plot

 First Coast-down plot from a double plot file

 Second Coast-down plot from a double plot file

 A "X" mark indicate that this file is already transferred in the machine

You can not transfer a file with a"X" mark again.
To do the transfer first selects a file from the list and after that a destination in the machine tree. The destination must be a *Direction* for spectra and Coast-down data and a *Machine* for balancing data.

Once the source and destination is properly selected the **Transfer** button will be enabled.

Now you can transfer the selected data in two ways:

Press the Transfer  button:

Alternatively, drag the selected item and drop to the proper destination.

If you check the "Automatic delete" check box, after transferring is done the file will be delete from the Analyzer memory. Here is an exception: if the file is double type, the file will be deleted only if both data is transferred.

In same session you can transfer all type of data (spectra, coast-down plots and balancing data).

If the "Automatic report" check box is selected, when you press the **Terminate** button, a report will be generating also.

If "Update Alarm" check box is checked, when you press **Terminate** button, the alarms will be update.

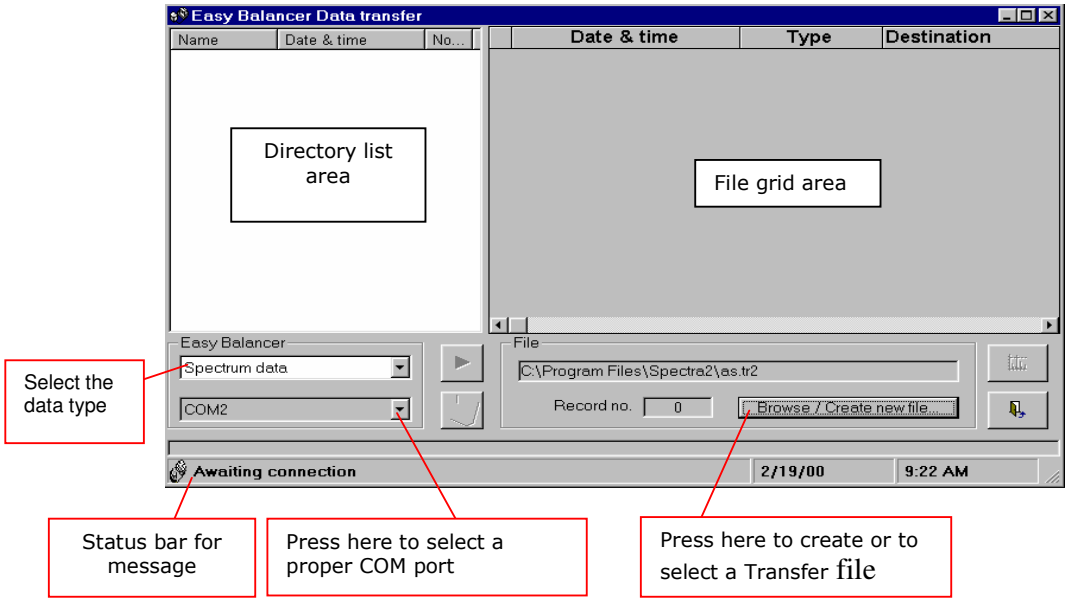
5.2. Indirect transfer

The indirect transfer must be done in two steps:

- First, using the external program "Easy Balancer transfer to file", you must transfer the data from EB or EV in a *Transfer file.* The Transfer file has the **.tr3** extension.
- Use the Transfer > From file command to transfer the data from the selected transfer file in the machine database.

5.2.1. Easy Balancer transfer to file program

Start the program from the Windows > Start > Programs Menu list.



Before to execute this command check:

- If the serial cable is properly connect on both EB and computer ports.

- If the EB is switched on and on the EB screen the main menu is displayed

Select an existing *Transfer file* or create a new one. The default extension for *Transfer files* is **.tr3**. In same file you can transfer data from **Easy Balancer** or **Easy Viber** analyzer.

Select a proper serial communication port (e.g. COM2).
Select the data type (e.g. Spectrum data).
From the EB/EV menu select "Print-out/communication" menu line and press "Enter".
The Status bar message will be "Ready to transfer".

A directory list will appear also. Select any file from this list and press the **Transfer** button.

The selected file will be transferred in the .tr2 file and will appear also in he grid list.
In the Destination field the name of EB file will appear.

Type the final destination in the Destination field of the grid list. You can type the whole tree or only Point and Direction.

	Date & time	Type	Destination
	1/27/00 2:22:27 PM	Spec. 6400	1MMS
	1/27/00 2:24:48 PM	Spec. 3200	2MMS
▶	1/27/00 2:24:49 PM	Spec. 3200	2MMS

Type here the destination in the machine database

After transferring you can press the **Recycle Bin** button to delete the file from the EB instrument.

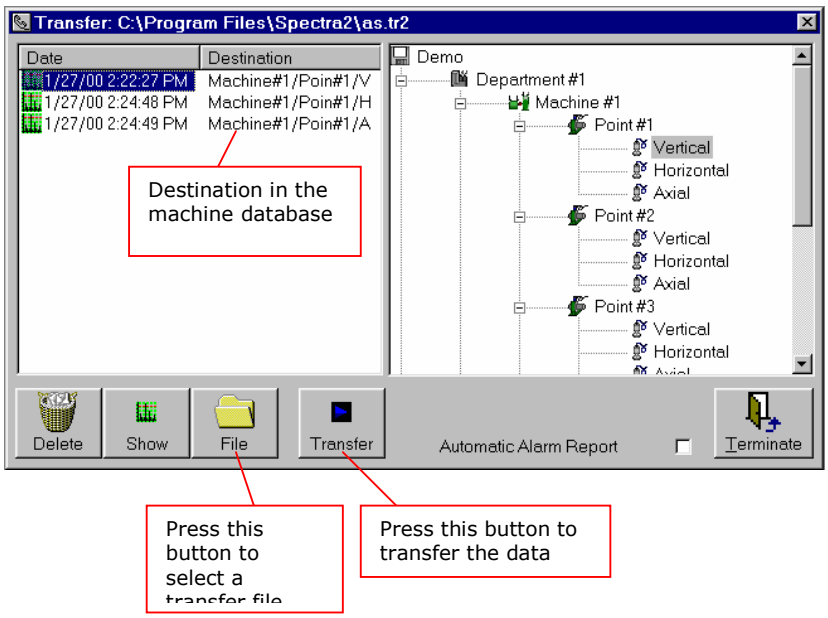
Select any record from the grid list and press the **Show** button if you want to see a plot of the selected item.

Finally press **Exit** button.

5.2.2. Transfer *From File* Command

This command is used to transfer data from any **.tr3** file in the machine database.
From the main menu select Transfer > From file command.

The following window will appear:



Press **File** button and select the required *Transfer file*.
All the record from this file will appear in left part of the window.
Select any record and a proper destination. For *Spectra* and *Coast-down* data a **Direction** must be selected in the machine tree. For *Balancing data* a **Machine** must be selected.
You can see the plot before transferring, pressing the **Show** button.
Now press **Transfer** button and the data will be transferred in the destination location.
Instead, you simple can drag and drop the selected item from the file list in the final destination.
After transferring you can, optionally, delete the record from the file list pressing the **Delete** button.

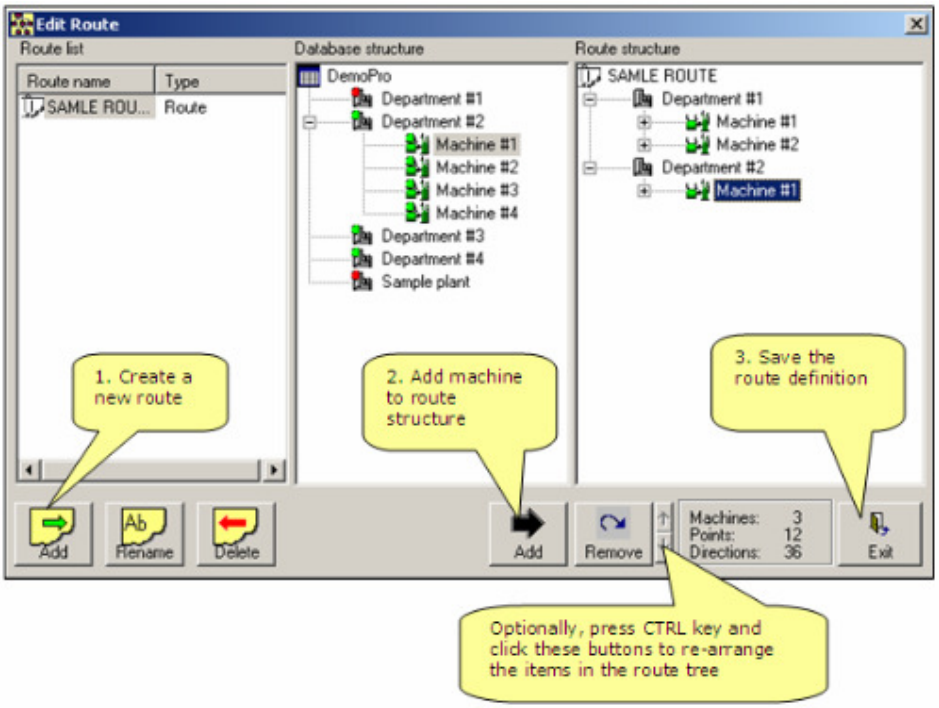
Finally, press **Terminate** button to conclude the transfer session.

6. Route transfer

The followings steps must be done to use the route transfer:
- Create a route;
- Download the route definition into **Easy Viber** Analyzer-Data collector;
- Perform the measurements;
- Download the route measurements.

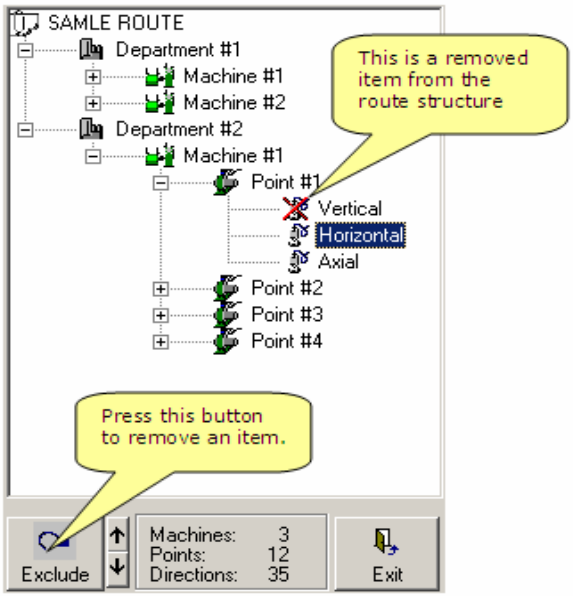
6.1. Create a new route

Select Database > Route Edit menu.



Press **Add** button to add a new route in the list.
Form the machine database tree select first machine and press **Add** button.

The selected machine will be added to the route structure.
Proceed as above with all machines.



From the route structure you can remove some points or directions. The removed items will be not deleted from the database, just will be not transferred in the Data Collector.

To remove an item, select it and press **Exclude** button.

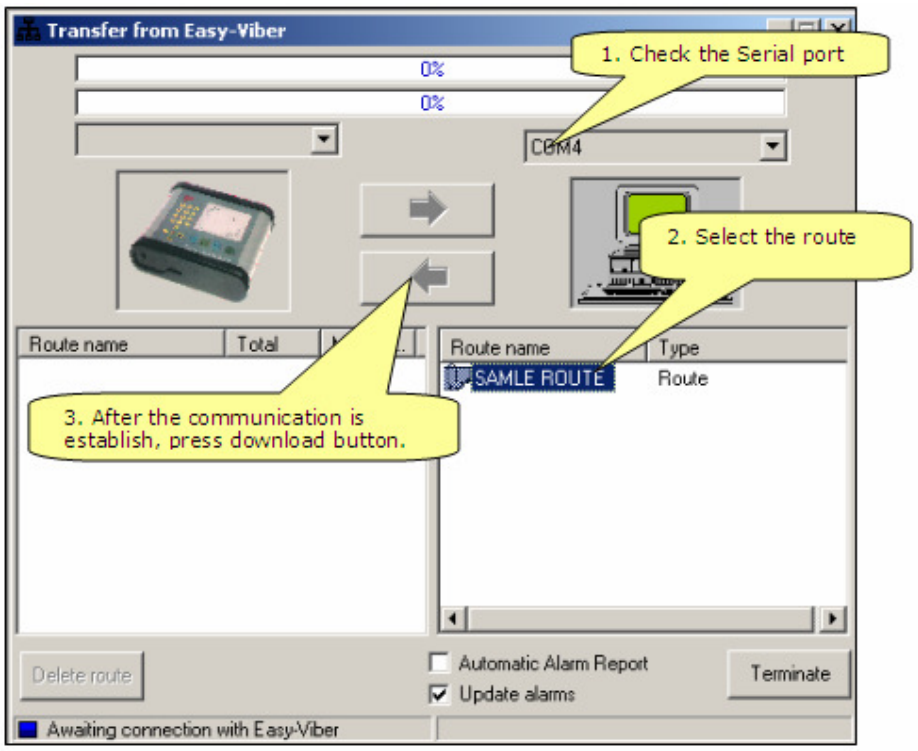
Finally, press **Exit** to save the route definition.

6.2. Download the route in the Data Collector.

Select Transfer > Route > EasyViber menu.

The Route Transfer window will appear.

First check the Serial communication port.



Establish the communication with the Data Collector.
Select the route definition and press download button. The route definition will be transferred in the Data Collector.

6.3. Download the measurements.

You can download measurements from a route directly in the machine database or in a transfer file.

6.3.1. Direct transfer.

Select Transfer > Route > EasyViber menu again.

Establish the communication with the Data Collector. From the Data Collector routes list select the route. Press up-load button (right arrow button).

6.3.2. Indirect transfer.

Use external program "Route transfer to file". Create a transfer file (with extension .tr4). Transfer the route in this file.

In the SpectraPro, select Transfer > Route > From file menu:
Browse for the transfer file. Press **Transfer** button to up-load the measurements into the database.

7. Importing data

External data can be imported in the machine notepad using **Import notes** command from the **Database** Menu.
With this command, you can complete your notes using helpful information from the maintenance team.
Import command is a easy way to add information's regarding repair process, spare parts used or any other information's, even picture or text file.
To do this, first you must prepare a text file, with any name, but with (**.** imp) extension.
The following reserved words can be included in this text file between square brackets:

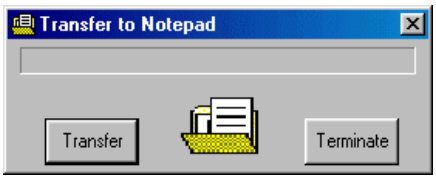
[PLANT] < plant name>	<plant name> must exist in the database
[MACHINE] < machine name>	<machine name> must exist in the database
[DATE] < date>	in computer format (e.g. dd/mm/yyyy)
[RTF] < file name>	full path and name of a rich text file
[FILE] < file name>	full path and name of a text file
[PICTURE] < file name>	full path and name of a picture file in Windows graphic format
[NOTE]	Next lines will be considered to be notes to be added. Finish with other reserved word or with [ENDNOTE]
[ENDNOTE]	
*	Is considered to be comments. Is not transferred.

For the DemoPro database, provided in installation kit an import file example is:

```
* Sample import file
[PLANT] Department #1
[MACHINE] Machine #1
[DATE] 23/08/1999
[NOTE]
Notes for Machine #1
[ENDNOTE]
* Next machine
[MACHINE] Machine #2
[NOTE]
Notes for Machine #2
[ENDNOTE]
* End of the import file
```

Generally, import files can be automatic generate by other computer software used in maintenance activity.

If ***SpectraPro*** not find a plant or a machine in your active database an error message will be generate.
If the software not finds a specific date, will add a new record to your database.

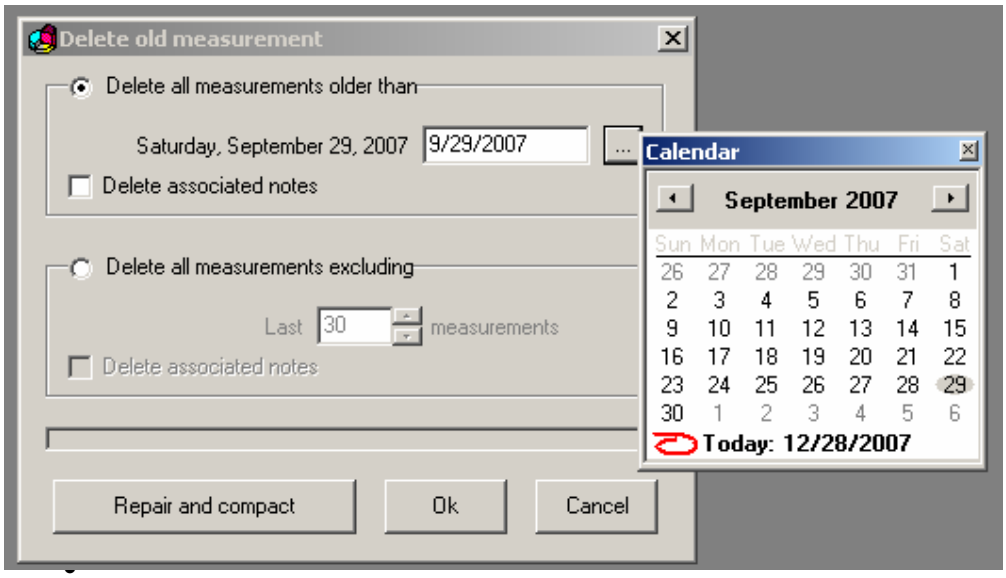


Then you execute this command, first press **Transfer** button. A specific window will appear and you will be asking to select the transfer file, somewhere in the accessible network. Select the file and press **Open**. The import procedure will begin. Finally, press **Terminate** button to finish the import procedure.

8. Database maintenance

From time to time run **Maintenance** command to optimize the dimensions of your databases.

You can select two way of deleting some old measurements:



- by date
- by number

The **baseline** spectrum will be not deleted.

Notepad records associated with measurements can be deleted only the checkbox "Delete associated notes" is checked.

Deleting process can take a long time, especially for long databases.

Repair and compact command can be used only with MS Access type databases.

9. Database filters

9.1. Why is using a Filter?

When is manipulate large ***SpectraPro*** machine database, you will find that is difficult to access a specific machine, point or direction. For this reason the user can use a "filter" condition applied to the machine database to reduce the items number. A filter is in fact a collection of some machines, points and directions, defined as a route. Many filters can be created for a machine database. This filter's is named also **Route.**

9.2. How to build a filter?

Any numbers of filters can be built using the **Edit Filter** command from **Database** menu.
Activate this command and the Filter Editor will be activated.
Press **Add** button to add a new filter.

An existing Filter can be renamed or deleted pressing the **Rename** or **Delete** buttons.
Once a new filter is created, you can add to the Filter some machines. To do this select any machine from the machine database tree area and then press Add button. In same Filter a machine can't be added twice.
In place to add a machine you can add directly all the machines from a department. To do these select a department and push the **Add** button:
All the machines belonging to the selected Department will be added.
To remove a machine from the Filter tree, select the machine and push Remove button:

You can remove entirely a Department, also. To do this, select a Department from the Filter tree and press same **Remove** button.

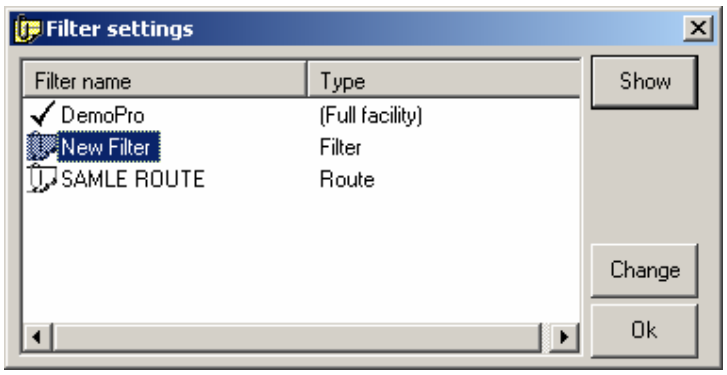
From an existing Filter you can exclude some Direction:

In a filter you can arrange the items using **Arrange** buttons. To do this, first press CTRL key from the computer keyboard and after that click on Up or Down **Arrange** buttons

9.3. Filter activation.

To activate a filter proceed as follow:

Select Settings > Set filter.



Select a Filter definition or a Route (A Route can be used anytime as a Filter).

You can press **Show** button to see the Filter contents.

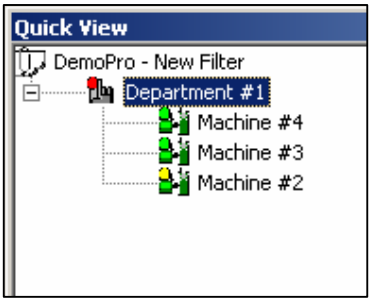
Press **Change** button to activate the filter.

