

# INSTRUCTION MANUAL

EN



## TEST BRIDGE PSA

Spectrum Analyser PC Software

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# 1. INTRODUCTION

## Features

Create and edit limit pattern, compensation table and marker files.

Create limit pattern files from Log, Scan and Trace files.

Open data files for further analysis.

Upgrade PSAxx02 setup file(s) to PSAxx03 format.

Live view of the PSA display.

## Intended Use

List of compatible instruments:

(Firmware updates may be required for compatibility)

| Spectrum Analysers |                   |
|--------------------|-------------------|
| Series             | Models            |
| 2                  | PSA1302 & PSA2702 |
| 3                  | PSA1303 & PSA2703 |
| 5                  | PSA3605 & PSA6005 |

Colour coding:

Green = Larger view / selected area

- ① Orange = Instruction to select
- ① Blue = Optional instruction to select
- ① Yellow = Description of item

## Symbols

The following symbols are displayed throughout the manual:

### CAUTION



Indicates a hazard that could damage the product that may result in loss of important data or invalidation of the warranty.

### NOTE



Indicates a helpful tip.

## 2. PSA LIVE VIEW

Connect the PSA to the PC using a USB cable and the mini-B connector on the PSA.

The Windows plug and play functions should automatically recognise the addition of new hardware attached to the USB interface and establish a virtual COM port within the PC.

To view the PSA display on a PC, the PSA must be put into the **View on PC** mode. To enable View on PC, select :

**Setup/Functions > System/file Ops > System Utilities > Status/System > Screen > View on PC.**

Follow the on-screen prompts to establish a connection.

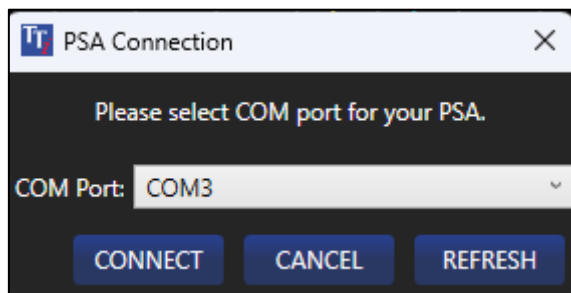
### NOTE



The View on PC mode is only available when Option U01 or U02 is enabled on the PSA.

Select **Connection > PSA Live View** to enable the connection between the PSA and Test Bridge PSA.

A Pop- up will appear, on the COM Port dropdown box select the COM port which is connected to the PSA and select **Connect**. If the COM port does not appear in the list, click the **Refresh** button and try again.



The connection process may take a few moments.



Once connected, the PSA screen will appear in the graphics window. Now changes on the PSA screen will also be seen in the graphics window. Operation of the PSA will slow down a little due to the large volume of data now flowing to the PC. Screen images can be captured using any of the following:  
Right click> **Export**, **File > Save** or **File > Export**.

To stop viewing on the PC, close the PSA Live View tab.

### NOTE



If disconnected, the PSA will leave the 'view on PC' mode, when reconnected it will require re-enabling.

## 3. FILE TYPES

### Images

Screen bitmaps (\*.BMP) are stored in the **IMAGES** folder and are Windows bitmap images of the PSA screen.

### Imports

The folder named **IMPORTS** is used for external .CSV files that are not created on the instrument or within Test Bridge PSA.

### Log Files

Log files (\*.LOG) are stored in the **LOGS** folder and contain multiple entries of sweep data. They can contain several types of data and are variable in size up to tens of megabytes. If View trace/ Limit Patterns/ Channel Markers are loaded at the time of saving, they will also be contained within the Log file. They will be visible if enabled during the logging process.

There are four types of log file which may be created by the PSA:

#### Full Trace

This file type contains the complete trace data for each log file entry.

#### Peak Level

This file type contains two values for each log entry these being the level at the highest peak in the trace together with the corresponding frequency value.

#### Centre Level

This type of file contains a single value for each log entry which is the value representing the level at the centre frequency of the original trace on the PSA.

#### Screen Image

This log file type contains a bitmap image of the trace for each log file entry.

### Setups

Setups are used to save the configuration of the PSA; Test Bridge PSA does not load setups.

Use **Tools>File Upgrade** tool to upgrade PSAxx02 format files to PSAxx03 format.

### Tables

#### Compensation Tables

Compensation tables (\*.CMP) are stored in the **TABLES** folder and are normalised files of amplitude compensation versus frequency created by Test Bridge PSA.

Compensation tables are normalised files of amplitude versus frequency that are used to compensate for frequency related non-linearity in antennae or transducers.

The files contain lists of up to 49 frequency/amplitude points. When a file is used by the instrument, linear interpolation is employed between the points. Every point on the trace is then changed by the amount calculated from the interpolated compensation table. Note that this could result in parts of the trace being outside of the graticule area.

#### Limit Patterns

Limit Patterns (\*.CSV) are stored in the **TABLES** folder and contain absolute values of amplitude versus frequency created by Test Bridge PSA.

Limit lines or patterns may be used as simple visual aids to determine whether a signal is within a specific level range, or they may be used in conjunction with the Limits Comparator to create an automatic action.

Limit Patterns can be displayed on the screen of the PSA, they can have multiple levels and can include vertical steps and angled lines. Patterns are contained within files that are lists of up to 49 frequency/amplitude points. When a file is used by the instrument, linear interpolation is employed between the points. Up to two patterns can be displayed simultaneously in different colours (red and blue).

### **Channel Markers**

Channel Markers (\$\*.CSV) are a special case of Limit Patterns that are also stored in the **TABLES** folder. They are created by Test Bridge PSA from a list of frequency values only.

Channel Markers are a special case of a Limit Pattern which consists only of vertical lines at frequency points defined within the file. These can be displayed as an alternative to limit lines/patterns on the PSA. Up to two files can be displayed simultaneously in differing colours. Each file can contain up to 49 frequency points.

## **Traces**

### **Trace Files**

Traces (\*.CSV) are stored in the **TRACES** folder and are lists of frequency/amplitude pairs representing the data from a single trace captured by the PSA.

Trace files have a .CSV extension and do NOT start with a \$ symbol.

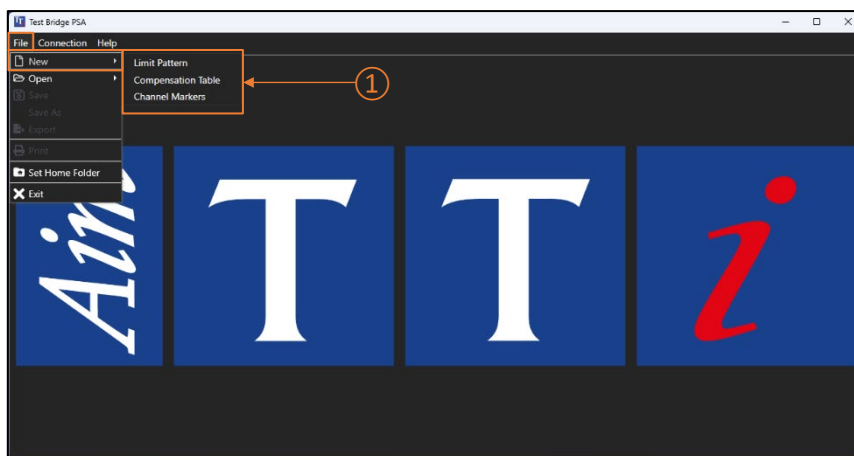
### **Scan Files (PSA Series 5 only)**

Scan Files (\$\*.CSV) are stored in the **TRACES** folder. Scan files always start with a \$ symbol to distinguish them from Trace files.

