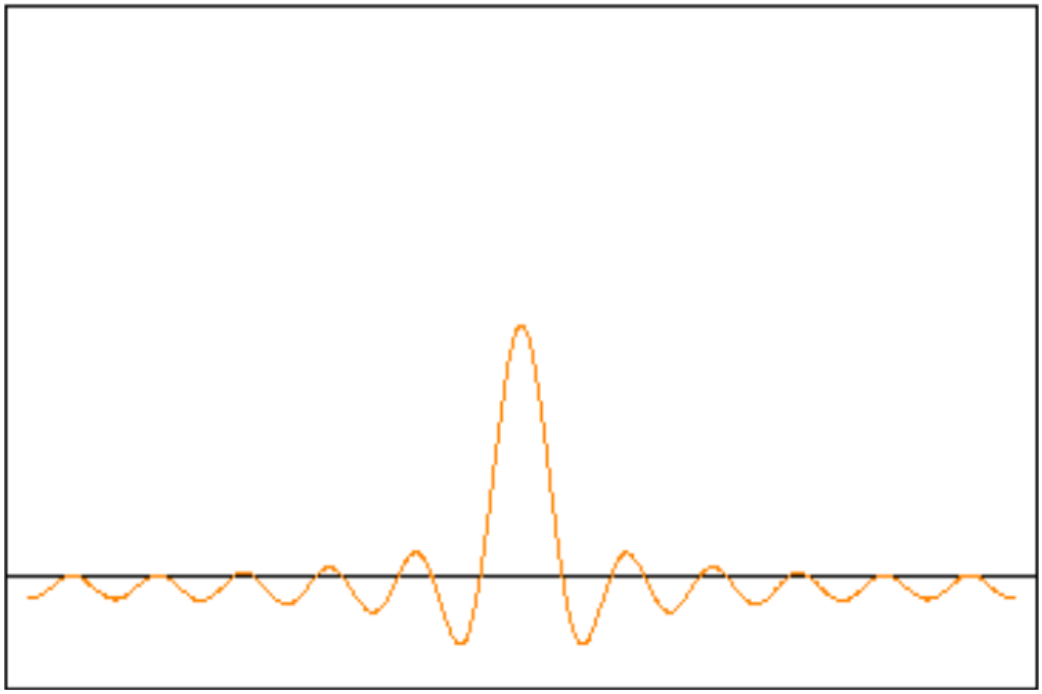
C-Trend II

Powered by C-Trend



The new generation of condition monitoring

User Guide: 2.4

Test Products International (TPI) Europe Ltd

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1 Software – C-Trend II™

Figure 1

This user guide describes the operation of **C-Trend II™** PC-based trending software.

1.1 Installation

1.1.1 SQL Database Server

Upon first activating the **C-Trend II™** software, the user is presented with a screen requiring the installation of SQL Server 2012 Express, which is required for the software to access its associated database (figure 4). The 'Install' button will download a new copy of the SQL server and take the user through the installation procedure. If a copy of SQL Server 2012 Express is already present on the computer, the 'Choose File' option allows this to be selected for installation.

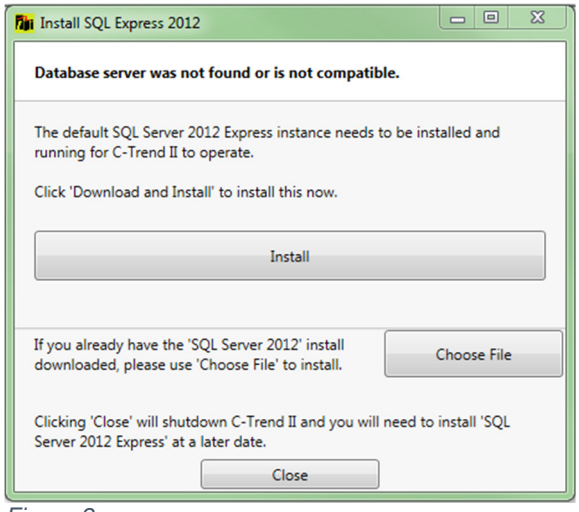


Figure 2

Closing this screen will shut down the **C-Trend II™** application, and the SQL Server installation procedure will need to be run on subsequent start-up before the software can be used.

During SQL installation, the screens shown in Figure 3 to Figure 7 are displayed in turn. No action is required by the user during this process, which will complete automatically.

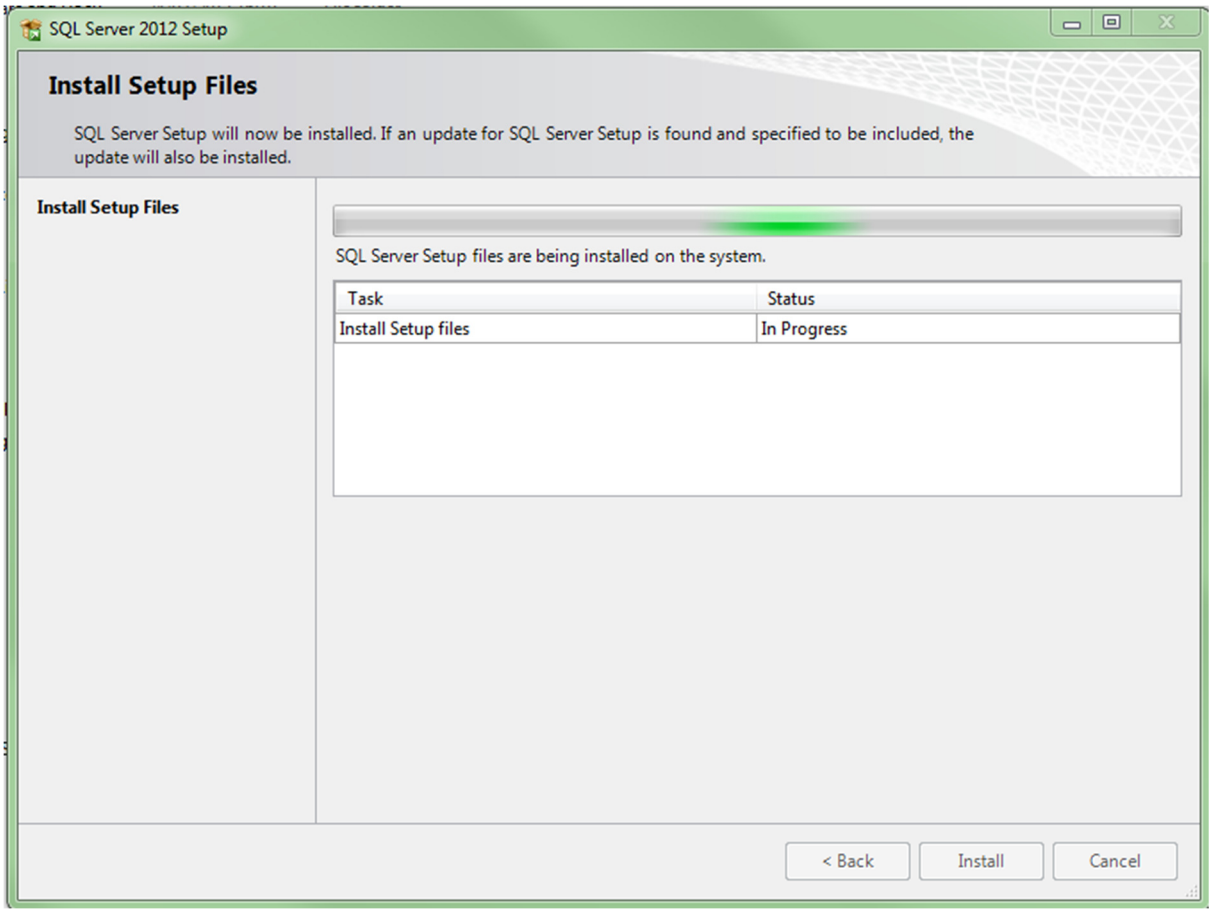


Figure 3

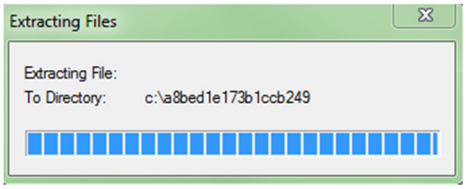


Figure 4

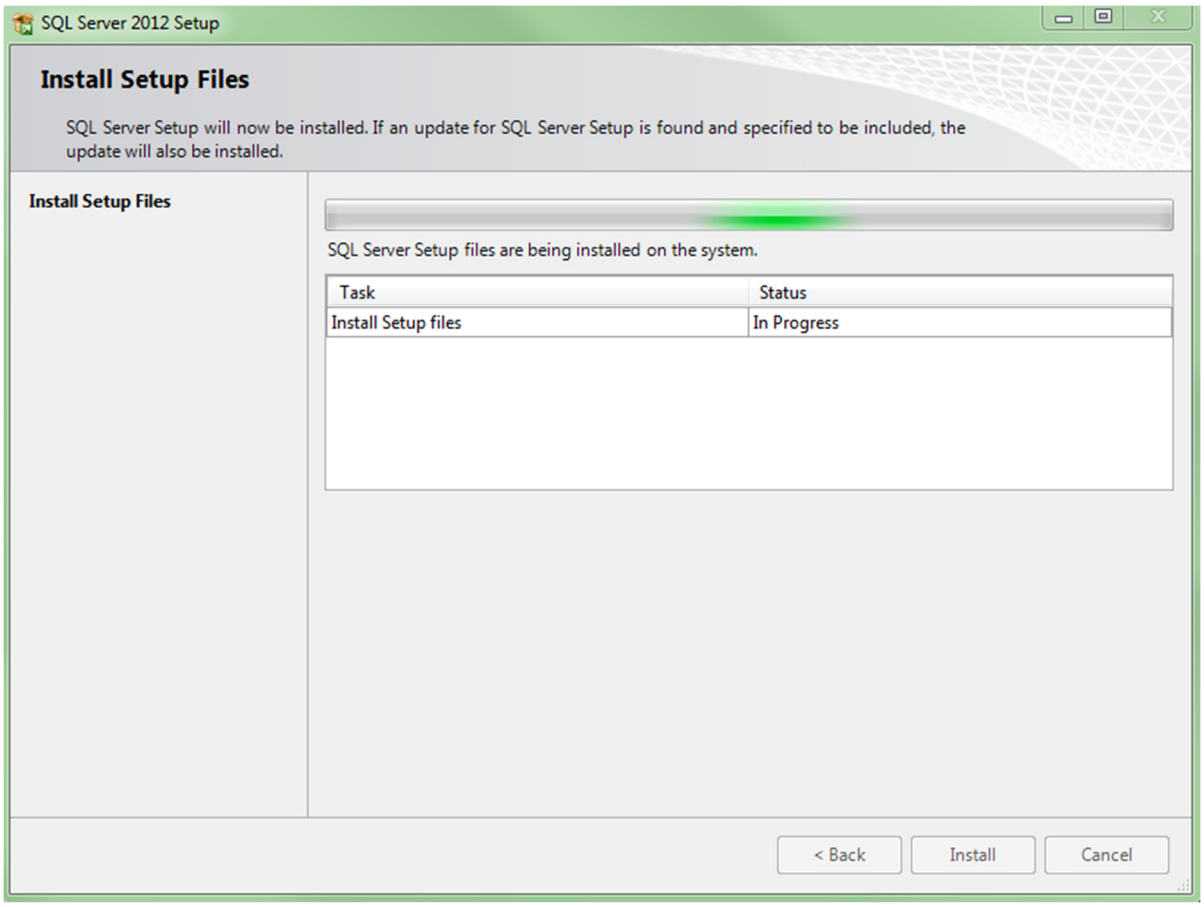


Figure 5

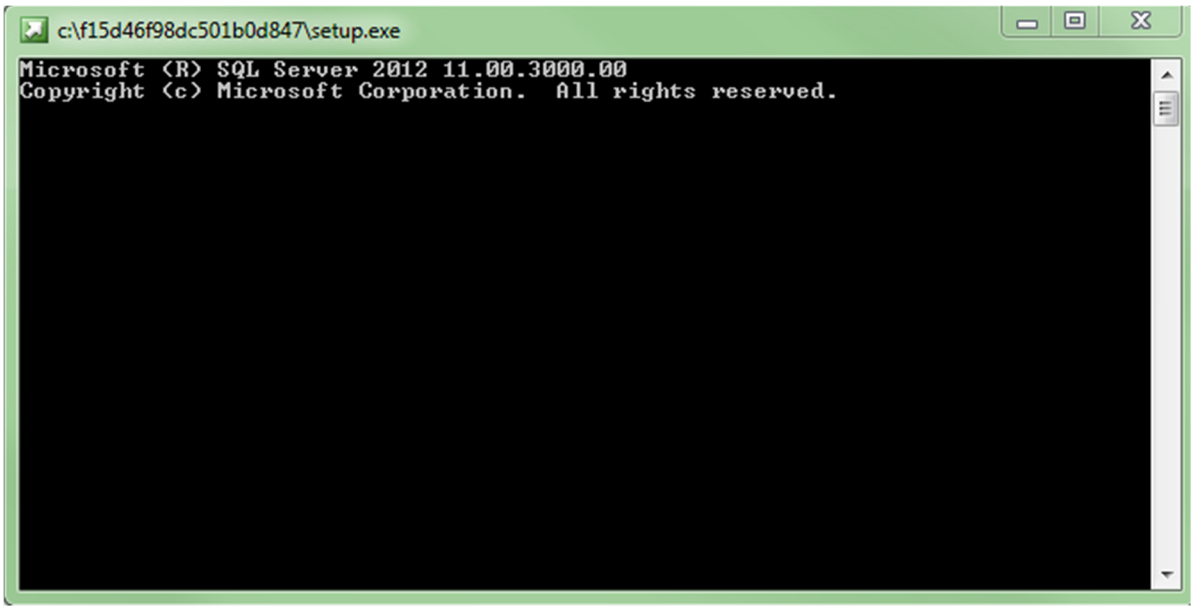


Figure 6

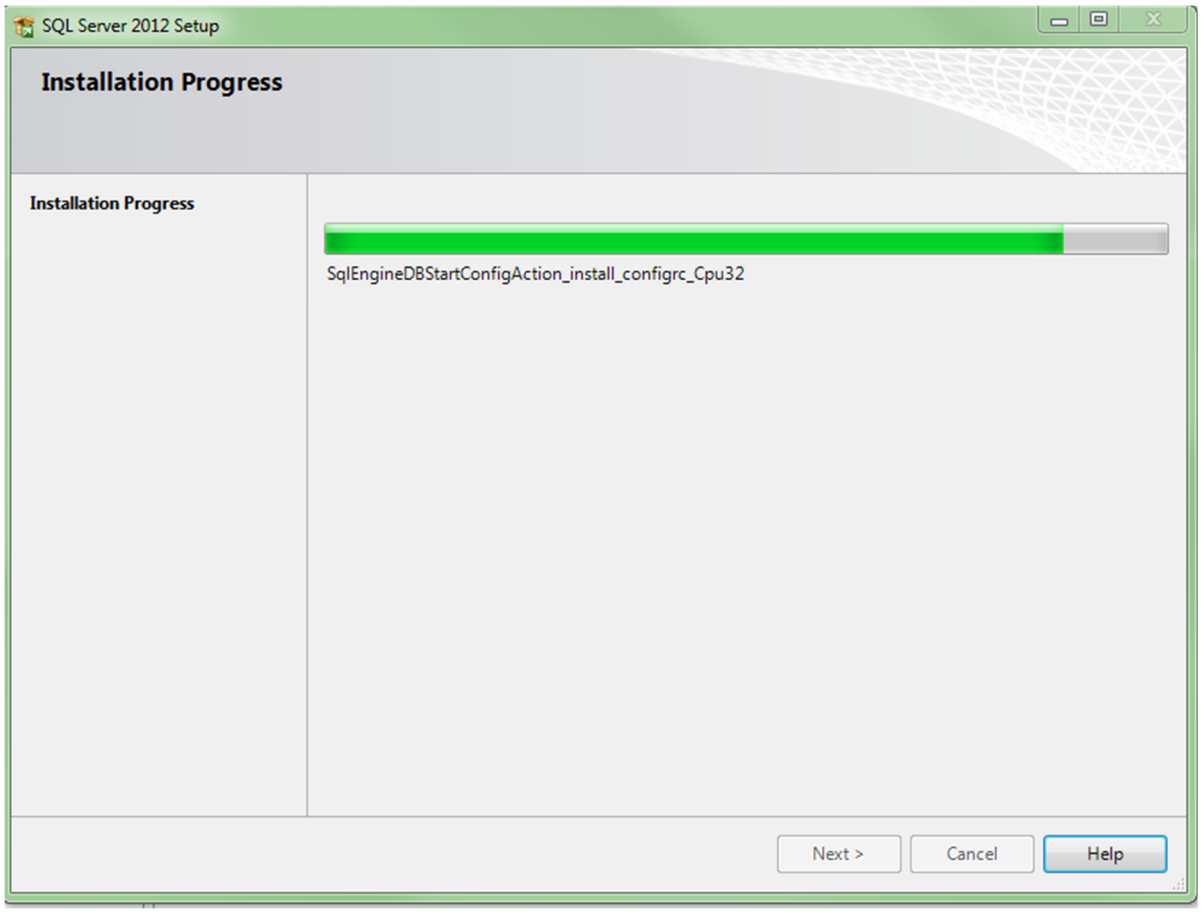

SQL Server 2012 Setup
Installation Progress
Installation Progress
Installation Progress
SqlEngineDBStartConfigAction_install_configrc_Cpu32
Next >
Cancel
Help

Figure 7

1.1.2 Product Activation

After SQL server installation, upon first starting **C-Trend II™**, and periodically (on every fifth restart), the Welcome Screen shown in Figure 8 is displayed. This will continue to occur until an activation key is entered. This screen gives the user the opportunity to activate the Full (Professional) version of the **C-Trend II™**. The alternative is to continue running the more restricted (Standard) version.