You can do the same from the SpectraPro Status bar. Just click on Filter icon:

If a filter is active, the filter name will appear in the Status Bar also.

To cancel the filtering, just select whole database as filter. In above example the database name is **DemoPro**.

NOTE: Then the database is filtered some machine, not included in the Filter, will not appear in the machine tree.



In the below example, the **DemoPro** database tree will appear as follow:

Only Department #1 is visible, because the Filter includes only this Plant.

After the database name also the Filter name is shown.

10. Viewing plots

SpectraPro can display the followings plots:

- Trends (for total value, BC, Envelope, Temperature, Speed, Manual Entry values and also Coast Up and Coast Down graph)
- Spectra (for vibration measurement and Envelope)
- Time signal plots

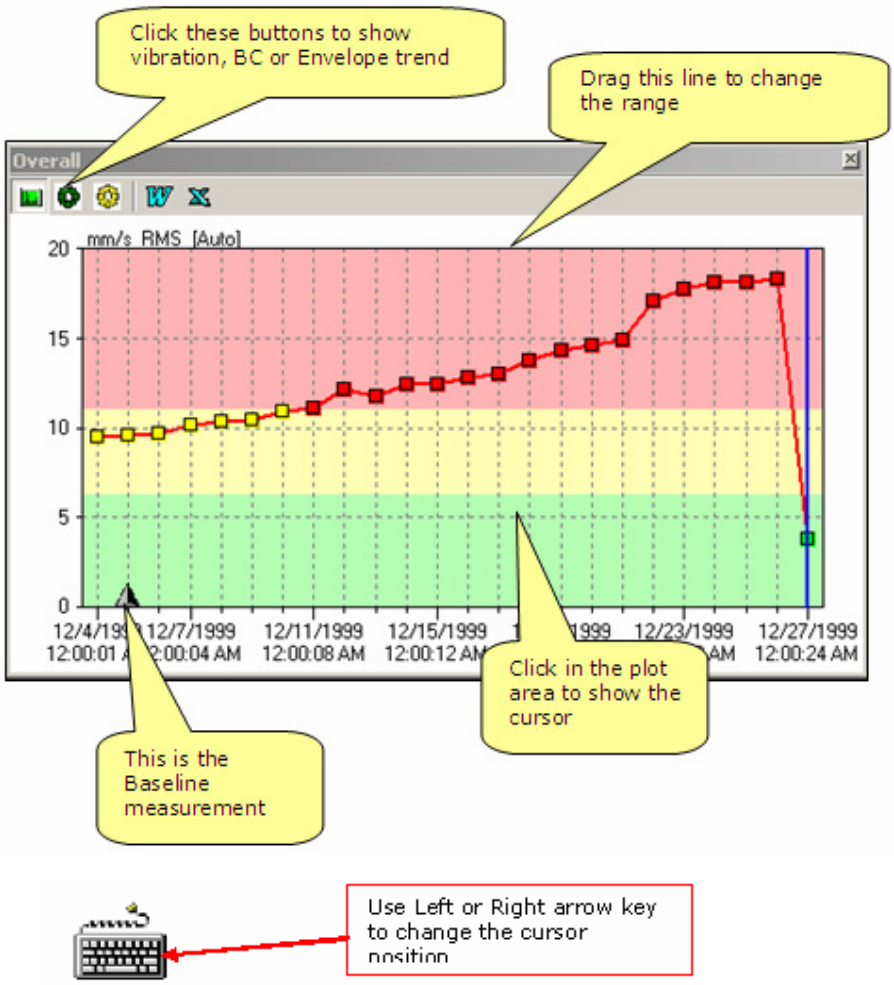
10.1. Trend plots

Trend plots can be show for any View or from **Edit** windows.

Then a Trend Plot is shown you can take a large number of actions to customize the graph.
Majority of these actions can be done using the **pop-up menu**, activate with right-mouse button. Other actions can be taken using the mouse or/and keyboard.
Also you can use the dedicated buttons from the Toolbar.

10.1.1. Actions with mouse and/or keyboard

In the following picture you can see all the action you can take using the mouse or the keyboard.

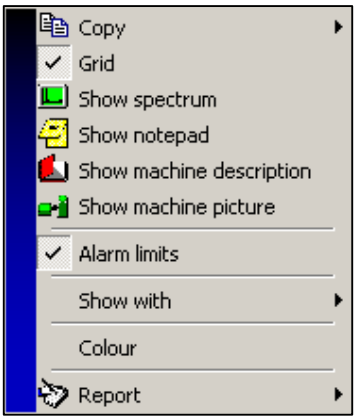


Unit and average – The trend unit for the Total value of vibration are, all the time, in according with the setting of the Alarm levels (in Edit Database window). The unit and average can't be changed.
Gain – Then the trend is show for the first time, the gain is set in respect of the biggest Total value from the trend (AUTO mode).
The gain can be change clicking and after this dragging the upper horizontal line of the grid
If you drag in down direction, the gain will decrease if you drag in upper direction the gain will increase.
A double-click in y-axis label area will restore the auto-gain.
The gain for BC can't be adjusted.

Cursor – Then a trend are shown, the cursor is placed on last (most recent) measured point.
You can place the cursor also in the other position using the mouse (click in the new position) or using left and right arrow from the keyboard. If the **synchronize cursors** command is check, depending on link level (**Synchronize to** menu) the cursors in other trend will move.

10.1.2. Actions from the popup menu

The Trend Menu can be activated in each Trend Plot with a right mouse click.
The Menu has the following actions:



Copy – This action copy the plot in clipboard or in a text editor. You can use also CTRL+C. You can paste the clipboard contents in the notepad with CTRL+V.

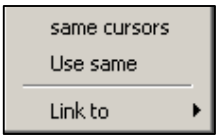
Grid – The grid of the trend can be shown on hide using this action

Show spectrum – Selecting this action the spectrum associated with the trend cursor will be shown.

Show Notepad – Selecting this action the Notepad associated with the trend will be shown. Notepad can also be activated with the specific button from the **toolbar**.

Show machine picture – If you select this action the machine picture will be shown in a separate window.

Alarm limits – You can make visible, with this action, the alarm limits for the selected trend.



Synchronize cursor – this action activates or deactivates the linking between the cursors for other trend plots. If a large number of trend plots are displayed is better to **not** synchronize the cursors.

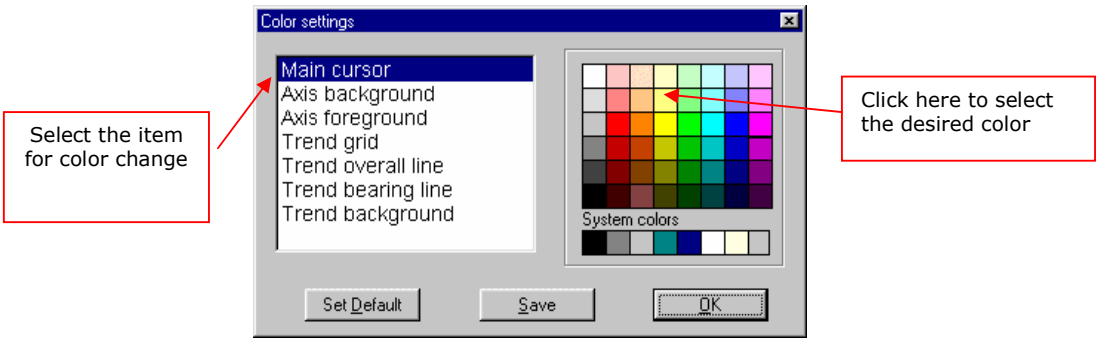
Use same scale for all – This command is an action, and adjusts the gain for all trends according with the gain of active trend, depending of the **link level**.

Link to – You can synchronize trends cursors and make same gain for all the trend plots, depending on link level: global (for all active trends), machine or point level.

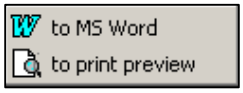
Colors – You can customize the color for:

- Main cursor
- Axis background
- Axis foreground
- Trend grid

- Trend overall alarm line
- Trend bearing alarm line
- Trend background



You can save these new colors using **Save** command. You can restore the default colors using the **Set Default** command.



Report – Using this command a trend report will be generated. After previewing, you can print the report to the system printer. The Report can be made directly in a text editor also.

10.1.2. Actions from the toolbar

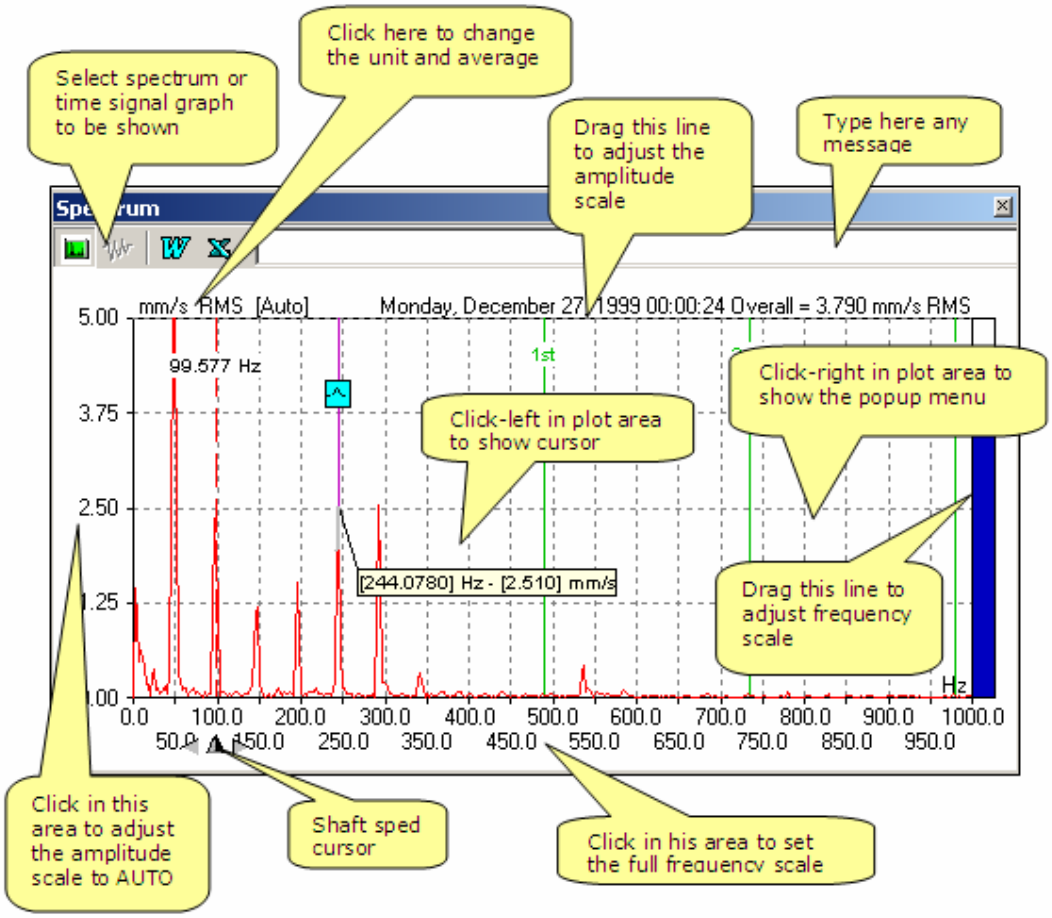
Notepad button – When this button is pressed the Notepad will be activate in accordance with the active Trend plot.

10.2. Spectrum plots

Then a spectrum plot is shown you can take a large number of actions to customize the graph.
Majority of these actions can be done using the **pop-up menu**, activate with right-mouse button. Other actions can be taken using the mouse or/and keyboard.
Also you can use the dedicated buttons from the Toolbar.

10.2.1. Actions with mouse and/or keyboard

In the following picture you can see all the action you can take using the mouse or the keyboard.



Gain – Then the spectrum is for first time shown the gain is set in respect with the overall value of the vibration (**AUTO** mode). The gain can be change clicking and dragging the upper horizontal line of the grid. If you drag in down direction the gain will decrease and if you drag in upper direction the gain will increase.
A double – click in X-axis labels area will restore the **Auto** gain.

Frequency range – If you click and drag the *y –axis* of the plot, you can adjust the minimum frequency range. If you drag in right direction, the minimum frequency range will increase.
Similar, you can increase the maximum frequency range, clicking and dragging the last vertical line of the grid. Difference between maximum and minimum frequency must be at minimum 50 Hz (3000RPM).
A double click in *Y-axis* labels zone will restore the whole frequency range.

Zoom – You can enlarge the plot with a *double – click*, anywhere in the plot area. To restore the spectrum plot to initial size *double-click* again.

Main cursor – Main cursor can be activated with a click in plot area. The main cursor has a label associated. You can use also the *Left* or *Right* arrow keys for a slow moving of the cursor or *CTRL + Left* (*CTRL + Right*) arrow keys for a fast

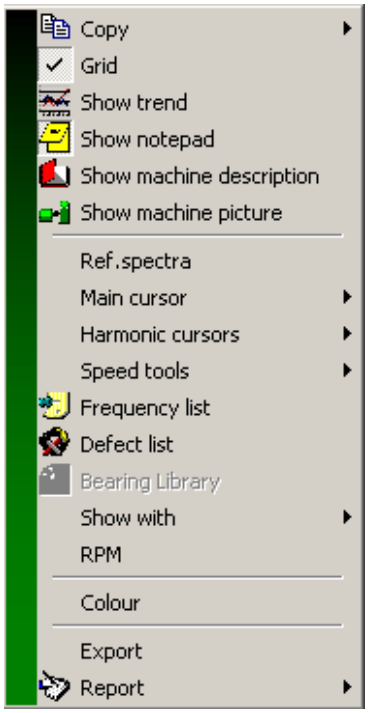
moving of cursor. Press keys 0 to 9 to move the cursor to the shaft frequency or to its harmonics. Move the cursor label up or down using the UP/DOWN arrow keys.

Shaft Speed cursor – The shaft speed cursor is shown like a small triangle near *x-axis*. With the mouse, you can adjust the position of this cursor.

If you select from the **pop-up menu** the command: *Bearing tools – Find best shaft speed*, the cursor will be move under the biggest peak located near the value give to the shaft speed cursor in **Edit** command.

10.2.2. Actions from popup menu

The Spectrum Menu can be activated in each Spectrum Plot with a right mouse click.
The Menu has the following actions:



Copy – This action copy the plot in Clipboard. You can use also *CTRL+C*. You can paste the clipboard contents in the Notepad with *CTRL+V*. Also you can copy the plot in a MS Word document file. First copy action in MS Word will open a new document. Consecutive copy action will insert the plots (any) in the same document file.

Grid – The grid of the spectrum can be shown or hide using this action.

Show trend – selecting this action the trend associated with the spectrum will be shown.

Show Notepad – Selecting this action, the Notepad associated with the spectrum will be shown. Notepad can be activated also with the specific button from the **toolbar**.

Show machine description – The machine description editor will be opened.

Show machine picture – The machine picture will be shown.

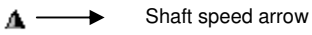
Reference spectra – The reference spectra (Baseline spectra), if exist, will be draw in the same plot with black lines. The Reference spectra have its own cursor, synchronized with the Spectrum cursor. Using the mouse, pointed in the origin of Reference spectrum axis, you can move the reference spectrum where you want in the plot area. If you want, you can place the reference spectrum over the actual spectrum.

Main cursor – Determine how the cursor will move in the plot:

- Peak locked – When a peak is detected, the cursor will be place on maximum calculate peak. *A small blue icon will indicate peak detection*. If a peak is not detected, the cursor will move with spectrum resolution steps.

- Frequency line – The cursor will follow the spectrum lines.
- Free – The cursor is moved with one pixel step. The peak amplitude will be calculated with linear interpolation between spectrum lines.

Speed tools – Determine how the software will place the speed arrow:

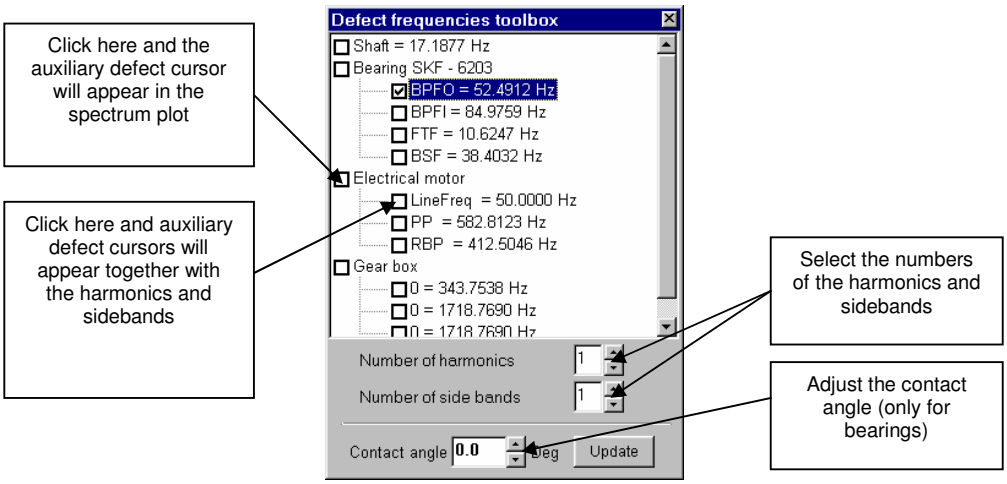


- Calculated – The speed arrow will be place in the position *calculated* from the actual spectrum (around the *defined* values). The software tries to detect a peak (a higher line between other two smaller) around the *defined* shaft speed. If a peak is found, the exact frequency and peak amplitude are calculated. If a peak isn't found, the speed arrow is place on the *defined* frequency
- Defined – The speed arrow will be place as is defined in *Database edit* menu.
- Measured – The speed arrow will be place in the position where was *measured*. If the shaft speed wasn't measured in time of spectrum acquisition, the cursor will be placed in the *defined* position.
- Saved shaft speed – The speed arrow will be place in the position saved before, using the *Save speed current* command. The speed value is saved only for the selected spectrum or for all spectra belonging to the machine (see Adjusting speed paragraph).

Harmonic cursors – As default, up to 10 harmonic cursors can be shown, together with the main cursor, but you can change this number in the Settings > Optional settings menu.

Side band cursors – As default, up to 10 side band cursors can be shown, together with the main cursor, but you can change this number in the Settings > Optional settings menu.

Fault frequency cursors – This is a powerful tool for fault identification. In a toolbox window, all the defined fault frequencies appear.



Any selection will update in real time the spectrum plot. Last selection is also saved for later use.

Fault list – The *Fault list* table will be shown. You can do this action also from the *Main* menu toolbar.
Depending of the gap setting, the labels attached with the fault frequencies will be shown also, accordingly.

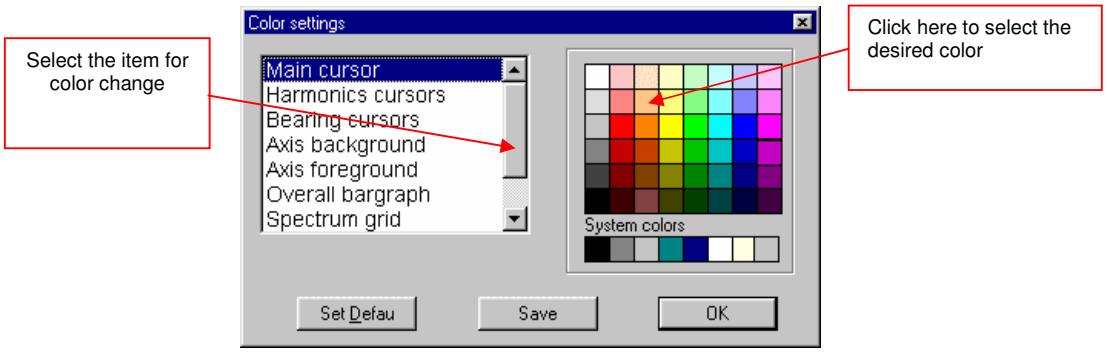
Show with- Same cursors – If on the screen is shown more that one spectrum, if you select this action the cursors from all spectra plots will be synchronizing, depending on link level (**Link to** action).

Show with- Use same – This action set the synchronism level for range, if more than one Spectrum is shown. You can select between *Frequency* range, *Amplitude* range or for *both*.

Show with- Link to – This action set the synchronism level if more than one Spectrum is shown. The synchronism level can be one of Global (for all the spectra plots), on machine level, on point level or on direction level.

CPM / Hz – You can change anytime the *Y-axis* unit, selecting **CPM** or **Hz**.