## 4. CREATING FILES TO USE ON THE PSA

Test Bridge PSA allows custom Limit Pattern, Compensation Table and Channel Marker files to be created, these can be transferred onto a PSA for further use. See '*Transferring Files*' for details on how to transfer files to the PSA.

To create a new file, select the required file type from: **File > New** ①.



Once a new file type is selected, a pop-up will appear with various settable options depending on the selection:

New Limit Pattern

Name

Untitled

Start Frequency (MHz)

1

Stop Frequency (MHz)

6000

Level

-60

Units

dBm

Points

5

OK

CANCEL

IMPORT FROM CSV FILE

New Compensation Table

Name

Untitled

Start Frequency (MHz)

1

Stop Frequency (MHz)

6000

Level

-60

Points

5

OK

CANCEL

IMPORT FROM CSV FILE

New Channel Markers

Name

Untitled

Start Frequency (MHz)

1

Stop Frequency (MHz)

6000

Points

5

OK

CANCEL

IMPORT FROM CSV FILE

Edit the values as required and click **OK** to create the file.

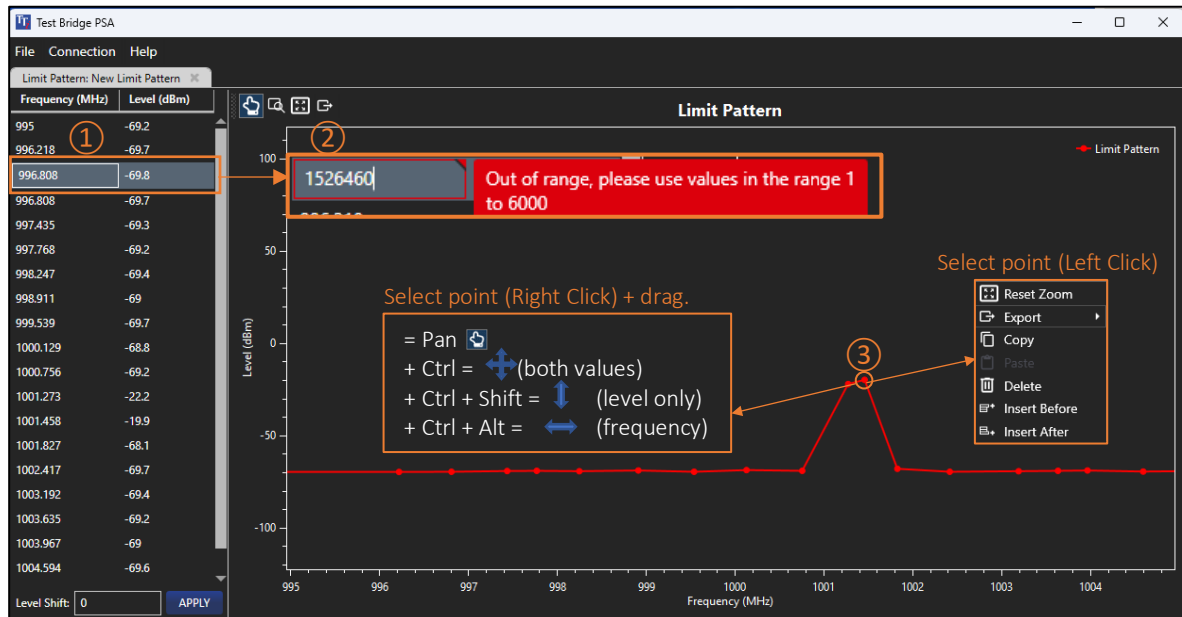
Alternatively, choose **Import from CSV file** to import values from an external .CSV file from the IMPORT folder. See '*File Locations*' for more details.

Test Bridge PSA also provides a feature to allow an existing file (Log, Trace, Scan) to be used as the basis for a Limit Pattern. See '*Creating a Limit Pattern file from a trace*'.

## Editing Values

Values can be edited on Limit Pattern, Compensation Table and Channel Marker files.

To edit a frequency/ level value, double click on the required field ①, enter a new frequency/ level and press the Return key on the keyboard. If an invalid number is entered the box will show an error ②.



Alternatively, both values can be edited simultaneously from the graph window. Select a point on the graph ③, hold the Ctrl key then click and drag the required point to the new frequency/ level.

To edit the level / frequency independently using the graph, select a point on the graph, hold Ctrl and Shift / Alt keys then click and drag the required point to the new level.

The List will reorder once the editing is complete.

### NOTE



The first and last frequency points can only be modified in the table.

#### Insert a New Point

To insert a point into the list, select either the frequency or the level value, right click in the list window ① and select Insert Before, or Insert After, as required.

To insert a point into the graph, right click on the required point ③ and select either Insert Before, or Insert After, as required.

Inserting a point before creates a new point with a value calculated using the average of the selected point and the previous one.

Inserting a point after creates a new point with a value calculated using the average of the selected point and the next one.

#### Copy/Paste

To copy a set of values, select either the frequency, level value or point from the graphic window, right click ③ and select Copy.

To paste a copied value, select either the frequency, level value or point from the graphic window right click ③ and select Paste.

#### Delete

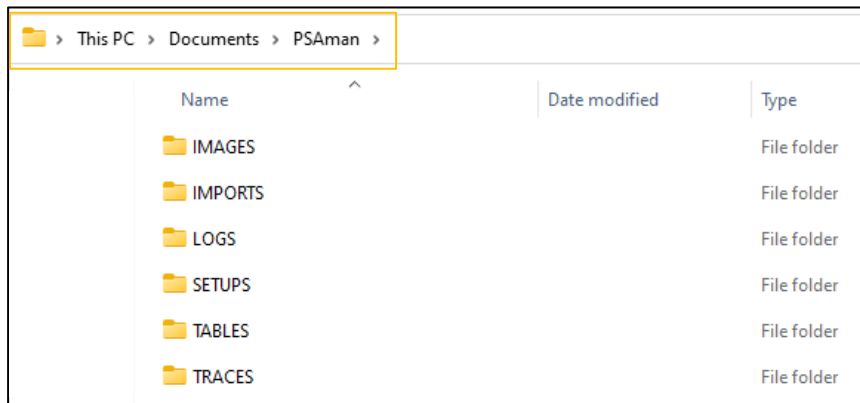
To delete a point, select either the frequency, level value or point from the graphic window, right click ③ and select Delete.



## 5. IMPORTING AND OPENING A FILE

### File Locations

The files used by Test Bridge PSA are stored in a folder structure similar to that used by the PSA itself. By default, the top-level folder created at installation is called **PSAman**, this is located in the **Documents** folder. It holds several other folders containing the different types of files.



### Transferring Files

Files need to be transferred from the PSA to a PC before using. This can be done either using a USB Flash drive or by direct USB connection and “Link to PC” (**Setup/Functions > System/File Ops > File Ops > Link to PC**).

