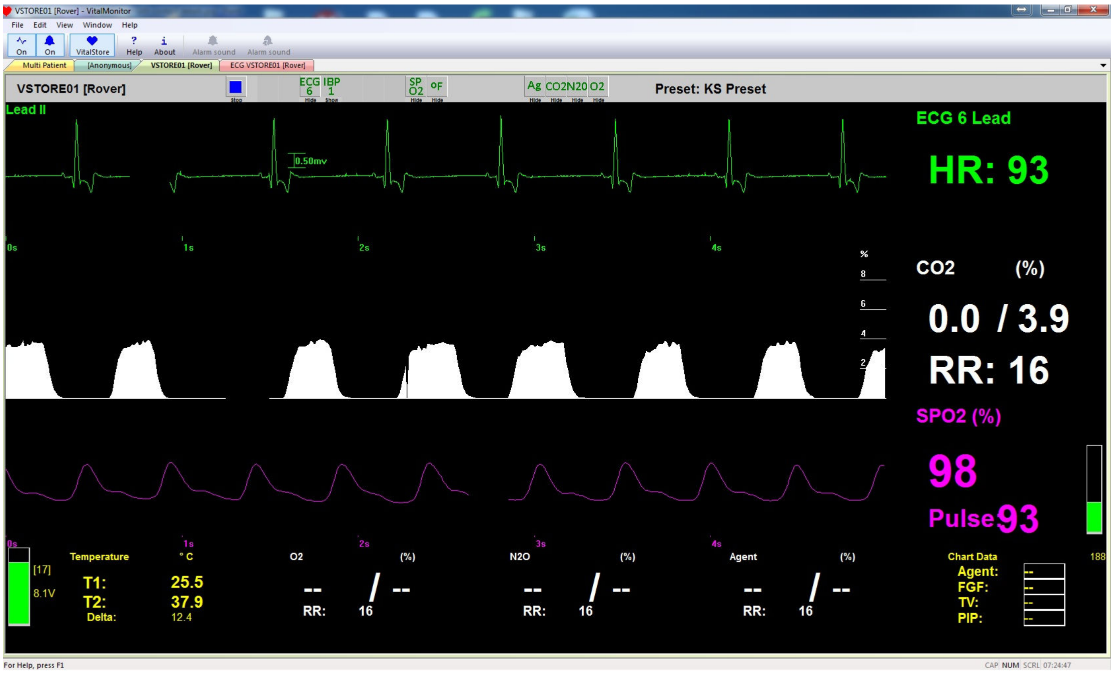
VitalMonitor Software Ver 4.1.XX

OPERATING MANUAL
VER 1 September 2015

Integrated Multi-Parameter monitoring for animals



A quick guide to using the VitalMonitor Version 4.0.xx Windows software

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Vital Monitor - real-time monitoring software

Once the software has been installed on your PC, connecting a MultiMonitor, Lightning, Sentinel, Impact-III or Sapphire Plus device is straightforward. Double-click the VitalMonitor icon on your desktop to start the software.

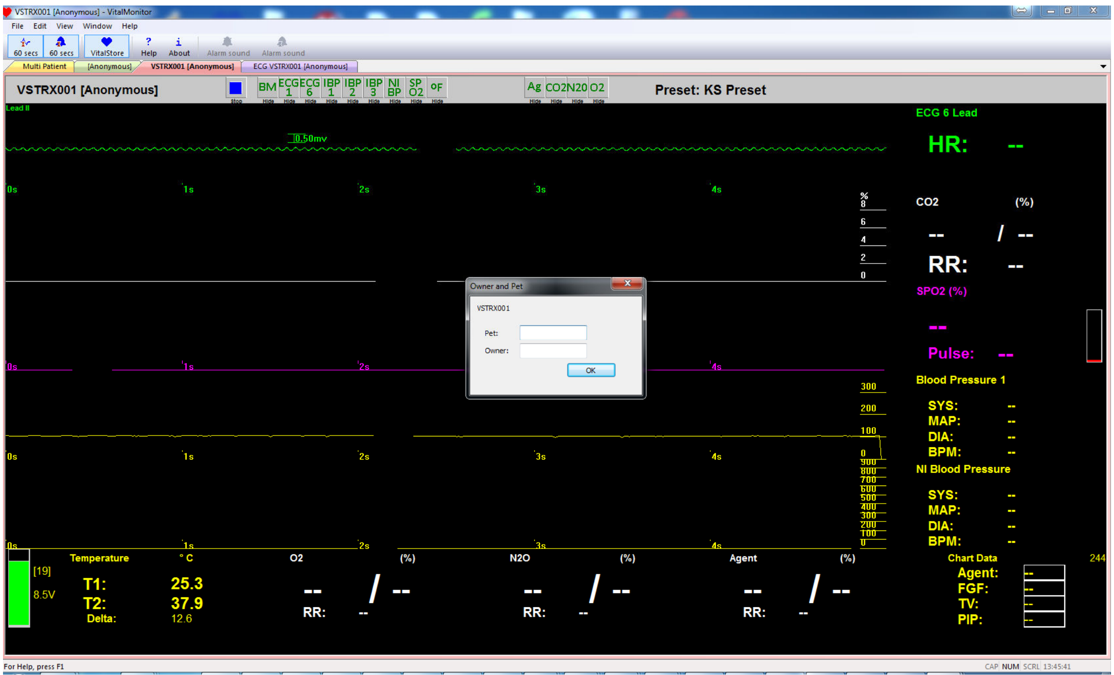
Using the USB cable

Connect the unit to the PC using the USB cable provide with your unit.

Wireless connection

For wireless devices, connect the USB receiver to the PC using the short USB cable provided. The USB Wireless receiver has some sticky velcro mounts to allow location close to the PC. For Vitaltore, Lightning and Impact-III make sure the data output is set to 'Radio' otherwise no data will appear at the PC.

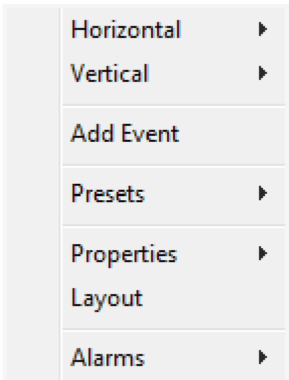
Turn the unit ON. The PC will recognise the incoming data and automatically open the appropriate displays to show the data. A small dialog box will appear asking for Patient name and Client name. Enter these now if you know them. If not press OK and the name “Anonymous” will be used for both Patient and Client. This data can be entered later using the Edit\Case Details file menu option.
The screen has 3 viewing windows: Multi-Patient, Monitoring and ECG, each on a separate tab. A typical screen will look something like this:



You are now connected. All monitoring data from your unit will appear on the display. If this is the first time you have used the software the loaded Preset will be the default Preset. This is shown at the top of the screen. When you make any changes to the layout and appearance of the screen you can save the screen setup as your own default. You cannot modify the factory default Preset, so if you don't like what you have done it is always possible to load the factory default and start again.