Colors – You can customize the colors in the spectrum plot. You can change the colors for:
- Main cursor
- Harmonics cursors
- Bearing cursors
- Axis background
- Axis foreground
- Overall barograph
- Spectrum grid
- Spectrum line
- Spectrum background



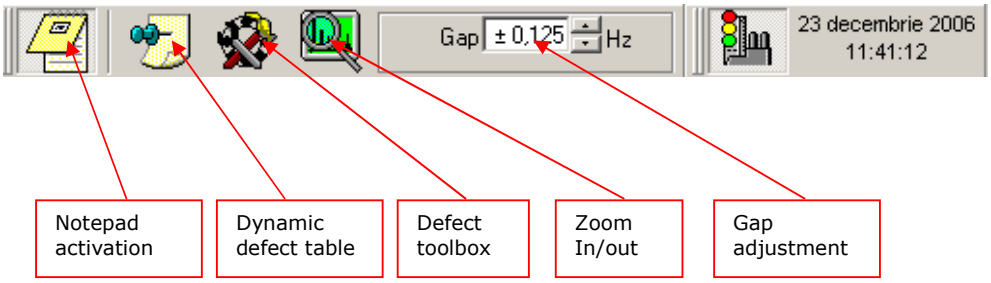
You can save these new colors like default color, or to restore the original colors, using **Set default** command.

Export – You can export whole spectrum in any transfer file (having extension .tr3)

Report – Using this command a spectrum Report will be generated. After previewing, you can print the report to the system printer. For more details see **Report preview**.
The Report can be transferred also in a MS Word Document. If no document is open, a new document will be opened. Consecutive reports will be inserted in the same document file.

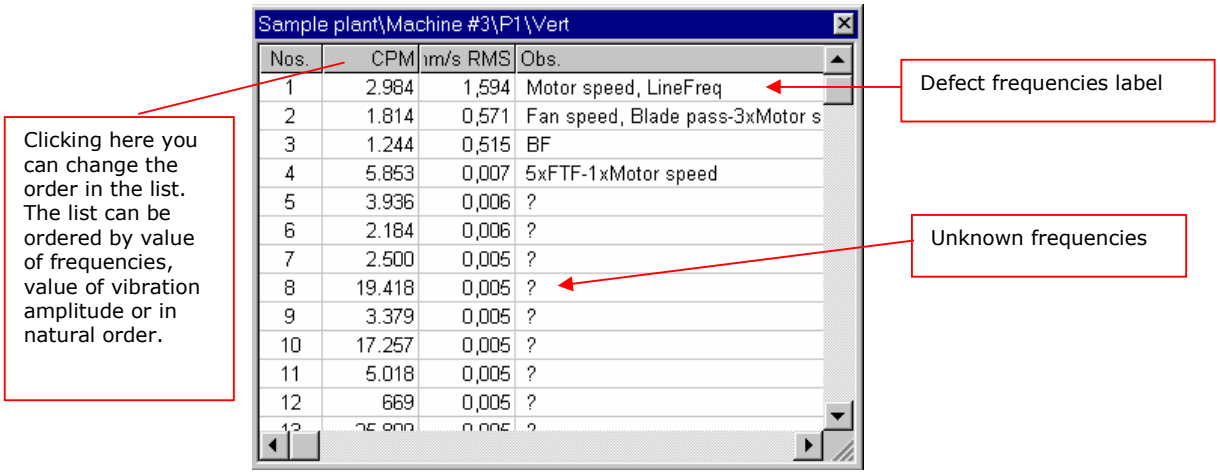
10.2.3. Actions from the toolbar

In the Main Menu some Toolbar buttons is dedicated for Spectra Plots:



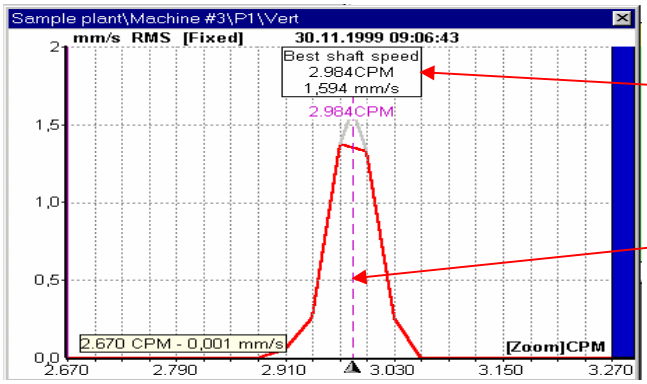
Notepad button – When this button is pressed the Notepad will be activate in accordance with the active Spectrum plot.
Dynamic table – A table with first 30 fault frequencies can be shown:

Fault toolbox –Activating this action the Fault frequencies toolbox window will be shown.
Gap – Depending on the gap, in the dynamic table less or more frequencies can be labeled.



If the gap is too small and the fault frequencies is not equal with fault definition, plus or minus the gap value, in place of label a question mark will be displayed. If the gap is too large, for the same frequency more than one label will be shown.

Zoom – This action can be used for a fine tuning of the shaft speed:

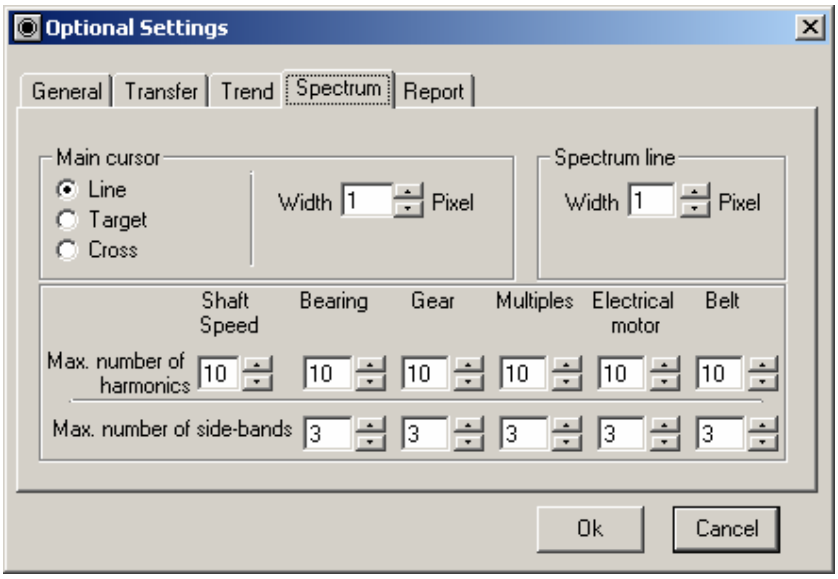


The real peak frequency calculates from the existing spectral line. The real peak is also reconstructed.

This cursor and associate label indicates the real frequency of the spectrum peak.

10.2.4. Other settings in the spectrum plot

The main cursor shape can be selected using the **Optional Settings** command from the main **Settings** menu.



Main cursor can be:

- Line (default)
- Target type
- Cross type

Just click on option you want and the cursor shape selected will be shown in spectrum plot all the time from now.
Also you can adjust the cursor thickness (default is 1 pixel)

The thickness of the spectrum line can be adjusted with a proper setting of the **Width**.

Maximum numbers of harmonics cursors and side-band cursor can be adjusted in the same tab.

Once set, any of above will be save in the *SpectraPro.ini* file.

10.2.5. Adjusting speed

Begin with *SpectraPro SP8*, new enhancement has added to the **Speed tools** menu.

A major task in spectrum analysis is to determine, with higher accuracy, the correct speed for each spectrum. Almost all fault frequencies are associated with the shaft speed. A small error in shaft speed determination can produce larger errors in fault frequencies calculation and as a consequence, a poor diagnosis process.

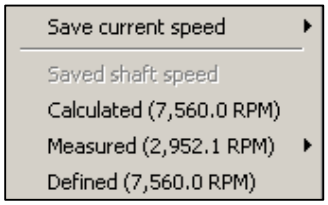
A solution can be to measure the spectrum from the route using speed reference (active tachometer input). This action is difficult to be done in most cases, because a speed sensor must be fitted to the each machine shafts.

Method **Using the Measured speed**, described bellow, allow a correct shaft speed calculation even if only a single measurement belonging to the machine has a speed reference. The algorithm works also if the machine has different shafts speed.

Method **Using the Saved speed,** allow a correct shaft speed calculation without to collect any spectrum with speed reference sensor. For a single spectrum belonging to a machine, the speed must be manually set. After that, using a back-calculation, all the spectra will appear with correct speed cursor.

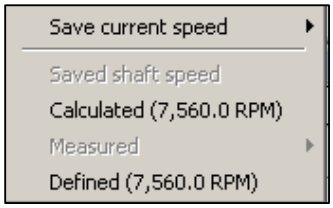
10.2.5.1. Using the Measured Speed

For a new un-loaded spectrum having the speed measured in time of the data acquisition, the **Speed tools** Menu appears as below:



In this example, the **Measured** shaft speed is 2952.1 RPM.
The **Saved shaft speed** item is disabled, because no any speed was saved before.
Because **Defined** speed is set to 7560 RPM, the **Calculated** speed, in our example, is the same.
Calculated speed is calculate around the **Defined** shaft speed (± 20%).

For a new un-loaded spectrum, without speed measurement in time of the data acquisition, the **SpeedTool** Menu appears as below:

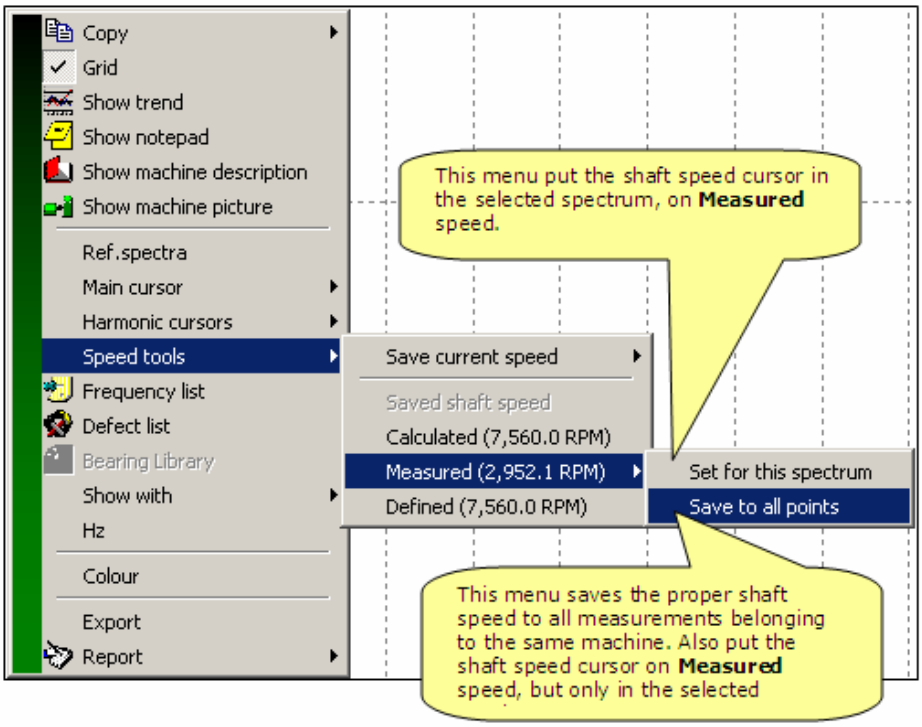


Measured item is disabled, because the speed was not measured in time of data acquisition.

Others items are the same.

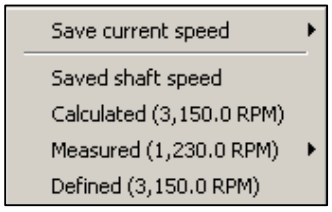
To set the proper shaft speed for all machines directions, proceed as follow:

- Identify the spectrum having **Measured** item enabled.
- Click on Measured item to extend the menu lines:



- Select menu **Set to all points**. The proper shaft speed will be back-calculated, using the speed settings in the database, for all the measurements belonging to the same machine and having the same transfer time (in fact this means that all the transferred measurements from the route belonging to the same machine will be settled with **Measured** speed).

The result can be seen immediately; just select another spectrum of the same machine and the **Speed Tool** menu will look like bellow:



In our example, the measured speed for this shaft is back-calculated to be 1230 RPM.

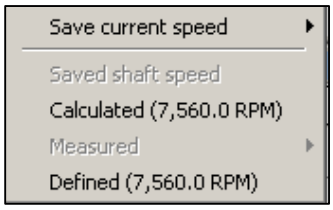
The calculations use the measured speed of the previous point as reference.

In the **QuickView**, you can do the settings in seconds.

Now all the spectrum of the same machine, without to be collected with speed reference, have the speed cursor in the correct position.
Of course, is assumed that in time of data acquisition, the machine speed remain the same.

10.2.5.2. Using the Saved Speed

For a new un-loaded spectrum, without speed measurement in time of the data acquisition, the **SpeedTool** Menu appears as below:

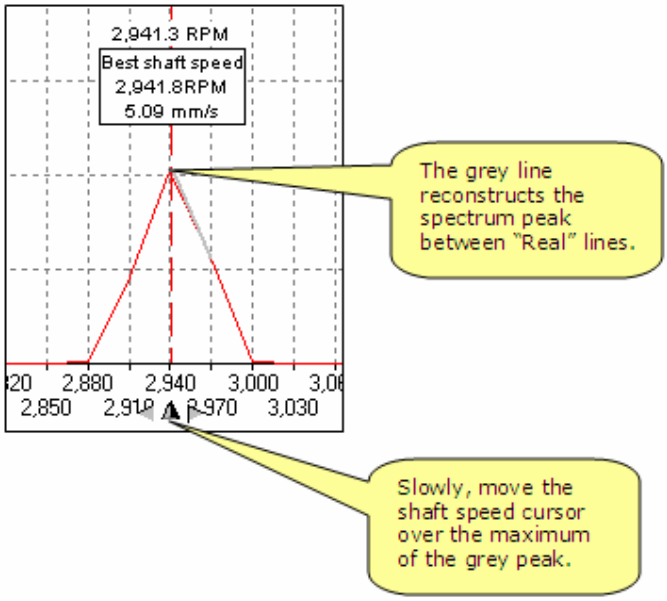


Measured item is disabled, because the speed was not measured in time of data acquisition.

Saved shaft speed item is also disabled, because no any shaft speed was saved.

To set the proper shaft speed for all machines directions, proceed as follow:

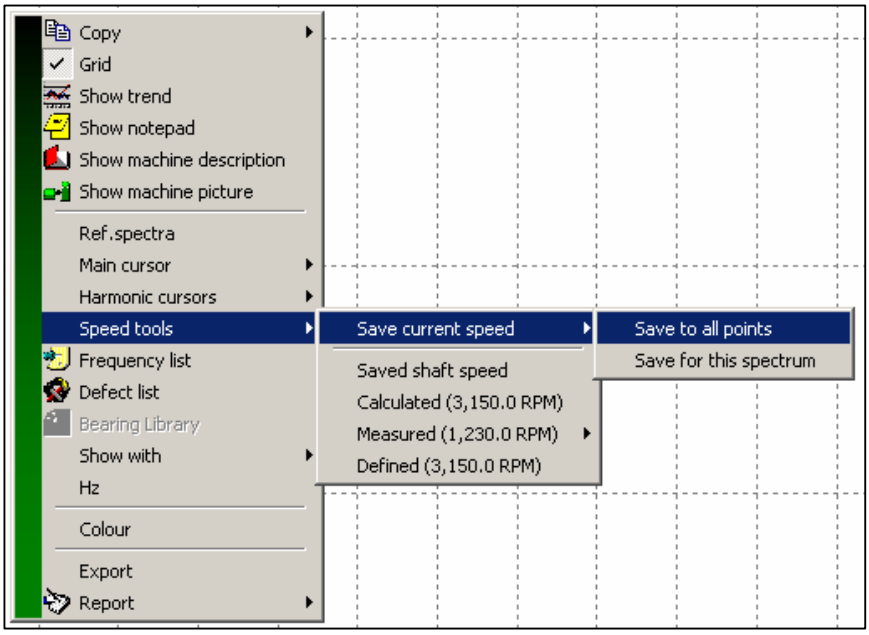
- Select any spectrum of the same machine.
- Manually move the shaft speed cursor near the frequency where you consider that the speed is correct.
- From the **Main Menu** toolbar, press  button.
- In the enlarged spectrum graph, locate the *Best shaft position*. This is the maximum of the peak, as bellow:



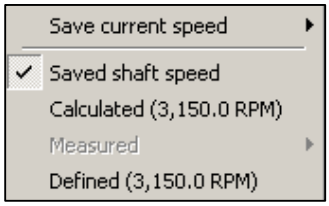
- Now press again  button to display whole spectrum.
- From the **Speed tools** item, select **Save current speed** and **Save to all points** item. The proper shaft speed will be back-calculated, using the speed settings in the database, for all the measurements belonging to the same machine and having the same transfer time

(in fact this means that all the transferred measurements from the route

- Belonging to the same machine will be settled with **Saved shaft speed).**
-



The result can be seen immediately; just select another spectrum of the same machine and the **Speed Tool** menu will look like bellow:



The **Saved shaft speed** is checked, even if was not saved for this measurement.

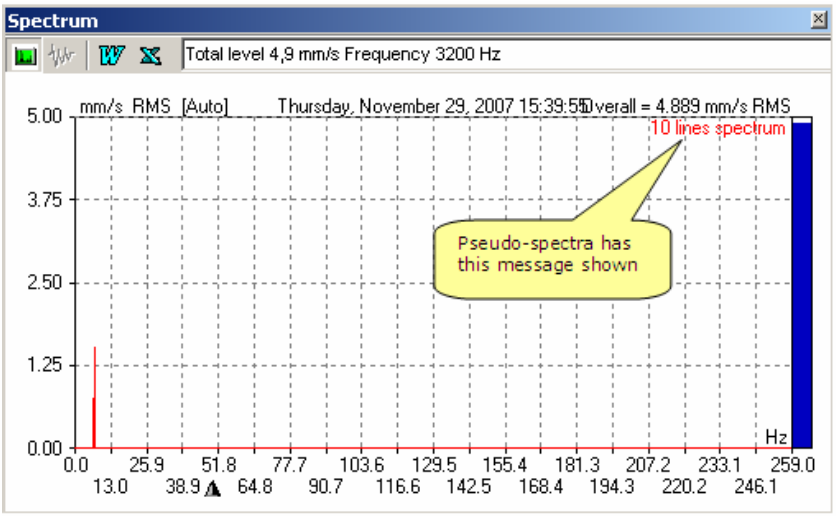
The calculations use the measured speed of the previous point as reference and the speed cursor in the spectrum is placed according with the calculation.

In the **QuickView**, you can do the settings in seconds.
Now all the spectrum of the same machine has the speed cursor in the position decided by you.
Of course, is assumed that in time of data acquisition, the machine speed remain the same.

10.2.6. Pseudo-spectra.

If the measurements are down-loaded from a XVIBER Instrument and the Instrument isn't set to collect spectra, the measurements don't contain spectrum line. Instead, only the first highest spectrum peaks are transferred.

Still SpectraPro will show the spectrum plot, but only with 10 lines. This is a pseudo-spectrum:



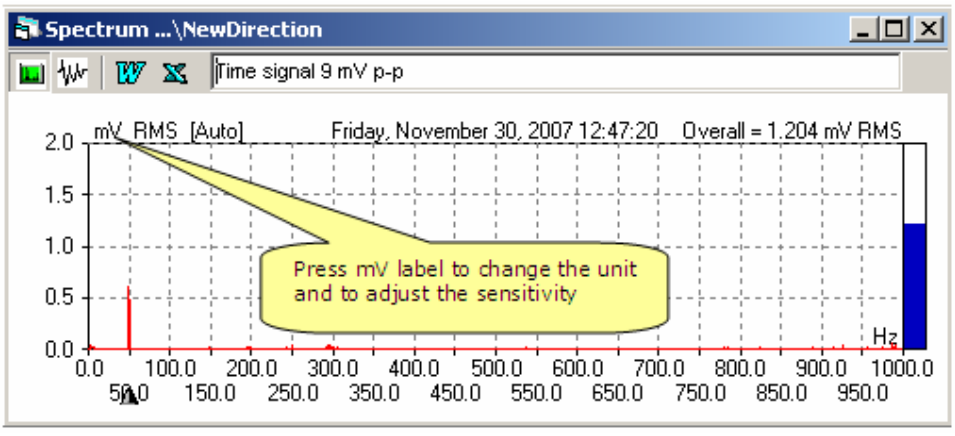
In such cases, the fault frequencies are calculated with a high error margin. Also all other spectrum lines has zero amplitude values.

10.2.7. Spectrum in mV unit.

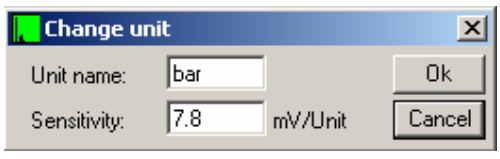
With the EasyBalancer or with EasyViber Instruments, mV spectra can be measure but only off-route. These spectra have special meaning: the engineering unit can be any, not only vibration unit.

The mV spectra can be shown only in the **Edit** windows and in **List View**.