Transfer the files as detailed in the table:

| File Type                            | Extension | Transfer files from folder: | Transfer files to folder: |
|--------------------------------------|-----------|-----------------------------|---------------------------|
| Image                                | .BMP      | PSA\IMAGES                  | PSAman\IMAGES             |
| Trace                                | .CSV      | PSA\TRACES                  | PSAman\TRACES             |
| Scan                                 | \$_ .CSV  | PSA\TRACES                  | PSAman\TRACES             |
| Full Trace                           | .LOG      | PSA\LOGS                    | PSAman\LOGS               |
| Peak Level                           | .LOG      | PSA\LOGS                    | PSAman\LOGS               |
| Centre Level                         | .LOG      | PSA\LOGS                    | PSAman\LOGS               |
| Screen Image                         | .LOG      | PSA\LOGS                    | PSAman\LOGS               |
| Compensation Table                   | .CMP      | PSA\TABLES                  | PSAman\TABLES             |
| Limit Pattern                        | .CSV      | PSA\TABLES                  | PSAman\TABLES             |
| Channel Markers                      | \$_ .CSV  | PSA\TABLES                  | PSAman\TABLES             |
| External<br>(not created on the PSA) | .CSV      | -                           | PSAman\IMPORTS            |

### PSAman ‘Home’ Folder

The ‘Home’ Folder is where Test Bridge PSA will locate all relevant files. The top-level folder, created at installation, is named **PSAman**.

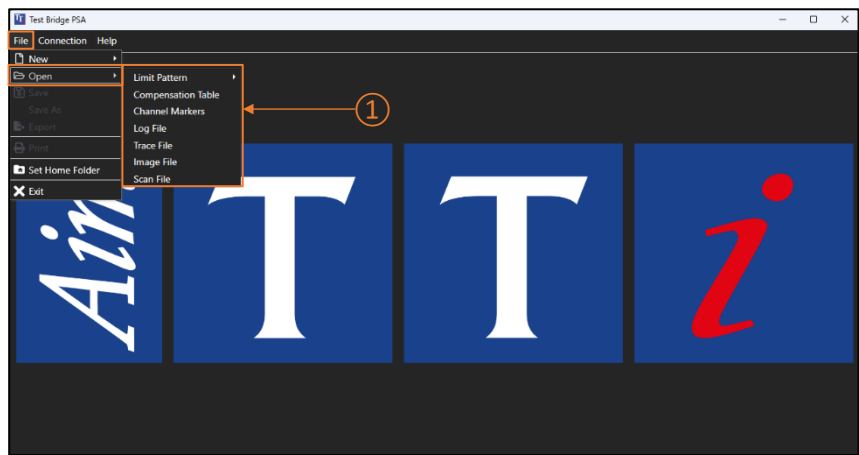
It is possible to create multiple ‘Home’ folders on any available disk drive and set Test Bridge PSA to use any one of them as the default. This allows multiple projects to be created and Test Bridge PSA will only use the files for the selected project.

To point Test Bridge PSA to another folder simply use **File > Set Home Folder**, navigate to the required folder and click OK. Test Bridge PSA will then remember the new location until it is changed again.

# Open a File

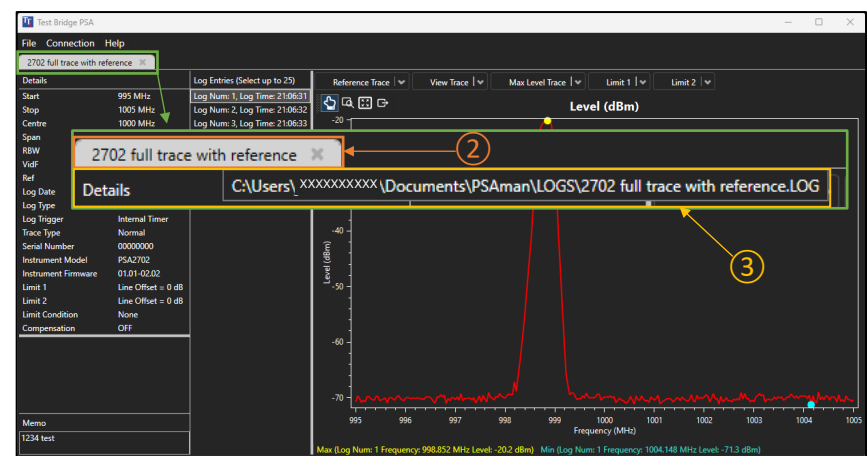
To open a file, select the required file type from: **File > Open** ①.

This will show the contents of the appropriate folder for the selected file type.  
For more information on file types and locations, see *'File Types'* or *'File Locations'*.



Opening a file will create a new tab ② along the top of the window. To view the file, select the required tab. The tab layout will vary depending on the file type, each file type is described in the following section.

Hover the mouse over a tab ② to see the full file name and location details ③.

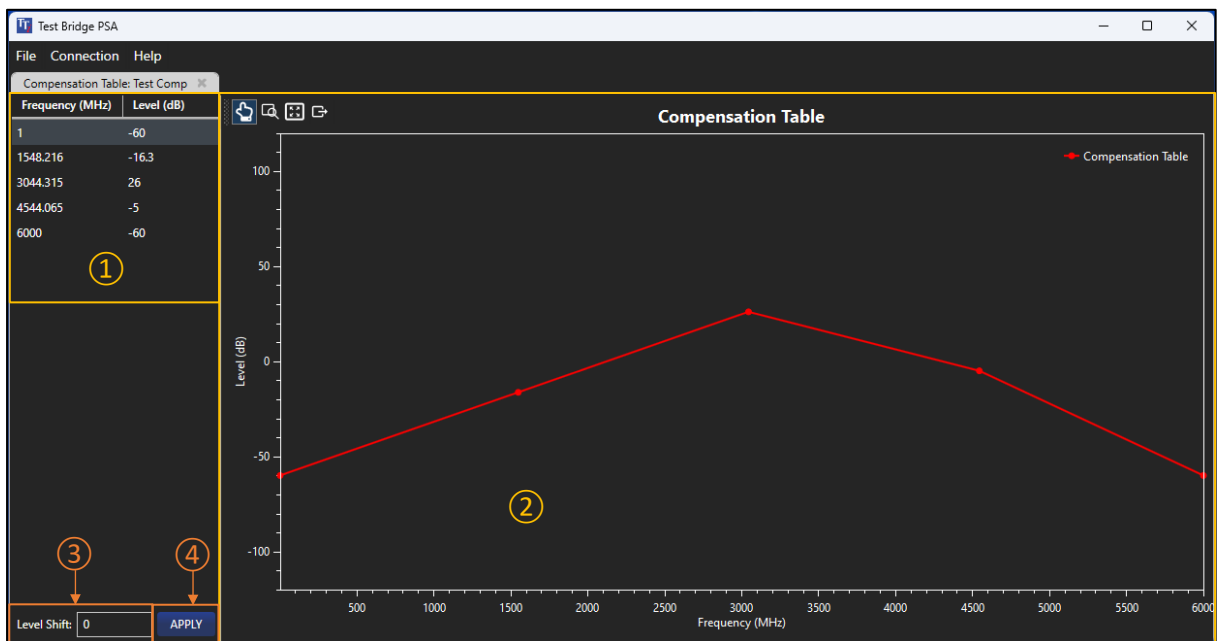
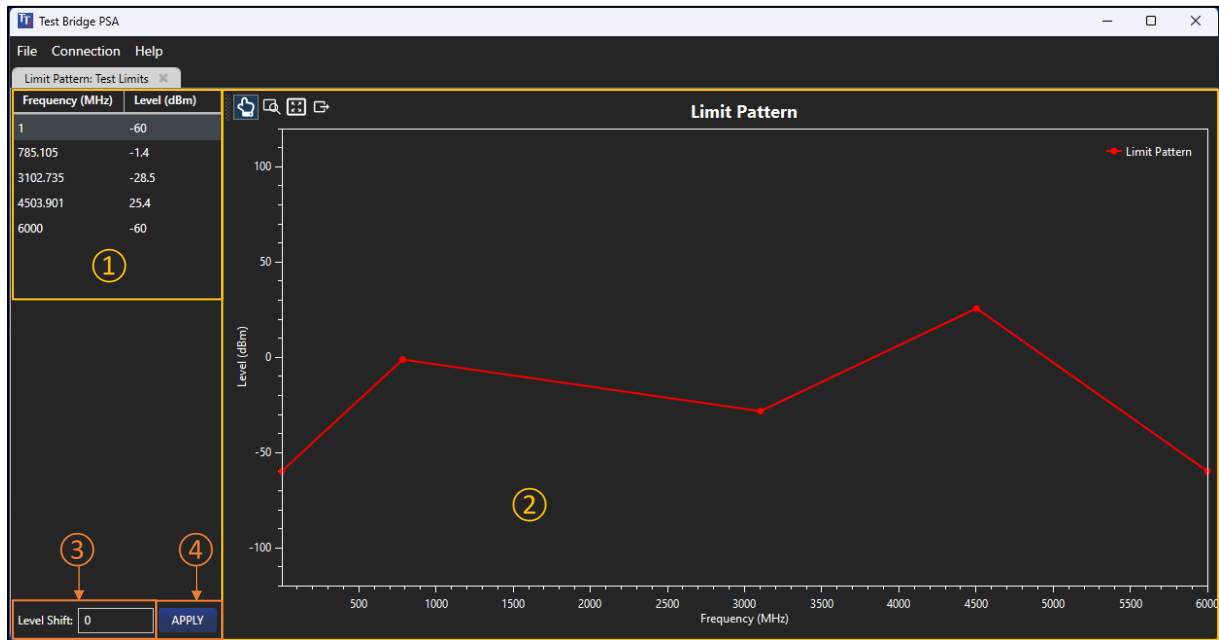


