



Naris

User Software Manual and Installation Notes V14



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SOFTWARE INSTALLATION

COMPUTERS SUPPORTED

Naris will work on any PC which can run Windows XP, Vista, 7, 8 or 10, and which has a free USB socket.

N.B. only units which comply with EN60950 should be used.

PRINTERS SUPPORTED

As these instruments operate in a Windows environment, print capability depends on having a printer installed under Windows. Virtually any printer, which works under the version of Windows you have, will be suitable.

INSTALLATION SEQUENCE

The software comes on 2 CDs or 1 Thumb Drive (containing 2 folders). It is advisable to close any other programs you may be running while performing the installation as you may need to restart the PC during this operation.

INTERFACE BOARD SOFTWARE (Measurement Computing)

Ensure the **USB cable is NOT connected to the A1 unit.**

If you have an MCC DAQ disk, put it in your drive and allow it to auto run, or open it and click on Install. You only need to install InstaCal/Universal Library software from this disk. Other options such as Tracer and manuals are not required.

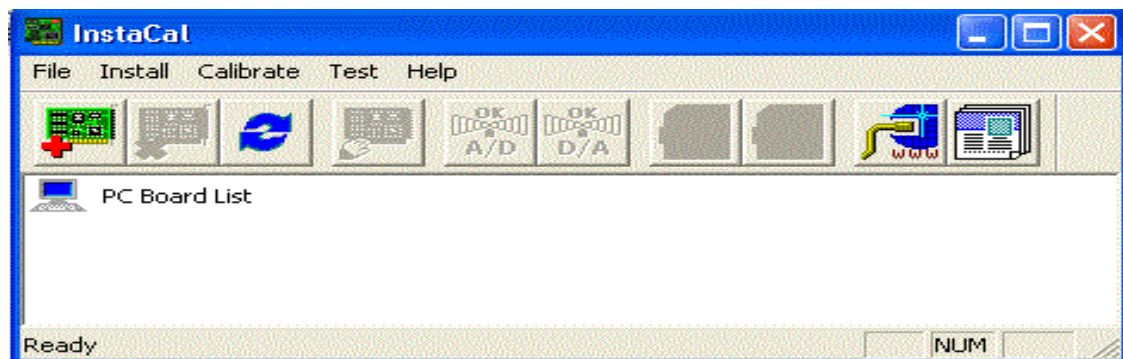
If you have a Thumb Drive put it in a free USB socket and navigate to it. Open the MC folder, and click on icalsetup.exe. Accept the defaults offered.

The program InstaCal and other driver software will be loaded to a folder called Measurement Computing.

INTERFACE BOARD HARDWARE

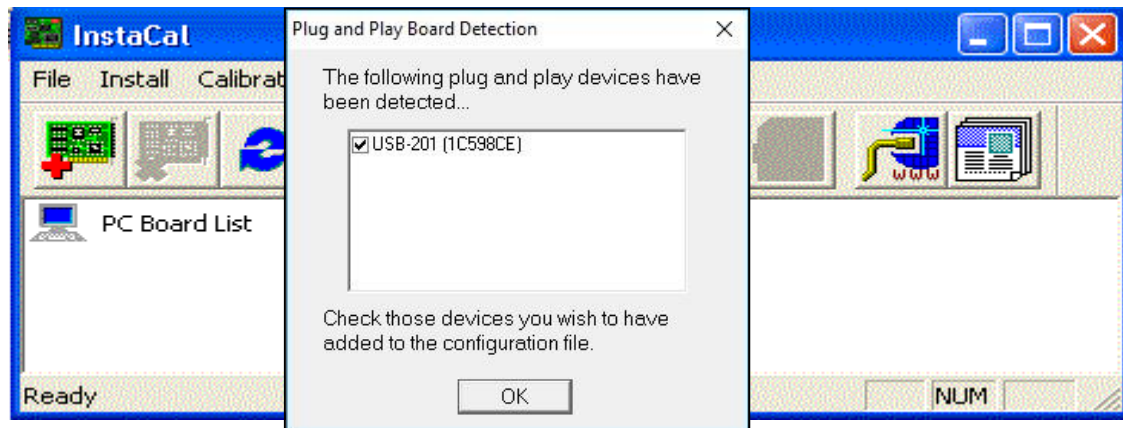
The next installation operation is to have your PC identify the USB A/D converter, which is built into the A1 unit. To do this, connect the A1 to your PC using the cable supplied. (It is not necessary to power up the A1 at this stage or load its software)

Click on the **Start button**, scroll down to **Measurement Computing**, select it and scroll down to **InstaCal** and click on it. **InstaCal** will show no boards installed as shown below.



Wait for a few seconds as the USB interface is recognised and the drivers loaded. If this doesn't happen, click on **Install**, then **Refresh**. Once completed, the InstaCal screen will offer the opportunity to accept your USB board.

N.B. the serial number for the USB in each A1 is unique. The most recent units are for type 201, while older A1 units will have a 1208 USB module installed.



Click on **OK**



When InstaCal shows the screen above, (shown for a 201 module) USB installation is complete and InstaCal can be closed.

GMI SOFTWARE

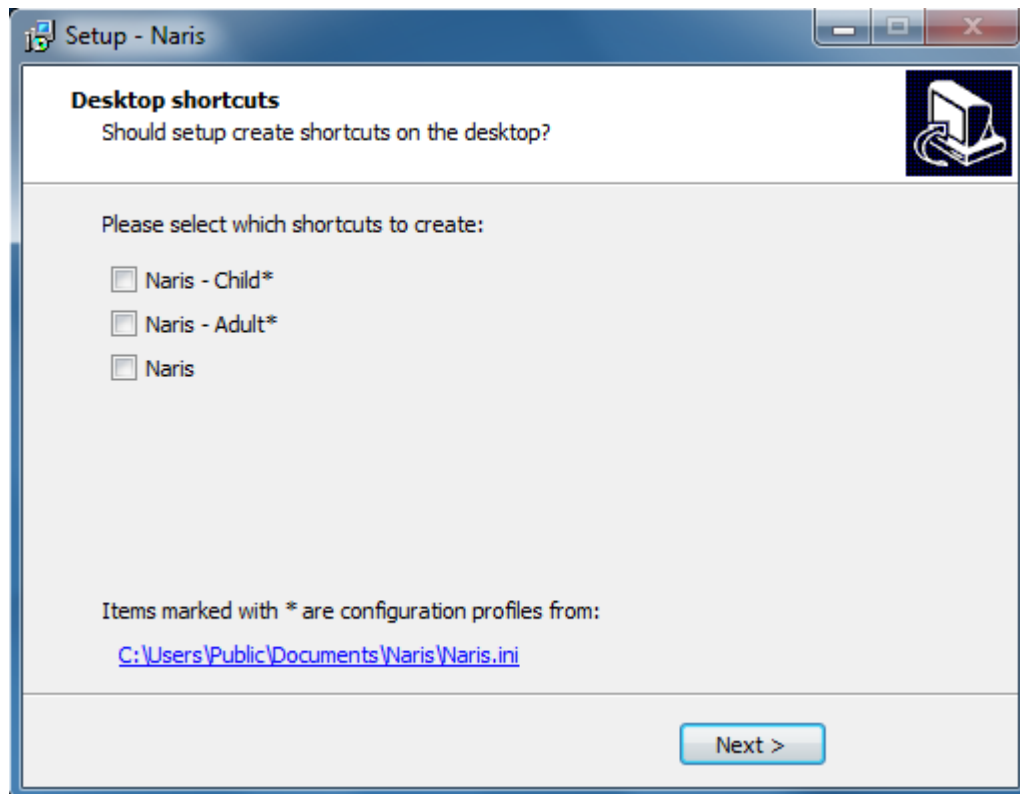
Put the GMI CD in your drive or open the folder Naris on your Thumb Drive. Navigate to the file Setup-Naris_V3_X_X_XXXX.exe and click on it. Accept the defaults offered at each stage, until you are asked for the desired location for the .ini file – you will be offered the choice of the shared folder or the application folder. Unless you plan on using the system on a network, the application folder should be selected.

CHILD SOUND TUBE

If you have purchased your NARIS with an additional, optional, smaller sound tube, for use with children or small animals, you will see a screen during the installation process which will allow you to have the wizard produce shortcuts on the desktop – Naris, Naris – Adult and Naris - Child. It is recommended that you select the Naris –

Adult and Naris – Child boxes and click Finish in the bottom right corner of the screen. Shortcuts will then appear on your desktop which will open the software, pre-configured for use with both the adult and child sound tubes.

N.B. If you open the wrong configuration of software for the sound tube you want to use it will produce erroneous results



The Naris program will start, and can be used, if you leave the final tick box marked.

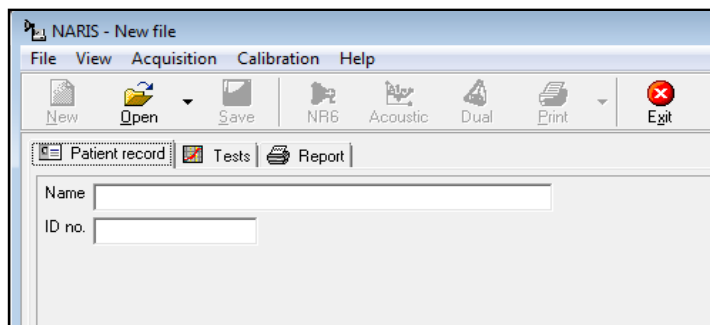
Store the software media in a safe place!

In future, the program can be started by clicking on:

Start -> Programs -> NARIS -> NARIS

Or by making use of the aforementioned desktop shortcuts – if you have both a child sound tube and an adult sound tube, we recommend using the desktop shortcuts to initialise the software. Using these shortcuts will initialise the correct profile within the software, whereas opening the software through the start menu will use the adult profile, by default.

HOW TO CONFIGURE THE SOFTWARE OPENING WINDOW



Several elements within the program can be configured to suit your application and although you may wish to change them again later it should be noted that fields within **the Patient Record** tab should **not** be changed after storing results for a particular subject as the stored information may become inaccessible. It is therefore recommended that you accept the default fields, or set up what you want before starting to measure and save results.

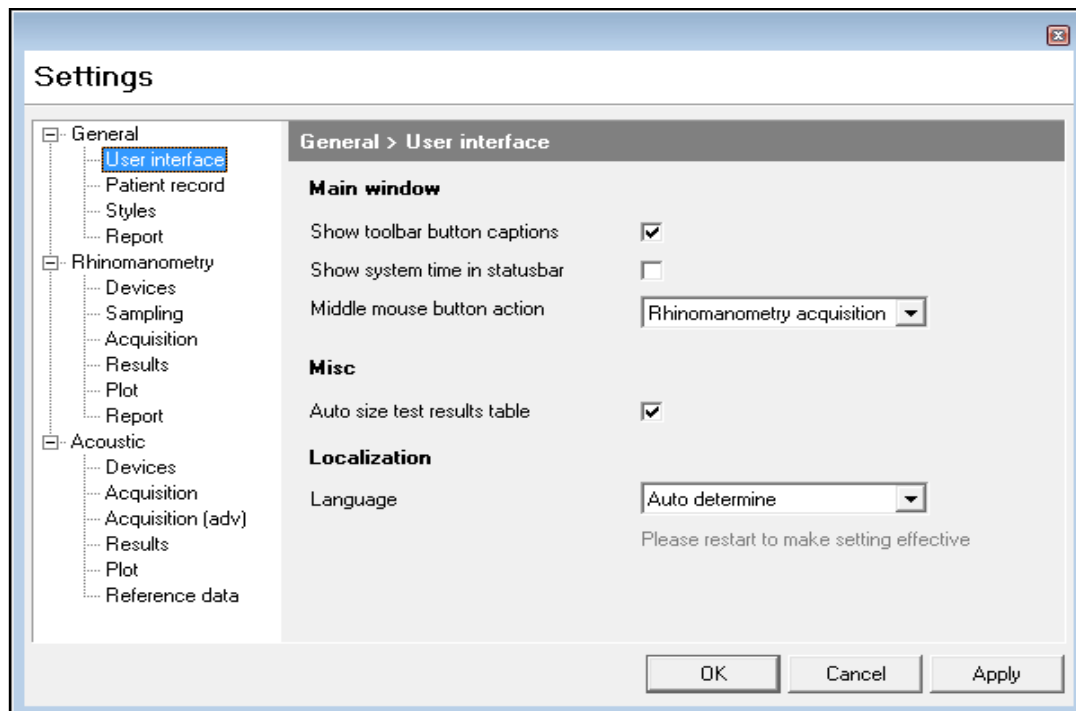
The software will open in a blank patient record. If you wish to add or remove any fields from this screen or make changes to them you must first close the current record by selecting **File** from the main toolbar and then selecting **Close** part way down the list. This software enhancement has been made to stop patient files being accidentally corrupted – a side effect of a patient record being changed while open within the software.

N.B. See page 9 for more details on changing the Patient Record fields.

If you wish to directly start with a new subject, click on **File, Close**, then on **New**.

All changes are made by clicking on **File -> Settings**. A new window named Settings is then displayed which shows three tabs, each of which contains user configurable items. The three tabs are labelled **General, Rhinomanometry, and Acoustic**.

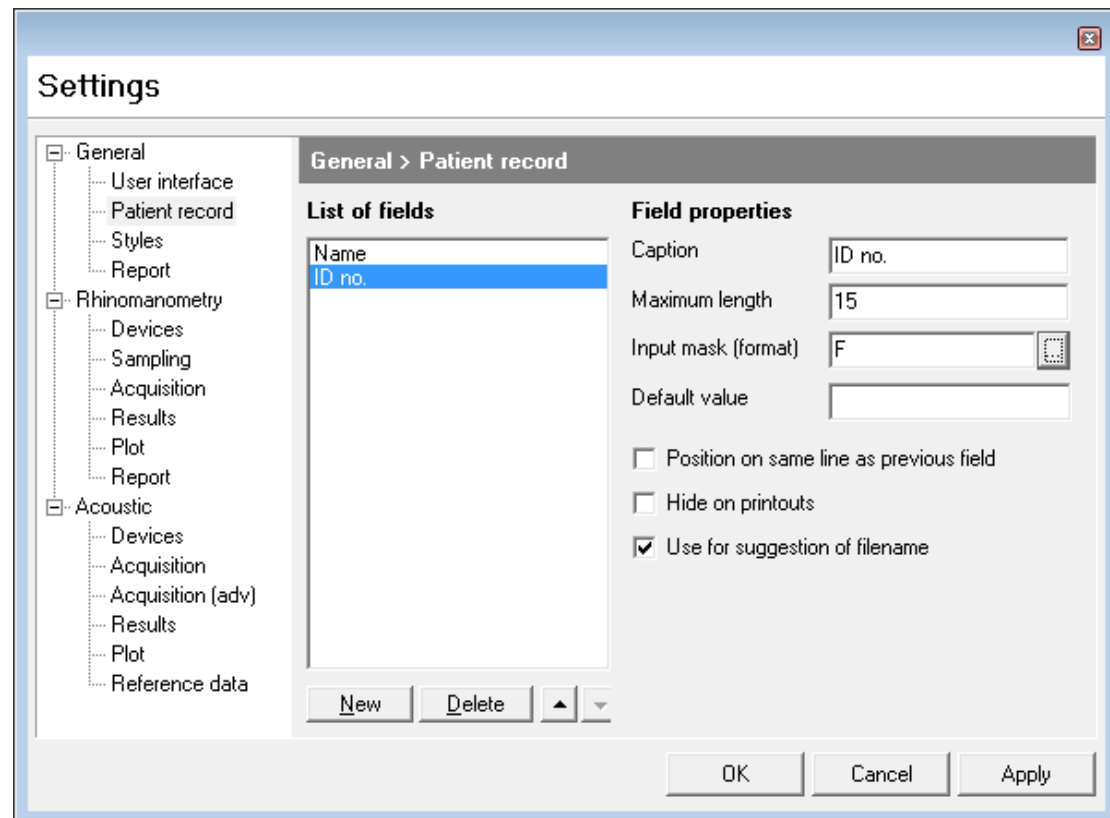
GENERAL > USER INTERFACE TAB



The **General > User** interface tab allows you to:

- Show captions on the toolbar buttons
- Show the PC system time in the status bar
- Enable the middle mouse button, or the use of a GMI USB footswitch to open the acquisition window (Rhinomanometry or Acoustic Rhinometer, based on how it has been set up))
- Make the system adjust the graphics display, following a test, to allow space for the table of results, appropriate to that test
- When possible, make the system match the language set on the PC to any of the options supplied with the Naris software

GENERAL > PATIENT RECORD TAB



The **General > Patient record** information window can contain many fields. You can, however, include as few as you like, put them in any order, define what kind of data is acceptable for entry in any field, and specify the size of any field.

