

Welcome to the XSENSOR Pressure Imaging System

First Things First:

[Activating the software](#)

[Calibration Folder](#)

[Session Folders](#)

Basic Features:

[Creating a new XSENSOR session](#)

[Recording a session](#)

[Viewing sessions in different modes](#)

[Printing](#)

Advanced Features:

[XSENSOR Session folders](#)

[Sensor Groups](#)

[X3 DISPLAY manager](#)

What's new in this release

Major Engine Overhaul

- Direct to disk recording.
 - Collected data is saved immediately to the disk reducing the risk of data loss.
- Increased session sizes. Allows for files >500 GB.
- Supports multi-core CPUs to allow simultaneous sensor recording.
 - Multi-spk sensors or multi-sensor configurations record at higher rates.
- Faster load/save times.
 - Load and save in under a few seconds.

User Interface Improvements

- [Basic and Advanced](#) Medical modes
- Customizable toolbars and docking window layout.
- Auto-optimizing dock window layout in Medical Basic mode.
 - The docking windows are automatically positioned to show the best view of the sensor area.
- Clipboard copy.
 - Select and copy pressure data directly from the 2D views.
- Integrated 2D numeric view.
 - A unified 2D view that can toggle pressure numbers on and off.
- 2D zoom mode.
 - Enlarge regions of the 2D map to get a better look at high resolution sensor data.
 - Very useful when used with the 2D numeric viewing mode.
- 2D rotation of rectangular sensors.
 - Change the 2D orientation of any sensor for optimized viewing or printing.

New Features

- Support for Digital Video (DV) camera capture.
- Multiple Image attachments.
- Notes templates.
 - Pre-populate notes for consistent data entry.

Activating the XSENSOR software

XSENSOR software programs are licensed products, and require product keys for activation. The product key is distributed with the installation disk, and consists of a licensee and a 25-digit code.

Product keys are valid for software updates for a limited time period, based on the product licensing through which the product keys are obtained. Licensee and product key information is displayed in the **About XSENSOR Pressure Imaging System** dialog box (to open this dialog box, from the **Help** menu, choose **About XSENSOR**).

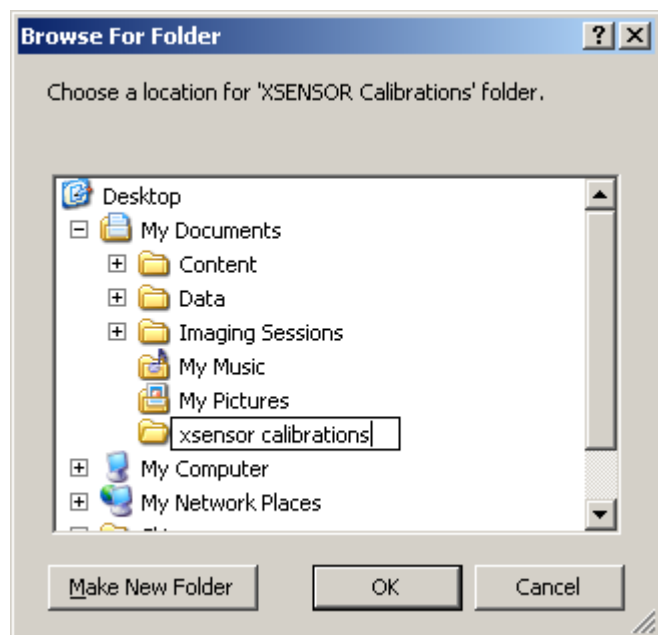
To activate the XSENSOR software:

1. Start the software and the **Product Key** dialog box appears.
2. In the **Licensee** field, type the licensee name.
3. In the **Product Key** fields, type the product key.
4. Select **OK** to finish.

Calibration File Folder

The first time the software is run, a prompt may appear requesting a location for the "XSENSOR Calibrations" folder. This folder is required by the software so that [calibration files](#) can be downloaded from the sensors and quickly retrieved at a later time. Any write-able folder location, including network folders, can be selected.

If you are unsure as to which folder should be selected, use the following instructions:



1. Highlight "My Documents" and select "Make New Folder".
2. Replace the "New Folder" name with "xsensor calibrations".
3. Select "OK".

The "xsensor calibrations" folder is now used to store calibration files. The folder does not need to be named "xsensor calibrations".

Quick Start

[Record](#) a session.

[View](#) a session.

[Save](#) and close a session.

Medical Modes: Basic and Advanced

The XSENSOR Medical software has two major modes of operation, Basic and Advanced.

The **Basic** mode, which is on by default, presents a streamlined user interface with a focus on pressure mapping and offering the most common operations via the menus and toolbar. The five option tabs of the **Advanced** mode have been condensed down into a single tab with only the most impacting options. The **Basic** mode also has an auto-dock feature that moves the docking windows (like statistics, pressure legend, and notes) automatically to the side or bottom of the screen depending on the sensor layout so as to maximize the viewing area of the sensor.

The **Advanced** mode, enables more features, such as video recording, file comparison, sensor groups, X3 DISPLAY connectivity, import/export csv data, and others.


The toolbar menu shows the active mode. Select To switch between modes, select the **Switch to Mode** option under the active mode menu item. This causes the software to restart in the new mode. By default the software will always start in the **Basic** mode. To always start in the **Advanced** mode, uncheck the **Default to Basic Mode** item under the active mode menu item.

Opening an XSENSOR session

XSENSOR sessions can be opened in any of the ways shown below. Sessions created with earlier versions of XSENSOR are automatically converted into the current format when opened.

To open a session:

1. Open the **Open** dialog box in one of the following ways:


- Click the **Open**  toolbar button;
- OR**
- From the **File** menu, choose **Open**;
- OR**
- Press <Ctrl+O>.

2. In the **Open** dialog box, navigate to the folder that contains the saved session file (these have a *.xsn file extension).

3. Select the file and click the **Open** button, or double-click the file to open the saved session.

Tip: The bottom of the **File** menu contains a list of the most recently opened XSENSOR sessions. Choose a session from the list to open it.

To open a saved session from within a [session folder](#):




1. [Open](#) the **Client** window.
2. Expand the client folder by clicking the **Plus**  sign next to the folder name.
3. Right-click the name of the session and choose **Open Session** to open it.

Recording a session

After a sensor system has been connected to the computer and a session is created, recording can begin immediately. The [basic](#) recording settings, such as speed and duration, are specified when a session is created. The [advanced](#) recording settings can be modified at anytime.

To record a session:

1. Either create a new session, or [open](#) an existing one. When opening an existing session file, any new frames are appended to the end of the file.

- When the Preview Mode is active, the **Record Frames** button turns yellow . Click this button to view live sensor images without recording them.
- To start recording, click the **Record Frames**  toolbar button, or press the <F8> key.
- To stop recording, click the **Stop Playback/Recording**  button, or press the <Spacebar>.

Note: The Record Frames button is disabled if the session file is read-only.

See Also:

[Setting playback/recording options](#)

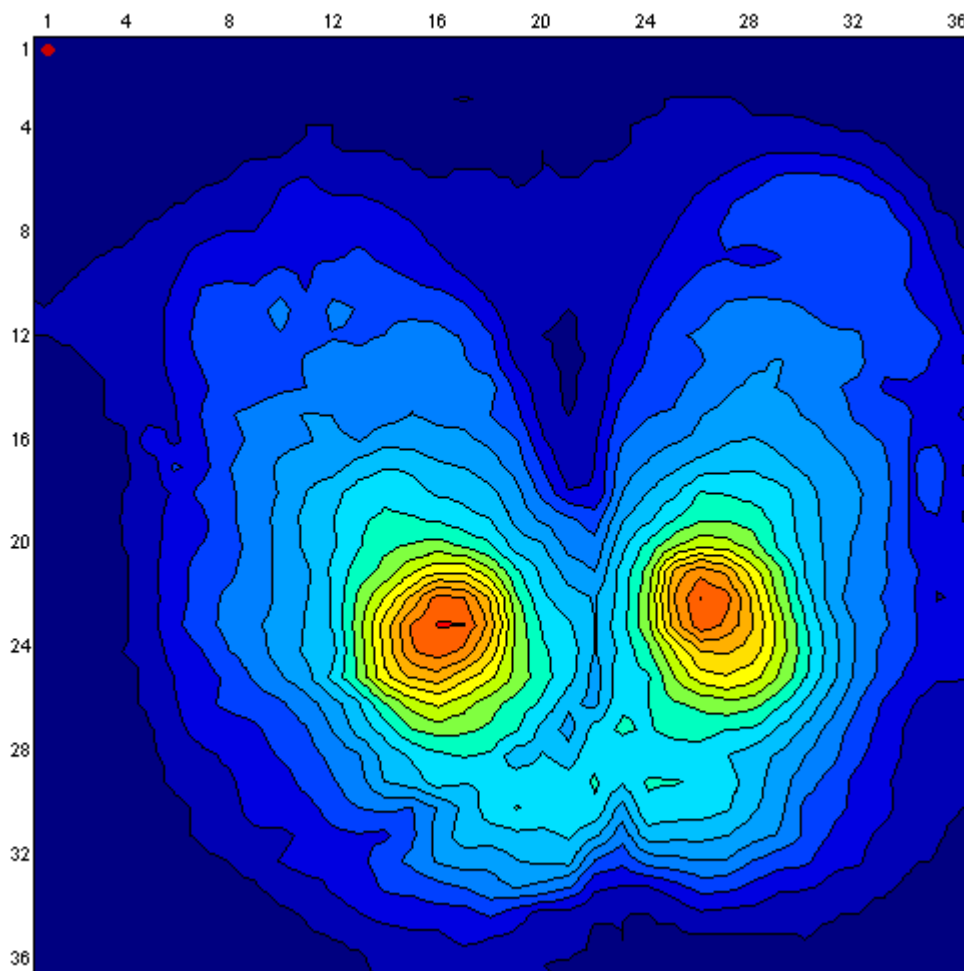
[Viewing recorded frames](#)

[Viewing session statistics](#)

2D View - Basic

The basic 2D view is the default viewing mode. This view shows a 2D representation of the recorded sensor pressure. The numbers across the top and sides of the 2D image correspond to the numbers printed along the edges of the sensors. Some of the more common features used with the 2D view include viewing the pressure values associated with the isobar colors, and copying pressure data directly from the view into the clipboard.

To enter the 2D view mode, from the **View / Current View** menu and choose **2D View**, or click the **2D View**  toolbar button.



The 2D viewing mode can be configured to display images in a variety of ways. See [2D Options](#) for more information.

View Pressure Values

One of the simpler methods of viewing the pressure values behind the colored isobars is to hold the left mouse button down and drag the mouse around the sensor. The pressure under the mouse is shown in the middle of the status bar. Another method involves enabling the [2D Numeric View](#) which shows the numbers directly over the pressure image. A third method is via the [2D Magnifier](#) window.


Clipboard Copy

A region of pressure data can be copied directly from the 2D view into the clipboard. While holding the <SHIFT> key down, press the left mouse button and draw the mouse pointer to form a selection rectangle. The region in the rectangle will show inverted colors. Release the left mouse button and the inverted rectangle will remain. Use <CTRL>+C to copy the sensels. The copied data can be pasted into any text editor or spreadsheet program.

Save and Close a session

To save a session file:

Select one of the following commands:

- Click the **Save**  toolbar button;
OR
- From the **File** menu, choose **Save**;
OR
- Press <Ctrl+S>;
OR
- From the **File** menu, choose **Save As**.

The first three commands save the session file over any existing file with the same name. The Save As command is used for creating a new copy of a session. If a session is new, then first three save commands cause the **Save As** window to appear prompting for a name and folder location.


Managed sessions (i.e.: sessions created within session folders) are automatically named using the folder name and a timestamp. Using the **Save As** command with a managed session produces an unmanaged copy of the session. This unmanaged session is not accessible from the session folder.

To close a session file:

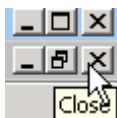
1. A session can be closed in two ways:

- From the **File** menu, choose **Close**;

OR

- Click the **Close**  button on the right-hand side of the session title bar.

Note: If the session window is maximized, be careful to click the bottom **Close** button, and not the XSENSOR application's **Close** button, which is directly above it, as shown here.



2. If a session is new or is modified, a pop-up message asks to save the changes:

- Click **Yes** to save the session file and close it.
 - If the session is managed (i.e.: created inside a session folder), click **Yes** to save it inside that folder.
 - If the session is unmanaged (i.e.: created outside a session folder) and is being saved for the first time, the **Save As** window appears. Choose a folder location and type a file name. Click Save to save and close the file.
 - If the session is being saved for the first time, the **Save As** window appears. Choose a folder location and type a file name. Click **Save** to save and close the file.

Note: Unmanaged session files are never shown under a session folder. In order to include an unmanaged session file under a session folder, the session must be imported into the folder.

- Click **No** to close the session without saving any changes made since it was last saved.
- Click **Cancel** to return to the session without closing it.

Seating Assessment Guide

The Seating Assessment Guide is a tool for assessing the effectiveness of different seating surfaces. By using a fixed assessment procedure, the software helps ensure consistency when pressure imaging of multiple surfaces. Reporting tools are available at the end of each assessment, allowing review of the gathered information to make an effective seating selection.

The Guide automatically track assessments for multiple clients via a custom [database](#). The database can be secured using a password such that only the operator can view confidential client information.

Links

[Assessment Database](#)

[Assessment Clients](#)

[Client Diagnosis](#)

[Surface Assessment](#)

[Surface Assessment: Imaging and Review](#)

[Assessment Summary](#)

Medical Modes: Basic and Advanced

The XSENSOR Medical software has two major modes of operation, Basic and Advanced.

The **Basic** mode, which is on by default, presents a streamlined user interface with a focus on pressure mapping and offering the most common operations via the menus and toolbar. The five option tabs of the **Advanced** mode have been condensed down into a single tab with only the most impacting options. The **Basic** mode also has an auto-dock feature that moves the docking windows (like statistics, pressure legend, and notes) automatically to the side or bottom of the screen depending on the sensor layout so as to maximize the viewing area of the sensor.

The **Advanced** mode, enables more features, such as video recording, file comparison, sensor groups, X3 DISPLAY connectivity, import/export csv data, and others.

The toolbar menu shows the active mode. Select To switch between modes, select the **Switch to Mode** option under the active mode menu item. This causes the software to restart in the new mode. By default the software will always start in the **Basic** mode. To always start in the **Advanced** mode, uncheck the **Default to Basic Mode** item under the active mode menu item.

Seating Assessment Guide

The Seating Assessment Guide is a tool for assessing the effectiveness of different seating surfaces. By using a fixed assessment procedure, the software helps ensure consistency when pressure imaging of multiple surfaces. Reporting tools are available at the end of each assessment, allowing review of the gathered information to make an effective seating selection.

The Guide automatically track assessments for multiple clients via a custom [database](#). The database can be secured using a password such that only the operator can view confidential client information.

Links

[Assessment Database](#)

[Assessment Clients](#)

[Client Diagnosis](#)

[Surface Assessment](#)

[Surface Assessment: Imaging and Review](#)

[Assessment Summary](#)

Assessment Database

The **Assessment Guide** organizes a user's clients and seating assessments by associating them with a user name and storing them in a database folder. Initially the user name is entered either via Create Database screen, or retrieved from the X3 DISPLAY via the Sync function.

The Assessment Guide can track one or more user databases, each of which can be password enabled to protect client confidentiality.

Creating an Assessment Database

An assessment database is created with a few easy steps. Open the **Seating Assessment Guide**, select **New** to view the **Create Database** screen.



X3 **Create Database**

Login New Sync

User Name: Isabelle

Password:

☒ **Enable Password**

Create Cancel Options

Database Creation screen


Next enter a user name. This can be anything like a last name or ID, though it should be used to associate the database with the user. Once the database is created, the user name cannot be changed. Please be aware that user names must be unique.

The Assessment database can be protected with a password. Select **Enable Password** and enter a password in the field. Note that for the **Create Database** screen, this field shows the characters typed. Be sure others are not viewing the screen while entering this password.

Select **Create** to proceed to the **Client** list.

Syncing an Assessment Database

The **Assessment Guide** has the ability to synchronize a database located on an X3 DISPLAY with its local database. This means that any changes to client details are refreshed in either database (with the most recent change taking precedence.) Any assessments created or updated on the X3 DISPLAY are automatically copied to the local database. Conversely, local database assessments are not copied to the X3 DISPLAY due to the memory constraints of that device.



X3 **Sync**

Login New Sync

User Name: fogarassy

Password: Password Disabled

Storage Card: Compact Flash

Login Cancel Options

To synchronize an X3 DISPLAY Assessment database, connect the X3 DISPLAY to the computer via the ActiveSync cable. Confirm that the device is connected via the Microsoft ActiveSync window, then select the **Sync** function. The function automatically scans the X3 DISPLAY for changes.

When an assessment database is found on the X3 DISPLAY, the user name is shown on the **Sync** screen. If the database is password protected, then the password must be entered. The Storage Card list shows which storage card the assessment database was found on. Select Login to begin synchronizing the assessment databases.

If the X3 DISPLAY database user name is not already in the desktop database, then it is added and any client details and assessments are copied.

Please be aware that user names must be unique, and any matching user names will cause all of the client and assessment data to be merged into one database folder.

Opening an Assessment Database

The **Login** screen shows the list of available user databases. The password field is appears if a password is required for the database.



Database Login screen

Select a name and then **Login** to proceed to the **Client** list.

Password Protection Note:

The **Guide** uses passwords to protect the confidential client list and prevent other users from opening the Assessments via the Guide tool. The assessment files can still be [opened](#) as normal XSENSOR sessions, however, these files do not contain any of the client details.

Database Options

The Database Options screen allows changing some of the assessment settings.

Settling Time and **Imaging Time** define adjustable durations for the **Seating Assessment Guide**. The **Settling** time is the duration from when a patient first sits on a cushion to when it has settled (or compressed) sufficiently to represent the cushions normal state. The **Imaging** time is the duration over which the assessment pressure image is recorded. Partial minutes can be selected by entering a fraction. For example, 1.5 minutes means 1 minute, 30 seconds.

Use Metric units for Client Details toggles between Metric and Imperial unit systems for client details like height and weight. Pressure readings and contact area use the regular software [options](#).



Options

Settling Time minutes

Imaging Time minutes

☒ Use Metric units for Client Details

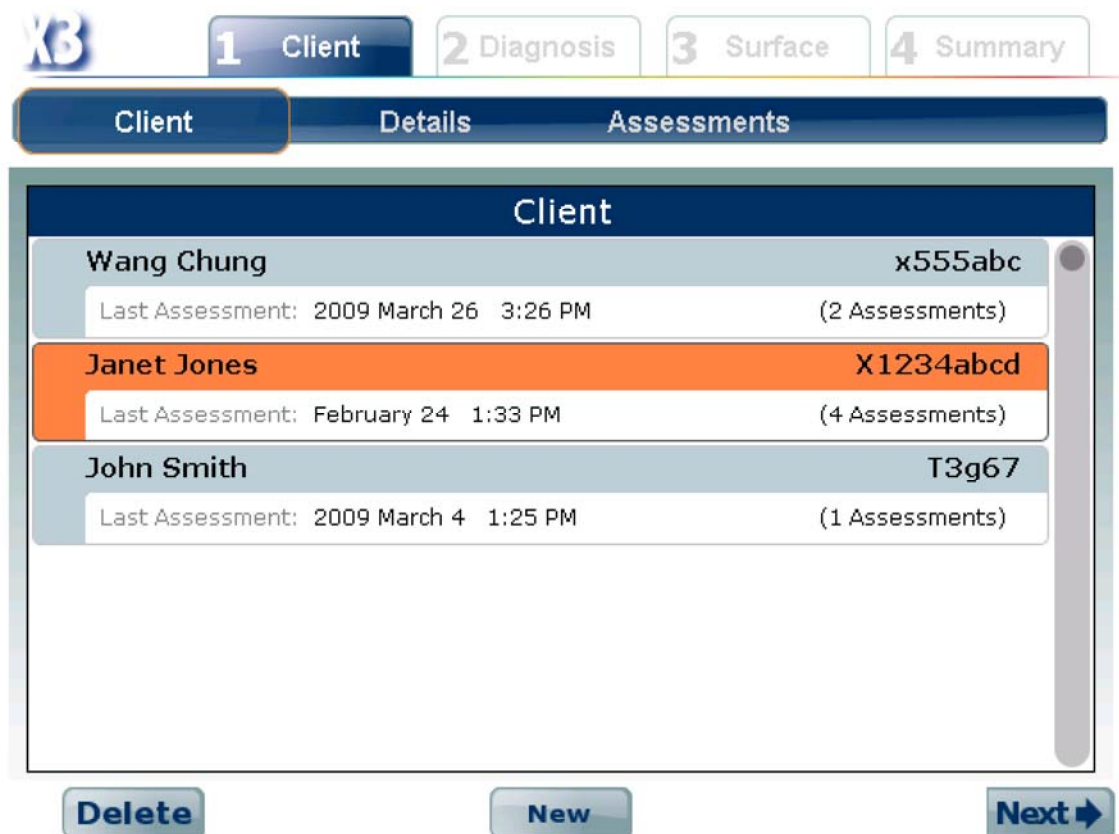
OK

Database Options screen

Assessment Clients

Seating assessments are always carried out in the context of a client. The assessment guide can store information for multiple clients.

Begin an assessment by creating a new client, or selecting an existing one via the **Client Selection** screen. All previous assessments for existing clients are accessed by selecting their profile on this screen.



X3

1 Client 2 Diagnosis 3 Surface 4 Summary

Client Details Assessments

Client

Wang Chung	x555abc
Last Assessment: 2009 March 26 3:26 PM (2 Assessments)	
Janet Jones	X1234abcd
Last Assessment: February 24 1:33 PM (4 Assessments)	
John Smith	T3g67
Last Assessment: 2009 March 4 1:25 PM (1 Assessments)	

Delete **New** **Next**

Client Selection screen

Open Existing Clients

Select an existing client by tapping on their name or ID and then tapping **Next**.

Create New Clients

Create a new client by selecting the name field containing **New** and tapping **Next**. Enter a first and last name for the new client and select **OK**.

After a new client is created or an existing one is selected from the list, the **Client Details** screen appears.

[Delete Clients](#)

Clients can be removed from the database. Select a client and tap **Delete**. This function should be used with caution as it will remove all assessments associated with the client.

Client Details

The **Client Details** screen contains details about a client that may be relevant for the seating assessment. These details can be changed by tapping the fields. Most of these fields are information only, however, the gender field affects the gender imagery used on some of the client diagnosis screens.

The unit system (Metric vs Imperial) used for the **Height** and **Weight** fields is selected on the [Database Options](#) screen..

X3

1 Client 2 Diagnosis 3 Surface 4 Summary

Client Details Assessments

Name
Jane Jones

Date of Birth
1979 JUN 25

Client ID
X1234abcd


Height
160.00 cm

Weight
55.00 kg

Sex
☐ Male ☒ Female

Prev Next

Client Details screen

From the **Details** screen select **Prev**  to return to the Client list, or **Next**  to proceed to the **Client Assessments** screen.

Client Assessments

The **Client Assessments** screen lists all of the current client's assessments, one assessment per row. At the top of the list is a row for creating new assessments. The four surface columns show the names of the cushions used for each surface that has been recorded in the assessment. The date field shows the creation date of the assessment.

Assessments			
February 24 1:33 PM (1 Surface)	1 No Cushion	2	
	3	4	
2009 March 31 12:50 PM (2 Surfaces)	1 ROHO Contour SELECT	2 ROHO Contour SELECT	
	3	4	
2009 March 4 1:17 PM (4 Surfaces)	1 Quantum Synergy	2 Motion Concepts Matrix	
	3 Varilite Evolution	4	
2009 February 26 1:28 PM (3 Surfaces)	1 No Cushion	2 My brand My model	
	3 ROHO AirLITE	4	

Delete
New
◀ Prev Next ▶

Client Assessments screen

[Open Existing Assessments](#)

Open an existing assessment by tapping its row and select **Next**. The software will open the assessment to the **Summary Review** screen.

[Create New Assessments](#)

Select the top row of the list, labeled **New**, and tap **Next**  to proceed to the **Diagnosis Condition** screen. (At this point, the software will search for any connected sensor pads. If none are found, the software will remain on the **Client Assessments** screen.)


[Delete Assessments](#)


Select an assessment and tap **Delete**. Use caution as this will permanently remove the assessment.

Client Diagnosis

The **Diagnosis** screens are used to record aspects of a client's health condition that may be relevant to a seating assessment. Specific medical conditions can be flagged on the **Condition** screen. Surface tissue damage can be indicated on the **Skin** screen. The **Risk** screen allows for a health risk assessment using the **Braden Scale**.

Diagnosis: Condition

The **Diagnosis Conditions** screen shows four categories of conditions. Tapping any of these categories will open the **Conditions Detail** screen. A notes button  allows entry of a page of notes pertaining to the selected conditions. If the condition of the patient is not included on these lists, please describe the condition by using the Notes section. This description will appear in the assessment report.



