

User Guide

Vision Software

MX280001A



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Chapter 1 — Vision Trace Monitor

1-1 Introduction

Vision Trace Monitor is a program to analyze traces collected from spectrum analyzers out in the field and placed in the Vision Monitoring database. Masks can be created to validate trace data. Base station channel color coded icons indicate which channels have failed recently or have a high failure rate historically. Base stations not responding to sweep requests can be spotted because of the few traces stored in the database.

Starting the program will open the Vision Trace Monitor user interface. On the left side of the interface will be the Base Station and Channel Directory and the Status Panel. Another panel can be displayed by clicking on the three dots located at bottom right corner of the Base Station and Channel Directory panel and selecting Trace History, Probe Map, or Live Data Stream. The following panels will be displayed on the right hand side of the user interface: Trace Panel, Spectrogram, and Trace Matrix.

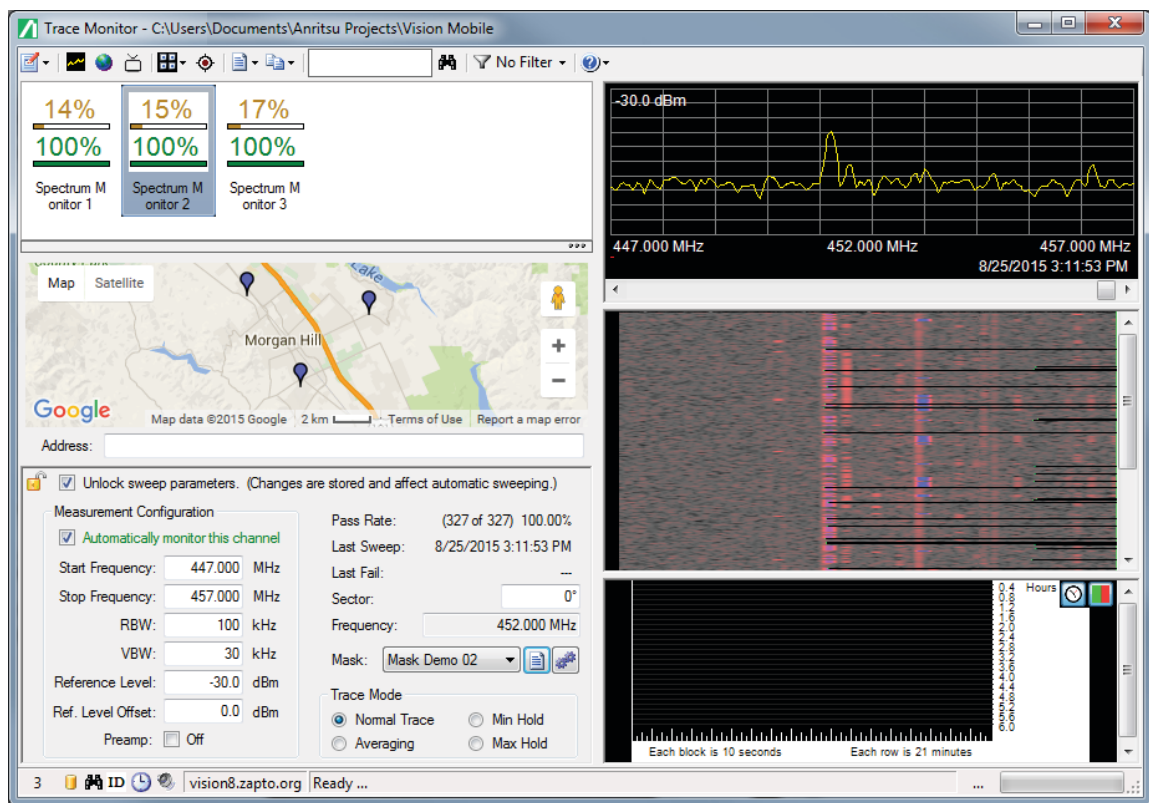


Figure 1-1. Vision Trace Monitor User Interface

1-2 System Requirements

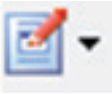




- Microsoft Windows XP or Higher
- 4 GB of RAM
- 100 GB of hard-disk space
- Microsoft.Net Framework 4.0





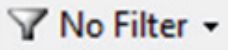

1-3 Tool Bar

The main options and application controls for Vision Monitor are found in the program toolbar. You can open a menu to configure software settings, pick a particular view mode, access advanced functionality, search for probes by name or description and filter the probe list based on various criteria options.



Figure 1-2. Vision Monitor Toolbar

| Icon | Description |
|---|---|
|  | <p>Configuration: Opens a pull-down list:</p> <ul style="list-style-type: none"> Set Time Frame Set Database Location Recent Databases Create a New Database Show Location Estimate on Map Preferred Web Browser Map Source |
|  | <p>Panels Switch: Returns to the measurement, spectrogram and time matrix panels from either the live data stream window or probe map window.</p> |
|  | <p>Show Probe Map: Displays a larger map for the current trace channel selected on the right side where the trace panel, spectrogram, and trace matrix were located.</p> |
|  | <p>Live Data Stream: Click on this button to live stream the selected current trace.</p> |
|  | <p>Open Trace Viewer Window: Allows you to view multiple channels at one time either in the current trace mode or spectrograph mode. In the Base Station and Channel Directory, hold down the Ctrl key on the keyboard and use the mouse to select multiple channels. Selected channels will be highlighted in dark blue. Once the channels have been selected, click on the Open Trace Viewer Window button and the selected traces will display in a single window. Click on the trace panel to change between current trace mode and spectrograph mode.</p> |





| Icon | Description |
|---|---|
|  | Location Finder: Opens the Source Locater window. |
|  | Generate Pass/Fail Report: Creates a Vision Monitor Failure & Status Report that will be displayed in your Internet browser. |
|  | Copy & Paste: Press this list arrow to display the various copy and paste functions. Click on the desired Copy/Paste function. |
|  | Search for base station: Instead of scrolling through a long list of base stations, enter the name of the desired base station and click on the Binocular . |
|  | Filter: Allows you to view a specific category group of probes on the current map. No Filter - Show All is the default view. The filter categories are: <ul style="list-style-type: none"> <li data-bbox="579 888 1414 947">No Filter Show All: All of the base stations in the Base Station list are displayed in the map. <li data-bbox="579 963 1481 1022">Filter by Map: Only base stations viewed in the map will be displayed in the Base Station list. You must be in Probe Map view. <li data-bbox="579 1039 1481 1098">Failure by Last Sweep: Base stations with channels whose last trace failed will remain on the list and displayed in Map view. <li data-bbox="579 1115 1493 1173">Failure in Past Hour: Base stations with channels that had a trace fail within the last hour will remain on the list and displayed in Map view. <li data-bbox="579 1190 1477 1249">Failure in Past Day: Base stations with channels that had a trace fail within the day will remain on the list and displayed in Map view. |
|  | Help: Press to open this documentation. |

1-4 Base Station and Channel Directory

The list on the left contains the names of the base stations. Columns numbered one through twelve are the base station channels.

| Base Station | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---------------------|---|---|---|---|---|---|---|---|---|----|----|----|
| SO SALTON SEA | █ | █ | █ | █ | █ | █ | █ | █ | █ | █ | █ | █ |
| SOLANA BCH | █ | █ | █ | █ | █ | █ | █ | █ | █ | █ | █ | █ |
| SOLEDAD FOM | █ | █ | █ | █ | █ | █ | █ | █ | █ | █ | █ | █ |
| SONY / HP | █ | █ | █ | █ | █ | █ | █ | █ | █ | █ | █ | █ |
| SORRENTO MESA | █ | █ | █ | █ | █ | █ | █ | █ | █ | █ | █ | █ |
| SORRENTO RAIL | █ | █ | █ | █ | █ | █ | █ | █ | █ | █ | █ | █ |
| SORRENTO TWRS | █ | █ | █ | █ | █ | █ | █ | █ | █ | █ | █ | █ |
| SORRENTO VLLY | █ | █ | █ | █ | █ | █ | █ | █ | █ | █ | █ | █ |
| SOUTH ESCONDIDO | █ | █ | █ | █ | █ | █ | █ | █ | █ | █ | █ | █ |
| SOUTH FALLBROOK | █ | █ | █ | █ | █ | █ | █ | █ | █ | █ | █ | █ |
| SOUTH MARKET | █ | █ | █ | █ | █ | █ | █ | █ | █ | █ | █ | █ |
| SOUTH MISSION TR. | █ | █ | █ | █ | █ | █ | █ | █ | █ | █ | █ | █ |
| SOUTH RAMONA | █ | █ | █ | █ | █ | █ | █ | █ | █ | █ | █ | █ |
| SOUTHPORT | █ | █ | █ | █ | █ | █ | █ | █ | █ | █ | █ | █ |
| SPORTS ARENA | █ | █ | █ | █ | █ | █ | █ | █ | █ | █ | █ | █ |
| SPRG CYN/SCRIPP | █ | █ | █ | █ | █ | █ | █ | █ | █ | █ | █ | █ |
| SPRING VALLEY | █ | █ | █ | █ | █ | █ | █ | █ | █ | █ | █ | █ |
| SPRINT TOWER | █ | █ | █ | █ | █ | █ | █ | █ | █ | █ | █ | █ |
| SQUIRES DAM | █ | █ | █ | █ | █ | █ | █ | █ | █ | █ | █ | █ |
| STAGECOACH | █ | █ | █ | █ | █ | █ | █ | █ | █ | █ | █ | █ |
| Star Of India | █ | █ | █ | █ | █ | █ | █ | █ | █ | █ | █ | █ |
| Starvation Mountain | █ | █ | █ | █ | █ | █ | █ | █ | █ | █ | █ | █ |

Figure 1-3. Base Station and Channel Directory

| Icon | Description |
|---|--|
|  | <p>The double bar represents a channel. The bottom bar indicates the varying passing percentages of traces within the channel.</p> |
|  | <p>The light blue outline indicates the current channel selected. The last trace collected from the spectrum analyzer will be displayed in the Trace Preview Panel, highlighted as a yellow line in the Spectrogram Pane, and outlined as a white square box in the Trace Matrix panel. In the Probe Map view, the base station and channel will be indicated as a bouncing pin.</p> |
|  | <p>The bars outlined in red indicate the last trace collected for that channel failed.</p> |
|  | <p>Multiple channels that have been selected are outlined in dark blue. These channels are used with the Open Trace Viewer Window feature or with the Location Finder feature.</p> |

You can also configure a specific probe through the use of its context menu. Highlight the desired base station and click the right mouse button. The context menu below opens.