The **Patient record** tab contains the following elements:

List of fields - a window which shows the current labels already selected for inclusion. If you click on one of these it can be edited or deleted or its position moved within the group. When highlighted the information relating to its structure is shown on the right-hand side of the window under the headings of:

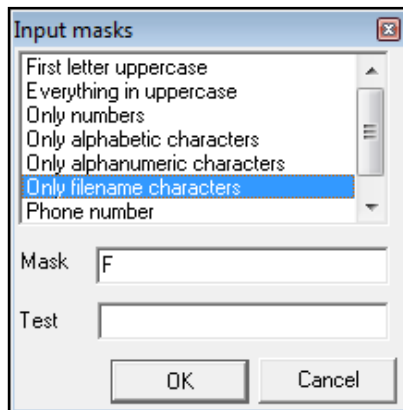
Caption - the current label selected for editing

Maximum Length - the number of character spaces allocated in the **Patient Information** window against that name

Input mask (format) - the conditions applied to character entry in the associated **Caption** field

In the above example, **ID no.** is highlighted in the **Lists of fields** window. The label **ID no.** is shown in the **Caption** field and the Maximum length field shows that the maximum allowed input is 15 characters. The mask applied was one which only allowed valid filename characters to be entered in that field. **Masks** can be selected

or changed by clicking on the button on the extreme right of the **Input mask (format)** field.



The **Input masks** window allows selection of the conditions you want to apply and has space below for you to **Test** the restrictions. If you wish to keep the currently selected field, click on **OK**, and then on **Apply**.

If you wish to discard any field, highlight that field and click on **Delete**. If you want to add a new one, click on **New**.

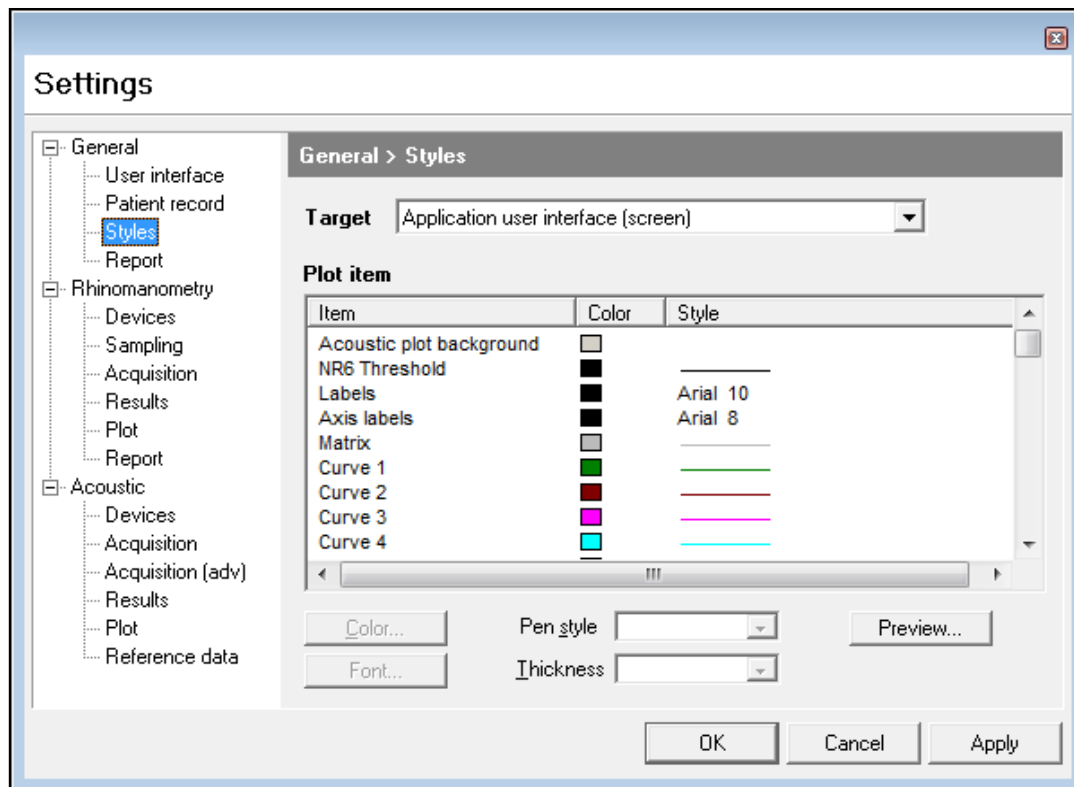
If you want to change the order in which they appear, highlight the one you want to move and then use the **Up** and **Down** arrow buttons to the right of the **Delete** button.

You can place more than one item on a line by placing it below the item you want it lined up with and clicking on **Position on same line as previous field**.

You can also hide a field from printout by highlighting it and clicking on **Hide on printouts**.

A field can be used for the test file name by highlighting it and then clicking on **Use for suggestion of filename**.

GENERAL > STYLES TAB



The **General > Styles** tab allows you to set up colours and line styles for either the screen or the printout.

Target – here you can select **Application user interface (screen)** (as shown above) or **Report (printer)** to make alterations

Item - scrolling window which contains a list of the screen or printout elements whose colour, line style or font can be changed

Color - colour palate from which you choose the colour you want applied to any element selected in the item window

Style - displays the colour, line style, or font currently set for the element shown in the item window

Pen Style - allows you to set different types of lines for the element selected

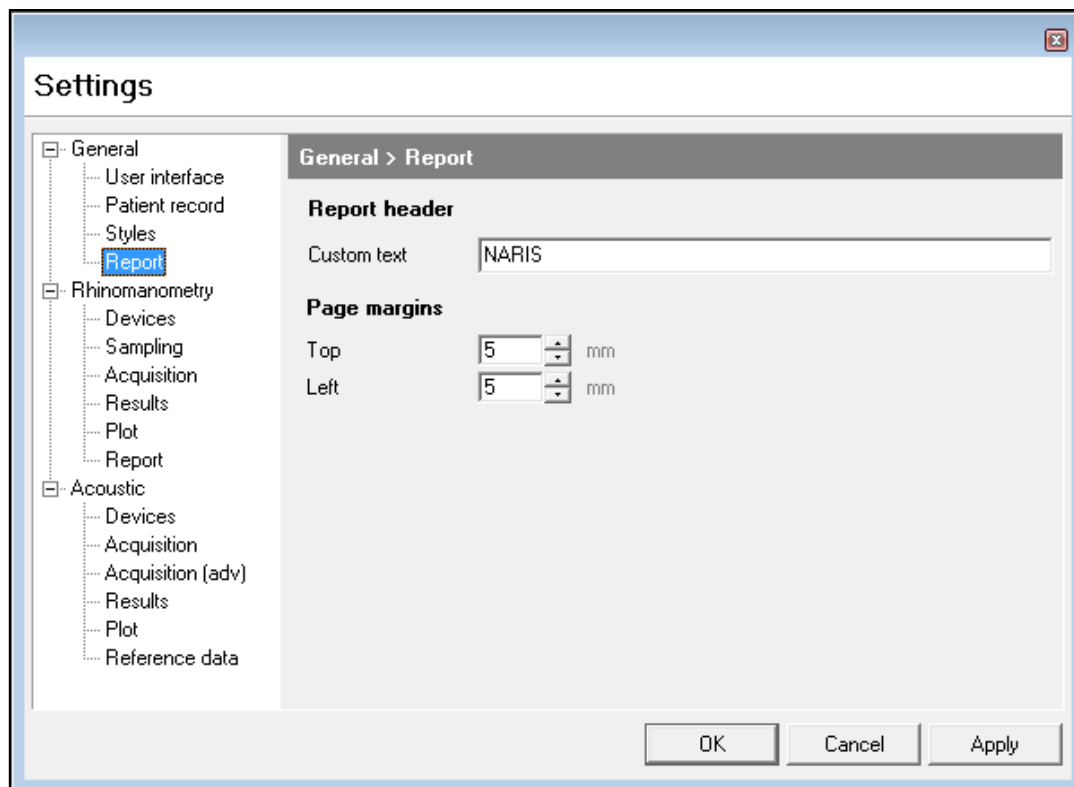
Thickness - allows you to apply a different line thickness to any line drawing element selected from the item window

Preview - window which lets you see the effect of a change

To make a change to the default settings select **Application user interface (screen)** or **Report (printer)** from the top dropdown menu, select an **Item** from the list, select your chosen **Pen** colour and, if appropriate, **Pen style** or **Thickness**. You can immediately see the effect of that change in the **Preview** window.

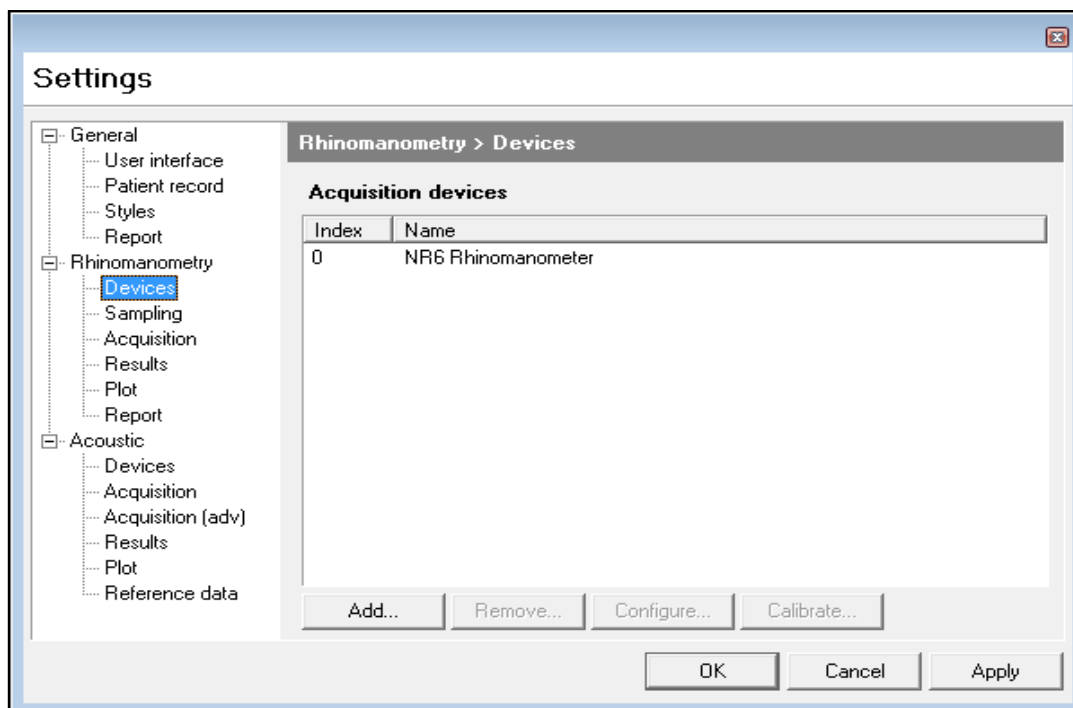
If you click on **Apply** the change will be recorded and you can move to another element. If you click on **OK** instead of **Apply**, the change will be made, and recorded, but you will close the **Setup** window and return to the main screen.

Application User Interface (screen) & Report (printer)	
Item Name	Item Description
Acoustic Plot Background (Testing screen only)	The background colour of the graphs viewed on the screen during testing
NR6 Threshold	The lines that mark the minimum pressure magnitude required to initiate capture during an NR6 test
Labels	Graph annotations for the NR6
Axis Labels	Numbers marking the axes on the A1 graphs
Matrix	The non-zero grid lines for each graph
Curve 1 – Curve 10	Each of the captured curves shown on a graph at any given time
NR6 Acquire Pen (Testing screen only)	Dot which draws the graph as the subject breathes
Rohrer Curve	Curve relating to linear and non-linear resistance (NR6)
Acoustic MeanBase (L+R)	Colour of the left and right baseline curves when performing a comparison
Acoustic MeanComp (L+R)	Colour of the left and right comparison curves
Acoustic Goldnose	Curve relating to the Goldnose Acoustic Rhinometer calibration device
Graph Border / Graph Area	Colour of graph borders and background areas
Axes	Zero lines on the graphs
Results Values Text	All text in the tables
Subgraph Caption	Text in the “Remarks” box in the bottom right corner of the screen
Legend: Item Text/Box Frame/ Box Background	Colour of the frame, background within the frame and the text within the frame of a legend describing the information contained within a graph
Patient Record Background	Background of the main screen where patient details are entered
Individual Base/Comp P/L/R	Colour of the baseline and comparison curves when comparing the whole nose (usually taken before and after a procedure)
Averaged Base/Comp P/L/R	Colour of the baseline and comparison curves when using averaged data (see Rhinomanometry Report tab, below)
Flow/Pressure Base/Comp P/L/R	Baseline and comparison graphs using NR6 results

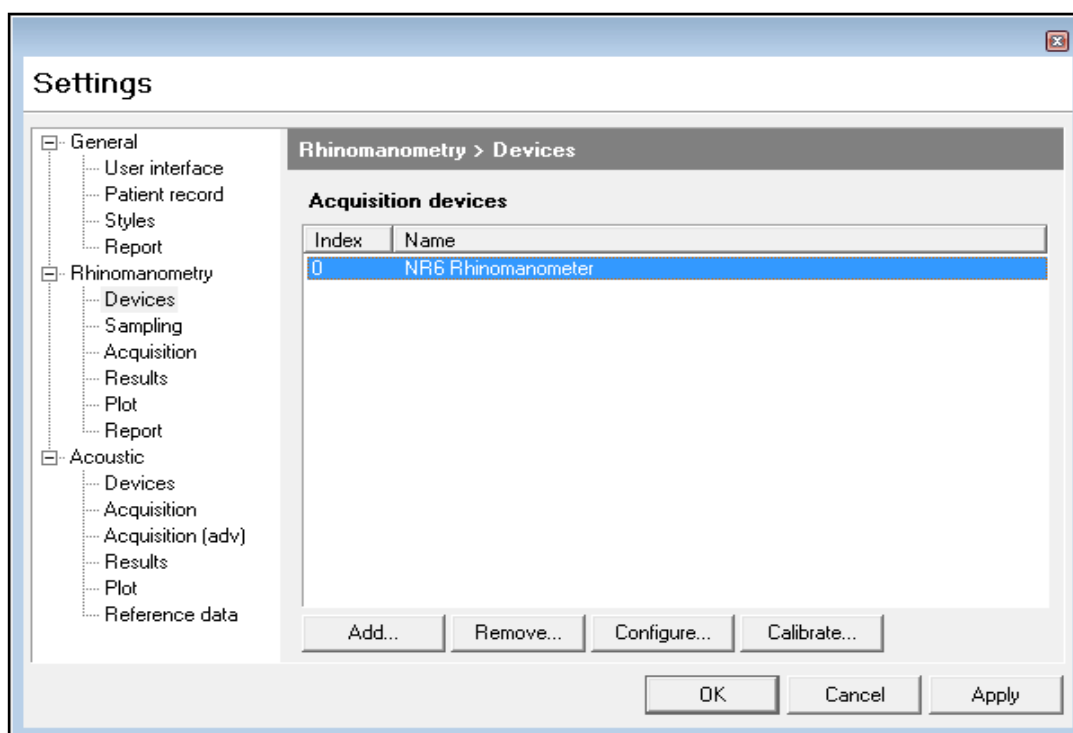
GENERAL > REPORT TAB

The **General > Report** tab allows the setting of a title which will appear on printouts and the alteration of printer margins. More detailed control of printer options is available in the normal Windows print driver dialogue box.