Bellow is shown an mV spectrum:



When the mV label is selected the following window will be shown:

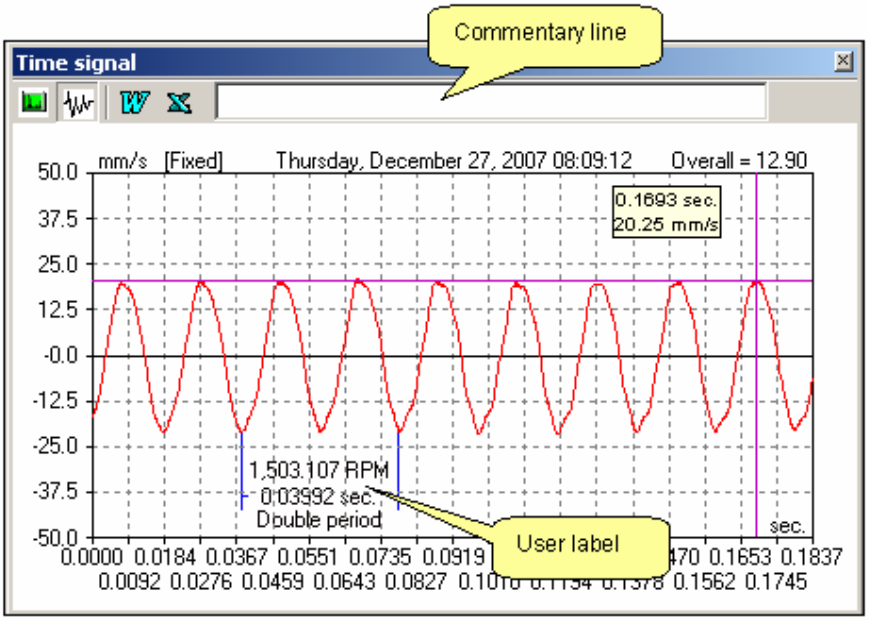


Now you can edit the unit and set the correct transducer sensitivity (in mV/unit).
The settings will be save in the database.

10.3. Time signal plots

Time-signal can be collected in either route mode or off-route measurements, only with Easy-Viber Analyzer.

The time-signal graph can be very usefully as a complementary plot in machine diagnosis process.



To add a user label in the plot area, proceed as follow:

- Move the mouse pointer in the position where the labeling will begin.
- Double-click (left button) and keep press the mouse left button. The labeling will begin, showing a blue colored label on screen.
- Move the mouse pointer in the end position and just click once.
- The label will show the distance between the start and end position (in seconds and in frequency units).

A short comment can be added to the label. Click right in the label area. A small window will be shown:

Enter your comment and press **ENTER** key. The comments will be added to the label.

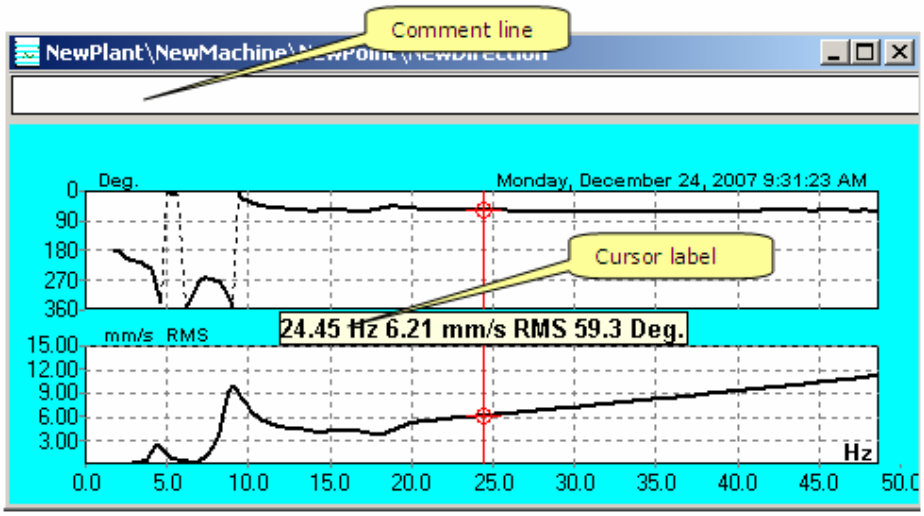
A label can be deleted. Proceed as above, but select **Delete** from the window.

More than one label can be added to the time-signal plot.
The labels are stored in the machine database for future use.

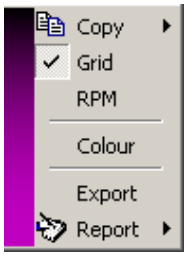
10.3. Coast-down/ coast-up plots

Coast-down and coast-up graph can be collected off-route only.

These graphs can be viewed only in the **Edit** window or in **Show selected information** view.



Each plot has a popup menu:



User can change the frequency unit (RPM or Hz).
The plot colors can be change using **Color** menu item.
From popup menu, the user can copy the graph in Clipboard or in MS Word and also to create a report.

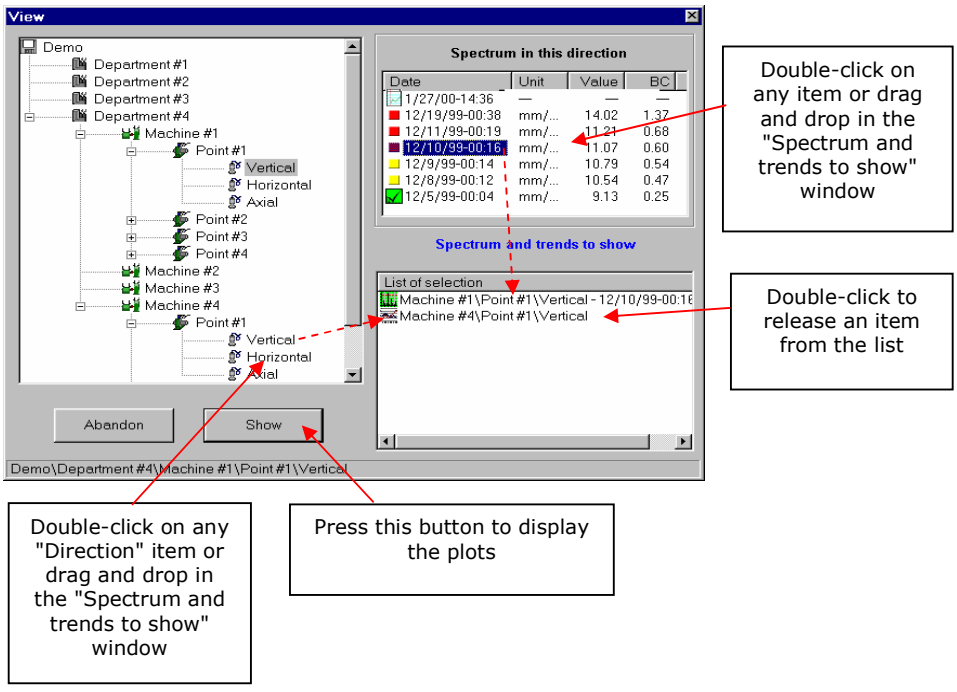
The graph can be exported in any tr3 transfer file.

11. Viewing data

In order to analyze the collected data you have on your choice many ways of viewing data:

- A collection of trends and spectrum selected by you (View > Show selected information).
- A **Quick View** session, in which you explore the machines, the trends and spectrum associated with the selected direction (View > Quick View). If Bands are defined, also Band Trends are available.
- **Trends and spectra from whole machine** in which you can see at once, all this trends and spectrum associated with the selected machine (View > Show spectra from whole machine).
- A **List View** in which you can see at once, all Total values (vibration, Bearing Condition and Envelope) for the whole machine (View > List View). Also the Alarm status is indicating.
- A **Band View** in which you can see, at point level, all vibration total values and Band values (peak average for the band width). Alarm status for above is also indicated (View > Band View).

11.1. Show selected information



Then you select this command, a specific window will appear in the screen, which will allow you to choose the department, the machine, the point and the wished direction. Choose are done selecting a certain direction, with the mouse, in the above-mentioned order. When the direction is selected, in the upper right side it

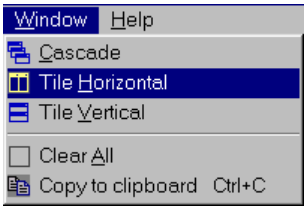
appears a list with all collected spectrums for that direction. Colored small icons indicate also an alarm condition for the measurements.

A check mark icon indicates the base line spectrum, if any. Coasts down measurements are marked with a blue icon. Now you can select a collection of trends and spectra to be shown. Just double – click to any trend or direction and the item will be move to the show list.

In place of double – clicking you can drag and drop any Direction or Spectrum to the show list.
If you want to not display some items from the show list, just double – click on that items and item will be remove from the list.

Finally, press **Show** button, and the entire list will be shown.
After you displayed some trends and spectrum – set, the main window remain active and you can select other trends or spectrum. Although it can display a large number of information's on a single screen, it is recommended to limit the number of simultaneously opened plots, because the plots will have smaller and smaller sizes and many details will be lost.

When one or more plots are displayed, you can use **Window** Menu to arrange the plots in the screen.
You can clear the screen using **Clear All** command or you can copy in the Clipboard any plot using **Copy to clipboard** command.



For details regarding an efficient way of using the spectrum and trends plot, see also: **Spectrum plot** and **Trend plot**

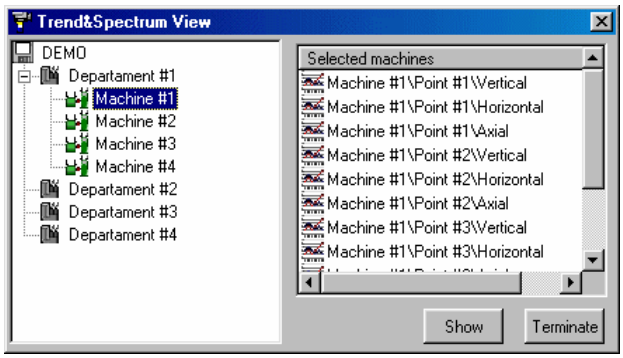
Advantage of using Selection view:
- Any trend, spectrum or coast down measurement can be displayed in a single screen.
- Number of plots displayed is limited only to the screen size.

Disadvantage of using Selection view:
- Long time for selection of plots.

11.2. Trend and spectra from whole machine

With this command you can see in a single "scrolling" screen all the trends and spectrum associated with a machine. Last measurements will be shown in the spectrum plots.

First, select from the hierarchy tree the desired machine. In the right part of the selection window, a list with all directions of the selected machine will appear.



Before showing, you can rearrange the list, dragging the items.
Now you can remove some items for the list (with a double-click) or show the list pressing **Show** button.
The plots will be shown in trends-spectrum pair
If you don't need all the plots, close some of them and use the **Pre-arrange Trend/Spectrum** command from **Windows** menu to rearrange the plots on the screen.
If you move the cursor in a trend plot, the contains of the associated spectrum plot also will be change, to reflect the actual position of the cursor.
You can synchronize the cursor in the spectrum or trend plots.
For more details see also: **Trend plot** and **Spectrum plot**
Finally, use **Clear All** command from **Windows** Menu to close all plots.

Advantage of using Machine plot view:

- All trends and spectra associated with a machine can be displayed in a single screen.

Disadvantage of using Machine plot view:

- Only plots belonging to a single machine can be shown.

11.3. Quick View

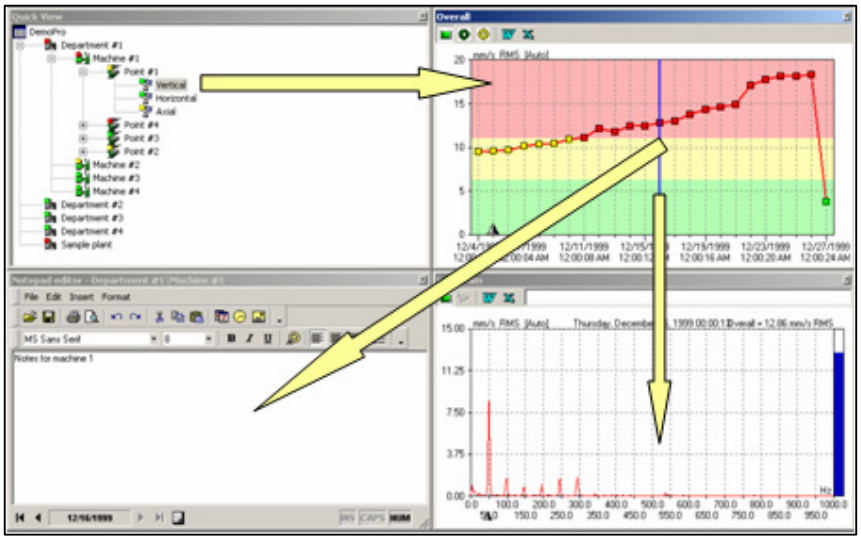
This command shows trends and spectrum in a special way. Then you select this command a four-window screen will appear:

- Database tree
- Trend plot
- Spectrum plot
- Notepad editor

All four windows are synchronizing. If you move the cursor in the database tree, all other windows will be refreshed.

If you change the position of the cursor in the trend plot, the spectrum plot and notepad contains will be change.

In this way, you can see very quickly all the information's you need for the whole database.



You can change the position of the windows in the screen, but you can't close plots windows. If you close tree window, all the windows will be also close. The last positions of the windows will be save.
Use **Arrange Quick View** command from the **Windows** menu to rearrange the window in a convenient way.

The Notepad Window can be closed any time.

Advantage of using Quick View:

- Any trend or spectrum from any part of the database can be shown.
- Quick access to any plot from the whole machine database

Disadvantage of using Quick View:

- Only a single pair trend-spectrum can be shown in same time.

11.4. Band View

A band is a defined portion of a FFT spectrum. The bandwidth can be calculated with the following formula:

$$\text{Band Width} = (\text{Central Freq} + \text{Gap}) - (\text{Central Freq} - \text{Gap}) = 2 \times \text{Gap}$$

The amplitude value of the band is calculated with the formula:

$$\text{Amplitude} = \text{Sqr}\left(\sum L_i^2\right) \quad \text{where:}$$

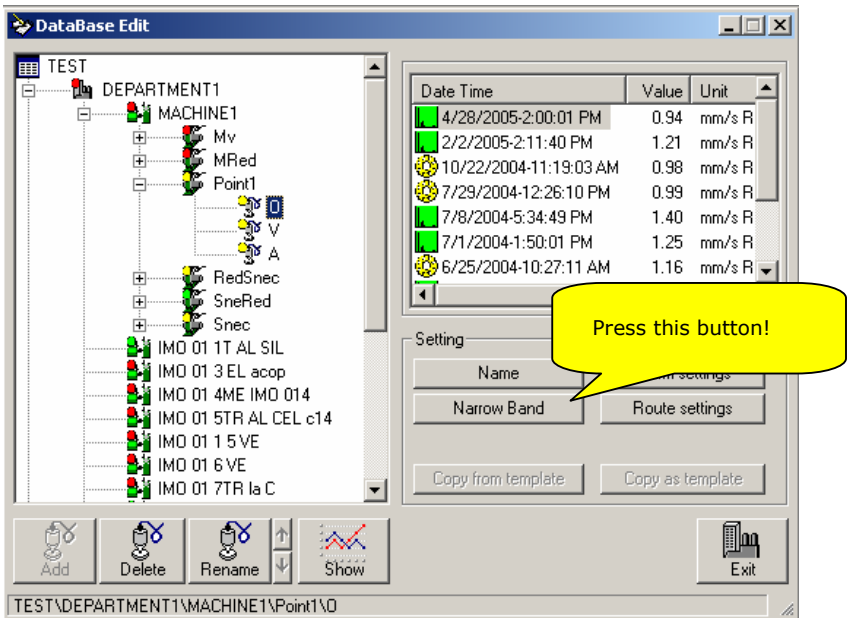
L_i =Spectrum line inside of Bandwidth

Each band has a specific frequency, generally a fault frequency or a multiple of it. In the *SpectraPro*, for each **Direction**, up to 32 bands can be defined.

11.4.1. Defining Band

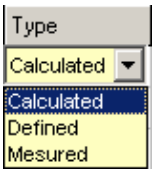
The bands can be defined in the *Database Edit* Menu, on each **Direction** level.

The Bands definition can be made after all the fault frequencies and alarms are defined for the selected **Machine**.
To start an editing session, just press the **Narrow Band** button:



The *Narrow Band Setting* window will appear:
The editing window contains a spreadsheet (or a table) in which you can edit up to 32 Bands.
The table has the following columns:

Type – In this column can be selected one of the following items from a combo box:



- **Defined** – The Band central frequency will not be calculated from the spectrum, just the defined frequency will be used to calculate the Band amplitude.

- **Calculated** – The Band central frequency will be re-calculate according with the real shaft speed from the Spectrum. The actual frequency is calculated around the Defined frequency with a gap of ± 2 X Spectrum Lines. If in this range a spectrum peak isn't detected, the Defined frequency band will be used instead. If the Defined frequency is zero (normal setting for variable speed machine), the best shaft speed is considered to be the highest peak in spectrum.

- **Measured** – The Band central line is calculated in relation with measured speed, in time of data acquisition. If the speed wasn't measured, the frequency of the band will be zero! Never define Band with Measured type, if you are not sure that the speed will be measured together with the spectrum.

Band name. – This item must be added by the user to identify later the band.

Frequency – This is the central frequency of the band. In time of editing must be selected from a list. 29 possible fault frequencies are available in the SpectraPro. These frequencies must be defined before. Only the defined frequency will appear in the list. In the following table are described the fault frequencies defined in the *SpectraPro*;

Frequency	Description
Primary reference speed	Defined at **Machine** level, normal the drive rotational speed (always exist)
Secondary reference speed	Defined at **Machine** level, normal the driven rotational speed
Line frequency	Defined at **Machine** level, this is the line frequency, 50 or 60Hz.
Pole pass	Defined at **Machine** level, this is Pole pass for asynchronous electrical motors.
Rotor bar pass	Defined at **Machine** level, this is the Rotor bar pass for asynchronous electrical machine
Belt	Defined at **Machine** level, this is Belt fault frequency
Multiply frequency	Defined at **Machine** level, these are any multiply frequency of above. In the SpectraPro, up to 5 Multiply can be defined
Shaft Speed	Defined at **Point** level, this is the shaft speed defined as a multiply of the primary or secondary reference speed (always exist).
BPFO, BPFI, BSF, FTF	Defined at **Point** level, these are the bearing frequency faults. In SpectraPro, for each **Point**, up to 4 bearings can be defined
Gear box fault	Defined at **Point** level, this is the gear mesh fault frequency.

A special, **1 Hz** fixed frequency can be also added as Band frequency definition.

Value (Hz) – This column can't be edited. In the column is indicated as reference only, the actual frequency of the fault as is defined before. In time of showing data, this frequency is re-calculated according with the **Type** setting.

Multiply –This is a multiplier of the fault frequency selected in the **Frequency** column. Using the **Multiply** factor, many Bands can be defined, having the same fault frequency as reference.

Gap (Hz) - This is the gap of the Band. The gap can be selected from a list and can be from 0 to 50 Hz. As a general rule, the gap can be at least the spectrum resolution. If the gap is selected below spectrum resolution, the band will be the peak amplitude.

If you select the gap value zero, the band will be the peak amplitude. Use a zero gap value if you intend to have a trend for a peak instead to have a trend for a Band. In run-time, for each measurement in the Trend, the correct frequency will be calculated, but only if you select **Calculated** type Band. If you select **Defined** type Band, because the peak value can shift, the Trend results can be erratic.
Using fixed frequency of **1 Hz** and gap, you can define fixed Bands. To define a band for low frequency from 0 to 6 Hz, select as **Frequency** the **Fixed (1Hz)** frequency, **Multiply** to be 1 and **Gap** also 5 Hz. The band will have a range from 0 to 6 Hz.

Warning – This is the Warning level of alarm, defined in the units and average selected in the **Alarm Settings**. Automatically setting is also possible, if a **Baseline** spectrum is defined.

Danger – This is the Danger level of alarm, defined in the units and average selected in the **Alarm Settings**. Automatically setting is also possible, if a **Baseline** spectrum is defined.

Active – If active is set to **YES,** the band can be shown in *"QuickView"* or in *"BandView"*. If the setting is **NO**, the Band is only defined, but can be shown.

In the Band definition window a series of buttons are available in editing time:

 **Delete** – Use this action to delete the selected portion form the table.

 **Copy** – Copy all table contents in the Clipboard. Later, you can Paste the table contents to another Direction in Tree.

 **Paste** – If is enabled, you can Paste the table contents previously copied.

 **Copy to all** – Copy the contents of the table definition and apply the contents to all **Direction** from the selected **Point**

 **Alarm** – Automatically apply a calculated level alarm for all the defined faults, based on Baseline spectrum. On same **Direction** must exist a **Baseline**, otherwise the action fail.

 **Save** – Save the definition in the Machine Database. Each time when you change an item in table, before to Exit, you must save your change. Automatically saving is done after **Delete** and **Paste** action. Also after **Copy to all** action, the band definition form other Directions are saved

Editing items in the table are very simple: Move the cursor in the cell where you intend to change something. Just type directly the new value. If a combo box appears, use the up and down arrows to select the proper item and press Enter to complete. If the cell is a direct editing field, just type the numbers or letters. To complete, press Enter key.
You can use also the mouse, just click in the cell you intend to edit. Once you click the mouse in another cell, the previous cell editing mode finish.