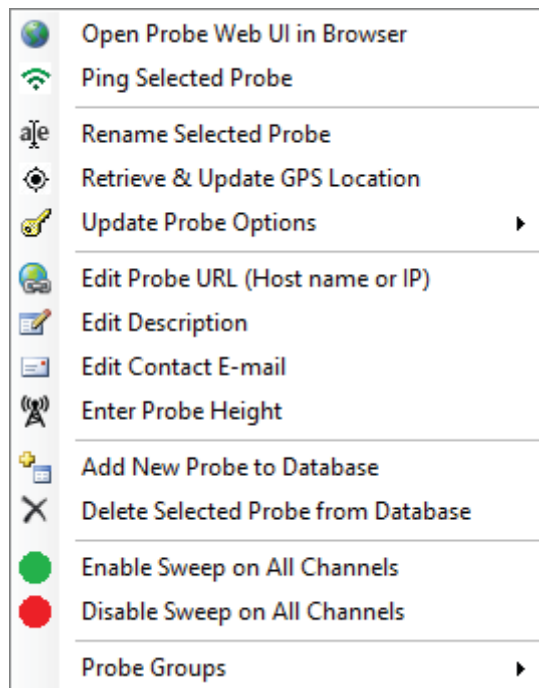


Figure 1-4. Base Station Context Menu

- **Open Probe Web UI in Browser:** Immediately opens the live trace view of the selected probe in a new browser.
- **Ping Selected Probe:** Establishes communication with the probe. The Vision Ping dialog opens displaying the reply information from the probe.
- **Rename Selected Probe:** Opens the Edit Base Station dialog to change the label of the selected probe. Enter a new name in the entry box.
- **Retrieve & Update GPS Location:** Does an immediate query to the probe for updated GPS location.
- **Update Probe Options:** To update any changes in options, this button must be pressed. A dialog will pop up stating if the update was successful and which base stations were successfully updated.
- **Edit Probe URL (Host name or IP):** Opens the Edit Base Station URL dialog to change the URL of the selected probe. Enter a new URL in the entry box.
- **Edit Description:** Opens the Edit Base Station Description dialog to change the description of the selected probe. Enter a new description in the entry box.
- **Edit Contact E-mail:** Opens Edit Base Station Contact dialog to add or change the e-mail address to those monitoring this base station. Add or change the e-mail address in the entry box.
- **Enter Probe Height:** Opens the Probe Height dialog to add or to change the height location of the selected probe. Enter the new height in the entry box. Units are in meters.
- **Add New Probe to Database:** The Create New Base Station dialog opens to enter information for the new database. Fill in the entries and press **OK**. The new probe is listed on the Base Station & Channel Directory.
- **Delete Selected Probe from Database:** Allows you to delete a base station from the directory.
- **Enable Sweep on All Channels:** Enables data collection for each channel on a probe. This can be done one at a time by clicking on the 'Unlock sweep parameters' check box, then checking the check box for 'Automatically monitor this channel'. Enable Sweep on All Channels is a quick way to do all channels on a probe at once, rather than the tedious process of enabling each separately.
- **Disable Sweep on All Channels:** Disables data collection for all channels on a probe. This can be done one at a time by clicking on the 'Unlock sweep parameters' check box, then clearing the check box for 'Automatically monitor this channel'. Disable Sweep on All Channels is a quick way to do all channels on a probe at once, rather than the tedious process of disabling each separately.
- **Probe Groups:** Probes can be assigned into groups. Groups are used only to visually arrange the probes so that associated probes are together in the probe list. By default, the probes are listed in the order they are entered into the database. To place the probes in groups, use the probe context menu to add and assign groups. You also must toggle the Show Groups setting on to see the grouped probe list. Individual groups can be collapsed or expanded to easier view just the probes that are of interest at a particular time.

1-5 Current Trace Panel

When a channel is selected, the last trace collected in the database is displayed. Use the Scroll bar at the bottom to view all of the other traces for the selected channel and base station. Figure 1-5 Trace Panel is an example of a Trace Matrix block that contains only one trace. See [Figure 1-8, "Trace Matrix with One Trace per Block"](#).

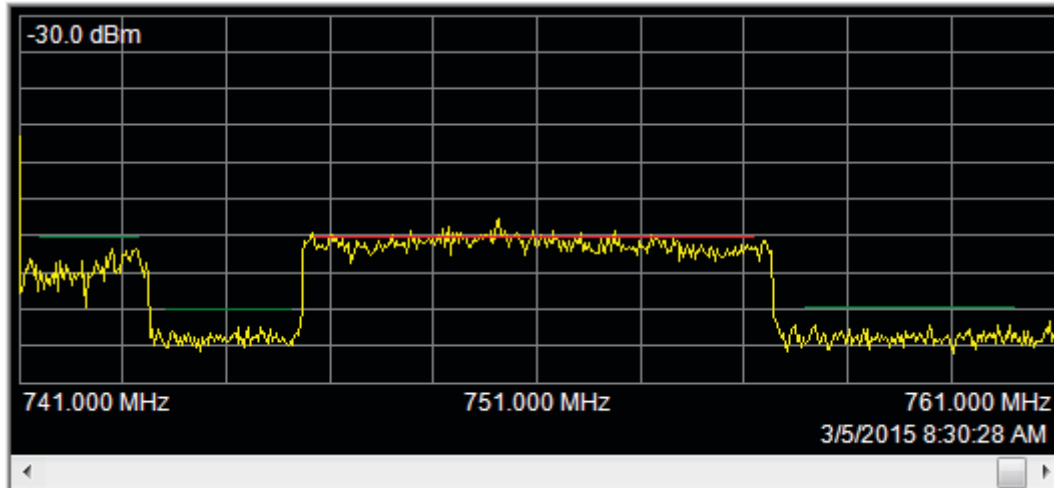


Figure 1-5. Trace Panel

If you select a block in the Trace Matrix that contains more than one trace, all the traces for that block are drawn simultaneously in the trace panel. See [Figure 1-9, "Trace Matrix with Multiple Traces per Block"](#). Four buttons will appear in the upper right corner of the display. These buttons allow you to select between seeing all selected traces as overlays, apply for Min Hold, Max Hold, or Averaging modes to the traces.

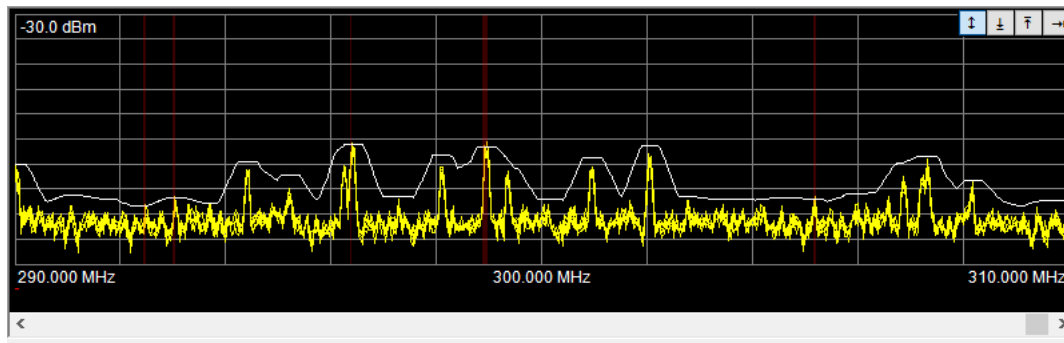


Figure 1-6. Trace Panel with Multiple Traces in Data Block

1-6 Spectrogram

Displays all of the traces collected from the 12 channels of the selected base station. The trace displayed in the Current Trace Panel is indicated by the short white line at the left edge of the display panel. Use the scroll bar on the right to view all of the traces.