RHINOMANOMETRY > DEVICES TAB



The **Rhinomanometry > Devices** screen shown above displays the USB device **Index**, which has been assigned to the instrument. If you highlight the device **NR6 Rhinomanometer**, the buttons at the bottom of the window become active.



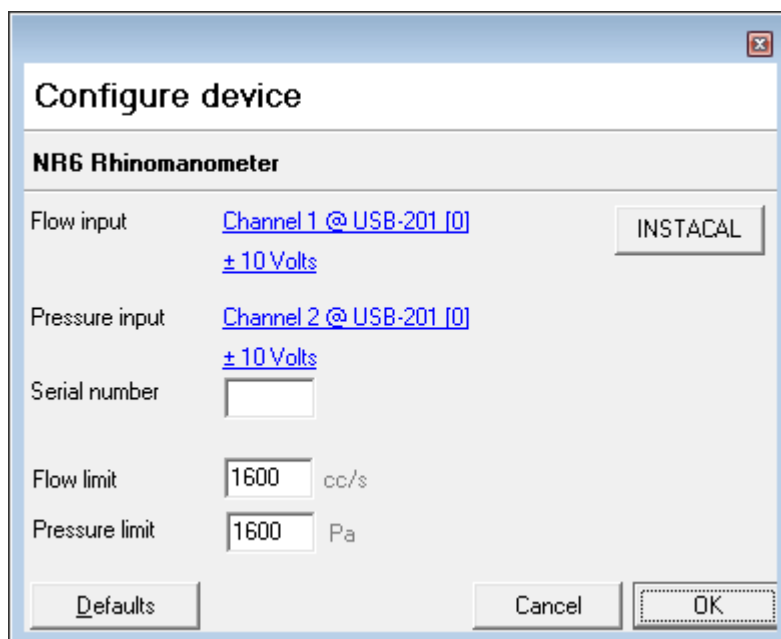
If you then click on **Configure** (or double-click on the device name) you will see:

the interface type (**USB-201**), Board number [0], the channels used for the flow transducer (1) and pressure transducer (2), and the gain setting which has been selected (**+/- 10 Volts**).

Also displayed are the flow and pressure limits (1600 units for each).

N.B. These are all default settings and should not be changed.

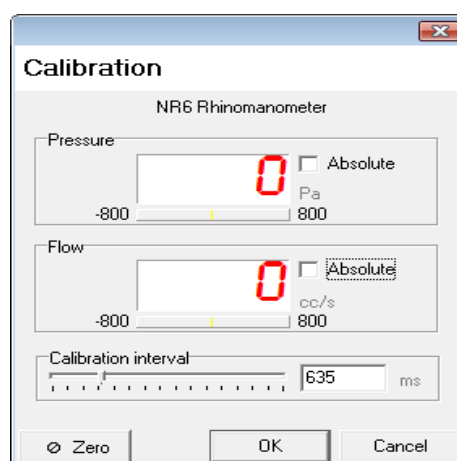
These are all default settings and should not be changed.



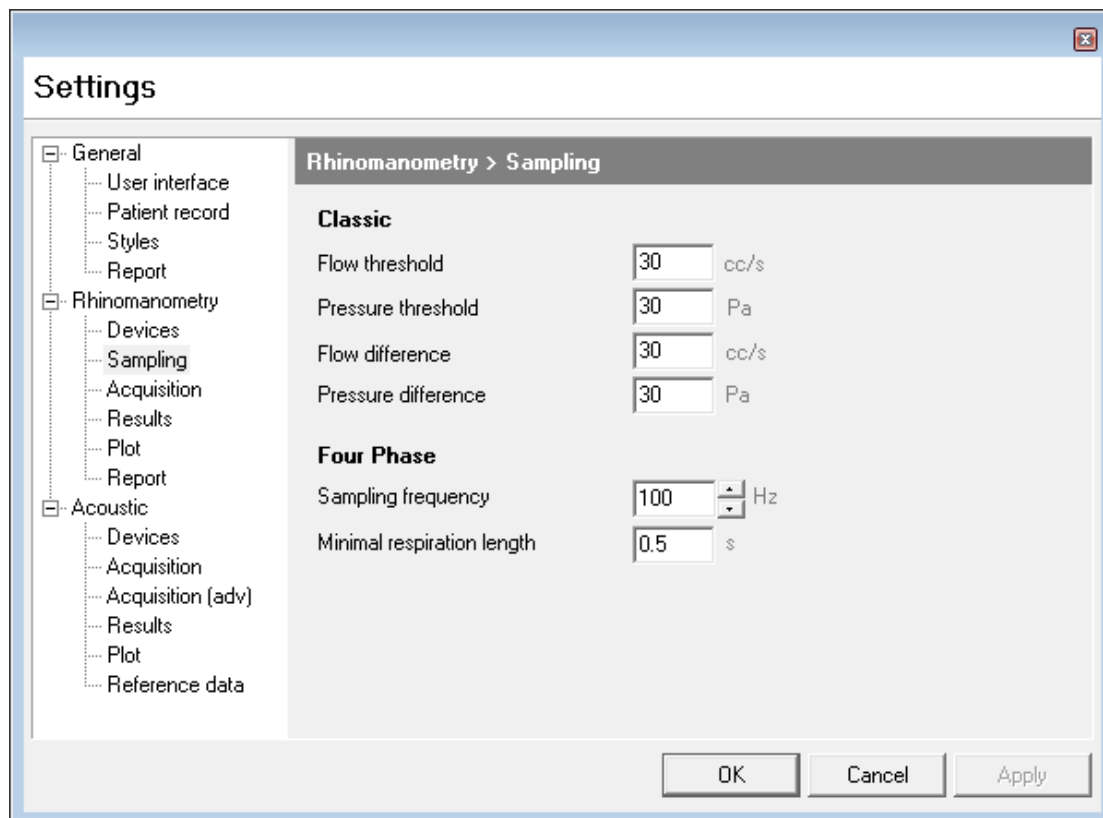
If you click on **Calibrate**, digital meters displaying the current Flow and Pressure signals will show.

If you have known sources of flow and pressure to apply to the NR6 and compare with the meter readings this will allow you to check the calibration, as explained in the maintenance section of the user manual.

Viewing this screen allows you to check the calibration, it does not alter the calibration in any way.

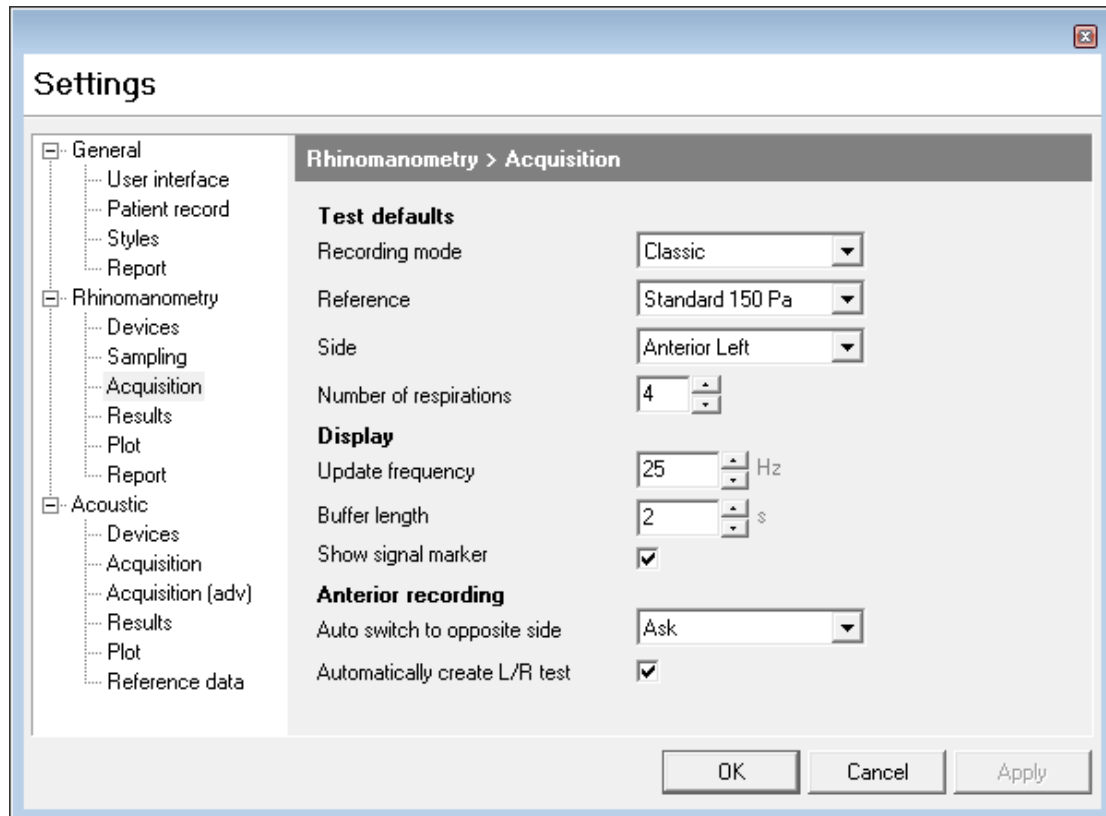


The **Add** and **Remove** buttons allow the interface to be changed if, for instance, you have an NV1 Rhinospirometer, which you want to install on the same PC. Each interface will be assigned a different number by InstaCal, and since the default setting for both instruments is board 0, one or other must be changed in the software to allow both to work. There is normally no need to alter these settings.

RHINOMANOMETRY > SAMPLING TAB

These settings relate to data sampling and should not normally be altered.

RHINOMANOMETRY > ACQUISITION TAB



The **Rhinomanometry > Acquisition** tab contains the default settings for:

Recording mode - where you can elect to use **Classic** Rhinomanometry or **Four Phase** Rhinomanometry

Reference - defines whether you will be offered a **Broms** or **Standard** fixed-point resistance test. You can always change at the time of testing but this facility allows a standard protocol to be offered

Side - gives the option of Posterior or Anterior Right or Anterior Left testing as the default test starting point

Number of respirations - lets you set the number of respirations required to complete a test - the default is 4

Update frequency - affects the rate at which the screen displays are updated; it does not affect the acquisition rate

Buffer length - specifies how many seconds of pressure/flow meter samples are retained

Show Signal Marker - lets you switch the circle which surrounds the Acquisition Spot during an Acquisition, On or Off

Auto-switch to opposite side

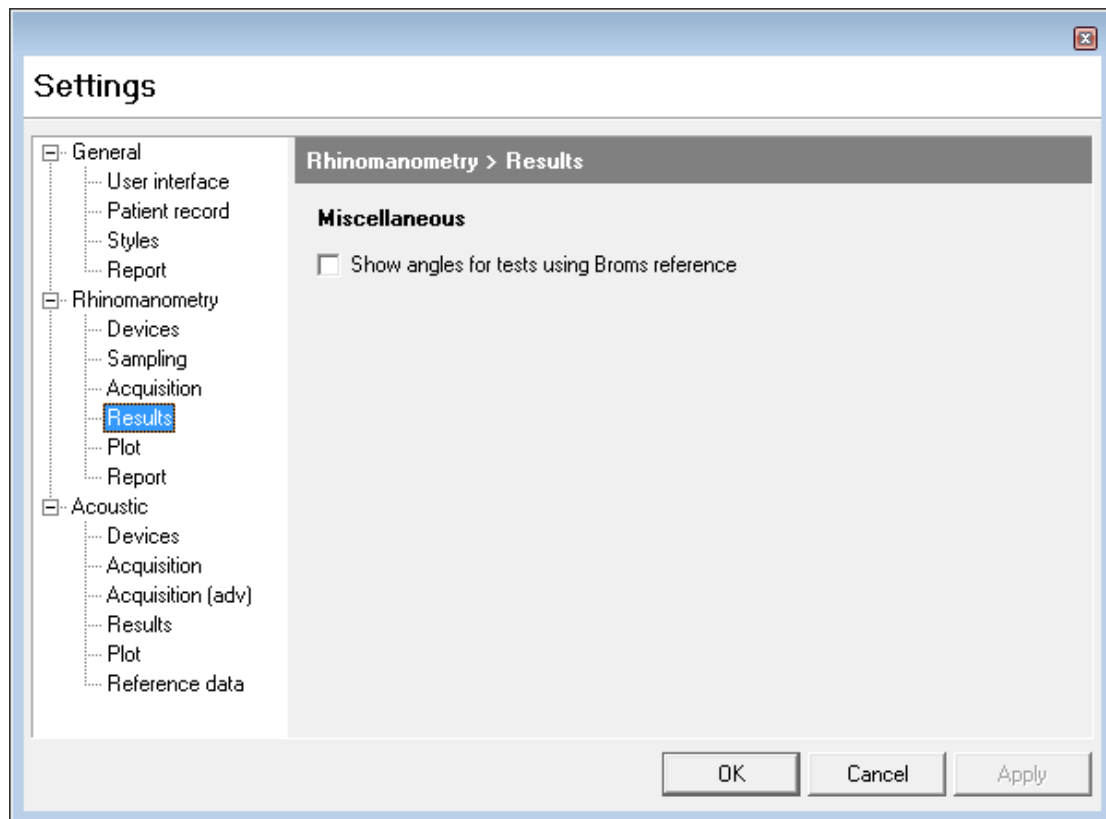
Ask - having performed a measurement on one side bring up a window offering to measure the other side

Always - having performed a measurement on one side, set up the acquisition screen to measure the other side