11.4.2. Recommendation for Band definition

A large numbers of bands can be added in the Database. Some of them can be usefully, but some of them not. Follow the rules described before, to not waste time and to add more functionality in your software.

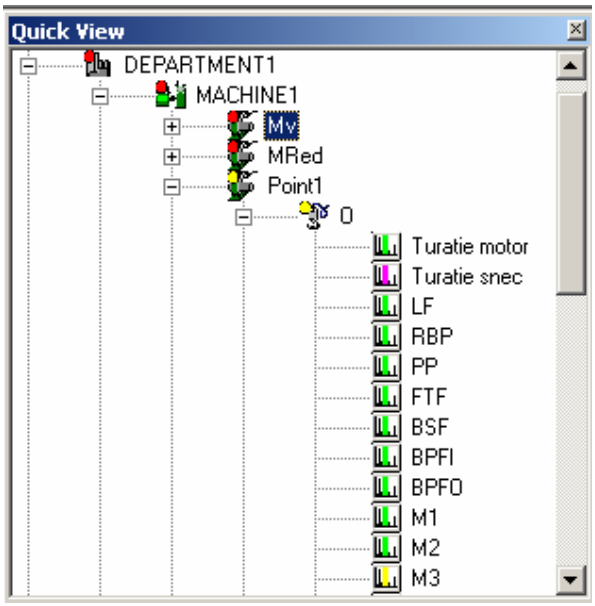
- Add bands for **Shaft Speed** and also for **2 X Shaft Speed** and **3 X Shaft Speed**. The best Gap setting is the spectrum resolution, but not less than 1 Hz. Band Type must be set to **Calculated**.
- Add a band to **Line frequency** and to **2 X Line Frequency** (if you have an asynchronous electrical motor). The best Gap resolution must be set as above. Band Type must be set to **Defined.**
- Add **Belt** fault if the assembly has a belt. The best Gap setting is 2 X spectrum resolutions. Band Type must be set to **Calculate**
- Add **Multiply** for motor fan blade and also for pump blade. The best Gap is 2 X spectrum resolutions. Band Type must be set to **Calculate**
- Add bearings fault frequencies, if you have roll bearings. Band Type- **Calculated**.
- Add a fixed 0 to 5 Hz band frequency. Band type – **Defined**.

Generally, above bands are required during diagnostics procedure.
More bands can be added for special machines or for specific purpose.

11.4.3. Showing Band in Quick View Mode

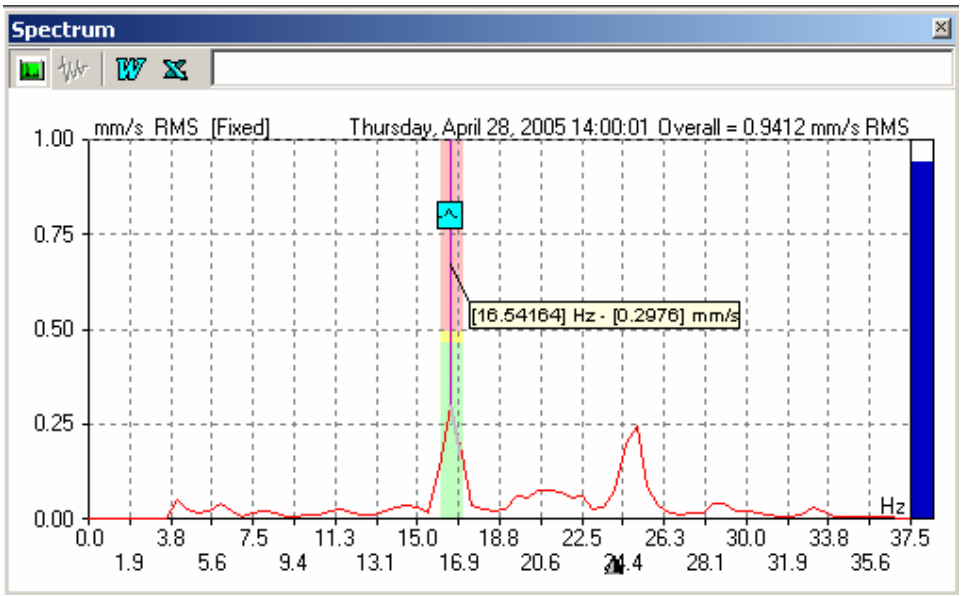
The bands can be shown in *QuickView* or in *BandView*:

In the *QuickView*, select a **Direction** and extend the tree. All defined bands will appear in the tree.



The *Trend Plot* will be shown in the right side (for the selected band).
The *Spectrum Plot* will be shown above.

In the spectrum the selected band will be clearly marked. If the band has also alarm defined, the band will be tri-colour, showing the *Warning* and *Danger* levels.



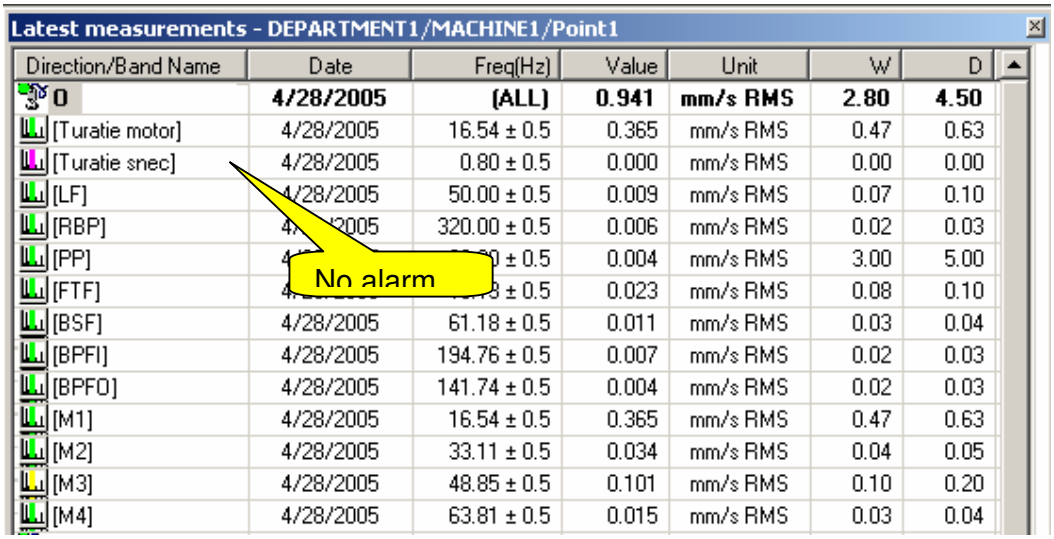
NOTE. In spectrum, the alarm levels are shown only for reference purpose. Remember that, the alarm levels are for the Bands and not for the peak. Always, the Band alarm limits will be greater than the peak high, because the band value is an average of all the band peaks. Only if the band contains a single peak, the alarm level will be valid also for peak.

NOTE. If the Gap value is zero, a single line will mark the Band.

A Band report is available from Trend popup menu.

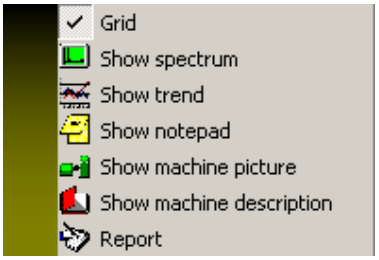
11.4.4. Showing Band in Band View Mode

Showing bans in *BandView* is very similar with showing bands in the *QuickView* mode. In the left tree appear only the Database hierarchy up to **Point** level. Once a **Point** is selected, in the right side appears a list showing Total values for all the **Directions** and also the bands values.
The items have colour icons to indicate the band alarm status. Magenta colour denotes that the **Warning** and **Danger** limits are zero (no alarm set).



Direction/Band Name	Date	Freq(Hz)	Value	Unit	W	D
0	**4/28/2005**	**(ALL)**	**0.941**	**mm/s RMS**	**2.80**	**4.50**
[Turatie motor]	4/28/2005	16.54 ± 0.5	0.365	mm/s RMS	0.47	0.63
[Turatie snec]	4/28/2005	0.80 ± 0.5	0.000	mm/s RMS	0.00	0.00
[LF]	4/28/2005	50.00 ± 0.5	0.009	mm/s RMS	0.07	0.10
[RBP]	4/[illegible]2005	320.00 ± 0.5	0.006	mm/s RMS	0.02	0.03
[PP]	4/[illegible]	[illegible] ± 0.5	0.004	mm/s RMS	3.00	5.00
[FTF]	4/[illegible]	[illegible] ± 0.5	0.023	mm/s RMS	0.08	0.10
[BSF]	4/28/2005	61.18 ± 0.5	0.011	mm/s RMS	0.03	0.04
[BPFI]	4/28/2005	194.76 ± 0.5	0.007	mm/s RMS	0.02	0.03
[BPFO]	4/28/2005	141.74 ± 0.5	0.004	mm/s RMS	0.02	0.03
[M1]	4/28/2005	16.54 ± 0.5	0.365	mm/s RMS	0.47	0.63
[M2]	4/28/2005	33.11 ± 0.5	0.034	mm/s RMS	0.04	0.05
[M3]	4/28/2005	48.85 ± 0.5	0.101	mm/s RMS	0.10	0.20
[M4]	4/28/2005	63.81 ± 0.5	0.015	mm/s RMS	0.03	0.04

In the **List**, a popup menu is available:



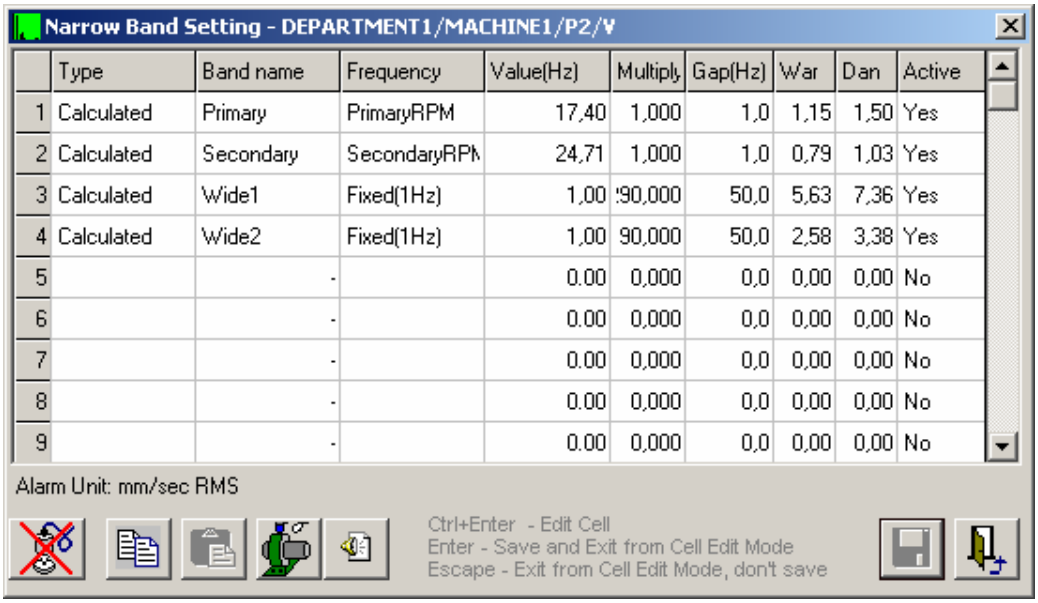
Using this menu, you can show the whole spectrum or the band trend.
This feature is not the same as in the QuickView. Each plot required the above Popup menu is displayed for the selected item from the table. The plots do not reflect the selection changes and must be closed manually.
You may copy the relevant plots in the **Notepad** or in **MS Word**.
A **Band Report** is available to be shown in **Print Preview** or to be inserted in a **MS Word** document.

If you intend to re-arrange the *BandView* windows, select from the SpectraPro main menu *Windows/Arrange BandView*

EXAMPLE

Copy the **BandTest.sp3** Database in the SpectraPro**Data** folder.
Open SpectraPro software and register the **BandTest.sp3** Database
Activate the **BandTest.sp3** Database

In this simple database, 4 bands are defined for each **Direction** as follow:



	Type	Band name	Frequency	Value(Hz)	Multiply	Gap(Hz)	War	Dan	Active
1	Calculated	Primary	PrimaryRPM	17,40	1,000	1,0	1,15	1,50	Yes
2	Calculated	Secondary	SecondaryRPM	24,71	1,000	1,0	0,79	1,03	Yes
3	Calculated	Wide1	Fixed(1Hz)	1,00	90,000	50,0	5,63	7,36	Yes
4	Calculated	Wide2	Fixed(1Hz)	1,00	90,000	50,0	2,58	3,38	Yes
5		-		0.00	0,000	0,0	0,00	0,00	No
6		-		0.00	0,000	0,0	0,00	0,00	No
7		-		0.00	0,000	0,0	0,00	0,00	No
8		-		0.00	0,000	0,0	0,00	0,00	No
9		-		0.00	0,000	0,0	0,00	0,00	No

- A narrow band for the **PrimaryRPM** (17.4 Hz ± 1 Hz)
- A narrow band for the **SecondaryRPM** (24.71 Hz ± 1 Hz)
- A wide band alarm covering the range of 290 Hz ± 50 Hz
- A wide band alarm covering the range of 190 Hz ± 50 Hz

Alarm settings for the bands are automatically calculated from the Baseline.

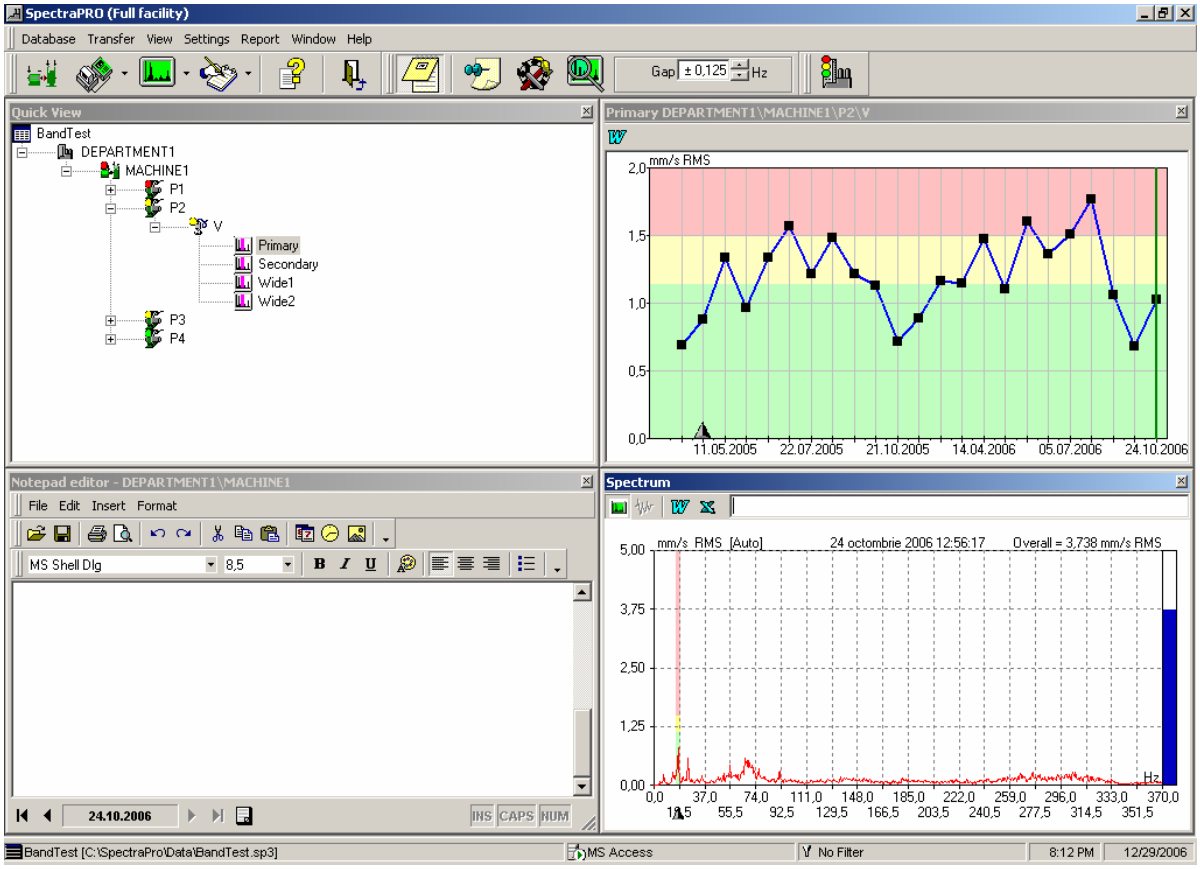
Open **QuickView** and extend the tree up to bands level. Select any one band. In the right side, the trend plot will be changed to show trend for selected band. Also in the spectrum plot, the band will be marked.

Notice that to display the normal QuickView style, just not extend the Direction item.

Now you can move the cursor in the trend and the spectrum plot will be refreshed. Each time you move the cursor, the peak found in the spectrum plot is slightly move, but always a peak is found correctly.

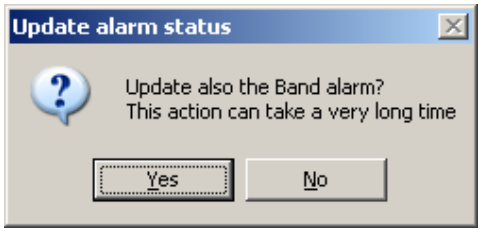
The wide bands cover a 200 Hz range, above the **SecondaryRPM** frequency.

Now you can return to the Database Edit and add more bands definition for all major faults found.



11.4.5. Band Alarm in tree

When you update the alarms in the Database (Command **Update Alarm Status** in **Database** Menu),
The following attention message will appear:



Now you have two choices:

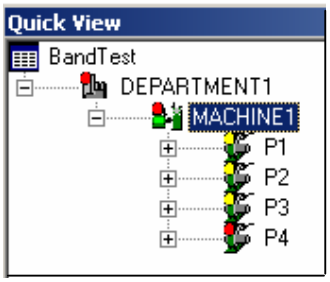
- To press NO and the bands alarm will be not update in the database tree
- To press YES and the bands alarm will be also include in the database tree.

If the database is large and many bands alarm are defined, the above action can take minutes.

Also you must consider the followings:

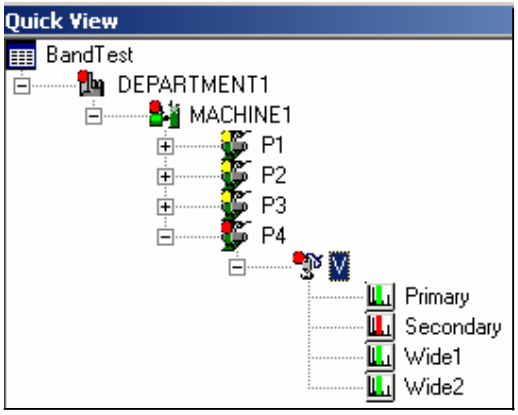
- The alarm in tree (coloured icons) is a good indication for you that something wrong is happened with your machine. In fact this is the first information regarding machines running conditions.
- If you add to the alarms also the band alarm and many band alarms are defined for the machine, the probability to obtain a "coloured" icon for machine is very high. In majority of the cases, the machines alarm will be in "red" status.

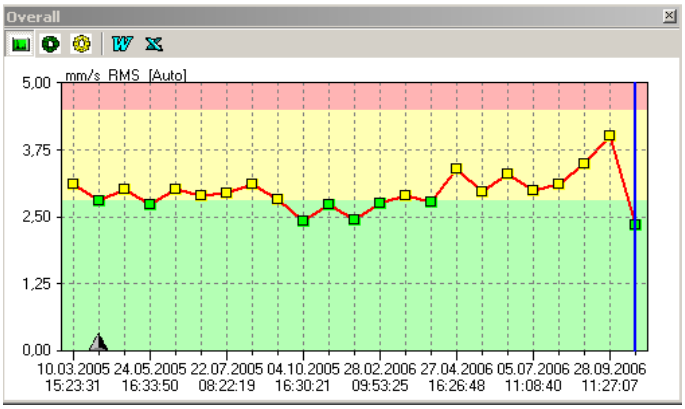
Have a look bellow:



In the machine tree, the MACHINE1 is in Danger condition:
Because the point P4 is in Danger alarm, also the MACHINE1 and DEPARTMENT1 are in Danger alarm. If you expand the tree more, you can see that the problem isn't the total value of the point P4, but the "Secondary" band, because the total value of the vibration in Point P4 is bellow the Warning limit.

Showing band alarm in tree can create confusion, so all the time is your decision if the band alarms will be added or not to the database alarms update.