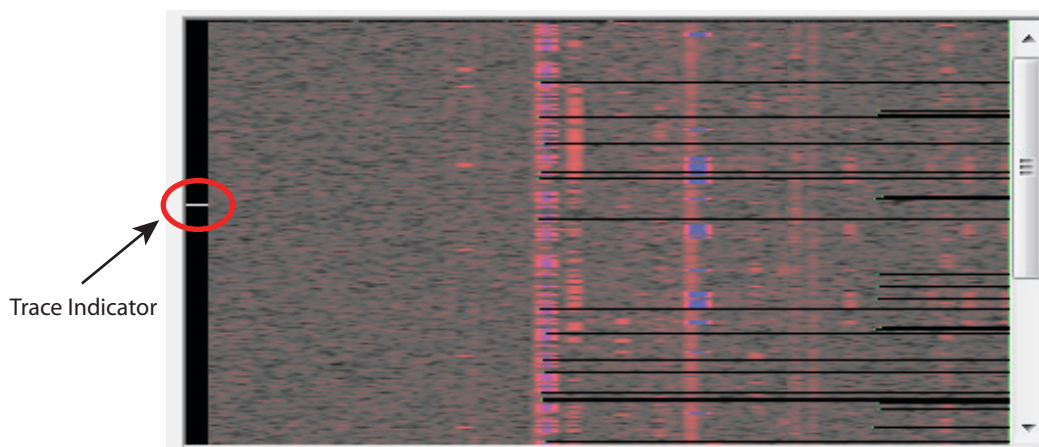


Figure 1-7. Spectrogram

1-7 Trace Matrix

Useful to observe interference signal patterns that are occurring based on time and day. At the top right corner of the Trace Matrix display are two buttons. The one that looks like a clock is for adjusting the start time of the trace matrix. Normally, the start time is the current time. If there are no recent traces in the database, the trace matrix may appear empty even though there are many traces in the database. These will not be shown if they are older than the time span shown in the trace matrix. Pressing the **Start Time** button adjusts the trace matrix to begin at the time of the last trace in the database for the active channel.

The **Color Bars** button allow you to change the color scheme of the of the data blocks in the matrix from green, red, and yellow to blue, yellow, and green.

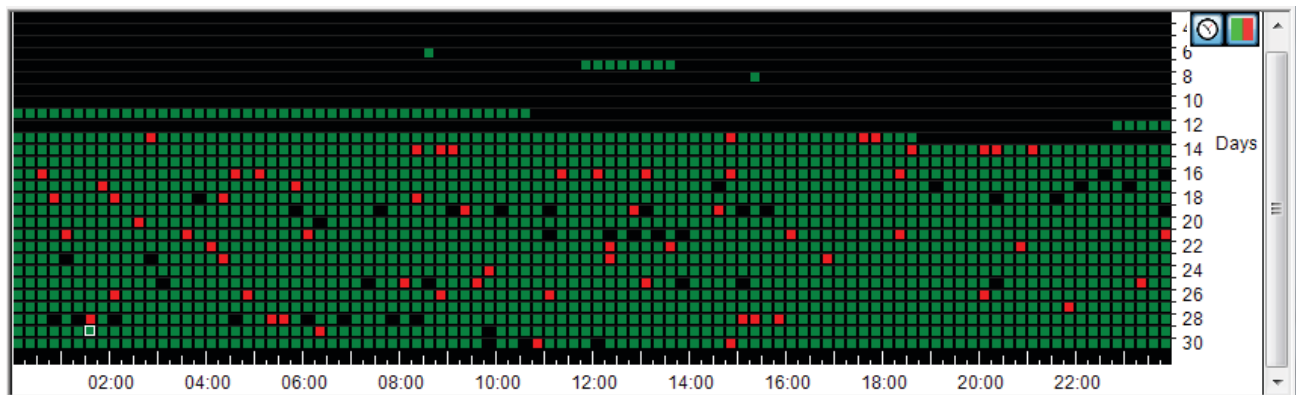


Figure 1-8. Trace Matrix with One Trace per Block

Depending on how you set up data collection, multiple traces can be collected during one data block. In that case green means all traces in the block pass. Red means all traces in the block fail. Yellow means that some pass and some fail. For example, data collection is set to 10 seconds and the time frame in Vision Monitor is set to 6 hours making a data block 20 seconds long. This results in acquiring two traces for each data block and the color coding shown in [Figure 1-9, “Trace Matrix with Multiple Traces per Block”](#).

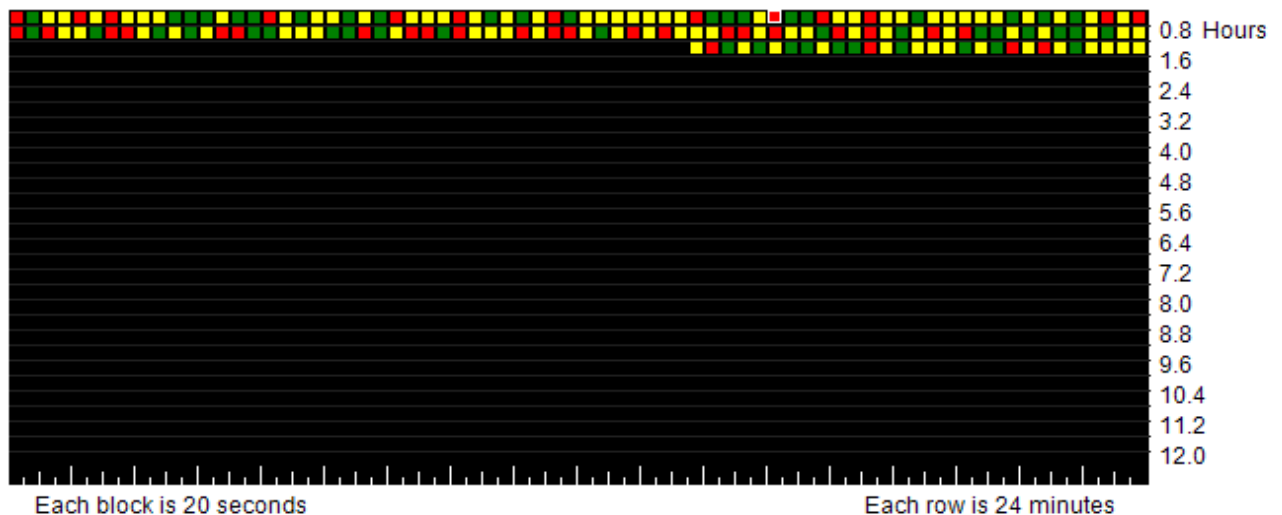


Figure 1-9. Trace Matrix with Multiple Traces per Block

1-8 Status Panel

The Status Panel is a combination of setup and status.

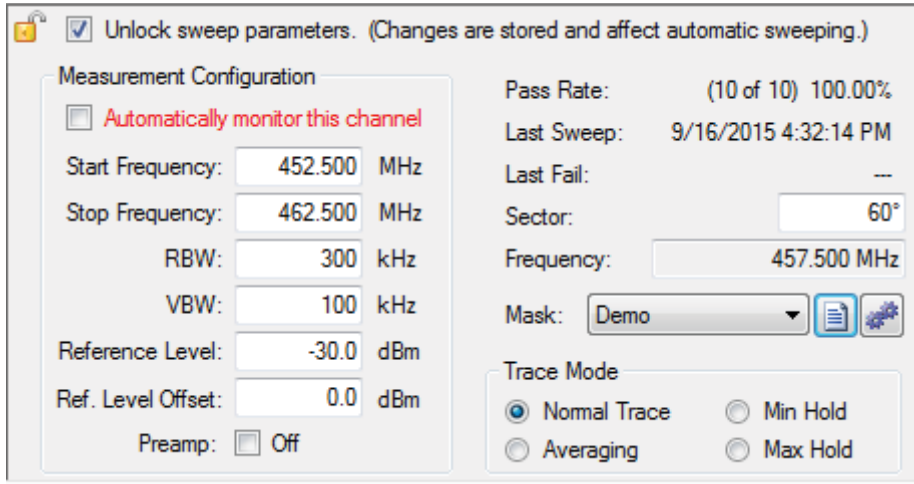


Figure 1-10. Status Panel

Unlock sweep parameters: Allows for information in this panel to be changed.

Measurement Configuration

Measurement Configuration contains the setup parameters of the spectrum analyzer in the field. If desired, they can be changed in their respective edit boxes.

- Start Frequency
- Stop Frequency
- RBW
- VBW
- Reference Level
- Ref. Level Offset

Status

- **Pass Rate:** Displays the total number of traces in the channels, the number of traces that passed, and the pass percentage.
- **Last Sweep:** Date and time of the last sweep.
- **Last Fail:** Date and time of the last trace that failed.
- **Sector:** The direction of the antennae in relation to north.
- **Frequency:** The center frequency of the transmission band.

Mask Setup

1. Check the **Unlock** sweep parameters box. This allows parameter changes and editing.
2. To create a new mask, press **Mask Editor** to open the Limit Line Editor. Go to Step 5.
3. For existing masks, press the down arrow for Mask to display the list of masks.
4. Highlight and click on the desired mask.
5. Use the tools in the toolbar to edit or create a mask.