Never - having performed a measurement on one side, close the acquisition window

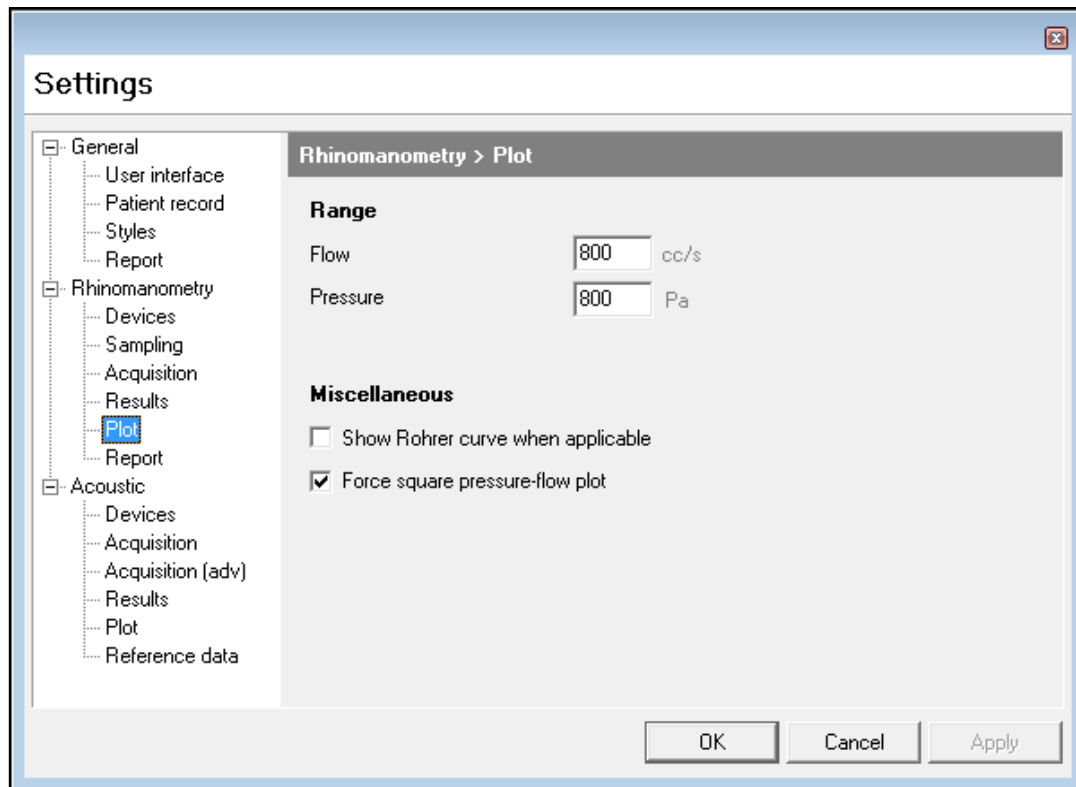
Automatically create L/R test when using Anterior Rhinomanometry. Having performed Left and then Right-side testing, if this box is ticked a new combined Left/Right test result will be added to the test list for the subject

RHINOMANOMETRY > RESULTS TAB



If a **Broms** test is to be done, the angles, with reference to the horizontal axis, can be shown in the results table when this box is ticked.

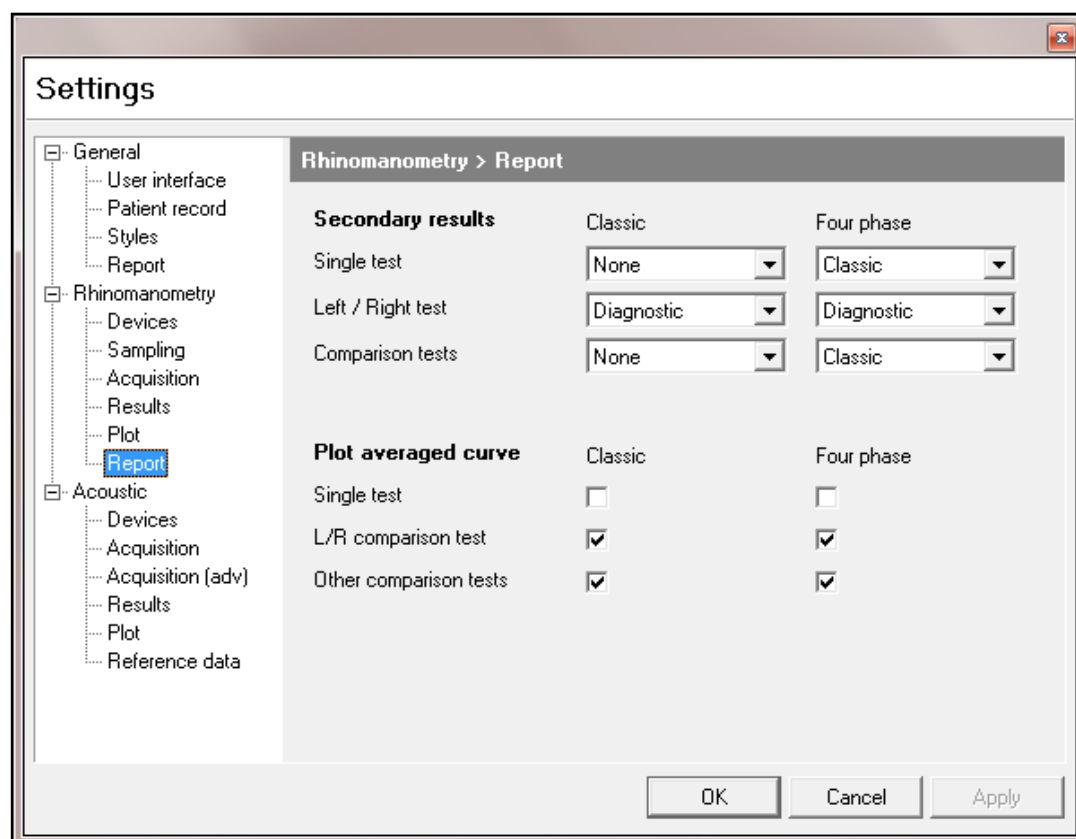
RHINOMANOMETRY > PLOT TAB



Range - The Flow and Pressure scales can be lowered if a smaller range is required; the default for both is 800 units. Normally, both parameters should be set to the same value.

Miscellaneous - Tick boxes are provided to display the Rohrer curve if selected and to maintain the display of the **pressure-flow** plot in a square (equal dimension) format.

RHINOMANOMETRY > REPORT TAB



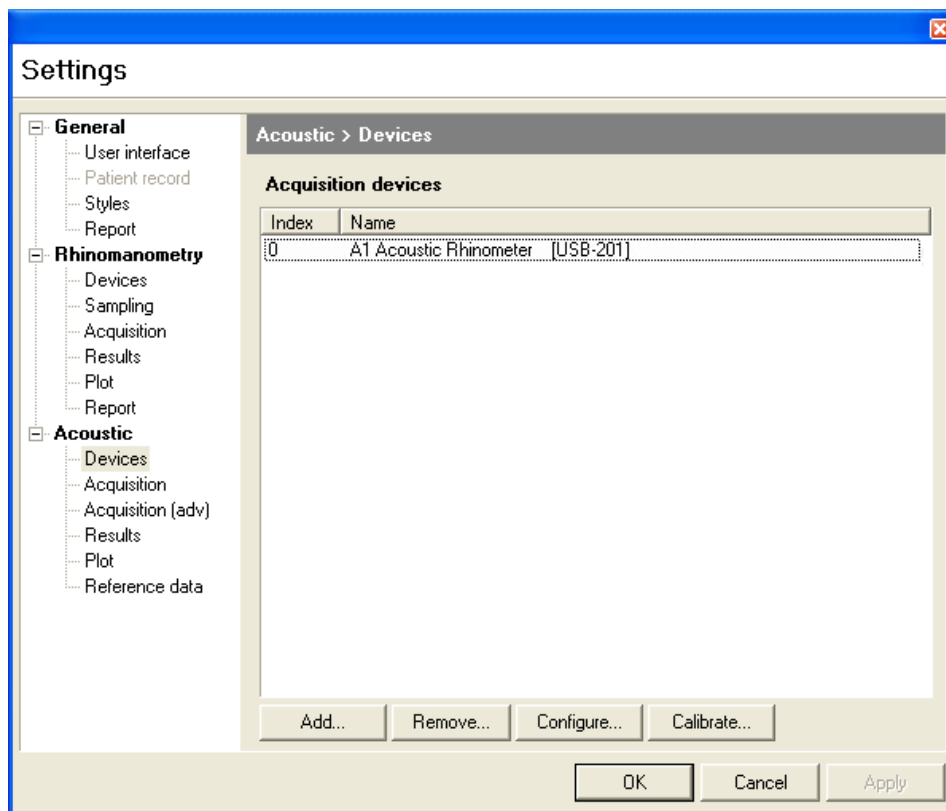
Secondary results

A number of formatting options exist when you come to generating a printed report, and these can be set here for both standard and enhanced (four phase) tests.

Graph options

Most test results are generated by averaging a number of breathing cycles. If this box is ticked, an average of whatever number of cycles have been measured is generated and displayed on the printout.

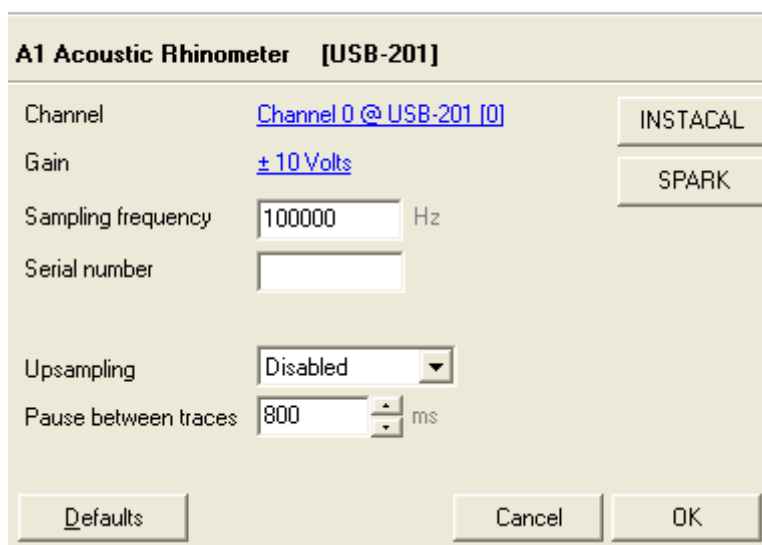
ACOUSTIC > DEVICES TAB



The **Acoustic > Devices** screen shown above displays the USB device number assigned to the instrument [0]. If you then click on the device (**A1 Acoustic Rhinometer**) the buttons at the bottom of the window become active.

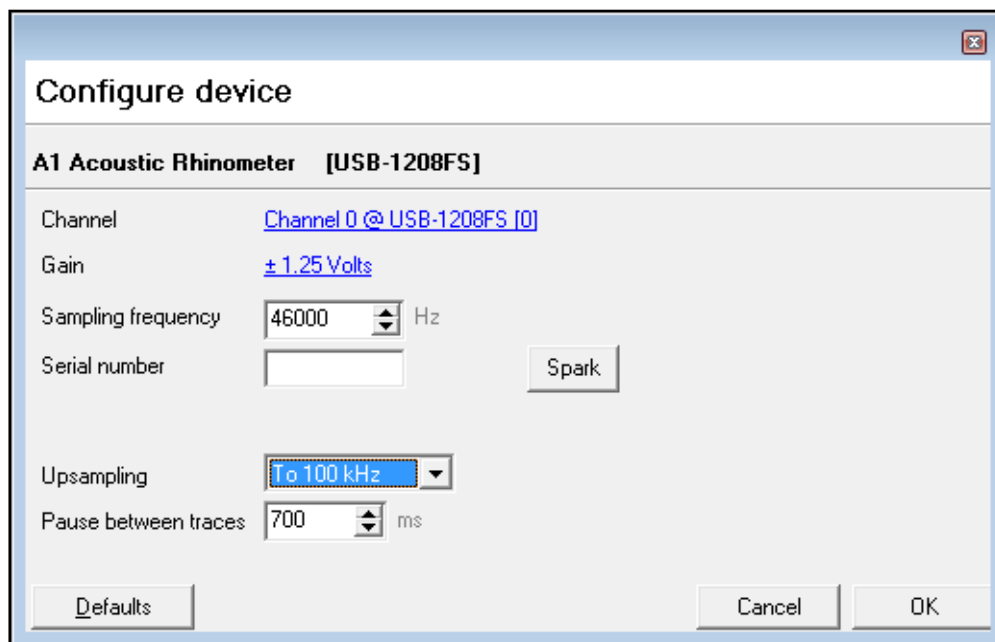
If you click on **Configure**, you will see:

Configure device



When the USB interface is installed (**USB-201**), the window will show: the board number [0], the channel used for the microphone (which, by default, is channel 0), the selected gain setting (**±10 Volts**), the basic sampling frequency (**100 kHz**), the upsampling option will be disabled, and the pause between each measurement (**700 ms**). These are the default settings for a **USB-201** interface and should not normally be changed.

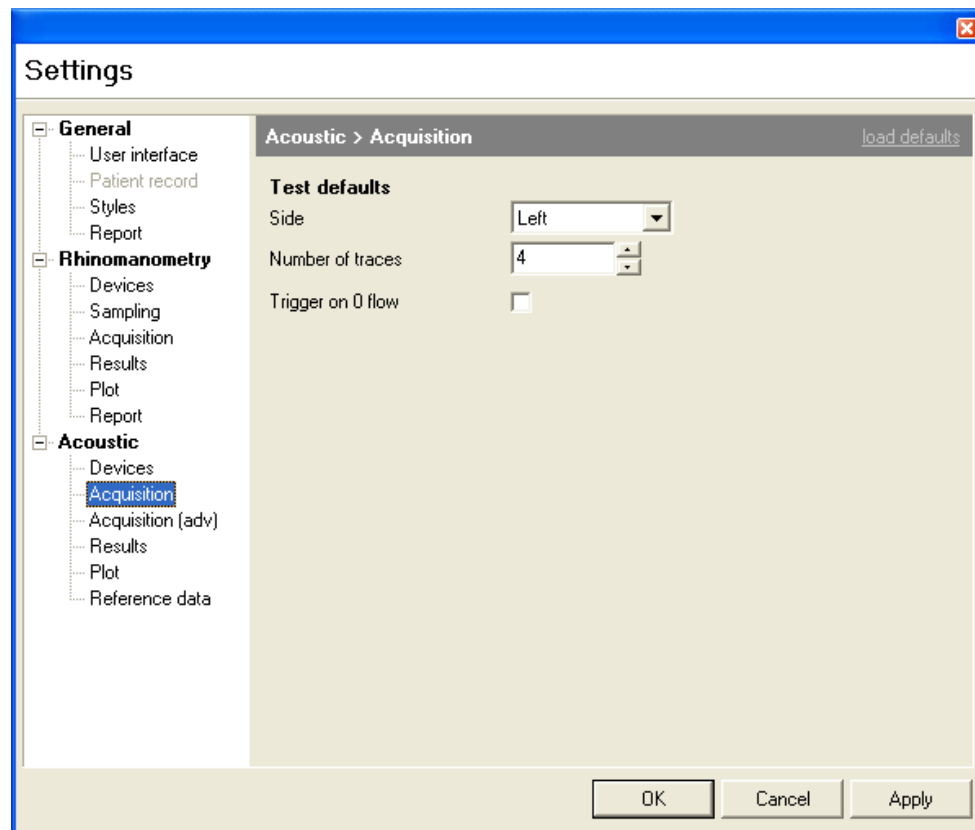
N.B. Earlier versions of the A1 may have also used a USB-1208FS interface, in this instance the window will show: the board number [0] and the channel used for the microphone (0), the selected gain setting (**±1.25 Volts**), also displayed are the basic sampling frequency (**46kHz**), the data processing upsampling equivalent (**100kHz**) and the pause between each measurement (**700 ms**).