Figure 8

Upon electing to activate the Professional version of **C-Trend II™**, the user is invited to enter their Hardware and Unlock Keys to activate **C-Trend II™ Professional** (Figure 9).

Figure 9

If required, these activation keys can be purchased from cbmsales@tpieurope.com (no purchase is required if the user owns a TPI Ultra-II device.)

1.2 Screen Layout and Data Display

Within the **C-Trend II™** screen (Figure 10*),* the left-hand side of the screen, by default, displays the Asset Manager window, showing information for any currently installed plants. Each plant which is set up within the asset will contain a hierarchy of assets (which can include Area, Location, Sub-Location, Machine Train, Machine and Component) culminating in vibration measurement points (at any level from Machine Train down) and inspection measurement points (at any level). The + and – signs to the left of each asset allow the expansion or collapse of a display of that item's subsidiary assets. The Asset Manager window can be resized horizontally, to reveal more or less text, by hovering the mouse 'arrow' cursor over its right hand border until the cursor transforms into a double headed arrow (↔). Holding down the left mouse button will then allow the user to drag this border left and right until the required Asset Manager window size is achieved.

Each asset within the Asset Manager 'tree' is colour coded to indicate the worst status returned for the most recent measurement taken for any point within this asset. (Red/Amber/Green represent Critical/Warning/OK.) The percentage figure displayed to the right of each asset represents the percentage of measurement points within this asset for which the most recently recorded status, whenever this was taken, is OK. Any bracketed figures appearing to the right of this percentage represent the total number of points within the asset for which the current status is either Critical (shown in red), or Warning (amber).

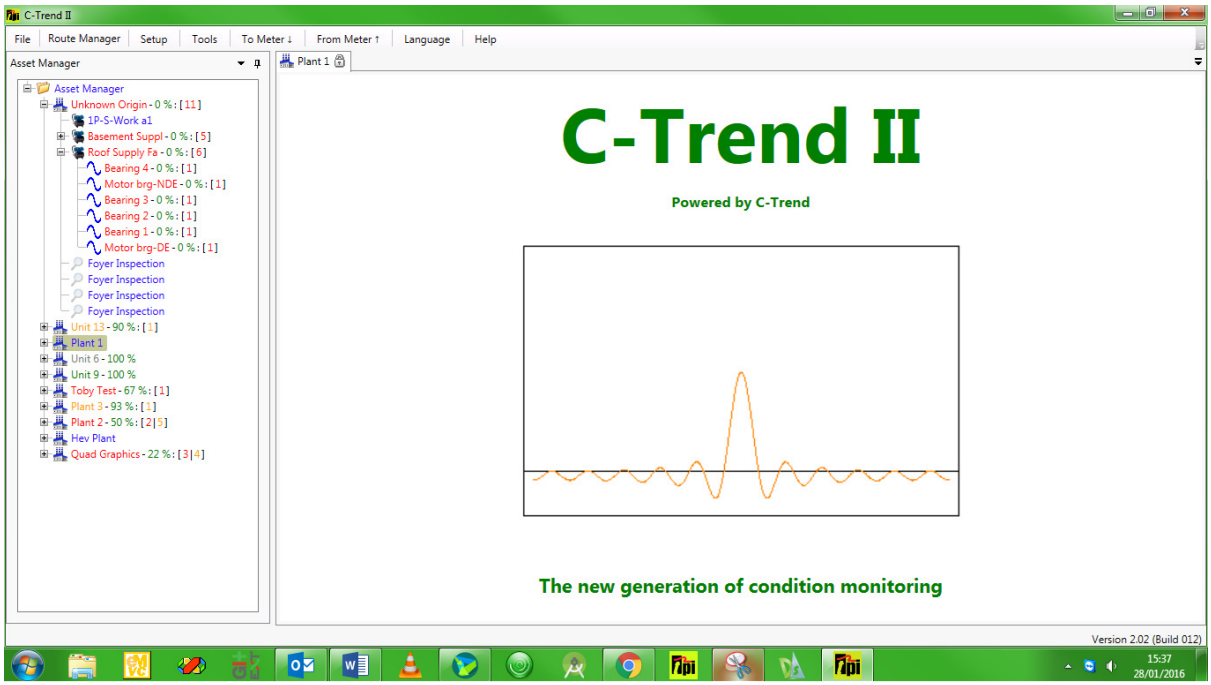


Figure 10

The right-hand side of the screen here shows the default **C-Trend II™** welcome screen, which is displayed on initially accessing the system, and also when any asset is selected for which there is no currently-available data

The user can exit and close **C-Trend II™** by clicking the standard X in the top right corner of this main screen, or by using the 'Esc.' key from any point within the

application. In either case, the exit dialog shown in Figure 11 is displayed to confirm this action.

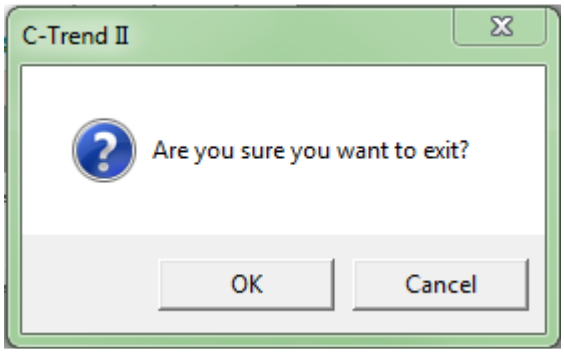


Figure 11

1.2.1 Useful Techniques

1.2.1.1 Zooming

Zooming on any of the graph plots within **C-Trend II™** can be achieved simply by drawing a rectangle from top left to bottom right of the area to be zoomed. This is achieved simply by holding the left mouse button down as the zoom window is dragged.

Double clicking the mouse on the graph will reset the zoom level to the original default value, except in those cases where a plot has 'Scale Lock' as an option in its 'right click' menu, selection of which will override the 'double click' option, locking the display at its 'zoomed in' setting.

1.2.1.2 Window Position

The user can control how subsidiary windows within the **C-Trend II™** system behave, in that they can be allowed to float, hidden, docked or docked as a tabbed window within the Dashboard (see section

1.2.2 Dashboard). This is accomplished by clicking on the small downward-pointing triangle at the top of the window and using the menu options provided. (Figure 12.)

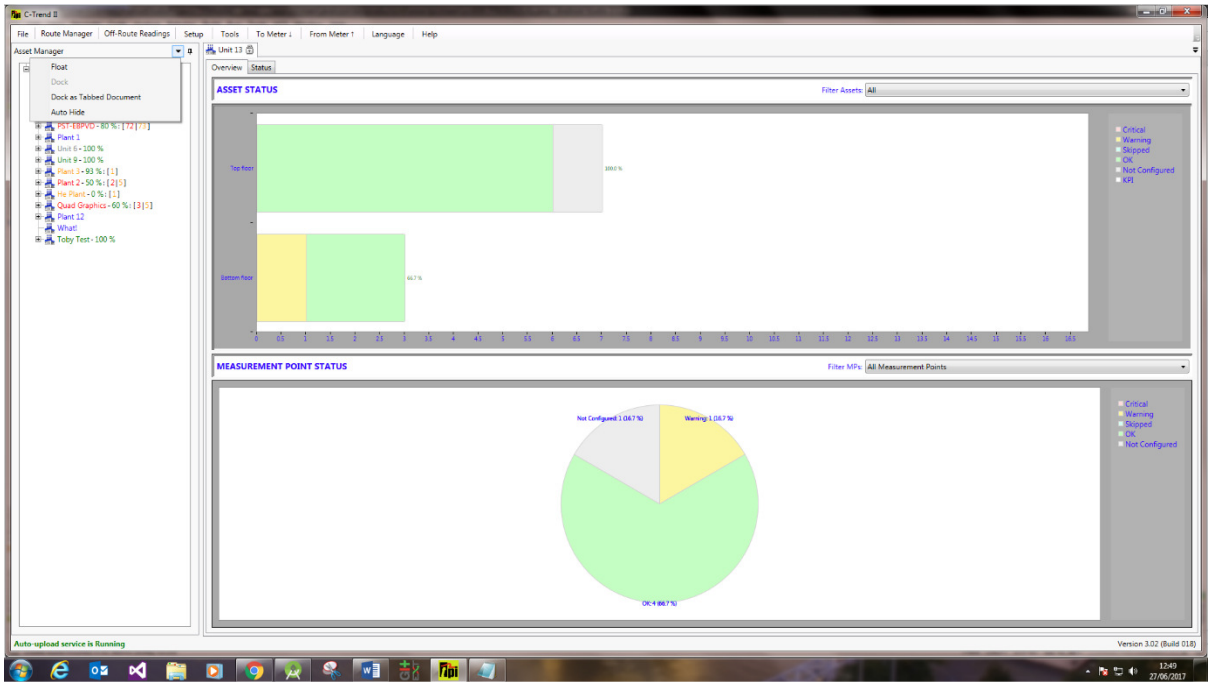


Figure 12

Alternatively, a window can be positioned and docked, by dragging it (using the held-down left mouse button) and positioning the mouse cursor over the appropriate portion of the 'guide diamond', which will appear on-screen as the window, is dragged. The area into which the window will dock will be highlighted, and releasing the mouse button will allow it to dock into this position. (Figure 13.)

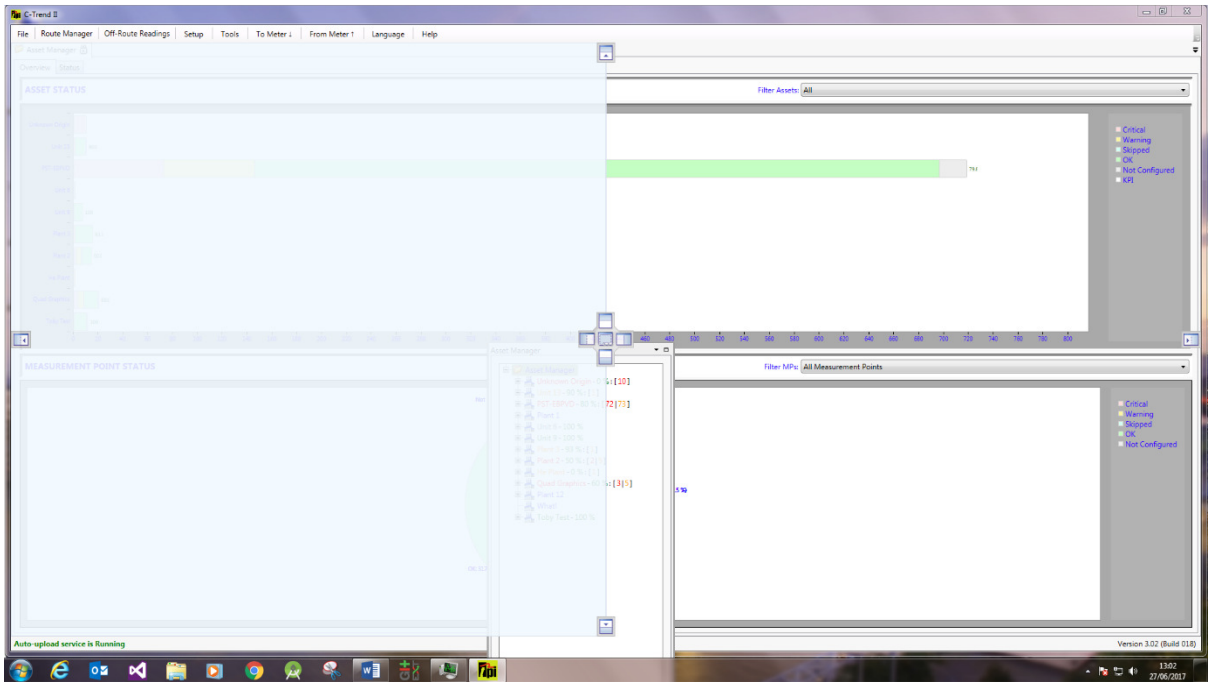


Figure 13

1.2.2 Dashboard

Left clicking (single click of left hand mouse button) on the name of any item within the Asset Manager screen, apart from an individual inspection point or vibration point (dealt with in section 1.2.3 Measurement Point Data Display), opens up the Dashboard to the right of the Asset Manager window. (Left clicking while holding down the keyboard 'Ctrl' key will concurrently open a separate Dashboard window for each additional selected asset. This window can be "dragged and dropped" to the desired screen position. For each selected asset, this dashboard has two tabs, labelled 'Overview' and 'Status'.

1.2.2.1 Overview

The Overview tab displays data in the format shown (Figure 14). This gives a graphically presented, at-a-glance, picture of the status of this asset, incorporating the relevant data from all its constituent assets.

Figure 14

The upper portion of the Dashboard displays the current status of the 'child' Assets of the one currently selected, either "All" or according to Asset Type, as selected by the user. The data is represented according to status, using the standard C-Trend II™ colour-coding system, described in Section 1.2.2.2 Status

The lower portion of the Dashboard shows the statuses of measurement points contained within the selected Asset. The user can select all measurement points, Vibration Points only or Inspection Points only.

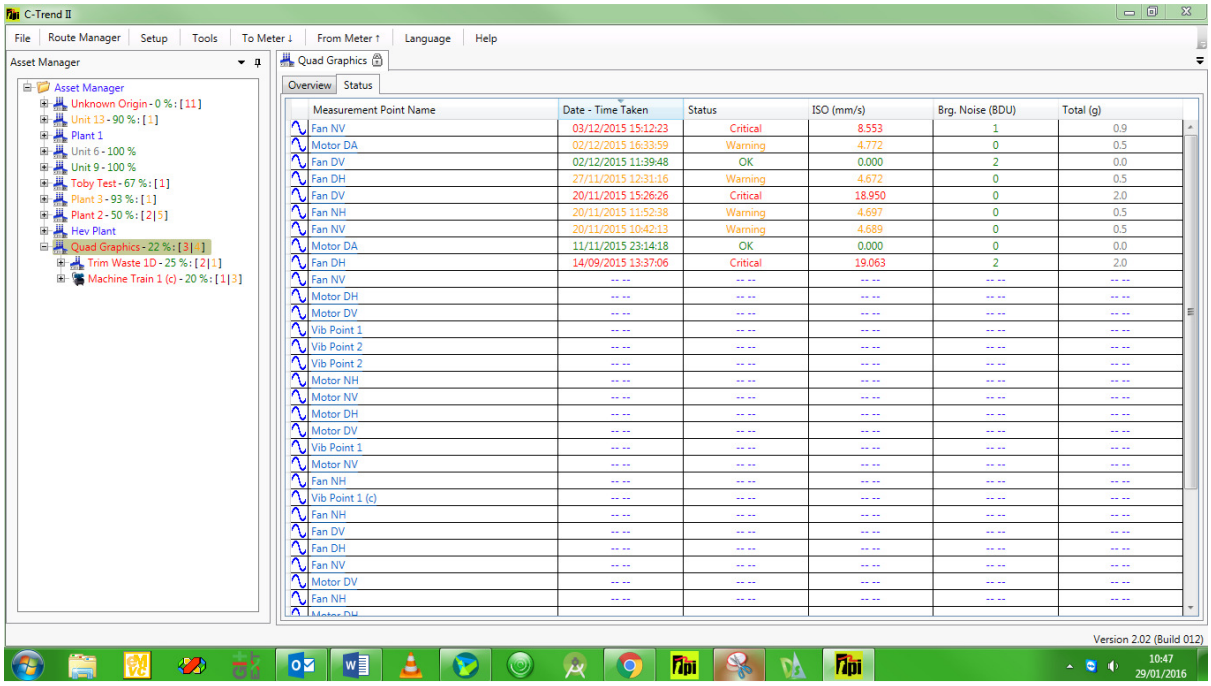


Figure 15

The Status tab within the Dashboard window displays detailed data for the most recent reading taken at each measurement point within the selected asset (Figure 15). The display has columns for the measurement point's name, the date and time of the latest reading and its most recent status, together with values showing the latest data for up to three vibration criteria, selected in the "Latest Status Display" section (See 1.8.3.6 Latest Status Display). By clicking on the heading of any column the user can choose to display the table sorted on that value, either ascending or descending.

1.2.3 Measurement Point Data Display

Clicking on an individual measurement point within this window, or within the Asset Manager window on the left of the screen, will display a trend plot and additional data, specific to the type of measurement point selected as described in the following sections.

1.2.3.1 Vibration Point Data Display

For a vibration point, the top half of the screen will, by default, display a data trend chart corresponding to the option which has been selected from the menu tab at the top of the screen. The lower portion of the vibration point data display screen displays a frequency (FFT) plot for the selected vibration point (Figure 16). The units displayed on the two charts are dictated by the parameters set up for the machine train. The user can also elect to show or hide the trend plot and/or the frequency plot by selecting from the two buttons to the right of the display.