1 Client
2 **Diagnosis**
3 Surface
4 Summary

Condition
Skin
Risk

Cerebral Palsy

Muscular Dystrophy

Spinal Cord Injury

Others

Notes

◀ Prev
Next ▶

Diagnosis Conditions screen

On the **Conditions Detail** screen, tap all conditions that apply to the client. Select **Prev** ◀ Prev or **Next** Next ▶ to navigate between the **Details** screens, or select **Finish** Finish once all conditions are specified.

Other
4 / 4

☐ ALS
☐ Amputee

Left Leg

N/A

Right Leg

N/A

☐ CVA-Stroke
☐ Developmental Delay
☐ Girdlestone

☐ Hemipelvectomy
☐ Mental Retardation
☐ Scoliosis
☐ Spina Bifida
☐ Traumatic Brain Injury

Injury Scale

N/A

◀ Prev
Next ▶
Finish

Conditions detail screen

Diagnosis: Skin

The **Skin** screen allows highlighting parts of the skin that may have wounds. Tap each color circle to select the appropriate skin wound level corresponding to the legend on the right side of the screen. A notes button allows entry of a page of notes that are specific to the

Skin condition.



1

Client

2

Diagnosis

3

Surface

4

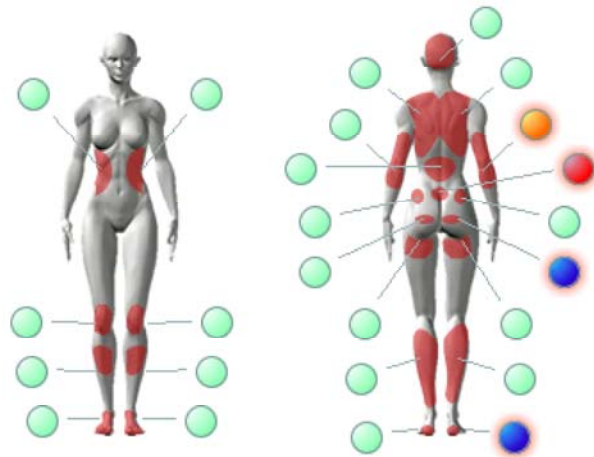
Summary

Condition

Skin

Risk

Tap each circle to select skin integrity of affected area.



Legend

- None
- Stage I
- Stage II
- Stage III
- Stage IV
- Unstageable
- Suspected DTI

Notes

[< Prev](#)
[Next >](#)

Diagnosis Skin screen

Diagnosis: Risk

The **Risk** screen shows the client's Braden Risk score. Tap any of the six Braden risk categories to open the **Risk Detail** screen and select the appropriate risk levels. Selecting a risk level will bring up a description of that risk level that will assist in selecting the appropriate level. The Braden Scale requires a risk assessment for each of the six categories. If a category is not entered, the Score evaluates to 0, which should be taken as meaning the Scale is not in use.



1 Client	2 Diagnosis	3 Surface	4 Summary
-----------------	--------------------	------------------	------------------

Condition	Skin	Risk
-----------	------	-------------

The Braden Scale

Sensory Perception	2	Mobility	3
Moisture	4	Nutrition	2
Activity	3	Friction & Shear	2

Braden Risk Score 16

◀ Prev Next ▶

© Copyright. Barbara Braden and Nancy Bergstrom, 1988. Reprinted with permission.

Diagnosis Risk screen

On the **Risk Detail** screen, choose values for all six categories. Select **Prev** ◀ or **Next** ▶ to navigate between the **Details** screens, or select **Finish** once all categories are specified.

The Braden Scale - Sensory Perception
1 / 6

Ability to respond meaningfully to pressure-related discomfort.

☐ 1. Completely Limited
☒ 2. Very Limited
☐ 3. Slightly Limited
☐ 4. No Impairment

Description

Responds only to painful stimuli. Cannot communicate discomfort except by moaning or restlessness. OR Has a sensory impairment which limits the ability to feel pain or discomfort over 1/2 of body.

◀ Prev Next ▶ Finish

Risk Detail screen

When leaving the **Risk** screen by selecting **Next** ▶ the following screen will either be **Surface Equipment** or **Summary Review**. The **Surface Equipment** screen is activated when in the context of creating a new assessment, or when a surface has been selected for review. Otherwise the **Summary Screen** is activated.

Surface Assessment

Assessment of a seating surface begins with selecting equipment on the **Equipment** screen. This may involve particular cushions, backrests, and wheelchairs. A **Position** indication screen allows the recording of details about body positioning in the seating configuration (cushion, backrest, wheelchair) being reviewed. The Imaging screen provides steps for generating a consistent pressure image. This screen is only present when assessing a new surface, otherwise it is replaced with a [Review](#) screen.

Surface: Equipment

The Equipment screen records the seating equipment in use for a particular surface. The three types of equipment represented are seating cushions, backrests, and wheelchairs.

Although the Brand and Model fields hold a variety of equipment for selection, it is possible to add more equipment to the lists. Tap **New** to open the **Add to Catalog** screen and add equipment for a particular type. If adding a model to an existing brand, first select the **Brand** before tapping **New**. This will carry the **Brand** name into the **Add to Catalog** screen. Added equipment will appear in all subsequent seating evaluations, so it is not necessary to enter this equipment information repeatedly.

If a particular type of equipment is not in use, either leave the **Brand** and **Model** fields blank, or select **None** in the **Brand** field.

The screenshot shows the 'Surface 1' equipment selection screen. At the top, there are four tabs: '1 Client', '2 Diagnosis', '3 Surface' (active), and '4 Summary'. Below these are three sub-tabs: 'Equipment' (active), 'Position', and 'Imaging'. The 'Surface 1' title is at the top left. There are three main sections for selecting equipment:

- Select Cushion:** Brand: ROHO, Model: Quadtro SELECT HP, New button.
- Select Backrest:** Brand: None, Model: (empty), New button.
- Select Wheelchair:** Brand: Drive, Model: Viper, New button.

At the bottom right, there are 'Prev' and 'Next' navigation buttons.

Surface Equipment screen

The screenshot shows the 'Add Cushion to Catalog' dialog box. It has a title bar with a close button (X). The form contains two fields: 'Brand' with the value 'My Brand' and 'Model' with the value 'My Model'. An 'OK' button is at the bottom right.

Add to Catalog screen

Surface: Position

Use the Position screen to indicate the placement of various parts of the body. Tap the body part name to activate its panel, which contains a list of possible positioning descriptions. Some of the details are represented by orientations that can either left or right only. Select the circle representing this left or right orientation.

Tap on body labels to adjust client position.
(*) Indicates position set



Surface Position screen

Once done with setting the selecting the **Equipment** and indicating the position of body parts, select **Next** to activate the [Imaging or Review](#) screens.

Surface Assessment: Imaging and Review

The Surface Imaging and Review screens shows the pressure image of the seating surface. The Imaging screen is used to create the pressure image, while the review screen is for review.

Surface Imaging

Surface Imaging consists of three stages that involve positioning the client on the sensor, placing markers to identify key areas of pressure (bony prominences), and recording the pressure image.

Imaging: Setup

The first stage of Imaging involves positioning the client on the sensor, such that the best use of pressure sensing area is made and so the pressure image shows the contact area made by the patient on the cushion.


Start by adjusting the client so they are centered in the pressure image. Next, if required, rotate the pressure image (using the rotate button) such that the back of the person is at the bottom of the screen, and their knees are towards the top.

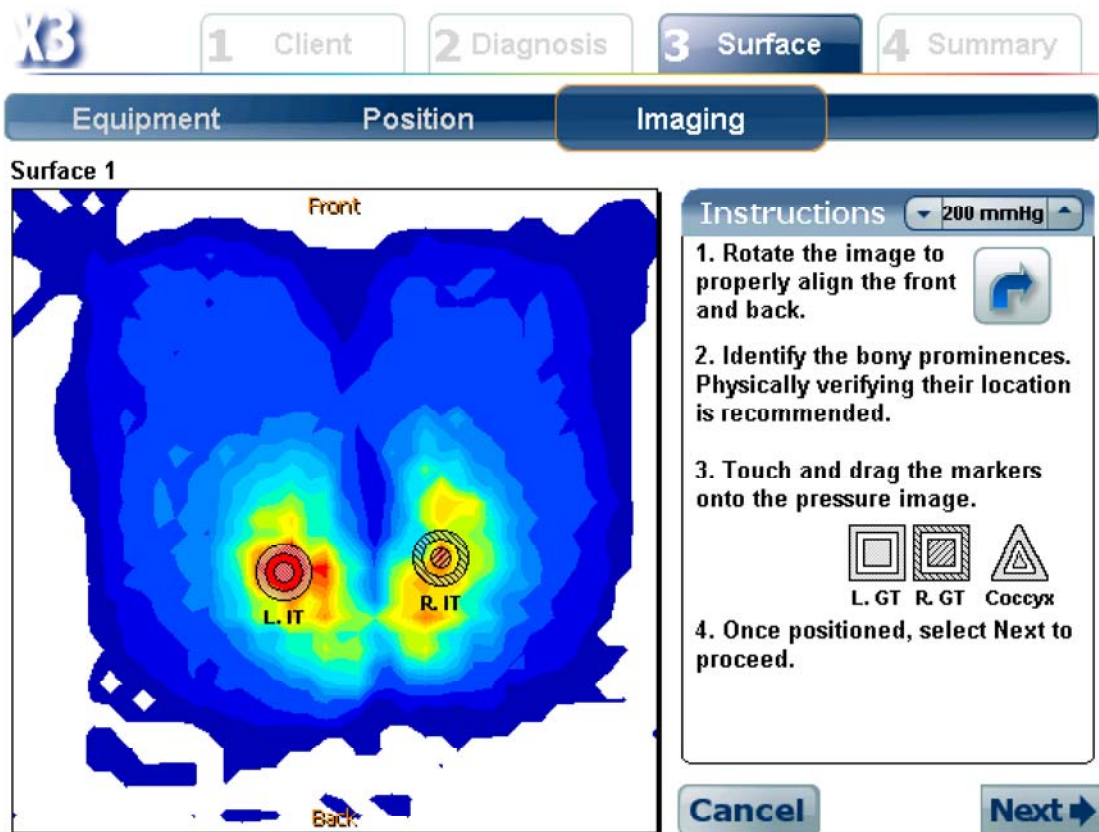
To adjust the upper pressure threshold, click on the up or down arrows on the pressure scale next to the word "Instructions" on the right side of the screen.

Identify the location of the bony prominences (ITs, GTs and coccyx) and mark them with the markers shown. The center of a marker should be over the center of the area you want to highlight. By doing this, the software will calculate the **Peak Pressure Index (PPI)** at the location of each identified prominence. **Take care in placing the markers, as they cannot be moved after the next screen in the assessment, patient settling time, is shown.**

The pressure scale can be changed to better highlight areas of high pressure. Adjust the scale by tapping the arrows on the scale

 widget.

Select **Next**  to move to the **Settling** stage, or **Cancel**  to stop the assessment.



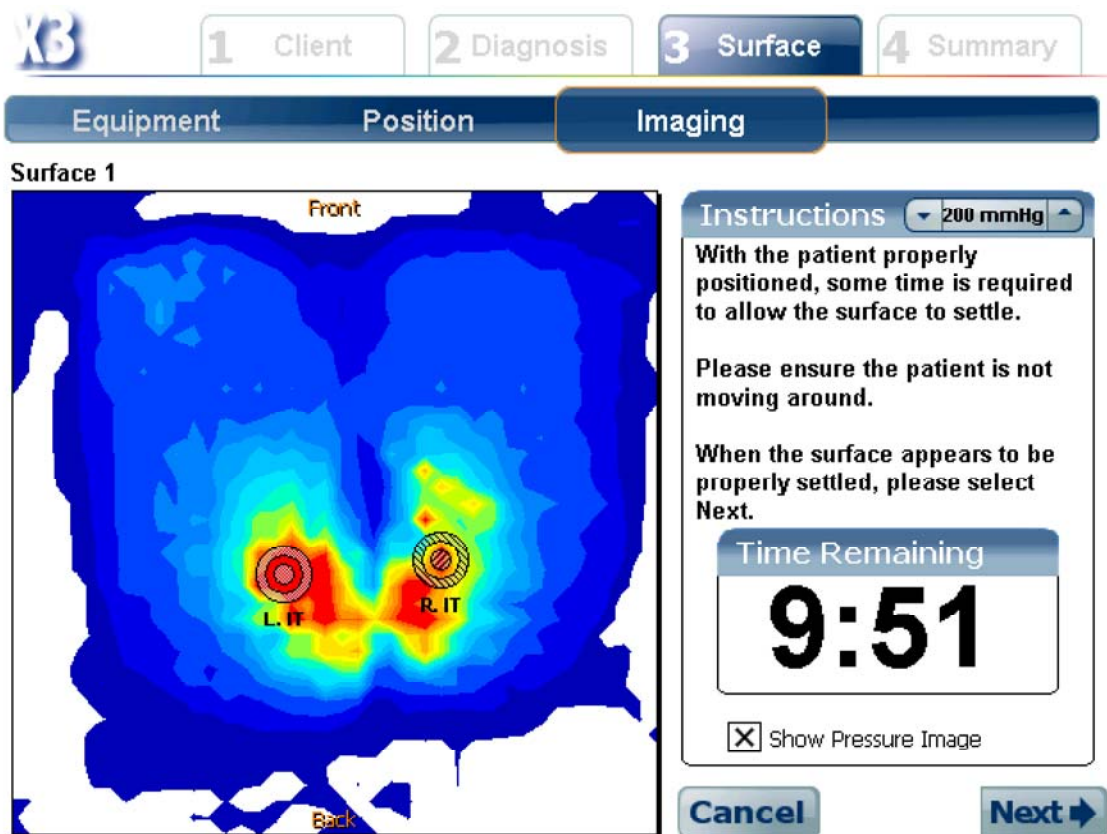
Surface Imaging in the Setup stage

Imaging: Settling

The **Settling** stage allows the patient to settle into their normal seating position, and for the surface on which the patient is positioned to compress under their body. A timer counts down the remaining settling time. However, at the operator's discretion the timer can be bypassed using the Next button. This should only be done if it appears the surface has reached a stable shape, or if the patient has already settled into their normal seating position. (The timer duration is set in the [Database Options](#) screen.)

The **Recording** stage begins when either the settling timer reaches zero, or **Next** is selected.

The pressure image can be hidden while in the **Settling** stage so as to reduce any client movement caused by their ability to see the screen.



Surface Imaging in the Settling stage

Imaging: Recording

The **Recording** stage collects the pressure data used to form the assessment statistics. During this stage the client should remain fairly still as any movement will impact the statistics collected. If the **X3 DISPLAY's** screen is visible to the client, then the pressure image should be hidden to prevent any sort of seating adjustments caused by feedback from the screen.

The screenshot shows the X3 software interface. At the top, there are four main tabs: 1 Client, 2 Diagnosis, 3 Surface (which is highlighted), and 4 Summary. Below these, there are three sub-tabs: Equipment, Position, and Imaging (which is highlighted). The main area is titled 'Surface 1' and contains a large gray rectangle representing the pressure image. To the right of this area is a panel titled 'Instructions' which contains the text: 'Recording the assessment images. Please ensure the patient is not moving around.' Below the instructions is a 'Time Remaining' section showing a large digital clock at '0:04'. Underneath the clock is a checkbox labeled 'Show Pressure Image' which is currently unchecked. At the bottom right of the panel is a 'Cancel' button.

Surface Imaging in the Recording stage

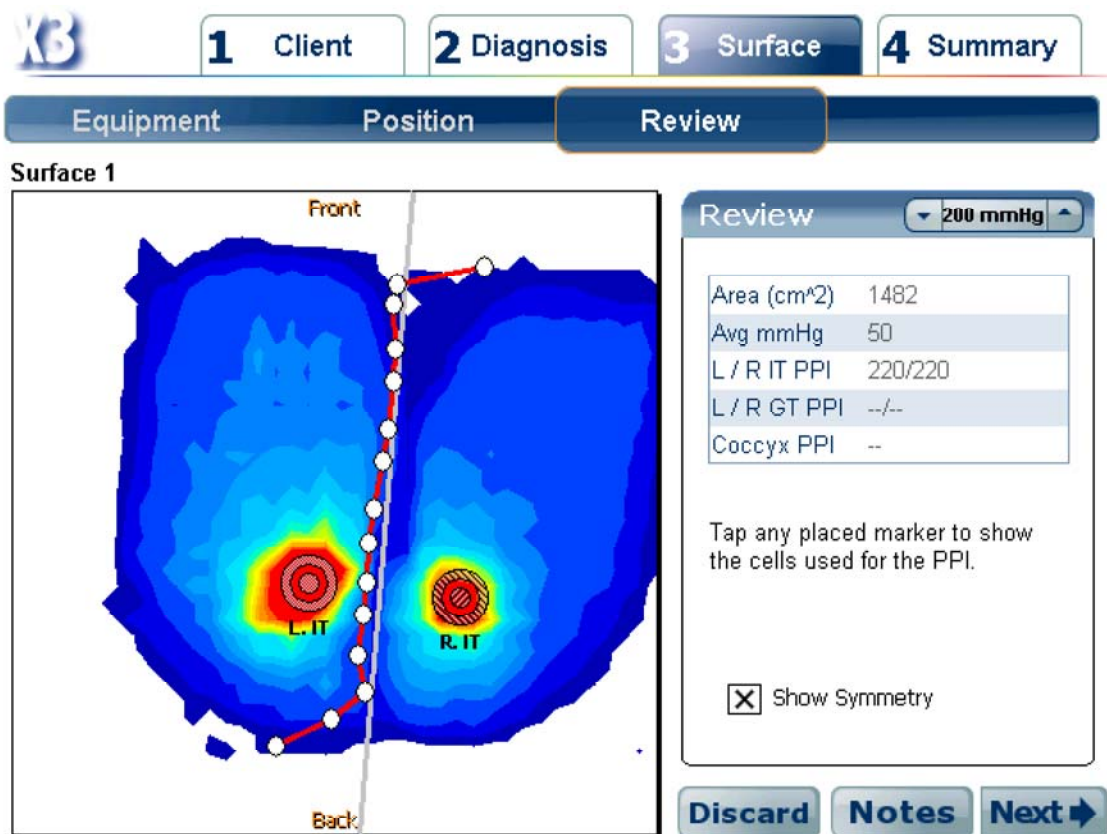
Surface Review

The **Surface Review** screen displays the averaged pressure image from the **Recording** stage. The contact area and average pressure are shown, along with the **Peak Pressure Indices** (PPI) of any placed markers. For any particular marker, the sensels used to evaluate the PPI can be seen by tapping the marker icon.

When the two ischial tuberosity markers are present, the **Show Symmetry** option will attempt to generate a line of symmetry. A light gray line through the pressure image represents the "perfect" line of symmetry, while the red line with white dots represents the amount by which the centers of gravity are off from the ideal. The white dots at the ends of the red line should be ignored as they tend to be skewed by an absence of pressure data.

A page of notes pertaining to the assessed surface can be entered by selecting the **Notes** button.

If for some reason there is a problem with the pressure image (e.g. if the client moved), then the surface can be discarded from the assessment by selecting **Discard**.



Surface Review after Imaging

From the **Review** screen, select **Next** to go to the [Summary Review](#) screen.

Assessment Summary

The **Assessment Summary** shows all of the surfaces on an assessment. New surfaces can be added, and existing surfaces can be marked as recommended. An assessment report can be generated and either saved as a PDF, or printed directly.

Summary Review

The Summary Review screen lists all of the surfaces assessed in an assessment. The statistics for each surface are shown, and the values that are best across all the surfaces are highlighted in **green**.

To review a surface in detail, select it by tapping the surface image. New surfaces can be evaluated by selecting the Next Surface button.

One or more surfaces can be marked as **Recommended**, tap the checkbox below the surface statistics. Enter a page of notes pertaining to the summary via the Recommendations button. These notes and the **Recommended** checkmarks will appear in the Assessment report.

Select the **Report** button to view the [Assessment](#) report, or the **Finish** button to return to the [Client Assessments](#) screen.

X3

1 Client

2 Diagnosis

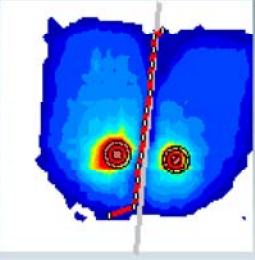
3 Surface

4 Summary

Review

Report

No Cushion



Area (cm^2)	1482
Avg mmHg	50
L / R IT PPI	220/220
L / R GT PPI	--/--
Coccyx PPI	--

☐ Recommended

Next Surface

Recommendations

(Tap on surface image to review.)

Report

Finish


Summary Review showing the surfaces of an Assessment

Summary Report

The **Surface Assessment** report is a multi-page report for a single seating assessment. The report sheet can either be printed to any PCL compliant USB printer via the X3 DISPLAY peripheral cable, or saved to the active storage card in PDF format.

The screenshot shows the X3 Medical Modes software interface. At the top, there are four tabs: 1 Client, 2 Diagnosis, 3 Surface, and 4 Summary. Below these is a navigation bar with 'Review' and 'Report' buttons. The 'Report' button is highlighted. The main content area displays a 'Surface Assessment Report' for a client named Jane Jones, born 1979-06-25, weighing 55.0 kg, and height 160.0 cm. The report date is Mar 9, 2009. Under 'Presenting Conditions', there are checkboxes for Cerebral Palsy (Spastic Quadriplegia, Spastic Diplegia, Spastic Athetoid) and Other (ALS, Amputee, CVA-Stroke). There are also fields for Left Leg and Right Leg. At the bottom, there are icons for document management, navigation (left and right arrows), page number (1 / 7), and a close button (X).



Report Screen Widgets


Since the report is normally larger than the viewing area, it can be fit to different scales. The **Fit Page** button  scales the image to completely fit in the viewing area. This shows the least detail, but gives a quick overview of the page layout. The **Fit Width** button




scales the image so that the width of the page takes of the width of the viewing area. This is the default view and offers a

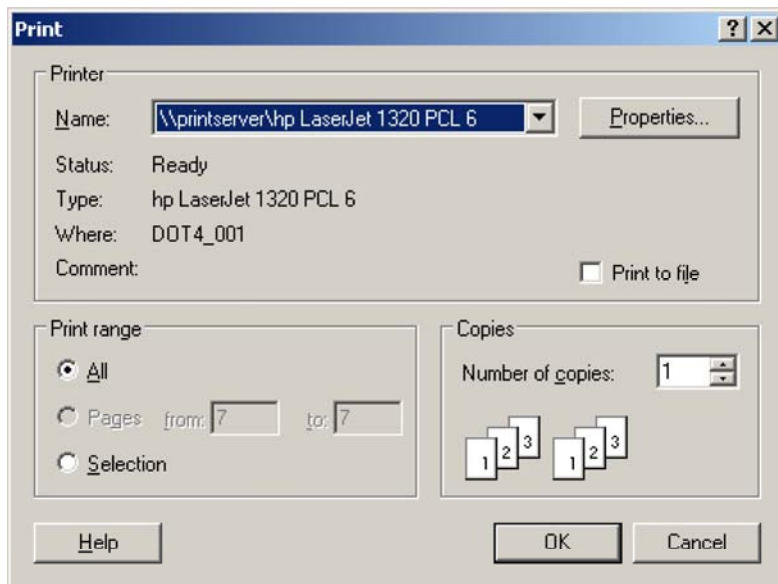
good tradeoff between viewing detail and page layout. Finally the **Fit Actual** button  shows the image nearly to the scale of the actual printed page.

If the report contains two or more pages, these can be navigated by tapping the page arrows,  and .

To exit the **Report View**, select the close button .

Printing the Report

Select the print button  to send the report to a printer. A warning message appears if no printer is attached, and the print is canceled. Otherwise, the printer selection window should appear.



Printer Selection Window

On the printer selection window, specify a printer and select **OK** to print.

[Saving the Report to Adobe PDF](#)



Select the **Save PDF** button to save the report in the Adobe PDF format. The saved PDF can be given a unique name, though by default it is named by the software.

Creating Sessions

Pressure data collected with the XSENSOR system is stored in a custom file format. These files are referred to as **sessions** and have an XSN extension. Besides pressure data, session files can also contain notes, attached images, and video frames. A session file represents a particular sensor recording configuration. Changing the configuration requires creating a new file. Sessions are configured either automatically by the software or manually by the user.

Session files can either be managed or unmanaged. Managed sessions are created inside session folders, while unmanaged sessions are stored in other locations on the computer.