The default patient name is "Anonymous". Edit the patient details by clicking on ***Edit - Case Details - Unit Name***, in the upper Windows menu. This opens a complete data entry screen where Owner Details, Patient Details and Case Details can be entered. There is a button labelled "Select from PMS.."
This feature is not yet implemented but will eventually allow clients and patient details to be obtained from your Practice Management System.

Changing the screen appearance
Right-clicking with the mouse in any area of the screen will bring up a standard menu:



Horizontal: allows you to change the sweep speed of the trace

Vertical: allows you to change the height of the trace

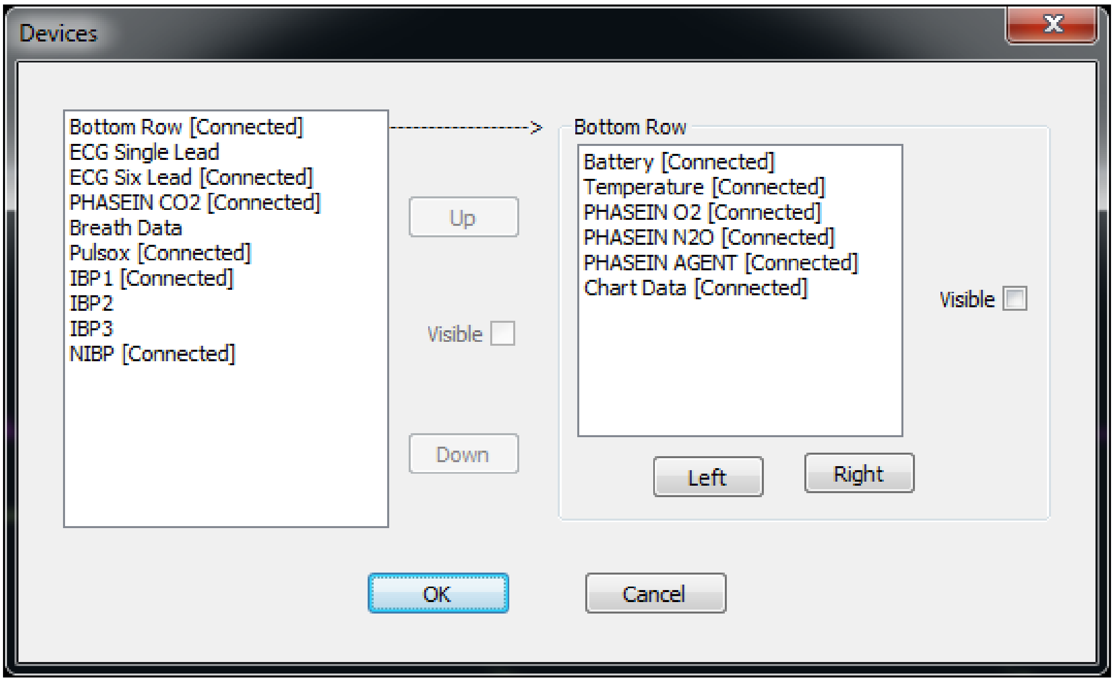
Add Event: allows you to add text information that is saved with the file and is time and date stamped.

Presets: allows you to load a Preset, save the current configuration as a new Preset or to just update the current Preset.

Properties: There are 2 levels of control over Properties: Standard and Advanced. The menu is context sensitive so e.g. right-clicking in the Pulse-Ox trace area will open the Properties of the Pulse-Ox device.
'Standard' allows changes to be made to all the attributes of a trace.
'Advanced' allows the actual positions of the traces and numbers on the screen to be altered and configured exactly as you want it. Use the Advanced option with care as it is possible to completely remove display fields from the screen.
Whichever option is selected a new panel opens on the right-hand side of the screen where attributes of the display can be changed. This is the place

where audible beeps are turned on or off, filters set up and colours of traces changed. When all the changes have been made, click on Finished at the bottom of the panel and then choose to update your Preset or save as a new Preset.

Layout: allows you to change what devices are displayed on the screen and also their position on the screen



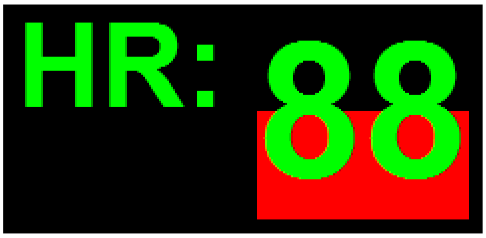
Any device with [Connected] next to it is currently sending data to the PC. If the visible box is ticked when a device is highlighted, then that device's data will be shown on the screen. This allows you to permanently hide devices and prevent them from showing on the screen.
To change a device's position, highlight it on the left hand side and use the Up and Down buttons to change its order. Devices are listed from top to bottom as they appear on the screen. For the above example, the Single Channel ECG is at the top of the screen with Pulse-Ox below it.

Alarms
This allows you to enable/disable the device's alarm and to set the alarm limits. Each Alarm has two limits - an Alarm limit and an Alert limit. An Alert will warn you that the parameter is approaching the alarm level. When the Alert level is reached the warning indicators on the screen will appear in orange. When an Alarm level is reached the warning indicators will appear in red and an audible alarm will be heard.