When you click on **Calibrate** in the test acquisition window, you should have the A1 switched on at the wall with the calibration plug fully inserted into the A1 sound tube. An Updated calibration file will be generated and saved to the default folder – the same directory to which the program was installed.

The **Add and Remove** buttons allow the interface to be changed, if, for instance, you have an NV1 Rhinospirometer, which you want to install on the same PC as the NARIS. Each interface will be assigned a different number by InstaCal, and therefore as the default setting for both instruments is board 0 one or other must be changed to allow both to work. Normally there is no need to alter these settings.

ACOUSTIC > ACQUISITION TAB

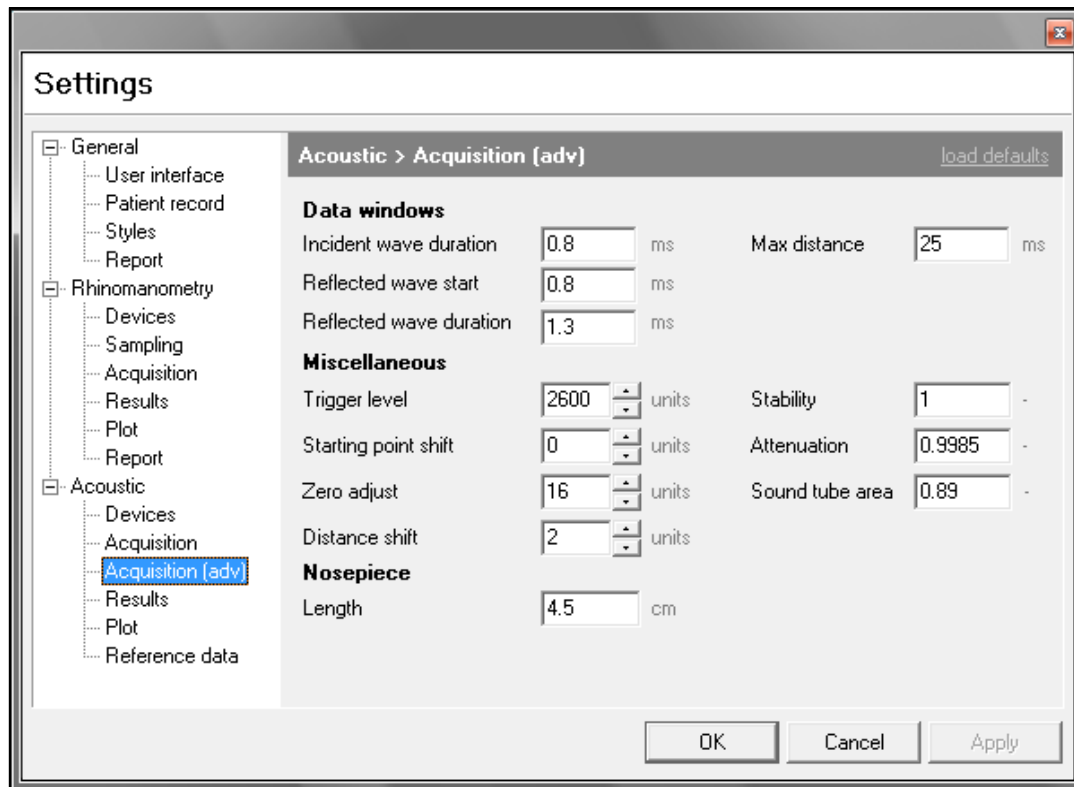


Side - sets the side of the nose offered first during a test

When acquiring acoustic data, the information can be obtained from a single measurement or from the average of a series of curves. The item labelled **Number of traces** specifies what is to constitute a single test – the default value is four.

Trigger on zero flow is a facility which is only usable with an open sound tube and should not normally be enabled.

ACOUSTIC > ACQUISITION (ADV) TAB



All of the parameters set up within this dialog box are pre-set by us and stored on your software media to give the best possible performance on your system.

Each sound tube is different and will most likely require different values, for example, alternative small animal/child/adult tubes will also use different values.

The **Distance shift** factor allows a small lateral movement of the measured data curve to give the best fit when comparing a measurement made with an artificial nose with the theoretical line produced by the profile of an artificial nose. It effectively compensates for variations in the speed of sound under different conditions.

Sound tube area, **Zero adjust**, **Stability**, **Starting point shift** and **Attenuation** factors are adjusted to provide optimum results while setting up the system with the artificial nose and straight tube, as recommended by the standardisation committee.

The **Max distance** factor is normally set to **25 mS** to limit the size of files created and saved. Normally scaling of the horizontal axis is set to run from -5 cm to +12 cm, so the minimum requirement is a maximum distance of 17 cm. If you want to measure further back, say to 20 cm, then the horizontal scale and Minimum distance would need to be increased.

If an improper data message is produced during acquisition the **Trigger level** factor can be reduced to allow measurements to be made.

Data windows parameters are based on the physical parameters of every sound tube and are, therefore, constant for every sound tube.

Nosepiece Length allows you to tell the software what nosepiece you are using to let it adjust the graphical display accordingly – this will normally be 4.5 cm.

ACOUSTIC > RESULTS TAB

The screenshot shows the 'Settings' dialog box with the 'Acoustic > Results' tab selected. The left sidebar lists various settings categories: General, Rhinomanometry, and Acoustic. The 'Acoustic' category is expanded, showing sub-items: Devices, Acquisition, Acquisition (adv), Results (selected), Plot, and Reference data.

Acoustic > Results

Volume calculation	Cross-sectional area minima
Start distance: 0 cm	Start distance: 1 cm
Stop distance: 5 cm	Stop distance: 5 cm
	Hysteresis: 0.015 cm ²
Comparison ranges: 0-5, 2-5 cm <small>Maximal 5 ranges: start-end. Separate ranges with comma (e.g. 0-5, 2-5)</small>	Comparison distances: 2,4 cm <small>Maximal 5 values. Separate values with comma (e.g. 3, 5, 7)</small>
Miscellaneous <input checked="" type="checkbox"/> Include totals <input type="checkbox"/> Include Minimal Cross-sectional Area (MCA)	

Buttons: OK, Cancel, Apply

Volume calculation Start distance and **Stop distance** specify the section of the nose over which you want to calculate a volume.

Cross-sectional area minima specifies the section of the nose over which you want to look for turning points, and **Hysteresis** specifies what constitutes a turning point.

Comparison ranges allows you to specify the volumes reported between up to 5 pairs of distances, when a comparison display is on screen.

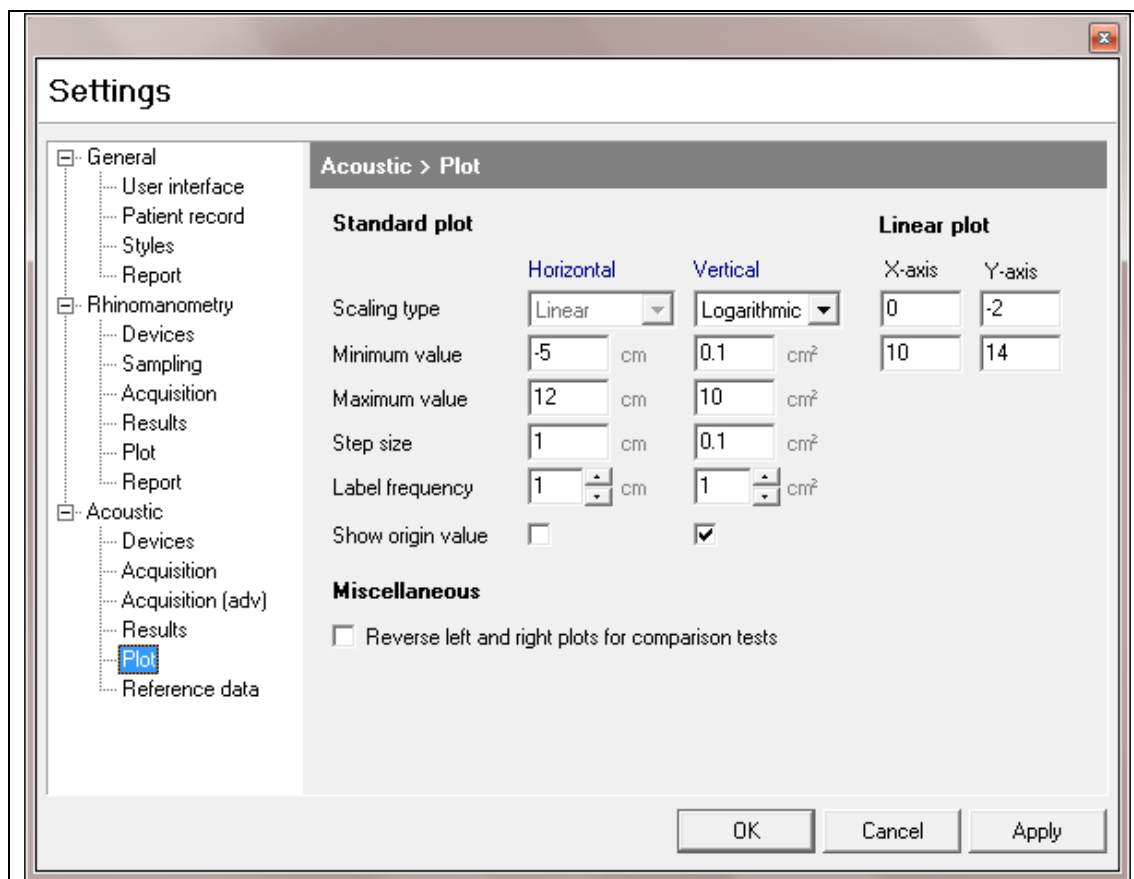
Comparison distances allows you to specify up to five distances at which cross-sectional areas will be reported when a comparison display is on screen.

Miscellaneous

An **Include totals** tick box is offered here to allow the standard result screen, when showing right and left side volumes etc., to also give a total nose figure. This summation may not be appropriate if you want to compare two right side or two left side measurements, and can therefore be switched off here.

Although the system will automatically report MCA1 and MCA2 (the first and second **Minimum Cross-sectional Areas** found, starting from the front of the nose), it can also automatically determine which is the smallest and report it as **MCA**, if the box is ticked.

ACOUSTIC > PLOT TAB



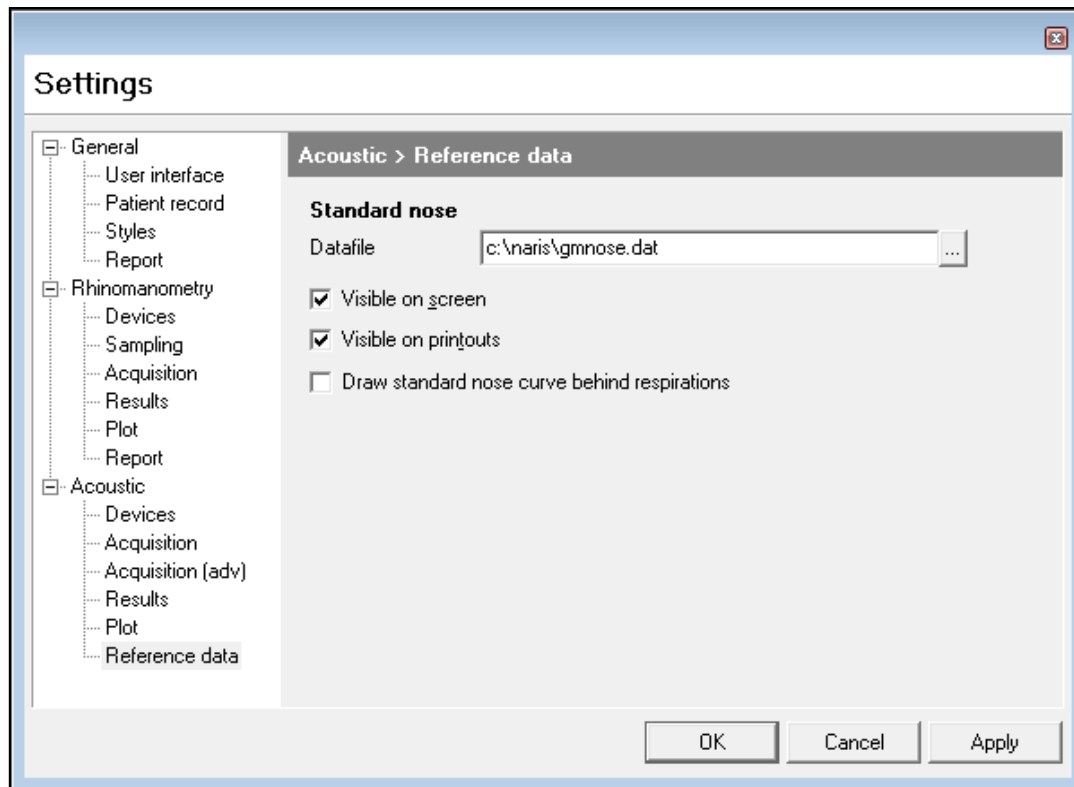
The scaling for the distance and cross-sectional area axes can be set up here, for the **Linear plot** and the **Logarithmic plot**, comparison and analysis view screens.

N.B. A logarithmic scale should not be assigned a minimum value of zero

Miscellaneous

A tick box is offered to allow the side used to display the left/right results to be switched.

ACOUSTIC > REFERENCE DATA TAB



Validation of system performance can be made by comparing a theoretical **Standard nose** curve, with that obtained when making a measurement on a **Standard nose** model.

The A1 GMNose allows such a system check to be made. The **Acoustic > Reference data** tab shown above, allows the appropriate theoretical curve to be drawn on the screen in a colour and line style specified in the **General > Styles** tab, under control of check boxes on this screen.

The **Datafile** used under normal circumstances is called GMNOSE.DAT and can be selected from file by clicking on the button to the right of the **Datafile** window. This file is installed into the same folder as the software program. The selected data file can be shown on screen if **Visible on screen** is selected and can be seen on printouts if **Visible on printouts** is selected.

The **Datafile** is drawn behind measured curves provided the 3rd tick box is selected.

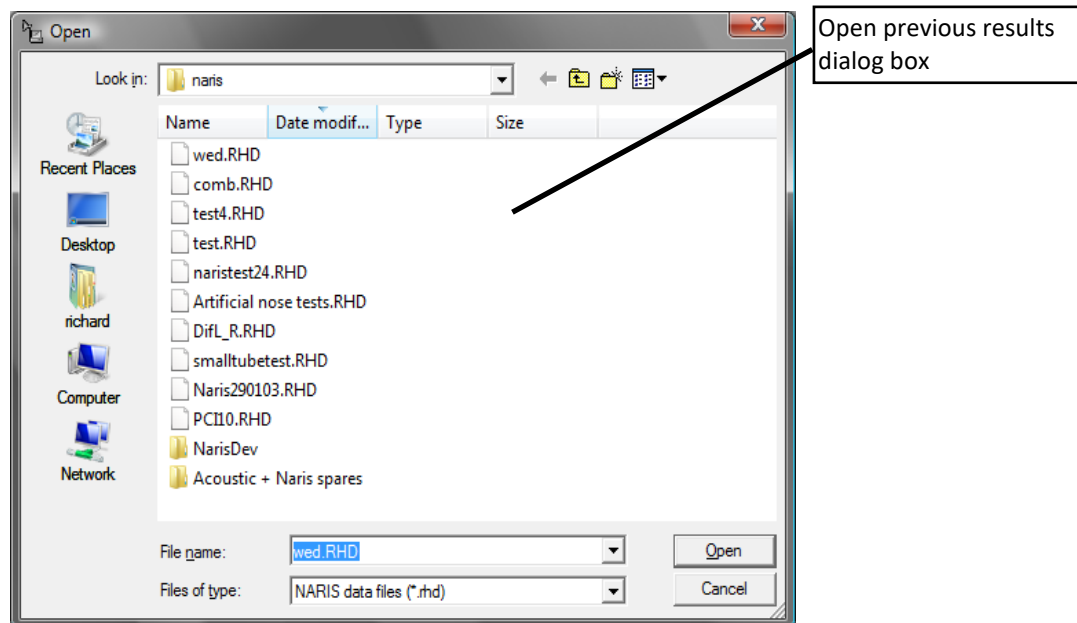
STARTING A TEST

TO PREPARE FOR MEASUREMENTS ON A NEW SUBJECT

1. All current patient information and test results are cleared when the program is started, or, if having performed other measurements, you click on the **New** button.
2. In either event, the cursor is set to the first field in the patient information window. You can then enter the required patient details. Pressing the tab key, **↹**, after entering information in each field will take the cursor to the next one.
3. To start the acquisition procedure, click on the NR6 icon or the Acoustic icon on the top toolbar.