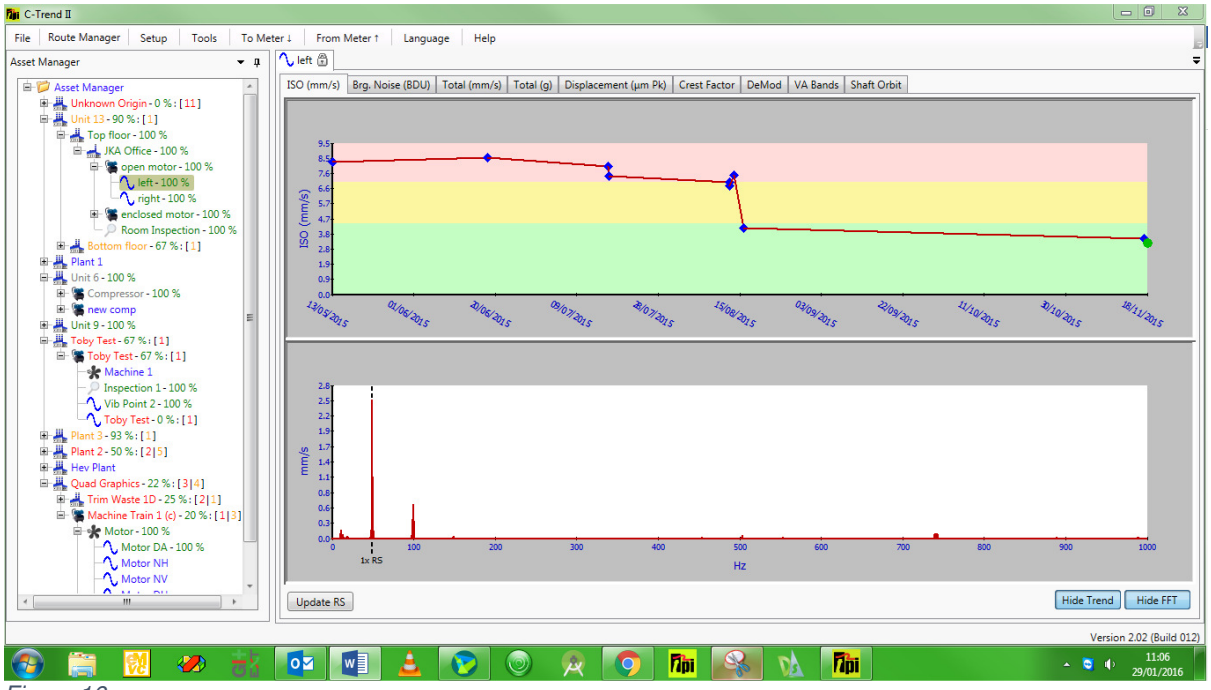


Figure 16

1.2.3.1.1 Vibration point trend chart

Positioning the cursor over a reading on the trend plots will cause a box to appear that contains the exact value of the measurement, the date and time the reading was taken. The alarm levels are shown as a colour-coded background to the graph in red, yellow and green, corresponding to Critical, Warning and OK.

1.2.3.1.2 Vibration point FFT chart

On initial display, the FFT plot shows the data for the most recent reading at this point. An FFT plot for any reading taken at a different date or time can be displayed simply by clicking on the required marker on the associated trend plot with the mouse. This will cause the trend plot marker for that measurement to change from a blue diamond to a green circle and the corresponding FFT plot to appear in the bottom half of the screen.

If it has been set, the running speed of the asset appears on the FFT as a vertical black dashed line. The “Update RS” button in the bottom left corner of the dashboard displays a larger-scale copy of the FFT plot, giving the user the opportunity to adjust the run-speed setting for this vibration point (Figure 17).

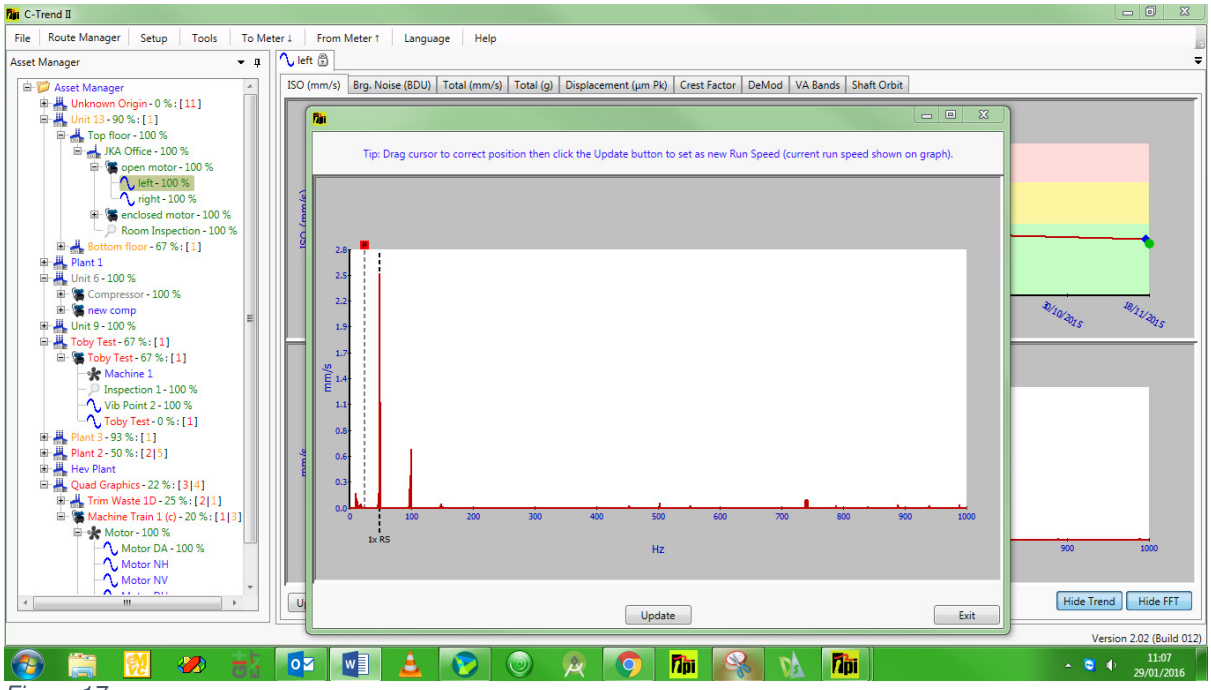


Figure 17

A right mouse-click anywhere on the FFT plot displays a menu offering the user a number of additional diagnostic tools (Figure 18).

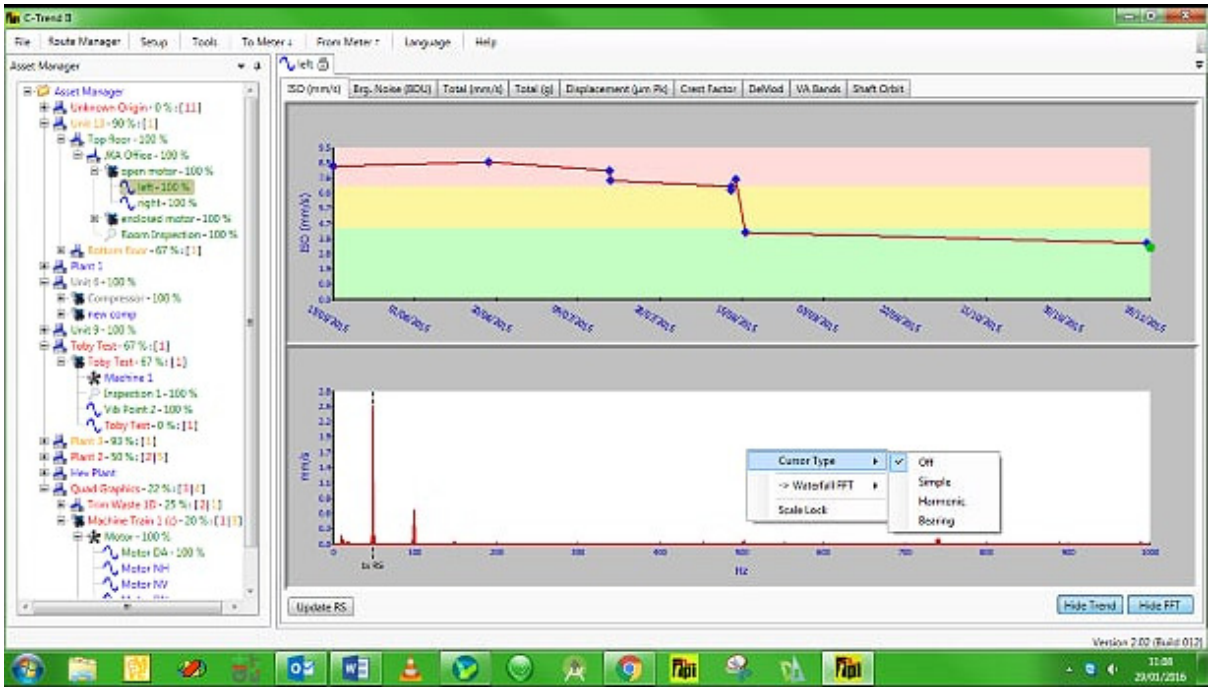


Figure 18

1.2.3.1.2.1 Cursor Type

When initially displayed, the FFT plot for a vibration plot appears with Cursor Type set by default to ‘Off’, which is as displayed (Figure 18).

1.2.3.1.2.1.1 Simple Cursor

Selecting ‘Simple’ displays a cursor () Figure 19which is initially located at the asset’s highest displayed frequency. The intersecting grey dotted lines on the plot show the precise vibration reading at this frequency.

By clicking and holding down the left mouse button on the cursor control (the red square containing a black ‘P’ at the top of the plot), the cursor can be moved left and right through the frequency spectrum, to select points of interest for analysis. This functionality can be used, particularly in conjunction with the Zoom function, to precisely identify the magnitude and associated frequency of any point on the FFT plot (Figure 20).

When any cursor has been selected, its current position is displayed in a repositionable and resizable window, initially positioned below the Asset manager tree.

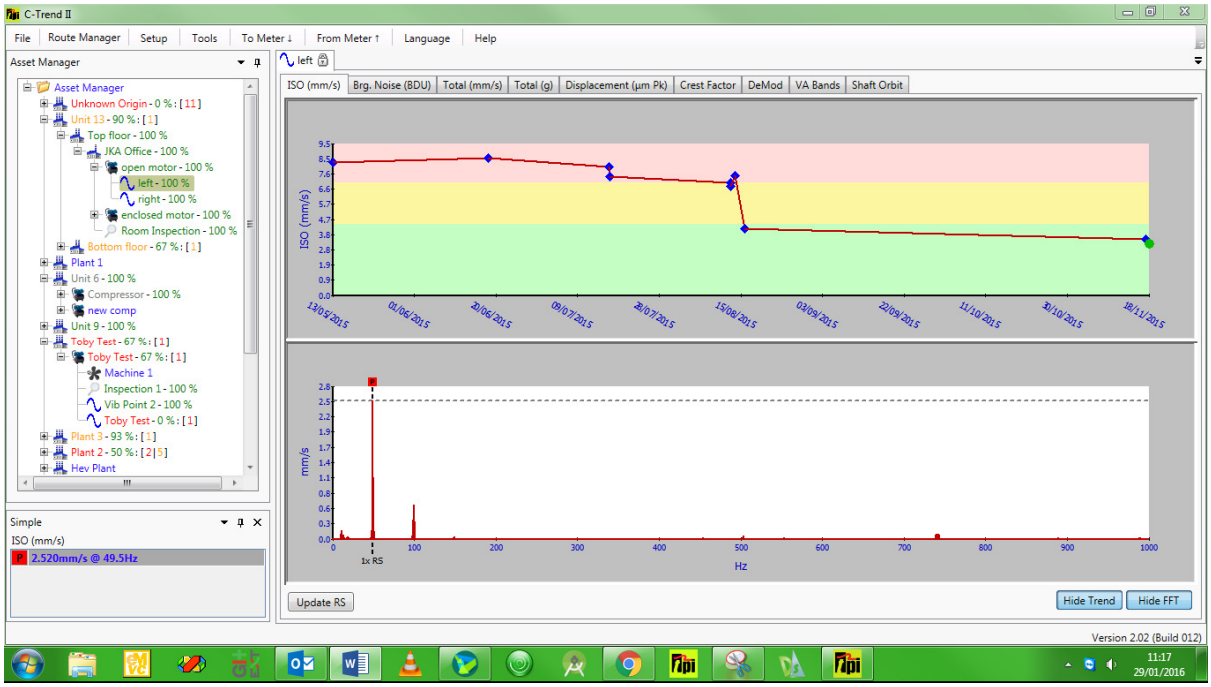


Figure 19

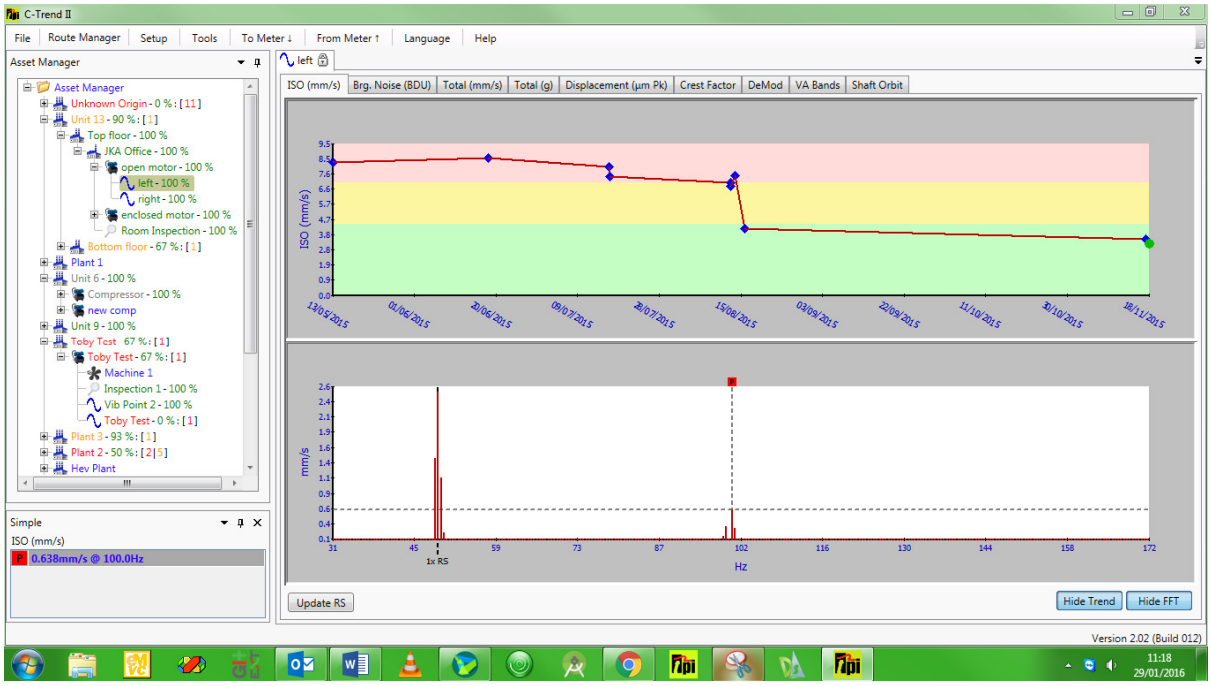


Figure 20

1.2.3.1.2.1.2 Harmonic Cursors

Another very powerful technique for fault-finding is the use of harmonic cursors. These can be an enormous help in identifying vibration frequency components which are multiples of other frequencies, such as the asset's running speed. Upon selecting harmonic cursors, the Fundamental harmonic cursor is initially shown at the far right of the displayed frequency spectrum. The user then moves this to the selected 'base frequency', which is typically, but not always, the asset's running speed. Selecting "Add harmonic" from the menu adds a second cursor, at a frequency of 'base x2'. Further harmonics up to 'base x8' can be sequentially added as required (Figure 21).

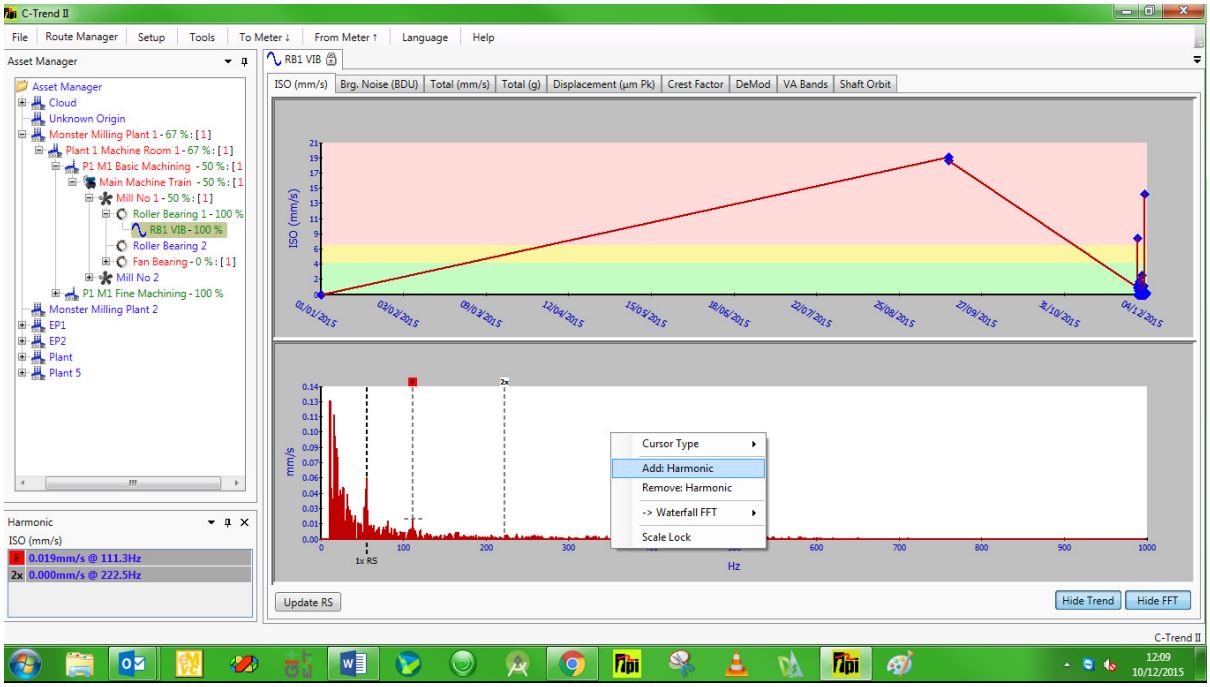


Figure 21

Adjustments to the position of any of the cursors can be made by clicking on a cursor and dragging it with the mouse, or by clicking on it (so that the top of the cursor turns red) and then positioning it with the PC keyboards arrow keys. Whenever any cursor is moved, the other cursors will move with it, maintaining the harmonic series ratio (x1, x2, x3, etc.) A window is also displayed showing the current values corresponding to each active harmonic cursor.