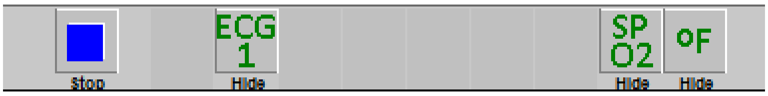
Alarm notification
If alarm beeps are enabled then all alarms will be accompanied by an audible warning.
Alarms involving parameters out of range will appear on the screen associated with the relevant parameter. All monitoring parameters displayed

as numbers have an upper and a lower part. If the alarm is a high rate alarm the upper half of the number will appear orange or red (alert or alarm respectively) If the alarm is a low rate alarm the lower half of the numbers will appear red. For example, this is an indication of an **upper** heart rate **alert**:

and this is an indication of a **lower** heart rate **alarm:**



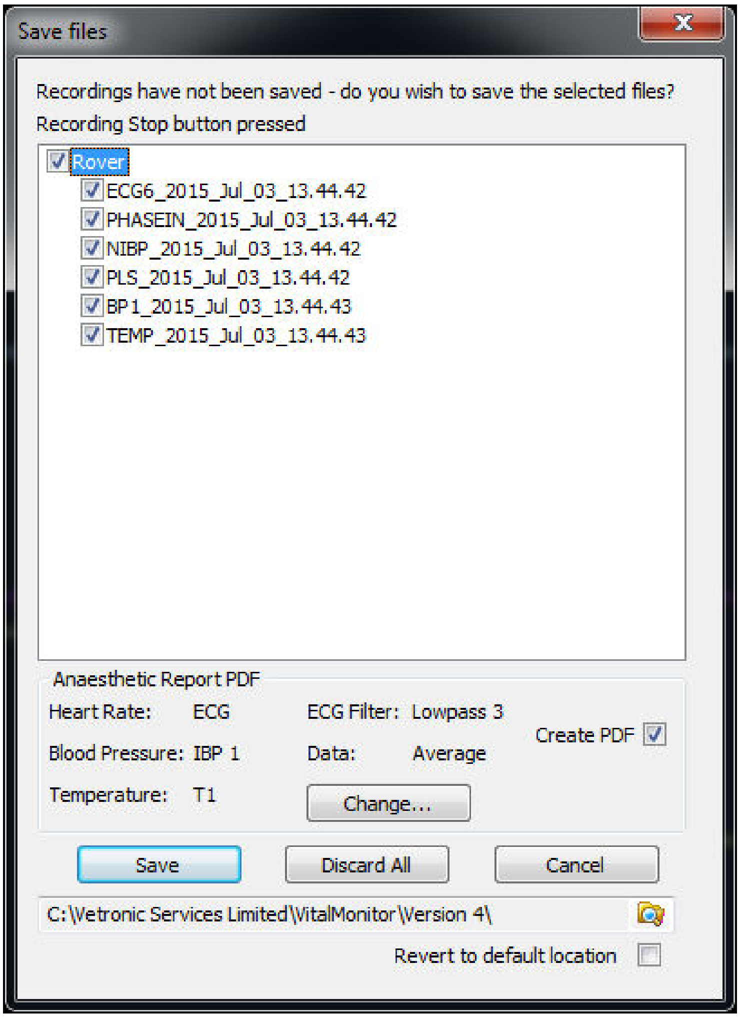
Window Status Bar



The upper status bar of the Monitoring window holds buttons that allow you to Hide or Show the devices on the screen. Use this to turn devices off that are not in use. For example to hide the Pulse-Ox trace, click on the button that says "SpO2 Hide".

Stop/Start recording

There is also a blue Stop/Start button that controls the recording of data. Data is recorded by default whenever you connect a unit to the PC. Clicking on the Stop button will halt recording at that point and allow you to save the data.

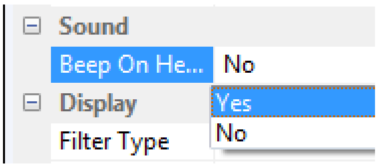


Data can be saved anywhere on your system. The data is always saved in a fixed format that subdivides the data by day, month and year. The default data location is at C:\Vetronic Services LTD\VitalMonitor\Version 4. To use a different location, use the browse icon to select a new path and then click Save. This location will be remembered next time you save any data. To use the default location make sure the tick is in the ***"Revert to default location"*** tick-box.

Program Status Bar

Just under the program menus (File,Edit etc) is the Program Status Bar. This has 5 buttons

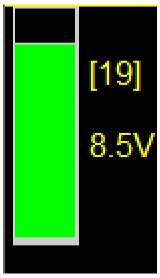
The first button controls audible beeps and can be set to On, Silent or Countdown. Note that only one device can beep at any one time. Also the audible beeps for a device must be set to On in the Standard Properties window for that device.



The second button controls audible alarms and can be set to On, Silent or Countdown.
At startup both the Audible Beeps and Alarm Beeps are silenced for 60 seconds.
The third button shows a blue heart icon and can be used to launch the VitalStore software for review of recorded data. Data that is currently being recorded can be viewed using the VitalStore software.
The Help button is for linking to support documentation
The About button gives program version and company information for the software.

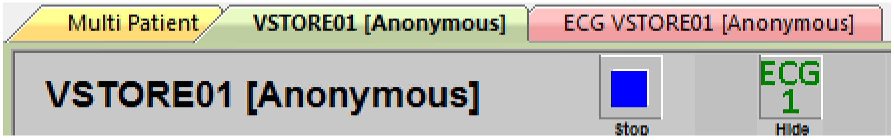
Chart Data
This region of edit boxes will flash for one minute every 5 minutes as a reminder to enter your monitoring data for the patient. Right-click and enter information on the vaporiser setting (Agent), Fresh Gas Flow rates (FGF), Tidal Volume (TV - if ventilating) and peak inspiratory pressure (PIP - if ventilating). The data is saved every 5 minutes and will appear on the Anaesthetic Record Chart. If no data is entered during a 5 minute period then this entry will be blank on the record chart.

Battery Data
The Battery voltage for your connected monitor is shown in the bottom left hand corner of the screen.



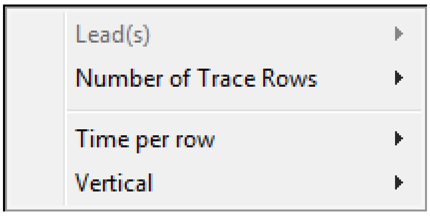
If more than one device is connected to the PC then the device is indicated by a number in square brackets. The different unit battery voltages are shown repeatedly in rotation.
Alerts and Alarms can be set here to warn of battery failure in portable devices. Use 7.5v as the alert value and 6.5v as the alarm value.

Multi-patient screen
If more than one device is connected at a time then these can be monitored collectively on one screen using the Multi-patient screen. Select the screen using the tabs at the top of the viewing windows:

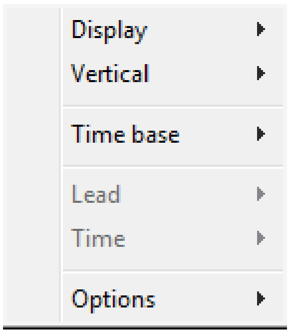


Each patient can show one device associated with it and this is selected using the device buttons at the top of the trace.