Next to the Mask Editor button is the Apply Mask To button. When pressed, it opens the Apply Mask To dialog. You can apply the selected mask in the limit line list to historical trace data in the database. You can choose to apply the mask to the selected channel, the current base station, all channels in the column or all channels in the table. Masks can also be applied to channels within a group or base stations within a groups. These groups were previously made using the Probe Groups function in the Base Station Context Menu or when creating a database. When a mask is applied to trace history, the status of previously collected traces is updated as are pass/fail statistics for the channels affected. Changing the mask in the list affects future traces acquired, but not the status of traces already stored in the database. To summarize:

- To change the mask only for future traces, change the mask without clicking on **Apply**.
- To change the mask for both past traces and for future traces, click on **Apply**.

Refer to [Section 1-12 “Limit Line Editor”](#) for more mask editing information.

Trace Mode

Select the desired Trace Mode Setting.

- **Normal Trace:** Displays data for the current trace sweep.
- **Averaging:** Shows an exponential average of a number of traces.
- **Min Hold:** Shows the cumulative minimum value of each display point over many trace sweeps.
- **Max Hold:** Shows the cumulative maximum value of each display point over many trace sweeps.

1-9 Location Finder

Review the data from the Base Station and Channel Directory. Hold down **Ctrl** on the keyboard and click on a channel of three base stations in the area where an interfering signal is suspect. Then press the **Location Finder** button to open the Source Locator window.

If you have selected three probes and have tried to open the Locator window but a message pops up informing you that they could not be found, it is possible the options looked for are not installed on the probes. Or, the probes may have the options installed but the database needs to be updated. The probe context menu has an selection to update the probe options to the database. See also [Figure 1-16, “Status Bar”](#).

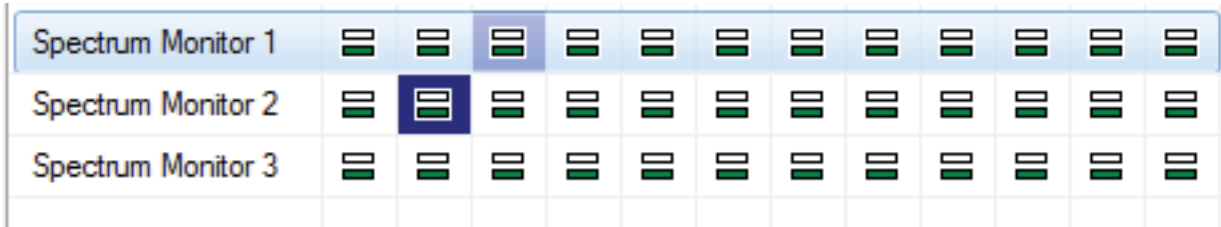


Figure 1-11. Channels Selected for use with Location Finder

The trace panels on the right side of the window are the signals from the base stations selected in descending order. A mini tool bar is above the top trace panel that includes the buttons:

- **Sync:** Use Sync to toggle time synchronization between the three probes used in the location algorithm. Each trace graph has a horizontal scroll bar that allows the user to scroll through the trace history and look for a particular trace that exhibits the interference most strongly.
- **Live:** Initially when the Source Locator opens, the last sweep taken is displayed in the trace panels for each of the selected probes. Press **Live** to view the trace measurements in real-time.
- **Sweep Config:** Press this button to open a sweep configuration dialog. This allows you to adjust the sweep parameters for each of the probes. This is useful for viewing live sweep data – it does not affect the sweep parameters stored in the database.
- **3 Probes/1 Probe List:** Select the desired probe quantity. To view signals at a single probe, select **1 Probe** from the Probe pull-down list above the top trace display. 1 Probe detection is only useful if the interferer can be seen in the sweep data on 2 more channels on the same probe. Click **3 Probes** in the pull-down list to triangulate the interferer position when it can be seen on 3 near-by probes.

Also at the top right corner of the three trace displays is a pull-down list. Use this list to select another channel in triangulating an interferer signal. When the Source Locator window opens, a best guess determination for channels is made for the three probes. You can select a different channel from the pull-down list. Select a channel that is closest in direction and frequency to the interferer signal.

Another function for fine tuning the frequency when searching for the interferer is through the graph. Click in a trace display and a red marker line will show. Move the marker line by:

- placing the cursor on the desired frequency and clicking the left mouse button
- scrolling the mouse wheel till the red marker line is on the desired frequency
- pressing the left or right mouse buttons to the desired frequency.

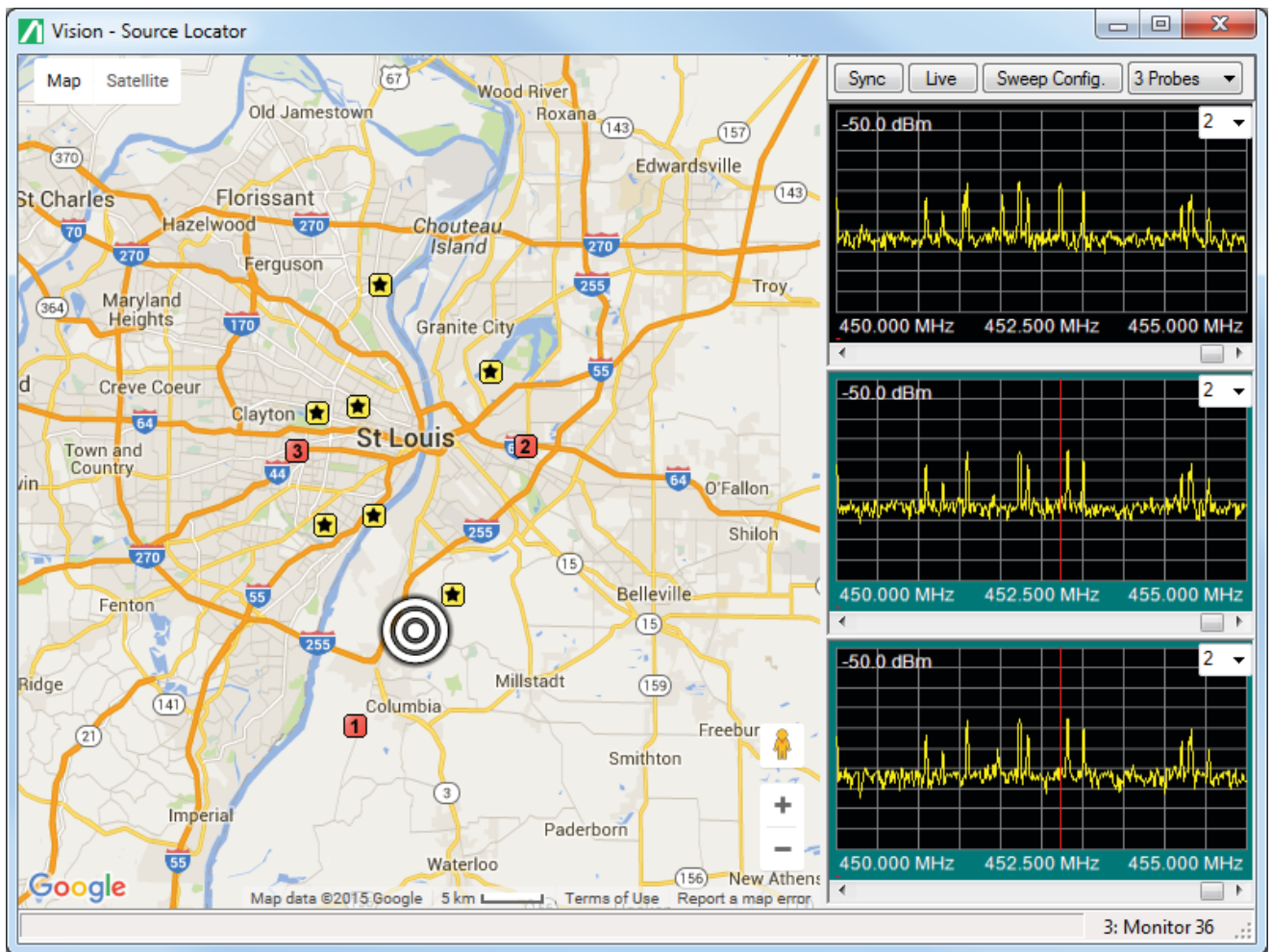





Figure 1-12. Source Locator Map

| Icon | Description |
|---|---|
|  | <p>Base Stations selected on the Base Station and Channel Directory to locate the interfering signal. The short lines that extend out from the square depict the direction of the interferer signal. For a view of the interfering signal's direction from a single probe, click the desired probe represented by a number or star then select 1Probe from the Probe pull-down list above the top trace display.</p> |
|  | <p>Base Stations that are close by that can be used to locate the interfering signal. Click on this base station icon to make it one of the three base stations locating the interfering signal. At the same time, the last active number icon base station will turn into a star icon. The trace for the base station will change accordingly in the trace panel.</p> |
|  | <p>The approximate location of the interfering signal based on the information from the selected base stations.</p> |

Once in the Source Locator Map, you can select another probe that may provide better data for triangulating the interferer signal. Click on one of the active three probes, numbered and colored red), or click on the side or bottom border of the desired trace panel. Click on a base station, symbolized by yellow square with a black star, to become the new active probe. It becomes numbered and red. If you switch from 3 Probes to 1 Probe, this new active probe is used.

1-10 Probe Map

Clicking the **Show Probe Map** button, the right side panel will change to Probe Map view. The blue pins displayed represent the base stations in the Base Station and Channel Directory window. The highlighted base station in the Base Station and Channel Directory will be represented by a bouncing blue pin. The map can be viewed in street map, terrain, and satellite modes. Use the **+** and **-** buttons to zoom in and out of the map. Use the drag mode of the cursor to adjust the location view of the map. Drag the person icon to the location of the pin to get a ground level view of that location. Use the Filter on the Tool Bar to view base stations based on specific criteria.

