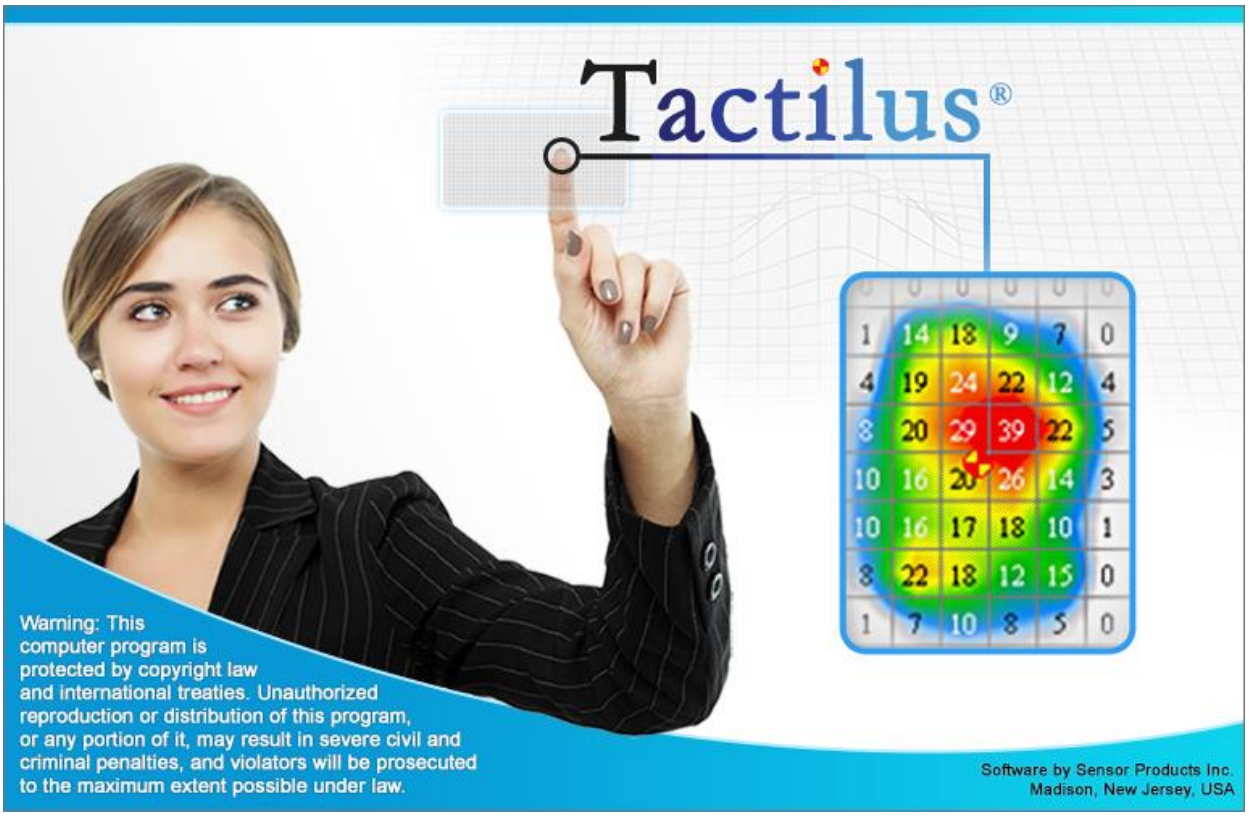
Sensor Products Inc, USA

TACTILUS® USER GUIDE

Version 9.x



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Welcome

Tactilus software is the graphical user interface for dynamically reading data from pressure sensors and displaying data on the screen while allowing a user to interpolate between measurements, plot 2D and 3D graphs, perform statistical analysis, save and export data to video and text formats.

The software is primarily designed to take data from Tactilus Sensors and display pseudocolored images with values of the pressure/temperature distribution over sensor areas. It allows a user to divide the screen into sub-divisions, hide unwanted areas, and sync the data recording with an external device or software, and provides a variety of features for data analysis and representation.

Tactilus software is versatile and highly customizable. Special enhancements can be made to the software based on customer needs. Please contact your sales representative for any requests for custom changes:

- 1+ 1.800.755.2201
- sales@sensorprod.com

Tactilus software is created by *Sensor Products Inc.* in Madison, NJ, USA. Please visit our website (http://sensorprod.com) for additional information on our company and products.

Install and Configure

Pre-requisites

Before installing Tactilus, verify that the following requirements have been met:

Item	**Minimum Requirement**
CPU	1.0 GHz or higher
OS	Windows 7 64-bit or Windows 10 64-bit
Memory	2.0GB or higher
Video	Video card 32MB memory or higher
Ports	2 available USB 2.0 ports

Installing Tactilus Software

1. Insert the Tactilus USB drive in any available USB port.
2. Using Windows Explorer, navigate to the Tactilus USB.
3. Double click on the Tactilus_setup_*versionnumber*.exe. The Tactilus Setup Wizard will appear.

Figure 1: Installation Screen 1

4. Click Next to move to the License Agreement.

Figure 2: Installation Screen 2

5. Read the license agreement and click the radio button to confirm that you accept the terms in the agreement.
6. Click Next to move to the Customer Information window.

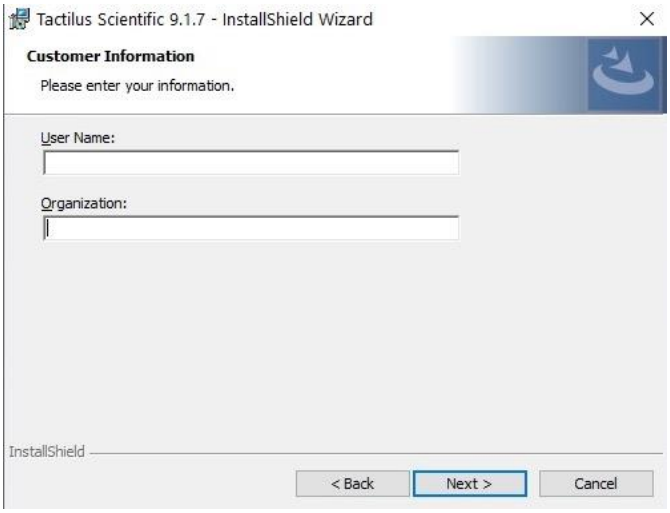


Figure 3: Installation Screen 3

7. Enter your user name and organization in the appropriate fields.
8. Click Next to move to the Setup Type window.

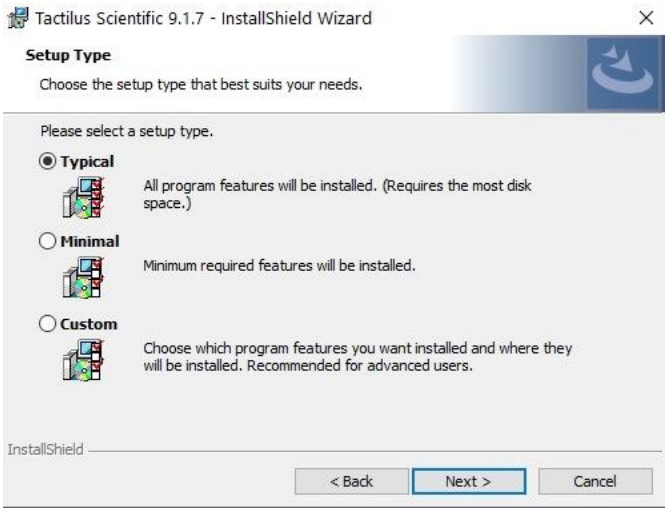


Figure 4: Installation Screen 4

9. Keep the radio button for Typical selected. This is the recommended setup type.
10. Click Next to show the window with the installation information.

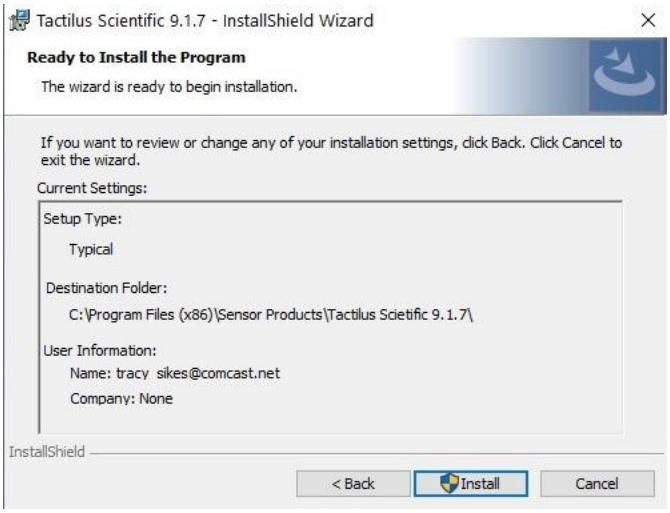


Figure 5: Installation Screen 5

11. When you're ready to start the installation, click Install. You'll see the installation progress on the next window.

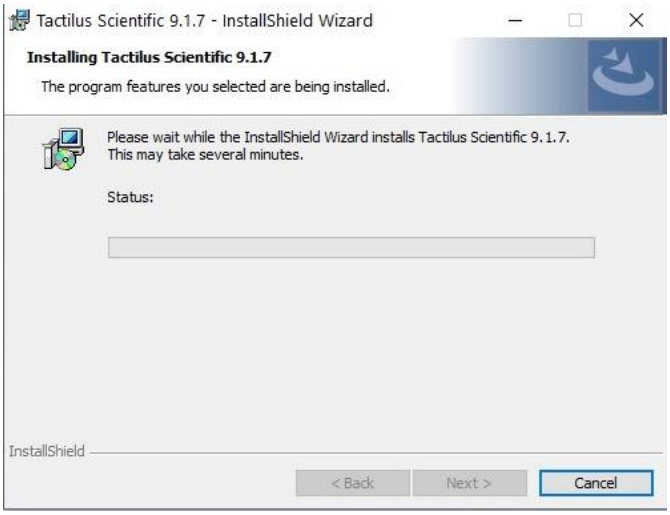


Figure 6: Installation Screen 6

12. When the installation is finished, a message appears to confirm that. Click Finish to close the window.

Figure 7: Installation Screen 7

Note: If you encounter a problem with installation, you may need to check your computer permissions and "Run as an Administrator" on the machine in question.