ECG Screen
This is a special screen dedicated only to ECG monitoring. This screen allows the ECG to be displayed in different ways - single lead to six lead or as a repeated lead II trace. Use the right-click menu to access these options.



Trend/Analyser display
The top part of the screen shows a trend display of the heart rate. Left click and hold anywhere on the trend screen to see the heart rate at that point. Right-click on the trend screen to show a sub-menu of options



Display - allows you to toggle between the trend display and the analyser display. The analyser display allows you to make quick ECG measurements and view the data more accurately without having to save and open the file. The analyser window allows viewing of up to the last 4 minutes of recorded data.
Vertical - allows control of the height and the offset of the baseline by means of a scrollbar.
Time-base (trend only). This allows the amount of data seen in the trend window to be changed between 1 minute and 1 hour.

Lead - allows the ECG lead shown in the analyser window to be changed. With a single channel ECG module only lead II will show data
Time - allows the amount of ECG data shown in the analyser window to be changed from 1 second to 20 seconds.
Options - allows the background and foreground colours of the trend window to be changed to your preferences.

Stopping Recording

To stop recording, click on the Stop button. You will be prompted to save the data. Select which items you wish to save and then click Save.
Recording will stop but monitoring for the patient will continue.

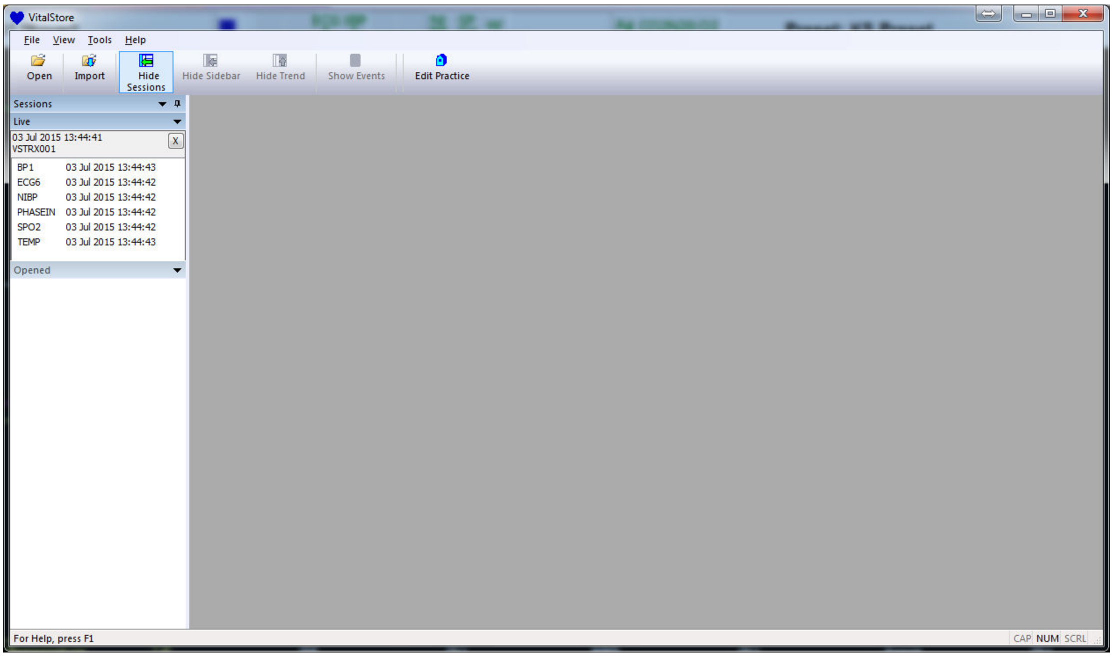
Stopping monitoring

Use File\Exit or click on the x button at the top right of the screen. If you are recording you will be prompted to save the data. The program will then close.

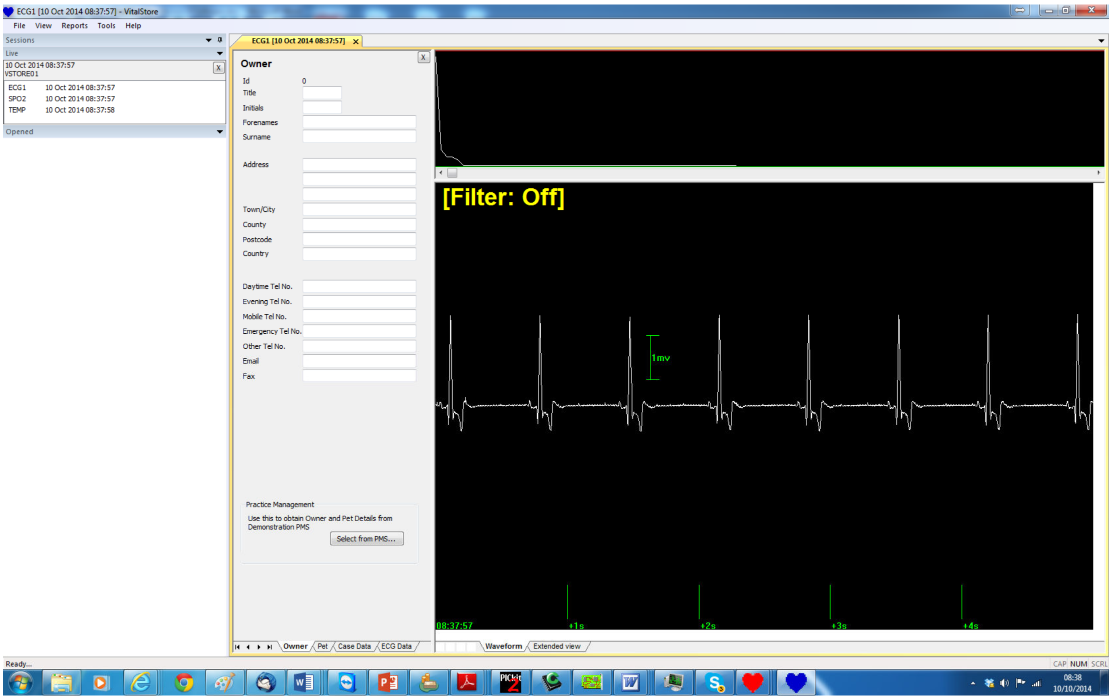
VitalStore - data analysis and report writing software

VitalStore is used to view all of the recorded data and to create monitoring and ECG reports.
VitalStore can be run by clicking on the desktop icon as above or by using the VitalStore button from within the VitalMonitor software.