Automatically configured sessions:

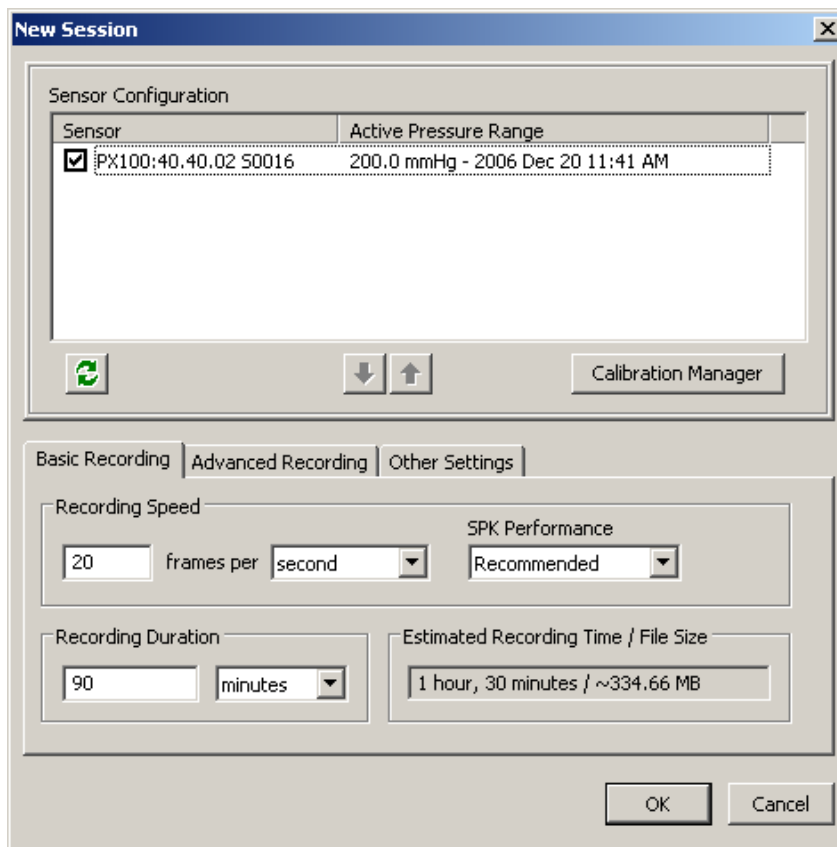
The XSENSOR software checks for the presence of sensors on startup. If any are found, then a new session file is created using all of them. The session is also configured for recording using the default settings.



The **New** toolbar button and the **<Ctrl+N>** keyboard shortcut also automatically configure a new session file when sensors are detected. (If no sensors are detected, then the New Session window is opened.)

Manually configured sessions:

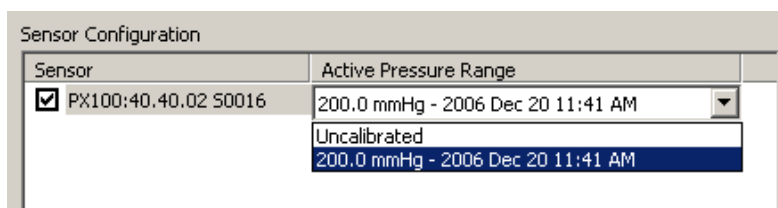
A new session can be manually configured via the New Session window. To open this window either Choose New from the File menu, or right-click a session folder and choose New Session.





New Session window with one detected sensor and default recording settings.

The Sensor Configuration list shows all of the sensors detected by the software. This list should update automatically as sensors are connected and disconnected from the computer. The Refresh List button  (or press <F5>) can be used to manually refresh the list. Sensors in the configuration list are identified by the model type and serial number. A checkbox beside the sensor indicates whether the sensor should be included in the new session file. Uncheck the sensor (using left click) to remove it from the configuration.

A column labeled "Active Pressure Range" shows the default pressure range for each sensor. The pressure range can be changed by selecting the existing range. A drop-list arrow appears and a new range can be selected. The range "Uncalibrated" represents a raw recording session. Any combination of pressure ranges can be selected, however, once "Uncalibrated" is selected for one of the sensors the entire session is treated as uncalibrated.



Selecting a pressure range.

The configuration lists order represents the order in which the selected sensors appear in the various viewing modes and graphs. To change this order, select a sensor and click the **Move Up**  or **Move Down**  buttons (or press <Ctrl+up arrow> or <Ctrl+down arrow>).

The **Calibration Manager** button opens the [Calibration Manager](#) window which is used for advanced management of calibration files and pressure ranges.

Look here for a description of the [Basic](#) and [Advanced](#) recording tabs.

The **Other Settings** tab is used for specifying some non-recording settings.

- Use the **Sensor Group Template** field to specify a [sensor group template](#). The templates are a convenient way to reuse pre-made sensor groupings.
- Use the **Notes Template** field to specify a default [notes template](#).

Basic Recording Options

The basic recording options control how fast and how long a recording session lasts. These settings define a session configuration and cannot be changed within a session file. To use new settings, manually create a new session file. This tab appears in the [New Session](#) window.

The Basic Recording tab.

Basic Recording tab:

Use this tab to set the [recording speed](#) and the [session duration](#).

- In the **Recording Speed** group, use these fields to select a recording speed. This can be set as slow as one frame per minute, or it can be set to the fastest speed of the slowest sensor in the Sensor Configuration list.

The recording speed field automatically selects the maximum recording speed for the configuration if a speed greater than the maximum is entered.

The **SPK Performance** field affects the maximum possible sampling rate. The **Recommended** setting is in fact recommended. Click [here](#) for more information.

- In the **Recording Duration** group, use these fields to set the recording duration as either a period of time or a given number of frames. The duration is limited by the size of the file that results from the Sensor Configuration and recording speed. The duration is automatically adjusted to ensure the maximum memory use is not exceeded.

The recording duration refers to a recording session and not the entire session file. Each time the record button is pressed, this duration is reapplied. For example, with a recording duration of 90 minutes a session file could have 180 minutes of total recording time split across two recording sessions.

Tip: Select slower recording speeds to maximize recording times and reduce memory consumption. Keep file sizes to under 200 megabytes to ensure best responsiveness in the software.

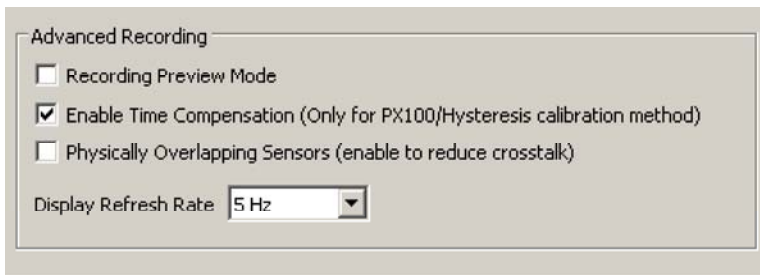
- The **Estimated Recording Time/File Size** field shows the expected duration and file size generated by a recording session (i.e.: pressing the record button). This size does not take into account other items that increase memory usage, like video capture, image attachments or text notes.

NOTE: The software will halt recording if at any point the total computer memory usage reaches 80% or greater. This is to prevent low memory conditions that might result data loss or corruption.

Advanced Recording Options

The advanced recording options provide control over when recording begins. These options also affect some of the recording behaviour and screen refreshes. The advanced recording options can be set on the **Advanced Recording** tab in the [New Session](#) window, and on the [Playback/Recording](#) tab in the **Options** window.



The Advanced Recording tab in the [New Session](#) window.



The Advanced Recording group in the [Playback/Recording](#) option window.

Recording Preview Mode:

- The **Recording Preview Mode** is useful for positioning a subject on a sensor before committing pressure data to a session file. When previewing, the pressure image from the sensors is displayed without using memory.

When this mode is selected, the **Record Frames**  button is replaced with the yellow **Preview Frames**  button. Clicking the yellow button (or press <F8>) starts the preview mode, and the button is replaced with the **Record Frames** button.

Time Compensated Calibration:

- Select **Enable Time Compensation** to apply an adjustment factor to the recorded data that takes into account the passage of time. This feature can produce more accurate readings over time, but is only available for sensors that have been time calibrated.
- Select **Physically Overlapping Sensors** to reduce any signal cross-talk that might occur when two or more sensors are used to gather readings from a single pressure source. For example, a seat sensor and a back sensor on a chair with some overlap of the sensors. Due to the nature of this feature, the sample rate can be impacted and may decrease.
- This mode is applied to all open sessions when enabled.

Note: This option only appears in the **Playback/Recording** options tab..

Other:

- Use the **Display Refresh Rate** drop-down list to change the rate at which the screen refreshes when recording a session. Higher refresh rates produce smoother display updates, but requires more processing. This increased processing requirement can interfere with the recording rate. The default rate is 5Hz.

Note: This option only appears in the **Playback/Recording** options tab..




See Also:

[Setting playback/recording options](#)

Recording a session

After a sensor system has been connected to the computer and a session is created, recording can begin immediately. The [basic](#) recording settings, such as speed and duration, are specified when a session is created. The [advanced](#) recording settings can be modified at anytime.

To record a session:

- Either create a new session, or [open](#) an existing one. When opening an existing session file, any new frames are appended to the end of the file.
- When the Preview Mode is active, the **Record Frames** button turns yellow . Click this button to view live sensor images without recording them.
- To start recording, click the **Record Frames**  toolbar button, or press the <F8> key.
- To stop recording, click the **Stop Playback/Recording**  button, or press the <Spacebar>.

Note: The Record Frames button is disabled if the session file is read-only.

See Also:

[Setting playback/recording options](#)

[Viewing recorded frames](#)

[Viewing session statistics](#)

Recording with Video Capture


The software has the ability to capture video images from any compatible USB web camera or Firewire Digital Video (DV) camera. Video is generally recorded at a rate of one video frame per frame of sensor data. If the sensor recording rate is faster than the video camera, then the previous video frame is used until a new frame is available.

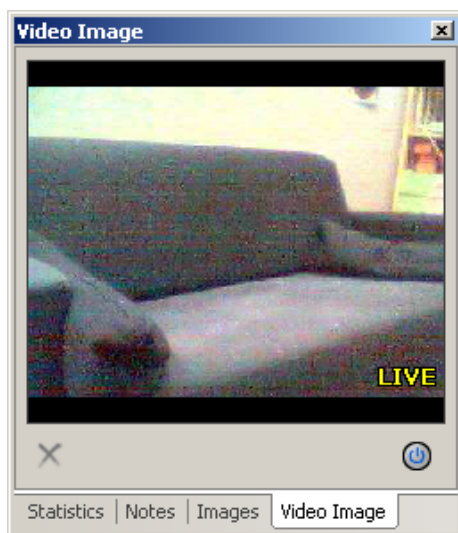
A video device is configured via the [Video Capture Options](#) tab. This must be done before any video capture can occur. The **Video**

Image window shows the video imagery, and is used to turn video recording on and off.

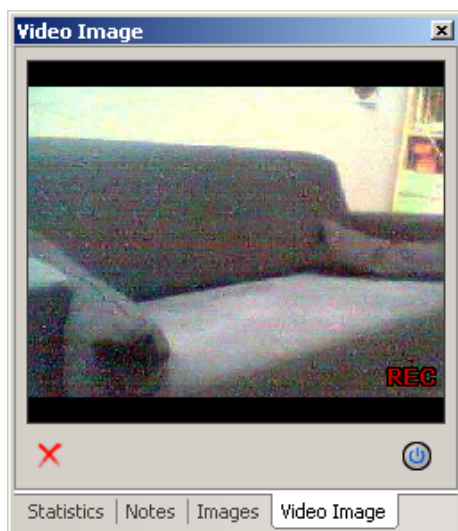
Note: To show the **Video Image** window, select  **Show Video Image Window** from the **View / Toolbars** menu. By default this window is docked next to the **Images** window.



The power button  is used to toggle the camera on and off.

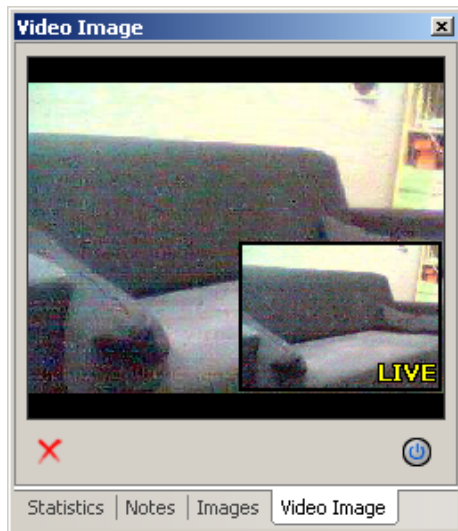


When the camera is toggled on, the **Video Image** window shows a live feed from the camera. If no video has yet been captured, then the live feed covers the entire **Video Image** window. The label **LIVE** appears in the lower right corner of the image.




Once session recording begins, the live feed is replaced with the video frame that is captured with the pressure image. The label **REC**

appears in the lower right corner to indicate the image is being recorded.



When a recording session ends, the live video feed appears in a small box over top of the recorded video. This is useful for repositioning the camera for the next session.

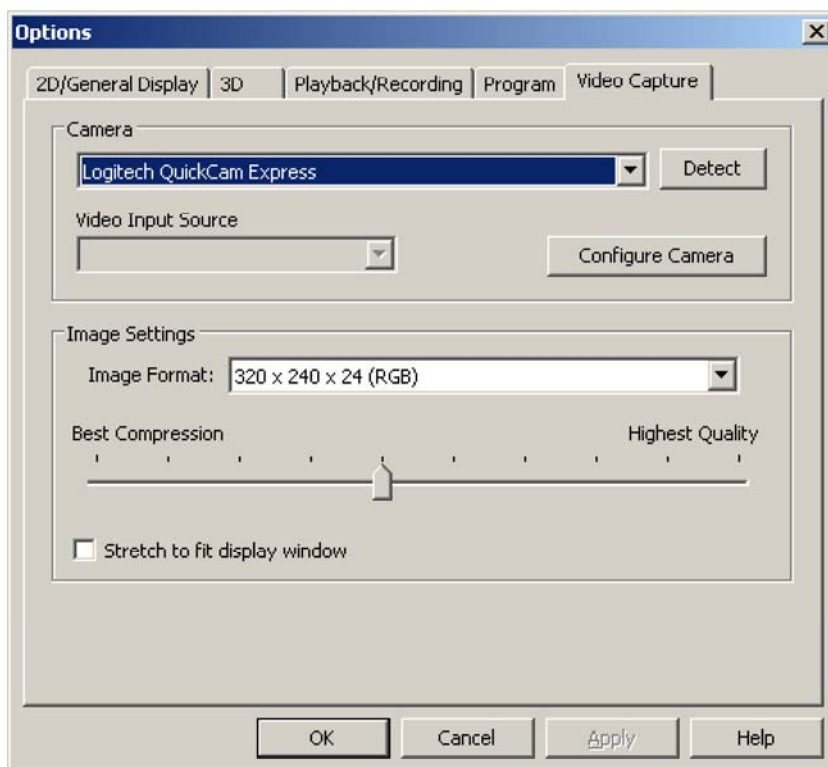
Video frames can be removed using the video removal  button. This is covered in more detail [here](#).

Video Capture Options

These options are only available in the [Advanced](#) medical mode. Look [here](#) for the Basic mode options.

Use the **Video Capture** tab in the **Options** window to detect video devices, control image compression and quality, and to specify device settings. Video devices are automatically detected when the XSENSOR software starts up, though if none were previously selected then a camera must be manually specified.

NOTE: Any changes to these settings will not take affect until the camera has been shut off via the [Video Image](#) window.

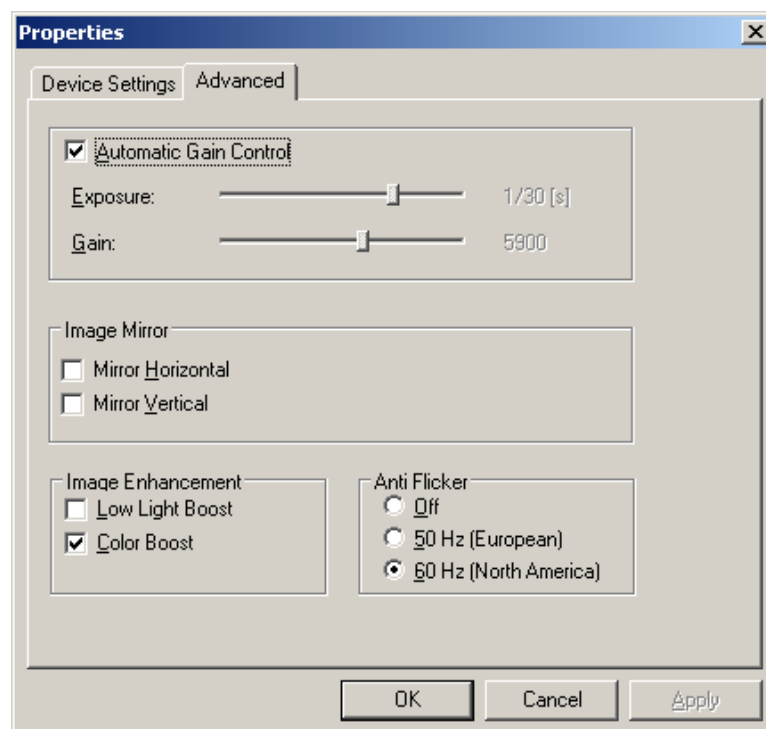
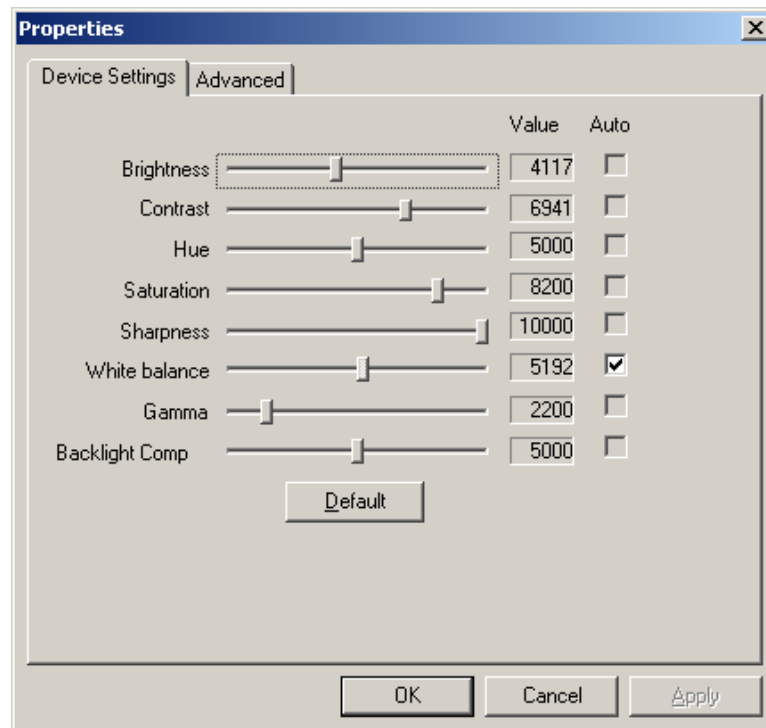


Camera

Select a camera from the top list or press **Detect** to search for any cameras that were connected after the software was started. Some cameras have extra input ports allowing for multiple video sources. In those cases, the **Video Input Source** field is activated and the most appropriate selection should be made from that list.

Configure Camera

The Configure Camera option opens the camera manufacturers settings windows for the camera. These windows may vary depending on the manufacturer. Below are two common windows.



XSENSOR recommends using the default settings presented by the manufacturer. However, experimentation with these settings may result in improved video image quality.

Image Settings

The **Image Format** lists shows the video formats made available by the camera manufacturer. The first two numbers specify the pixel

resolution of the image (in the image above, it's 320 pixels wide by 240 tall). The third number specifies the color resolution. The higher the number the better the color resolution. However, there is no difference between 24 and 32 and using 32 only results in greater memory use. The final tag in brackets is the color format. If possible select an (RGB) format as the software natively handles video images in that format and will not incur a format conversion penalty. If (RGB) is not available, experiment with some of the other available formats to find one that gives the best performance.

NOTE: To reduce memory use and processing requirements, choose the lowest pixel and color resolution that gives acceptable results.

Select **Stretch to fit display window** to stretch the video image to fill the **Video Image** window. Otherwise leave this off to maintain the original aspect ratio.

Use the **Image Compression/Quality** slider bar to set a balance between compression and image quality when recording video images. Better compression reduces the file size requirements for each video image, but reduces image quality. Likewise, the highest quality setting provides almost no compression and requires the most file space per image, but preserves the highest image quality.

Other Options

[Basic Medical options](#)

[Setting 2D/General Display options](#)


[Setting 3D options](#)

[Playback/Recording options](#)

[Program options](#)

Zero Pressure Filter

The Zero Pressure filter is used during [recording](#) to set a zero reference that reduces the effects of the environment when no pressure is being applied to a sensor. This function affects the recorded data and should be used with care. To enable the filter, begin recording,

ensure the sensor has no pressure on it, and then select the **Zero Pressure Filter**  toolbar button.

Viewing sessions in different modes

Session data can be viewed in a variety of ways that include 2D and 3D representations, and as graphs.

These modes can be switched via the  **View** menu, or by the  **Display Mode Toolbar**.

Click the links below to find out more about the different viewing modes.



[2D View](#)



[2D Numeric View](#)



[3D View](#)



[Pressure Distribution graph](#)




[Pressure vs Time graph](#)

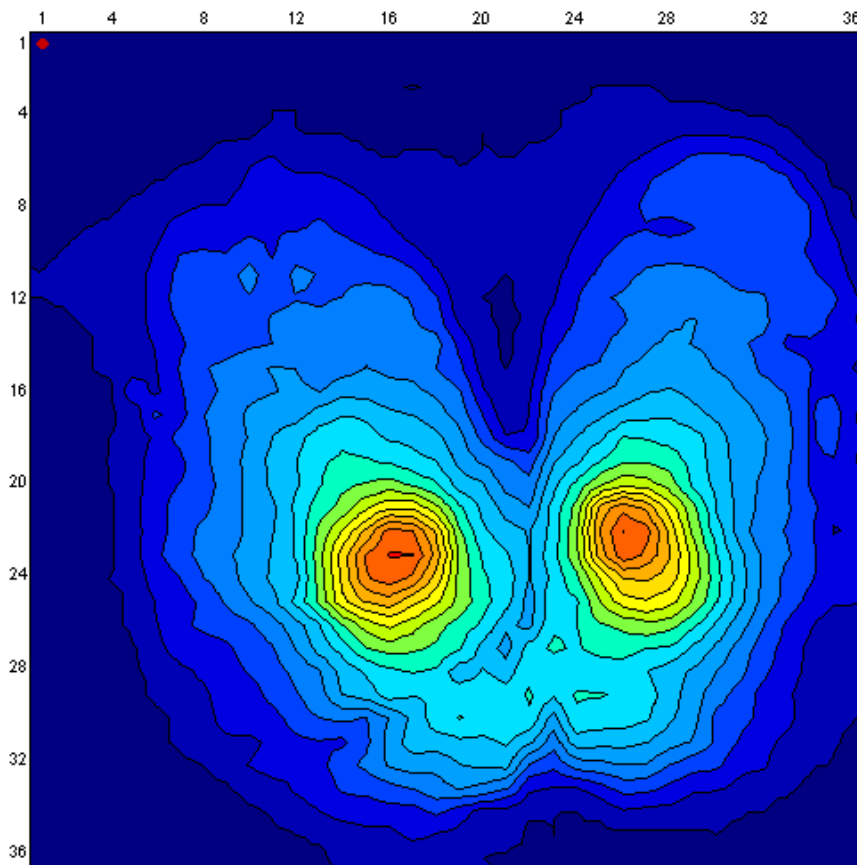


[Multi-View mode](#)

2D View - Basic

The basic 2D view is the default viewing mode. This view shows a 2D representation of the recorded sensor pressure. The numbers across the top and sides of the 2D image correspond to the numbers printed along the edges of the sensors. Some of the more common features used with the 2D view include viewing the pressure values associated with the isobar colors, and copying pressure data directly from the view into the clipboard.

To enter the 2D view mode, from the **View / Current View** menu and choose **2D View**, or click the **2D View**  toolbar button.



The 2D viewing mode can be configured to display images in a variety of ways. See [2D Options](#) for more information.