Updating Sensor Drivers

Note: For Windows 10, no driver installation is required.

1. Plug the USB Cable of the sensor pad into a computer.
2. For Windows 7, open Windows Device Manager by clicking the Start menu and choosing Devices and Printers.
3. Right-click on the Sensor device.
4. Select Update Driver.
5. Select the USB memory stick with your Tactilus software as the location of the updated driver. The system will find the driver you need and update it.

Note: The sensor pad drivers are located on the software USB. Should you need additional assistance, please contact support.

Note: Plug the USB cable of the sensor pad into the computer before opening the Tactilus software.

Sensor Connection

Note: Please check other connection documentation if your sensor does not use USB or Wifi connections.

USB Connection

To use the USB connection, plug the USB Cable of the sensor pad into a computer.

WiFi Connection

Note: Before first use of the Tactilus WiFi dataport, ensure that the battery has charged for a minimum of 8 hours, or until the Charging light has turned off.

Set Up the WiFi device

1. Power up the sensor through a power source.
2. On the label of the sensor, you'll see the serial number of your sensor; this number should start with BT2. Select the network with same name as on the label on the sensor.

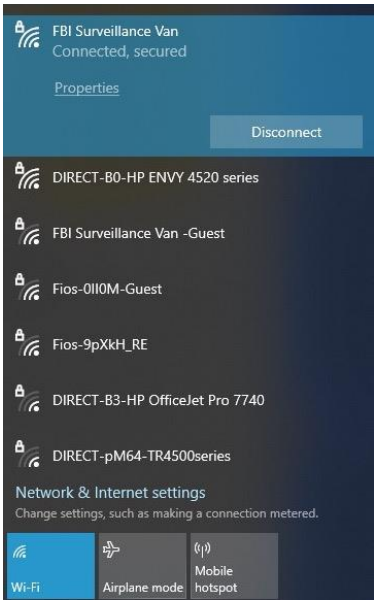


Figure 8: Wifi Network

3. Check the box for Connect Automatically.
4. Click Connect.
5. When the password box appears, enter the network password from the label.

Bluetooth Connection

1. Pair the Bluetooth sensor device with the PC.
2. On the computer, go to the Devices and Printers in the settings and find the Bluetooth sensor in the device list.
3. Right click on the device and choose Properties from the pop-up menu.
4. Click the Hardware tab and make a note of which COM port the device is assigned to. In the example below, the device is assigned to COM6.

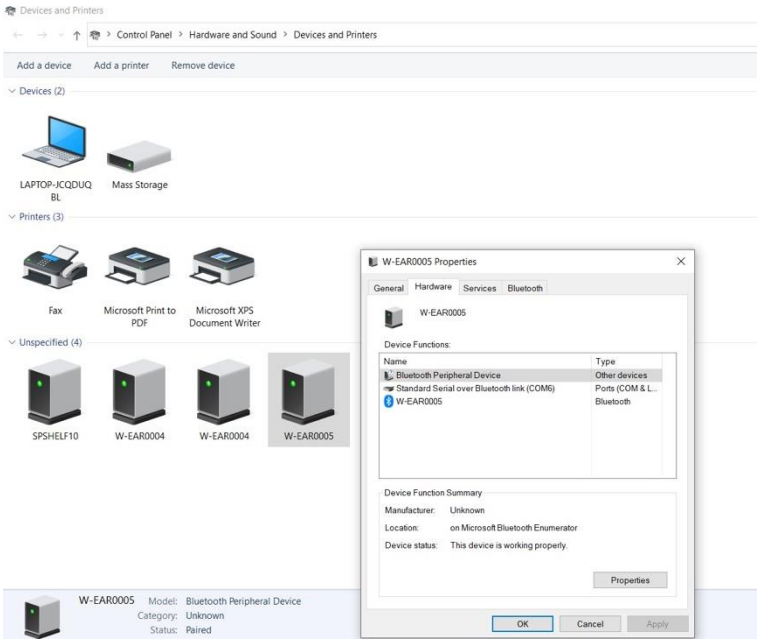


Figure 9: COM Port Information

5. Open Windows File Manager and navigate to the directory C:\Program Files (x86)\Sensor Products\Tactilus ScientificXXX.
6. Open the LSERIES.INI file.
7. Change the PORT entry to match the COM port you identified in step 4.

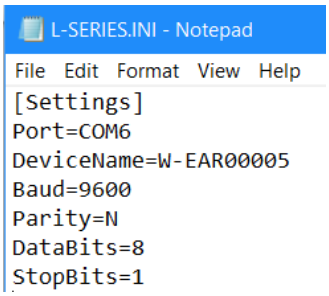


Figure 10: INI File with COM Port Change

8. Save and close the INI file.

Explore the Interface

The Tactilus interface consists of various component displays that can be customized based on user preferences. The major areas of the interface are the Menu bar, the Toolbars, the main navigation and viewing area, and the Status bar.

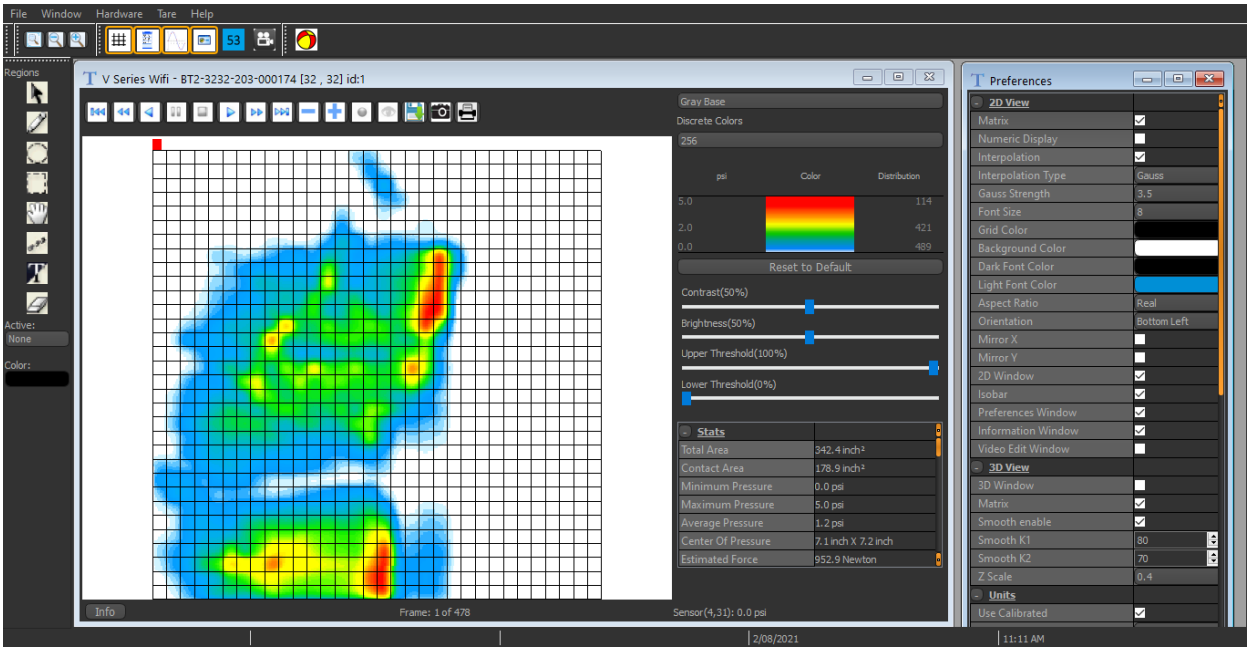
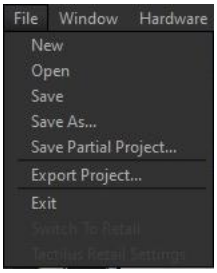


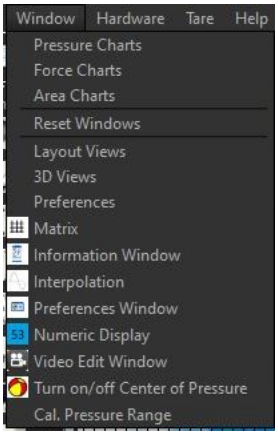
Figure 11: Home Screen

Menu Bar

- File Menu: Use to Open, Save, Export and Close Projects.