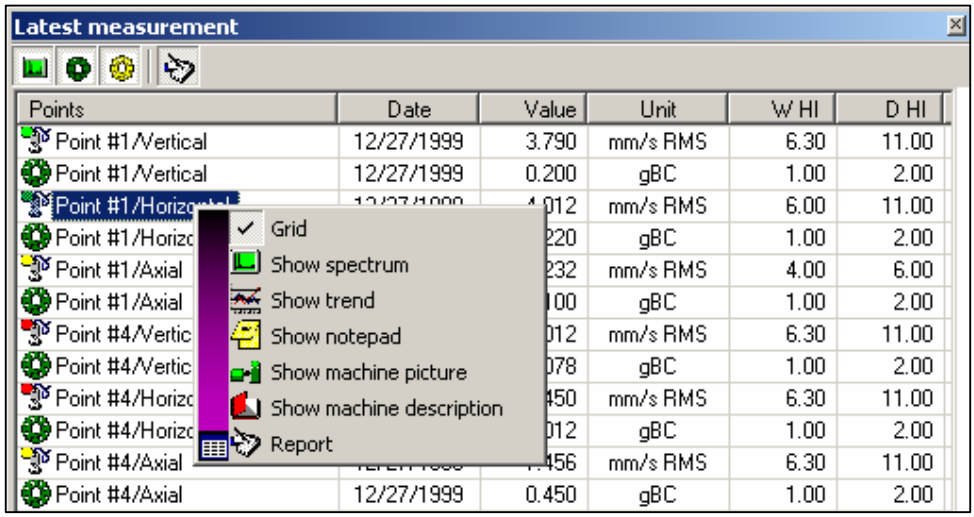




11.5. List View

Using **List View** you can see the alarms status for all the Machine Points in a single list, without the bands alarm included.

List View *never includes the bands alarm.*



In the List View is shown:

- Total vibration values
- Total BC
- Total Envelope values
- Manual entry point
- mV Measurements

12. SpectraPro Reports

The following pre-defined report is included in the SpectraPro software:

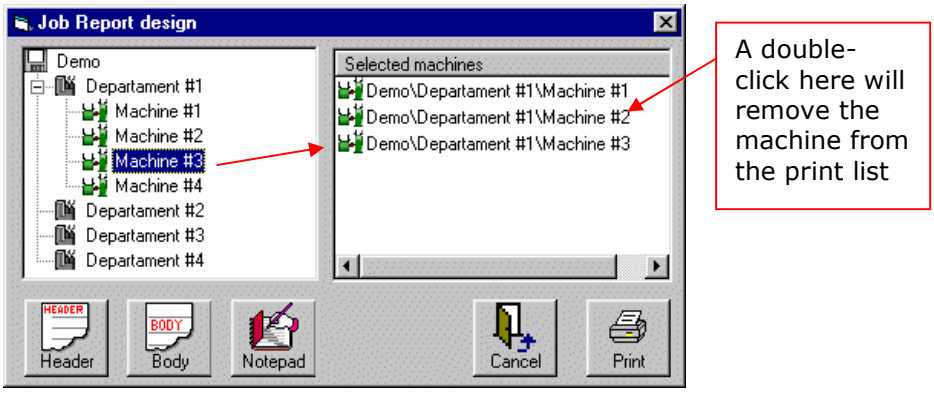
- Job Report
- Machine history Report
- Machine description Report
- Transfer Report
- Un-measured Machine Report
- Diagnosis Report

Majority of them can be user customize.

Any report can be send to a text editor for more modification.

12.1. Job Report

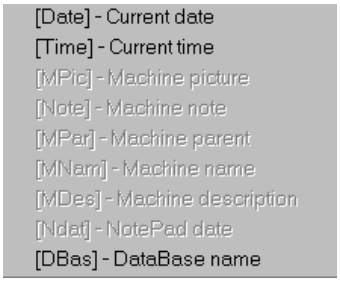
The Job Report contains the last notes made by you for the selected machines.
This report is addressed to the maintenance team.
The notes are a consequence of the diagnostic process, using the measurements unloaded from the data-collectors.



First select the machines from the hierarchy tree. Just double-click on each machine or drag and drop the machines in the **selected machine** list.
You can remove some machines from this list, with a double click.
Now, if you use the software for the first time, you must customize the header and the body of this report.

To edit the header press **Header** button. A specific window will appear.

In the pop-up menu (activate with a right-mouse click) you have some reserved word, all included in square brackets. This words will be replaced in the final report, according with the actual contains from the database. In the Job Report Header you can add the following items:



[Date] – Current date
[Time] – Current time
[DBas] – Active Database name

You can preview a sample of the header pressing the **Preview** button from the toolbar.

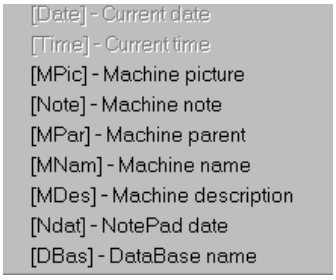
The last contents of the header will be automatically saved for later use.
If you want to have more then one type of header, save contain of the header in a file. In this way you can customize how many header type you want.

Next time, you can restore from the saved file the contents of the header.

Pressing **Picture** button from the toolbar you can include a picture in your header (e.g. company logo).
The Header Edit Window shows the header to 1:1 scale depending from your printer setting.

In very similar manner you can customize the body. Press **Body**.

In the pop-up menu (activate with a right-mouse click) you have some reserved word, all included in square brackets. This reserved words will be replaced in the final report, according with the actual contains from the database. In the Job Report Body you can add the following items:



[MPic] – Machine picture, defined in the Database Edit
[Note] – Contents of the last Notepad contents
[MPar] – Department name
[MNam] – Machine name
[MDes] – Machine short description
[Ndat] - Last Notepad entry date
[DBAs] – Active Database name

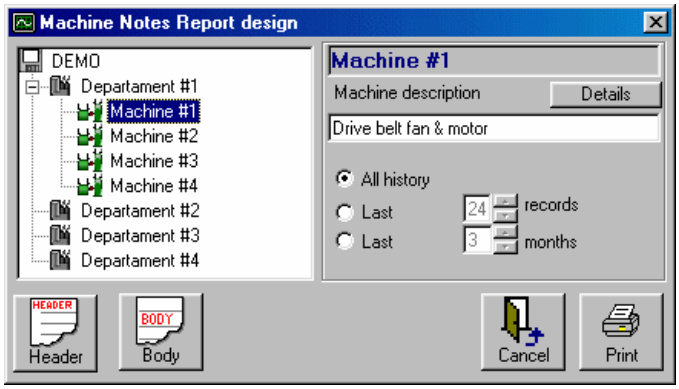
Before printing you can edit contain of the notes. Use **Notepad** button, but first select the desired machine from the **Selected machine** list.

Finally press **Print** button and the Report Preview windows will be activated

See **Report Preview** for more details.

12.2. Machine History Report

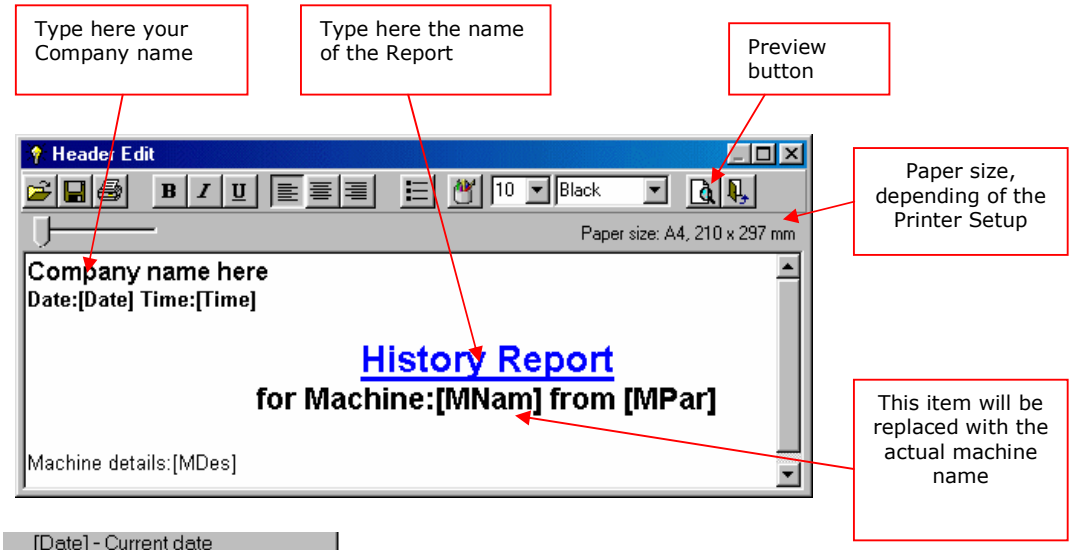
The Machine History Reports contain all the notes for a selected machine.

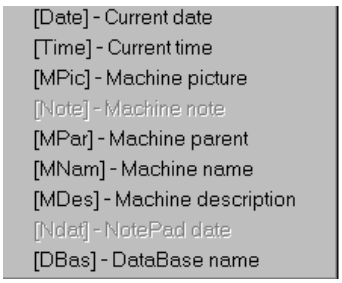


First select the desired machine, and decide if you want a report with all the history or a partial report.

Now, if you use the software for the first time, you must customize the header and the body of this report.

To edit the header press **Header** button. A specific window will appear.





In the pop-up menu (activate with a right-mouse click) you have some reserved word, all included in square brackets. These words will be replaced in the final report, according with the actual contains from the database.

You can preview a sample of the header pressing the **Preview** button from the toolbar.
The last contents of the header will be automatically saved for later use.
If you want to have more then one type of header saves the contents in a file. In this way you can customize how many header type you want.
Next time, you can restore from the saved file the contents of the header.
Pressing **Picture** button from the toolbar you can include a picture in your header (e.g. company logo).

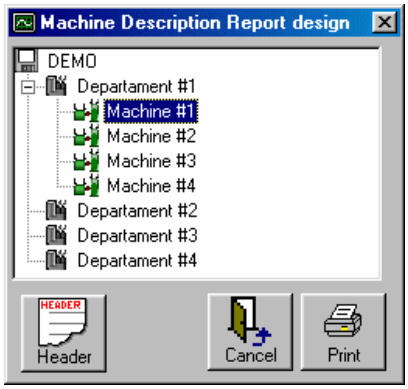
The Header Edit Window shows the header to 1:1 scale depending from your print setting.

In very similar manner you can customize the body. Press **Body**.

Finally press **Print** button and the Report Preview windows will be activated

See **Report Preview** more details.

12.3. Machine Description



The Machine Description Report contains in the body the description of the selected machine. First select the desired machine.

Now, if you use the software for the first time, you must customize the header and the body of this report.

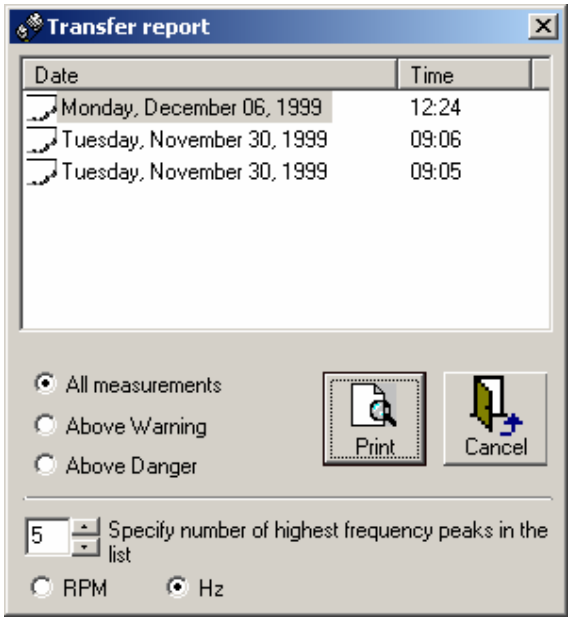
To edit the header press **Header** button. A specific window will appear. In the pop-up menu (activate with a right-mouse click) you have some reserved word, all included in square brackets. This words will be replaced in the final report, according with the actual contains from the database.
You can preview a sample of the header pressing the **Preview** button from the toolbar.
The last contents of the header will be automatically saved for later use.

If you want to have more then one type of header, save the contains of the header in a file. In this way you can customize how many header type you want.
Next time, you can restore from the saved file the contents of the header.
Pressing **Picture** button from the toolbar you can include a picture in your header (e.g. company logo).
The Header Edit Window shows the header to 1:1 scale depending from your print setting

Finally press **Print** button and the Report Preview windows will be activated

12.4. Transfer Report

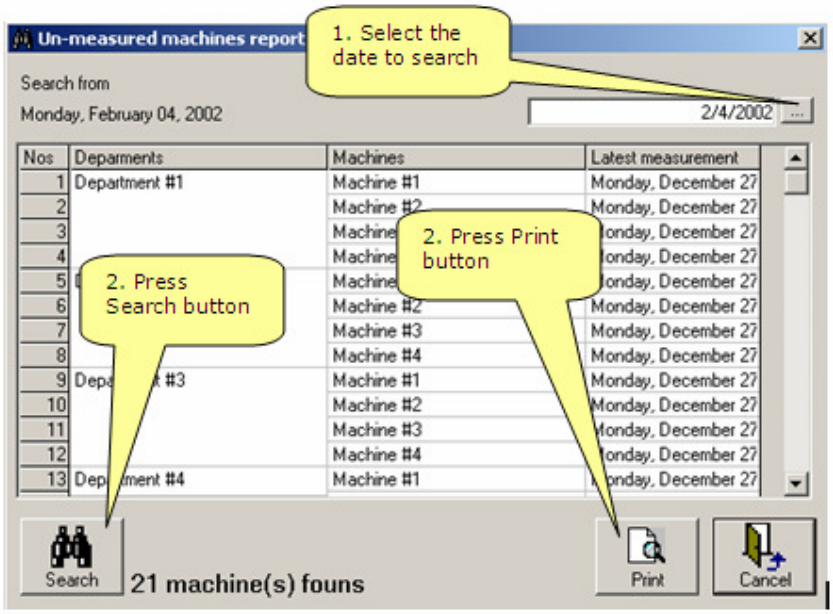
Transfer Report can show any of route transfer in the SpectraPro database.



From the list, select the transfer date.

Press **Print** button to show the report.
The report can contain all measurements or a selection, depending on Alarm condition.
Also the specified number of highest peaks from spectrum can be shown.

12.5. Un-measured machine Report



This report can be usefully to find the machines un-measured from a specific date.
Select the date first and press **Search** button.
The report will be shown in the print preview window.

12.6. Diagnosis Report (Defect List Report)

This paragraph describes how to use the Defect List Report for diagnosis purpose.

In a machine diagnosis task a major difficulty occur because many information are required for a precise diagnose. The computer size is limited, so no all necessary spectrum plot can be displayed in the same time.

In the spectrum plot can be shown the fault lines, but if are many, these can't be usable.

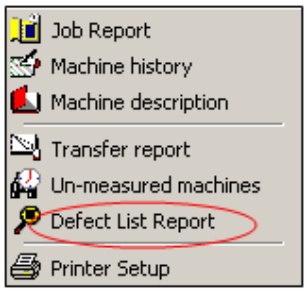
The Base line spectrum and the latest measurement are very useful for diagnosis also. The alarms limit settled in the machine Edit time can also provide valuable information's.

Using this new report, the user can have access once to all relevant information regarding machine condition.

The Defect List Report is a valuable tool to speed-up the diagnosis process.

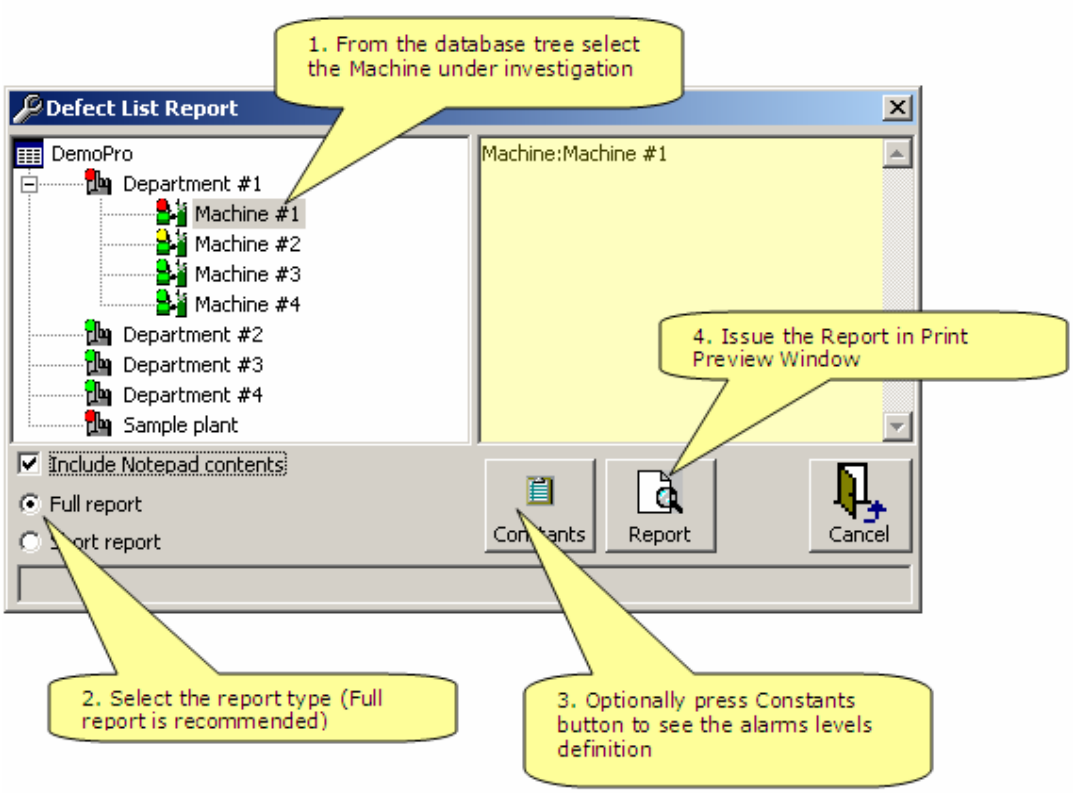
The Defect List Report is available in the SpectraPro© application begins with SP8.

The command is included in the **Main** menu, under **Repor**t menu:



12.6.1. Using Defect List Report

When this command is selected, the following window will appear:



The **Constants** window shown the alarm level, for all fault type available in the SpectraPro© software.
The alarm levels are calculated using the alarm defined for Total Vibration values (Warning and Danger limits.

In this first release, the constants values can't be adjusted by the user.

The report has several tables for each **Direction**:

- Total value table
- Fault frequency table – latest measurement
- Fault frequency table – base line
- Highest peak value in spectrum – latest measurement
- Highest peak value in spectrum – base line

If Base line is not defined, the table with base line information will not appear.
Is highly recommended to define a base line measurement for each **Direction**,

This can be done in Edit Command.

12.6.1.1. Total value table

Name	Last value	Prev value	Base Line	Unit	W HI	D HI
Total	**3.790**	3.790	9.564	mm/s RMS	6.30	11.00
BC	**0.200**	0.200	0.230	gBC	1.00	2.00

In above table appear latest two measurements values together with the base line value. If Envelope measurement is defined, also the Envelope magnitude will appear.
If the alarm limits is exceeded, the values appear colored in yellow or red.

12.6.1.2. Fault frequency table – latest measurement

Defect Name	Bearing	Value	Unit	Freq	W	D	Trusty
ShaftSpeed		14.517	mm/s RMS	48.80 Hz	5.04	8.80	Yes
X2 ShaftSpeed		2.368	mm/s RMS	97.60 Hz	3.15	5.50	Yes
X3 ShaftSpeed		1.365	mm/s RMS	146.38 Hz	1.89	3.30	Yes
LOW FREQ		1.489	mm/s RMS	3.10 Hz	0.63	1.10	Yes
LINE FREQ		0.000	mm/s RMS	0.00 Hz	0.63	1.10	No
LF X 2		1.258	mm/s RMS	100.00 Hz	0.63	1.10	No
BELT		0.183	mm/s RMS	15.00 Hz	1.26	2.20	No
BPFI[1]	6203	0.013	mm/s RMS	227.50 Hz	0.32	0.55	No
BPFI[1] X 2	6203	0.008	mm/s RMS	457.50 Hz	0.32	0.55	No
BPFO[1]	6203	0.051	mm/s RMS	162.27 Hz	0.32	0.55	Yes
BPFO[1] X 2	6203	0.032	mm/s RMS	322.50 Hz	0.32	0.55	No
BSF[1]	6203	0.032	mm/s RMS	130.00 Hz	0.32	0.55	No
FTF[1]	6203	0.089	mm/s RMS	27.50 Hz	0.32	0.55	No
BPFI[2]	1105	0.123	mm/s RMS	252.50 Hz	0.32	0.55	No
BPFI[2] X 2	1105	0.027	mm/s RMS	502.50 Hz	0.32	0.55	No
BPFO[2]	1105	0.072	mm/s RMS	186.64 Hz	0.32	0.55	Yes
BPFO[2] X 2	1105	0.040	mm/s RMS	373.82 Hz	0.32	0.55	Yes
BSF[2]	1105	0.040	mm/s RMS	115.09 Hz	0.32	0.55	Yes
FTF[2]	1105	0.023	mm/s RMS	20.00 Hz	0.32	0.55	No

In above table is shown the values for all defined fault frequency.