Starting VitalStore whilst a patient is being monitored and recorded will show a screen similar to this:



Under the Live heading on the left-hand side are 6 recordings; BP1, ECG6, NIBP, PHASEIN, SPO2 and TEMP. Double clicking on any of these files will open them for viewing. Each set of files is recorded as a Session. The Session window can be hidden by using View\Hide Sessions and shown using View\Show Sessions.
Live data is continuously updated so if you close the Live Session by clicking on the X in the upper right corner of the Session window, the files will disappear but then immediately reappear.
If the ECG file is double-clicked then the ECG file is opened and the data displayed:



All data has 3 viewing areas. There is the main trace viewing area, shown here with the ECG trace in it. Above it is the trend viewing area and to the left is the data area.

The Waveform tab

Producing an ECG report

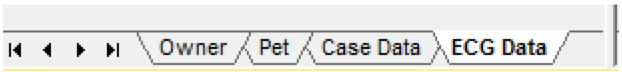
The steps in producing an ECG report are as follows:

1. Open the ECG file
2. Enter the relevant Owner and Patient data
3. Make measurements using the ECG Data tab fields and enter any relevant case notes
4. Select a portion of the ECG for reporting (see below)
5. Right-click in the trace window and choose "Create Monitoring Report".
6. Select the options required for the report. You then have 3 options; Preview, Save to Session or Save As.
7. Choose Preview to see the report before you create it.
8. Choose Save to Session to save the report and associate it with the original Session (most common). The pdf report created will then be visible in the Open Session dialog box.
9. Choose Save As to save the report in a different location
10. Click Close.

Selecting a portion of the trace for a Report

Move to the point in the file (in the Trace shown by the Waveform tab) where you wish to start the report data. Right-click and choose "Select Reporting Times --> Set Start Time". A 1 second portion of the data is now highlighted by a grey background. Now move to the point in the file where you wish to end the report data. Right-click and choose"Select Reporting Times --> Set End Time". Now the whole of the selected data has a grey background indicating it has been selected.

Making ECG measurements
Click on the ECG Data tab at the bottom of the Data area:



In the list of measurement options, click on the first box of the P amplitude series. The box fills with yellow. This is now active for making a measurement.

Now follow this series of steps using the left mouse button -

- Click and **hold** the button down on the ECG trace area.
- Move the mouse to position the line at the bottom of the p-wave.
- Release the mouse left button.
- Another line appears
- Use the mouse to move the line to the top of the p-wave
- Click on the left mouse button to end the measurement
- The measured value appears in the box

Use the other boxes to make several measurements. The average value will be shown at the end of the series of boxes. This value will be used in the ECG report.

This sequence of events is used to make all ECG measurements. The ECG trace can be changed in size to aid measurements.

Selecting a portion of the ECG trace to be used in the report
Scroll along the trace data until you get to the part of the ECG that you would like in the report. Right-click on the trace and choose Set Start Time from the Reporting option of the pop-up menu. The first second or so of the ECG is shown with a grey background.
Now scroll to the end portion of the ECG that you would like in the report. Right-click on the trace and choose Set End Time. The whole of the selected trace area is shown with a grey background.

Producing the report
Click on the Reports menu option and choose Monitoring reports. A comprehensive dialog box appears that allows you to set the options for the report. Select the Sensitivity and Print Sped as required. Also select whether you want a Report page, a trend page and how many pages of traces you want. If you have selected a region of the trace for printing then in the Traces group box the selected times and duration of the trace to be printed will be shown. Click on Preview to view the report.

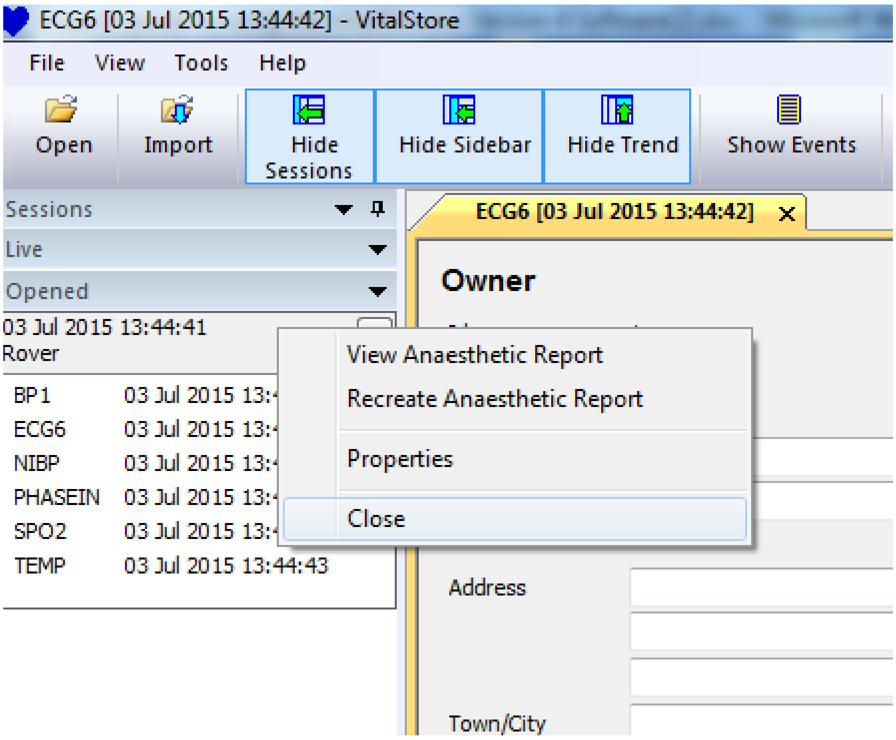
Click on Save to Session to save the report with the session. This will allow quick viewing of the pdf file when using the File Open menu.
Click on Save As to save the pdf report to any chosen location.

Linking to Practice Management Software (PMS)

This option is not yet implemented. When complete, this will allow you to extract data from your PMS to fill the Client and Patient details.

Creating an Anaesthetic Monitoring Report

The Anaesthetic Report (AR) is produced from the Session data as this contains all of the files that made up the monitoring session. If you had the tick-box enabled during Session saving then the Anaesthetic monitoring report will already have been created. To update the AR or to create an AR, right-click in the Data area of the Session and choose Recreate Anaesthetic Record.