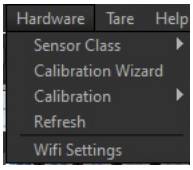


- Window Menu: Use to Toggle Viewing Panes (this can also be done using the Toolbar), or view sensor data in chart form.

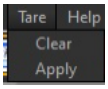


- Hardware Menu: Use to select between Sensor types and to access settings to connect the different types of sensors.

  Note: the Calibration Wizard is reserved for use by Sensor Products.



- TARE Menu: Used to define TARE settings for pressure readings



Toolbars

Tactilus includes several toolbars that can be used to navigate and set project options while the program is in use. All toolbars can be moved by selecting the vertical bar at the left of the toolbar.

Zoom Toolbar

The Zoom Toolbar allows the user to zoom in and out on an image.

Window Toolbar

The Window Toolbar is used to toggle various Tactilus option windows open and closed. The system will remember window status when closing and re-opening the program.

Refer to the Preferences section of this guide for details on settings available in each of these windows.

Navigation Toolbar

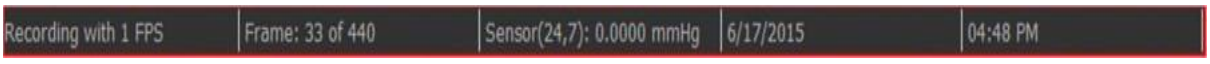
The Navigation Toolbar is used to control image viewing.

Region Toolbar:

The Region Toolbar allows you to define up to eight shaded regions on the screen. The various options can be used to select and annotate within each defined region.

Status bar

The Status Bar, located at the bottom of the screen, displays the current date and time, the current frame number, and the total number of frames in the recording. Any cell the mouse points to is identified by its row and column, and current pressure reading. While recording or playback are in progress, the frame speed (frames per second) is displayed on the left side of the status bar.



Projects

Create a New Project

Note: Ensure the sensor pad is properly connected to the computer before initiating a new project.

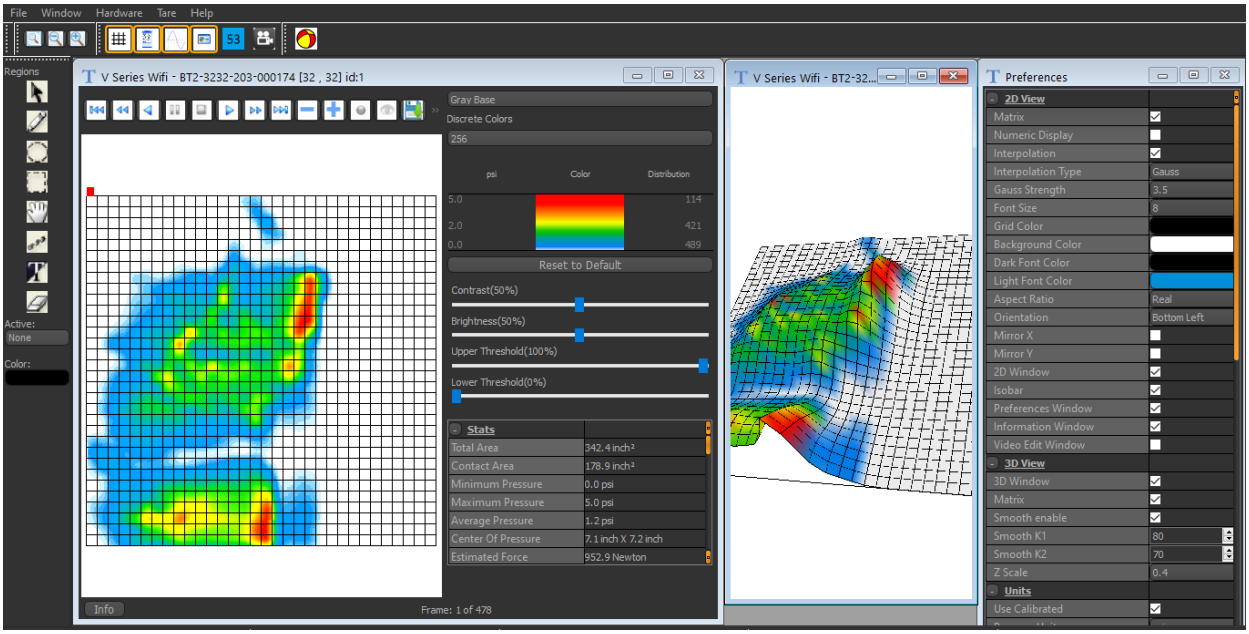


Figure 12: Project Screen

The system will default to the above screen when opening the application for the first time. Subsequent launches will retain your setting of any open task panes.

Note: The 2D and 3D matrices are toggled on, with gridlines, by default. You can use the task panes or toolbar to toggle the options on and off.

The software defaults to a New project and is ready to display data from a sensor. You can preview data without recording (it will display one frame at a time without recording) or you can record the entire session.

If you are in a current project and want to start a new one, click the File menu, then click New.

Record Mode

To record an entire session, use the Record option. If you have not already done so, you will want to set your video options first. Refer to Video Options in the Preferences section of this manual.

1. To begin a recording session, click the Record button. You will see the frame counter begin in the status bar.

2. Begin applying pressure on the sensor.
3. Click the Record button again to stop recording.

Preview Mode

If you would like to display the dynamic reading of pressure distribution without recording it, you can use Preview mode.

1. Click the Preview button. The Record button will turn grey.
2. Begin applying pressure on the sensor.
3. Click the Pause button to pause the display session to save a particular frame. You may aggregate multiple frames before saving.

   Note: Clicking the Pause button turns Preview mode off.

Taking a Snapshot

From either the preview mode or the recording mode, the user can capture a single Tactilus session frame using the Snapshot feature.

1. When the desired image appears, click on the Snapshot icon on the toolbar.
2. In the Save window, name the file then click the Save button.
3. In the options dialog that follows, set your options for the save. Options are available to specify the image size and customize image quality.

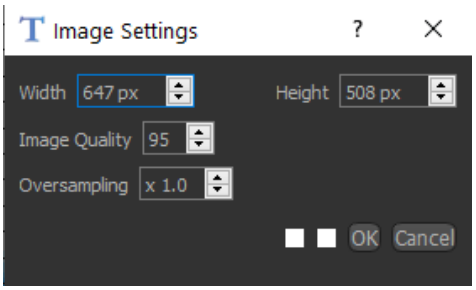


Figure 13: Image Settings

4. Click the OK button.

Save a Project

1. To save the entire session, click on the File menu then click Save.

   OR

   To save part of a project click on the File menu, then click Save Partial Project.

2. In the dialog box, name the project, then click the Save button. The software will save the session in .tct format.

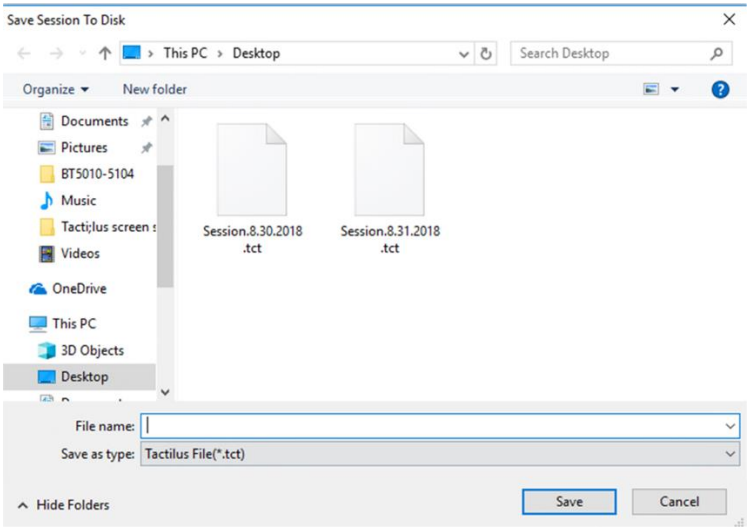


Figure 14: Save Session

3. In the options dialog that follows, set your options for the save.

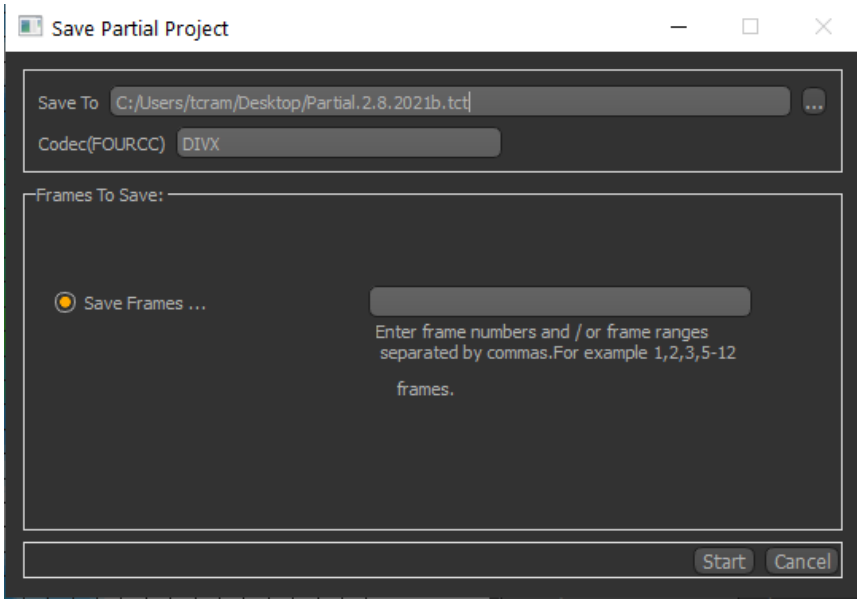


Figure 15: Save Options

The Save Options are:

- Save To: allows you to select where to save the file.
- Save Frames: allows you to enter specific frames to save.