Fault frequency can be defined in the Edit Window.
The fault frequency can be define on Machine, Point or Direction level.
Shaft speed, fist two harmonics and Low frequency are shown always.

If the fault frequency represents a peak in the spectrum, the value is marked with a trusty flag. If the fault frequency is not a peak, but near, the values are marked as not trusty. In this last case the value shown, in majority of cases, DON'T represents a fault.

All defect frequencies is related with the shaft speed. If the shaft speed is incorrectly settled in the spectrum, all the values can be wrong!
For more information regarding how to set the shaft speed BEFORE to issue this Report, please read the document AN 01452 –"Improved speed tool menu"

12.6.1.3. Fault frequency table – base line.

This table is similar with the previous, but is referred to base line spectrum.

A simple analysis of these tables can give a first impression regarding the faults evolution.

12.6.1.4. Highest peak value in spectrum – latest measurement

Frequency	Value	Unit	Defect name	% Change	Warning	Danger
48.80 Hz	14.517	mm/s RMS	ShaftSpeed	+ 96.30	5.04	8.80
292.91 Hz	2.594	mm/s RMS	[X 6] ShaftSpeed (Multiply 6)	+ 96.30	0.84	1.47
244.08 Hz	2.510	mm/s RMS	[X 5] ShaftSpeed (Multiply 5)	+ 96.30	1.01	1.76
97.60 Hz	2.368	mm/s RMS	X2 ShaftSpeed	+ 96.30	3.15	5.50
195.11 Hz	1.511	mm/s RMS	[X 4] ShaftSpeed (Multiply 4)	+ 96.30	1.26	2.20
2.50 Hz	1.435	mm/s RMS		+ 96.30	(none)	(none)
146.38 Hz	1.365	mm/s RMS	X3 ShaftSpeed (Multiply 3)	+ 96.30	1.89	3.30
9.27 Hz	0.646	mm/s RMS		+ 96.30	(none)	(none)
536.62 Hz	0.450	mm/s RMS	[X 11] ShaftSpeed	+ 96.30	0.46	0.80
24.04 Hz	0.399	mm/s RMS	[X 0.5] ShaftSpeed	+ 96.30	2.52	4.40

In this table are shown only the first ten fault frequencies, but also is shown the changing in magnitude since the last measurement.
If a peak is not identifying, the Fault name is missing. If this is happened for majority of the highest magnitude lines, seems that the fault frequencies are not completely defined for that Direction. Return to Edit menu and add all available fault frequencies associated with the Machine.

12.6.1.5. Highest peak value in spectrum – Base line

The table is similar with the table above, but is shown the highest magnitude peak for base line spectrum.

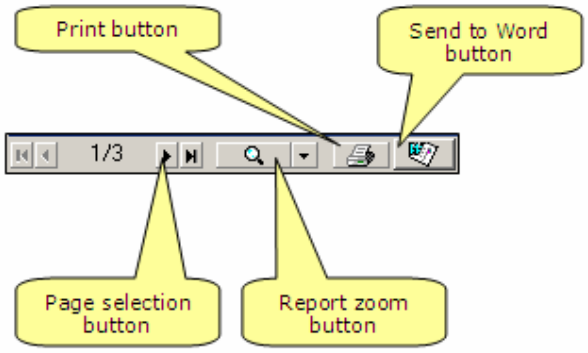
12.6.2. Best practice for a suitable Defect List Report

The Report contains only known information. Lack of information's will give a poor Report.
Follow the bellow rules to produce a usefully Report:

- Define as many fault frequencies are possible.
- Always define a base line spectrum for each Direction
- Adjust the correct shaft speed in spectrum before to use this Command. Measuring the speed in time of data acquisition is the best practice, at least for a single Direction. If this isn't possible, adjust manually the correct shaft speed for a single Direction belonging to a Machine and use the Speed Tool menu to set the proper shaft speed to all Machine Directions.
- The magnitude values are important. Even low magnitude peak can be relevant for the machine conditions.
- Set the Total value alarms according with a well known standard. Be carefully to set other smaller limits for Vertical and Axial directions. Don't use same limits for all measurement direction!
- Add to the Report your comments from the NotePad. Will be very helpful in time of diagnosis process.
- From information provided by this Report try to find first what faults the machine DON'T have, rather then to try to detect the existing possible fault. Eliminate, one by one, the inexistent fault and finally you will obtain a short list with all possible faults. Now will be much easy to determine the real faults!

12.7. Print Preview

Before a Report to be printed, the contents are shown in a Print Preview window.



Page selection is used to browse between report pages.
Using **Zoom** button you can adjust the report size on the screen
Press **Print** button to print the report to the computer default printer.

Press **Word** button to copy the report contents in a MS Word document (the MS Word must be installed in your computer)

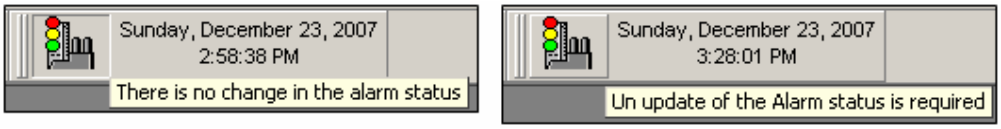
13. Updating alarms

13.1. Introduction

When the machine tree is shown, the items icons are colored according with the actual alarms level.

This is true only if the latest alarms were updated recently.

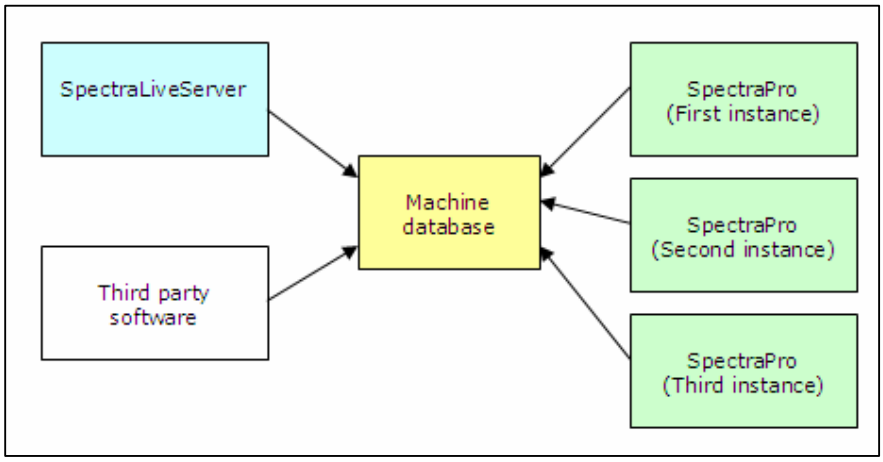
The actual Alarm Status can be seen looking on the **Manual Alarm Update** button from the Main Menu toolbar:



If the button is pressed (right picture), the alarms are shown correctly, no update is required.
If the button is not pressed (left picture), the alarms need to be refreshed manually. To do this, just press the **Manual Alarm Update** button.

Because the machine databases can be accessed in the same time from many computers across the network, in a network environment only, exist the possibilities that the user isn't informed about the real status of alarm in the database tree.

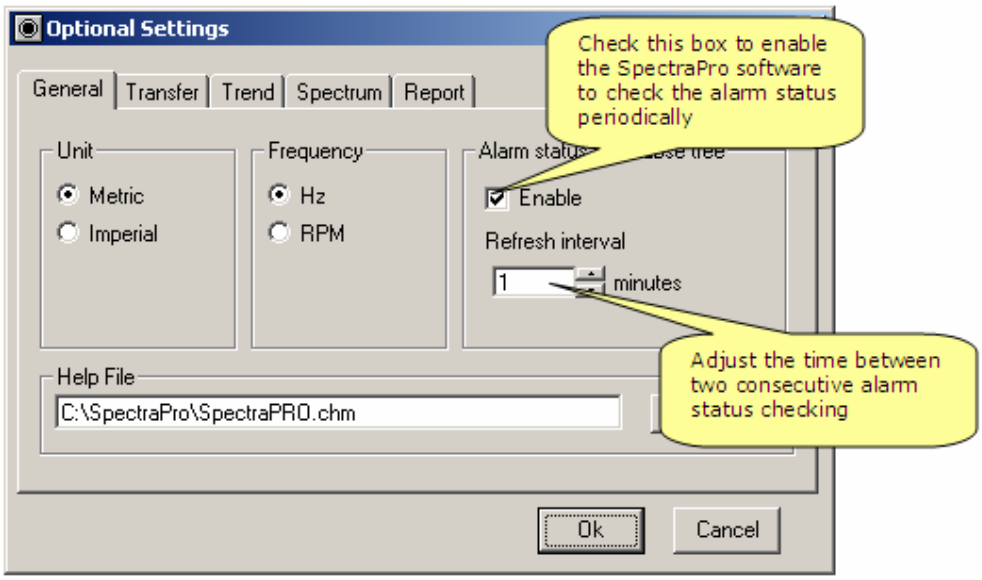
See the schematic bellow. This is a typically accessing diagram for machine database in a network:



Any of above users can made some change in the machine database adding new measurements.
In this paper is described how the user can set the SpectraPro in a way to be informed all the time about any changing in the alarm status and also how the alarms update can be done.

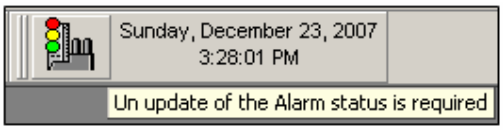
13.2. Settings of SpectraPro application

In order to receive periodically information regarding alarm update status, the user must set some option in the **Setting > Optional settings** window, as bellow:



NOTE: The alarm are not updated automatically, just the database is checked for new measurements.

If new measurements exist in the database the **Manual Update Alarm** button will be change to not pressed, as follow:



If the mouse cursor is moved in the button area, the tooltip text will indicate if the alarm update is required or not.
If the alarm update is required, a manual update is necessary. Just press the button and the update procedure will begin.

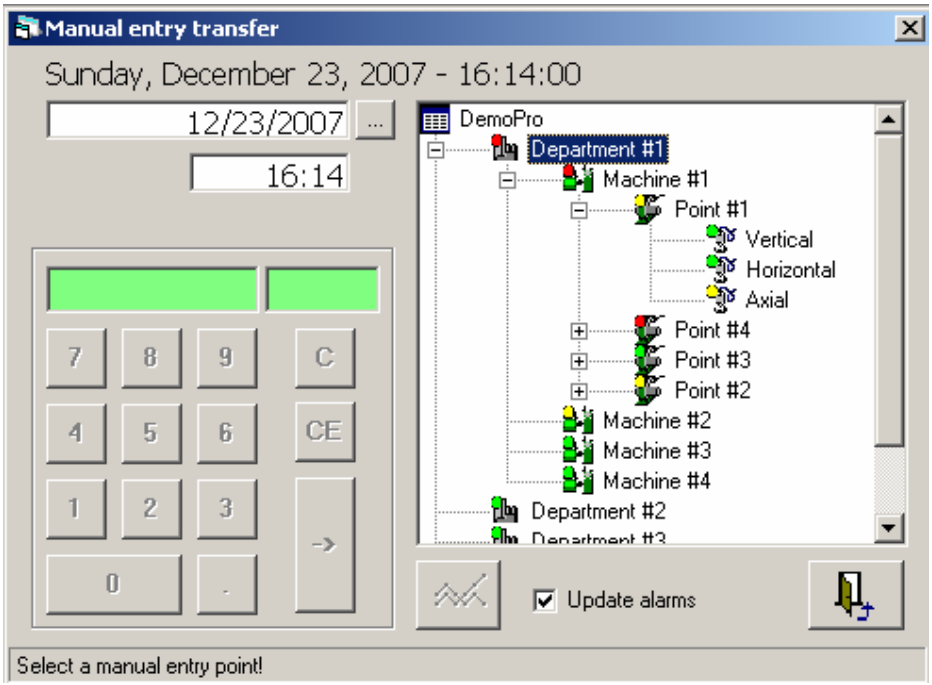
NOTE: For medium and large size machine databases, a complete updating procedure can take minutes. In time of alarm update, the software is locked for the user. This is way a full automatically procedure can't be implemented.

13.3. Semi-automatic alarm update

If in the SpectraPro instance a measurement down-load occur, the user can decide if also the alarms update must occur when the transferring measurement is finished.

In any transfer windows a check box is placed in the window lower side.

Bellow is presented the Manual Entry transfer windows:



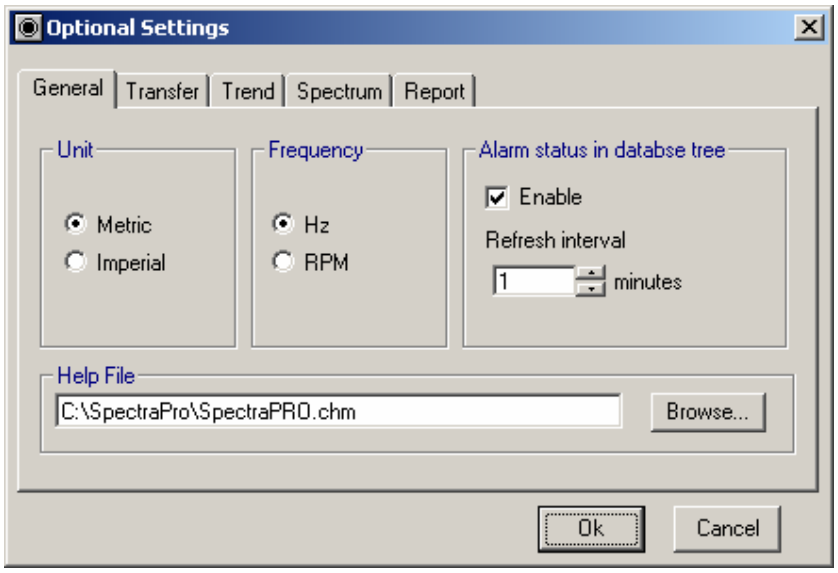
Update alarm box is checked as default. When the **Exit** button is pressed, an automatically alarm updating will occur also.

NOTE: If any user form the network perform alarm update procedure, all other user will be informed about this. The **Manual Update Alarm** button will change the status to un-pressed.

14. SpectraPro general settings

After the SpectraPro is installed on your computer, you can customize some software appearance.

Use Settings > Optional Settings command:



In the **General** tab you can set the followings:

- Unit used (Metric or Imperial)
- Frequency unit (Hz or RPM). This setting can be modified in all the plots showing frequency.
- Alarm status in database tree (See paragraph 13 for more details)
- Help file. The default help file is *SpectraPRO.chm*, but the file can be changed if a help file translation is available.

In the **Trend** tab you can set the followings:

- Dimension (width) of the total value and BC line in trend plot.
- Number of measurements in the trend plot (default are 24)

In the **Spectrum** tab you can set the followings:

- Cursor type and width. The cursor can be show as Line, Target or Cross.
- Spectrum line width.
- Number of harmonics for each fault type (default are 10)
- Number of side bands for each fault type (default are 3)

In the **Report** tab you can set the followings:

- Header of each report type.
- Body of each report type.

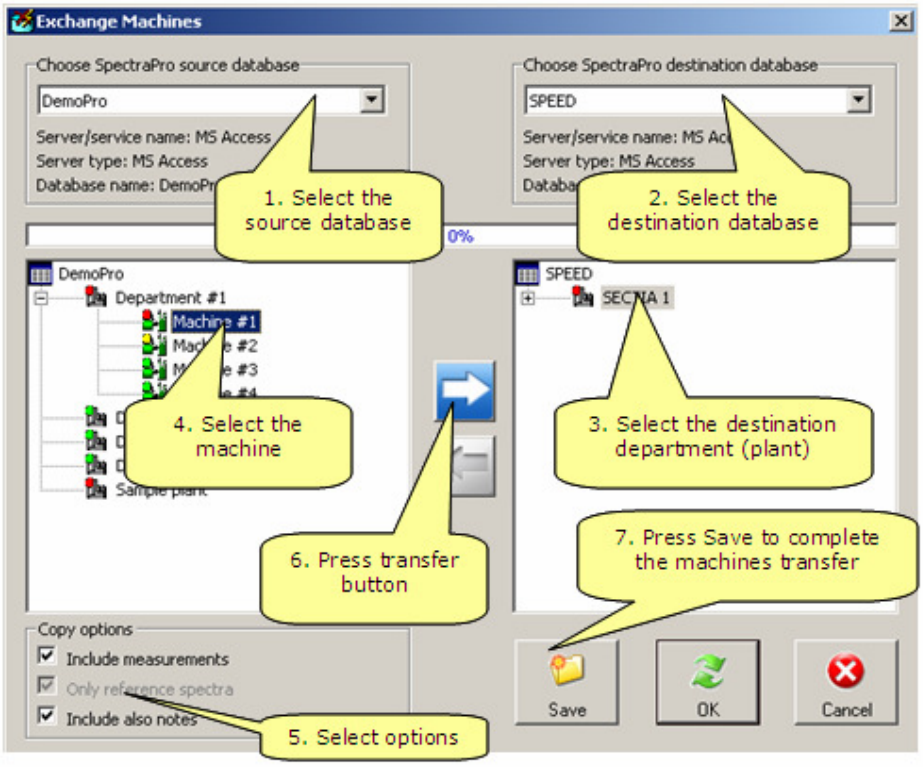
Once set, the contents of Header and report Body will appear every time when a report is shown.

If you select Imperial unit for SpectraPro, all the measurement will be automatically presented in Imperial units.

15. Exchange machines

Sometime you will need to move or copy a machine from a database to another. SpectraPro offer a possibilities to move or copy machines between any two databases.
The database can be creating in any Server type.

Select Database > Machine exchange command.



Both databases must be registered.
Do the followings:

- Select the source database from any registered databases.
- Select destination. The destination database must have at east one Department (or Plant). You can't copy a machine in an empty database. If you intend to move whole source database in a new destination database, first use **Edit** command and create the same Departments as in the source database.
- Select first Departments where you intend to copy a machine.
- Select the machine. The **MOVE** button will be activating. Press the button and the machine name will be moved to the destination. The contents will be not transferred yet. After transferring one machine, the item in the source tree will advance to the next machine. Press again **MOVE** button up to all machine will be "moved" to the destination.

- Select the copy options: you can copy only machine definition or also the measurements.
- Finally, press **SAVE** button. All the selected machines will be copied to the destination. This action can take few minutes.

Using **Exchange Machine** command you can create a single database using the machine stored in several database.

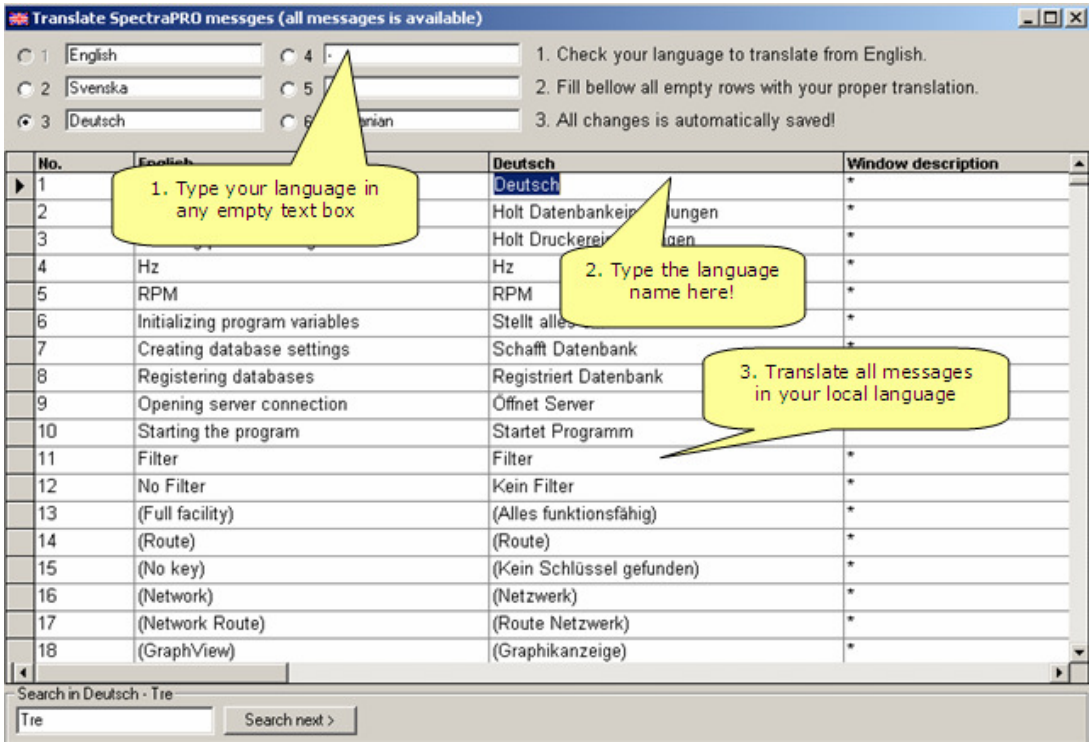
Also you can transform a database type (Example a MSDE Database) in another (Example: MS Access Database). This action can be helpful to move your databases into another computer.