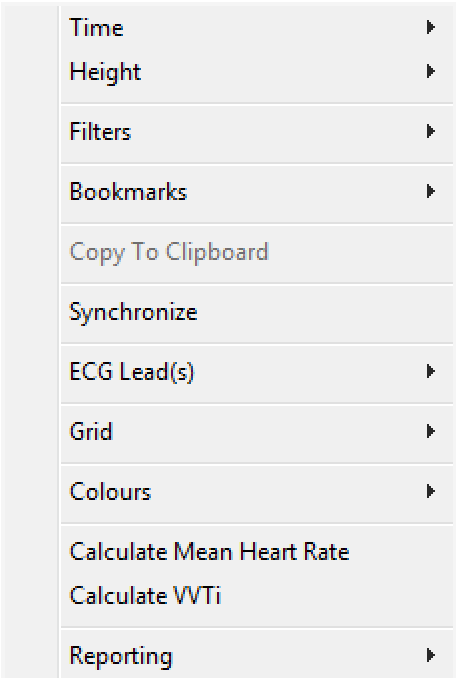


A new dialog box appears with some options on selecting the sources of different parameters. This is because heart rate could be logged by ECG, Pulse-Ox or Blood pressure devices and you may wish to use one in preference to another. The same applies for a source of Blood Pressure and Temperature. Also for ECG files, filters can be applied.
Data option - there is an option of averaged data or spot data. Average data is data averaged over the 5-minute monitoring interval between data collection. Spot data is data collected only at the time of data collection.
Choose your options and click Preview to see the AR in pdf format.

Choose Save to Session to save the AR with the session. This will allow quick and easy reviewing of the report when browsing using the File Open dialog. Alternatively choose Save As to save to any other location.

Other options on the Waveform tab

Right-clicking on the ECG trace brings up a menu

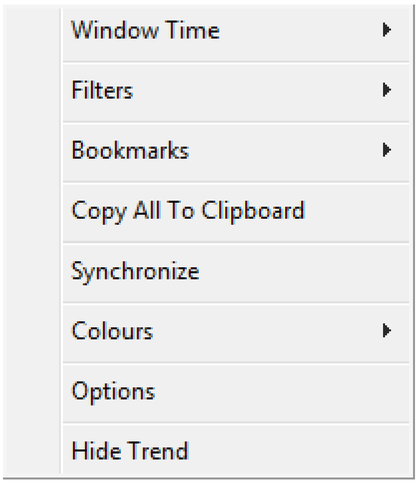


Time & **Height** control the appearance of the trace by changing the horizontal and vertical scales.
Filters allows you to apply filtering after a recording has been made. Two types of filters are available: Lowpass and Notch. A lowpass filter removes all noise above a certain frequency and is good for removing all mains interference and muscle tremor noise. The notch filter only removes mains interference at 50Hz and can be useful if your recording has a lot of mains noise only. The level of attenuation can be set between 1 and 20 for lowpass filters and 1 and 4 for a notch filter. All filtering, distorts the ECG to some degree so use as low a level of filter attenuation as possible.
Bookmarks are like Events but are added after the recording. Unlike Events they can be added at any time. Use bookmarks to annotate your recording and to indicate or highlight special features of the recording.
Copy To Clipboard
This item is active once an area of the trace has been selected by dragging the left mouse button over the ECG trace.
Synchronize - use this option to synchronise in time the upper trend trace with the lower trace
ECG Lead(s) for 6-lead ECG traces different leads can be chose to display in the Trace window.
Grid - turn a scaled background grid on or off

Colours - choose your preferred background and foreground colours for the trace window
Calculate mean heart rate - select four or more complexes and then right-click and choose "Calculate mean heart rate". The calculated value will appear on the Data tab on the left hand side of the trace window.

Calculate VVTi - this option will calculate the Vaso-Vagal Tone Index based on the start position and number of chosen complexes either to the right or the left of the mouse position. The result will appear on the ECG Data tab below the mean heart rate value.
Reporting - use this option to set the Start and End positions of the area of the trace to be included in the monitoring report.

Right-clicking on the ECG trend brings up a small menu

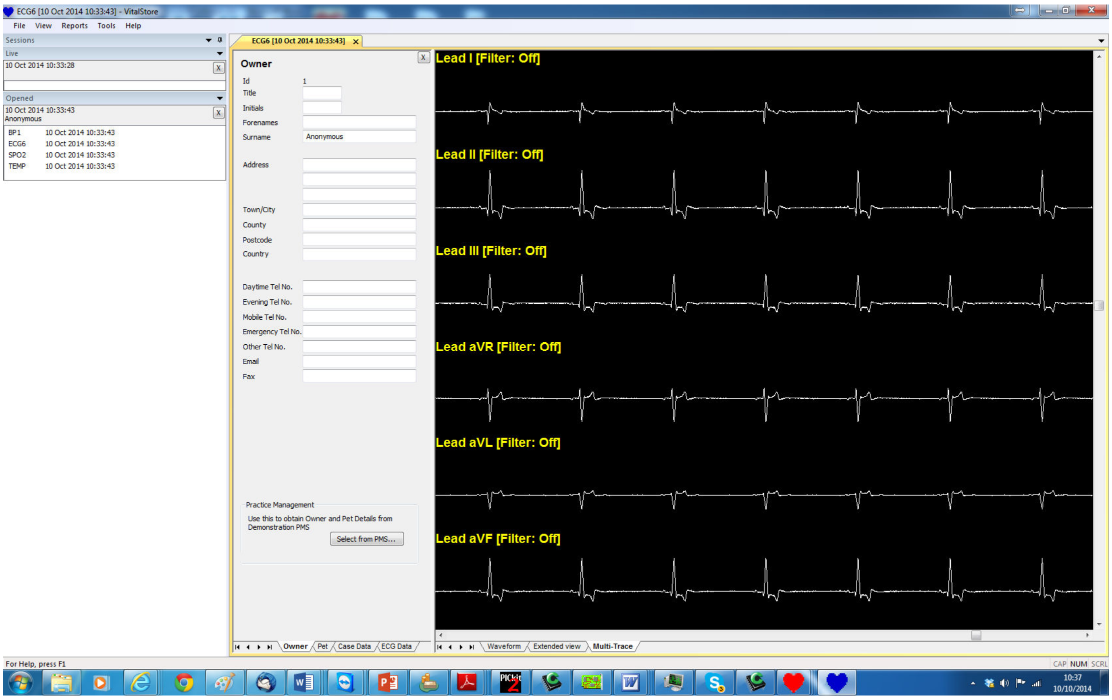


Window Time - this sets the time span of the trend window
Filters - these are the same filter settings as described in the above section
Bookmarks - add comments to the ECG data at the point in the trend line where you right-click
Copy All To Clipboard - copies the trend window to clipboard
Synchronize - this synchronises in time the ECG trace with the ECG trend
Colours - set your preferred background and foreground (line) colours
Options - Change the averaging time for heart rate calculation and change the alarm limit demarcating lines
Hide Trend - closes the trend view. Show the trend view using the menu option View\Show Trend View

The Extended View tab
This view allows large amounts of ECG data to be viewed quickly. Once identified, specific regions of the ECG trace can be viewed by double-clicking on the trace to jump straight to that point in the Waveform tab. The amount of data viewed on the Extended tab can be changed using the edit boxes at the top of the screen. The "Time:" value at the top of the view shows the cursor position in real time values when moved over the Extended view.