If you do not have an Internet connection or if Google Maps is not allowed at your location, you can use an already developed map or create a map using OpenStreetMap for off-line viewing. For more information see [Chapter 4, “Map Creation”](#).

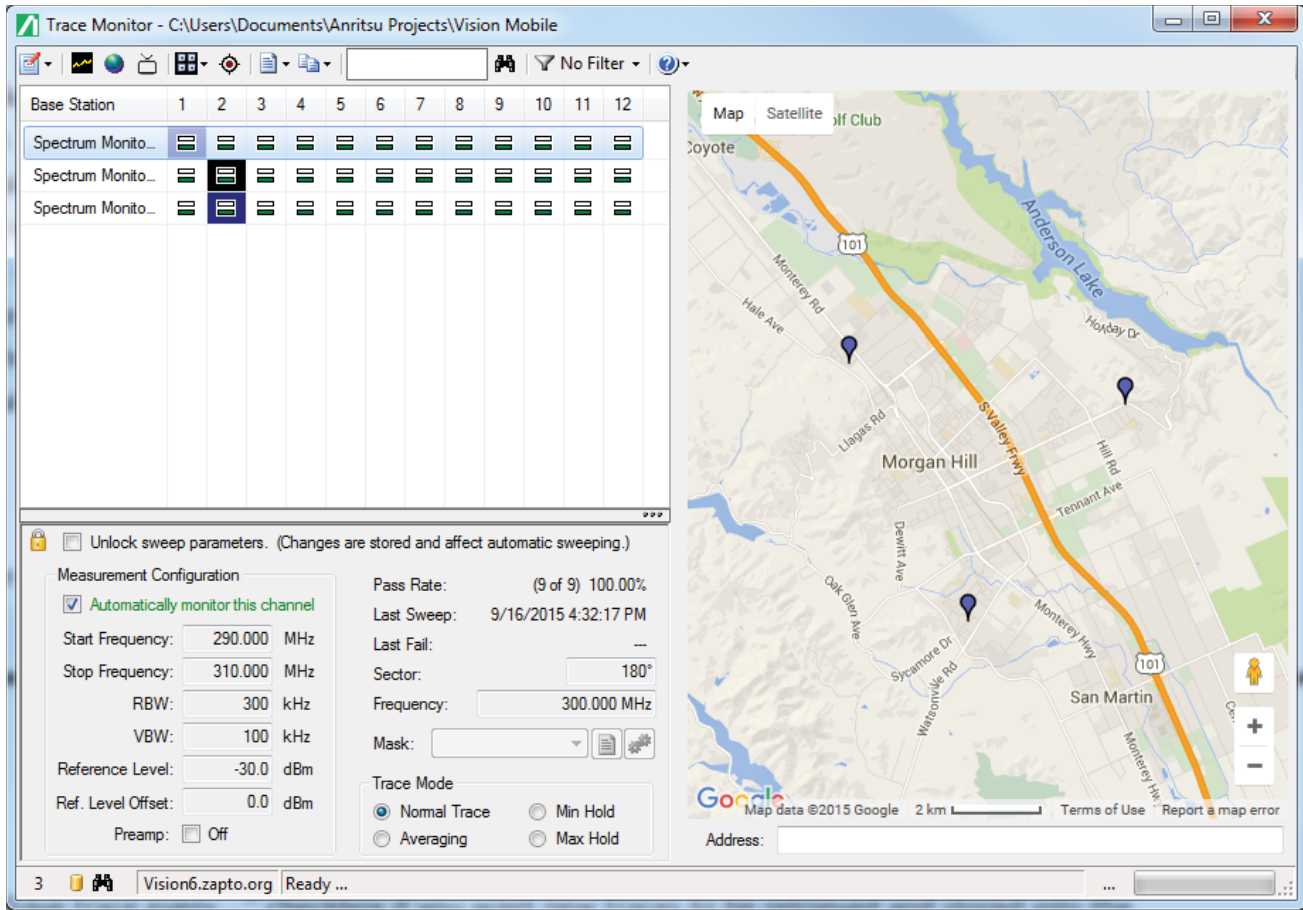
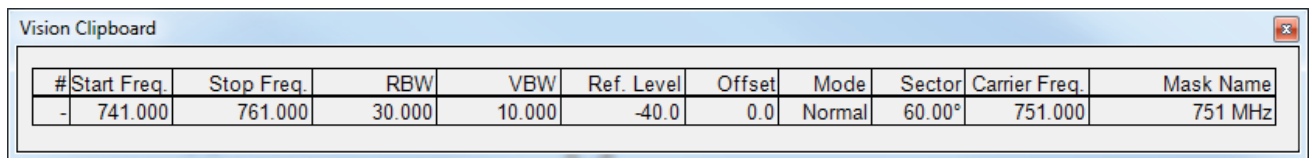


Figure 1-13. Probe Map

1-11 Copy & Paste Functions

The Copy and Paste Function allows you to copy Measurement Configuration information, Sector, Frequency, Mask, and Trace Mode information to the Vision Clipboard.

Press the Copy & Paste list arrow button to display the various copy and paste functions. Setups can be done efficiently by copying the setup of one channel to another or to multiple channels. Click on the desired Copy/Paste function. To view the information that was copied in the Vision Clipboard, click View Vision Clipboard.



| # | Start Freq. | Stop Freq. | RBW | VBW | Ref. Level | Offset | Mode | Sector | Carrier Freq. | Mask Name |
|---|-------------|------------|--------|--------|------------|--------|--------|--------|---------------|-----------|
| - | 741.000 | 761.000 | 30.000 | 10.000 | -40.0 | 0.0 | Normal | 60.00° | 751.000 | 751 MHz |

Figure 1-14. Example of the Vision Clipboard Contents

- **Copy Selected Channel Details (Ctrl+C):** Copies the details of one channel, the selected channel, to be copied to other channels using the Paste Channels Details, Paste Channel Details to Entire Column, or Paste Channel Details to Entire Column in Group functions.
- **Copy Selected Probe Details (All Channels) (Ctrl+B):** Copies the details of the selected probe to be copied to other probes using the Paste Probe Details to Select Probe, Paste Probe Details to All Probes in Group, or Paste Probe Details to all Probes functions.
- **Paste Channel Details (Ctrl+V):** Paste the information you obtained using the Copy selected Channel Details function onto the desired channel.
- **Paste Channel Details to Entire Column in Group:** Paste the information you obtained using the Copy Selected Channel Details function onto the desired channel column in the selected channel group. Select the desired column from one probe in the group to accomplish this task.
- **Paste Channel Details to Entire Column:** Paste the information you obtained using the Copy Selected Channel Details function onto the desired channel column.
- **Paste Probe Details to Select Probe (Ctrl+G):** Paste the information you obtained using the Copy Selected Probe Details function onto the desired probe.
- **Paste Probe Details to All Probes in Group:** Paste the information you obtained using the Copy Selected Probe Details function onto all probes in the selected group. Select one probe in the group to accomplish this task.
- **Paste Probe Details to All Probes:** Paste the information you obtained using the Copy Selected Probe Details function onto all base stations in the base station directory.
- **View Vision Clipboard:** Displays the information copied using either the Copy selected Channel Details or Copy Selected Probe Details (All Channels) functions.
- **Copy Base Station List: (Ctrl+A)** Copies the list of base stations and their channels' passing percentage. Channels with failing percentages will be colored yellow and red. The list is placed in the Windows Clipboard in two formats - a formatted version that can be pasted into a word processor or a plain text version that can be pasted into a spreadsheet or other text based programs.

You can be in either Panel View or Map View to execute the following functions - Copy Trace Image, Copy Spectrogram Image, Copy Time Chart Image. And a channel must be selected for data to be copied. The images will be copied to the Clipboard. You can then paste the copied images to any picture editor or document processor such as Microsoft Paint, Microsoft Word or Microsoft Excel.

- **Copy Trace Image:** Copies the active trace image displayed in the Trace Preview Panel to the clipboard.
- **Copy Spectrogram Image:** Copies the all of the traces for the selected channel including those not displayed in the Spectrogram Preview Panel.
- **Copy Time Chart Image:** Copies the full time chart regardless of the size of the Time Chart Preview Panel. The image size will match the current size of the Time Chart on screen. To capture a larger image, increase the size of the window in Vision Monitor by maximizing the window or dragging up the separator bar between the Spectrogram display and the Time Chart.

1-12 Limit Line Editor

Use the Limit Line Editor to create a mask that will determine the pass/fail limits of the traces collected. You can apply the mask to an individual channel or to the entire database. A panel titled How to Edit Limit Lines contains instructions and hints for developing a mask. There are two types of limit lines: segmented and trace masks. This description only describes using the limit line editor for segmented masks. The toolbar changes when editing trace masks.