View Pressure Values

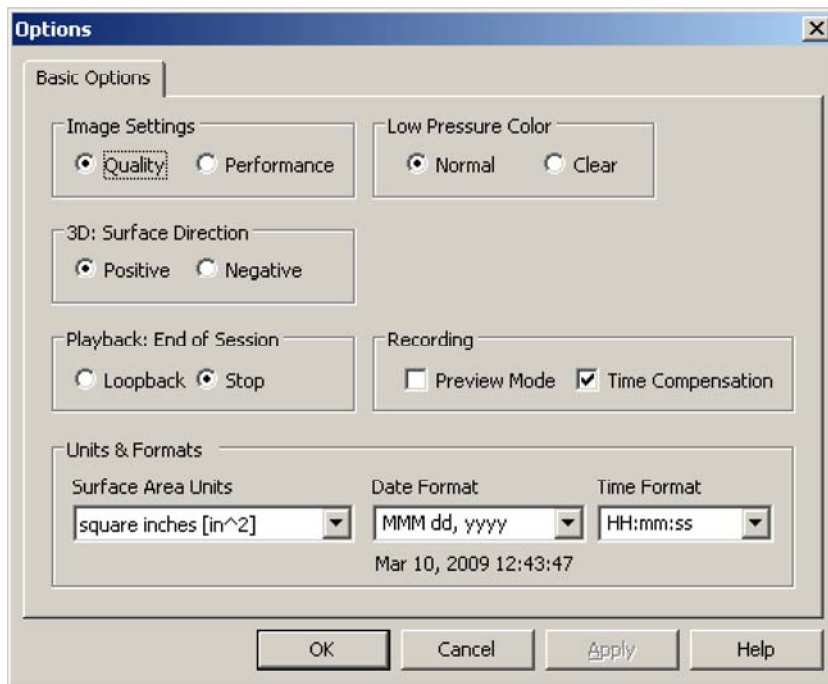
One of the simpler methods of viewing the pressure values behind the colored isobars is to hold the left mouse button down and drag the mouse around the sensor. The pressure under the mouse is shown in the middle of the status bar. Another method involves enabling the [2D Numeric View](#) which shows the numbers directly over the pressure image. A third method is via the [2D Magnifier](#) window.

Clipboard Copy

A region of pressure data can be copied directly from the 2D view into the clipboard. While holding the <SHIFT> key down, press the left mouse button and draw the mouse pointer to form a selection rectangle. The region in the rectangle will show inverted colors. Release the left mouse button and the inverted rectangle will remain. Use <CTRL>+C to copy the sensels. The copied data can be pasted into any text editor or spreadsheet program.

Basic Medical options

These options are only available in the [Basic](#) medical mode. Look [here](#) for the Advanced mode options.



Basic Medical mode options

Image Settings

The Quality and Performance options change how the 2D and 3D views are rendered. Quality gives a better looking image at the expense of a slower frame rate during playback. (In some instances, the recording playback may also be reduced.)

Low Pressure Color

The Low Pressure Color setting controls the color used when drawing sensor cells that fall below the pressure range supported by the sensor. The Normal option draws those cells with a dark blue color. The Clear option draws those cells in white. Use the Clear option to better see those cells that fall near the low end of the pressure range.



3D: Surface Direction

Changes the direction in which increasing pressure travels from the plane of the sensor. The positive direction causes higher pressure to rise up (like a mountain). The negative direction causes higher pressure to sink down (like a valley).

Playback: End of Session

These options control what happens when during playback when the end of the file is reached. Loopback rewinds to the beginning of the file and continues playing. Stop causes playback to end and remain on the last frame.

Recording

The **Preview Mode** is useful for positioning a subject on a sensor before committing pressure data to a session file. When this mode is selected, the **Record Frames**  button is replaced with the yellow **Preview Frames**  button. Clicking the yellow button (or press <F8>) starts the preview mode, and the button is replaced with the **Record Frames** button.

Select **Time Compensation** to apply an adjustment factor to the recorded data that takes into account the passage of time. This feature can produce more accurate readings over time, but is only available for sensors that have been time calibrated.

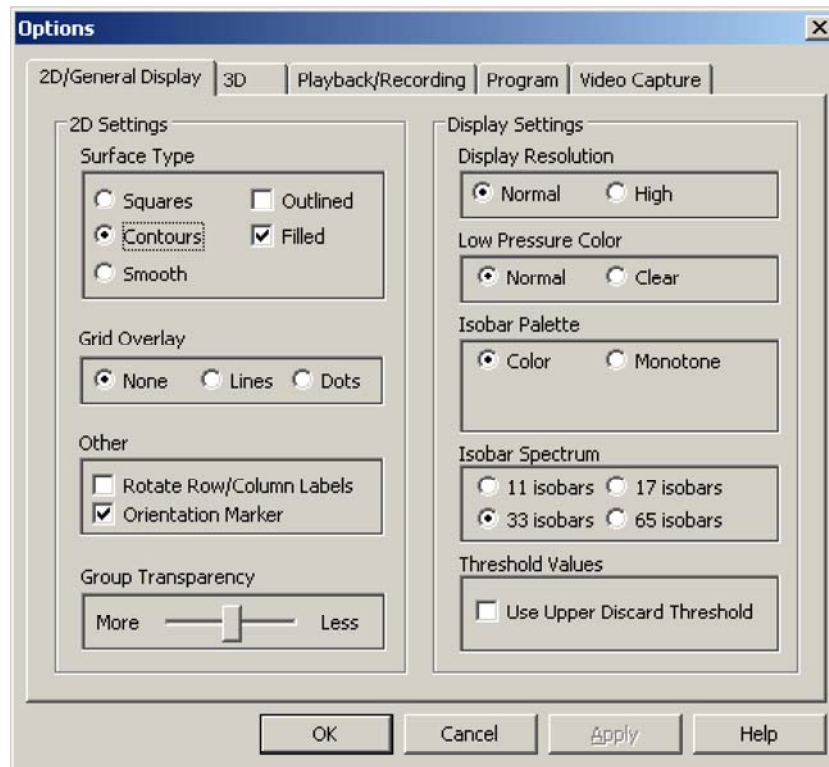
Units & Formats

Change Surface Area units with this list. Options include square inches and square centimeters. The date and time formats can also be modified.

Setting 2D/General Display options

These options are only available in the [Advanced](#) medical mode. Look [here](#) for the Basic mode options.

Use the **2D/General Display** tab in the **Options** dialog box to control the appearance of the 2D viewing mode. To open the **Options** dialog box to this tab, from the **Options** menu, choose **2D**.



The **2D Settings** option group is used to set controls for the [2D](#) view. The **Display Settings** box is used to set controls for all viewing modes.

To set 2D options:

Click the links below for more information about the options in this option group:

- [▶ Surface Type:](#)
- [▶ Grid Overlay:](#)
- [▶ Other:](#)
- [▶ Group Transparency:](#)

To configure display settings:

- [▶ Display Resolution:](#)
- [▶ Low Pressure Color:](#)
- [▶ Isobar Palette:](#)
- [▶ Threshold Values:](#)

Other Options

[Basic Medical options](#)

[Setting 3D options](#)

[Playback/Recording options](#)


[Program options](#)

[Video Capture Options](#)



Sensor Orientation

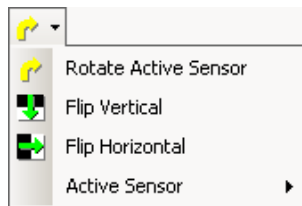
When working in the 2D and [3D](#) viewing modes, a sensor can be rotated, and flipped vertically or horizontally. This enables optimal use of the available screen space and also allows aligning the pressure image with the physical orientation of the sensor.

Rotate a sensor

Click the **Rotate Active Sensor**  button to rotate a sensor 90 degrees clockwise.

Flipping a sensor

Click the **Flip Sensors Vertically**  button to flip the image vertically, and the **Flip Sensors Horizontally**  button to flip the image horizontally. These two buttons are found under the **Rotate Active Sensor** drop list.



Rotate Active Sensor drop list.

The rotate and flip functions only operate on the active sensor. When working with a session that includes multiple sensors, the active sensor is indicated under the **Active Sensor** menu which appears via the Rotate Active Sensor drop list. Use this menu to change the active sensor, or alternatively in the 2D viewing modes, the active sensor can be changed by left clicking on a sensor.

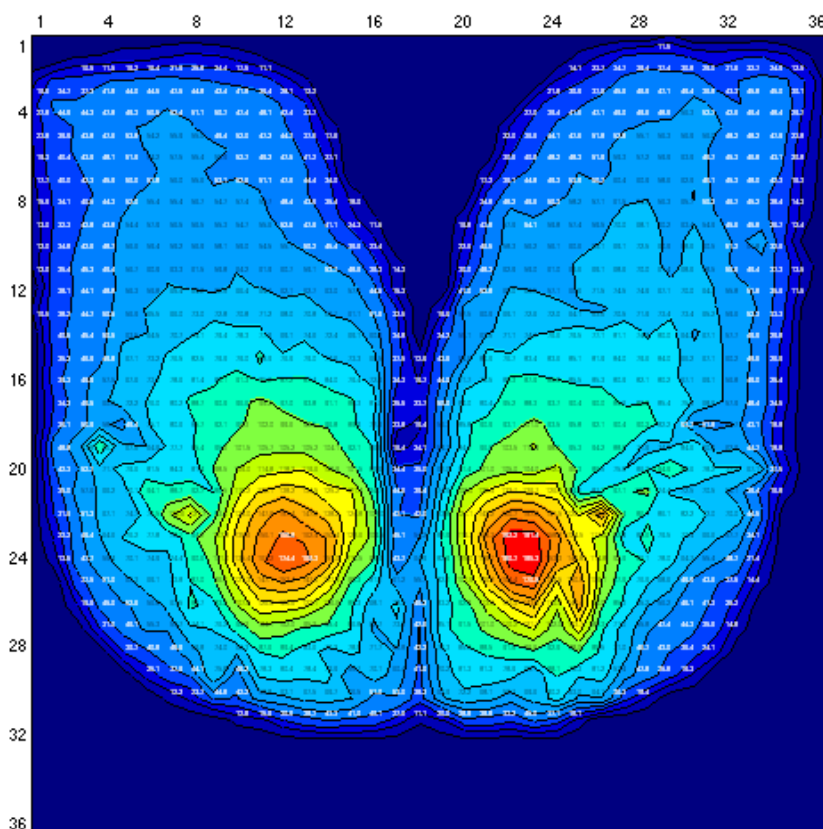
The row and column labels normally stay in the left and upper sides of each sensor. This behaviour can be modified to allow rotation and flipping of the labels. Use the Rotate Row/Column labels option in the [2D/General Options](#) window.

Orientation Marker

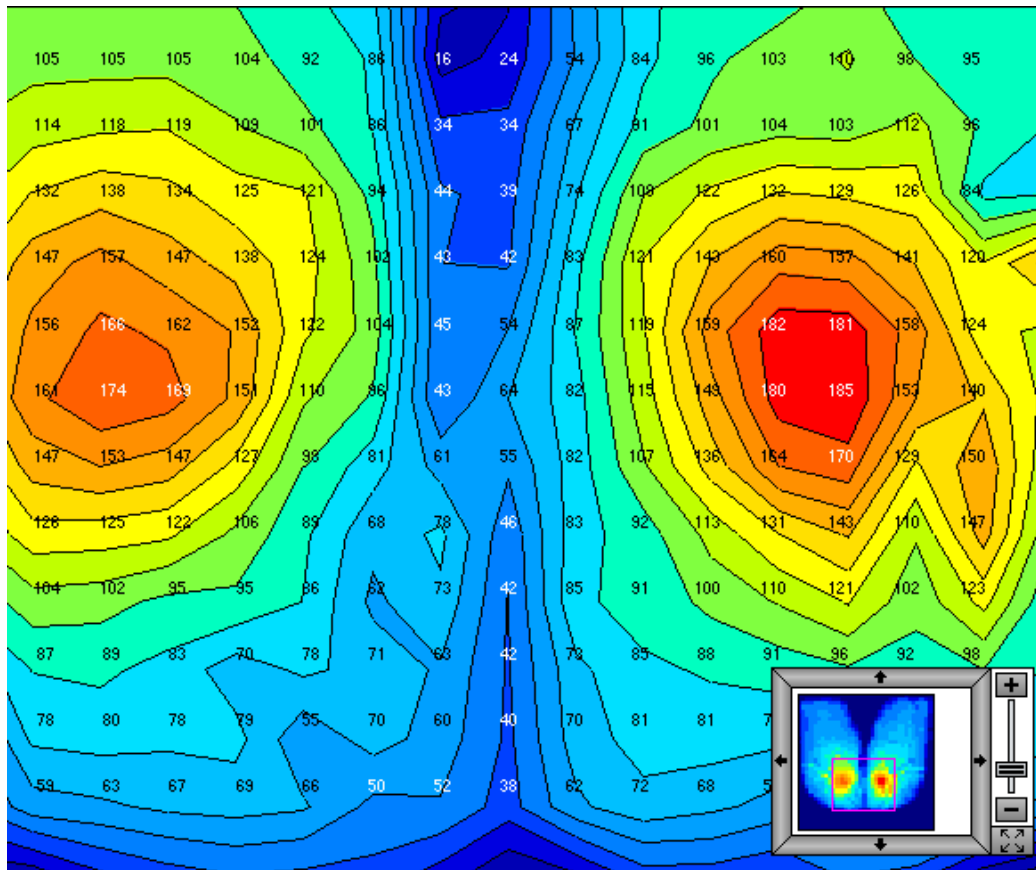
When working in the 2D view, an orientation dot in the corner of the image corresponds with the top-left hand corner of the sensor (column 1, row 1). This dot serves as a reference point when rotating or flipping the on-screen image. It also indicates the active sensor. The marker can be toggled on or off via the **Orientation Marker** option on the [2D/General Display](#) window.

2D Numeric View


The numeric 2D view overlays pressure numbers over the isobar colors. Only pressure that is greater than the lower threshold is shown. Normally the text is very condensed and so a [zoom mode](#) can be accessed to better see the numbers.



2D View in numeric mode - very condensed pressure numbers.




2D View in numeric mode - zoom mode is activated.

The numeric viewing mode is activated via the menu View -> Current View -> 2D Numeric View, or by the 2D View Modes toolbar drop-list and selecting the **2D Numeric View**  button.

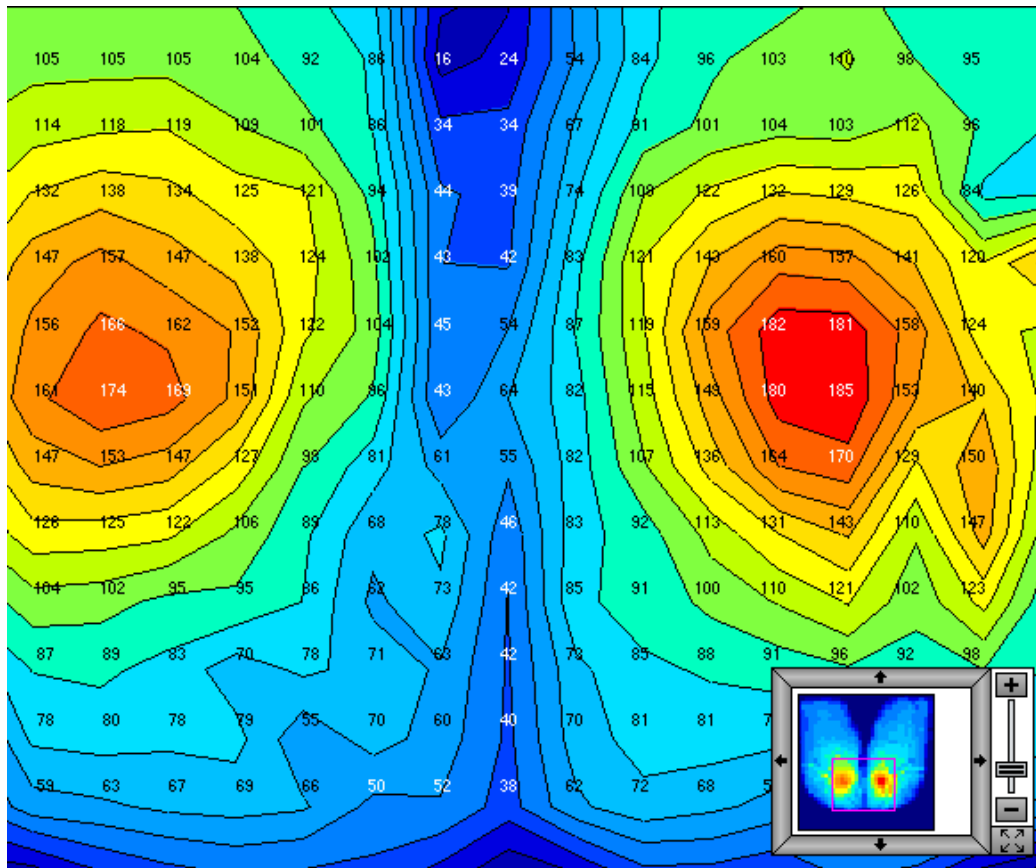
Center of Pressure Indicator

The **center of pressure** indicator shows the spot on a sensor where the surrounding accumulated pressure is equal in all directions.

Click the **Center of Pressure**  button to toggle the indicator. This button is located under the View menu.

2D Zoom Mode

The 2D Basic and Numeric views support a zoom feature that allows magnification of the pressure map for better viewing. The zoom feature can be activated by scrolling a mouse-wheel, or by holding the <CTRL> key and the left mouse button and dragging a selection rectangle.



2D View in numeric mode - zoom mode is activated.

While this feature is active, a zoom control window appears in the lower right corner of the screen. The zoom window shows a thumbnail of the sensor configuration, and the current view is highlighted by a rectangle. The highlight rectangle can be moved around the thumbnail by either selecting a movement arrow button, or by left clicking and dragging it.

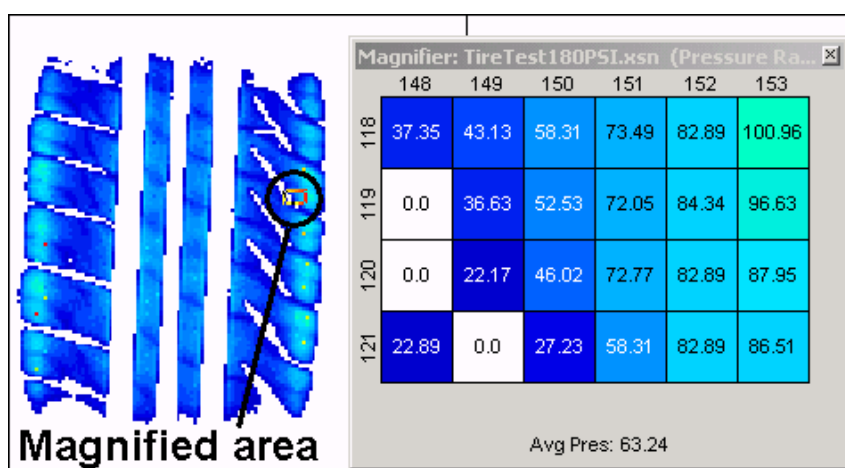
The level of zoom is controlled by either scrolling a mouse-wheel or by selecting the slider bar on the right.

To exit the zoom mode, press the Full View  button.

2D Magnifier window

When working in the 2D viewing modes, it can be convenient to examine portions of the pressure image in detail. To do this either the [2D zoom mode](#) can be activated, or more simply the Magnifier window can be opened.

To open the Magnifier window, right click on the pressure image. A small window appears with 9 sensels. The corresponding sensels are also highlighted on the 2D image. The highlighted area can be moved by right clicking else where on the 2D image. If the right mouse button is held, the mouse can be dragged to smoothly update the magnifier window.



Magnifier window.

Window Size

The number of sensels shown in the magnifier window can be changed by resizing it. Position the mouse pointer over one of the sides or corners of the magnifier window so that the pointer changes to a line with two arrows. Click and drag a window edge to increase or decrease the sensel selection as desired.


Sensel Formatting

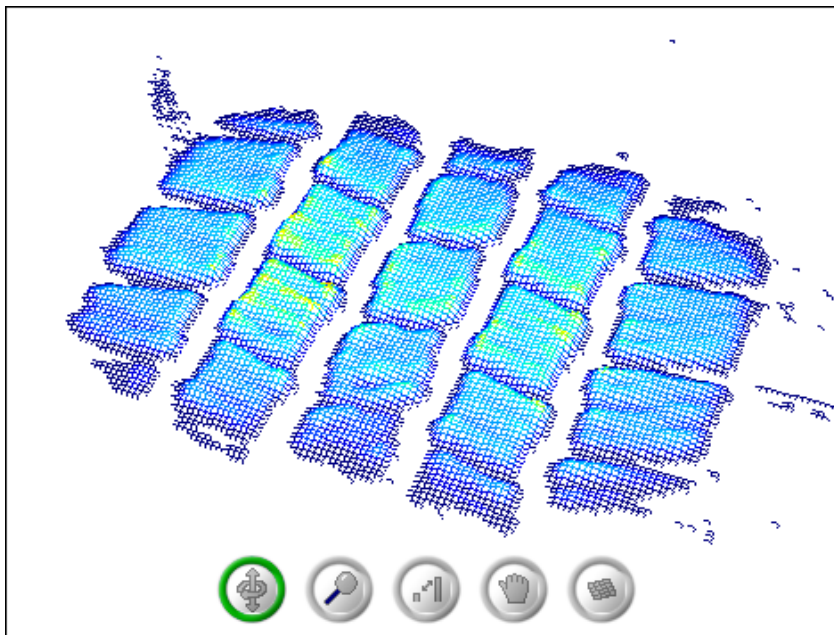
The sensel dimensions and font used in the Magnifier can be changed. To change the dimensions right-click in the window and choose **Change Size**. Move the **Width** or **Height** slider bars to adjust the size of the sensels. Similarly choose **Change Font** and select a new font. To reset the size and font of the sensels select the **Defaults** option.

Clipboard Copy

The displayed sensel pressures can be copied to the clipboard. Right-click on the window and select **Copy to Clipboard**. These values can be pasted into any text editor or spreadsheet program.

3D View

Choose this mode to view the current session as a three-dimensional pressure contour, as shown below. The pressure from each sensel defines the 3D height. To enter 3D viewing mode, choose **3D View** from the **View / Current View** menu, or click the **3D View**  toolbar button.



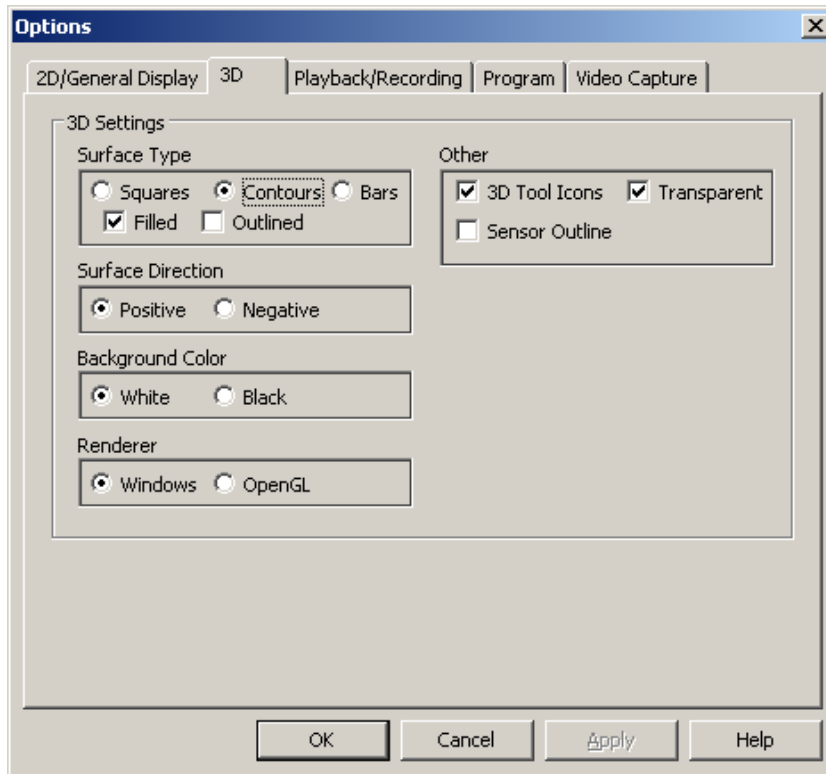
The size, orientation and position of the sensors can be changed using the mouse and the [3D settings icons](#). The icons are only present if the 3D Tool Icons is selected in the [3D option](#) window.

The 3D view can be [configured](#) in a variety of ways.

Setting 3D options

These options are only available in the [Advanced](#) medical mode. Look [here](#) for the Basic mode options.

Use the **3D** tab in the **Options** dialog box to control the appearance of the 3D viewing mode. To open the **Options** dialog box to this tab, from the **Options** menu, choose **3D**.



To set 3D options:

Click the links below for more information about the options on this tab.