Where the series of harmonic cursors forms a good fit with the peak values of the FFT spectrum, it is indicative of a harmonic component in the measured vibration.

1.2.3.1.2.2 Waterfall FFT

The Waterfall FFT option from this menu allows the user to evaluate the FFT plot for this vibration point by comparison against either historic data for the same vibration point, or the FFT plots for all other vibration points currently open on the system (Figure 22).

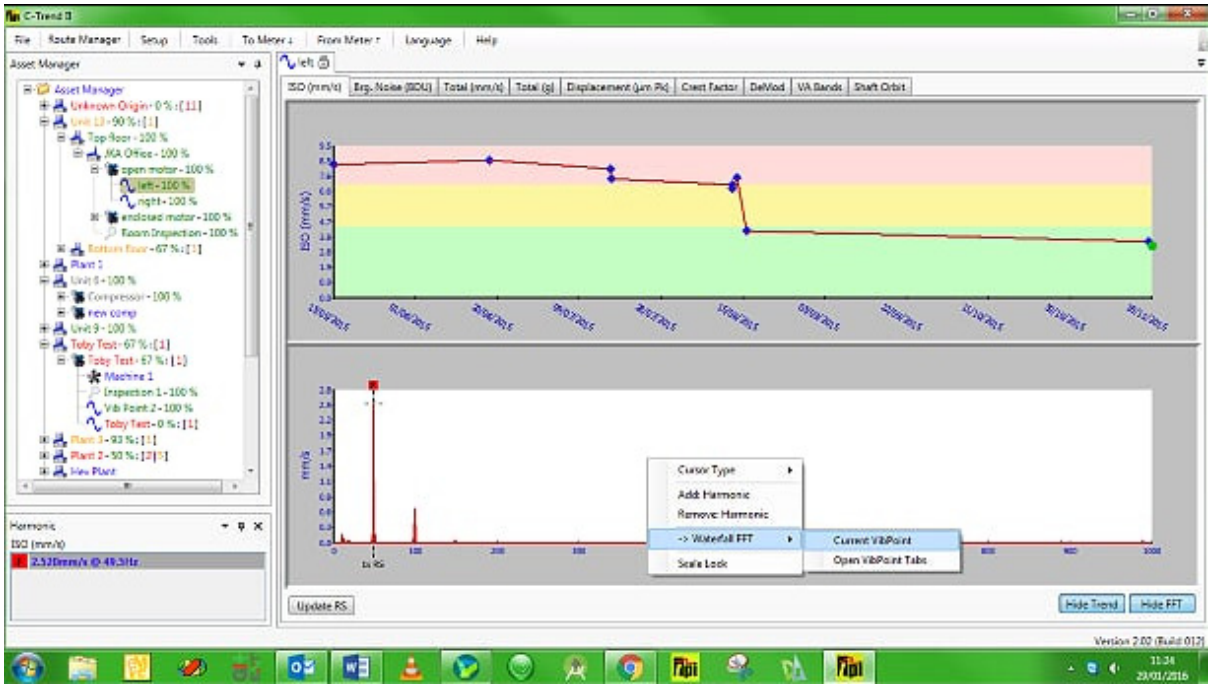


Figure 22

1.2.3.1.2.2.1 Current vibration point

When this option is selected, the user can add historic FFT plots for the currently selected vibration point simply by clicking the left mouse button on the required point on the trend plot in the top part of the screen.

In this instance the blue diamond in the trend plot changes into a circle, colour-coded to match the corresponding plot, which now appears in the FFT window (Figure 23**Error! Reference source not found.**). Additional plots (up to a maximum of ten) can be added to the waterfall in the same way, always appearing in chronological order, with the most recent at the front. This allows the visual identification of anomalies or trends which may not otherwise be apparent. The view of the waterfall plot can also be swivelled horizontally using the computer keyboard left and right arrow keys, with the Ctrl key held down.

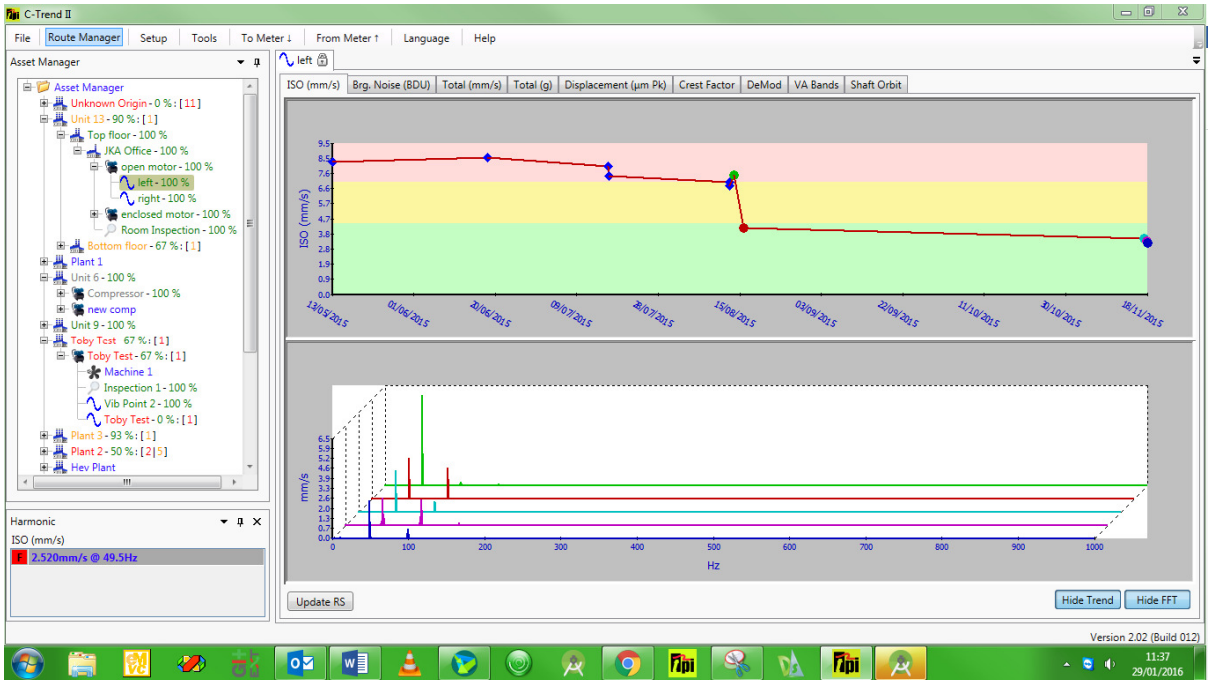


Figure 23

1.2.3.1.2.2.2 Open vibration point tabs

This option opens a waterfall FFT plot in a separate window. This includes the FFT plot for the currently selected measurement, together with one for the selected measurement for each vibration point with a currently open dashboard tab. The FFT plots are again colour coded, this time to match the text in the dashboard tab for each vibration point. The individual plots appear in the waterfall in tab *order* (Figure 24).

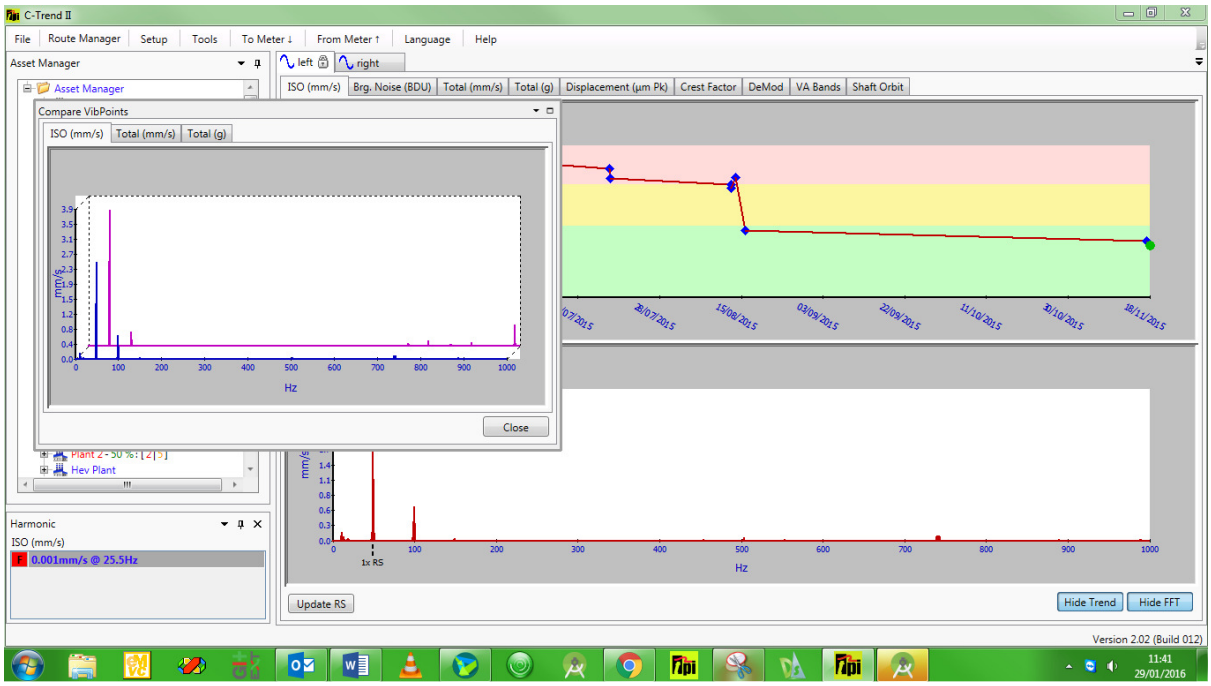


Figure 24

1.2.3.1.3 Bearing Noise Analysis

Selecting the Bearing Cursor option allows the user to examine bearing wear for this vibration point, by comparison of the measured vibration against the known characteristics of the type of bearing in use. Each vibration point can be linked within **C-Trend II™** to a comprehensive database of bearing types (sections 1.4.1 Adding/Editing a vibration point & 1.6.2.1 Exception Report).
The Bearing Noise plot displays a fundamental cursor, which should be positioned at the run speed (R). If a bearing type has been linked to this vibration point, four additional cursors appear, at multiples of the fundamental which are defined in the database as representing wear to each of: **the rolling element (RE), the bearing cage (CG), the inner race (IR) and the outer race (OR)** for this type.

The fundamental cursor can be moved by the user, to align with a selected point on the frequency (FFT) plot, which will typically be typically a peak representing the true run-speed, where this differs from the nominal speed. The bearing-noise cursors will move in conjunction with the fundamental, maintaining the ratios defined in the database, thus allowing peak vibrations matching the selected criteria to be identified.

For more detailed examination, harmonic cursors can be added to the plot by choosing “Add Harmonic” on the right-click menu. This will incrementally display up to eight harmonic cursors, at integer multiples of the cursor values for the four types of wear.

An example of a plot with bearing cursors enabled, is given in Figure 25.

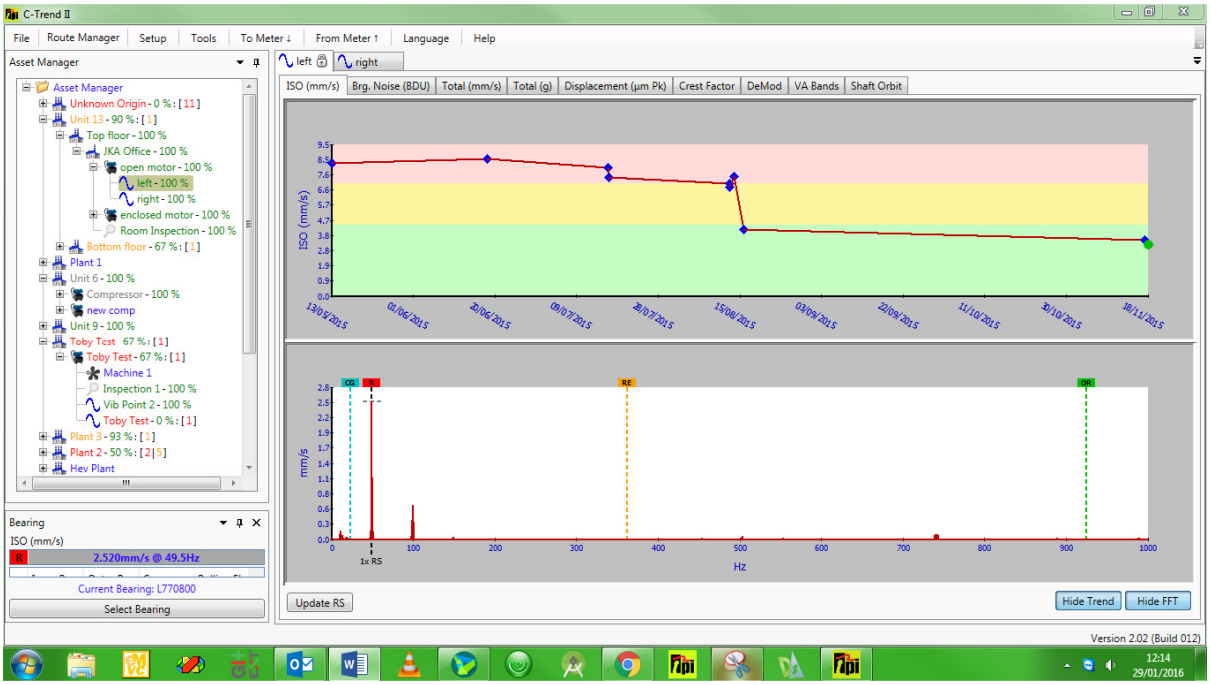


Figure 25

1.2.3.2 Inspection point data display

Where the selected measurement point is an inspection point, the top portion of the screen again displays a trend graph for the status of this point, plotted over the familiar Green, Amber and Red alarm bands (Figure 26).

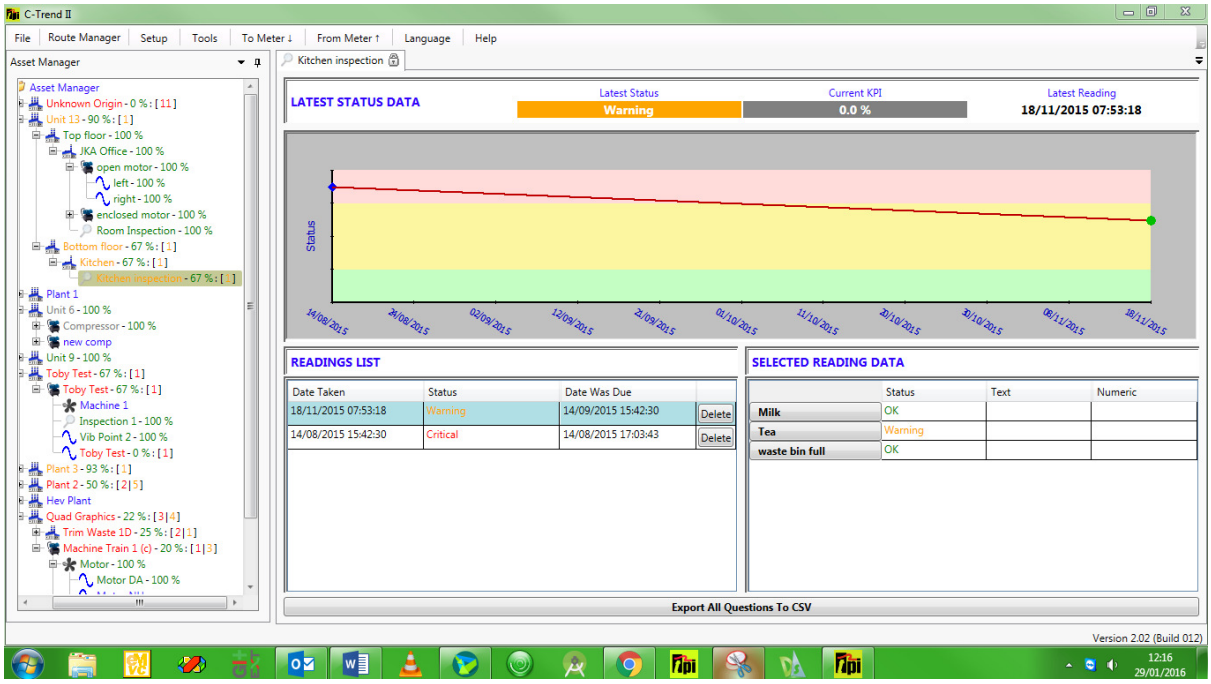


Figure 26

The lower portion of the window, in this instance, is split vertically into two sections. On the left is chronological list of readings for this point (oldest first). This displays the date and time when the reading was taken, the reading's status and the date upon which it was scheduled to be taken, to indicate whether it was early, on time or late. A button is provided, to the right of each reading's details, giving the option to delete the reading. (This can also be accomplished by 'right-clicking' the selected reading's plot-point on the trend graph above.)