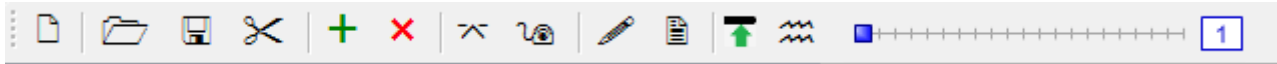





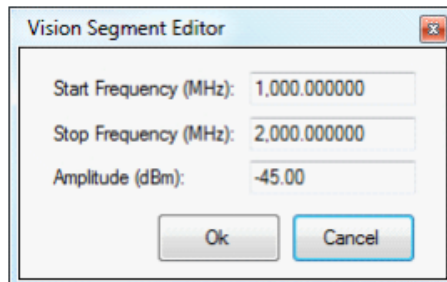
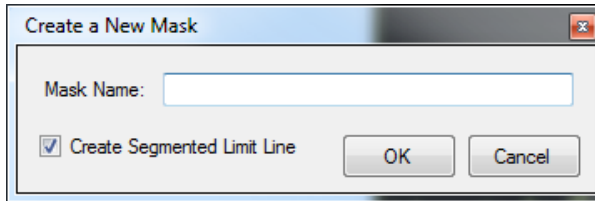









Figure 1-15. Limit Line Editor Toolbar for Segmented Masks

| Icon | Description |
|---|--|
|  | Add new limit line: Opens the dialog Create New Mask. Enter a mask name in the entry window and press OK . It will be added to the list of masks under Mask name and its segment parameters listed in the same row with its respective values. |
|  | Import Masks: The Open window displays the Documents Library. Navigate to the desired folder and select a mask file (.msk). Press Open . |
|  | Export Mask: The Save As window displays the Documents Library. Navigate to the desired folder to save the mask file (.msk). Press Save . |
|  | Cut (Delete) Masks: Removes the highlighted mask file from the list. |
|  | Add new segment to current limit line: The Vision Segment Editor opens. Enter a new Start Frequency, Stop Frequency and Amplitude in their respective entry boxes. Then press Ok . |

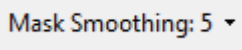
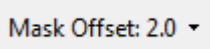



| Icon | Description |
|---|--|
|  | Delete the selected segment: Highlight the segment on the segment list or in the mask editor to be deleted then press this button. |
|  | Split selected segment: Highlight the segment on the segment list or in the mask editor to be split then press this button. The segment is split into two. |
|  | Join selected segments: Hold the down Ctrl button on the keyboard. Select the two or more segments to be joined together then press this button. The segments become one. |
|  | Draw a new segment: Click on the editor panel and the pencil becomes activated. Draw a segment at the desired location. |
|  | Edit selected segment: Click on a segment in the segment list or in the editor panel. The Vision Segment Editor dialog opens. Change the desired parameter in the dialog. Then press Ok . |
|  | Max Hold on all traces in reference set: Activates the Max Hold function. Displays the cumulative maximum value of each point over multiple trace sweeps. A typical application for employing Max Hold is to first set up your Envelope segment lines (see feature immediately below). Then activate the Max Hold feature. You can then scroll through the trace measurements and observe that all traces under consideration would pass. |
|  | Envelope segments: Uses the number of segments determined by moving the scroll bar. The number of segments will display in the box at the right end of the scroll bar. |

Select a limit line by clicking it on either the table or the graph. You can drag a limit line with the mouse to reposition anywhere on the graph. To adjust the segment size hold down the Control key and use the mouse wheel.

- For precise placement use the segment editor accessed from the toolbar.
- For crude adjustments, the keyboard arrow keys are very useful.
- For finer adjustment hold the Shift or Control keys while adjust a segment.

The Limit Line Editor tools slightly change for trace masks. While several of the Segmented Mask buttons are eliminated, three are added for Trace Mask - Mask Smoothing, Mask Offset, and Create mask over current trace data.

| Icon | Description |
|---|---|
|  | Mask Smoothing: Determines how jagged or how smooth the mask is over the trace. Press the list arrow to select the desired smoothing number. The higher the number the smoother the mask. |
|  | Mask Offset: Place the mask closer or farther away from the trace by changing the offset distance. The lower the value, the closer the mask is to the trace. |
|  | Create mask over current trace data: Press this button to immediately create an envelope of segments around the trace. You may have to use the other editing tools to create the correct mask. You can also use the mouse drag feature to move a segment around. |

To edit trace masks:

1. Press the **Create mask over current trace data** toolbar button to create/recreate a mask.
2. Set the smoothing and power offset using the toolbar drop-down lists.
3. You can nudge a section of the mask down using the left mouse button.
4. You may want to use the Max Hold button before creating the mask.

Changing the mask in the list affects future traces acquired, but not the status of traces already stored in the database.

1-13 Status Bar

The Status Bar displays information relating to the number of probes, the URL or IP address of a probe, installed options, database location and loading of database information.

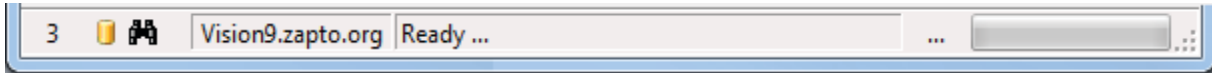


Figure 1-16. Status Bar

| Icon | Description |
|--------------------|---|
| 3 | Displays the number of probes (remote spectrum monitors) found in the database. Also, a refresh of new data stored in the database by Vision Acquire occurs approximately every 15-20 seconds. During the refresh this field with count up from 1-100% indicating the progress of the update process. |
| 📁 | Indicates Vision software, option 400, is installed. |
| 🔭 | Indicates Vision Source Locator software, option 401, is installed. |
| Vision9.zapto.org | Displays the URL or IP address of the probe. |
| Ready ... | When selecting or setting the database location, the folder and file destination is displayed. When selecting a channel, the probe (spectrum monitor) and channel number are displayed. During the refresh of the selected channel's database the date and time will be displayed. |
| ... [Progress Bar] | Indicates the loading of database information into the software for the channel selected. |

Chapter 2 — Vision Acquire

Vision Acquire collects traces from multiple spectrum analyzers located at base station sites. The trace collection is periodical configured by the user. Vision Acquire also maintains the database of traces by archiving them, removing old ones, and compacting and compressing the database if necessary. If desired, email notifications can be sent to the individual in charge of monitoring the traces.

Vision Acquire is not set up to run automatically at startup. It can be changed by selecting **Set Program to Run Automatically** in the user interface located in the System Tray of the toolbar. See [Figure 2-2, “Vision Acquire Icon in System Tray”](#).

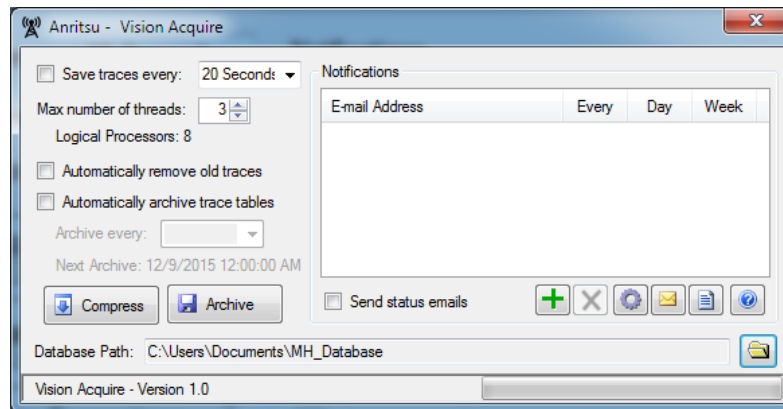


Figure 2-1. Anritsu - Vision Acquire User Interface

To close the application, click on the “Show hidden icons” up arrow button on the Taskbar to display the window of active applications. Right click on the antenna and click **Exit**. The application closes. Clicking the **X** button in the top right corner of the user interface window will not quit the program.

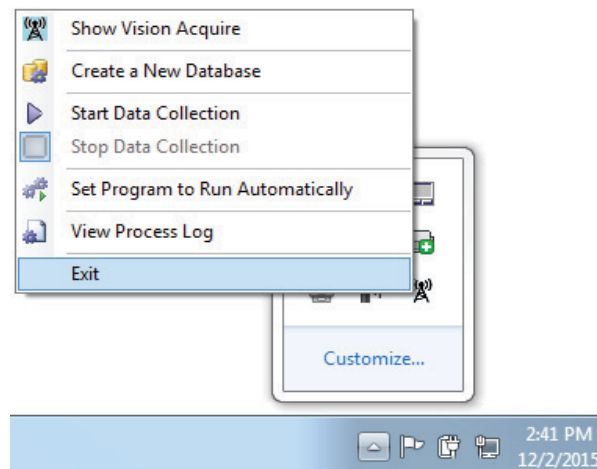


Figure 2-2. Vision Acquire Icon in System Tray

2-1 Trace Setup

For a typically large scale deployment of 1000 remote probes, it can take considerable time to collect all of the trace data. For the case of 1000 probes, each with 12 channels, the system needs to setup and acquire 12,000 unique traces in each collection run. If it takes 2 seconds to switch the channel and set the desired frequency range, reference level and trace mode, wait for the sweep to complete, and then retrieve the data. With this setup, we need 24,000 seconds to complete the entire acquisition run. That is almost 7 hours if each is done sequentially. Acquiring a sweep trace once every 7 hours is not really monitoring each channel. For this reason, Vision Acquire uses multiple processor threads so it can simultaneously talk to multiple remote probes at once. If you use 24 threads the total acquisition time is more like 20 minutes. You can set up to 64 threads; however, the optimal number depends on the speed and processor count of the server running Vision Acquire. The time to collect from each channel may be different than the two seconds used in the example above. It will take longer if you are using Min Hold or some other form of trace math, and also longer if the network connection between the server and the remote probes has a lot of lag time. You will need to adjust the acquisition interval and thread count to get optimal performance on your server and network setup. If the data collection run takes longer than the set time, then the next run starts approximately 3 seconds after the previous is completed. The next acquisition run will not launch in competition with one that has not completed.