- [▢ Surface Type:](#)
- [▢ Surface Direction:](#)
- [▢ Background Color:](#)
- [▢ Renderer:](#)
- [▢ Other:](#)

Other Options

[Basic Medical options](#)

[Setting 2D/General Display options](#)




[Playback/Recording options](#)




[Program options](#)

[Video Capture Options](#)


Changing the 3D View

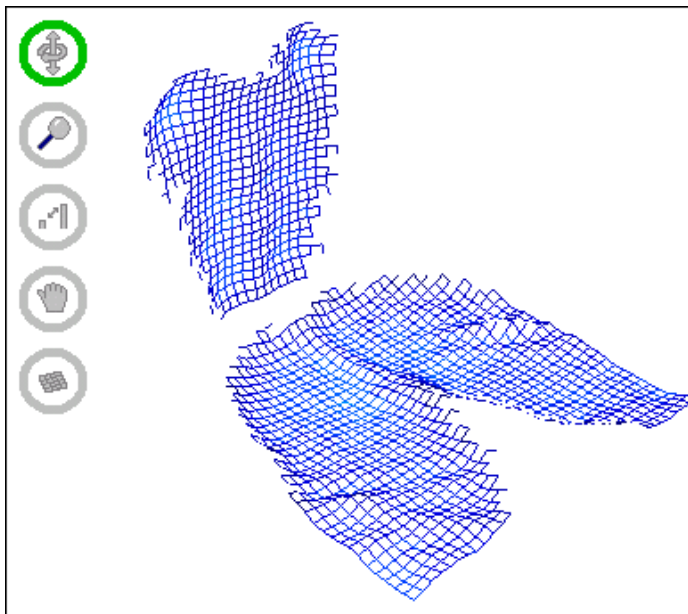
When working in the 3D view, the size, orientation and position of the sensors can be adjusted using the mouse and the **3D Tool** icons. The tool icons are only present when **3D Tool Icons** is selected in the [3D option](#) window. Consult the table below to see how each tool works.

Click this icon...	To do this
	Click the Rotate icon to rotate the image horizontally or vertically. Place the hand pointer  on the image, click and hold the left mouse button, and then move the pointer back and forth (or up and down) to rotate the image along the horizontal or vertical planes. Note: This icon is active by default when entering the 3D viewing mode .
	Click the Zoom In/Out icon to increase or decrease the size of the image. Place the hand pointer on the image, click and hold the mouse, and then move the pointer back and forth (or up and down) to zoom in or out.

	Click the Height icon to adjust the relative height/depth of the peaks and valleys in the image relative to the x-y plane. Place the hand pointer on the image, click and hold the mouse, and then move the pointer up and down to move the peaks up or down.
	Click the Move icon to move the image around within the 3D view. Place the hand pointer on the image, click and hold the mouse, and then move the image to the desired position. The right mouse button also provides this functionality.
	Click the Reset Default Position icon to reset the 3D view to the default settings.

3D Chair Configuration mode

This 3D-only mode is used to orient a two sensor system such that it appears as a chair with a 90 degree back. The mode expects the first sensor in the configuration to be the seat and the second to be the back. To enter the mode, select Chair Configuration  from the **View / Current View / 3D Modes** menu.

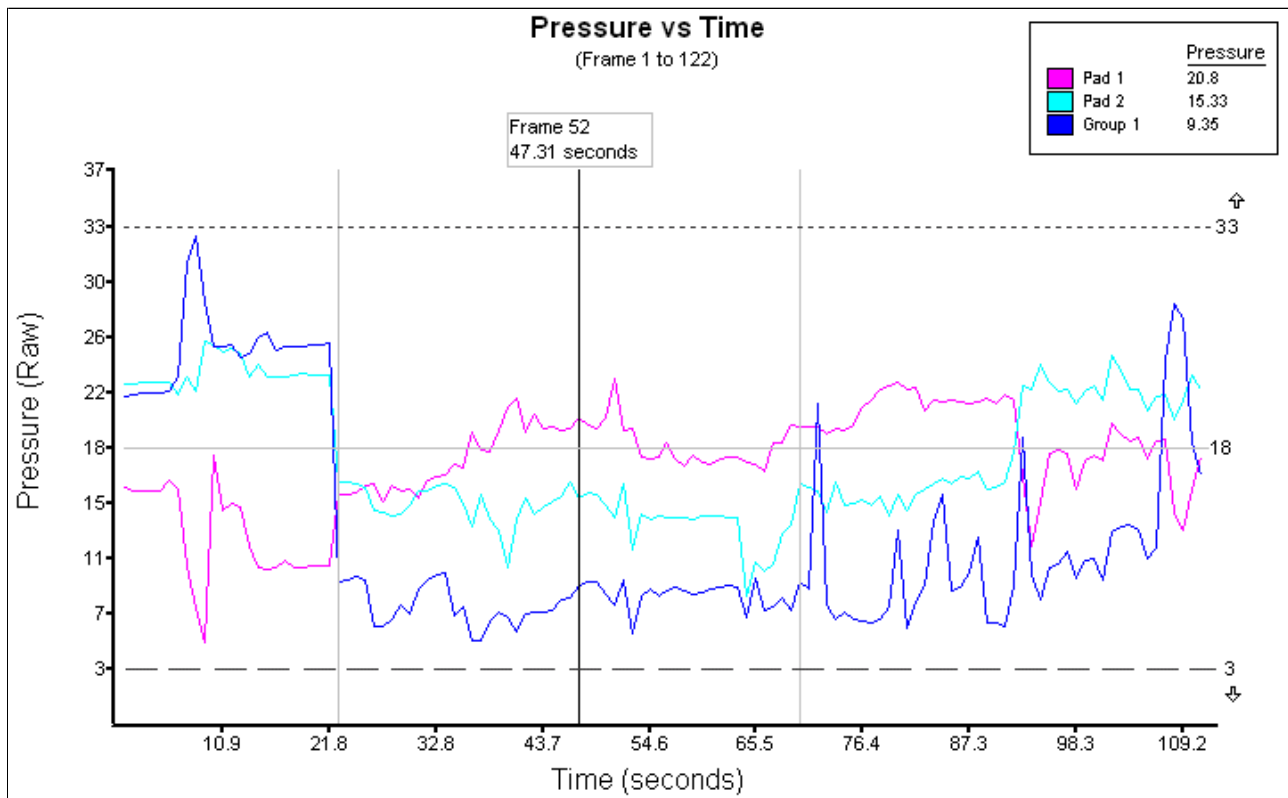


Note: This mode is only available when working with a two sensor configuration.

Pressure vs Time Graph

The Pressure vs Time graph plots pressure or contact area along the Y-axis and time across the X-axis. The plotted values are generated from sensors or sensor groups.

Show this graph by selecting **Graph: Pressure vs Time** from the **Graph** menu, or click the **Pressure vs Time**  button found in the **Display Mode** and **Graph Mode** toolbars.



Pressure vs Time graph with pressure plots for two sensors and a sensor group.

- Change the settings for this graph via the [Graph Settings](#) tab or by right clicking on the graphing area.
- Subsets of the Pressure vs Time graph can be selected with the [graph zoom](#) feature.
- When the [Pressure Legend](#) option is selected, a legend appears showing the graphed elements and the pressure or area value for the current frame.
- A **grey vertical line** indicates the beginning of each recording session within an session file.
- A **black vertical line** marks the current frame position. The current frame can be changed by clicking and dragging this line with the mouse, or using the keyboard left and right arrows.
- The **horizontal** lines are pressure indicators used as visual aids in interpreting the graph. These lines can be moved by either clicking and dragging with the mouse, or by double-clicking a line and editing the pressure numbers directly in the Indicators window (see below). The solid light gray line is the **base** indicator, and the dotted and dashed lines are the **upper** and **lower** indicators respectively.

Pressure vs. Time Indicators

mmHg Deltas

Upper: 55 + 5

Base: 50 0

Lower: 45 - 5

Max. 100.0

OK Cancel

Pressure vs Time Indicators Editor

Tip: The current range of frames can be easily selected for export. Right click the graph and select **Export Graphed Frames** from the popup menu.

Pressure vs Time Zoom Feature

The Pressure vs Time graph normally shows all frames along the X-axis and the full pressure range along the Y-axis. A zoom feature allows for graphing of a subset of the session frames and pressure range.

Viewing a Frame Subset

To zoom in to a subset of frames, leaving the pressure range unchanged, move the mouse pointer over the subset start frame, hold the <SHIFT> key and press the left mouse button. Drag the mouse to the subset end frame and release the mouse button.

Viewing a Pressure Range and Frame Subset

To zoom in on a subset of frames and pressure range, move the mouse to the subset start frame and pressure, hold the <CTRL> key and press the left mouse button. Draw the mouse to the subset end frame and pressure and release the mouse button.

NOTE: The zoom selection can be canceled by either pressing the right mouse button, or by releasing the <CTRL> or <SHIFT> key before the left mouse button

To restore the frame and pressure ranges, right click on the graph and select **Show All**. The **Zoom Out** option is used to show increasingly larger ranges.


The Y-axis pressure range can be adjusted by holding the pointer over the graph, and using the mouse wheel to adjust the upper pressure, or hold <SHIFT> and use the wheel to adjust the lower pressure.

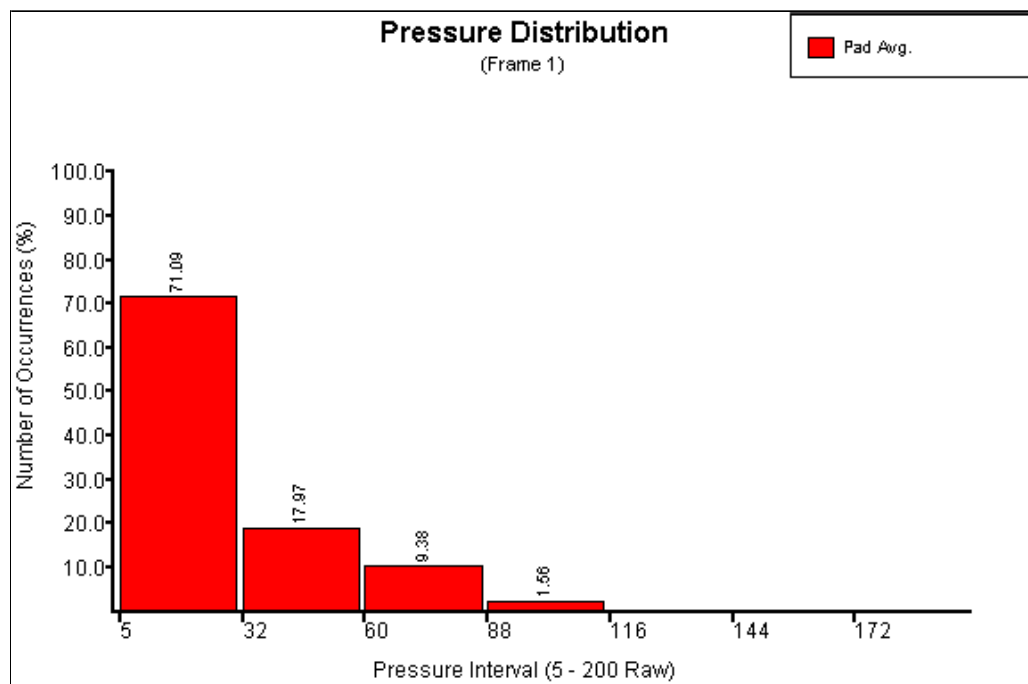
[Click here to see an example](#)

Pressure Distribution Graph

This graph is used to view the pressure distribution of the current frame. The graph can display individual pads, the average of all pads, and sensor groups.

The pressure distribution graph shows the number of occurrences of sensor readings within set pressure intervals. Each interval is represented by a bar, and the height of the bar is the relatively percentage of readings within the interval. For example, if 100% of the cells of a sensor fall within a pressure range, then that bar appears as the maximum height while all other bars are not drawn.) The pressure range can be split into 1 to 250 intervals...

To display the Pressure Distribution graph, from the **Graph** menu, choose **Graph: Pressure Distribution**, or click the **Pressure Distribution**  toolbar button.



In the example above, the first bar shows the occurrence of sensor readings between 5 mmHg (the threshold) and 31 mmHg to be 71.09%. Therefore 71.09% of the sensors for frame 1 are within the range of 5 and 31 mmHg. The next bar indicates that 17.97% of the sensor readings are between 32 and 59 mmHg, and so on.

Graphing a Selected Pressure Distribution Interval

The Pressure Distribution graph normally shows the entire pressure range along the X-axis. A smaller subset of the range can be viewed.

- [To display a smaller range:](#)
- [To show the full interval](#)

Note: The pressure interval can also be specified in the **Plot Distribution Subset** option group on the [Pressure Distribution](#) options

tab.

Graph Settings

Use the **Graph Settings** window to change how the various graphs are displayed.

- [General](#)
- [Pressure Distribution](#)
- [Pressure vs Time](#)

Tip: After selecting one or more options on any of these tabs, click **Apply** to see the changes without closing the **Graph Settings** window.

General Graph settings

- Colors are assigned to each sensor based on its configuration order. To change a color, left click in the color box and chose a new color.
- The **Average Sensor** color is averaged sensor generated for the Pressure vs Time and Pressure Distribution graphs.
- Click the **Restore Default Colors** button to restore the default colors for all sensors.

Pressure Distribution Settings

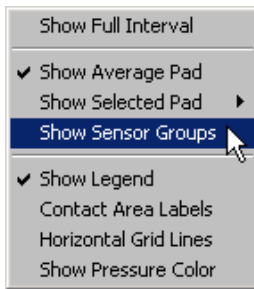
Use this tab to configure the Pressure Distribution graph.

The screenshot shows the 'Graph Settings' dialog box with the 'Pressure Distribution' tab selected. The 'General' tab is also visible. The 'Pressure vs Time' tab is not selected. The 'Graphed Items' section has three checkboxes: 'Average Sensor' (unchecked), 'Selected Sensor' (checked), and 'Sensor Groups' (checked). The 'Selected Sensor' dropdown menu is set to 'All Sensors'. The 'Num. Bars (X-axis)' section has a text box 'How Many? (1-250)' with the value '25'. The 'Percentage Range (Y-axis)' section has a text box '0 % to 100 %'. The 'Plot Distribution Subset' section has a checkbox 'Plot Distribution Subset' (unchecked), a 'Set' button, and two text boxes: 'Lower' with '5.0 mmHg' and 'Upper' with '200.0 mmHg'. The 'Miscellaneous' section has three checkboxes: 'Contact Area Labels' (unchecked), 'Horizontal Grid Lines' (unchecked), and 'Show Legend' (checked). At the bottom are buttons for 'OK', 'Cancel', 'Apply', and 'Help'.

Pressure Distribution settings

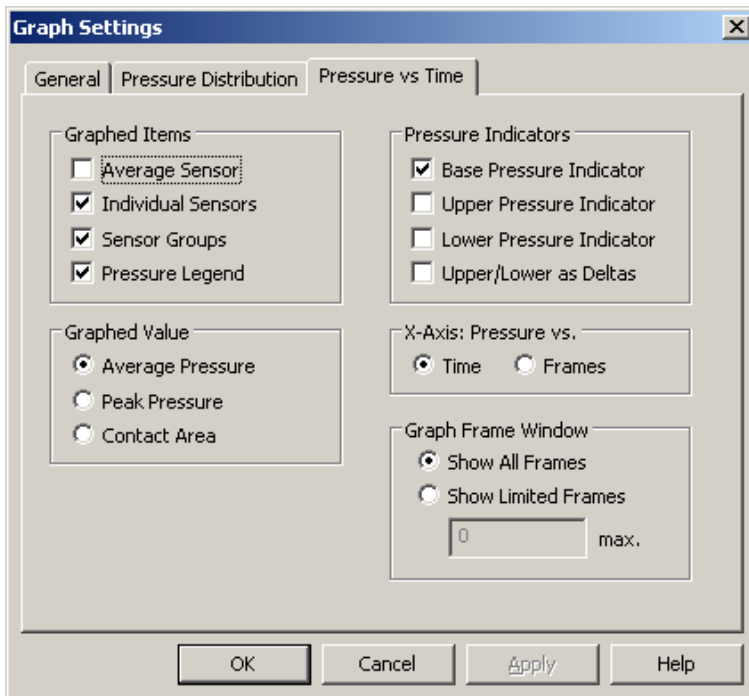
- [Graphed Items](#)
- [Num. Bars \(X-axis\)](#)
- [Percentage Range \(Y-axis\)](#)
- [Plot Distribution Subset](#)
- [Miscellaneous](#)

Tip: When working with the Pressure Distribution graph, many of the settings can be accessed by right-clicking the graph.



Pressure vs Time Settings

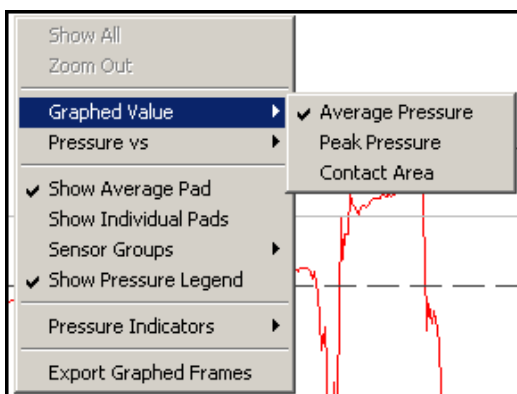
Use this tab to set options for the Pressure vs Time graph.



Pressure vs Time graph settings.


- [Graphed Items](#)
- [Graphed Value](#)
- [Pressure Indicators](#)
- [X Axis: Pressure vs.](#)
- [Graph Frame Window](#)

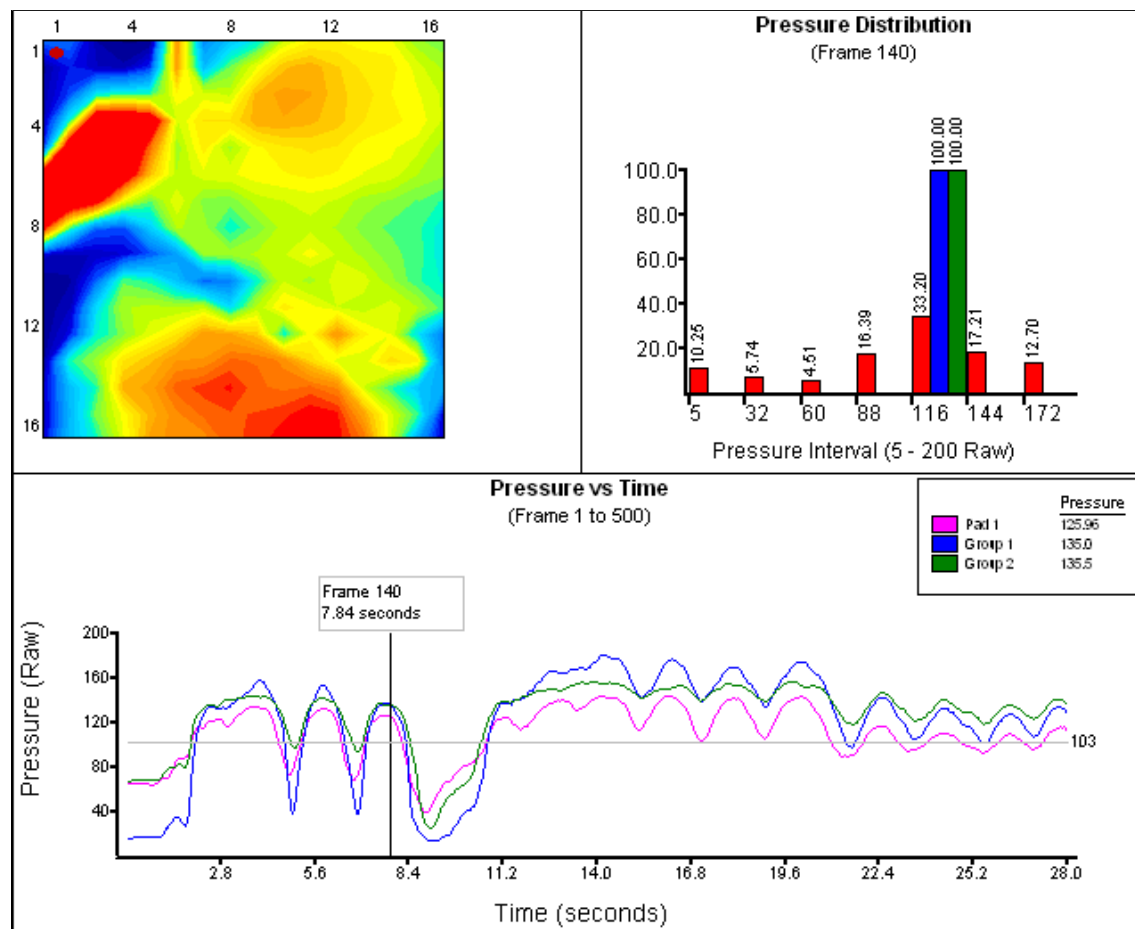
Tip: When working on the Pressure vs Time graph, all of these settings can be quickly changed by right-clicking the graph and using the popup menu (shown below).



Pressure vs Time graph right click menu.

Multi-View mode

Use the **Multi-View** mode to display the current frame in up to four different [views](#) at once. This mode is activated by selecting **Multi-View Mode** from the **View / Current View** menu, or by the **Multi-View Mode**  toolbar button.

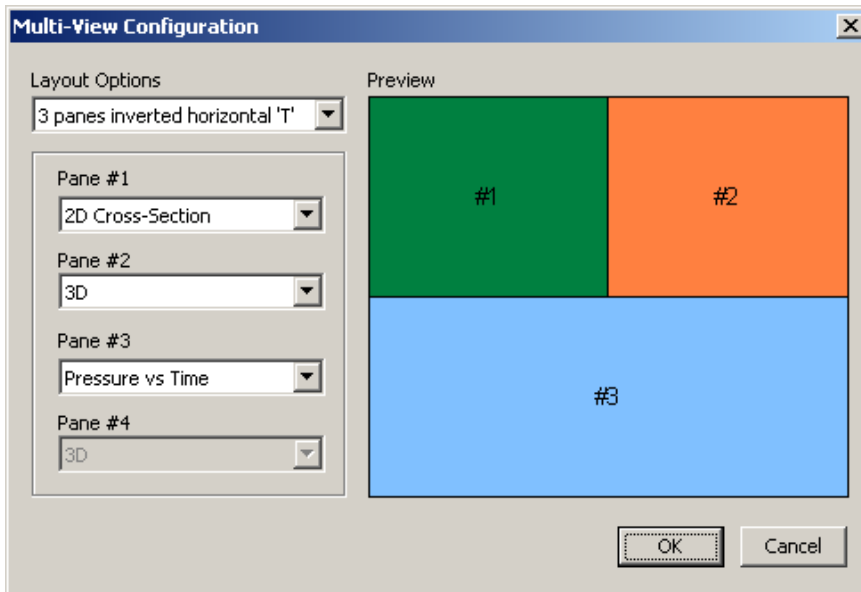


This illustration shows the Multi-View Mode view with three panes configured.

Multi-View Configuration

The Multi-View mode is configured through the Multi-View Configuration window. To open this window, select **Multi-View Config** from the **View / Current View** menu.

The number of panes and layout is selected by the **Layout Options** drop-list. Each pane has a drop-list of available views that can be shown. A view can only be present in one pane.



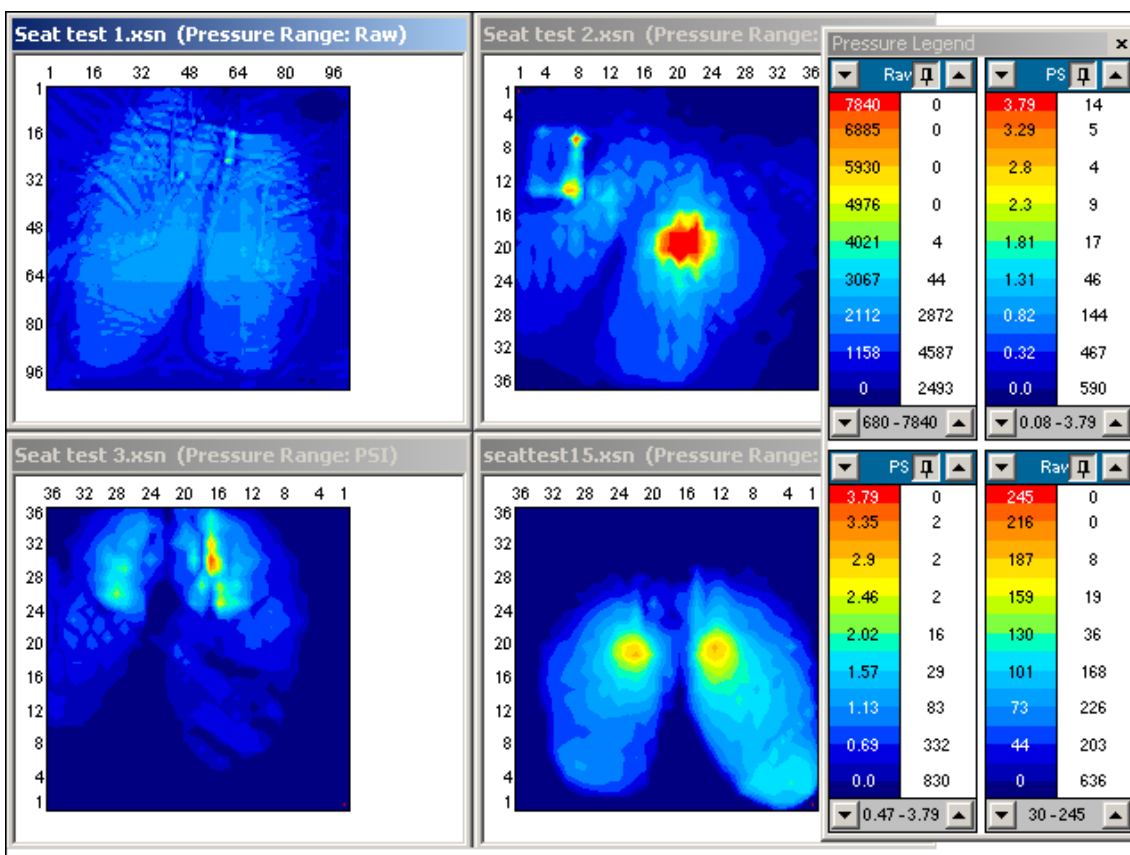
Multi-View Configuration window showing three configured panes.