# 6. WINDOW / TAB LAYOUT

## Limit Patterns, Compensation Tables and Channel Markers

### Limit Pattern and Compensation Tables

Limit Pattern and Compensation Table files contain a list of frequency/level pairs, as a table ①, alongside a graph ②.



The list of frequency/level pairs (minimum 2, maximum 49) define the absolute value of the limit pattern at the given frequency. The level of the limit pattern at frequencies not listed will be calculated by linear interpolation between the nearest frequency points above and below the required frequency. Level values may be in the range -120dBm to +120dBm, frequency values may be in the range of 1 and 6000MHz.

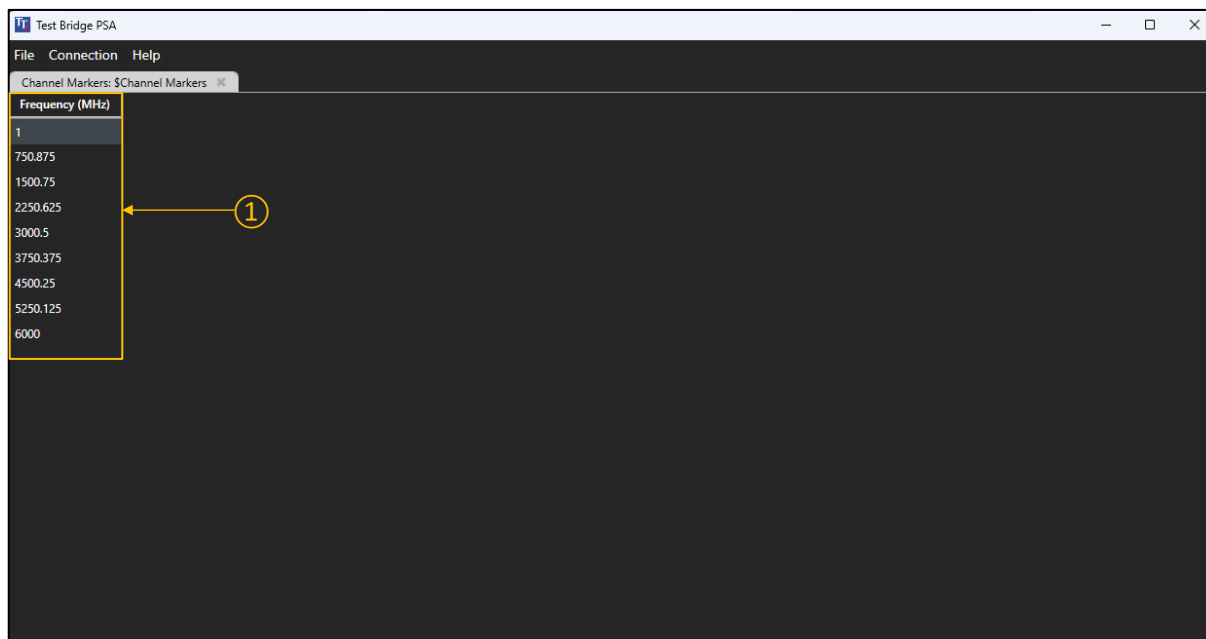
## Level Shift

To apply a user defined shift to all points in the limit pattern, enter the shift value into the Level Shift parameter ③; the value may be positive or negative. Each time the Apply button ④ is clicked the Level Shift value will be applied to all points in the limit pattern. If the new level is outside of the allowed range or an invalid number, the **Apply** button will be disabled. Values between -100 and +100 are allowed.

For details on editing the values and graph, see *'Editing and graph controls'*.

## Channel Markers

Channel Marker files contain a single list of frequency points ① that represent the points at which display markers are required (minimum 1, maximum 49 points). The Channel Marker window contains no graphical display.



# Log, Scan and Trace Files

## Common Features



### File Details

Log, Scan and Trace files, show the details of the file (1) alongside a graph (2). The details of the file are always shown on the left of the screen.

### Tabs

The graph contains tabs along the top (3), the tab contents will vary depending on which file type is selected, these are described further in the following sections. Each tab has a drop-down menu (4) and a visibility toggle button (5).

### Max / Min Stats

The Minimum and Maximum levels of the selected log are shown as a point (6) (coloured dot) on the graph, details of these points are shown at the bottom of the graphical window (7) in the reference colour.

### Splitter Bar

The thicker grey dividing line (8) indicates a 'splitter bar' and that the window size can be adjusted by clicking and dragging the bar into the required place.

### Memo

A Memo area is provided (9) into which explanatory notes can be typed, a .MEMO file will be automatically saved in the assigned file location and recalled when the file is opened, the original file is not altered. This can also be viewed separately as a text file if required.

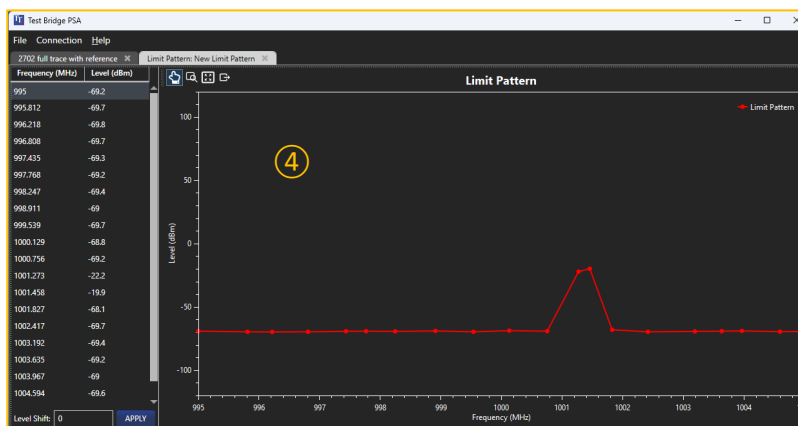
## Creating a Limit Pattern File from a Log, Scan or Trace File

It is possible to create a Limit pattern file from a log file trace. This can be a useful starting point for limit patterns intended to show the acceptable boundaries for known trace shapes.