Viewing and selecting the data for a specific reading is achieved exactly as described for vibration points.

The lower right quarter of the screen holds the status responses to the questions specified for any selected reading. Each question is presented as a button, selection of which gives access to historic analysis of that individual question (see

1.2***.3.2.1 Inspection point question data display***).

All the reading data for this Inspection Point can be exported to a comma separated file (CSV) for external analysis, using the ‘Export All Questions to CSV’ button at the bottom of this screen.

1.2.3.2.1 Inspection point question data display

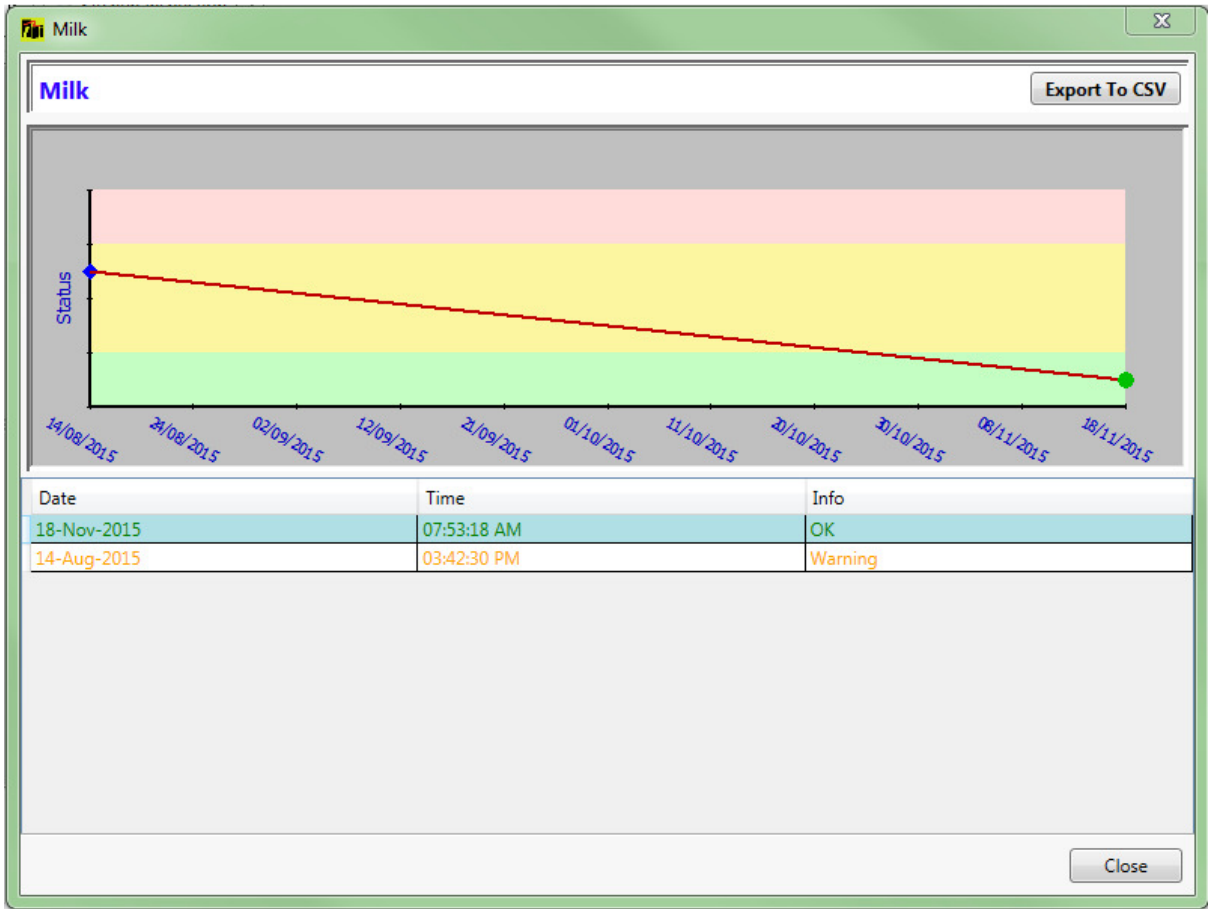


Figure 27

Selecting a question within an inspection point displays a plot of statuses returned for this question over time (Figure 27). This data can be exported to a comma-separated file (CSV) using the button in the top right-hand corner.

1.3 Asset Addition/Editing/Deletion

Right clicking the mouse on the name of any asset within the Asset Manager menu, in addition to showing the dashboard for this asset, displays a menu of the available edit options (Figure 28).

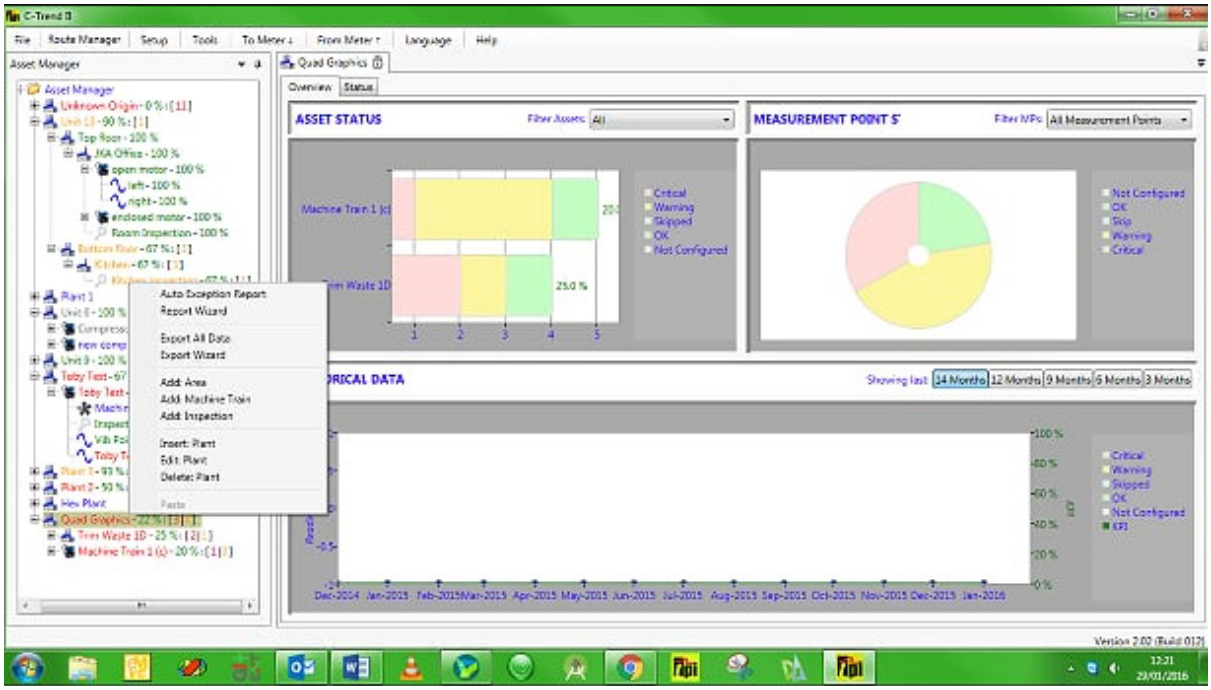


Figure 28

The first two items, Auto Exception Report and Report Wizard are covered later, in Section 1.6 Reporting**.**

The third and fourth items: 'Export All Data' and 'Export Wizard' are covered in Section 1.7 Data Import/Export.

The remaining options allow:

The addition of additional subsidiary assets within this one.
The insertion of an additional asset at the same level in the hierarchy as this one.
Editing of the data held to define and describe this particular asset.
Deletion of this asset from the system.

A particularly useful feature is the ability to add email addresses to each asset. This allows emails to be automatically issued to all relevant and responsible parties, immediately upon **C-Trend II™** encountering any warnings and alarms when readings are uploaded.

The criticality of any asset on the system can be individually set through this screen, or, below plant level, it can be defaulted to inherit from its parent asset.

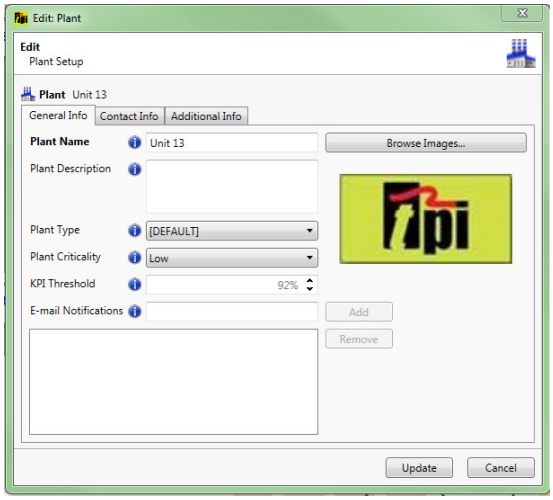


Figure 29

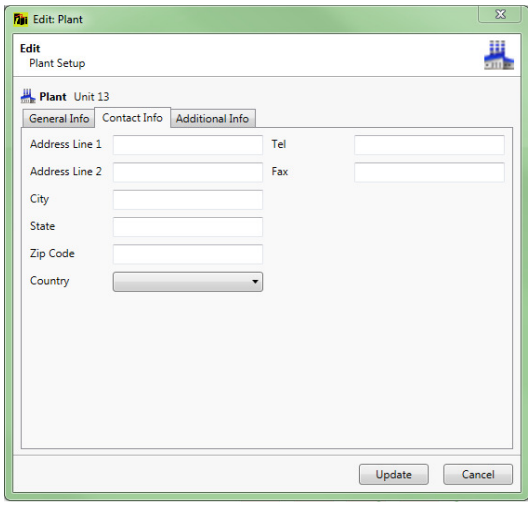


Figure 30

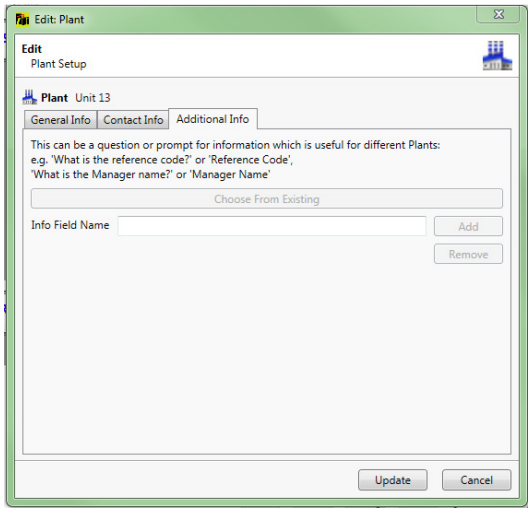


Figure 31

(Figure 29,Figure 30 and Figure 31) illustrate the ‘General Info’, ‘Contact Details’ and ‘Additional Info’ tabs within the ‘Edit’ in the case where the asset is a Plant.

Other asset types, (with the exception of 'Machine Train', discussed in section 1.3.1 Machine Train addition/editing and deletion), are treated in a similar manner, except that 'Contact Details' is not offered as an option, and the 'General Info' screen is as shown in Figure 32.

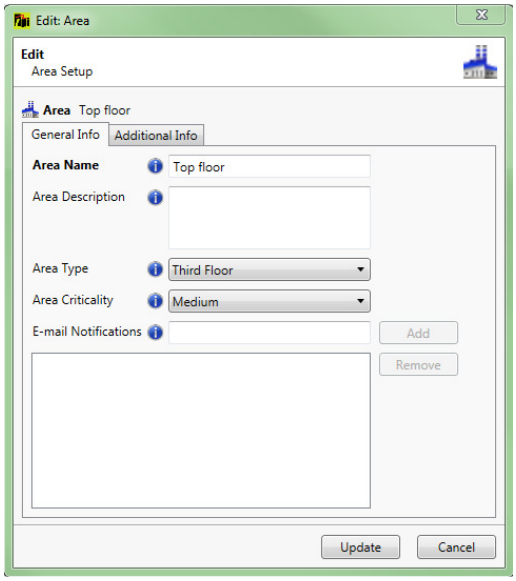


Figure 32

1.3.1 Machine Train addition/editing and deletion

This is special case of asset maintenance. Default parameters can be set at this level for all machines within the train. There is a "Setup" tab (shown in Figure 33, giving access to the screen in Figure 34. This allows default units, run speed etc. to be set on the dashboards of all vibration points within this machine train.

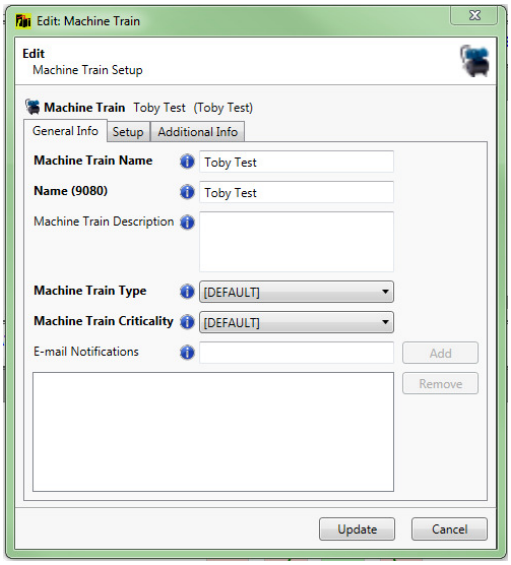


Figure 33

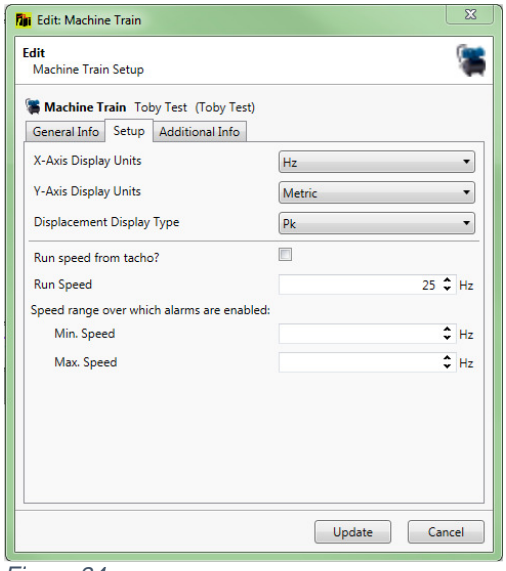


Figure 34

1.4 Measurement point addition/editing and deletion

In the same way that right-clicking on any asset presents the user with add, delete and edit options, the same is true of measurement points. The specific activities associated with the options for a vibration point and an inspection point are demonstrated in sections 1.4.1 Adding/Editing a vibration point and 1.4.2 Adding/Editing an Inspection point below.

1.4.1 Adding/Editing a vibration point

The vibration point add/edit options display four tabbed windows (Figure 35).

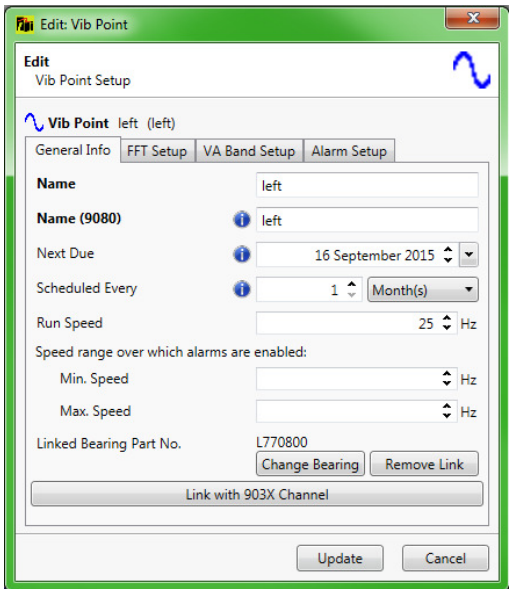


Figure 35

The first tab (Figure 35) allows the maintenance of general information for this vibration point.

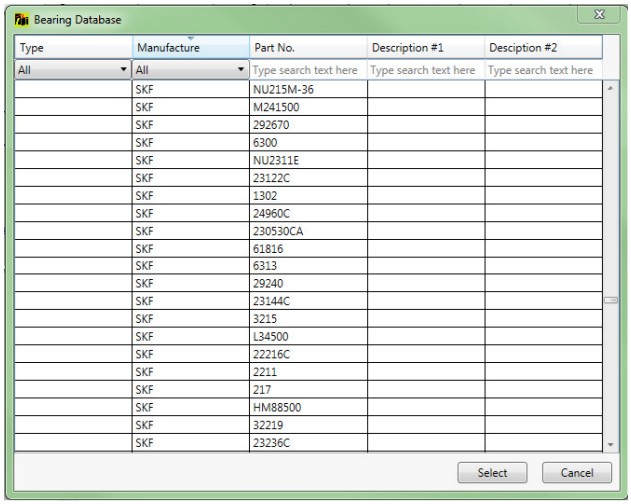


Figure 36

The Link/Change Bearing Button uses bearing part numbers from the bearings database (Figure 36).