4. Once you have set your options, click the Start button. The system will save the project then display a confirmation dialog box.
5. Click the OK button.

Auto Backup

Auto backup will save your data at specified intervals in a unique file name. If the software should stop functioning, you will not lose all of the information. The selected settings are also saved in the backup file, so when you restart the software, it will start recording with the previously saved configuration.

To use auto backup:

1. Create a temp directory on the main drive of the computer where Tactilus is installed. The path to this directory should be: C:\\temp (where C is the name of the hard drive).
2. In the Project Backup section of the Preferences, check the Active box.

3. Select your backup interval in seconds. The recommended interval is 360 seconds (6 minutes).

   NOTE: The backup files can accumulate very quickly in the temp directory you created so you'll need to go into that directory and manually delete files regularly. Keep this in mind when you are choosing the interval for the backup. When you delete backup files, remember to keep the most recent backup file!

Close a Project

To close the current project, click on the File menu, then click Close.

To close the current project and start a new session, click on File and then New.

Open a Project

1. Click on the File menu, then click Open.
2. Navigate to the Project file you wish to work with.
3. Click on the Project file to select it.
4. Click the Open button.

Working With Regions

The system allows you to define up to eight different regions for each project. Regions can be used to annotate varying areas of a project for further investigation.

Create a Region

1. Create a new Project or open a previously saved Tactilus session.
2. Using the Region toolbar, click on the Active Region drop-down menu to select the region to define.

Figure 16: Regions Toolbar

3. Use the icons on the Regions toolbar to define the shape for region selection (line, ellipse or rectangle), or use the pen tool to draw a freeform region. Once the tool is selected, click and drag in the matrix area to define the region.

Figure 17: Select Region Icons

4. Once a region is defined, an Information pane with region statistics will automatically open. In the image below, you can see where multiple regions have been defined using the ellipsis (green, orange) and rectangle (pink). Use the + signs next to each region name to view

statistics about that region.

5. Use the Hand tool to relocate a defined region.

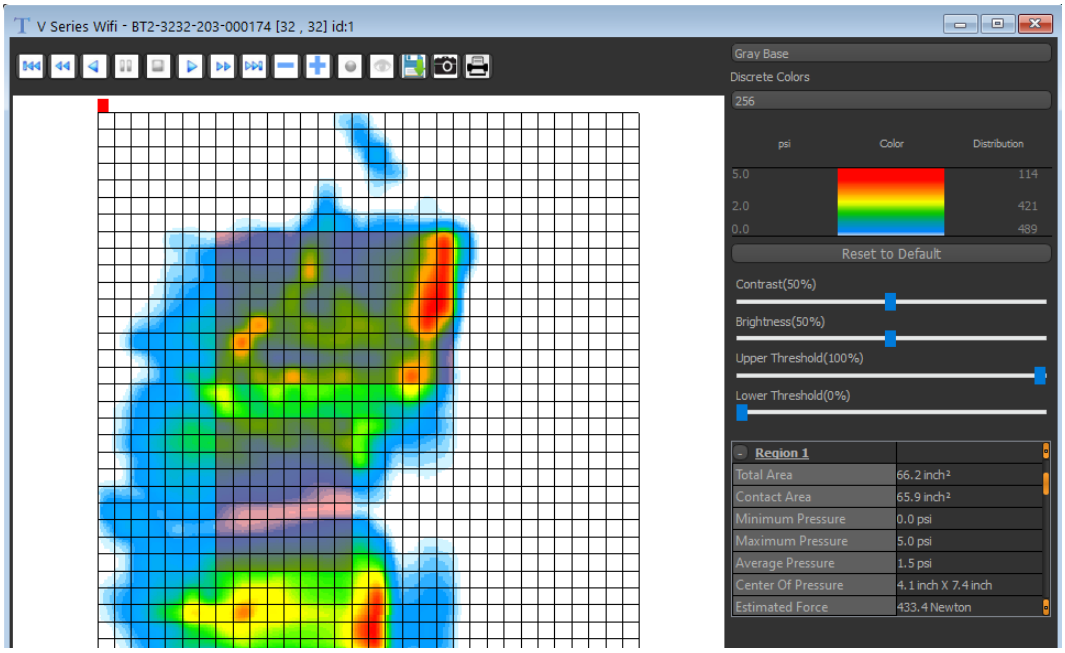


Figure 18: Regions of Interest

Export Region Data

To export region data:

1. Click on File, then select Export Project.
2. Select the option to Export Region of Interest.

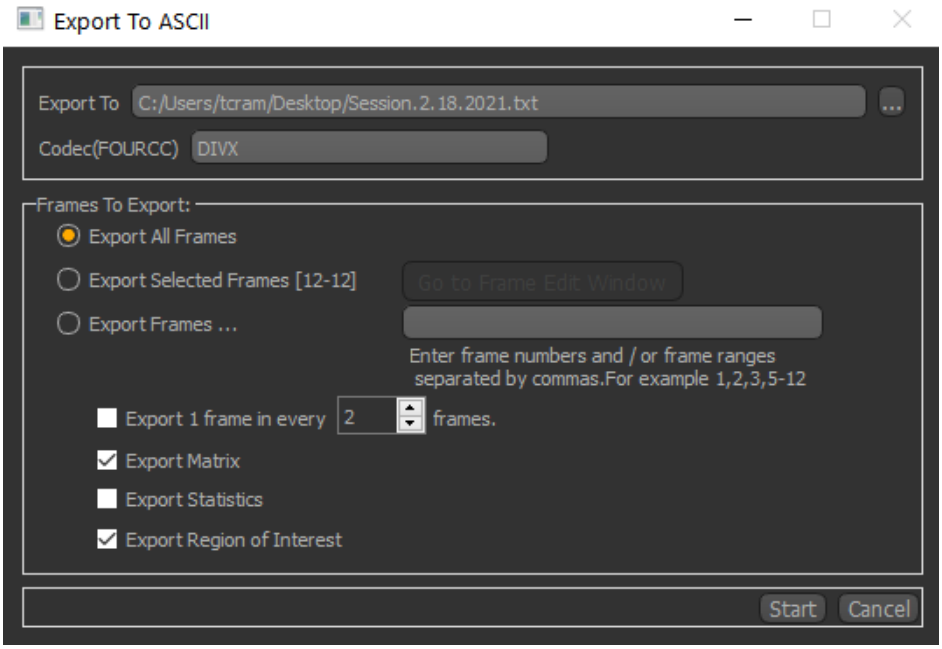


Figure 19: Export Region of Interest

3. Click Start button. For additional information refer to Exporting Data.

Adding a Background Image

You can add a background image to the pressure display. This is generally used to show how pressure is distributed on an object, such as a piece of furniture.

To add a background image:

1. Click the Background Image button on the toolbar. A dialog box opens for you to select the image you want.
2. Navigate to the desired file, click on it and click the Open button. The background image is added to the display.