To create a limit pattern, select the drop-down box ① on the required trace tab.



Set the number of points to use when creating the limit pattern in the Points parameter box ②, the enveloped option will attempt to create a rectangular area about the highest peak in the trace data. Click ③ to select and create the pattern. A new List window will open containing the values calculated for the new pattern and the Graphic window will show the new pattern ④.



The number of points will need to be at least twice the number of peaks in the trace data to get a meaningful result. The number cannot exceed 49.

## Creating a Trace File from a Log File

It is possible to create a Trace file from a log file trace.

To create the Trace file, select the drop-down box ① on the required trace tab and select Create Trace File ⑤.

## Log Files

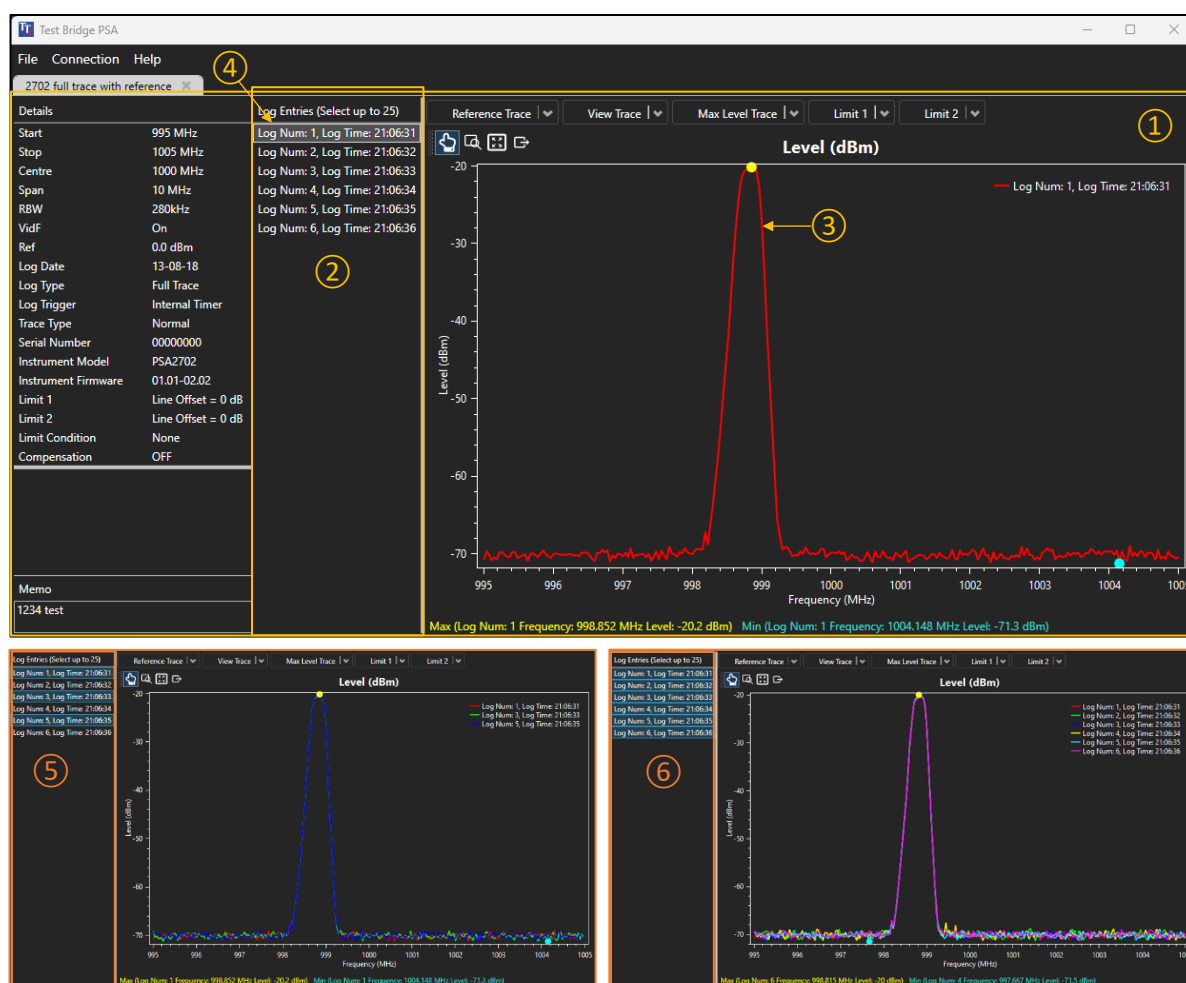
The Log Entries window shows the selected trace ① in the Log File Browser window ②.

The Live Trace ③ is always shown and cannot be removed from the Graphic window. If the log file contains a View Trace, Reference Trace or Limit Lines, these may be shown in the Graphic window by either selecting the tab or using the drop-down list. Once shown, the 'visible' icon will appear in the tab. See '*Common features*' for more details.

If the log file contains a limit pattern for Limit 1 or Limit 2 these may be shown in the same way. Items not available will be greyed out.

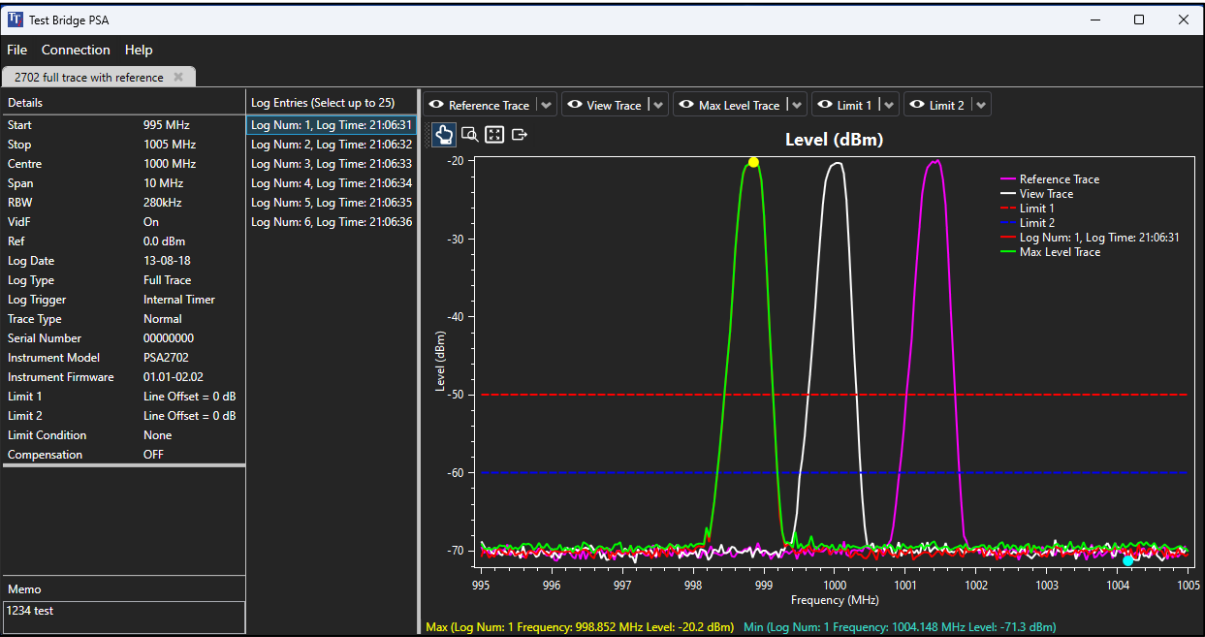
The displayed log entry is highlighted in the Log File Browser window (4).