This database is searchable on any or all of: type, manufacturer, part number and two search text fields. Selecting an entry from the database will link this bearing type to the vibration point, allowing detailed bearing noise analysis (see section

1.2.3.1.3 Bearing Noise Analysis).

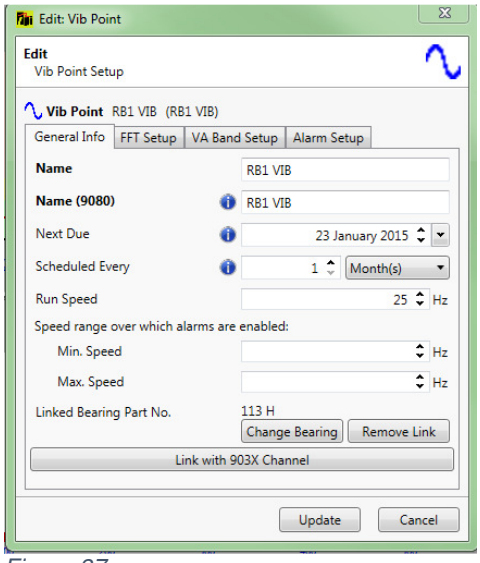


Figure 37

Editing a Vibration Point which already has a Bearing link established gives the option to remove the link.

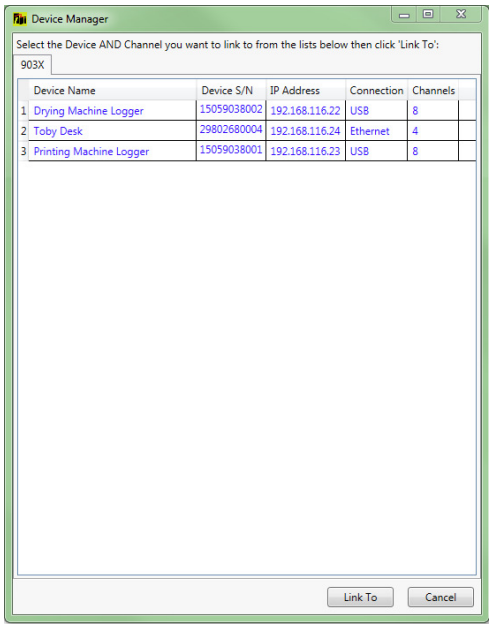


Figure 38

The “Link with 903X From Channel” button across the lower part of the screen **(which is visible only when C-Trend II™ Professional has been activated)** allows a fixed link to be established between this vibration point and a designated monitoring channel on a specified TPI903X (i.e. TPI9034 or TPI9038) Smart Vibration Monitor unit.

Upon selection of this option, the user is presented with a list of currently available 903X monitors. If it is necessary to add monitors to the list, the “Import Device Settings from File” button within 1.8.3.8 Device Manager can be used to locate the appropriate file (extension .ob1), which must have been generated by the TPI903X

software, to import the device details. Selection of the desired monitor will then display its channels. Those shown in green are already assigned – clicking any that are shown in red, followed by “OK” will link this vibration point to that monitor channel.

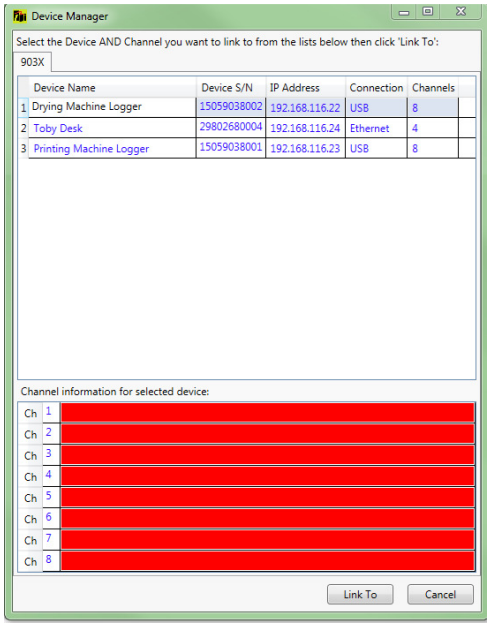


Figure 39

The second tab (Figure 40) handles the set-up of the frequency analysis (FFT) parameters for this vibration point.

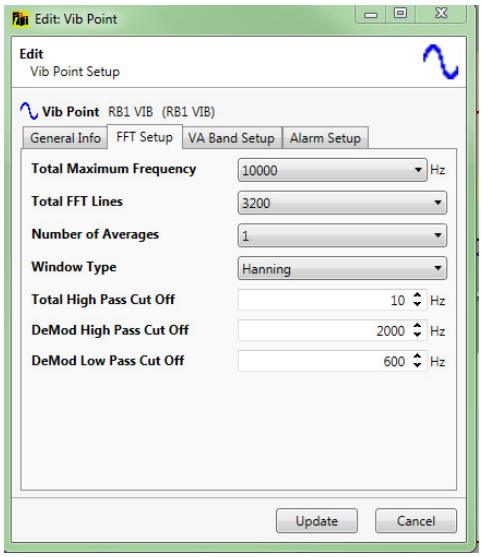


Figure 40

The third, VA (Vibration Analysis) band editor tab (Figure 41) allows for the specification of particular frequency bands for different potential problem types, tailored to the known characteristics of this vibration point, thus allowing for accurate diagnostics.

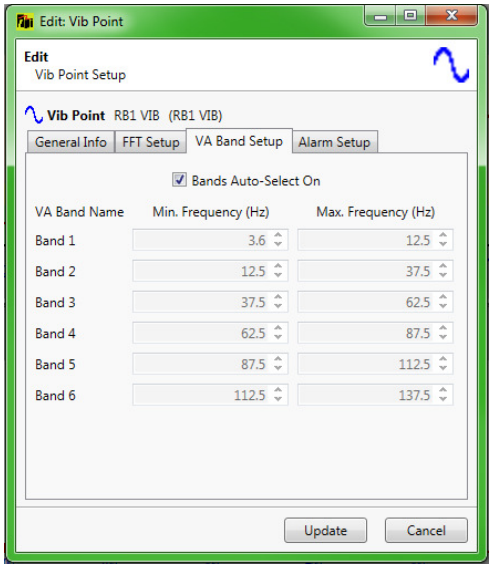


Figure 41

The alarm setup window for vibration point editing allows the activation and deactivation, plus the setting of alarm criteria, for a range of alarm types. In this instance (Figure 42), the screen is showing ISO, BDU (Bearing Damage Unit) and displacement alarms.

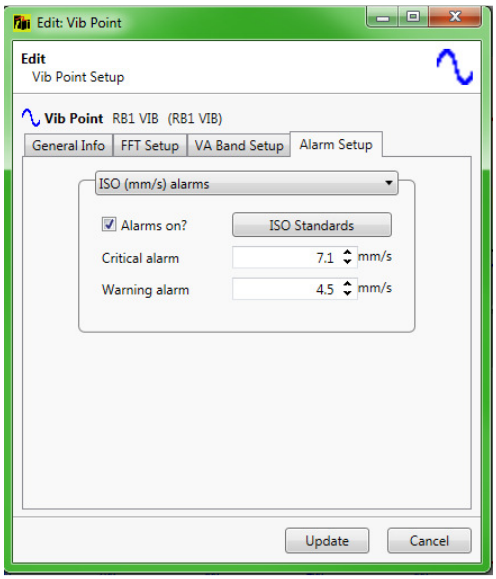


Figure 42

The ISO Standards button allows the selection of the appropriate ISO alarm levels for this situation from the ISO Standards machine groups window)

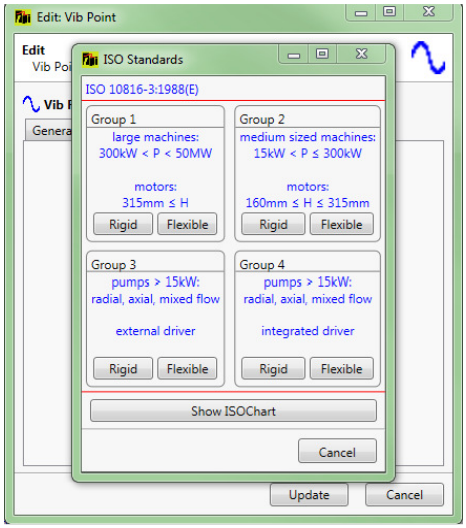


Figure 43

The Show ISO Chart button within the ISO Standards machine groups window displays the standard ISO machine-type recommendations (Figure 44).

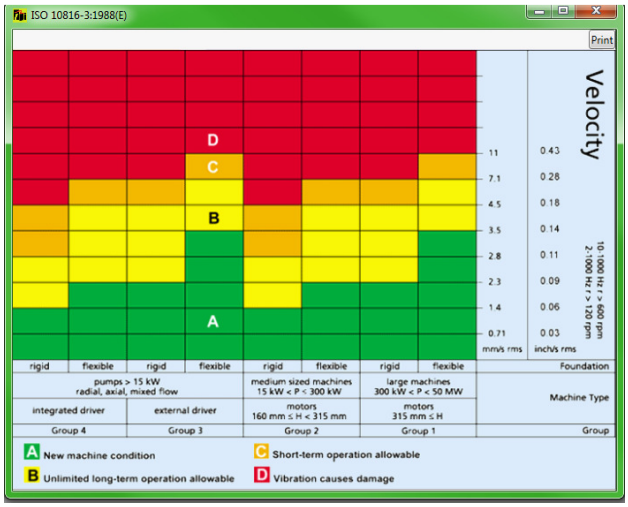


Figure 44

1.4.2 Adding/Editing an inspection point

In addition to maintaining the general information for the selected inspection point, this option () allows the creation and editing of a list of inspection items within this inspection.

Right clicking on any existing item gives access to the Edit Item window (Figure 45*).* It is worth noting that, whilst ‘Item Name’ can be edited at any time, ‘Answer Type’ and ‘Answer Data’ cannot be changed once the item has been incorporated into trending data.

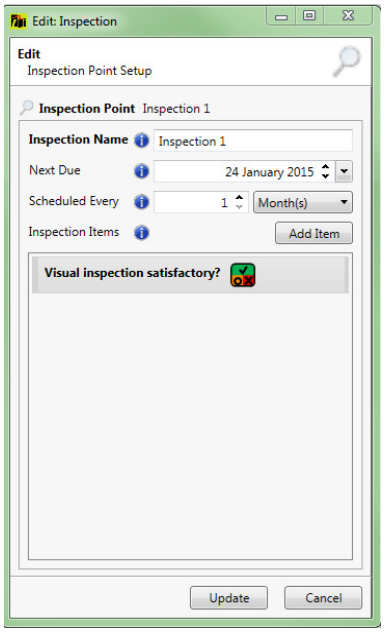


Figure 45

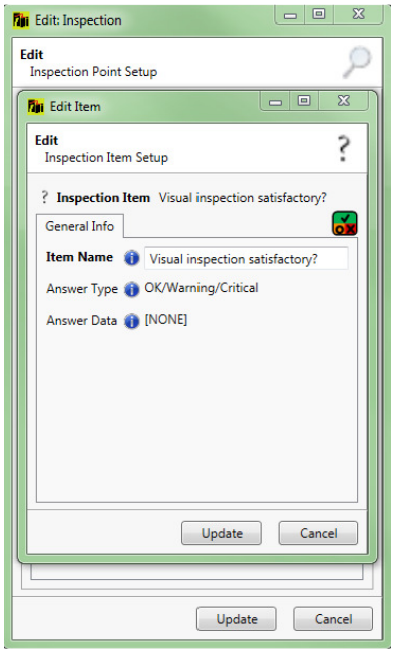


Figure 46

1.5 Copy/Paste Function

The right-click menu for each item in the Asset Manager tree, from the level of Machine Train downward, also includes a 'Copy' option. This can be used to facilitate the setting up of the Asset Manager hierarchy, by allowing a copy to be taken of the selected item, together with all of its existing subsidiaries.

This copied structure can then be pasted below any existing item in the tree, provided this follows the hierarchical rules of the Asset Manager structure.

Pasting is accomplished by right-clicking the 'target' item in the Asset Manager and selecting 'Paste' from the menu displayed. The copied data then appears in the 'tree', immediately below the target, with each item's name suffixed with "(c)". At the

same time, the 'Edit' screen for the highest-level copied item is displayed (as described in Sections 1.3 Asset Addition/Editing/Deletion and

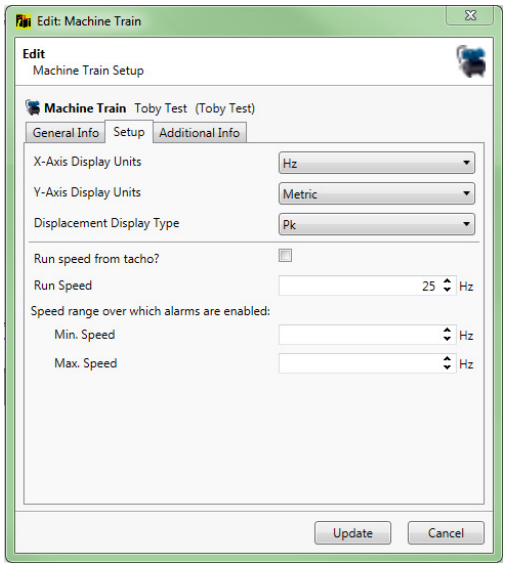


Figure 34

1.4 Measurement point addition/editing and deletion), allowing the user to amend its details to match its new location.

The copied data item, or hierarchy of items, remains available to be pasted into as many further locations within the Asset Manager as are required.

1.6 Reporting

1.6.1 Auto Exception Report

C-Trend II™ has a built-in facility to automatically generate an exception report for all measurement points returning Warning or Critical values within any selected asset. This is achieved simply by right-clicking on the required asset and selecting the **Auto Exception Report** function from the drop down menu.

The report is produced, without any further user action, as an open, unsaved WORD™ document, which can be edited, with comments if desired, and then printed or saved as a DOC file.

1.6.2 Report Wizard

The second option on the right-click menu for a selected asset is the **Report Wizard.** This allows the flexibility for the user to exercise considerably more control in specifying which assets are to be reported on, and what status tables, trends and FFT plots are required within the chosen asset. This displays the **Report Type** window, which offers the choice between Exception Report and New Manual Report (Figure 47).

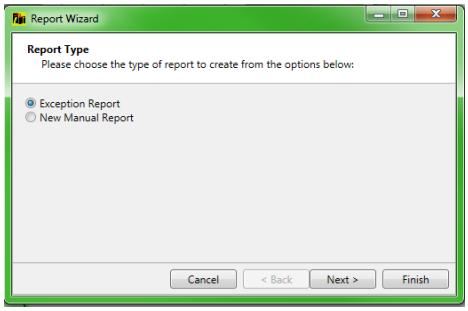


Figure 47

1.6.2.1 Exception Report

This option allows the user to specify that the report will contain only items that are registering an alarm status (Warning or Critical). The user is at this point offered the option to report on all measurement points, only vibration points or only inspection points *(*Figure 48). On clicking Finish, the report is again generated as an open, unsaved WORD™ document.

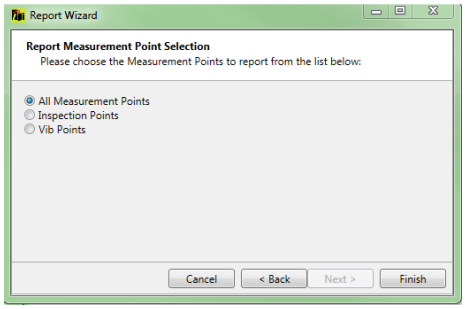


Figure 48

1.6.2.2 New Manual Report

Selecting the **New Manual Report** option from the **Report Type** screen allows the user maximum scope to specify manually what the report content will be.

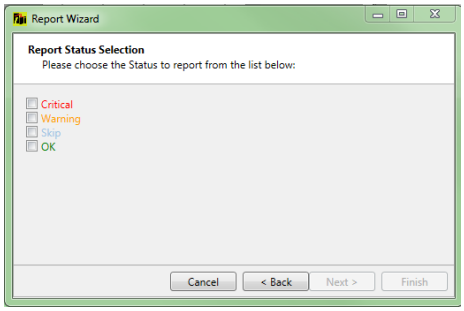


Figure 49

The user is now asked to select which of the available statuses (Critical/Warning/Skip/OK) are to be included in the report. Any or all of these options may be selected (Figure 49). Similarly, the user is now given the choice between all measurement points, inspection points only, or vibration points only (Figure 50).

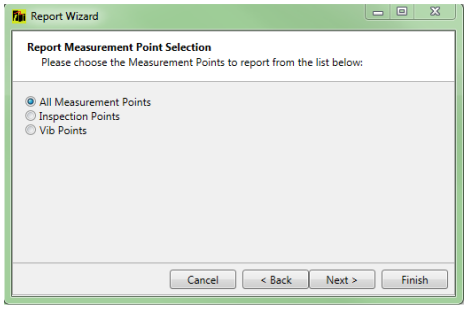


Figure 50

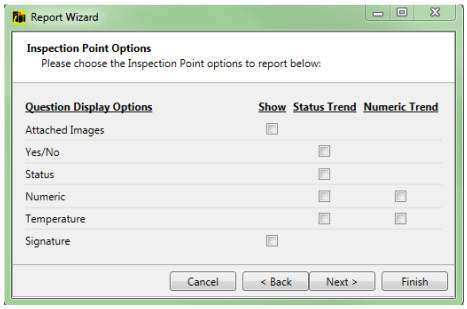


Figure 51

Next, the user can select from a range of options for Inspection Point question display (Figure 51), Vibration Point display (Figure 52) and VA Band trend and FFT (Figure 53).

Finally, the report dates can be selected (Figure 54). The choice here is between the most recent measurements, a data range, or all available measurements for the selected options.