Comparing Files

Use the **Compare Files** mode to compare frames from two to four open session files. While in this mode, the [display mode](#) settings and [frame navigation](#) tools are synchronized across the compared files. Playback can also be synchronized when the [Link Compare Mode Play](#) option is enabled. The [pressure legend](#) is split to show the distributions of the compared sessions.

To use this mode, [open](#) or [create](#) up to four sessions and select **Compare Files**  button found under the **Tools** menu. If more than four sessions are open, the **Compare Open Documents** window prompts for the sessions to compare.


In Compare Mode, only one session is active and accepts [frame navigation](#) commands. To activate another session, click the session title bar or within the session view. By default, the top left corner is active when Compare Mode is turned on.



Comparison of four sessions.

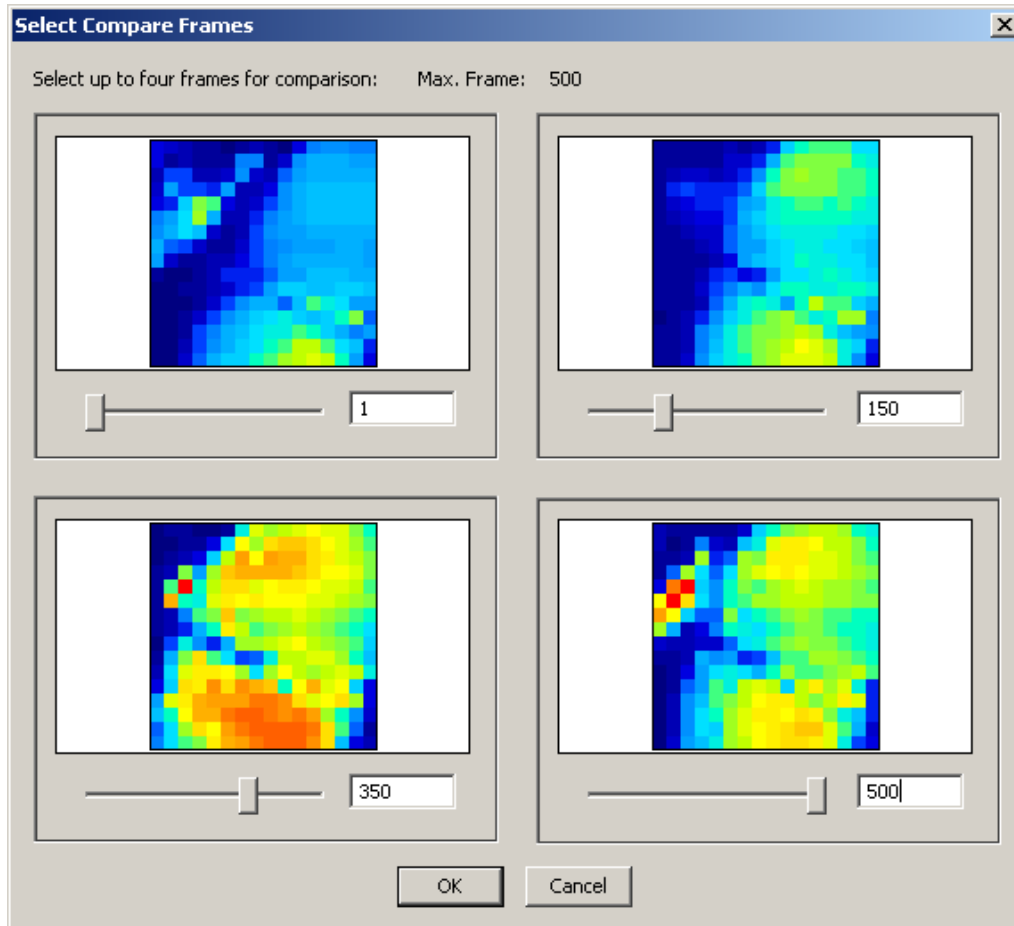
To exit the compare mode, either select the Compare Files button. The mode is also exited when a session file is created or opened.

Comparing Frames

The **Frame Compare** mode is used to visually compare up to four frames from within the active session file. This mode is activated by selecting **Compare Frames**  from the **Tools** menu. Exit the mode using the same method.

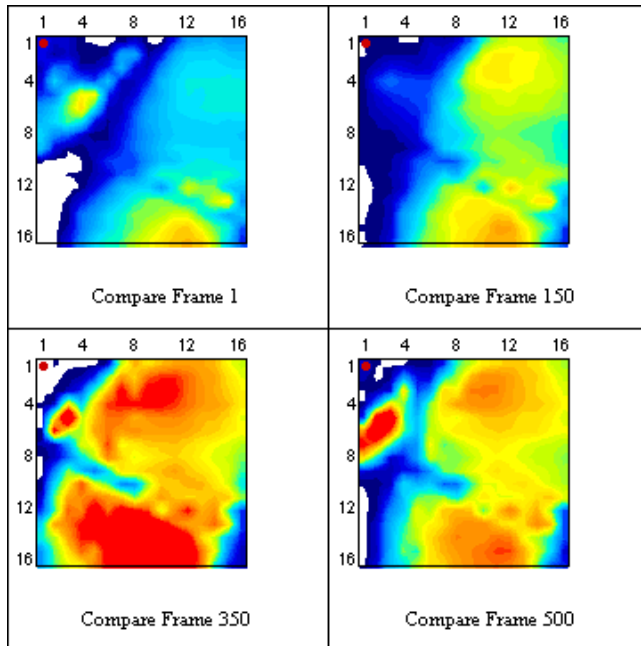
When the Frame Compare mode is first activated, the **Select Compare Frames** window appears to allow up to four frames to be selected for comparison. The candidate frames can be selected by using the slider bars or by directly entering the frame number.

NOTE: The candidate frames are rendered in a low resolution to improve selection speed.



Selecting four frames for comparison.

NOTE: Recording and playback are disabled while in the Frame Compare mode.



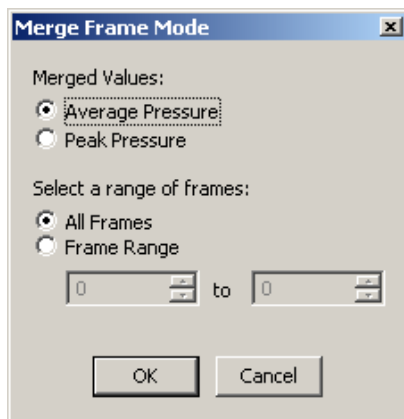
Viewing four frames.

Merge Frame Mode

The **Merge Frame Mode** creates a composite pressure image from a selected range of frames. The composite image is created by either averaging the selected frames together, or by picking the peak pressures across the range.

The frame created by this mode is temporary and is for visual inspection only. However, the pressure data can be extracted using the [clipboard copy](#) method. Alternatively the [export](#) function can be used to generate an averaged frame.

This mode is toggled on and off via the **Merge Frame Mode** $\frac{\Sigma}{n}$ entry under the **Tools** menu.



Setting up the merged frames.

Navigating Frames

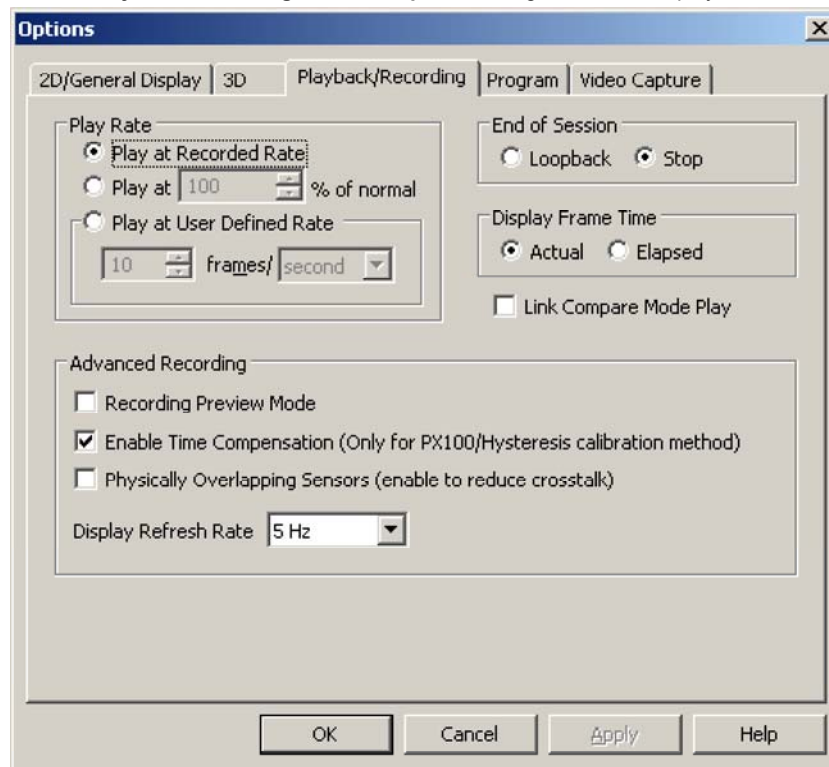
Navigation of recorded frames can be accomplished in a number of ways. The primary method is the Frame Control Toolbar.

- [Using the Frame Control Toolbar:](#)
- [Using the Go to Frame window:](#)
- [Using the keyboard:](#)
- [Using the Pressure vs Time Graph Frame Marker:](#)
- [Using the Notes: All Frames window:](#)

Playback/Recording options

These options are only available in the [Advanced](#) medical mode. Look [here](#) for the Basic mode options.

Use the **Playback/Recording** tab in the **Options** dialog box to control playback behaviour and to change advanced recording options.



- [▶ Play Rate](#)
- [▶ End of Session](#)
- [▶ Display Frame Time](#)
- [▶ Link Compare Mode Play](#)
- [▶ Advanced Recording](#)

Other Options

[Basic Medical options](#)

[Setting 2D/General Display options](#)

[Setting 3D options](#)

[Program options](#)

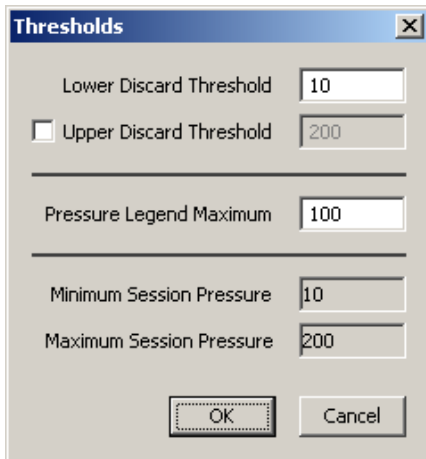
[Video Capture Options](#)

Pressure Thresholds

Use the **Lower** and **Upper Discard Thresholds** to eliminate potential sources of noise. Pressure readings below the lower threshold and above the upper threshold are treated as zero. These thresholds only affect the calculation of statistics and the display of pressure data. Changing the thresholds does not affect the saved pressure data.


The default lower threshold for new sessions is the minimum pressure supported by the calibration range. If a higher **Lower Discard Threshold** pressure is selected, any new session will use it. If a pressure below the calibration range is selected, then any new sessions will default to the minimum calibration pressure. By default the **Upper Discard Threshold** is off. This can be enabled via the **Thresholds** window or in [2D/General Options](#)

The **Thresholds** window is activated either via the **View / Pressure Threshold**  button, or by left clicking the Pressure Legends range bar.



The Thresholds dialog box contains the following fields and controls:

- Lower Discard Threshold:** A text box with the value 10.
- Upper Discard Threshold:** A checkbox (unchecked) followed by a text box with the value 200.
- Pressure Legend Maximum:** A text box with the value 100.
- Minimum Session Pressure:** A text box with the value 10.
- Maximum Session Pressure:** A text box with the value 200.
- Buttons:** OK and Cancel buttons at the bottom.

The **Pressure Legend Maximum** field affects the displayed maximum pressure of the [Pressure Legend](#). Changing this field affects the active sensor (if opened with the **Pressure Threshold**  button), or the sensor associated with clicked the **Pressure Legend** range bar.

NOTE: Changing the discard thresholds affects all statistics computed by the software. This is particularly computationally expensive for the Pressure vs Time graph because the entire graph must be regenerated when the thresholds are changed. For very large files, regenerating the graph data may take minutes.

Pressure Legend

The **Pressure Legend** shows the distribution of sensels across a fixed number of [isobars](#). Its also used as a color reference for viewing the pressure image in the various [viewing modes](#).

The values in the left column denote the start pressure for each isobar. The colored isobars represent a range of pressure values from the start pressure to just under the start of the next highest isobar. The top (typically red) isobar spans all values at and above its start pressure. The right column values denote the distribution of sensor cells (sensels) that occur in each isobar. For example, in the image below, there are 187 cells that lie between 10 and 22.67 mmHg.

The legend header shows the pressure units (in this case mmHg). The pressure units can be changed by left-clicking the units label and selecting a new unit from the list. (See Figure 2.) Two arrows in the header change the legends upper pressure in steps of 1% of the maximum pressure. (In this case the total range is 200 mmHg, hence the step is 2 mmHg.) The upper pressure can be changed by moving the mouse pointer over the legend and spinning the mouse wheel. Another method of changing the upper pressure is to click on a colored isobar. This cause the isobar pressure to become the top pressure. To restore the full scale range, click the top isobar. The pin button in the header is used to link multiple legends. Linked legends share pressure range changes.

The legend footer shows the pressure range (in this case 10 to 200 mmHg). The lower pressure is a threshold under which any sensor readings are considered to be zero. The lower pressure can be changed in steps of 1% of the maximum pressure.

The legend footer shows the pressure range currently active. The upper number is associated with the legend's maximum pressure. The lower number is associated with the [lower discard threshold](#). A single click in the footer opens the [threshold](#) window.

The pressure cannot go outside the range defined by the calibration settings. For example, suppose a sensor is calibrated from 10 to 200 mmHg, the lower pressure cannot be less then 0 mmHg and the upper pressure cannot be greater than 200 mmHg.

NOTE: To show the Pressure Legend, select Show Pressure Legend  from the View / Toolbars menu.

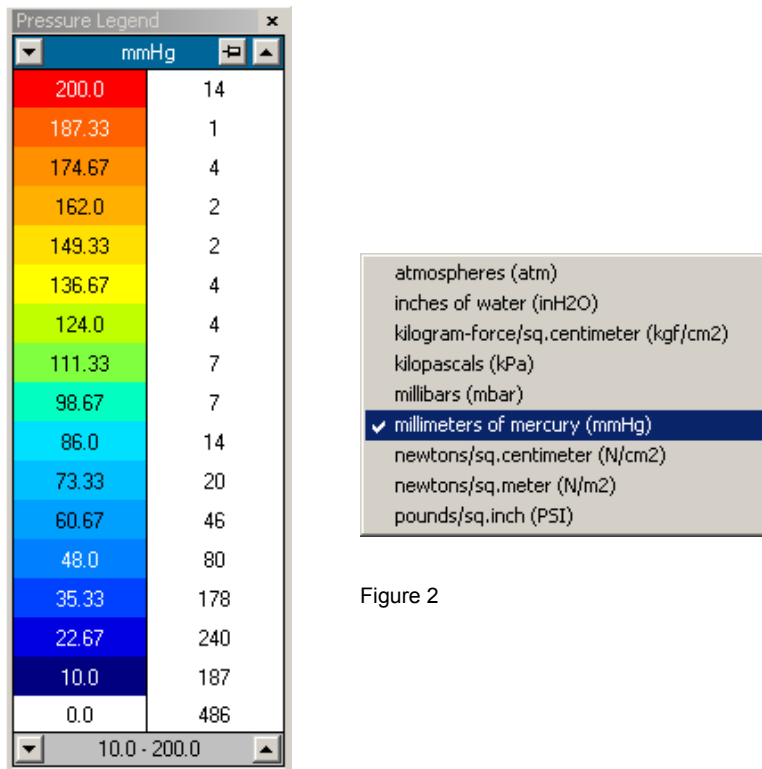


Figure 2

Figure 1

Session Properties

The **Properties** window shows information about the session file, including the sensor configuration, recording rate, recorded session statistics, and calibration details. To open this window, select **Properties** from the **File** menu.

Statistics window

The **Statistics** window displays statistical data for the active session file. The window can show statistics for individual sensors or for sensor groups. The different statistics are split across columns. Each row contains the statistics for a single sensor or sensor group. The first column shows the sensor or group name. The other columns vary depending on which statistics are selected in the [Program Options](#) tab.

The font used to display the statistics can be changed for easier viewing. Right click the column labels in the **Statistics** window and select **Change Font**. The original font can be restored with the **Defaults** option.

Clipboard Copy

The entire contents of the statistics window can be copied to the clipboard. Right-click on the window and select **Copy to Clipboard**. These values can be pasted into any text editor or spreadsheet program.

Status bar

The Status bar, located along the bottom of the software window, shows information about the active session. Enable the status bar via the **View** menu.

The bar is divided into four main fields. The left most field displays information about toolbars, error conditions, and playback/recording settings. For example, during recording and playback the frame rate is displayed as a Hertz number. The next field to the right is used to show the pressure and sensor located under the mouse pointer. This field is updated when the mouse pointer is held over any of the 2D views and left mouse button is pressed. The next field to the right shows the date and time of the active frame. The final right most field shows either the frame number or the progress of a recording session. The formatting for this frame can be modified in the [Playback/Recording Options](#) tab.







10.00 Hz	P1,R26,C22=177.105 mmHg	Oct 07, 2004 15:05:13.600	Frame: 128 of 3627
----------	-------------------------	---------------------------	--------------------

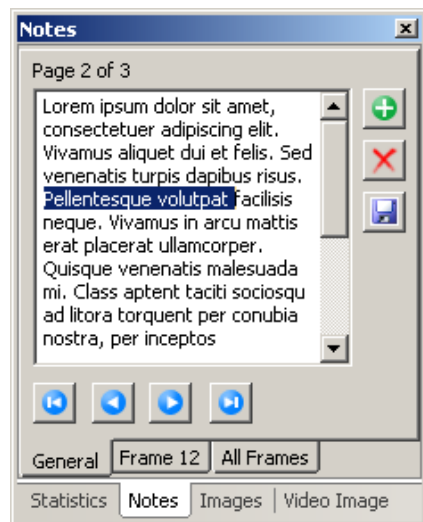
Adding Session Notes

Notes in the form of text can be added to a session file. These can either be general to the entire file, or specific to a recorded frame. Text is entered via the tabs of the **Notes** window.

Note: To show the Notes window, select  **Show Notes Window** from the **View / Toolbars** menu. By default this window is docked next to the **Statistics** window.


General Notes

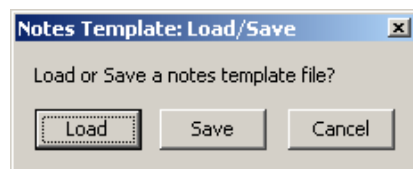
Use the General tab to enter notes regarding the session file as a whole. General notes can be separated into up to 99 pages. The Insert  button inserts an empty page after the current page. Pages can be removed using the Delete page  button. Page navigation buttons allow movement between pages either one at a time ( and ) or by moving directly to the first  or last  pages.



General Notes with selected text.

General notes can be saved as a template file (file extension XNT). This allows sharing commonly entered text between session files.

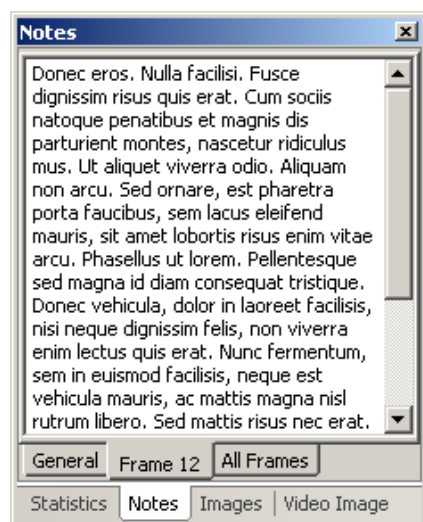
Use the Template  button to load or save a notes template. A default notes template can be loading on session creation using the **Notes Template** field in the [New Session](#) window.



Notes Template Load/Save prompt.

Frame Notes

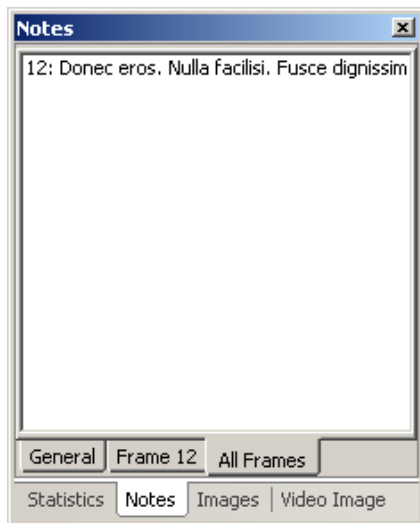
Use the Frame tab to enter notes that are specific to particular frame. The frame note consists of a single page.



Notes entered for a single frame.

All Frames

The All Frames tab shows a list of frames that have had notes entered. The frame number and the first part of the note is shown in the list. Double-click (using left mouse button) on a row in the list to make that frame active.



All Frames showing the list of frames with frame notes.

Text Editing

Editing such as word selection and cut-copy-paste is available through the normal Windows keyboard shortcuts or by right clicking the mouse in the editing field.

Note: The software is presently limited to basic text formatting (I.E.: Spaces and the linefeeds. Tabs are allowed if pasted from another source.)

Attaching Images to a Session

One or more picture images can be attached to a session file. These images are displayed in the **Images** window. Supported image file formats include JPEG, PNG and BMP.

Note: To show the **Images** window, select  **Show Images Window** from the **View / Toolbars** menu. By default this window is docked next to the **Notes** window.



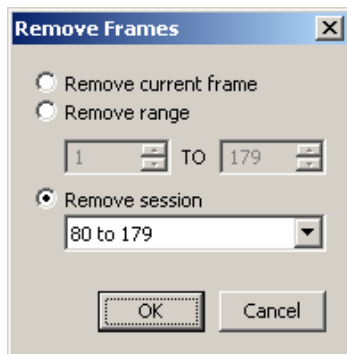
Images are attached using the **Insert**  button, or removed with the **Delete**  button. **Previous Image**  and **Next Image**  buttons allow navigation through the attached images. The **Save As**  button allows exporting of an attached image to an image file.

Image attachments can also be manipulated via the **Tools / Attached Images** menu.

The original file names of the attached images are retained and displayed in the **Image** window.


Removing Frames from a Session

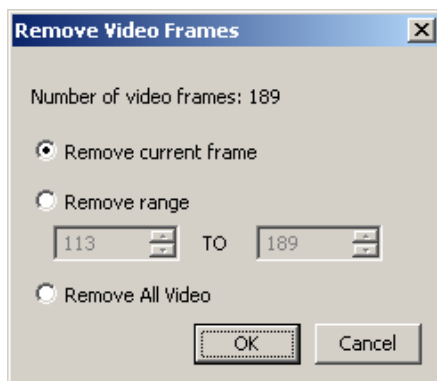
Recorded frames can be removed from a session. The **Remove Frames** window is accessed via the **Tools** menu.



The **Remove Frames** window has three options for frame removal. The current frame can be removed, or a selected range of frames. The third option allows removing all frames associated with a recording session. The recording session intervals are shown in a drop-list.

Removing Video

Captured video frames can be removed from a session file. To do this select the video removal  button on the [Video Image](#) window to access the **Remove Video Frames** window.



Video frames can be removed individually or by a range of from frames.

Configuring the print layout

When printing an XSENSOR session, you can define which display elements to print, along with their position, size, and stacking order. You can also use grid lines to help you align display elements in the page layout, and adjust the margins for your print job.

To perform any of these tasks, from the **File** menu, choose **Print Layout** to open the **Print Layout** dialog box, or click the **Print Layout**





toolbar button. Click the underlined links below to find out how to perform a given task.

- [To choose which display elements to print:](#)
- [To change the stacking order of display elements:](#)
- [To move a display element to another part of the layout:](#)
- [To change the size of a display element:](#)
- [To use grid lines to align design elements:](#)
- [To add margins to a print job:](#)

Click the **Defaults** button to reset all the page layout settings to their default values.

Print Preview

Use the **Print Preview** option to see what a print job will look like before printing it.