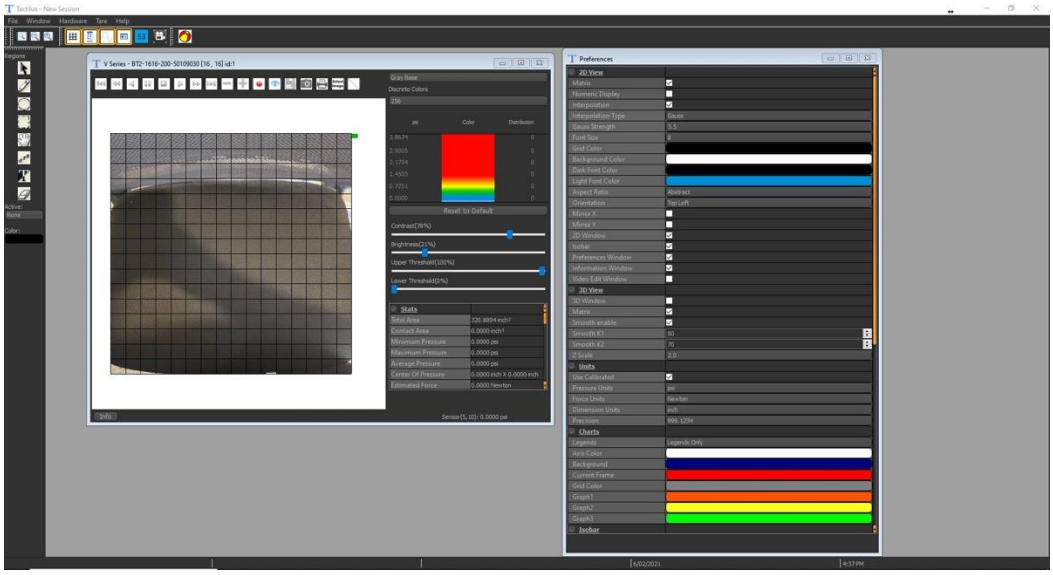


Figure 20: Background Image

Line Scan

The Line Scan feature allows you to draw a line on the image to have an XY graph appear with pressure values plotted across the line.

To use the Line Scan feature:

1. Click the Line Scan button on the toolbar. The Line Scan window opens.

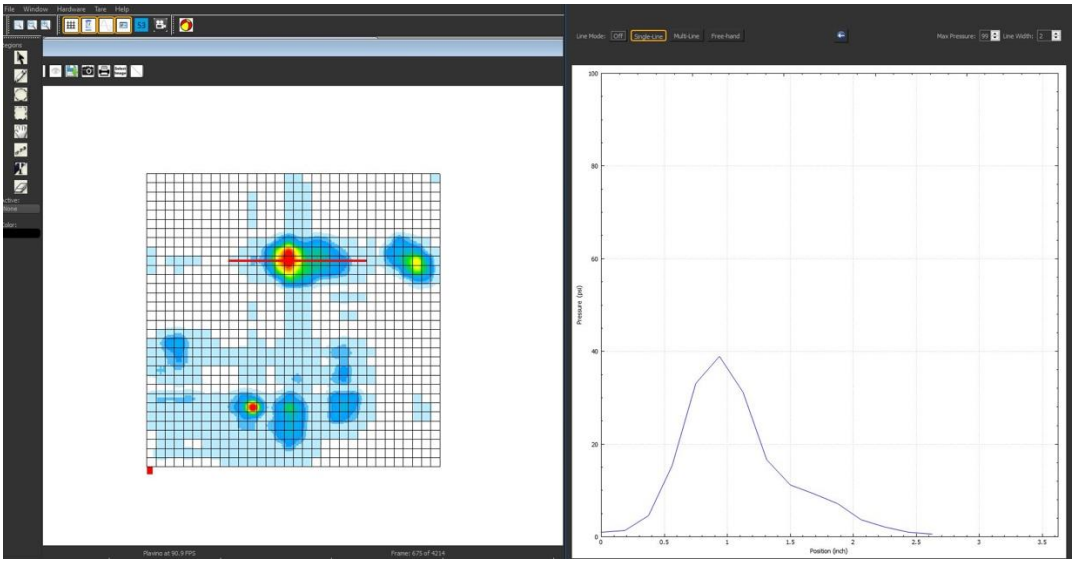


Figure 21: Line Scan

2. Choose the type of line you'd like. Your options are: Single-Line, Multi-Line and Free-

Hand.

3. To create the line:
   - Single-Line – click at the location where you want the line to begin and then click at the location where you want the line to end.
   - Multi-Line – click at the location where you want the line to begin, click again to create another point at the next location, continue clicking at other points until you've created all of the lines you want.
   - Free-Hand – press the shift key and drag the mouse arrow around the scan image. You do not need to click the mouse button.

   After you've drawn the line(s), the pressure along the line is displayed in the Line Scan window.
4. To move a line, click and drag it to another area.
5. To remove the last line you create, click the back arrow button in the Line Scan window.
6. To change the maximum pressure shown, change the setting for the Max Pressure option in the Line Scan window.
7. To change the line width, change the setting for the Line Width option in the Line Scan window.

Working with Video

Recorded frames can be used to create a video file in standard .avi formats. Resulting videos may be viewed using Windows Media Player or uploaded to any internet application that supports uploaded .avi video.

Create a Video

Create a new Project or open a previously saved Tactilus session.

The Video Edit Window displays a frame-by-frame read-out of pressure measurements as the video is played. Click on Window then Video Edit Window or the Video Edit window icon to open the video editing window. Resize the window as desired.

Use the Navigation toolbar to manipulate the file. The file can be replayed as many times as needed to find desired frames. As the file plays you can view the pressure readings in the 2D and 3D matrix windows.

While the file is playing, decide which portions will be saved or deleted. You can make a video with a certain range of frames, skipping certain number of frames, or with selective numbers of frames.

Various video editing tools can be used to edit the video to create the video for the project. You may need to make use of different video editing tools depending on the needs of the project

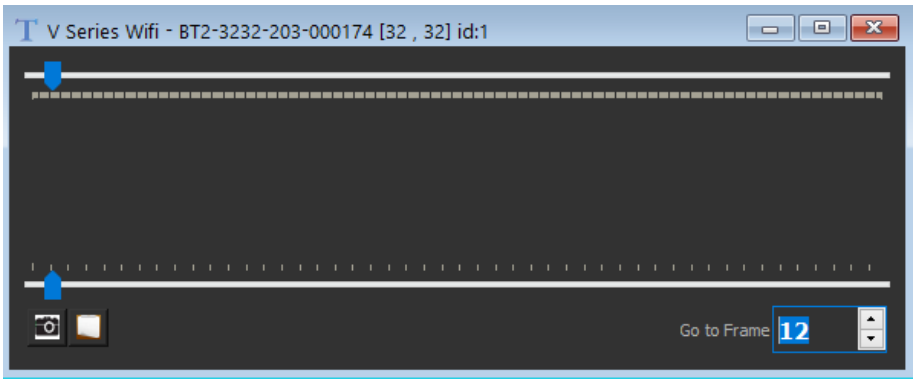


Figure 22: Video Window

- Frame Locator Sliders: Click and drag the arrows at the top and bottom of the video edit screen to select a range of frames to include in the video.
- Go to Frame function: use to locate a specific frame

Click File, then Save As to save the edited video copy while retaining the original file.

Click the Export Video button to save the modified video in .avi format. Enter the filename in the Save dialog box, click OK, select save options, then click OK on the confirmation screen.

Exporting Data

Selected portions or entire sessions can be exported to a tab-delimited ASCII text file for post-processing using various external data analysis applications, such as MATLAB, Mathmatica or Origin.

To export session data, click on File, then select Export Project.

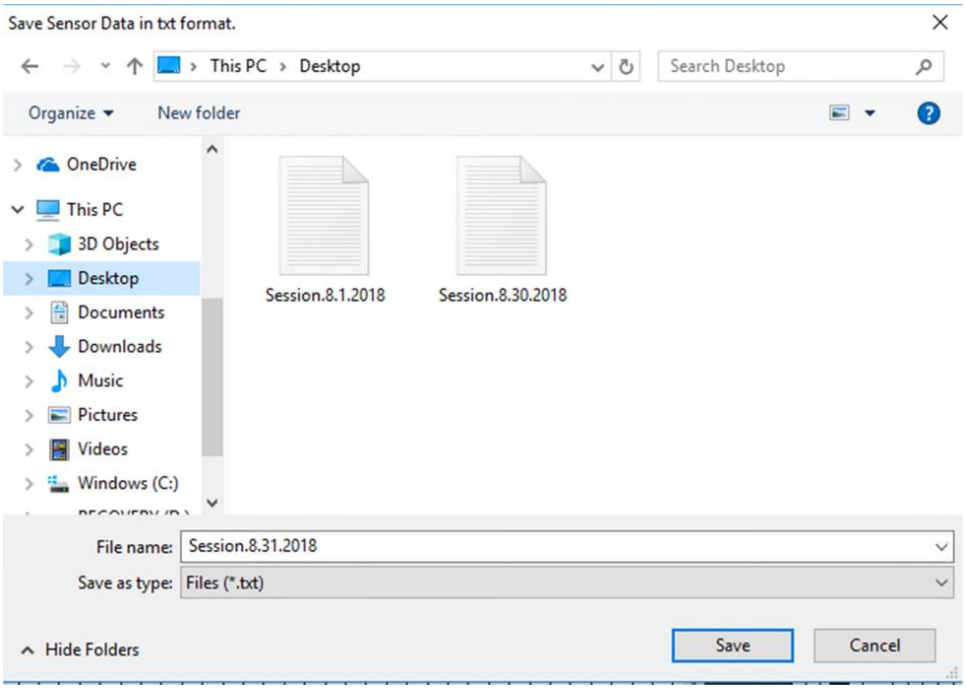


Figure 23: Save Window

In the Save screen, name the file, then click Save. Note: the default export filetype is .txt and cannot be changed.

In the options dialog that follows, set your options for the save. The system defaults to Export All Frames.