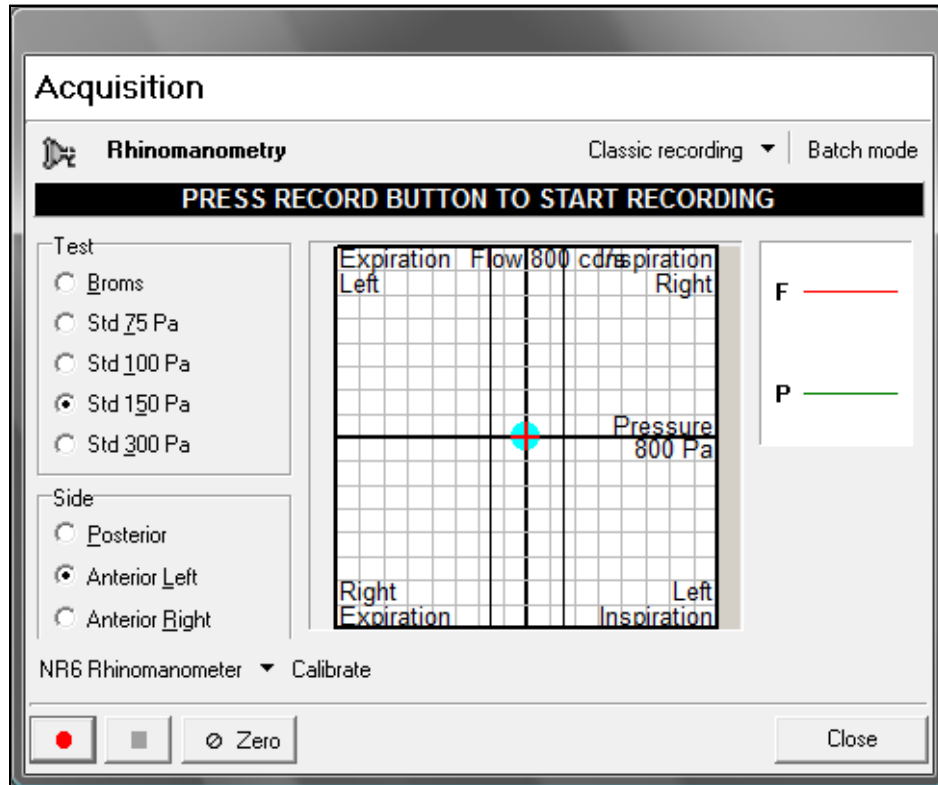
TO PREPARE FOR MEASUREMENTS ON A REPEAT SUBJECT

1. Click **Open** and then, using the dialog box offered, go to the folder you store your results in and click on the appropriate subject's file name.
2. You will then be able to examine the patient details and check that you have the correct subject by clicking on the **Patient record** tab. Clicking on the **Tests** tab will show you all previous test dates and results for that patient.



TO MAKE A NEW RHINOMANOMETRY RECORD

1) Click on the icon marked NR6 on the top bar - the **Acquisition** dialog box will then open as shown below



2) The software offers two options, selectable from the top bar:

- Perform a **Classic** recording i.e. make standard resistance measurements or perform a **Four Phase** recording i.e. add Vertex and Effective resistance measurements
- For either of the above enable the **Batch** mode facility. This is described in detail later in this manual, but it is essentially a way of validating the results achieved and printing them off without the possibility of modifying data. This feature is of particular interest to those involved in running clinical trials. Select the options above, as appropriate, then select **Side** → Posterior, or Anterior (Left or Right) testing, and the Test conditions (**75 Pa** for Posterior or **150 Pa** for Anterior).

3) With the flowhead and tubes sitting undisturbed, check that the spot is zeroed on the origin of the graph. If not, click on the button marked **Zero**.

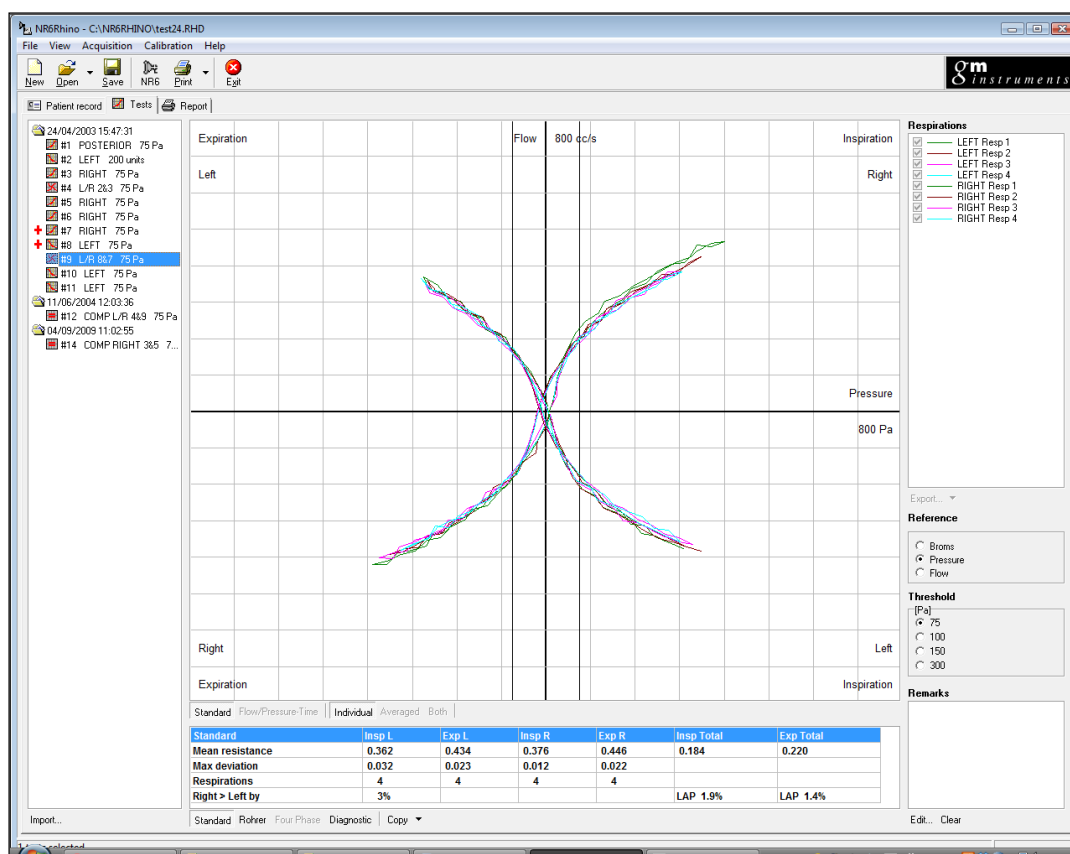
Connect the subject to the mask and mouth tube for **Posterior** or **Anterior** testing and ask them to breathe in a normal relaxed way.

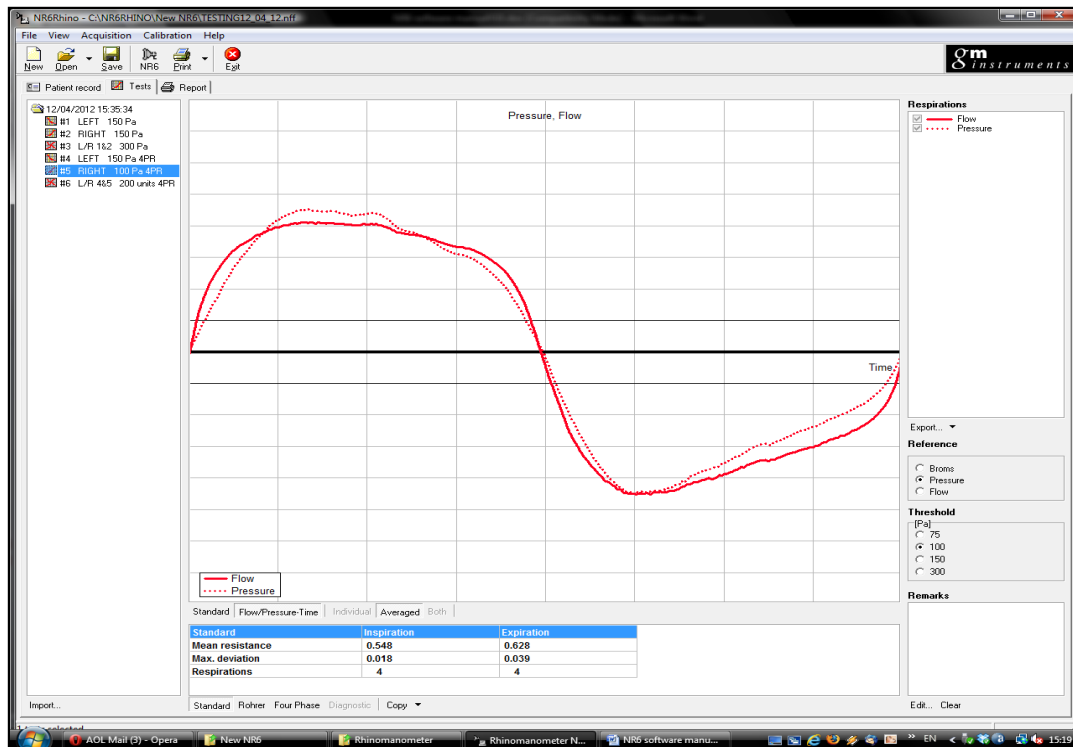
You should see the trace being described across the screen and once that shows in a consistent fashion click on the red button to begin recording data.

N.B. a USB footswitch is available as an optional extra to begin the recording cycle

4) Once four complete respiratory cycles (or however many you have the system set to) have been captured, the system will stop taking in data, show you the resultant curves (each of which will be drawn in a different colour), and add the test to the test list for that subject.

5) If any curve is obviously bad it can be de-selected by clicking in the appropriate check box in the **Respirations** section on the right of the screen.





A row of buttons just below the graph allows you to select the **Standard** X/Y display or **Flow/Pressure-Time** display, and if **Standard**, you can display the traces as **Individual**, **Averaged** or **Both** (**Individual** and **Averaged** superimposed).

A further row of buttons on the bottom bar allows the calculated values of **Standard Resistance**, **Rohrer Coefficients**, **Four Phase** (Log Vertex & Log Effective Resistance) and for, L/R comparison traces, **Diagnostic** values to be displayed.

6) If required, additional testing can be done, or the current test printed by clicking on **Print**, or saved by clicking on **Save**.

7) The **Output** tab can be used to create a printout consisting of a number of curves by selecting the check box for each on the left of the test list.

8) Additional facilities available from the screen include:

Import --- This allows you to merge data from two saved files

Export --- This allows the raw data to be sent to a text file

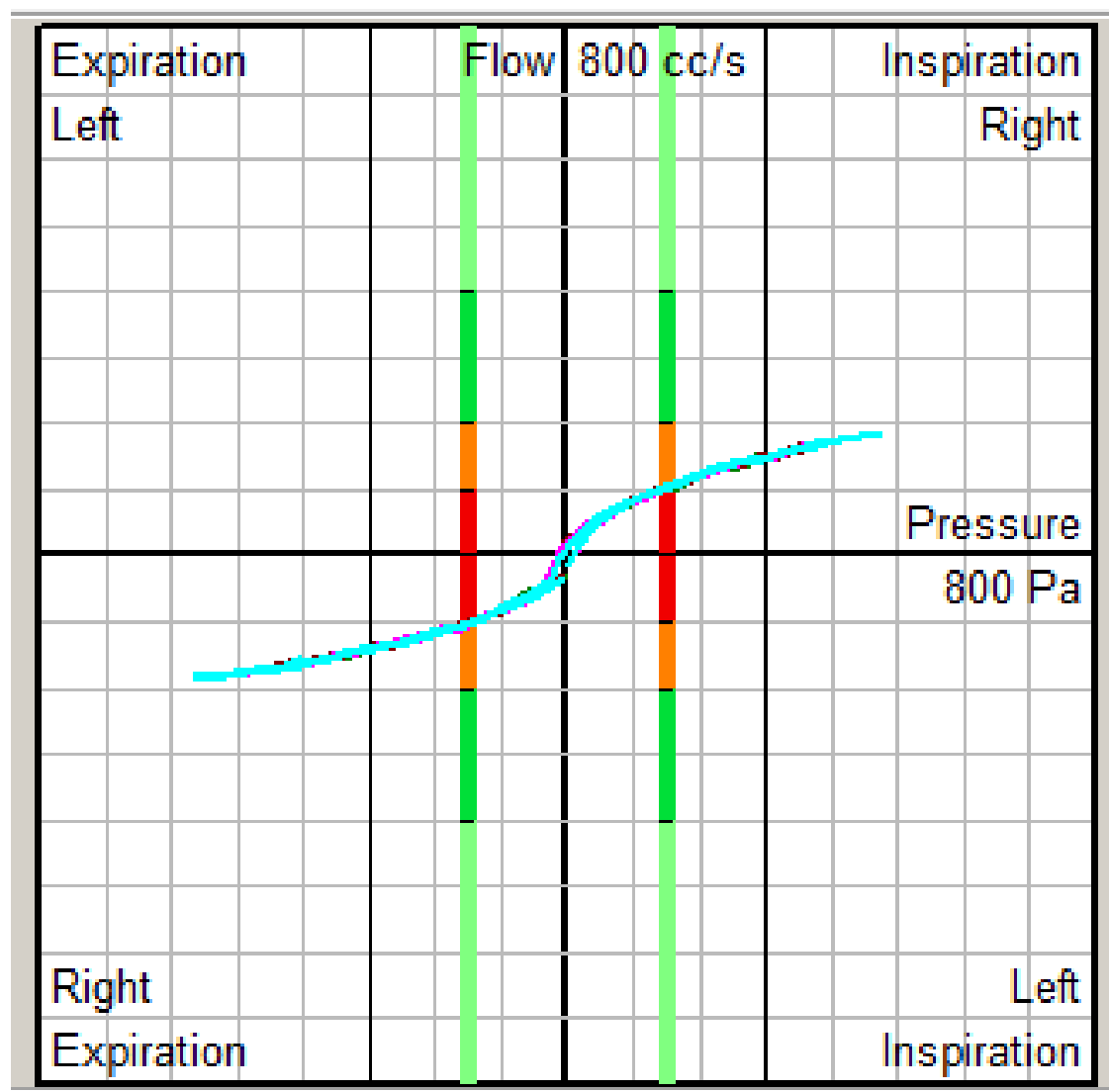
Copy --- This allows the calculated values to be put on the clipboard, ready to be pasted into a spreadsheet

INTERPRETING RESULTS

Recorded curves in a patient's file will show a series of coloured sections on the vertical lines either side of the y-axis. These lines are designed to aid in categorisation of the results of any given patient using a 'traffic light' system:

i.e. light green is normal resistance, dark green is mild resistance, orange is moderate resistance, and red shows severe resistance.