As each trace is collected it is tested against a limit line mask. If the trace exceeds the mask, that trace is marked as having failed. At the end of each run, a report is generated listing each channel that failed. Depending on settings, the database may store weeks or months of trace data, so the report also includes sections for channels that have failed in the past hour, the past day, the past week, and the past month. Users who want to be notified can register to receive this report via email. There is an option to receive the report at the end of each run, at the beginning of each day or each Monday morning, depending on the user's role in the company and the level of notification they desire. There is also a contact for each probe individually, and an email can be sent just for that probe when it has a channel failure. The user interface provides a table where contacts are registered and the level of reporting is indicated by checking a box. There is also a check box that enables sending emails. If this is not checked, no emails will go out.

There are several database maintenance features available through the UI. If the check box is clear for removing old traces, then nothing will get automatically removed and the trace tables will continue to store old data and grow very large. Keep in mind that a typical installation with 1,000 probes will store 12,000 traces 4 times an hour. Using rough numbers, that is 50,000 traces per hour, or 1.2 million traces a day. If you store 30 days of data, that is almost 40 million traces in the database. Each trace takes around 4,000 bytes, so we have 160 Gigabytes of data. If you let that go several months without removing old traces, it can become quite large and unwieldy, potentially exceeding space available and certainly affecting system speed and responsiveness.

Save traces every

Click the check box in front of the "Save traces every:" text to begin the collection of traces to the database. Uncheck to stop data collection. Following the "Save traces every:" text is a number box to set the data collection period in hours, minutes, or seconds. Scroll down in the dropbox for the desired time or press the up/down arrow buttons to the desired time. You must select one of the timing options in the drop down box. Alternative time intervals are not allowed.

Max number of Threads

This is the number of traces to be collected during the data collection period. The number of threads represents the number of probes under simultaneous communication. It cannot be more than the number of probes in the database.

Logical Processors

This is the number of processors in the computer used to collect traces. Data collection is very processor intensive. The more processors used the lighter the workload on the computer.

2-2 Database Setup

Automatically remove old traces

Check this box to remove old traces from the database. Old traces are removed once each day following the first data collection after 6:00 am.

Automatically archive trace tables

Check this box to archive the trace tables into the database. Click on the **Archive every** drop-down list. Select the desired amount of time for archiving the trace tables. Next Archive will notify you when the next archiving process will take place.

Compress

Compact & Repair Database immediately compresses the data in the database file. It removes the unused space created by the deletion of old traces from the database. If Vision software seems to be running unusually slow, compacting the database may be necessary.

Archive

You can save the current database to a different directory location. Press this button to open the Browse For Folder dialog. Select a folder or Make a New Folder to place the archive database. Press **OK**. This makes a copy of the active database, but new traces are still added to the old database.

Database Path

Displays the directory location of the current database. Press the folder button to select a different database. This will not create a new database, but will point Vision Acquire to a different existing database for future data storage.







2-3 Notifications

Send status emails

Check this box to have a message sent to the persons (on the email list) managing the trace collection that the collection period is complete. You must setup the email configuration before this will become active.

Toolbar

The Toolbar icons are used for notifications settings.

| Icon | Description |
|---|---|
|  | Add new email address: Press to add a new email to the Notifications list. A box containing [New] will be listed under the Email Address column. Enter the email into that box. |
|  | Delete an email address: Press to delete an email address from the Notifications list. Highlight the email address to be deleted. Press this button. A prompt will display to confirm you want to remove the email from the list. Press Yes and the email is deleted. |
|  | Configure e-mail: Press this button to open the Email Configuration dialog. Enter the Host name and Port Number of the email server. If the User Authentication box is checked, enter the User name and Password for the email account listed. If needed, refer to your IT administrator for assistance and the necessary information. |
|  | Send Email to Selected Address: Press to immediately send an email to the listed email recipients with the list of traces in the database. |
|  | Generate Status Report: A report titled Vision Monitor Failure & Status Report is generated and placed in the default browser. |
|  | Help: Opens this Help file. |

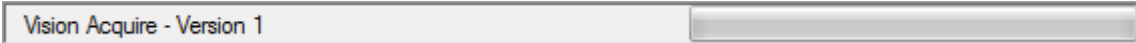
Status Bar

Version

Displays current software version.

Progress Bar

A visual display of the data collected for the time set.



Vision Acquire - Version 1

Figure 2-3. Status Bar

Chapter 3 — Vision Create Database

Base Station Database Creator

Vision Create Database creates a database consisting of base stations, channel setup definitions, and mask definitions for use by Vision Trace Monitor. Databases can be created by converting comma separated value base station files into database files. Databases can also be created by manual entry of database information into the New Database Description dialog.

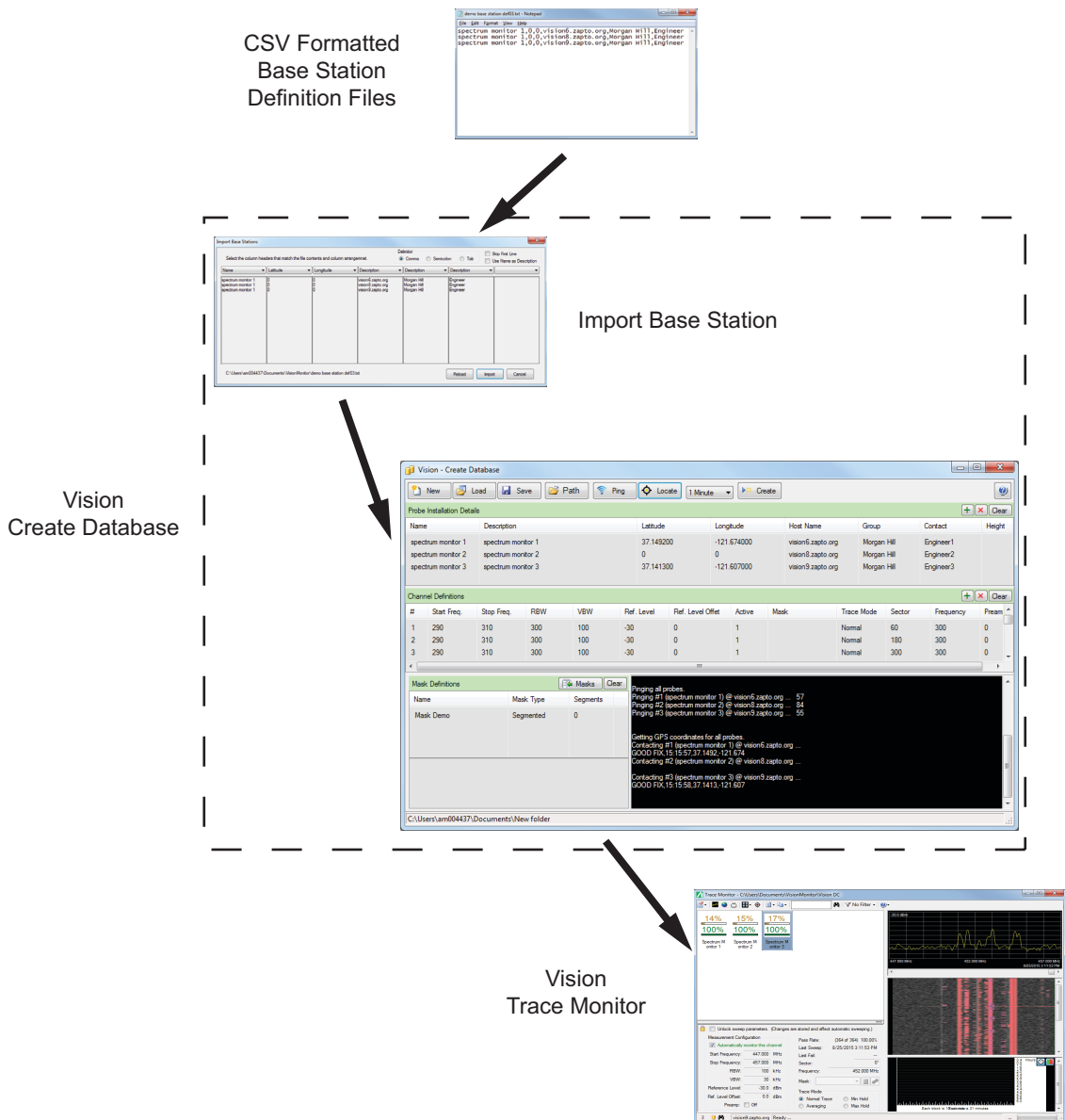


Figure 3-1. Vision Create Database Work Flow

3-1 Overview

The Vision - Create Database graphical user interface (GUI) includes a Tool Bar, Probe Installation Details List, Channel Definitions, Mask Definition, and a Response Data window. (Throughout this chapter “probe” will be used interchangeably with Remote Spectrum Monitors.)