Multiple log entries can be viewed on the graph. To select more than one log entry to view, hold the ctrl key and select individual logs to be viewed (5). Alternatively, hold the Shift key and select a range of log entries to view from the list (6).



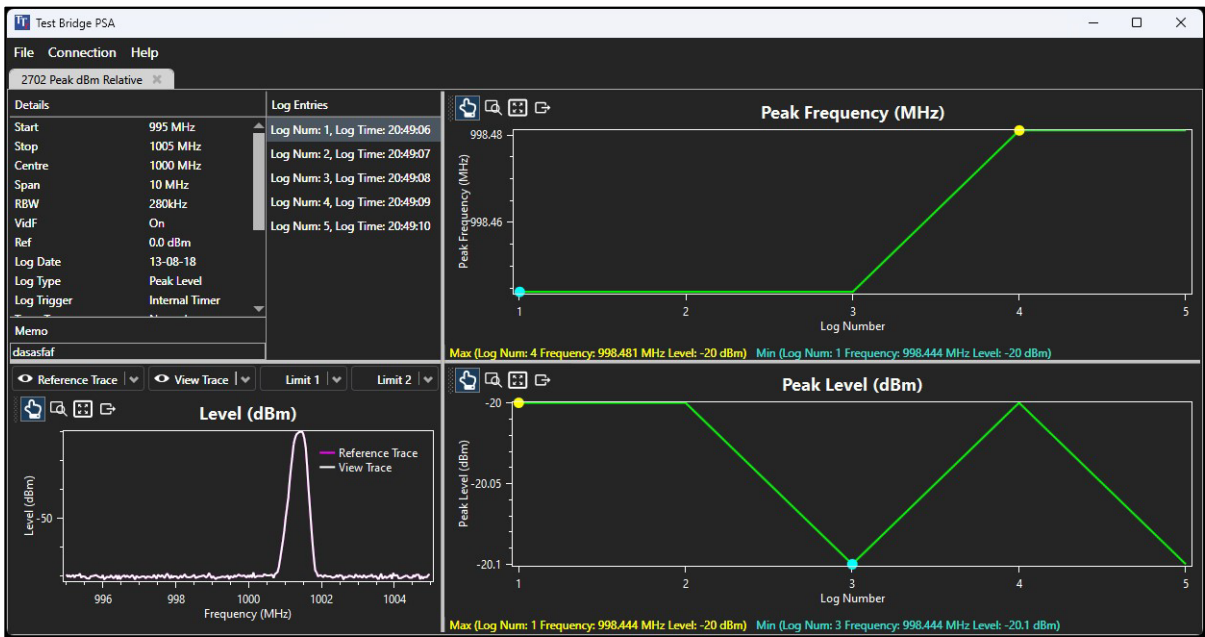
Full Trace Log Files

This file type contains the complete trace data for each log file entry. A maximum of 25 traces can be selected.



Peak Level Log Files

This file type contains two values for each log entry these being the level at the highest peak in the trace together with the corresponding frequency value.





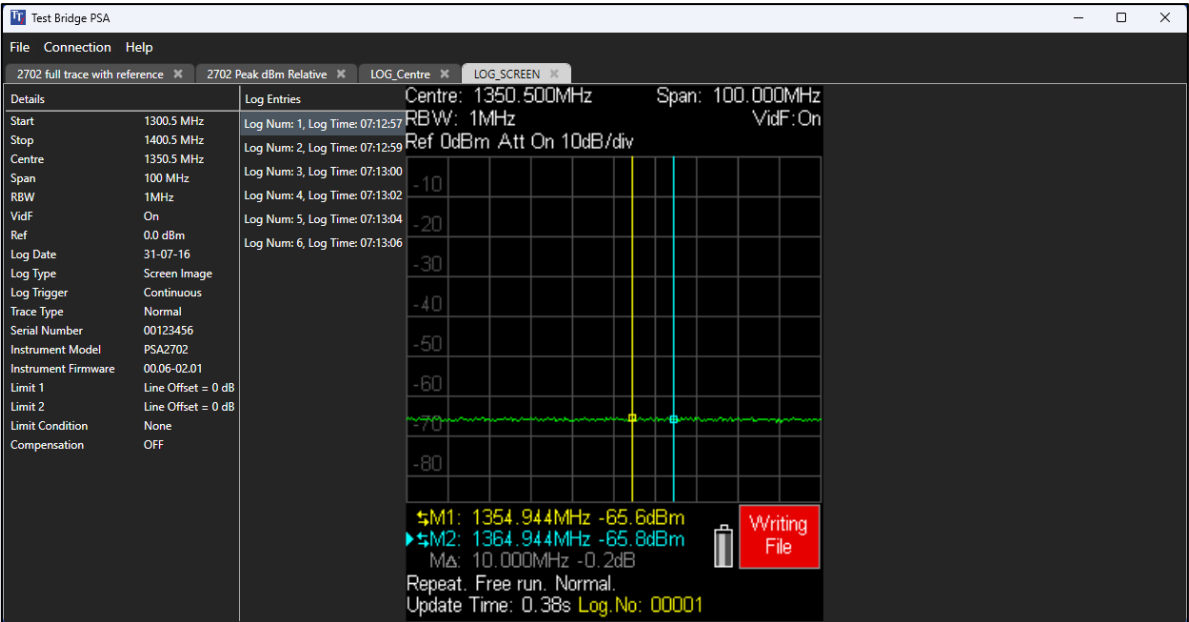
### Centre Level Log Files

This type of file contains a single value for each log entry which is the value representing the level at the centre frequency of the original trace on the PSA.



### Screen Image Log Files

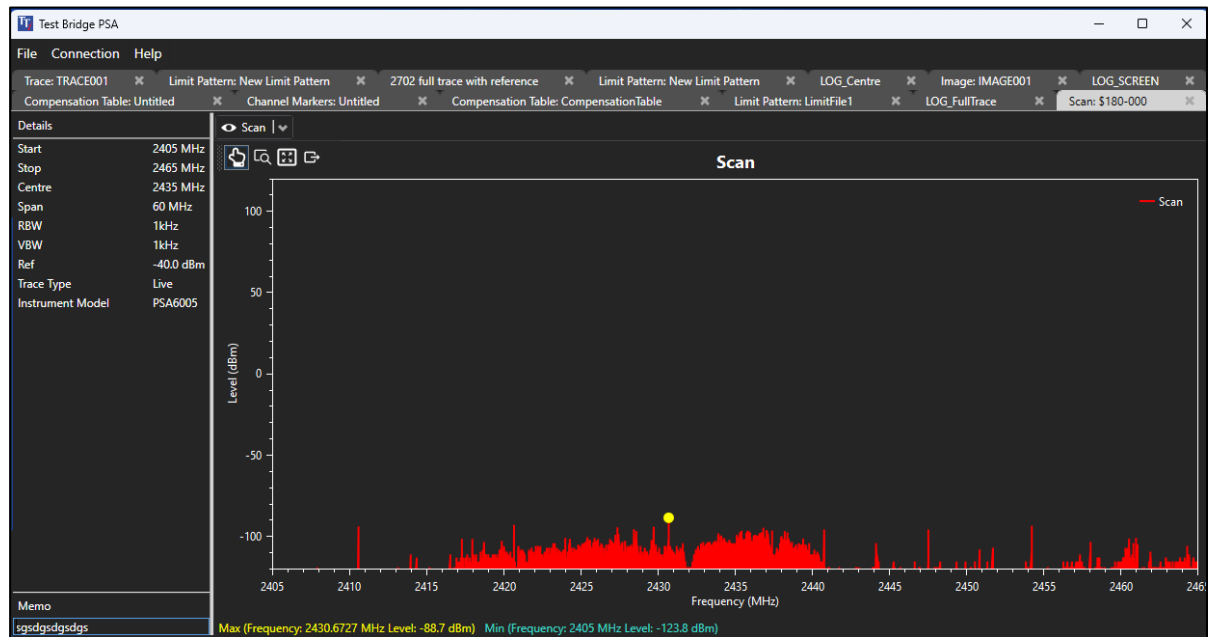
This log file type contains a bitmap image of the trace for each log file entry. Moving the Highlight through the Log Entry list will show the bitmap image at each entry.