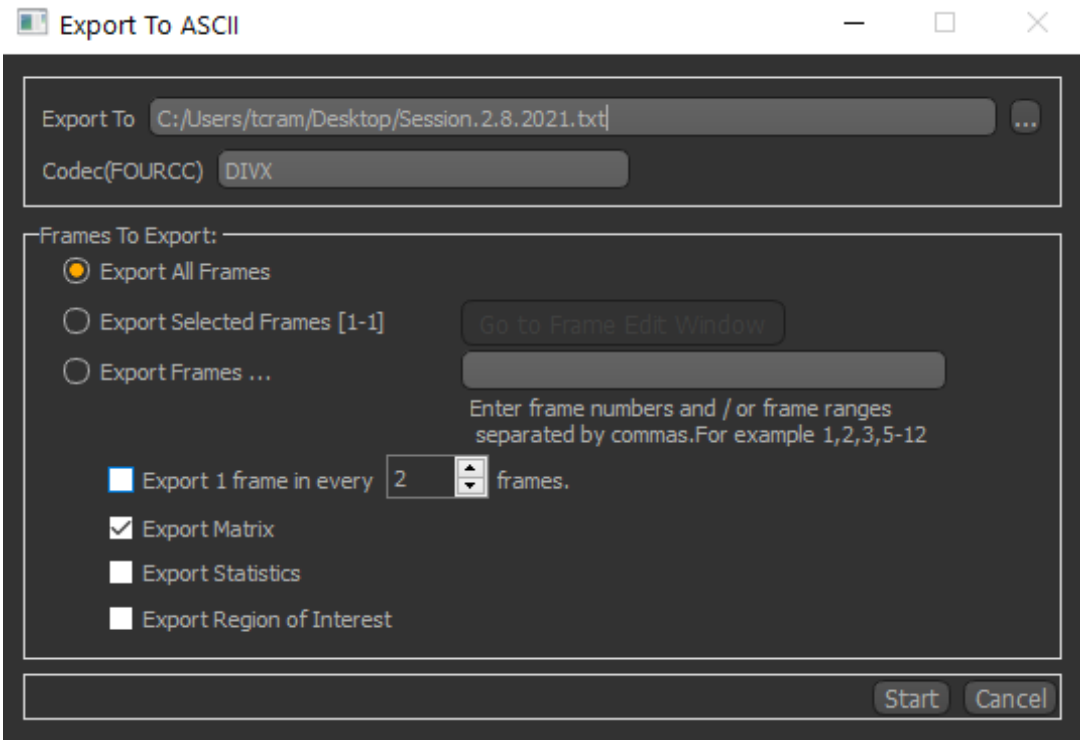


Figure 24: Export Options

- Export All Frames – includes all frames in the export file.
- Export Selected Frames – allows you to select specific frames to export.
- Export Frames -- allows you to define the specific frames to include in the export.
- Selecting the Export Matrix option will include the 2D information from the session.
- Selecting the Export Statistics option will include the information from the session Information task pane.
- Selecting the Region of Interest option will include any defined and annotated regions.

Note: You must select either Export Matrix, Export Statistics, or both to avoid creating an empty file.

Once you have set your options, click Start. The system will save the project then display a progress dialog box while the ASCII text file is being generated.

Figure 25: Export in Progress

Export - Notepad

File Edit Format View Help

```
FRAME      1 (RAW)
Thu Jul 16 14:07:58 2015
    21    21    22    24    25    24    25    25    26    24    37    74   119   105   145
    22    26    48    44    43    37    39    39    37    33    54    68   104   153   236
    24    44    80    79    91    66    66    66    63    61    92    95   107   168   243
    27    50    67    98    97    70    52    50    48    47   128   149   160   170   224
    37    75   101   174   172    97    73    72    71    66   140   135   183   198   224
    49   100   274   212   157   257   157    96    74    74   101   148   176   175   221
    59   122   373   204   157   197   199   154    88   124   118   173   201   451   289
    93   427   278   267   209   353   183   213   200   117   225   206   288   316   238
    67   228   376   341   257   372   499   182   162   122   334   489   415   256   314
    74   247   288   484   203   311   281   907   154   219   136   210   420   687   294
    59   149   216   550   384   284   358   334   819   293   128   155   173   219   538
    70   146   238   449   568   464   424   389   262   584   152   168   224   235   190
    74   139   194   229   509   590   415   282   198   275   800   133   215   227   140
    70   106   184   268   298   485   501   287   260   125   603   774   150   204   124
    38   106   149   270   269   286   543   246   246   175   350   312   797   126   102
    32   105   129   261   194   210   301   378   130   148   189   194   282   682   100
    27    81    66   157   165   185   151   266   426    57    57   139    65   234   266
    23    38    45   111   114   228   149    85   128    65    36    50    40    45    45
    21    27    26    28    30    35    36    36    34    29    27    28    28    27    28
    20    24    23    23    24    26    26    26    26    23    22    23    23    23    22
    20    23    21    22    22    23    23    23    22    21    21    21    21    21    21
    20    21    21    21    20    21    21    22    21    21    21    20    20    20    21
    20    20    21    21    20    21    21    21    21    20    20    20    21    20    20
    20    21    20    20    20    21    21    21    21    21    20    20    20    20    20
    20    20    20    21    20    20    20    21    21    20    20    21    21    21    20
    20    20    20    20    20    21    20    21    20    20    21    20    20    20    21
    20    19    20    20    20    20    20    20    20    21    20    20    20    20    20
    20    20    20    20    20    20    20    21    20    21    20    20    20    20    20
    20    20    20    21    20    21    20    20    20    20    20    20    20    20    20
    20    20    21    20    19    20    20    22    20    21    20    20    20    19    20
    20    20    19    19    20    20    19    21    20    20    19    20    20    19    20
    20    21    20    20    20    20    20    21    20    21    20    20    21    20    20

Maximum pressure              3.324    PSI
Minimum pressure              0.070    PSI
Average pressure              0.317    PSI
Center of Mass(x)            31.119    cm
Center of Mass(y)            28.113    cm
Contact Area               2321.169    cm²
```

Figure 26: Exported File

Charts

Charts can be used to create a graphical representation of project data.

Use the Preferences window to set Chart display options for colors and Axis label options:

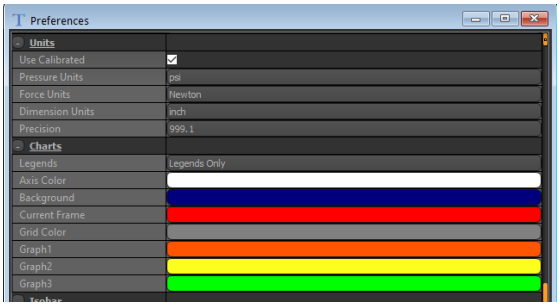


Figure 27: Color Options

From the Window Menu, select one of the three chart types: Pressure, Force or Area. Use the scroll bar at the bottom of the chart to navigate to the desired frame.