- **To open the Print Preview dialog box**, from the **File** menu, choose **Print Preview**, or click the **Print Preview**  toolbar button. [Move](#) any display elements if necessary before continuing.
- **To change the size of the Print Preview dialog box**, hold the pointer over the dialog-box border; the pointer will change to a .


Click and drag to change the size of the dialog box.

- To **increase or decrease the size of the image**, click the **Zoom In** or **Zoom Out** buttons.
- To **print the image**, click the **Print** button.
- To close the **Print Preview dialog box** without printing, click the **Close** button.

Note: The **Next Page**, **Prev Page**, and **Two Page** buttons are not available when previewing a screen image.

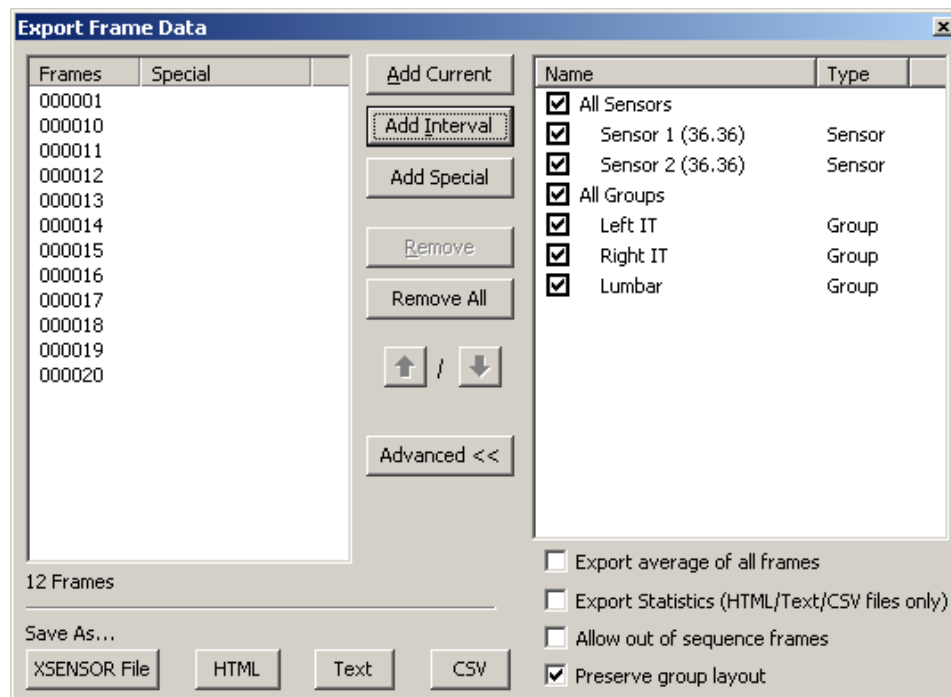
Printing

To print the current view of pressure data, use the following instructions. The layout and printed elements can be adjusted on the [print layout](#) screen.

1. [Open](#) the desired XSENSOR session.
2. [Go to](#) the frame that you want to print (if working in one of the graph views).
3. Open the **Print** dialog box in one of three ways:
 - From the **File** menu, choose **Print**;
 - OR**
 - Click the **Print**  toolbar button;
 - OR**
 - Press the **<Ctrl+P>** keys.
4. In the **Printer** option group:
 - Use the **Name** drop-down list to select the printer where you want to print the image.
 - Select the **Print to file** check box to output the image to a print (*.prn) file.
 - Click the **Properties** button to set the properties of your printer. The options available will vary depending on the type of printer.
5. In the **Print range** option group, leave the default selection (**All**).
3. In the **Copies** option group, select the number of copies that you want to print.
7. Click **OK** when finished to print the image(s).

Exporting Data

Pressure data can be exported from a session into either a new XSENSOR session file, into text files, or as HTML. The **Export Frame Data** window is used to select the frames, sensors, and groups for export. The frames can be exported wholly, merged to create a single average frame, or as just statistics. Select **Export** from the **File** menu to open the **Export Frame Data** window.



Selecting all sensors and groups for export across 12 frames.

Frame Selection

Select **Add Current** to add the current frame to the list. Note that it is possible to use the frame navigation buttons while this window is open to change the current frame. **Add Interval** is used to add large intervals of frames via the **Add Frame Interval** window. The **Add**



Special function is used to select frames based on special criteria. This function is covered below in the **Add Special Frames** section.

Frames can be removed from the list using the **Remove** and **Remove All** buttons.

Advanced Options

The advanced options give finer control over the data being exported. Show the advanced options with the **Advanced** button.

Use the check boxes to choose which sensors and groups to export. By default all are selected.

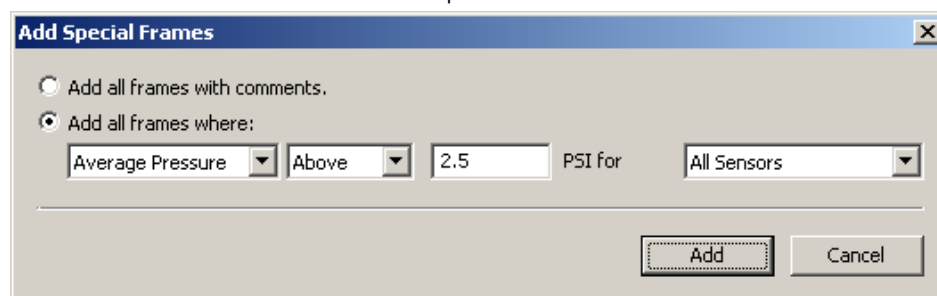
- **Export average of all frames** - All frames in the export list are merged together to create a single averaged frame.
- **Export Statistics (HTML/Text/CSV files only)** - Exports just the statistics for the selected sensors and groups.
- **Allow out of sequence frames** - Frames can be exported in an arbitrary order. Use the arrow ( / ) buttons to reorder the frames.
- **Preserve group layout** - Sensor group data is exported in the layout that it is defined. The software exports each group in an encompassing rectangle. Sensels that are not within the group are marked with an "X".

Save As...

- **XSENSOR File** - Creates a new session file. This option is disabled when Export Statistics is selected.
- **HTML** - Creates a web page with the sensor data.
- **Text** - A tab delimited file of pressure data. This can be imported into a spreadsheet for further processing.
- **CSV** - A comma delimited file format, which can be imported into spreadsheets. Please note that some spreadsheet programs mistakenly treat the comma delimiters as decimals. If this occurs, please use Text export.

Add Special Frames

Use this function to select frames that match special criteria.

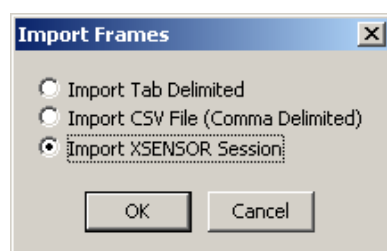


Selecting frames for export based on pressure criteria.

- **Add all frames with comments** - Adds all of the frames that have frame [comments](#).
- **Add all frames where** - Adds frames that match the statistical criteria. The drop list allows further refinement of the selection criteria by allowing selection of sensor and sensor group configurations.

Importing Data

Frames of pressure data can be imported into a session from other session files or from text based files. The **Import** feature is accessed via the **File** menu.



Import format selection.

Text Import Format

The Tab Delimited and CSV options share the same file format requirements with the only difference being the data value delimiters. The imported data is expected to be structured in rectangular blocks, with one block representing a single sensor pad.

Each frame of data is identified by a line that begins with the frame tag "FRAME:". (Note the quotes should not be included and the semi-colon is required.) Any data that falls between the first frame tag and the next is considered to be part of one frame. Within a frame, each sensor pad must be identified with the sensor tag "SENSOR:" which must also appear as the first element on a line. The individual rows of a sensor are identified with the sense tag "SENSEL:".

Here is an example of two frames of a two pad system where each sensor has three rows and three columns.

```

FRAME: 1
SENSOR: 1
SENSEL: 29.5      32.0      33.0
SENSEL: 28.0      30.0      32.5
SENSEL: 28.5      31.0      32.0
SENSOR: 2
SENSEL: 20.0      21.0      22.5
SENSEL: 19.0      19.5      20.5
SENSEL: 19.5      19.5      20.5
FRAME: 2
SENSOR: 1
SENSEL: 30.0      32.5      32.5
SENSEL: 28.5      30.5      32.0
SENSEL: 29.0      30.5      31.5
SENSOR: 2
SENSEL: 20.5      21.5      22.5
SENSEL: 20.0      20.5      20.5
SENSEL: 19.5      20.0      20.5

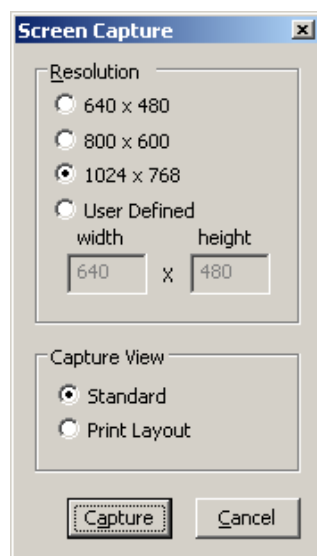
```

NOTE: If still in doubt of the required import format, try exporting a single frame of data using a text format and examine the output.

When importing pressure data from text files, the pressure units are assumed to be in the current display [pressure units](#).

Screen Capture

The easiest way to capture a screen image is to use Window's built-in screen capture function. Simply press the <Print Screen> key to capture the entire screen and paste it into a paint program, word processor, or e-mail. Alternatively the software provides a screen capture function. Select **Capture Screen** from the **File** menu.



Screen Capture setup.

Select the resolution of the captured image. The User Defined option allows images up to 10000 by 10000 pixels. Select a capture view. With the **Standard** option, the software captures whatever is currently displayed in the main session view. The **Print Layout** option uses

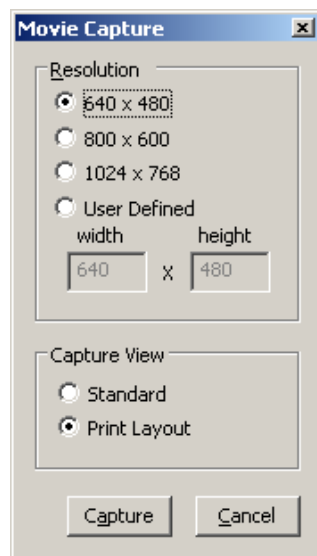
the current [Print Layout](#) settings to capture an image.

After the screen is captured, save the image as a PNG, JPG, or BMP type file. PNG offers good compression with no image distortion. JPG offers the best compression, but has lower quality. BMP performs no compression, but is the native Windows image format. Captured images are in a 24 bit RGB color format.

Movie Capture

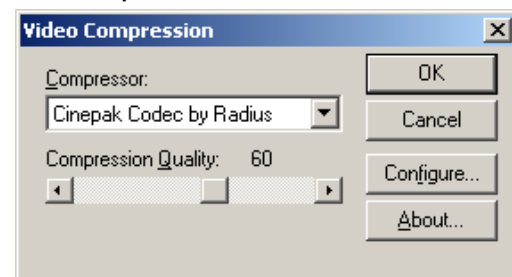
Session playback can be captured in an AVI movie format. for viewing outside the XSENSOR software.

Select **Capture Movie** from the **File** menu. Set an image resolution, and select the capture view. With the **Standard** option, the software captures whatever is currently displayed in the main session view. The **Print Layout** option uses the current [Print Layout](#) settings to capture an image. Press Capture and then specify a location and filename for the captured movie.

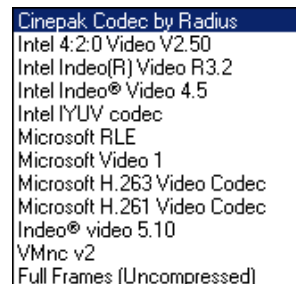


Movie Capture Setup

Video Compression



Window's Video Compression screen



Compression Options

The compression method must be selected for the resulting AVI movie. Select a compressor, and if possible, the compression quality. The list of available compressors depends on the computer and version of Windows. Experiment with different compressors to find the best compression. XSENSOR recommends "Cinepak Codec by Radius" and "Microsoft Video 1". "Full Frames" can also be selected, however, the resulting image files tend to be massive.

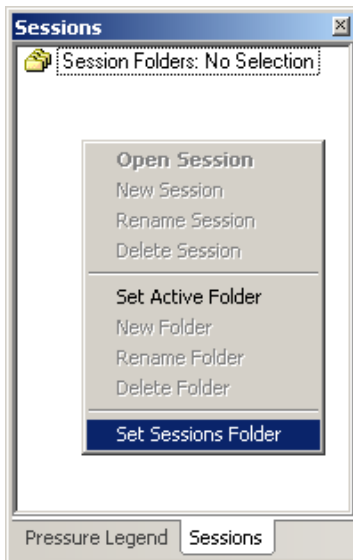
While in the Movie Capture mode, the status bar displays AVI in one of its fields.

Exit movie capture by deselecting **Capture Movie** in the **File** menu.

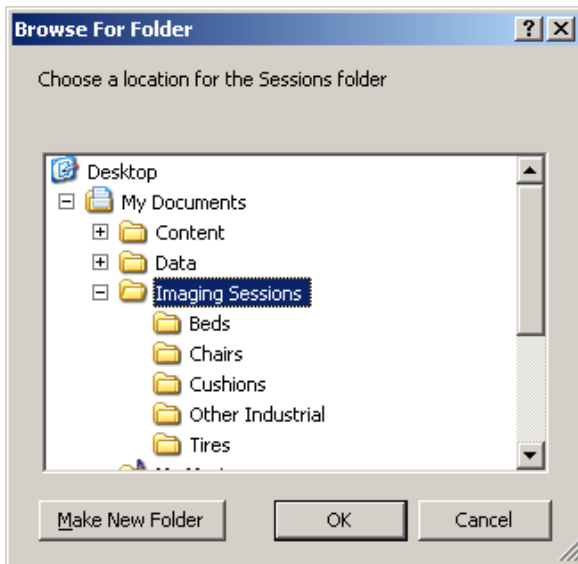
About Session Folders

The Sessions window is an easy way to organize session files. The window maps directly to a local disk folder (sorry Network folders are not currently supported) and represents a manages viewed of it.

To begin using Session Folders, open the Sessions window (by default located next to the Pressure Legend) right click with the mouse and select **Set Sessions Folder**. In the example below, an existing folder is selected, however, a new folder can be created.

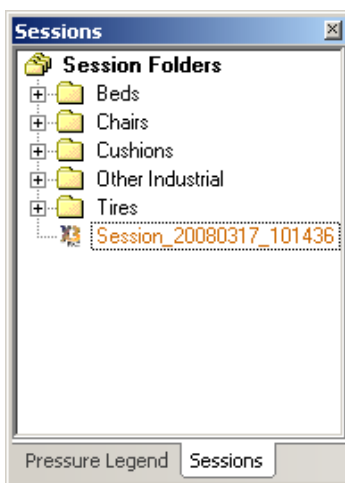


The Sessions window showing no selection.



Selecting an existing folder.

The selected folder appears in the Sessions window with the title **Session Folders** and any sub-folders are listed. Notice that **Session Folders** appears in bolded text. This bolding indicates the active folder.



The active folder is the default storage location for all new sessions. This location can be changed using by right clicking a folder in the session window and selecting **Set Active Folder**.

The Sessions window allows other folder operations such as renaming, deleting, and creating new folders.

Session Operations

Session files found in the Sessions window can be opened by either double clicking with the left mouse button, or by right clicking and selecting Open Session. The label of an opened session turns red, which indicates that the session cannot be renamed or deleted.

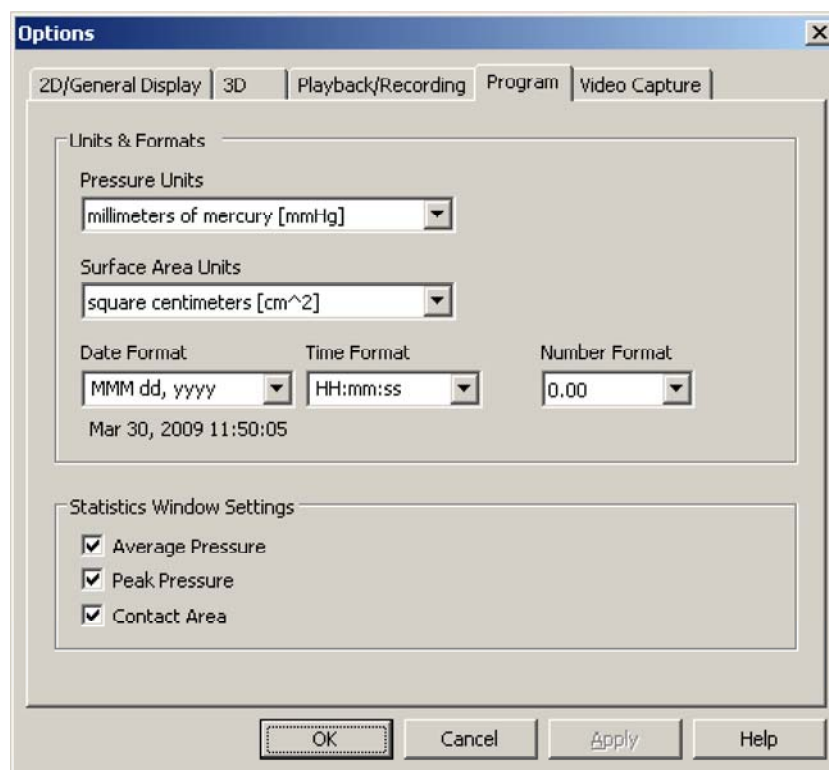
Unopened sessions can be renamed or deleted by right clicking and selecting the corresponding function from the menu.

NOTE: Deleting a session removes it from the computer and cannot be recovered.

Program options

These options are only available in the [Advanced](#) medical mode. Look [here](#) for the Basic mode options.

Use the **Program** tab in the **Options** dialog box to set pressure units and the area units used to calculate surface area, to define the format used to display numbers, and to define how pressure bars are drawn in the **Pressure Legend** window. Click the links below for more information about the option groups on this tab.



- [Units and Formats:](#)
- [Statistics Window Settings:](#)

Other Options

[Basic Medical options](#)

[Setting 2D/General Display options](#)

[Setting 3D options](#)

[Playback/Recording options](#)

[Video Capture Options](#)

Sensor Calibration

What is sensor calibration?

Sensor calibration refers to the process of translating raw electronic signals into pressure readings. Each sensor is calibrated in

manufacturing to a specified pressure range. A file containing the calibration settings is stored on the sensor. This file is copied from the sensor into a [folder](#) and is used by the XSENSOR software to perform the raw to pressure translation.

Advanced Topics

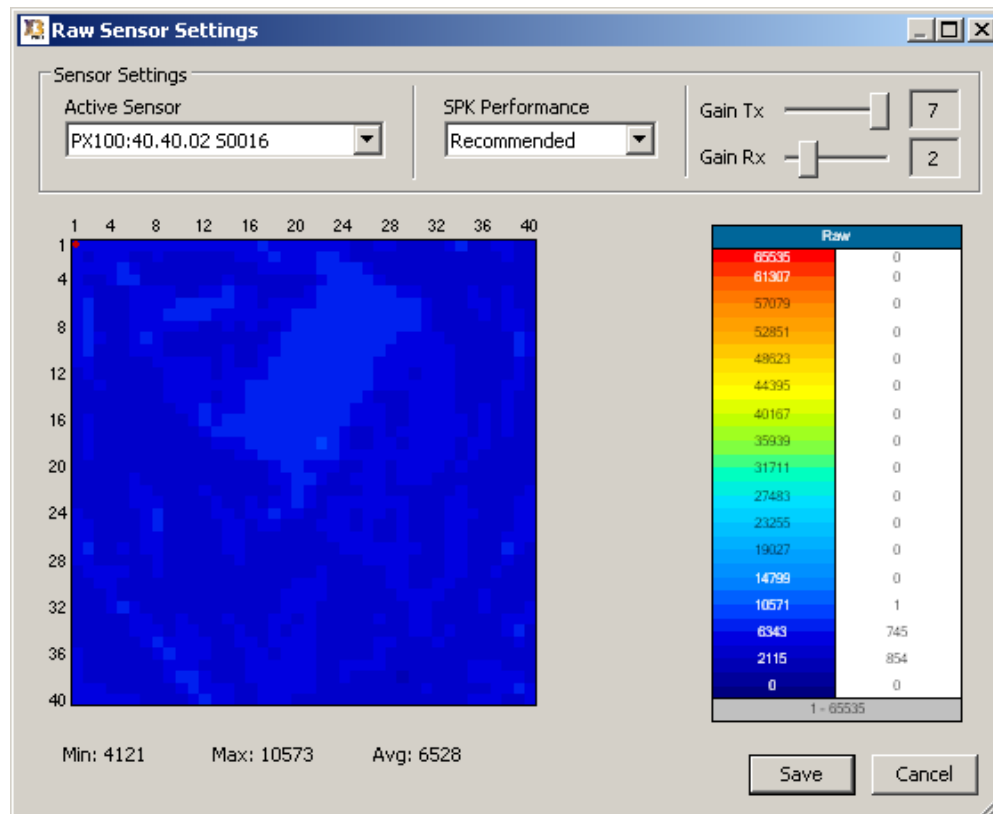
[Managing Calibration Files](#)

[Sensor Recalibration](#)

[Raw sensor settings](#)

Raw Settings

Use the **Raw Sensor Settings** window to adjust a sensor's sensitivity to pressure changes during uncalibrated recording sessions.



- Select a sensor from the **Active Sensor** drop-down list .
- The **SPK Performance** field affects the maximum possible sampling rate. The **Recommended** setting is in fact recommended. Click [here](#) for more information.
- Use the **Gain Tx** and **Gain Rx** sliders to adjust sensor signal strength. Larger gain values mean greater signal strength, and as signal strength increases, so does sensitivity to pressure changes. For best operation, adjust Gain Tx before Gain Rx, to maximize the noise resistance of a sensor.
- The procedure for adjusting the raw sensor gain settings is as follows:
 - Set the Rx and Tx gains to a value of 1, and apply the maximum load (as per the application of the sensor).
 - Next slowly increment the Tx gain levels until the peak raw value is as close as possible to the maximum while still being below it. If the peak raw value is far below the maximum and the Tx gain is at 7, then leave the Tx gain at 7 and slowly increment the Rx gain setting until the peak raw value is near, but just below the maximum.

Once this procedure is completed, the sensor pack will be in the optimum mode for raw or uncalibrated measurements.

Sensor Re-calibration

Calibrated sensors ensure optimal performance for clinical or scientific applications. After repeated use, the characteristics of a sensor may become modified as a result of subtle changes in the sensor's materials. Updating the calibration file allows the XSENSOR software to compensate for changes in the internal properties of the sensor.

Sensor re-calibration requires the XSENSOR Calibration Device. For more information please contact an authorized XSENSOR distributor.

The calibration process has two parts. The first involves selecting a sensor and a pressure range. The second is a series of steps that guide the creation of a calibration file.

Calibration setup:

- From the **Tools** menu, choose **Sensor Calibration**, and then **Calibrate a Sensor**; the **Calibration Setup** dialog box opens.
Note: A sensor cannot be calibrated while a sensor session is being recorded.
- From the **Sensor Pad** drop-down list, select the pad that you want to calibrate (if you added more than one pad to your sensor configuration, you must calibrate them one at a time).
- Select a pressure range from the **Pressure Range** drop-down list.
 - A pressure range represents the minimum and maximum pressure readings that a calibration file supports. Sensor readings that fall below the minimum pressure are interpreted as zero pressure. Sensor readings above the maximum pressure are capped at 10% above the maximum.
 - Apply one of the standard ranges that are available with XSENSOR, or create a custom pressure range. [Click here for more information.](#)
- Once a pad and pressure range are selected, click the **Calibrate** button to begin the second part of the calibration process via the **Manual Sensor Calibration** window (below).

Manual sensor calibration:

- The **Manual Sensor Calibration** dialog box has two display areas: The top area shows the step instructions and a flashing step button; the bottom area shows a live recording of the sensor.
- To calibrate the pad, follow the instructions given for each step. Pressure readings should be performed using a pressure gauge connected to the XSENSOR calibration device (as per the XSENSOR Calibration Device and User's Guide.)

The calibration steps vary depending on the type of pressure range selected (Standard or Custom), but in general, the steps consist of gain optimization, pressurization, and finally depressurization. When the final depressurization step is finished, a **Save Calibration File** dialog box opens, showing the status of the new calibration file, including whether there are any problems with the file.