## Scan Files (PSA Series 5 only)

When a Scan file is opened a List window will be shown containing the scan data. The graphic window will also show the trace as it appeared on the PSA screen.

Unlike a Trace file, which always contains 271 data points, a Scan file can contain any number of points between 541 and 210,000. A large scan file may take several seconds to load.



### Viewing Scan Files without Header Information (No State)

The PSA Series 5 is capable of creating Scan files which contain no header information within the CSV file (see the PSA Series 5 Operating Manual). This capability is provided because some external programs can only import data which consists of frequency/amplitude pairs alone.

When such a file is opened in Test Bridge PSA, information regarding RBW, VBW, Sweep Mode and Detector Type is not available, and that area of the graphics display window is left blank.

Start, Stop, Centre and Span are calculated from the frequency values within the file, and the reference level is set in relation to the highest amplitude value found, to a resolution of 10dB.

## Trace Files

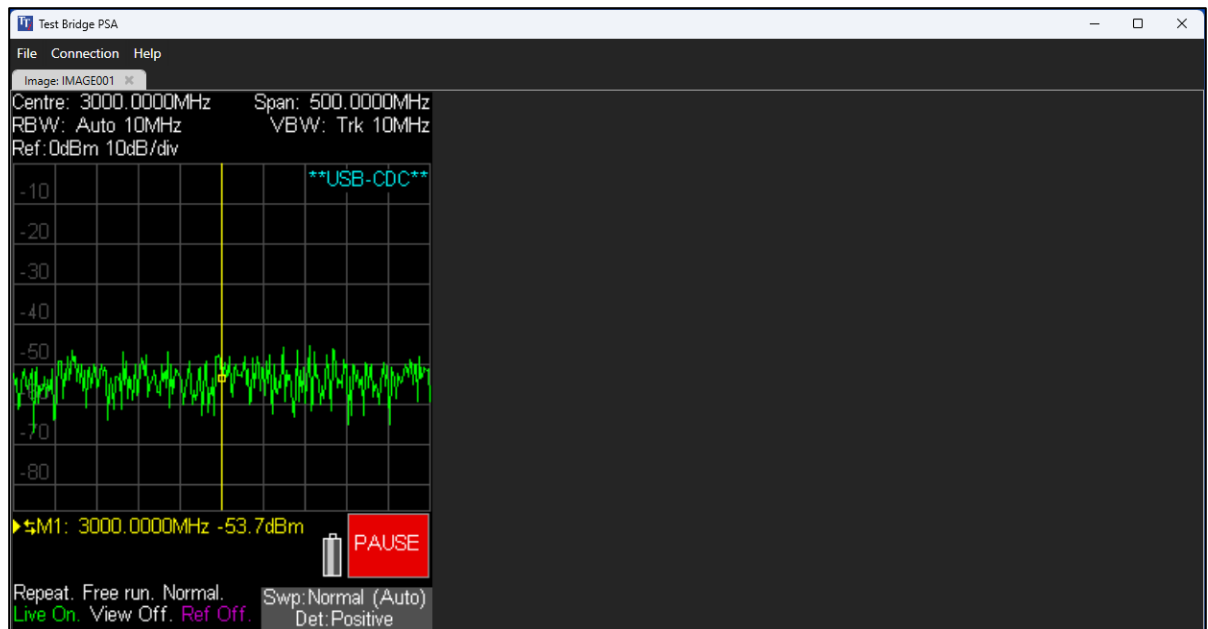
When a Trace file is opened a List window will be shown containing the trace data. The graphic window will also show the trace as it appeared on the PSA screen.



The list window shows all 271 frequencies with their level values as they appear in the trace file from the PSA. The graphic window shows the data as it would appear on the PSA screen. This means that the level values in the two windows can differ depending upon the settings for fixed offsets and other parameters which are used to shift the trace.

## Image Files

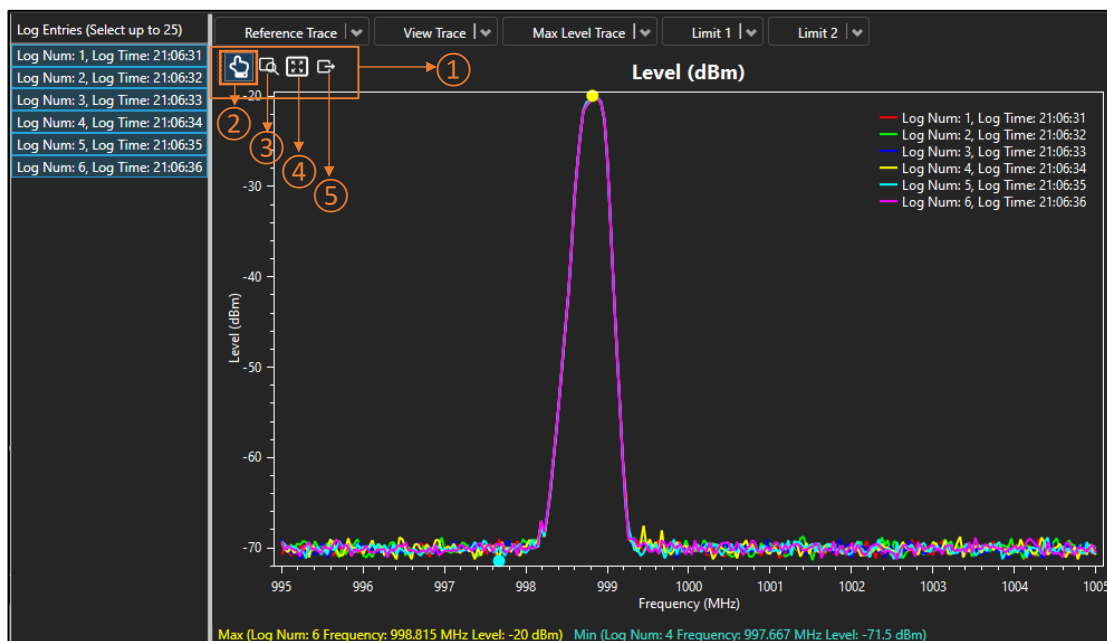
Opening an Image file will display a Windows bitmap image of the PSA screen.



## 7. GRAPH CONTROLS

Select an icon ① to enable the function.

When a function is enabled, the icon will change state as shown ②.