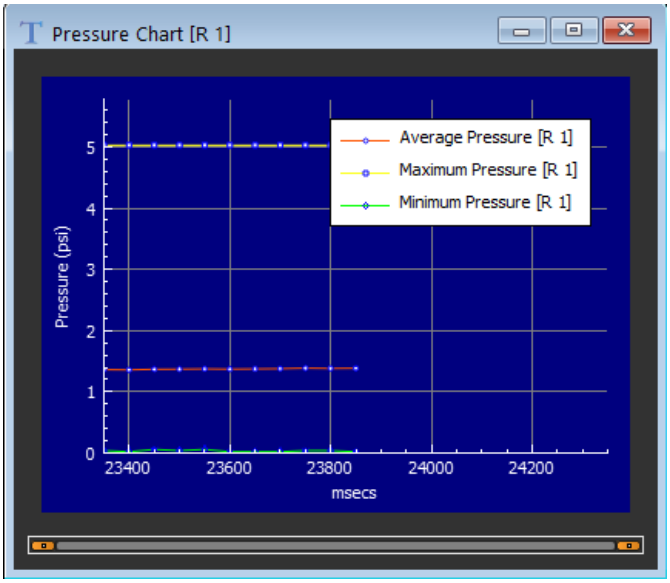


Figure 28: Pressure Chart

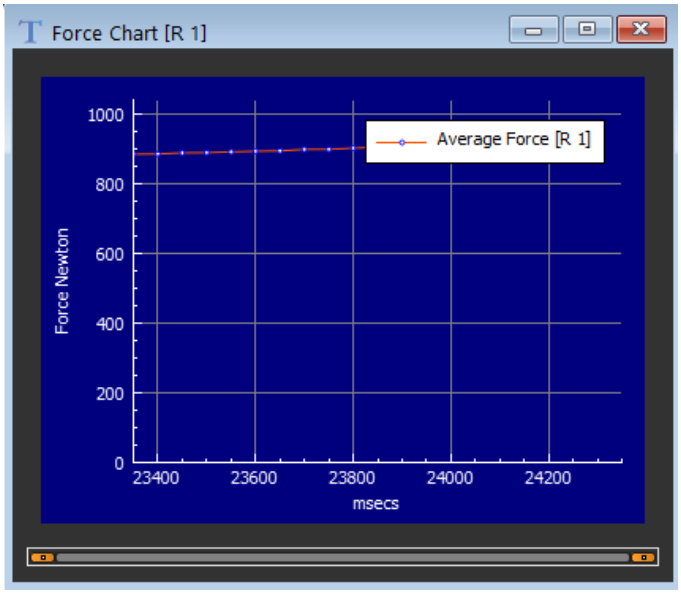


Figure 29: Force Chart

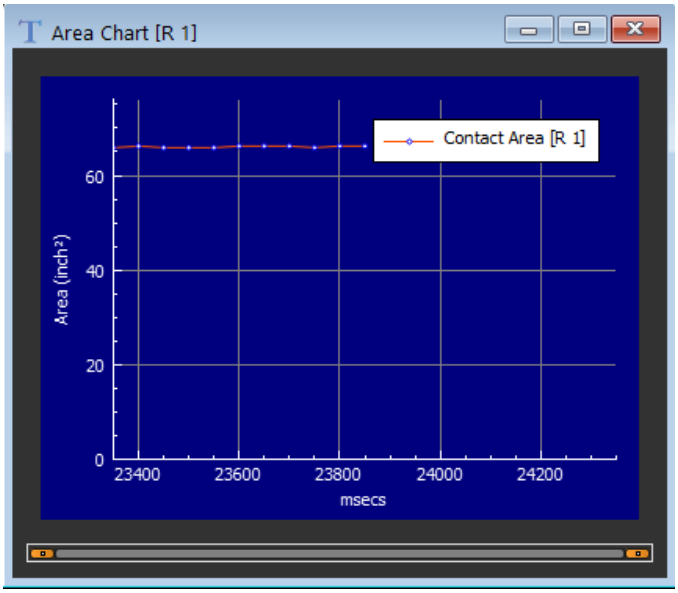


Figure 30: Area Chart

Preferences

Tactilus offers detailed control of pressure measurement analysis and its visual presentation. Use the icons in the *Window Toolbar* to toggle the various function windows to set measurement options. Clicking on the Minus sign (-) in the upper right corner of the window will keep the window open but minimized.

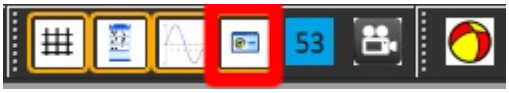


Figure 31: Preferences Button on Toolbar

Preferences Window

The Preferences window provides the user with the ability to change background colors, color compression, units, scaling, and data interpolation. Each property can be changed by clicking on it in the Preferences window and either toggling that feature on/off or selecting from a pull-down menu. These functions allow Tactilus to be customized for each user and each for project. When any feature is selected, a prompt appears at the bottom of the Preferences window explaining its function.

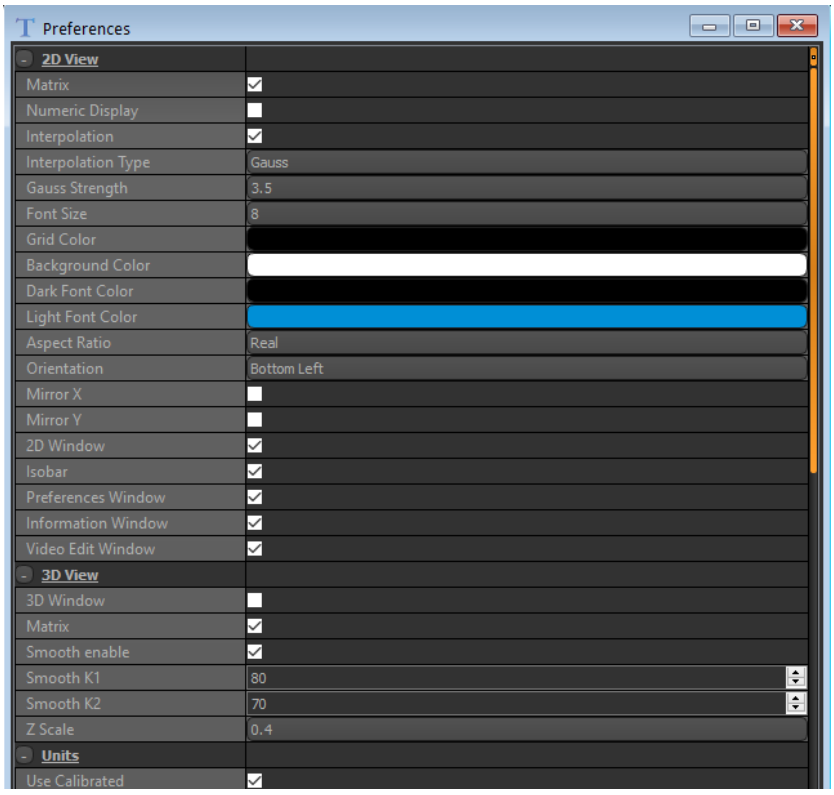


Figure 32: Preferences Window

2D View Options

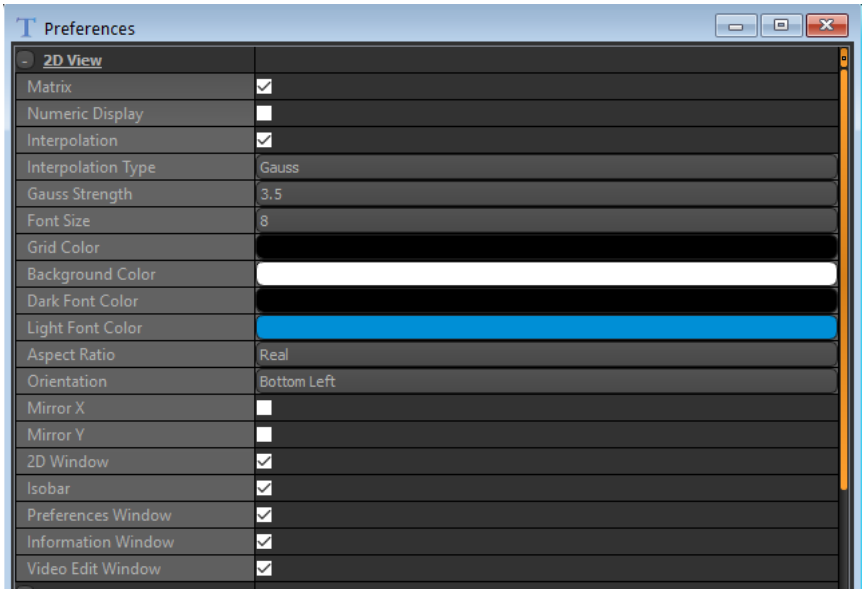


Figure 33: Preferences Window – 2D

Use the checkboxes in the 2D View option window to toggle on/off: display for matrix lines, pressure numeric display and interpolation as well as other option windows (Isobar, Preferences, Information, Video Edit and WiFi.

Click in the box to set any of the additional 2D View options:

- Interpolation Type: Coarse, Linear, Linear HD, Cubic, Gauss, Smart Gauss, Low Pass
- Gauss Strength
- Font Size
- Colors: Grid Color, Background Color, Dark Font Color, Light Font Color
- Aspect Ratio: Control ratio of the width of the picture on the screen to its height
- Orientation: Top Left, Top Right, Bottom Right, Bottom Left

3D View Options

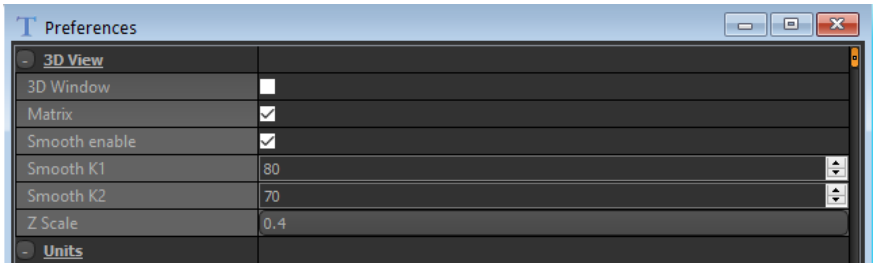


Figure 34: Preferences Window – 3D

- 3D Window
- Matrix
- Smooth enable
- Smooth K1
- Smooth K2
- Z Scale

Note: There is no toolbar icon to toggle the 3D Window. The 3D window can only be toggled on and off using the 3D View option in the Preferences Window.

Unit Options

Figure 35: Preferences Window -- Units

Using the lookup(s) you can select the following options:

- Use Calibrated
- Pressure Units: mmHg, atm, psi, bar, Pa, mmH_2O, kPa, N/cm^2, MPa, kg/cm^2
- Force Units
- Dimension Units: cm or inch
- Precision: Specify number of decimals used in pressure measurement

Interpolation

Interpolation smooths the visual presentation of the pressure data being collected.

When Interpolation is toggled off the image appears in a grid-like form. Differences in pressure are represented by distinct sections of color.