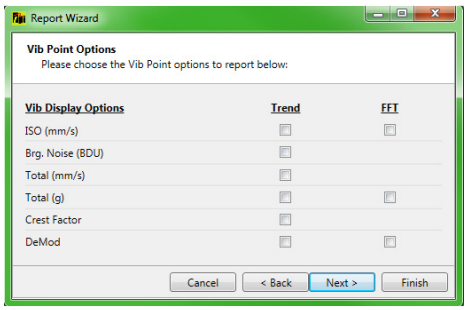


Figure 52

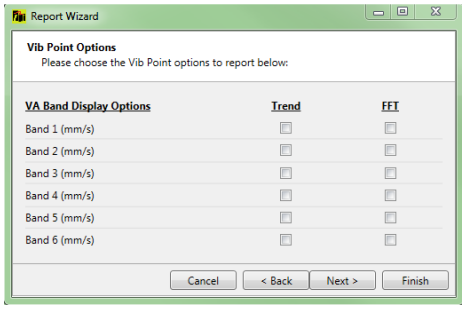


Figure 53

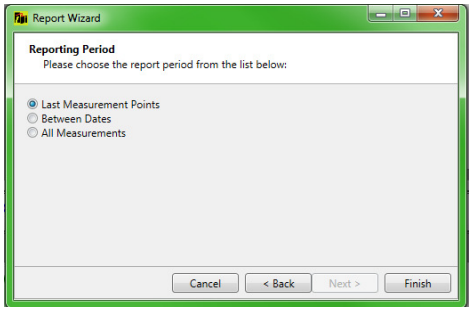


Figure 54

N.B. The asset status tables included in the report will contain the same information as the status tables displayed in **C-Trend II™** and as selected by the user in the asset status set-up.

Tip: The Report Wizard should be used thoughtfully if reasonable length reports are to be produced. The temptation to simply tick everything should be resisted, as this will generate reports of excessive length when large numbers of assets are included. A useful strategy is to start off with the minimum of information and gradually expand the size of the report by including graphs only where they are necessary. For example, by only including FFT plots when a trend plot indicates there might be a problem with a particular measurement point.

1.7 Data Import/Export

1.7.1 Import Data

1.7.1.1 Import Data ('File' tab in App Menu)
This option is used to import data from a .ct2 file. (The user can also double-click on a '.ct2' file in the file explorer which will automatically start the import from that file)

1.7.1.2 Import from VibTrend Data ('File' tab in App Menu)
This option is used to import from .vt2 file which is created by separately installed software, specifically to convert VibTrend and **C-Trend II™** files into a compatible format.

1.7.2 Export Data

1.7.2.1 Export Data ('File' tab in App Menu)
This option exports all the data currently held in **C-Trend II™**

1.7.2.2 Export All Data (From selected Asset Manager item)
The right-click menu for a selected item on the Asset Manager menu contains the option 'Export All Data', which exports everything below that selected item in the tree

1.7.2.3 Export Wizard (From selected Asset Manager item)
The right-click menu for a selected item on the Asset Manager menu also contains 'Export Wizard', which allows the user to select which data to export below that selected item (only inspection points, only vibration points etc.)

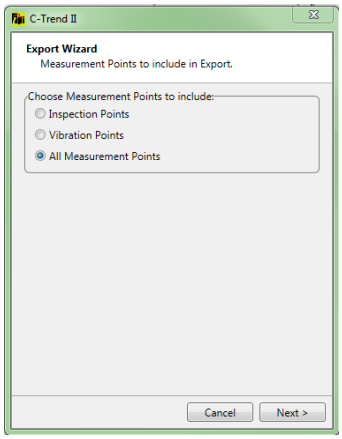


Figure 55

1.8 App Menu Options

The App Menu located at the top of the screen contains a range of functions which are mainly concerned with administrative and interface activities.

1.8.1 File Tab

The functions on this tab are all concerned with the import and export of data, and as such are all covered in section 1.7 Data Import/Export.

1.8.1.1 Import Data

See (1.7.1.1 Import Data ('File' tab in App Menu))

1.8.1.2 Export Data

See (1.7.2.1 Export Data ('File' tab in App Menu))

1.8.1.3 Import VibTrend Data

See (1.7.1.2 Import from VibTrend Data ('File' tab in App Menu))

1.8.2 Route Manager

This option allows the user to assign measurement points to a route, which can then be downloaded to a specified measurement device to carry out the assigned measurements (Figure 56). This screen follows the **C-Trend II™** standard of providing an Add/Edit/Delete menu when the user right-clicks in the appropriate position.

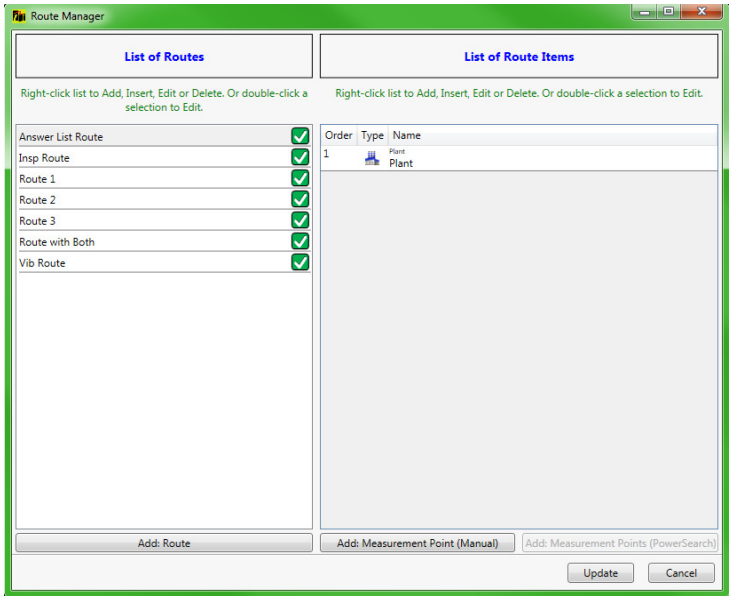


Figure 56

1.8.3 Setup

1.8.3.1 Bearing Database

The bearing database (Figure 57) holds frequency criteria, based upon the specific bearing part involved, to identify different types of bearing wear. It holds a comprehensive list of bearings, searchable by type, manufacturer, part number and two optional search text fields.

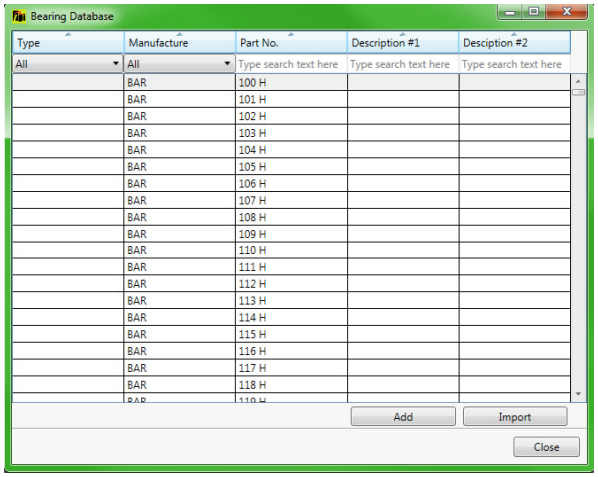


Figure 57

Four fault frequency values are held (as multiples of the run speed) for each part, representing the diagnostic frequencies for faults with: the inner race, the outer race, the cage and the rolling element.

Selecting an existing entry, by double clicking, or clicking the Add button allows the user to edit, or add, an individual item within the database Figure 58).

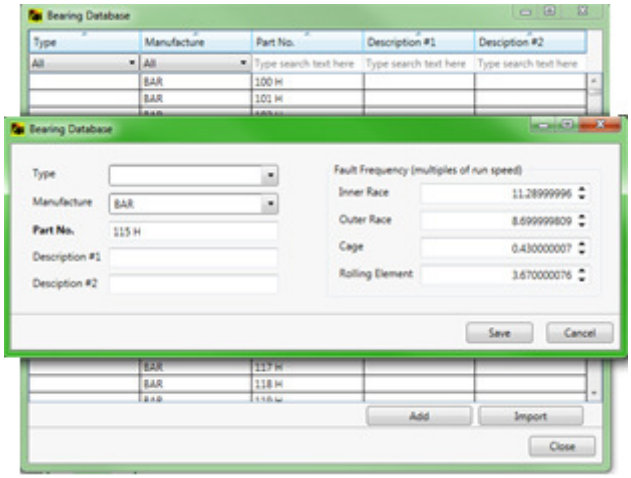


Figure 58

The Import option in the main bearings database screen (Figure 58) allows for the import of **additional** bearing types from a CSV (Comma Separated Values) file, formatted as described in Figure 59.

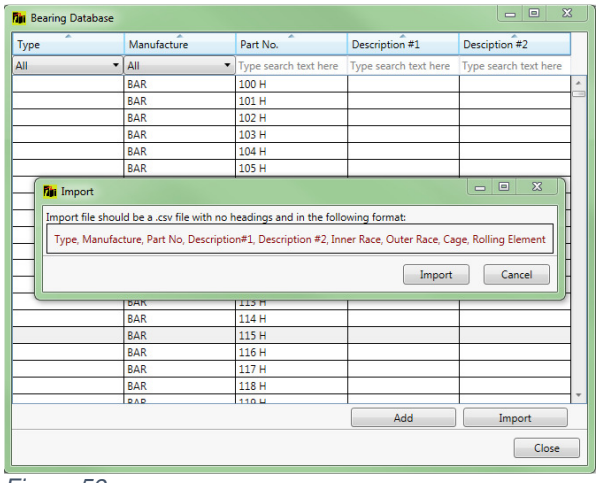


Figure 59

1.8.3.2 Default App Units

This option allows the user to choose default display units for: machine trains, vibration point FFT comparisons, reports and latest status (Figure 60). **C-Trend II™** will only use these units when comparing more than one vibration point. In all other cases, the units from the parent machine train will be used.

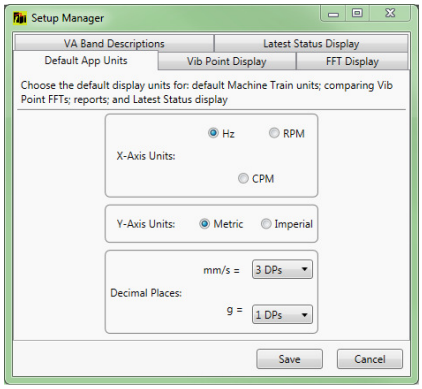


Figure 60

1.8.3.3 Vibration Point Display

This sets the default options for the vibration point dashboard display (Figure 61).

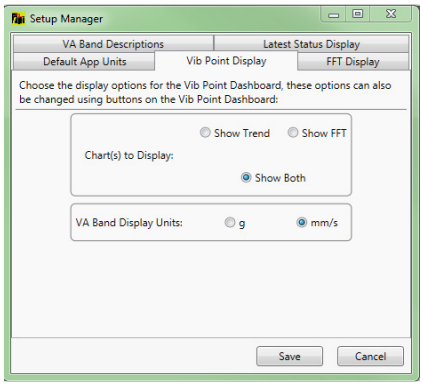


Figure 61

1.8.3.4 FFT Display

The style of FFT display (bars or lines) can be selected from this option (Figure 62).

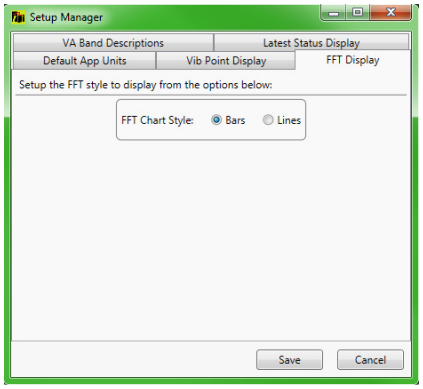


Figure 62

1.8.3.5 VA Bands

This option allows the user to assign meaningful names to the selected VA Band ranges (Figure 63).

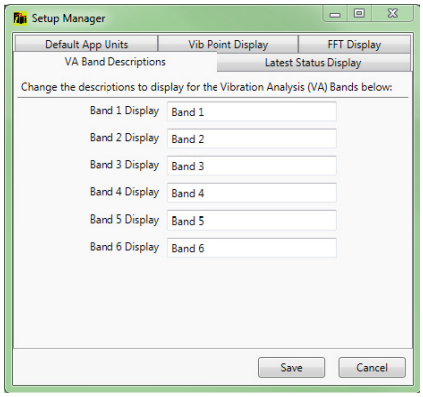


Figure 63

1.8.3.6 Latest Status Display

Here the user can choose which columns will be displayed upon selecting the latest status option from the main dashboard screen, up to a maximum of three *(*Figure 64). These selections also define the content of any reports generated.

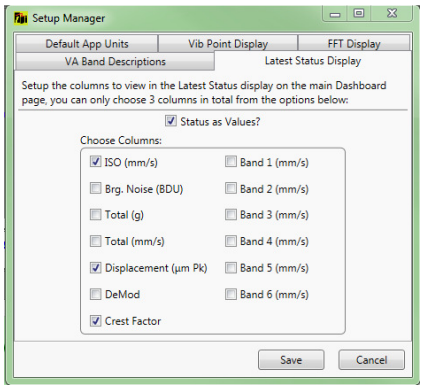


Figure 64

1.8.3.7 Email exceptions on upload

Provides the user with the option to automatically generate an email to the responsible stored address (see section 1.3 Asset Addition/Editing/Deletion), upon any exceptions being encountered during data upload to the **C-Trend II™** system. A comma separated file (CSV) containing the data responsible for the exception is automatically attached to any emails sent.

1.8.3.8 Device Manager

This option allows the user to view, maintain, and, when a vibration point is currently selected, connect, the metering and/or monitoring devices used by **C-Trend II™**.

For Ultra2 and TPI9080 meters, which are added to the device database when data is uploaded from the device, this is the one place within **C-Trend II™** where device names can be edited as required (Figure 65 & Figure 66).

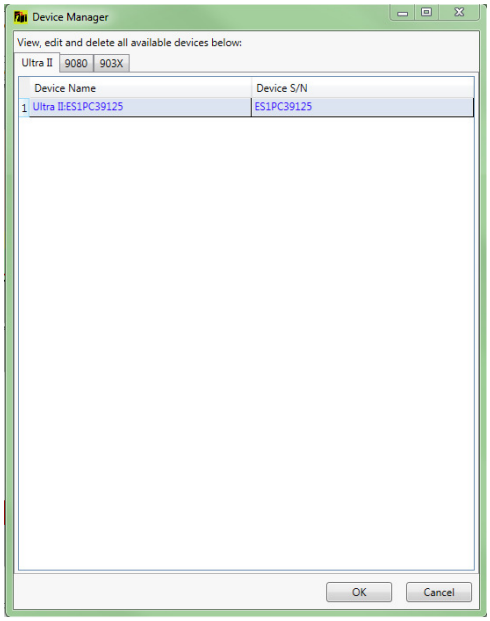


Figure 65

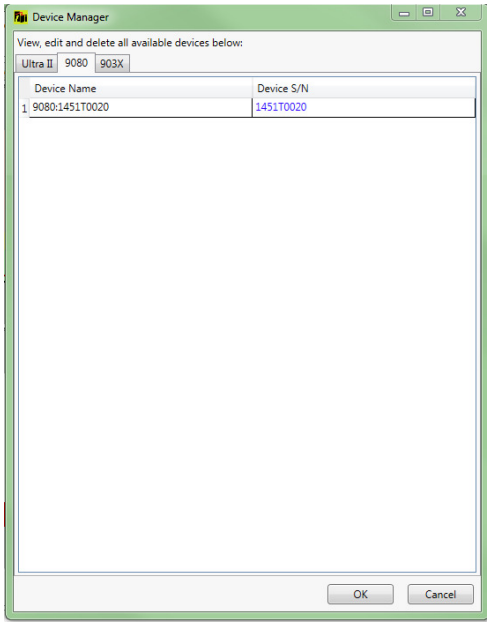


Figure 66

For 903X monitor devices (Figure 67 & Figure 68) this option additionally gives the chance to import new devices into the database. In this case, the device has to be imported (via an '.ob1' file generated by the TPI903X software), and a channel assigned to a vibration point, before this point can be monitored. The correct connection type for the device (USB or Ethernet) must also be selected, to enable **C-Trend II™** to recognise the device.

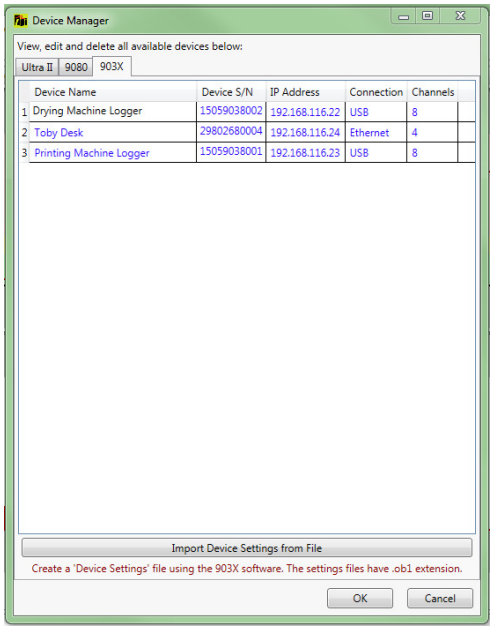


Figure 67

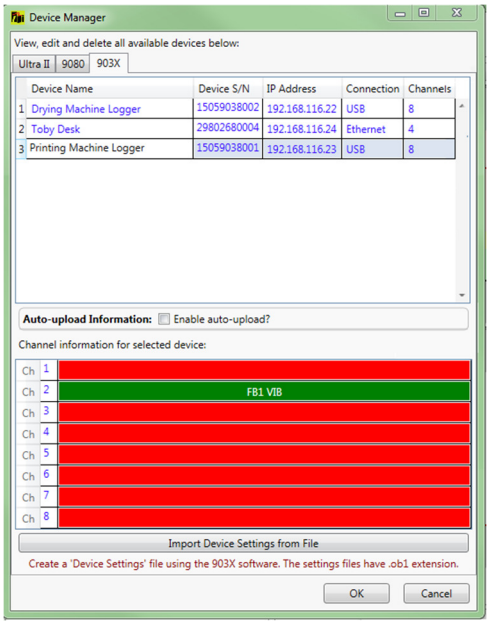


Figure 68

The check-box marked “Enable auto-upload” (Figure 68) allows the user to elect to have data from the selected 903X device uploaded automatically to the database, via a Windows service, which is external to the **C-Trend II™**. This will take place automatically, as long as the PC is turned on, regardless of whether the **C-Trend II™** software is currently active. The external Windows service also handles the email distribution of any reports generated from these readings. Upon restarting **C-Trend II™** all readings uploaded from the 903X unit will automatically load into the history for the monitored components.