Pan



Select the icon ② to move the graph along the X and Y axis. To zoom in and out freely, use the mouse wheel.

Zoom



To zoom in and out freely, use the mouse wheel. Alternatively select the rectangle zoom icon ③ and use the mouse to select an area to zoom into.

Reset Zoom

Select the icon ④ to reset to the default zoom level. Alternatively, right click and select Reset Zoom

Export

Any of the graph images can be exported as a SVG, PNG or PDF file. To export, select the Export icon ⑤ followed by the required file type. A Windows file Save-As dialog will appear to allow the exported data to be written to a file.

## 8. SAVING AND PRINTING

### Save a File

To overwrite the existing file with any amendments made, select **File > Save**.

To save the file as an entirely new one, select **File > Save As**.

### Export a File

All files (with the exception of Image files and Screen Image Logs) can be exported to a .XML (\*.xml) or .JSON (\*.json) file. To export a file, select **File > Export**.

A Windows file Save-As dialog will appear to allow the exported data to be written to a file.

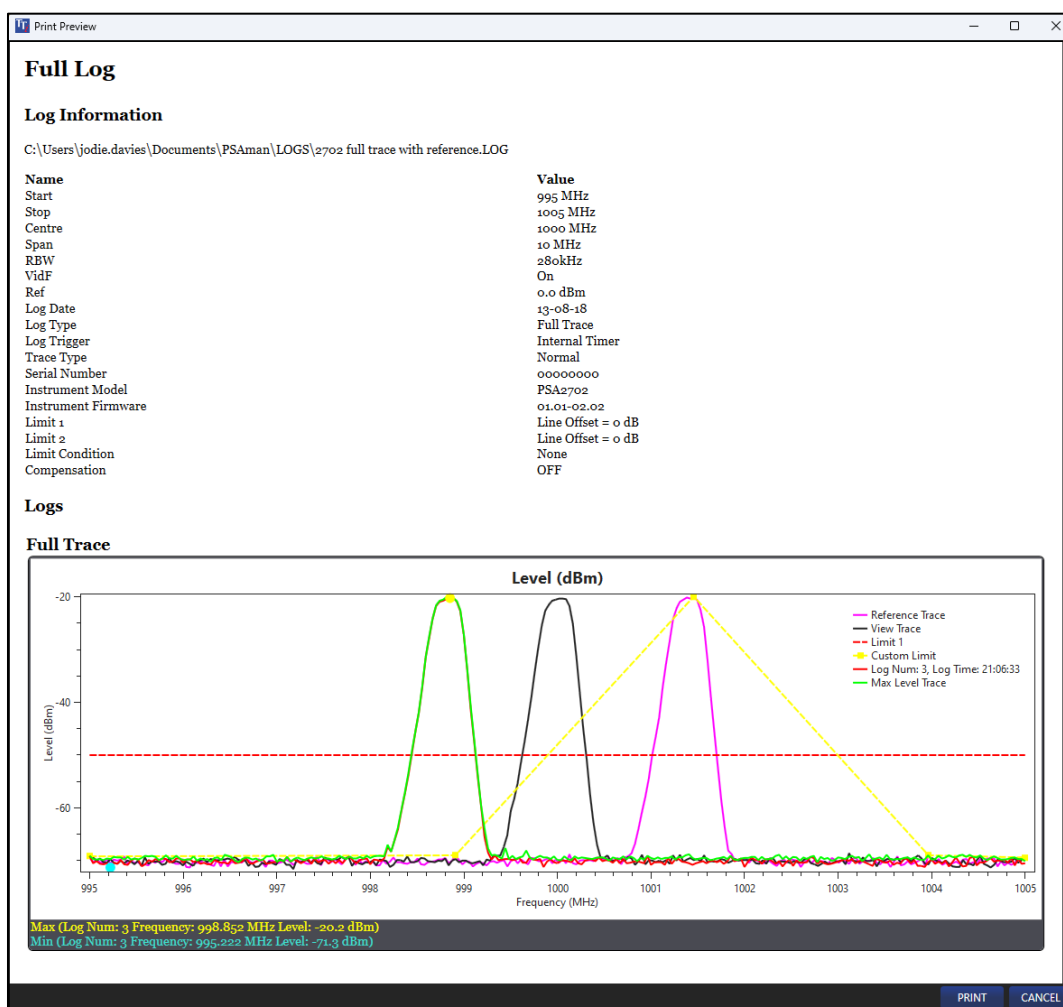
### Export an Image

Images can be exported directly from the graph, see '*Export*' for more details.

### Print a Report

A report contains the graph image alongside the log information and file details for the selected tab. To print a report, select **File > Print**.

A print preview will appear, select **Print** to print the image.



## 9. TRANSFERRING AND USING FILES

### Transferring and Using Limit Patterns

Limit Pattern files created under PSA-Manager are stored in the TABLES folder (by default this will be Documents\PSAman\TABLES). Limit Patterns are identified by having the extension .CSV and having file names that do not begin with \$.

These must be transferred to the TABLES folder of the instrument (PSA\TABLES) using either a USB Flash drive or direct USB connection and "Link to PC".

(Setup/Functions > System/File Ops > File Ops > Link to PC)

A Limit Pattern is loaded from the Level/Limits menu using:

Level/Limits > Limits > Set Limits > (Limit 1/Limit 2) > Select Pattern.

### Transferring and Using Compensation Tables

Compensation Table files created under PSA-Manager are stored in the TABLES folder (by default this will be My Documents\PSAman\TABLES). Compensation Tables are identified by having the extension .CMP

These must be transferred to the TABLES folder of the instrument (PSA\TABLES) using either a USB Flash drive or direct USB connection and "Link to PC".

(Setup/Functions > System/File Ops > File Ops > Link to PC)

A Compensation Table is loaded from the Level/Limits menu using:

Level/Limits > Offset/Tables > Set > Comp. Table > Select Table.

### Transferring and Using Channel Markers

Channel Marker files created under PSA-Manager are stored in the TABLES folder (by default this will be My Documents\PSAman\TABLES). Channel Markers are identified by having the extension .CSV and having file names that begin with \$.

These files must be transferred to the TABLES folder of the instrument (PSA\TABLES) using either a USB Flash drive or direct USB connection and "Link to PC" (Setup/Functions > System/File Ops > File Ops > Link to PC)

A Channel Markers is loaded from the Level/Limits menu using Level/Limits > Limits > Set Limits > (Limit 1/Limit 2) > Select Pattern

It is possible to display a combination of one channel markers file and one limit pattern or limit line. Note, however, that the Limits Comparator is disabled whenever is channel markers file is displayed.

## 10. FILE UPGRADE

### Upgrading PSApp02 setup Files to PSApp03 Format

Upgrade a file created a PSA2702 or PSA1302 so it can be read by a PSA2703 or PSA1303.

To upgrade a file, select: Tools>File Upgrade>PSApp02 to PSApp03.

Select the file(s) you would like to upgrade.

Click **Open**. the files will be loaded, and a dialog box will appear stating the number of files that were successfully upgraded.

#### NOTE



The upgraded file(s) will be saved as original name.

The original file(s) will be called <filename>.bak as a backup.

## 11. HELP OPTIONS

**Help** - This PDF guide to using the software.

**About** – Application details and a 'report generator' function to provide feedback.

**Quick Start** – Quick access to instructions on how to use the software.

## 12. TERMS AND CONDITIONS

### **Freeware Licence Agreement of THURLBY THANDAR INSTRUMENTS LTD (TTI)**

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