The Multi-trace tab

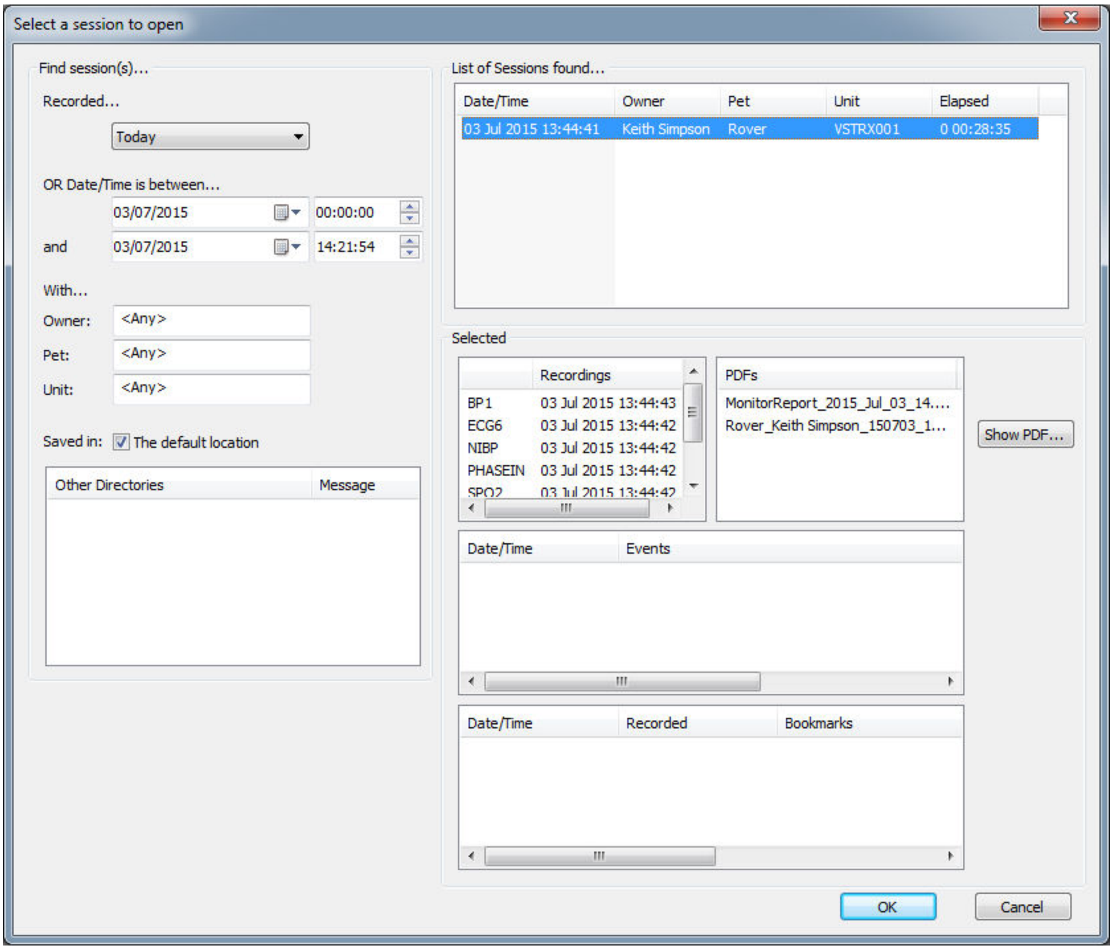
This view shows all six ECG leads with them all aligned vertically and in time with each other.



The ECG data can be copied to clipboard for inclusion in documents. Use the left-mouse button to select an area and then use the right mouse button to save it to clipboard. When saving to clipboard either just the trace selected or all 6 traces can be saved.

Opening saved data

Use the File\Open menu option to access all previously saved data. A large dialog box opens



By default the recorded sessions for today are shown. Use the drop down box to choose other time periods or to enter your own custom time period.
If you are searching for a particular patient or client use the filters indicated under the **"With..."** option.
If you have chosen not to save data in the default location, untick the tick-box next to Saved in:☐ The default Location. This will show saved data from all other saved locations.
Highlight a session in the List of found sessions by clicking on it. On the right-hand side are listed the associated files and any pdf files that have been saved with the session. These pdf files can be viewed directly by highlighting the pdf file and then clicking on Show pdf.
Any other features of the session data such as recorded events or bookmarks are indicated by the other panels on the right hand side of the dialog box.
When the session has been chosen click on OK to open that session of data.
The data appears in the left-hand panel of the VitalStore window. Double-click on any file to open it for editing and review.

Importing Data into the VitalStore Software

For VitalMonitor recordings made on another PC or for ECG recordings saved to a USB stick directly from the Lightning unit, the Import facility can be used.
In VitalStore, choose File \ Import from the File Menu.
A new File Browser opens entitled "VitalMonitor Recording File". Navigate to the file that you wish to import and then select "Open".
You will then be prompted for the name of the pet and the name of the owner. Enter those details and click "OK". If no details are entered then the data will be imported under the Patient name of "Anonymous" and the Owner name of "Anonymous".
After clicking "OK" a new dialog box will appear indicating the success of the import. If the files cannot be imported they may not be compatible VitalStore files or Session files.
After a successful Import the new files will appear on the left side of the VitalStore program and can be viewed in the normal way. After closing these Files or Sessions they can be opened using the standard File \ Open command.
Important Note
When searching for Imported files, remember that the date that they are associated with is the creation date, not the Import date. If you import an ECG file on August 25th 2015 that was recorded on a unit on June 17th 2015, then the file will be found by searching the June date, not the August date.