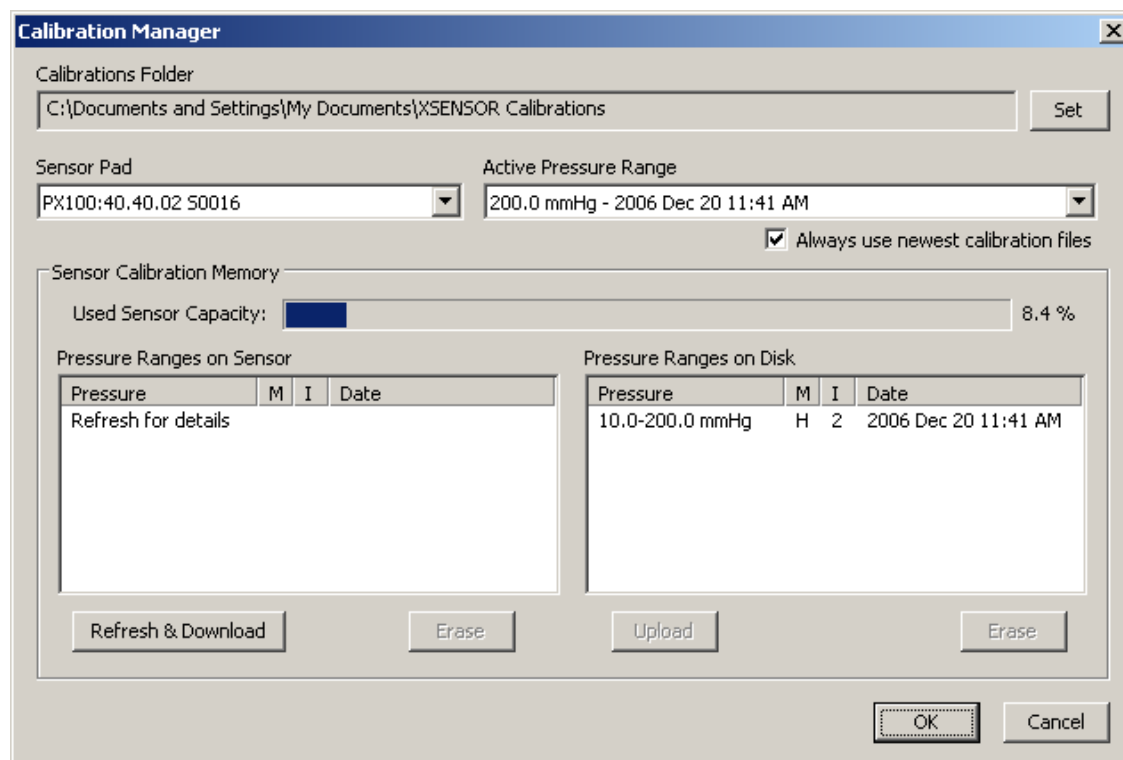
Problems might arise if the instructions were not followed properly, or if there are issues with the sensor. The dialog box also shows the location of the "Xsensor Calibrations" folder, and has a button for setting the folder. This folder must be set, and the calibration file must saved to it before the XSENSOR software can use the calibration file.

See also:

[Managing sensor pressure ranges and calibration memory](#)

Managing calibration files and sensor memory

Use the **Calibration Manager** window to change the active pressure range of a sensor, or to manage the calibration files stored on the sensor.



- [To change the pressure range of a sensor:](#)

-  [Managing Sensor Calibration Memory:](#)

About sensor groups

Sensor groups are user-defined collections of sensor cells that can span one or more sensors. Sensor groups are used to gather statistics (area and pressure) from small areas of interest, which can be graphed or [exported](#) to a text file.

Up to 32 groups can be defined via the **Sensor Groups** dialog box. Each group can be as small as one cell, or can include just over 65000 cells (enough to cover an entire 256-by-256 sensor). Sensor group layouts are internally saved in a XSENSOR session file, and can also be saved externally as a template, which can then be loaded for use with other XSENSOR sessions.

Viewing Sensor Groups

Sensor groups appear in the 2D and 3D pressure map viewing modes (2D, 2D Cross Section, and 2D Numeric) whenever the **Sensor Groups** window is open or when the **Show Sensor Groups** menu item is checked. Groups can be edited in all the 2D views, except 2D Cross-Section.

- To show or hide all sensor groups, choose **Show Sensor Groups** in the **Tools / Sensor Groups** menu.
- To show individual cells of all sensor groups, uncheck **Show Groups as Outlines** in the **Tools / Sensor Groups** menu.


See Also:

[Creating, editing and deleting sensor groups](#)









[Loading and saving sensor group templates](#)

Creating, editing and deleting sensor groups

Sensor groups are created, edited or deleted in the **Sensor Groups** dialog box, which can be opened using one of the following methods:

- Click the **Sensor Groups**  toolbar button;
OR
- From the **Groups** menu, choose **Edit Sensor Groups**;
OR
- Double-click a sensor group cell while in the 2D view.




Click the links below for more information about the various editing options:

-  [To create a new group:](#)
-  [To select one or more groups:](#)
-  [To edit group settings:](#)
-  [To add or remove cells in a selected group:](#)
-  [To move groups around a sensor:](#)
-  [To export group statistics and values:](#)
-  [To delete one or more groups:](#)
-  [To graph sensor group data:](#)

Loading and saving sensor group templates

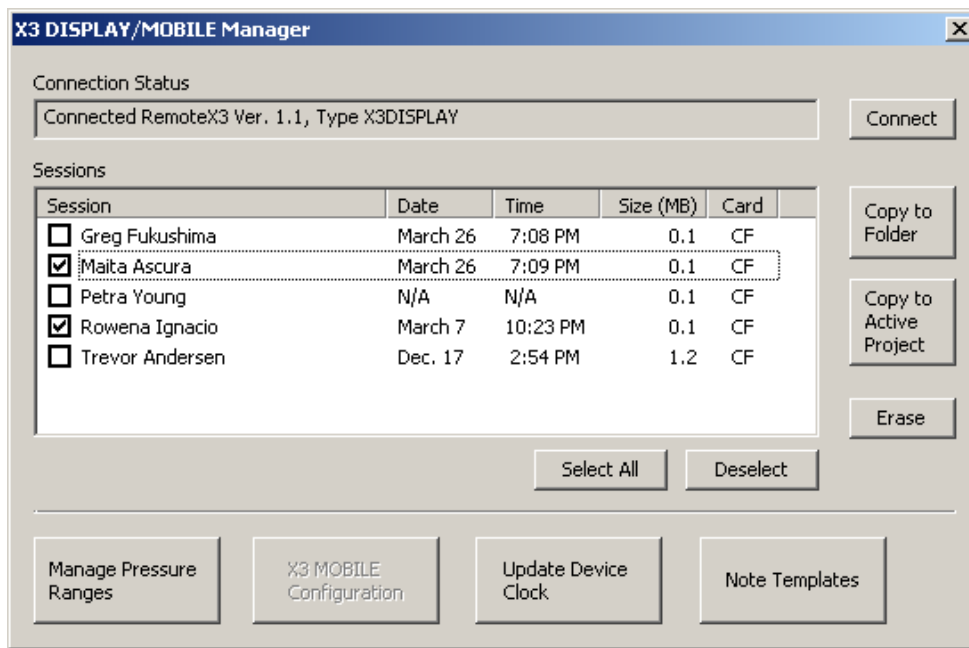
Sensor group layouts can be saved to an XSENSOR Group Template file (extension .XGT). A group template can be loaded into an existing session (replacing any current group layout), or when [creating](#) a new XSENSOR session.

Click the links below for more information about saving and loading sensor group templates.

-  [To save a sensor group template:](#)
-  [To load a sensor group template into an existing open XSENSOR session:](#)
-  [To automatically load a sensor group template for new XSENSOR sessions:](#)

Managing the X3 DISPLAY/MOBILE

Use the **X3 DISPLAY/MOBILE Manager** to manage sessions, calibration files, and note templates on the X3 DISPLAY/MOBILE. To open the **Manager** window, from the **Tools** menu, choose **X3 DISPLAY Manager**.



To connect to the X3 DISPLAY/MOBILE:

Attach the X3 DISPLAY or MOBILE to the computer via the ActiveSync/COM cable, and then click the **Connect** button. The **Sessions** list displays any session files located on the device's storage cards. (The Card field shows either CF for Compact Flash, or SD for Secure Digital).

To copy and erase sessions:

Sessions files can be copied and removed from the X3 device via the Sessions list. To perform either of these operations, select the check boxes beside the session names and do the following:

- Select the **Copy to Folder** button to copy the selected sessions into any folder on the PC.
- Select the **Copy to Active Client** button to copy the selected sessions into the active client folder.
Note: Copying session files may take several minutes, depending on the size of the files.
- Select the **Erase** button to remove sessions from the X3 device. This operation frees up memory for further recording.

To set the X3 DISPLAY/MOBILE clock:

Select **Update Device Clock** to synchronize the X3 device clock with the computer's clock. Note that only the UTC time is updated. The time zone and/or daylight savings time settings are unaffected.

To disconnect the X3 DISPLAY/MOBILE:

To disconnect from the X3 device, press the "X" in the top right corner of the **Manager** window.

To manage pressure ranges:

This is covered in detail in a separate [topic](#).

To manage Note templates:

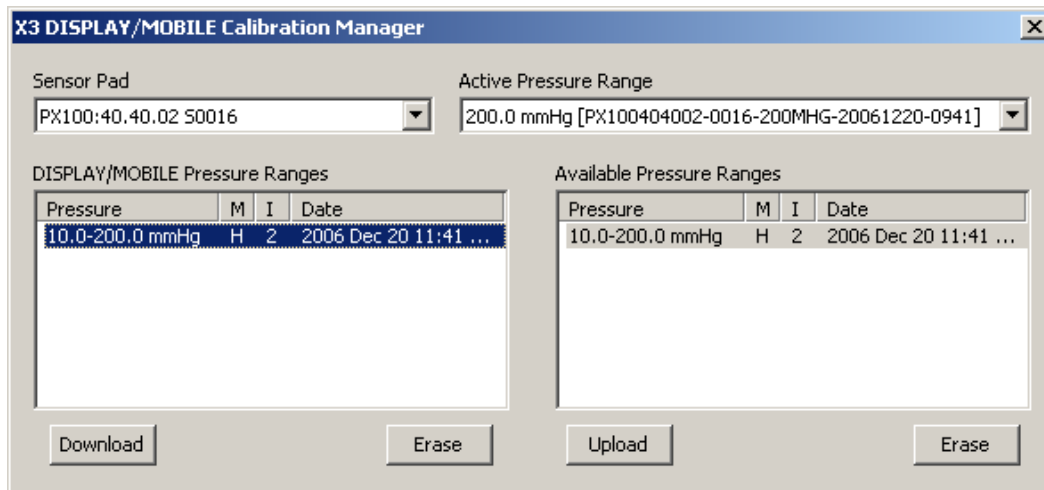
This is covered in detail in a separate [topic](#).

To manage the X3 MOBILE Configuration:

This a future release feature.

Manage X3 DISPLAY pressure ranges

Use the X3 DISPLAY Calibration Manager window to manage the calibration files and active pressure ranges for sensors used with the portable X3 devices.



The Manager window:

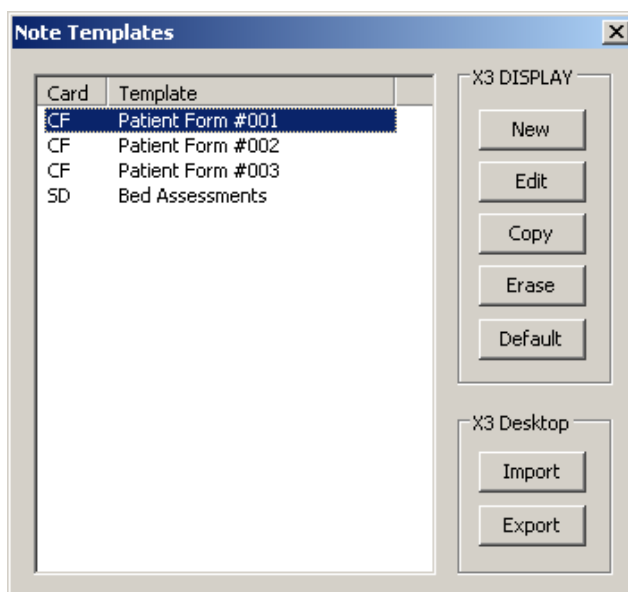
The **Sensor Pad** drop list shows all sensors that have been connected to the X3 device. The **Active Pressure Range** drop list shows all of the available pressure ranges present on the X3 device, including "Uncalibrated" for raw recordings. The pressure range shown is active, meaning a new session will use that range.

The **DISPLAY/MOBILE Pressure Ranges** list shows all of the calibration files present on the X3 device for the selected **Sensor Pad**. (This is the same as the **Active Pressure Range** drop list). The **Available Pressure Ranges** lists shows the calibration files on the computer that are available for the selected sensor.

- Select one or more (CTRL+left mouse) calibration files in the **DISPLAY/MOBILE Pressure Ranges** list and press the **Download** button to copy calibration files from the portable X3 device to the [calibration cache](#).
- Select one or more calibration files in the **DISPLAY/MOBILE Pressure Ranges** list and press the left **Erase** button to erase calibration files off the X3 device.
- Select one or more calibration files in the **Available Pressure Ranges** list to either copy them to the X3 device (via the **Upload** button) or erase them from the computer's calibration cache (via the right **Erase** button).

Manage X3 DISPLAY Note Templates

The **X3 DISPLAY** has the capability of storing notes in each session file. To facilitate the entry of notes, a file called a **note template** can be created on the desktop and saved to the X3 DISPLAY. Select the **Notes Template** from the X3 DISPLAY [Manager](#) screen.



The **Note Templates** window lists templates present on the X3 DISPLAY. Templates can be created, edited, copied and erased. To perform an action on a template, first select it from the list. The **Default** button is used to flag a template so that it is automatically loaded when a new session is created.

Templates can be copied between the desktop computer and the X3 DISPLAY. Use **Import** to copy from the desktop to the **X3 DISPLAY**, and **Export** to copy the selected template to the desktop.

The **Note Template Editor** allows entry of text based on the expected X3 DISPLAY format. Text on the X3 DISPLAY is separated into pages, each of which can contain a maximum of 1000 characters. Each template can have up to 99 pages.

A template requires a name before it can be saved. The card list shows the available storage cards on the X3 DISPLAY. Select CF for Compact Flash, or SD for Secure Digital. The CF and SD cards are only lists if present in the card slot. The storage card list is not selectable when editing an existing template.

Use **First**, **Prev** and **Next** to navigate the note pages. **Insert** and **Delete** are used to create or remove note pages. The standard Windows key combinations can be used for cut-copy-pasting text, CTRL+X, CTRL+C and CTRL+V respectively.

Customizing Toolbars and Windows

The XSENSOR desktop software features the ability to change the layout of its toolbars and docking window. Docking windows can be repositioned by selecting the window title-bar or tab (if tabbed) and dragging to a new position.

To show and hide a toolbar or docking window, open Toolbars from under the View menu and make a selection.

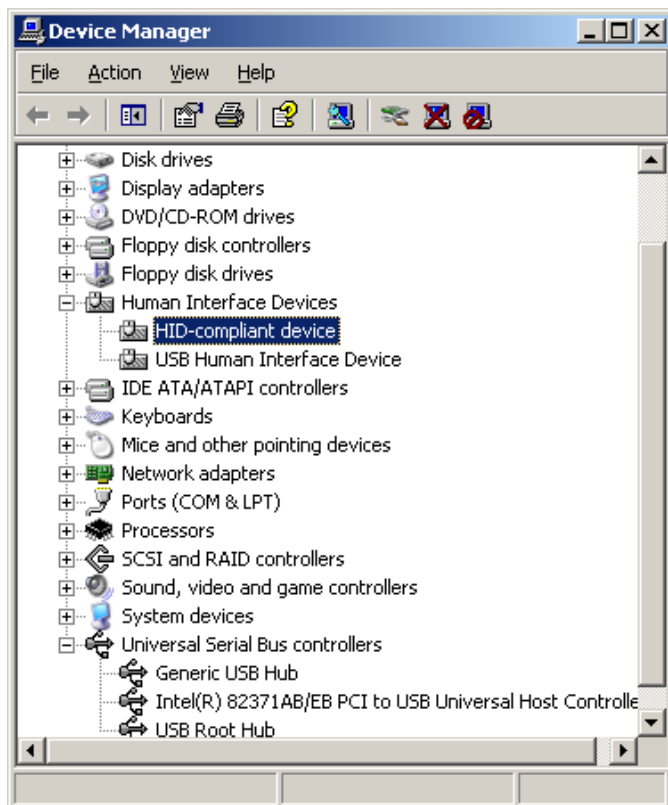
To add or remove buttons from the toolbars, select Customize from under the Toolbars / View menu.

Troubleshooting

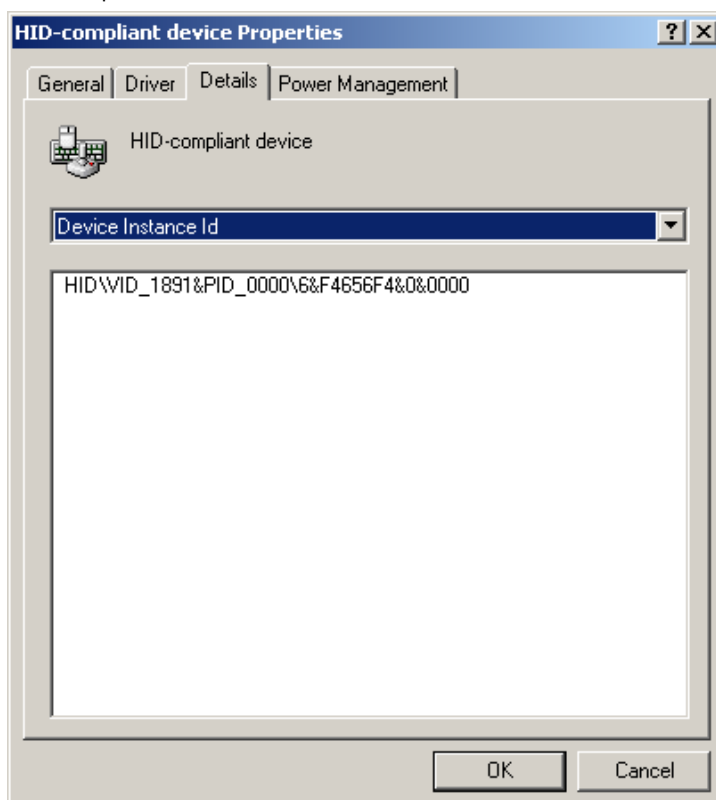
Sensor is not appearing:

1. Check physical connections. Ensure each connection has a good fit all the way to the computer.
2. Check the X3 SPK or X3 PRO SPK for a green power indicator light. If this light is not on or is amber, the SPK is not receiving sufficient power to operate.
3. Check the green power light on the X3 or X3 PRO connector hub. Ensure the hub is on (press the power button) and plugged into an outlet that has power.
4. Check the Device Manager for each SPK:

Open the Control Panel and select System. Choose the Hardware tab and press the Device Manager button. Look for an entry called **Human Interface Devices**.



For each attached SPK, there should be a "HID-compliant device" entry. To confirm the entry corresponds to an SPK, right click on it and select Properties.



Under **Device Instance ID**, the string "VID_1891&PID_0000" should appear. This indicates the device is an XSENSOR SPK.

If an entry for the SPK does not appear after a minute, recheck connections. It is possible that the USB port on the PC is overloaded due to other USB devices. Try plugging the X3 or X3 PRO hub into another USB port.

Sensor is recording very slowly:

1. Open the [New Session](#) window. Try entering a larger recording speed. If the recording speed is stuck on 1 frames per second, then


that might indicate a connection problem. A common cause for that is a missing USB 2.0 extender cable. If the XSENSOR system was shipped with a USB 2.0 extender cable, then it must be used to ensure proper operation.

2. The performance of the system can be affected by the USB components used in the computer. Laptop computers in particular use components that may not be able to operate at the speeds required by the XSENSOR sensor hardware. Please try the XSENSOR system on another computer (of different make or brand.)

If these problem persist, or your problem does not appear here, please [contact](#) XSENSOR technical support.

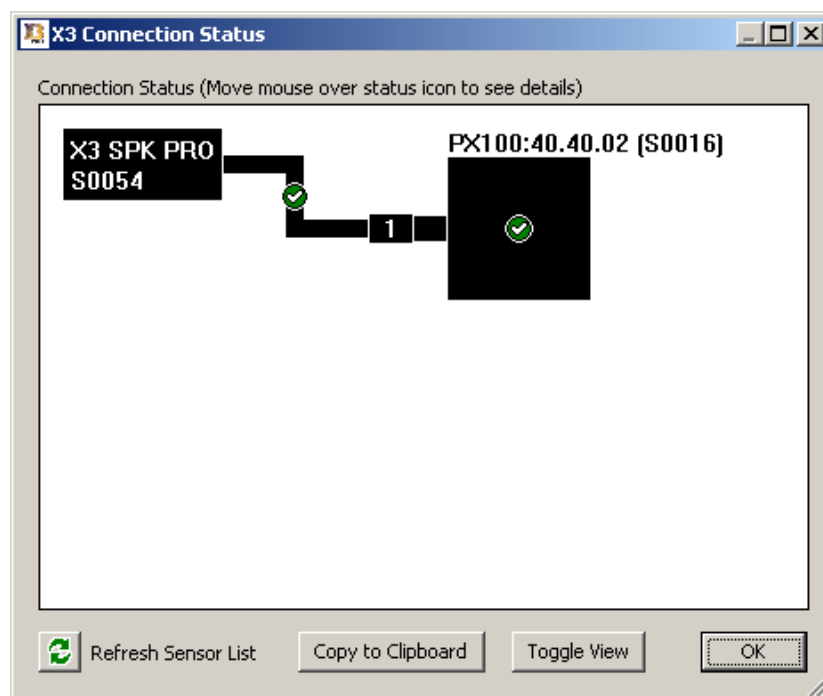
See [X3 Connection Status](#) for more diagnostic information.

X3 Connection Status

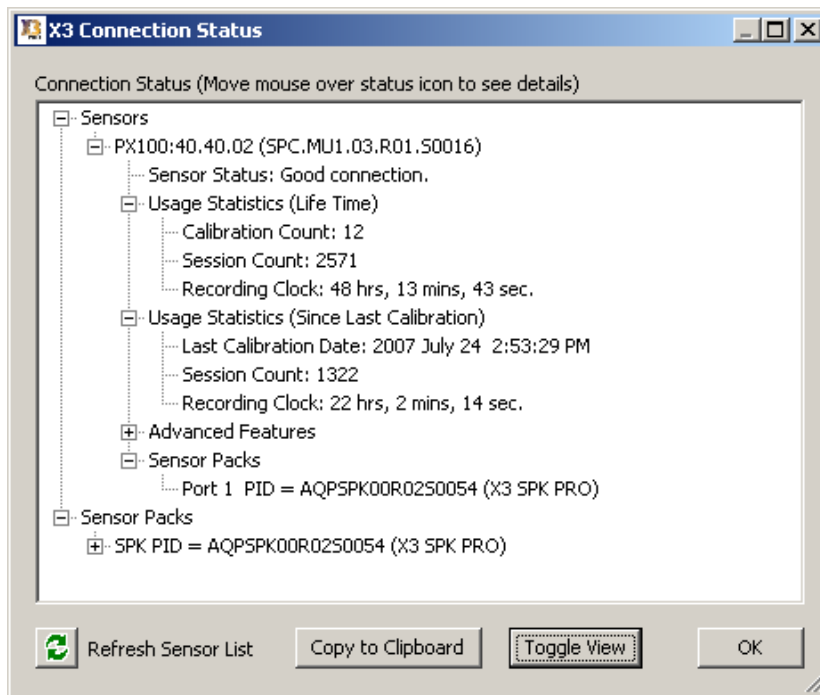
The **X3 Connection Status** window shows details about each sensor connected to the computer. The listed details vary depending on the sensors. Open this window via the **X3 Connection Status / Tools** menu or by the **Connection Status**  button.

Some common details include Usage Statistics, Advanced Features, and sensor pack firmware version information. Usage statistics show the number of recording sessions and the total recording duration for a pad. Usage statistics also show how long it has been since a pad was last calibrated. The Advanced Features and Sensor Pack Firmware details tells the XSENSOR Desktop software what features and capabilities are supported by the sensor pads.

Use **Toggle View** to toggle the view between a graphical representation of the sensors and a detailed text view. The **Refresh Sensor List** button is used to force the window to refresh its contents. Use **Copy to Clipboard** to copy the connection details to a document or e-mail.



Graphical view of the connection status.



Detailed view of the connection status.

How to reach us

Company Information

XSENSOR Technology Corporation is the leading innovator of advanced pressure imaging solutions for the patient safety, sleep, and automotive testing markets. Offering superior sensors, custom solutions and X3 technology, XSENSOR is an internationally recognized leader with customers in over 50 countries.

Contact Information

Phone:

North America: 1.403.266.6612

Toll-free (North America): 1.866.927.5222

Toll-free (International): 0011.800.5913.4444

Extension 240 for technical support.

Fax:

1.403.205.4013

Email:

support@xsensor.com

Address:

Suite 111, 319-2nd Ave SW

Calgary, AB, T2P 0C5

CANADA

Web:

www.xsensor.com