These colours are provided for guidance only.



TO COMPARE TWO RHINOMANOMETRY TEST RESULTS

Any two test results (of the same type) can be compared, i.e.

- Two left-side records or
- Two right-side records or
- Two left/right records.

- 1) Select the **Tests** tab
- 2) Click on what is to be the baseline test using the left mouse button, hold down the Ctrl key and click on the test you want to compare with the baseline test, again, using the left mouse button. You should now have two tests highlighted.
- 3) Click on one of the selected tests using the right mouse button, and, depending on which types of records you are comparing, the drop-down menu will offer one of the following:

Comparison to generate a record **Comp L** or **Comp R** if comparing two same-side records, or

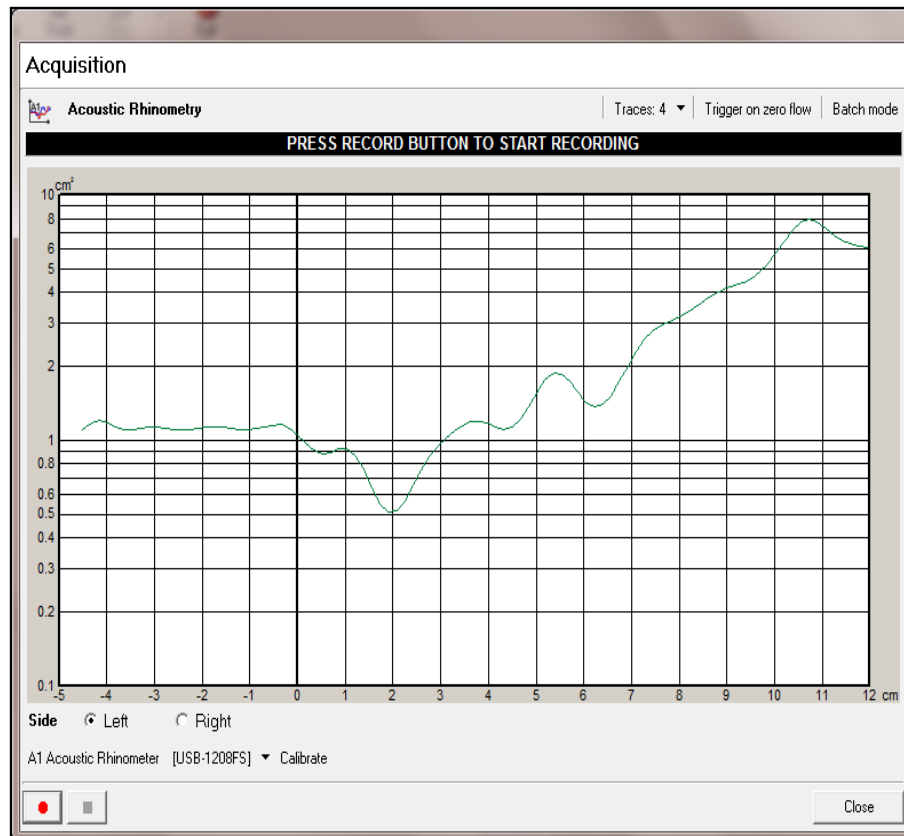
Create Left/Right to generate a **L/R** record, which shows the whole nose, or

Create Comparison Test to generate a **COMP L/R** record to compare a pre and a post result for the whole nose.

- 4) A new test entry is created with each of these operations.

TO MAKE A NEW ACOUSTIC RHINOMETRY RECORD

- 1) Click on the Acoustic icon on the top bar to open the acoustic acquisition window.



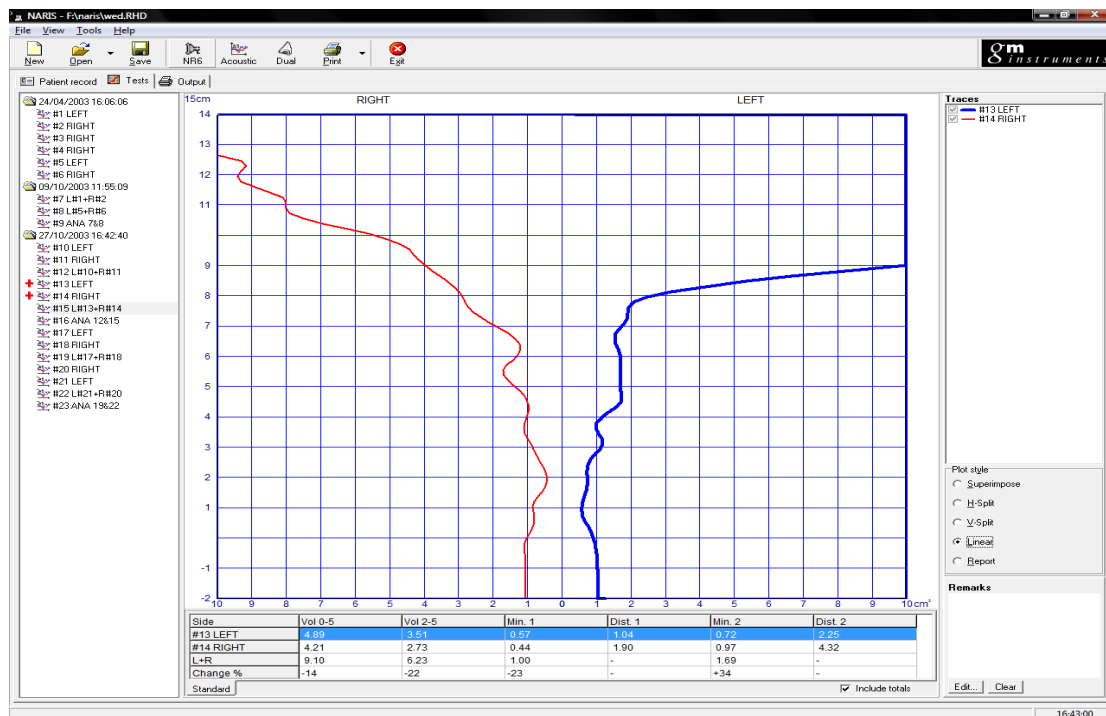
- 2) In the top right of the window the number of traces representing a test can be changed from the default, four. You can also switch on **Batch mode** to allow result validation (this is explained in more detail on page 42). The facility “**Trigger on zero flow**” is a specialised feature used in conjunction with a research-based combined acoustic rhinometer and rhinomanometer sound tube.
- 3) Confirm that the side you want to test is selected (left or right), and once the patient is connected, click on the button with the red spot on it (or, provided the mouse cursor is within the acquisition screen, press your mouse middle button, or your USB footswitch (optional extra)) to begin the acquisition.
- 4) Once the pre-set number of measurements has been taken, the system will stop capturing data, will show you the resultant curves, each of which is drawn in a different colour, and will add the test to the test list for that subject.

- 5) If any curve is obviously bad it can be de-selected by clicking on the appropriate check box in the **Traces** section on the right-hand side of the screen.
- 6) Remarks can be added to, or altered within, the box found in the bottom right-hand corner of the screen by clicking **Edit**, and removed entirely by clicking **Clear**.
- 7) If required, additional testing can be done or the current test printed by clicking on **Print**, or saved by clicking on **Save**.
- 8) The **Output** tab can be used to create a printout consisting of a number of curves selected by clicking in the check box on the left of the test list.
- 9) Additional facilities available from the screen include:
 - Import -- This allows you to merge data from two saved files
 - Export -- This allows the raw data to be sent to a text file
 - Copy -- This allows the calculated values to be put on the clipboard, ready to be pasted into a spreadsheet.

TO COMPARE TEST RESULTS (L/R AND L/R-PRE AGAINST L/R-POST)

If you want to create a complete nose record from Left-side and Right-side results:

- 1) Select the **Tests** tab
- 2) Click on the left test, using the left mouse button
- 3) Hold down the ctrl key and click on the right test using the left mouse button - both tests will now be selected
- 4) Click on one of the selected tests using the right mouse button and from the drop-down menu, click on **Create Left/Right Test**
- 5) A new test entry is created (**L+R**) which shows both the left and the right curve. This can be displayed in a number of ways and can be changed by selecting different "radio" buttons



Comparison of a Left and Right side result in Facing view

TO CREATE A RECORD WHICH COMPARE 2x LEFT OR 2x RIGHT SIDE RECORDS

1. Select the **Tests** tab
2. Click on the record you want to be the baseline test, using the left mouse button
3. Hold down the Ctrl key and click on the record you want to be the comparison test using the left mouse button. Both records will now be selected
4. Click on one of the selected records using the right mouse button and from the drop-down menu, click on **Create Comparison Test**
5. A new test entry is created called **COMP**, which shows both curves. This can be displayed in a number of ways and can be changed by selecting different "radio" buttons

TO CREATE A COMPARISON OF 2x LEFT/RIGHT RECORDS

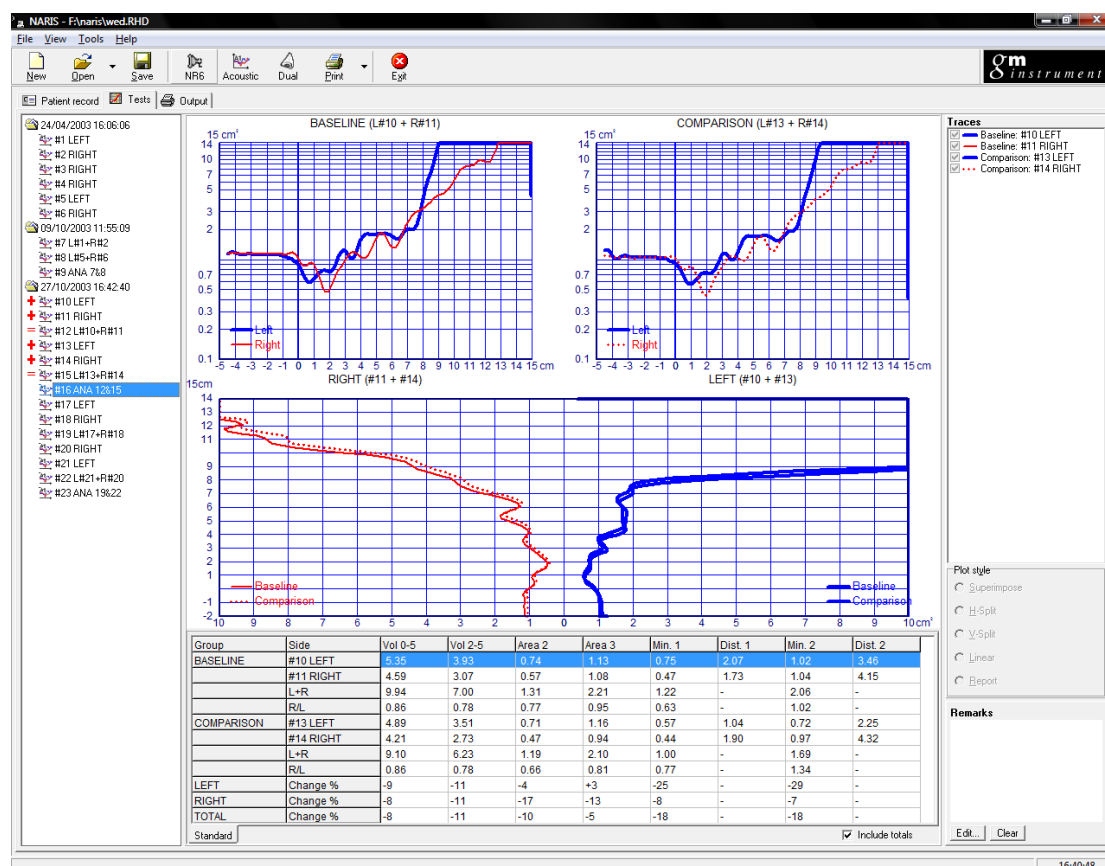
It is also possible to compare a pair of total nose records. In this case one pair (**L+R**) record is designated as the baseline result and a second pair (**L+R**) is designated as a comparison record as described above

N.B. Colours and line styles for these are specified in the Style tab

The baseline (L+R) record should be selected using the **left** mouse button, and, with the **Ctrl** key held down, the comparison record (L+R) should be selected using the **left** mouse button at which point both records should appear highlighted.

Click on either using the right mouse button and, from the drop-down menu which appears, select **Create analysis test**.

This new test is called an **ANA** record which allows for detailed examination of the two sets of records and calculation of % change at different points.



TO DELETE A TEST RESULT

Select the test result to be deleted from the test list using the left mouse button to view it on screen, then right-click on the test and, from the menu which appears, select delete.

TO MAKE A DUAL RECORD (REQUIRES EXTRA HARDWARE)

The tests described above for rhinomanometry and acoustic rhinometry can be performed using the standard NR6 masks and A1 sound tube.

The dual test facility is intended for use with a very specialised NARIS combined sound tube, which allows a rhinomanometry test and an acoustic measurement to be made concurrently. This is not intended to be used for normal clinical or research work.

- 1) The first thing to check is that the rhinomanometer section has been set up for posterior measurements. The test differs from the standard one in that the posterior measurement will be made on one nostril only - the side selected by default for the acoustic measurement.
- 2) The second thing to do is set the default acoustic side to the one you want to test (see the section labelled **Acoustic > Acquisition** tab on page 23 and then set the number of curves required for each measurement.

As the combined sound tube is an open tube and the patient is required to breathe through it during the rhinomanometry acquisition, and as the acoustic test follows on immediately afterwards, it is assumed that it would be impractical to expect the patient to hold their breath during the measurement. A tick box marked **Trigger on 0 flow** exists on the **Acoustic > Acquisition** tab, which, if selected, only allows an acoustic measurement at times when there is no airflow through the tube, thus eliminating any possibility of errors due to airflow-generated pressure on the microphone. The box should be selected before starting a combined measurement.