16. SpectraPro translation

SpectraPro is multi-lingual software. The entire program message is stored in *Message.mdb* file, a *Microsoft Access* databases.

In order to have a *SpectraPro* version in a specific language, the entire database must be translated.

Then you install the *SpectraPro,* also some additional executable file is automatically installed. For translation purpose run Start > Programs > SpectraPro > Translate message software.



First select any empty text box and fill it with your language name.
In the table, complete item 1 with your language name (can be typed in your local language)
Now begin translation. Be carefully, in English language all the message are shorter as in he majority of other languages!
If you not fully understand how to translate some propositions, just skip the row. You can do this later.
When you finish, close the translation windows. Your work will be save in the *Message.mdb* file.

If you update the SpectraPro with a new Service Pack, don't be worry. The Service pack will not delete your translation file, but will add to this newest words or propositions (in English language). You must only run again the **Translation** software and translate the latest messages.

When you close the Translation software the following window will be shown:

Your language will appear in the translation list. Just select your language from the list and next time when you will start the SpectraPro, all the message will be in your language.

The latest saved language is saved in the *SpectraPro.ini* file, as is shown above.

If some messages are not translate, you have the possibilities to made translation in time of running the SpectraPro software.

To do these proceeds as follow:
Locate SpectraPro.ini file in your computer (in a default installation the file will be in *C:\Program Files\SpectraPro* directory).
Just double-click on file to be opened in **NotePad**.

Bellow is presented the first part of this file:

```
 [General]
Language=1
MessagePro=C:\SpectraPro\MessagePRO.mdb
TranslateMode=0
; TranslateMode=0 Un-translated message will be shown in English
; TranslateMode=1 Un-translated message will be shown as #NoMessage =
Message in English
; TranslateMode=2 Un-translated message can be edited on fly
```

Change TranslateMode to 2 and save the file.

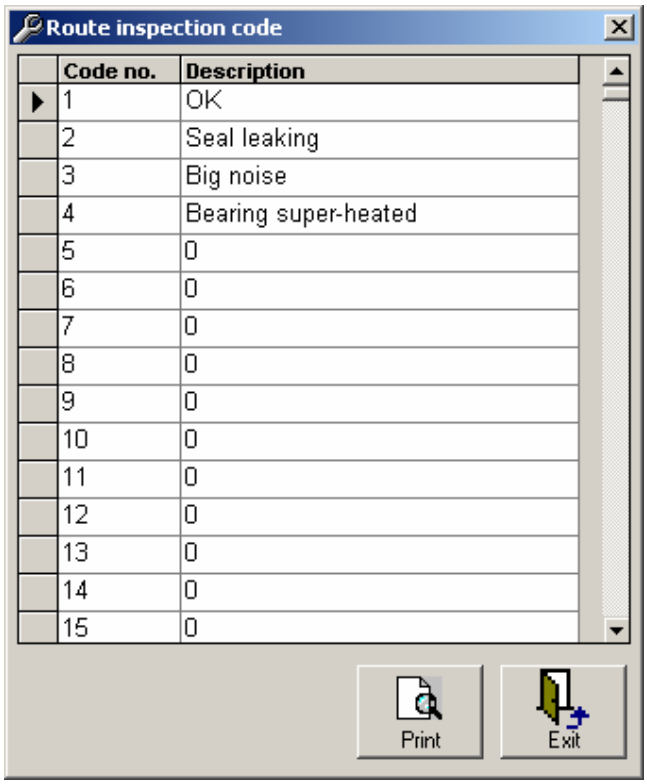
Now when you will run SpectraPro again, each time when an un-translated message will be find in the translation file, an edit windows will be shown:

Now you have the possibilities to translate on-fly the message.

Don’t use this settings when too many message are not translated!
The running of SpectraPro will be interrupted many times and you will be unable to use the software. Don’t forgot to set back the TranslateMode in the *SpectraPro.ini* file.

17. Route inspection code

From Settings > Route inspection code menu you can activate the bellow window:



In the table you can add up to 100 inspection codes.
The inspection codes work only in conjunction with the **Easy Viber** Data Collector.

Each time when a measurement is done, in the Instrument you have the possibilities to add an inspection code number.
When the measurements will be down-loaded in the machine database, in the NotePad also the contents of the inspection code will be added.

For each measurements\ you can add more than one inspection code. Read the **Easy Viber** User Manual for more details.

In the **Easy Viber** Instrument the Inspection Codes can e mixed with some text message. Between Inspection code and text a separator is required.
The separator can be: dot, dash or space.

In the same message the same separator must be used.

Consider the Inspection Code for the above list:

What user type in EV	**What SpectraPro send to Notepad**
1 status of machine -1-status of machine	Ok status of machine
4 and 2 -4-and-2- .4.and.2.	Bearing super-heated and Seal leaking
4 and 70C .4.and 70C -4-and 70C	Bearing super-heated and 70C
Here is 3 Here is.3. Here is-3-	Here is Big noise

18. Using Notepad

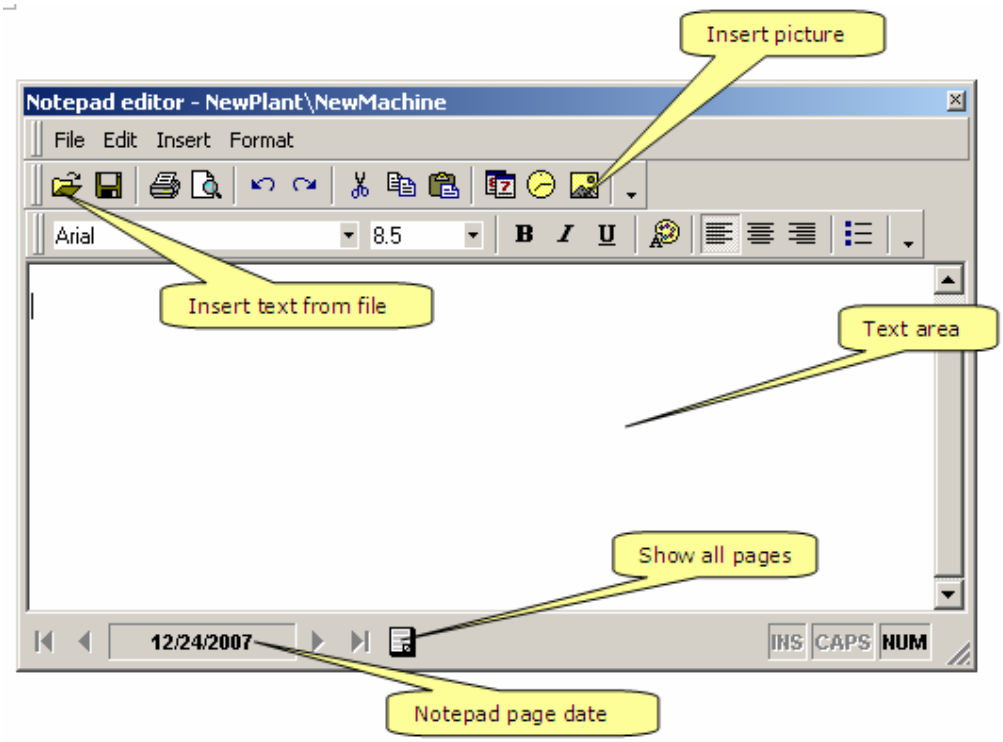
Notepad is available all the time when a plot is visible on the screen.

The *Notepad* can be activated from the main toolbar menu:

Also the *Notepad* can be activated from the popup menus of each plot (**Show notepad** command line).

The *Notepad* date appears in accordance with the plot date. From a trend plot, the *Notepad* will appear with the cursor date.

Because the *Notepad* contains appear in many Reports, a proper documentation done in the *Notepad* will assure a good report also.



The *Notepad* must be use to document your diagnosis process.
In the *Notepad* can be added:
- Any plot form the screen
- Any text using copy and paste
- Any text or *rtf* external file
- Any picture (including digital camera picture)

The text can be formatted as in any standard text editor.
The contents of a page can be saved in an *rtf* file type.

Notepad is page and machine oriented. Each page has its own date. Also the *Notepad* is synchronized with the plots. When a plot set focus and the *Notepad* is visible, the *Notepad* page will be automatically changed to the plot date and to the machine.

If only the point or direction of the same machine is change in plot, the Notepad contents will be not affected.

This means that all the time the *Notepad* has the active page on the right date and for the active machine.

Is not need to save explicit the Notepad contents. Every time when the page is changed the previous contents is automatically saved in the database.

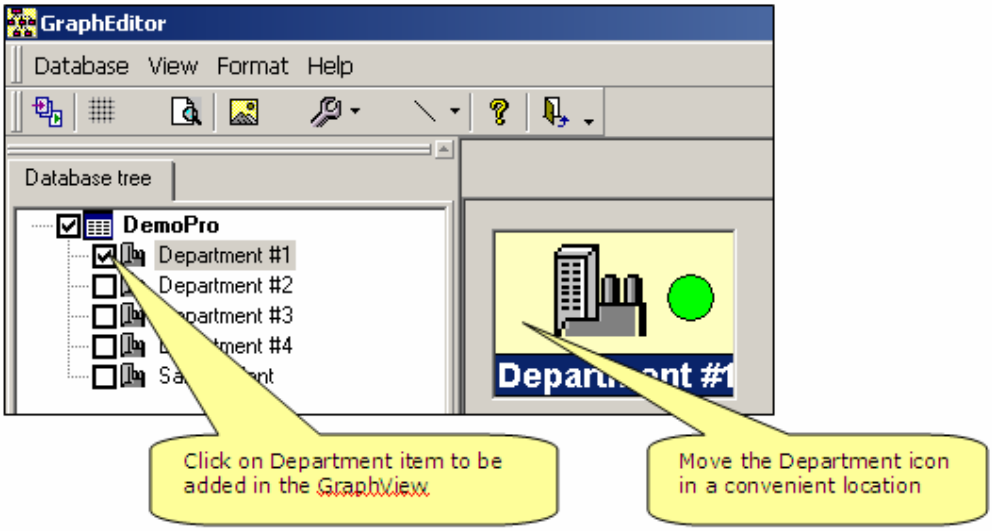
19. GraphView

If the machine database is accessible in a network, is possible to present data in a simple, graphical way.

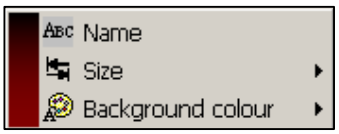
A "black" protection key is required for each workstation.

To create a **GraphView** data presentation follow the steps:

1. In any computer from the network where the SpectraPro is installed, start SpectraPro and select (Database > Change) a database.
2. Run external software Start > Programs > SpectraPro > GraphView Editor.
3. The following windows will appear:



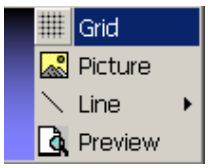
4. Check one by one each Department to be moved in the graphic area.
5. Move the icons in convenient location using the mouse.
6. Click-right on Department icon and a popup menu will be shown:



From the above menu you can:

- Re-name the Department
- Adjust the icon size (small, medium or large)
- Select a background color for icon.

7. Click-right in the graphic area. The following popup menu will be shown:



8. You can do the followings:
   - Add a temporary grid to the graphic area
   - Select a background picture. The picture must have an approximate size to cover all the display area. Any type of picture file is accepted.
   - Add to the icons some position lines.
   - Preview the final graphic aspect of the page.

9. Double-click on each Department icon. In the left side of the windows the machine list will be shown. Proceed as before and add machine. For each Department a new graphic page will be created.
10. In each new page, double-click on each machine. In the left side of the windows the Points list will be shown. Add for each machine the points (Directions will be added also). For each machine a new graphic page will be created.
11. In each page you can add a background picture.
12. When you finish, just exit from GraphView Editor. The he pages will be automatically saved in the machine database.

Now any computer from the network can be configured to show a graphic format of the database.

To do these proceeds as follow:

1. Install SpectraPro in the computer (and the latest Service Pack). Use a normal protection key to start SpectraPro. Select the desired database and close the SpectraPro. Remove the normal HASP protection key.
2. Insert in any available USB hub a "black" protection key.
3. Now when the SpectraPro start, instead to open the normal windows, will show a graphical view of the database.

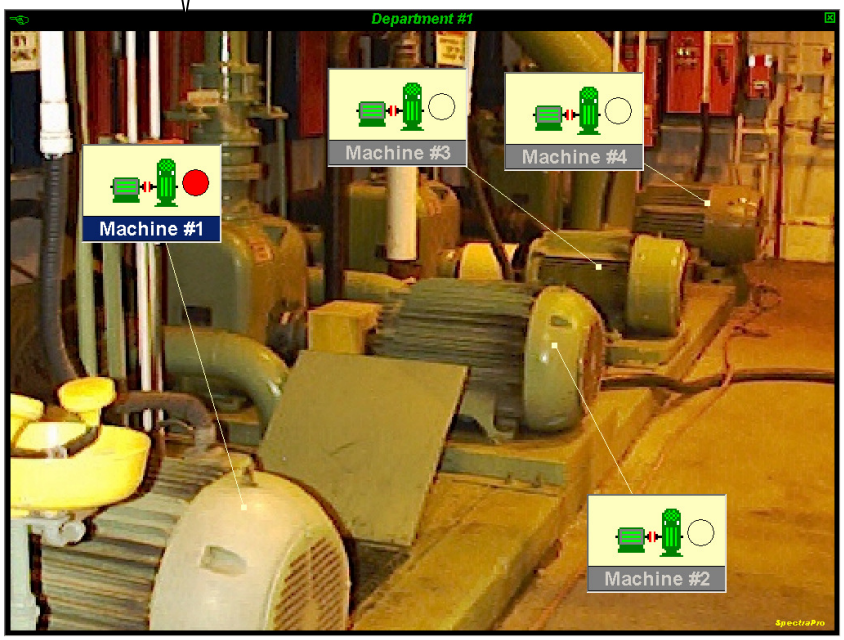
In GraphView mode, the user can change nothing; the database is read-only.

If alarm limit is set, also the icons will be colored according with alarm level in the machine tree.

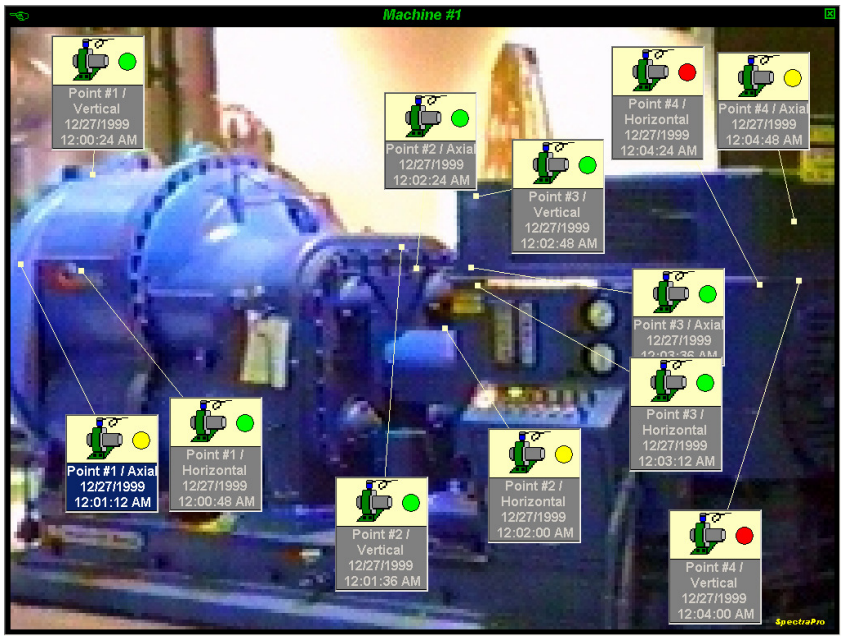
Clicking on a Department icon, the Machine page will be shown.
Clicking on a Machine icon, a Point page will be shown.
Clicking on Point icon a special kind of Quick View will be shown.

This is what the user can see in GraphView mode:

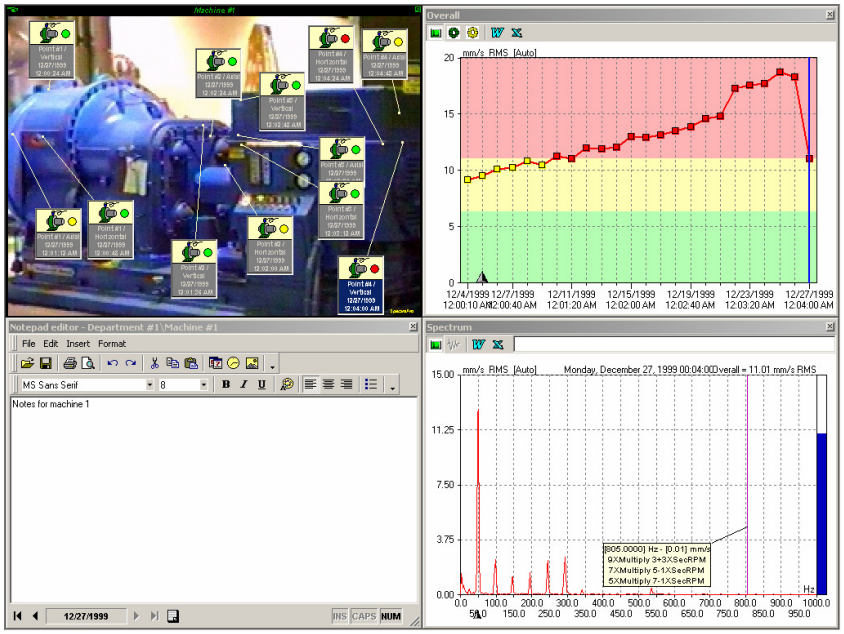
On Department level



On Machine level



On Point level



The number of workstations to show GraphView is unlimited.
Contact VMI AB to obtain GraphView Protection Key.

20. SQL Server Database Manager

If you create database in MSDE database Server, you are not able to make periodically database backup or to delete unused database.

For this reason a simple Database Manager is included in each SpectraPro package.

Run Start > Programs > SpectraPro > MSDE Database manager.

If you have an older SpectraPro installation, the application will not appear as above. In this case, locate the SpectraPro installation directory (in a default installation is *C:\Program Files\SpectraPro* and run manually *DBManager.exe*.

In the left windows all the SpectraPro database are shown.
In the right side are presented some statistics regarding the selected database.

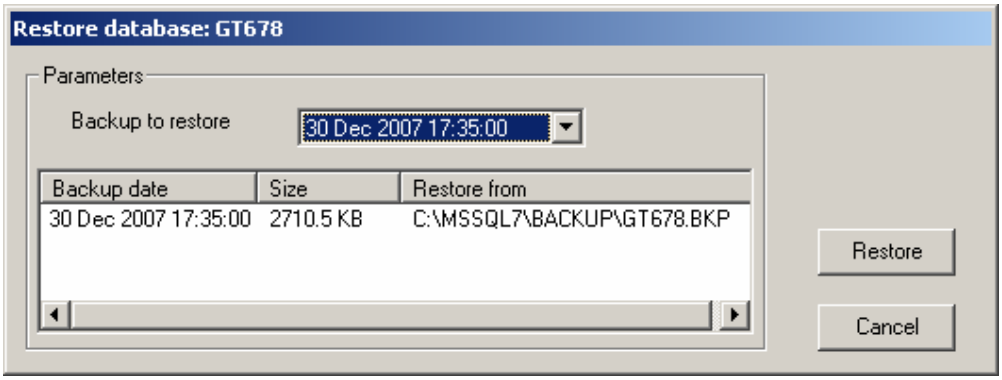
This software is provided "as is it". No any guarantee is provided using this software. Microsoft can provide professional tools for SQL Server maintenance!

You can do the following actions:

- **Register** the selected database into SpectraPro.
- **Remove** the selected database from the SpectraPro registration list
- **Erase** the selected database files. **All the information's will be lost!** No recovery is possible!
- Create a protection backup. To do this press **Backup** button:

Select a directory where the backup copy of the database will be created and press **Backup** button.

- Restore a previous backup of the database. Use **Restore** command:



From the list select a file to be restored (normally the latest backup). Press **Restore** button.

If restore process occur, any information since the last backup will be lost!

- Update the selected database. This action will optimize the size of the database and will re-index the tables. This action will seep-up the access to the database items.
- **Detach** command. This action will detach the database from the MSDE server. After detaching, the database files can be copied and moved in another computer.
- **Connect** command. A detached database can be connected (attached) to another MSDE database.