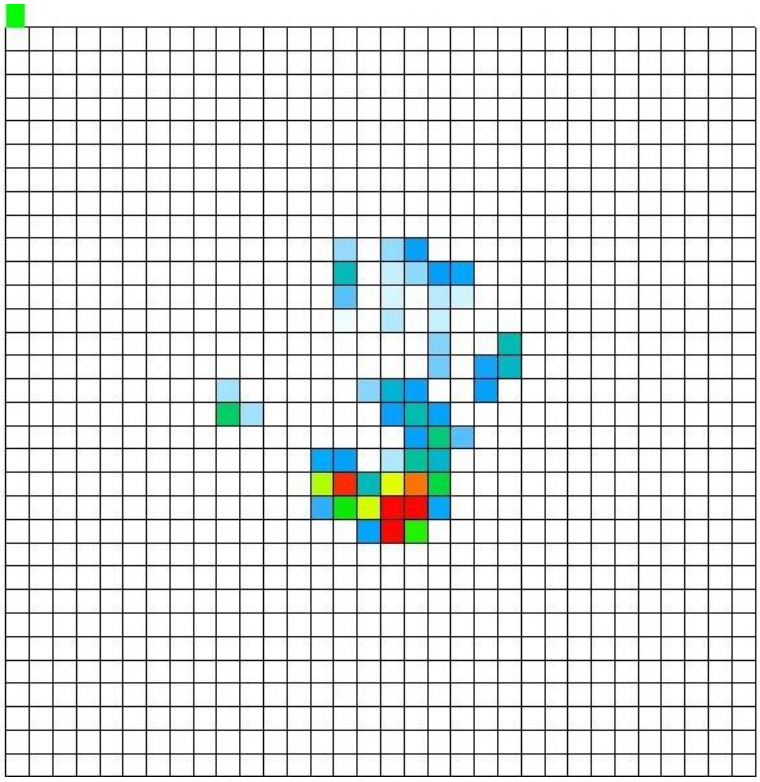


Figure 36: Interpolation Off

When Interpolation is toggled on, the image appears in a more realistic view. Differences in pressure are represented by more gradual color transitions.

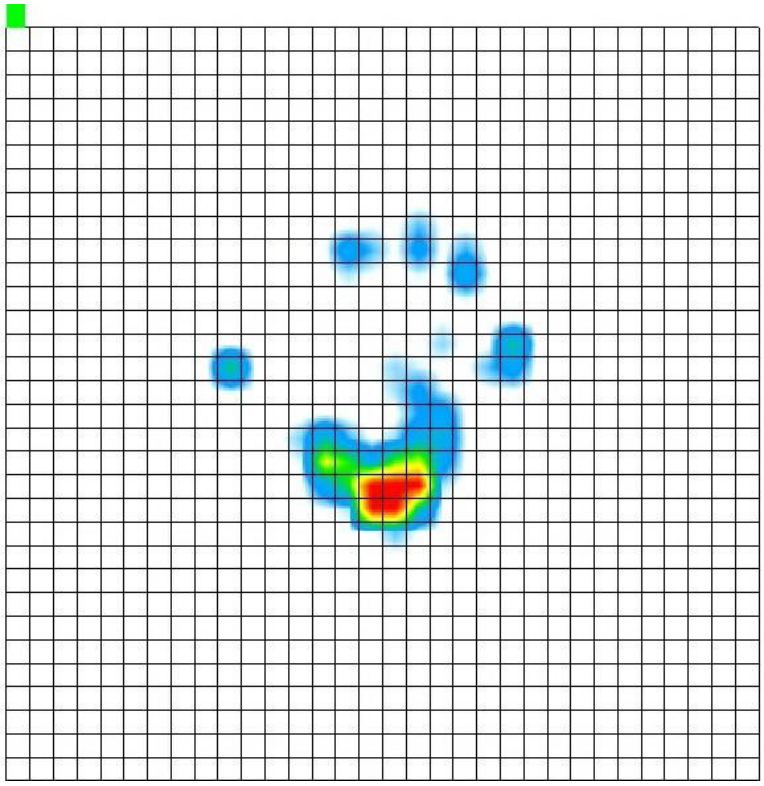
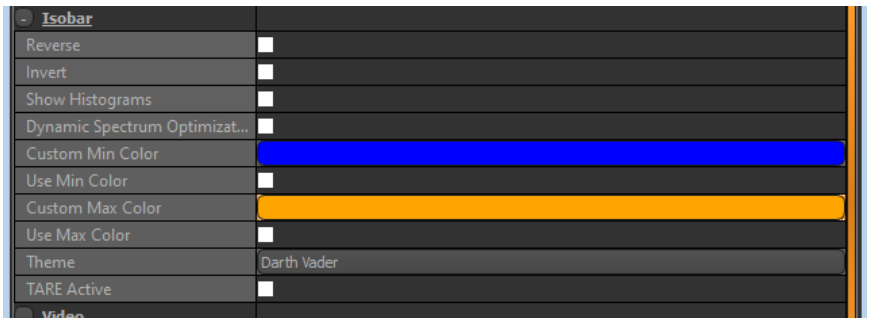


Figure 37: Interpolation On

Isobar Options

The Isobar Options window provides the user with the ability to change the Isobar display by toggling that feature on/off or selecting from a pull-down menu. When any feature is selected, a prompt appears at the bottom of the window explaining its function.



Using the Isobar task pane, and selecting More Options, you can set granular details for the Isobar display.

- Reverse
- Invert

- Show Histograms
- Dynamic Spectrum Optimization
- Custom Min Color
- Use Min Color
- Custom Max Color
- Use Max Color
- Theme
- TARE Active

You can select the number of discrete color for representing the different ranges of pressure in different colors. Isobar shows the color spectrum for different pressure ranges along with the pressure range the pad is calibrated to (in the left) and the histogram of the pressure distribution in a particular range (in the right).

Contrast and Brightness features give you option to change the color spectrum in a certain range.

Lower and upper threshold features give you option to let the pad to display data only in a specific pressure range. Threshold features are very important when you calibrate a pressure to a certain high pressure, but you want to operate the pad in a considerably lower pressure range, then you can lower the upper threshold value so that the pad shows data in that low pressure range only.

Lower threshold feature is important when there is some low-pressure noise, and you want the software not to display data under a certain pressure.

Figure 38: Color Options

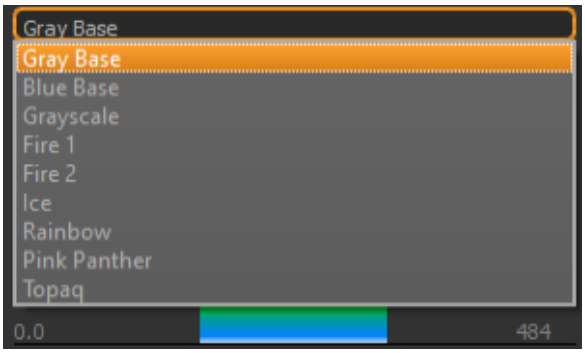


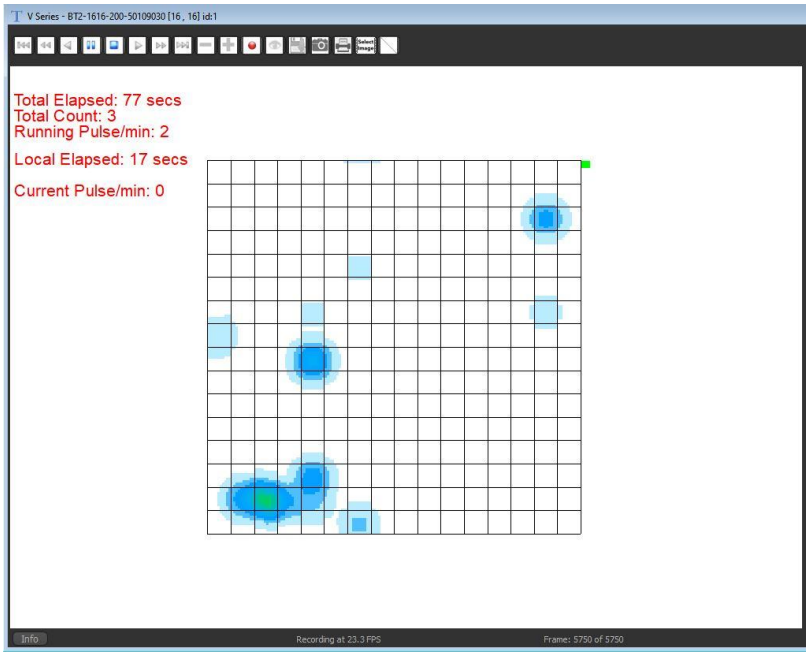
Figure 39: Color Options

Note: To see the effect of the threshold features, you have to uncheck the Dynamic Spectrum Optimization by clicking the Preferences menu and choosing Isobar.

Video Options

Use the video options to control the speed of data recording and playback.

- FPS: set the recording speed in frames per second.
- Use Max: will set the software to record at the fastest possible speed.
- Loop playback: use to set the playback of the recorded session in a continual loop
- Average Frames: set the number of frames to be averaged during playback

Pulse Monitor

The Pulse Monitor counts compressions and indicates compressions per minute.