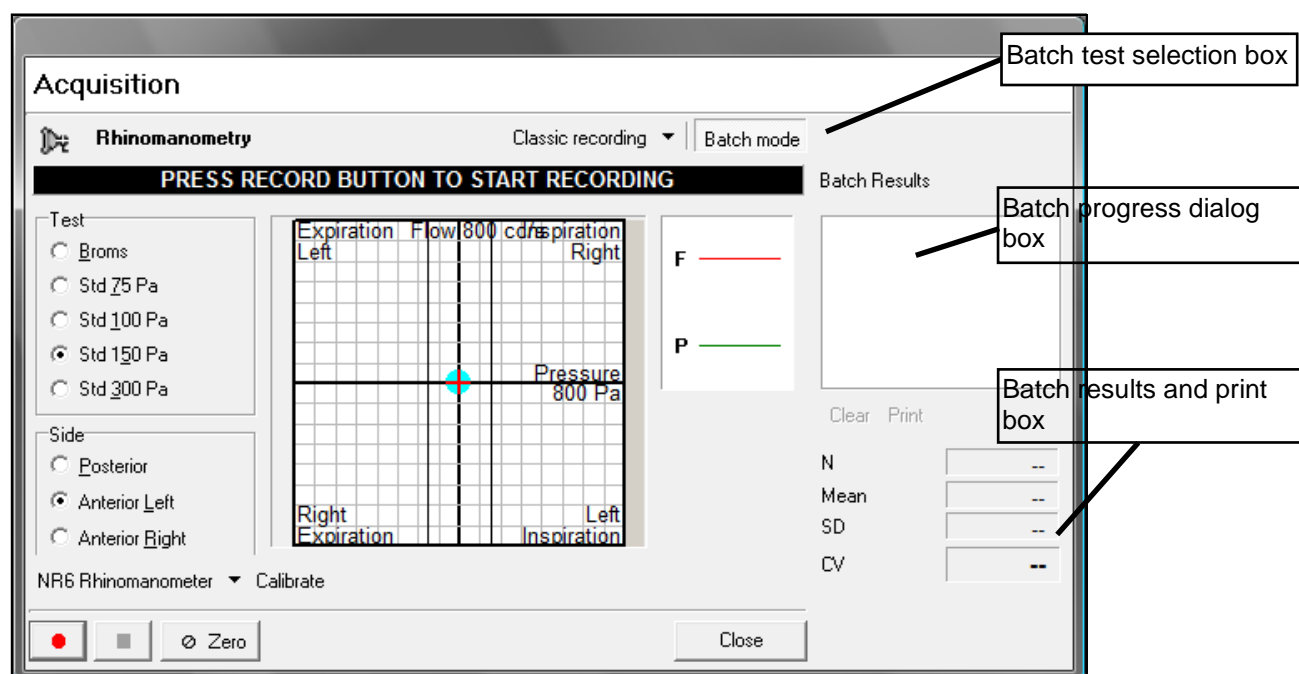
The test sequence is initiated by clicking on the button with the red spot on it, while displaying the rhinomanometry screen. This automatically changes to the acoustic screen as soon as the four respirations are recorded. The acoustic measurements are then made and the test sequence terminates. The rhinomanometry result and associated acoustic result are then added to the test list.

BATCH TEST FACILITY (CLINICAL/RESEARCH VERSION ONLY)

Validation of test results is a facility which has proved invaluable in many situations. In rhinomanometry and acoustic rhinometry result variation is normally caused by distortion of the nose or leakage in the connections to it.

The batch test facility has been incorporated into the program in order to allow users to check for these sources of result variation.

The program offers the possibility of switching on the batch process when you go into the **Acquisition** screen, by clicking on the small check box in the top right of the window. The Acquisition screen will then extend to display a number of pieces of information which will be added when test results are captured.



At the end of the first test the words **Start batch** will be shown in the progress dialog box. At this point the subject should be disconnected from the equipment, and then reconnected.

The red button in the bottom left corner should be clicked on again, or the middle mouse button clicked, or footswitch pressed, to start part two. Once completed, a coefficient of variance figure, **CV**, will be shown in the progress box, while additional information such as the mean resistance, standard deviation between values, and an average CV figure are shown in the results section.

If the **CV** figure is low then there is a strong likelihood of the values being accurate, as the chance of creating the same distortion or leakage twice in succession is remote.

However, additional tests can be added to the batch (with the subject disconnected between each) if you want further re-assurance.

The batch values can be printed directly without any possibility of modifying the data by clicking on the batch print button.

When you close the batch test window, the tests are transferred to the normal test list for further examination and permanent storage.

DATA EXPORT FACILITY (CLINICAL/RESEARCH VERSION ONLY)

Test results can be outputted from Naris in several ways.

STANDARD PRINTOUTS

Graphical and numerical information can be outputted in the form of printed records either directly from the **Test** screen by selecting records required and clicking on the **Print** button, or as a composed report by clicking on the **Output** tab and selecting the records you want in your report. These can be viewed on the right of the screen prior to clicking **Print**.

SCREEN TRANSFERS

A single tap on your keyboard's Print Scrn key will transfer the contents of the screen to the clipboard, which can then be pasted into other record keeping systems.

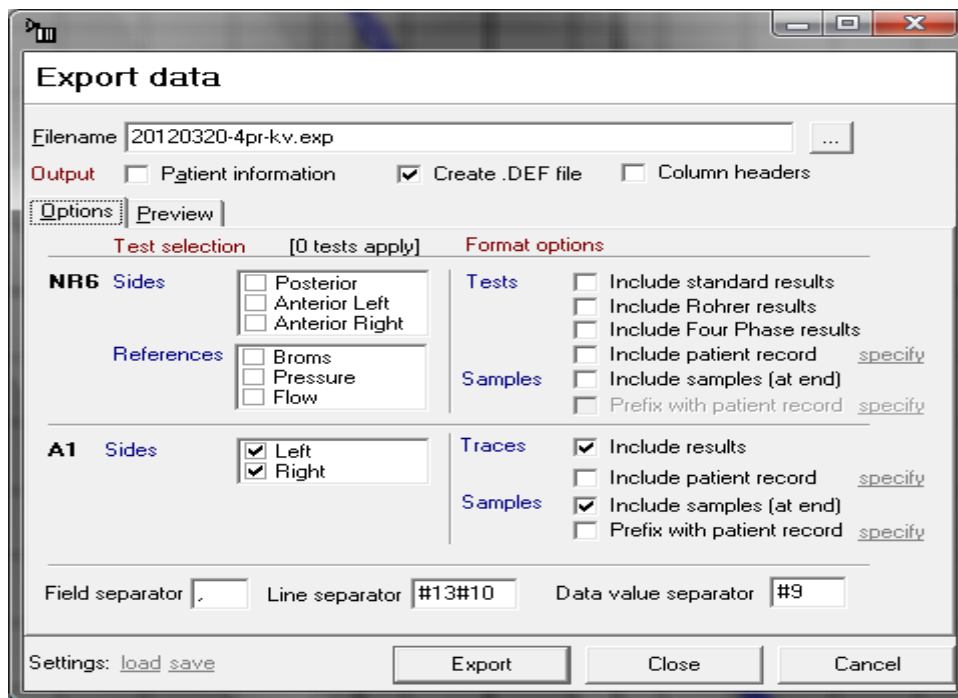
DATA OUTPUT

Numerical information can also be outputted from Naris.

The Naris Export facility has been designed to allow the extraction, display, and manipulation of data contained within a Naris record file.

Extraction and conversion of a patient's data requires their file to be currently active in the program:

- 1) Start the Naris program (see page for information on the different ways to start the software)
- 2) Select the file to be converted by clicking on the **Open** button and then clicking on the appropriate file. Confirm that this is the file you want to extract by checking the patient details, then click on **File -> Export**

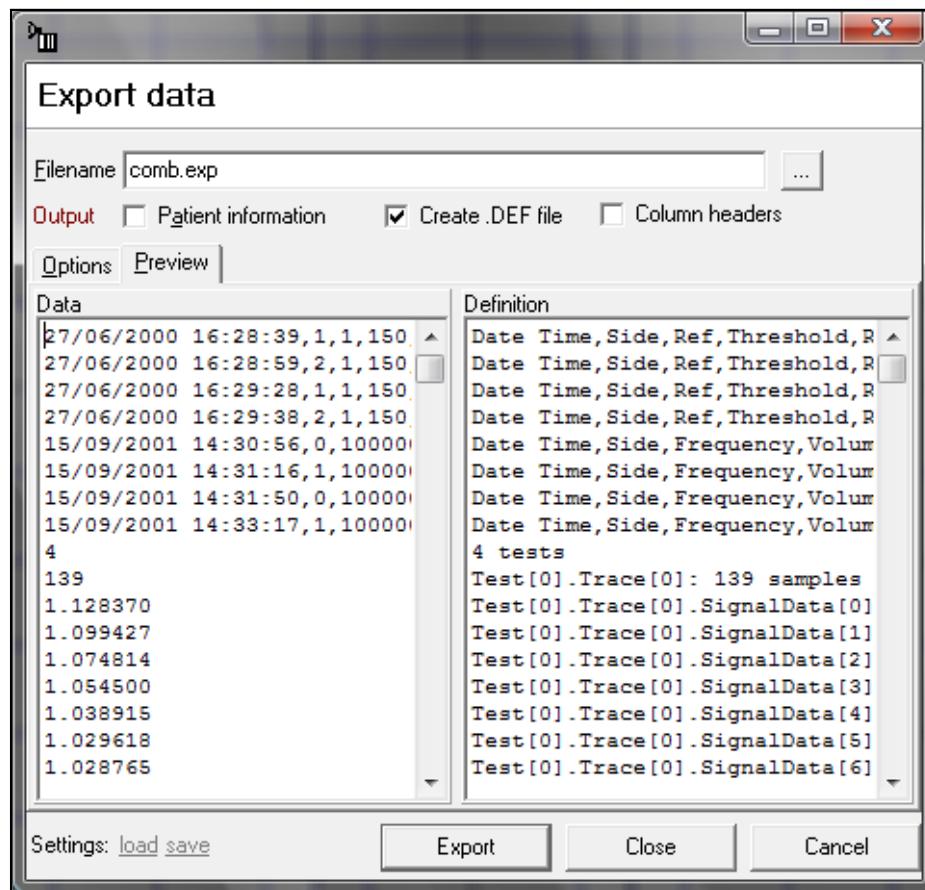


3) Click on options and choose from the following to select which type or part of the file should be extracted:

In the **Output** section, you can tick patient information and all of the fields completed in the patient ID section of the NARIS program will be displayed along the top line of the file.

You can also create a **.DEF** (definition) file which contains details of the data held in each section of the exported file.

The **Preview** tab lets you see how what you have selected will look in the exported file.



Under **Test Selection**:

For Rhinomanometry

- a) **Sides** - posterior and/or anterior left and/or anterior right test results can be extracted, provided they are in the patient's test list
- b) **References** - select records created with Broms and/or Pressure and/or Flow reference settings
- c) **Tests** - shows standard and/or Rohrer calculated results for the sides selected above, and, if ticked, repeats selected patient information at the beginning of each line
- d) **Samples** - lists the raw pressure and flow data values for the above records by clicking on **Include Samples** and put selected items of patient information at the beginning of each sample line by clicking on **Prefix with patient record** (you can define which fields you want present by clicking on **specify** and selecting appropriate fields).
If you select the samples option, two vertical columns are produced containing a list of pressure and corresponding flow values. If you further select and **specify prefix with patient** record a third column is generated

which shows the patient details selected. The number of full tests included is shown before the first column of values

For Rhinometry

1. Sides - select Left or Right-side results for inclusion
2. Traces - include standard calculated values and selected elements from the patient data
3. Samples - include the raw data values, which will be a column of cross-sectional area points at fixed distance increments (1.73 mm when re-sampling at 100,000 Hz) as well as selected elements from the patient details
- 4) Once the elements required for extraction have been selected click on **Export**
- 5) A file name for the file which is soon to be created should already be present in the space in the top left-hand side of the dialog box. This will have the suffix .EXP. Click on **Export** to begin the conversion
- 6) The file created will be saved to the folder **C:/NARIS** unless you have altered the standard setup

The processed data for rhinomanometry is displayed in the following order:

Date	Time	Side	Reference	Threshold	InspL	InspR	ExpL	ExpR	K1In	K1Exp
K2In	K2Exp	Sdresin	Sdresout							

Side Coding 0 = post 1 = left 2 = right

Ref Coding 0 = Broms 1 = pressure 2 = flow

If test data is selected two vertical columns are produced, the first of which lists pressure values and the second lists flow values.

A sample converted file may look like the printout on the following page:-

```

Test,Ashgrove Workshops,Kilwinning,UK,KA13 6PU,St Michael's,4,34,Dr Smith,Challenge
03/11/94,17:49:21,2,1,75, 0.541, 0.541, 0.000, 0.000, 4.000, 4.000, 0.000, 0.000, 0.000, 0.000, 0.000
03/11/94,17:49:25,1,1,75, 0.541, 0.541, 0.000, 0.000, 4.000, 4.000, 0.000, 0.000, 0.000, 0.000, 0.000
03/11/94,17:50:05,1,1,75, 0.541, 0.541, 0.000, 0.000, 4.000, 4.000, 0.000, 0.000, 0.000, 0.000, 0.000
03/11/94,17:50:11,2,1,75, 0.541, 0.541, 0.000, 0.000, 4.000, 4.000, 0.000, 0.000, 0.000, 0.000, 0.000
03/11/94,17:51:11,2,1,75, 0.541, 0.541, 0.000, 0.000, 4.000, 4.000, 0.000, 0.000, 0.000, 0.000, 0.000
03/11/94,17:51:16,1,1,75, 0.541, 0.541, 0.000, 0.000, 4.000, 4.000, 0.000, 0.000, 0.000, 0.000, 0.000
03/11/94,18:10:32,1,0,200, 0.637, 0.637, 0.000, 0.000, 4.000, 4.000, 0.000, 0.000, 0.000, 0.000, 0.000
03/11/94,18:10:37,2,0,200, 0.637, 0.637, 0.000, 0.000, 4.000, 4.000, 0.000, 0.000, 0.000, 0.000, 0.000
07/11/94,17:25:34,1,1,150, 0.637, 0.637, 0.000, 0.000, 4.000, 4.000, 0.000, 0.000, 0.000, 0.000, 0.000
07/11/94,17:25:43,2,1,150, 0.637, 0.637, 0.000, 0.000, 4.000, 4.000, 0.000, 0.000, 0.000, 0.000, 0.000
07/11/94,18:06:26,0,1,75, 0.478, 0.486, 0.052, 0.125, 4.000, 4.000, 0.000, 0.000, 0.000, 0.000, 0.000
07/11/94,18:07:19,0,1,75, 0.395, 0.391, 0.015, 0.018, 4.000, 4.000, 0.000, 0.000, 0.000, 0.000, 0.000
07/11/94,18:26:26,1,1,150, 1.498, 1.466, 0.109, 0.091, 4.000, 4.000, 0.000, 0.000, 0.000, 0.000, 0.000
07/11/94,18:26:44,2,1,150, 1.402, 1.300, 0.013, 0.060, 4.000, 4.000, 0.000, 0.000, 0.000, 0.000, 0.000
07/11/94,18:27:30,1,1,150, 1.002, 0.984, 0.067, 0.036, 4.000, 4.000, 0.000, 0.000, 0.000, 0.000, 0.000
07/11/94,18:27:45,2,1,150, 1.115, 1.029, 0.030, 0.049, 4.000, 4.000, 0.000, 0.000, 0.000, 0.000, 0.000
09/11/94,14:50:13,2,1,75, 1.434, 0.096, 1.342, 0.093, 4.000, 4.000, 1.217, 1.203, 2.118, 3.079, 6.000, 7.000
09/11/94,14:50:28,1,1,75, 1.676, 0.255, 1.257, 0.092, 4.000, 4.000, 0.893, 1.701, 4.883,-1.829, 6.000, 8.000
09/11/94,14:51:43,0,1,150, 1.559, 0.102, 1.437, 0.098, 4.000, 4.000, 1.413, 1.584,-0.199,-0.868, 9.000,12.000

```

N.B. All combined tests (i.e. left and right comparison tests) are not included in the output file

This allows you to select which type of measurements you want to export to a file of type .EXP, what patient information you want included in the file, and whether the information should be calculated values or “raw” data.

Closing the Program

The software can be closed by clicking on **File** and selecting **Exit** from the drop-down menu, or by clicking on the box containing a cross in the top right-hand corner of the screen.

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