Special Features

There are two additional special features available for use with VitalStore as optional Add-Ins. For pricing of these Add-Ins, please contact your Vetronic Services supplier or representative.

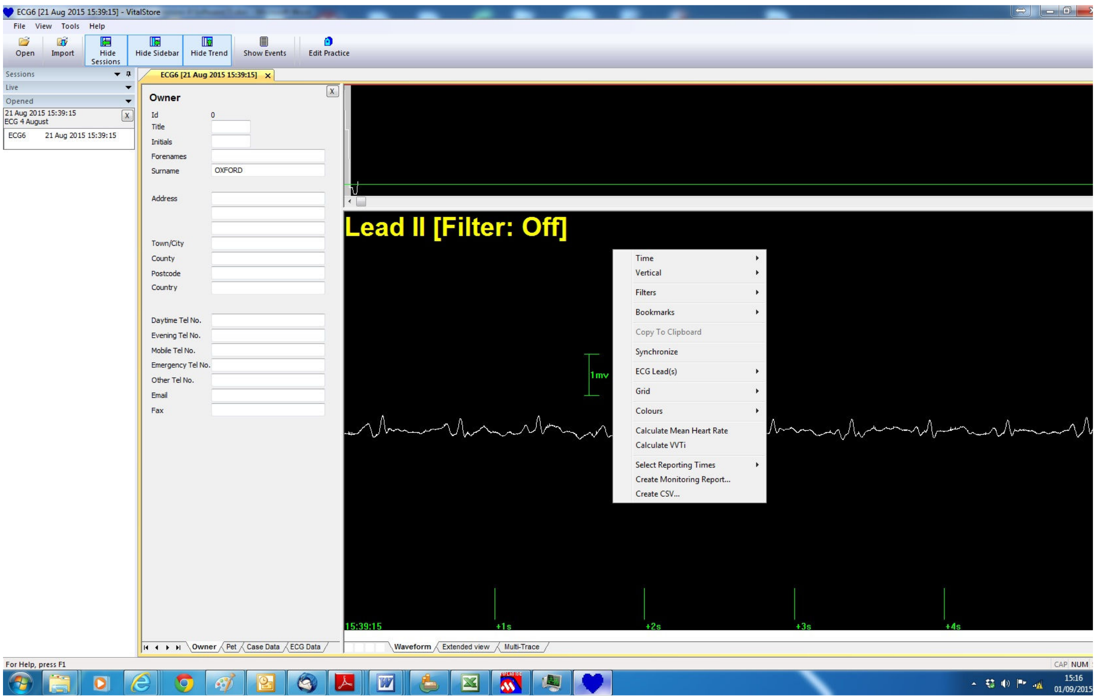
The two options are:

1) Exporting Data to a csv file
2) Integration with your Practice Management software.

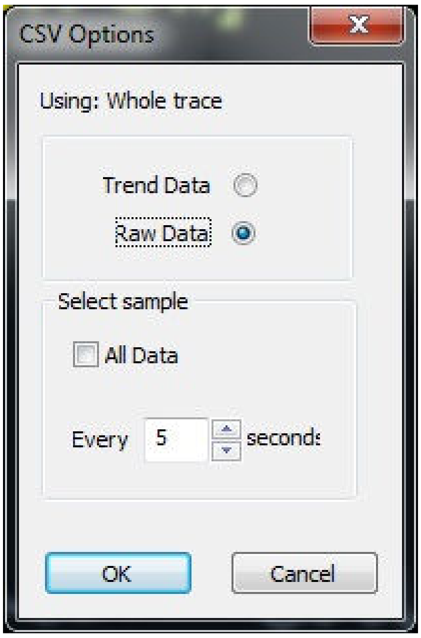
For either option you will need to follow the Add-In Request Procedure to obtain a license to use these features.

Exporting Data to a CSV File

Open a file using VitalStore and move the cursor to the normal trace screen. You can choose to export either the whole file or a selected portion of it. If you wish to only export a portion of the file, set the Start and End Reporting Times using the right-click and the "Select Reporting Times" feature. Once this is done, right-click on the trace and select the "Create CSV.." option:



A small dialog box will open, from which you can choose how the data is to be sampled prior to export.



Selection options:

Trend Data or Raw Data
Selecting Trend Data will create the CSV file based on the trend data only. For example if this was an ECG file, then the Trend Data would hold the heart rate. If it was a Pulse-Ox file then the Trend Data would hold both the saturation and the heart rate.

Selecting Raw Data will create the CSV file based on the raw data only. For example if this was an ECG file then the Raw Data would hold the instantaneous height value of the ECG waveform. If this was a Pulse-Ox file then the Raw Data would hold the instantaneous value of the height of the plethysmogram.

Note that at the top of the dialog box the "Using:" text indicates whether the whole trace or only the selected trace is to be exported.

For either option the data can be exported at a fixed sampling rate or, if the "All Data" is checked then at the original sampling rate. In other words with "All Data" selected the entire waveform data will be exported. This option should be used if the original waveform needs to be re-created.

Integration with Practice Management Software

The feature to integrate with existing Practice Management is in place in the VitalStore software. However, every PMS is different and at the time of writing a limited number of PMS companies have volunteered their integration information to allow this feature. To see whether the option is available for your system, please contact Vetronic Services LTD. To enable this feature you will need to follow the Add On Request Procedure and pay the appropriate license fee.

Add-On Request Procedure

The procedure for either the CSV Export or the Practice Management Integration feature follow a similar path. To begin, choose "Tools \ Add Ons \ Select \ " from the VitalStore software.

When the appropriate Add On is selected a new File Save dialog box opens. Enter the practice name in the File Name Box, or any name that you wish to identify the person or practice requesting this Add On. Use the Browse feature to save this new file to a known location.
Once the file is created and saved to your preferred location attach it to an e-mail and send it to Vetronic Services : enquiries@vetronic.co.uk with a request to purchase the Add On. Once the request is received you will be sent an invoice, or asked to produce a Purchase Order covering the cost of the Add On. On receipt of payment you will be sent a new file by e-mail which you must save to a known location. Then use Tools \ Add Ons \ Install. This opens a new "File Open" dialog box. Navigate to the location of the file sent to you By Vetronic Services and then click "Open". When this file is opened a dialog box will confirm that the feature has been enabled by installing the file.
The new feature is now ready to use.

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