Enabling the auto-upload facility for the selected 903X monitor overlays the Device Manager screen with the options shown in Figure 69. The “Start uploading from:” field defaults to the current data and time, but can be reset by the user to the desired point for auto-uploads to commence.

The default frequency at which these uploads will then occur is controlled by the Auto-upload schedule, in minutes, hours, days or weeks, and the number of readings per channel to be contained in each upload is controlled by the value of “Readings to Load”.

If “Allow different upload schedules for alarm status?” is selected, two additional scheduled upload frequencies can be specified, to be implemented when an alarm returns a status of “Critical” or “Warning” respectively. This allows for more frequent checks to be made should it be necessary to monitor a potentially deteriorating situation.

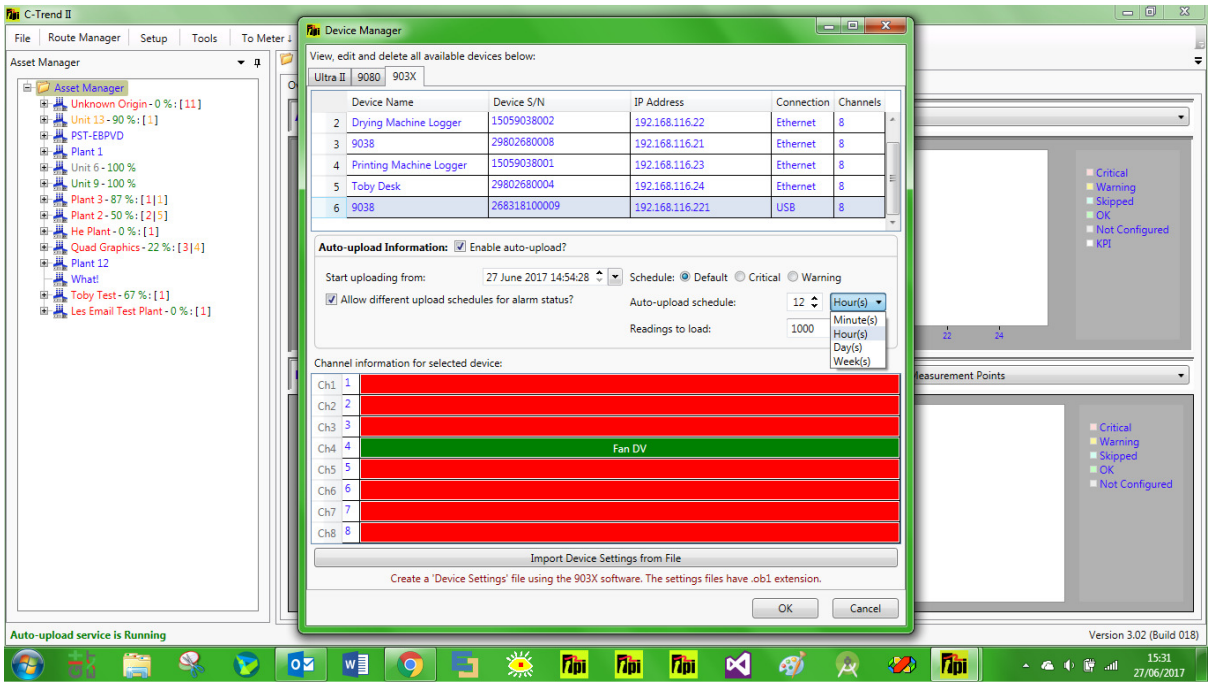


Figure 69

1.8.3.9 Reset 9080

This option resets the route information on a connected 9080 device.

1.8.4 Tools

1.8.4.1 Route Manager
***See section 1.8.2 Route Manager*.**

1.8.4.2 Type Manager
This allows the user to assign different ‘asset types’ to each level within the hierarchy in Asset Manager (Figure 70).

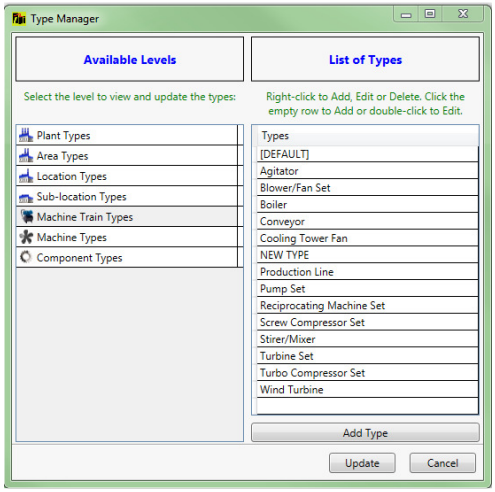


Figure 70

1.8.4.3 Answer List Manager
This allows the user to maintain lists of questions which can be assigned to an inspection, with a list of acceptable/valid answers to provide a dropdown list of responses at the point of inspection (Figure 71).

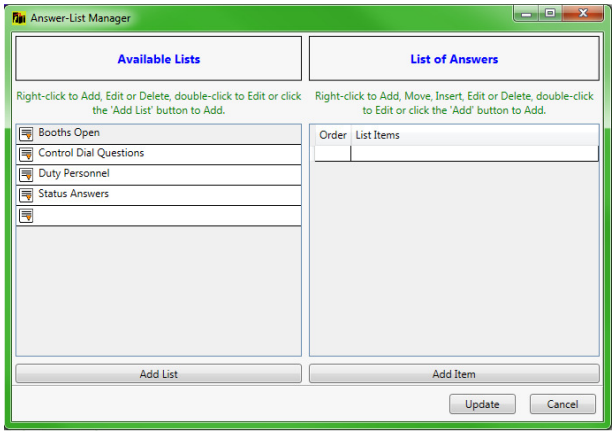


Figure 71

1.8.5 To-Meter

This option allows the user to select a meter type (TPI9080 or Ultra2) and download a route to a connected device of the chosen type (Figure 72)

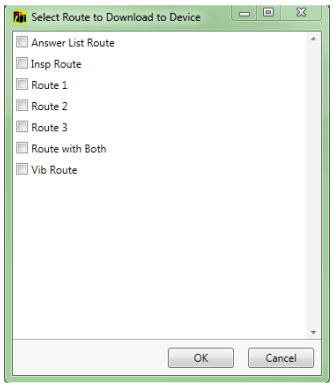


Figure 72

1.8.6 From-Meter

This allows the user to select a meter type (TPI9080 or Ultra2), and automatically upload any available measurement data from a connected device of the chosen type.

This option also includes the method for the **C-Trend II™** to obtain data from TPI903X Smart Vibration Meters. Additional devices, for which '.ob1' files have been generated by the TPI903X software, may be added to the database via the "Import Device Data from File" button within 1.8.3.8 Device Manager

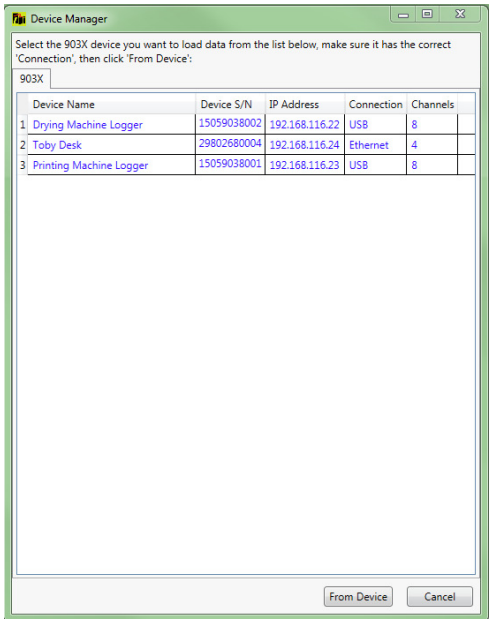


Figure 73

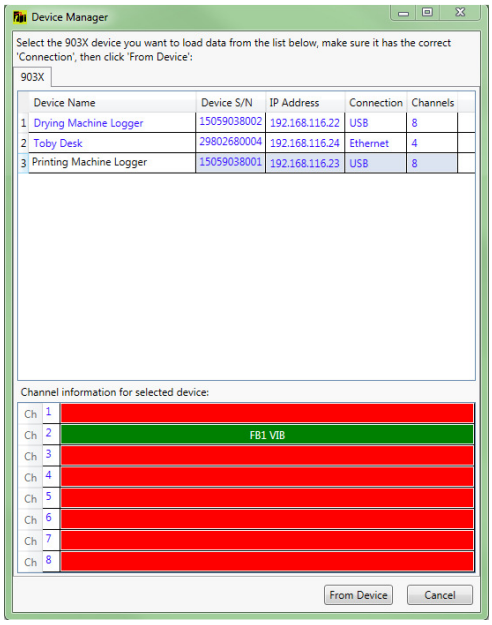


Figure 74

In this case selecting a device from the list of available monitors displayed will allow the user to edit the device name and temporarily (for the duration of this upload only) override the connection type (USB or Ethernet) for this device. Upon the user clicking 'OK', data for any channels on the monitor device which are currently connected to a vibration point (those channels displayed in green) will then be uploaded into **C-Trend II™**. If it is not possible, for any reason, to establish a connection to the requested TPI903X device, the following screen (Figure 75) is displayed.

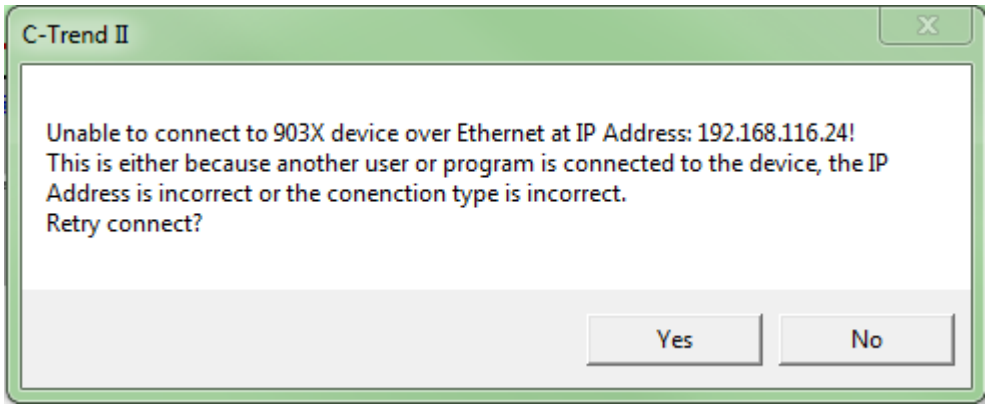


Figure 75

1.8.7 Help

1.8.7.1 User Guide

This option gives the user on-screen access to a PDF copy of the **C-Trend II™** User Guide.

1.8.7.2 Contact Details

This option displays full contact information for Test Products International (TPI).

Figure 76

1.8.7.3 ISO Standards

See Figure 44.

1.8.7.4 Activation

This option allows the user to activate **C-Trend II™ Professional** from within the application**,** if this has not already been done (Figure 77).

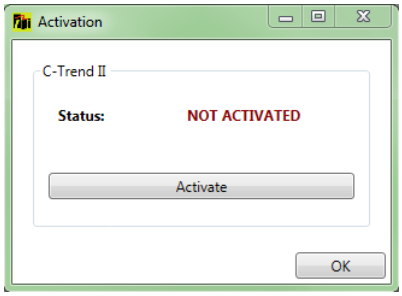
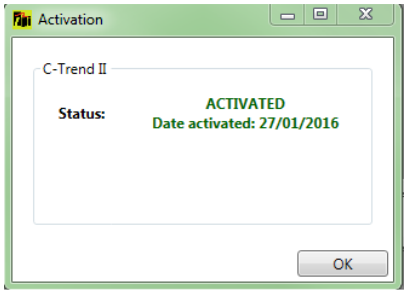


Figure 77

See Section 1.1 Product Activation for details of how to proceed after selecting “Activate”.

If **C-Trend II™ Professional** has already been activated, the date of activation is displayed.



1.8.7.5 Check for Updates

This displays details of any new **C-Trend II™** Software versions not currently installed, and, if found, gives the user the option of updating to the latest version.

1.8.7.6 Software Version

This displays details of the **C-Trend II™** Software version currently in use.

1.8.8 Off Route Readings

In addition to the route-based information already covered, the vibration data uploaded from a meter may include off route readings. These are ad-hoc measurements taken outside the scope of regularly scheduled testing. Once any off route readings have become available for viewing within **C-Trend II™**, an additional "Off Route Readings" tab will appear at the top of the screen alongside the other app menu options. Selecting this option displays the Off Routes Readings screen (Figure 78*).*

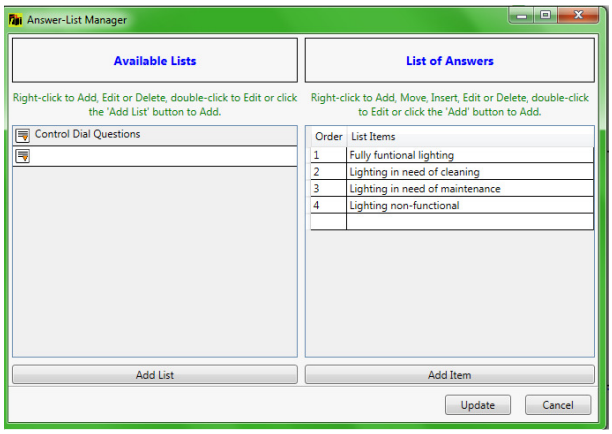


Figure 78

A list of available readings is produced, identified by a reading name, together with date, time and source device information. Four vibration figures representing, ISO, Bearing Noise, Total(g) and Displacement are held for each reading. Selecting any item from the list will display a frequency (FFT) chart for the reading in the lower part of the screen. Right clicking on a reading allows the user to either delete a reading, or move it to the vibration point to which it relates (Figure 79 *&* Figure 80).

Selecting the "Move to…" option presents the user with a copy of the Asset Manager hierarchy, which allows navigation to the vibration point at which the off route reading was taken. The "Move" button on this screen only becomes enabled when a

vibration point is selected from the tree. Clicking “Move” will remove this reading from off route readings and incorporate it into the data held for the selected vibration point.

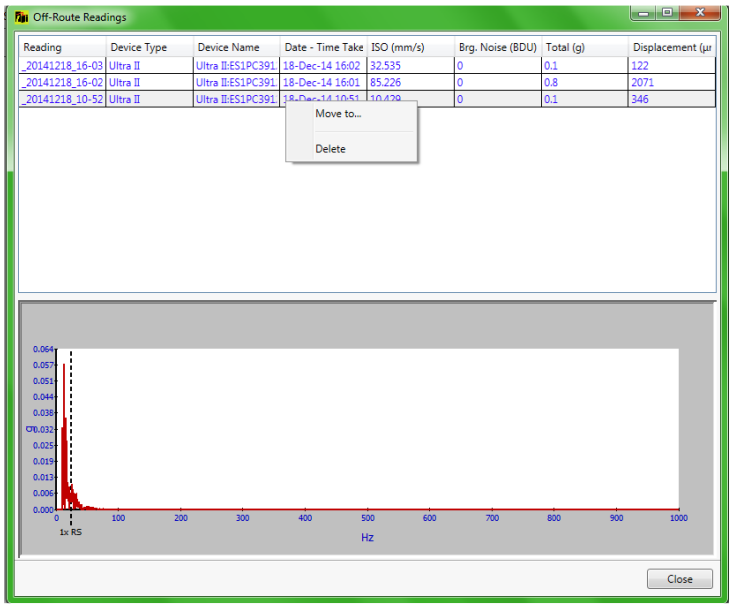


Figure 79

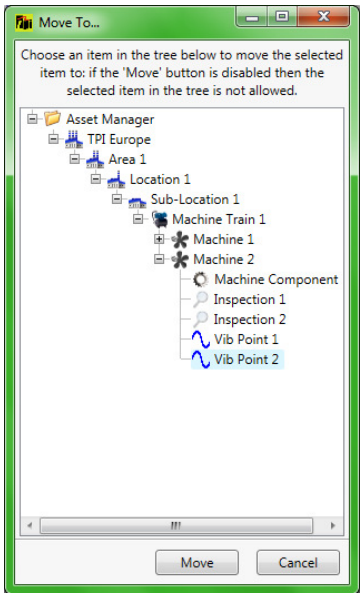


Figure 80

Revision History

Version	PAGES	DATE	NOTES
Issue 1.0	47	09 February 2015	First Issue – Les Jordan
Draft 2.2	53	05 April 2017	Various updates including SQL database installation.
Draft 2.3	53	21 June 2017	Auto Upload from 903X devices. New activation screen. Removed “Historical Data” plot from dashboard.
2.4	54	27 June 2017	Additional explanation and illustration of Auto Upload. Improved dashboard illustrations.