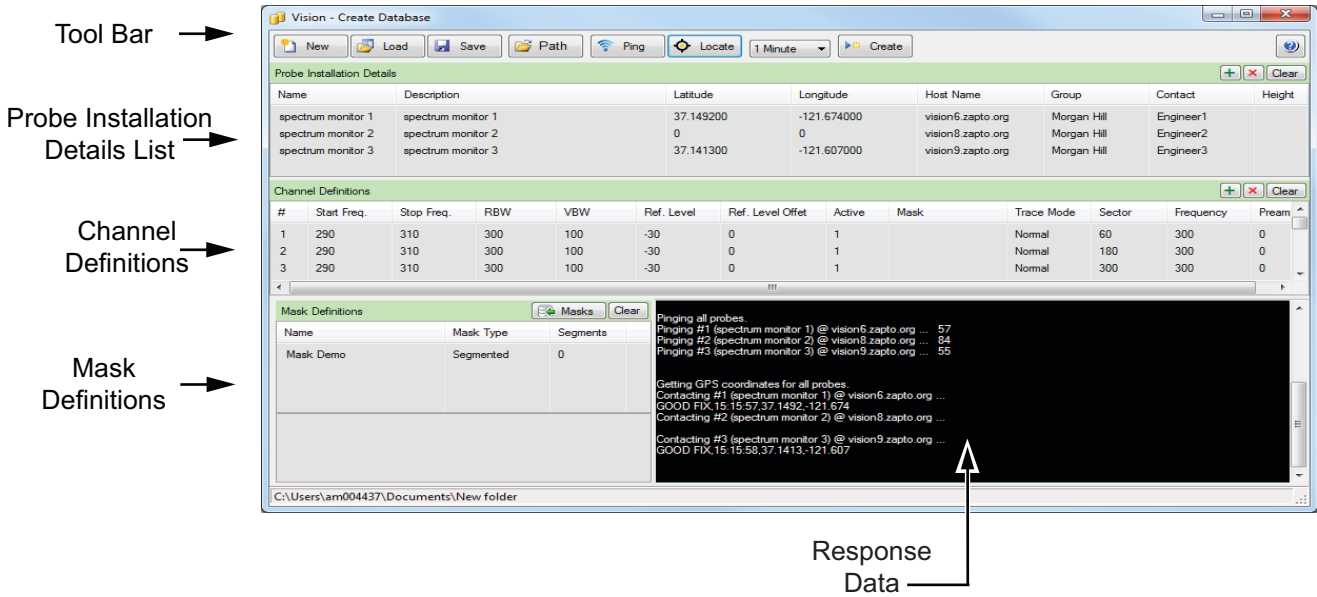


Figure 3-2. Vision - Create Database Software GUI

Tool Bar

The Tool Bar contains buttons used in creating a database file. See Table - Tool Bar Buttons Definition.

Table 3-1. Tool Bar Buttons Definition

| | |
|-------------------|---|
| New | Opens the New Database Description dialog to create a new definition file or database file from a base station list file. This file is in comma separated value (CSV) file format and can have the following extensions - .csv, .txt, .lst. |
| Load | Opens the Open window to load the contents of a base station definition files (.def) into the Vision - Create Database program. |
| Save | Opens the Save As dialog to save the current information in the Vision - Create Database program as a definition file. |
| Path | Sets the directory path for the base station definition files and database files. |
| Ping | Establishes communication with the Remote Spectrum Monitor. |
| Locate | Obtains the GPS Latitude and Longitude coordinates of the Remote Spectrum Monitors to place into the definition file or database file. |
| Sweep Rate | A pull down list to set a measurement cycle. |
| Create | Creates the database file for use in Vision -Trace Monitor. |
| Help | Opens this online Help. |

Probe Installation Details List

Displays information regarding the Remote Spectrum Monitors in the field. Information can include a name, description, latitude and longitude positions, a host name or IP address, group and contact name, and the height position of the Remote Spectrum Monitor.

Channel Definitions

The Channel Definitions are the setup parameters for the instruments.

Mask Definitions

Mask Definitions contain the list of mask files used in determining the pass/fail limits of the measurements taken. The Mask Type and number of segments are displayed as part of the mask description in this list.

Response Data Window

The Response Data window allows you to view responses from the Remote Spectrum Monitor after it is pinged or when the Locate button is pressed. The Locate query will return the GPS coordinates of the instrument.

3-2 How to

Three types of files can be used to create a database file:

- Base station list file: Contains probe station information in comma separated value (CSV) file format and can have the extensions .txt, .csv, and .lst.
- Base station definition file: Contains probe station and channel information including measurement setups and masks.
- Base station database: A previously created file can be used to create a new database file.

Set the Path for a Database File

1. Press **Path** on the Tool Bar. The Browse For Folder opens
2. Navigate to the desired folder or create a new folder for the definition file or database file.
3. Press **OK** when done.

Update a Base Station Definition File

Update a previously created base station definition file.

1. Press **Load** on the Tool Bar. The Open dialog is displayed.
2. Confirm or select **DB Definition Files (*.def)** as the file type to be used.
3. In the directory, locate and select the definition file.
4. Press **Open**. Data from the definition file for Probe Installation Details, Channel Definitions, and Mask Definitions loads into the Create Database program.
5. Edit the information as desired. Click once on an entry to edit. Press the **(+)** button to add a new item to the category. Highlight a line and press the **(X)** button to delete the line from a category.
6. Save the new data as a definition file.
 - a. Press **Save** on the Tool Bar. The Save As dialog opens.
 - b. Navigate to the desired folder.
 - c. Enter a File name and press **Save**. The file will save as a .def file.

Create a Database File Using a Base Station Definition File

Create a database using information from a previously created base station definition file.

1. Press **Load** on the Tool Bar. The Open dialog is displayed.
2. Confirm or select **DB Definition Files (*.def)** as the file type to be used.
3. In the directory, locate and select the definition.
4. Press **Open**. Data from the definition file for Probe Installation Details, Channel Definitions, and Mask Definitions loads into the Create Database program.
5. Edit the information as desired. Click once on an entry to edit. Press the **(+)** button to add a new item to the category. Highlight a line and press the **(X)** button to delete the line from a category.
6. Press **Create** to create a new database file. The database file is created in the directory previously set using the Path button.

Create a Definition File (.def) or Database File (.mdb) Using a Database File

Create a database file using information from a previously created database file, .mdb.

1. Press **Load** on the Tool Bar. The Open dialog is displayed.
2. Confirm or select **Vision Database files (BaseStationMonitor.mdb)** as the file type to be used.
3. In the directory, locate and select the database, .mdb, file.
4. Press **Open**. Data from the database file for Probe Installation Details, Channel Definitions, and Mask Definitions loads into the Create Database program.
5. Edit the information as desired. Click once on an entry to edit. Press the **(+)** button to add a new item to the category. Highlight a line and press the **(X)** button to delete the line from a category.
6. Press **Create** to create a new database file. Or, press **Save** to save the information as a definition file. A new database will be created in the directory set using the Path button.

Create a Definition File (.def) or Database File (.mdb) Using a Base Station List File

Create a a definition file or database file using information from a previously created base station list file, (.lst,.txt, .csv).

1. Press **New** on the Tool Bar. The New Database Description dialog opens.
2. Click the **Import Base Station list from file** radio button.
3. Manually enter the directory and filename of the Base Station List File or navigate to it by selecting the **Folder** icon. Press **Open**. You can view the contents of the file by selecting the Search button. Use the scroll bars to see the whole contents of the file.
4. Set the parameters for the base stations under Channel Description.
5. Press **OK**. The Import Base Stations window opens.
6. Set the column label names in accordance to the contents of the columns. For example, if the column contents is the host name or IP address, click the pull down list for that column and select **Host Name/IP**. If the first line of the base station list file contained labels, select the **Skip First Line** check box. If you want to use the names of the base stations as descriptions select the **Use Name as Description** check box.
7. Press **Import**. Data from the definition file for Probe Installation Details, Channel Definitions, and Mask Definitions loads into the Create Database program.
8. Edit the information as desired. Click once on the desired entry to edit. Press the **(+)** button to add a new item to the category. Highlight a line and press the **(X)** button to delete the line from a category.
9. Press **Create** to create a new database. A new database will be created in the directory set using the Path button. Or, press **Save** to save the information as a definition file.

Create a Database Manually

This is useful in creating a database for a small number of base stations.

1. Press **New** on the Tool bar. The New Database Description dialog opens.
2. Click the **Manual entry of base station details** radio button.
3. Enter the information for the number of base stations to create, base station name, base station host name. In the Probe Name and Host Name fields, you can enter '[nn]' to add sequential numbering, or enter '[nn:m]' to add sequential numbering starting at number 'm'. For example, entering 'St. Louis [nn:5]' in the Probe Name field will produce a series of probes whose names are 'St. Louis 5', 'St. Louis 6', etc.
4. Set the parameters for the base stations under Channel Description.
5. Press **OK**. The New Database Description dialog closes and the information you entered is used to populate the Probe Installation Details and Channel Details Definitions tables. You must have Latitude and Longitude coordinates in order to create the database. If you don't have Latitude and Longitude coordinates, use the **Locate** button to capture the GPS location from the probes directly only if Host Names are valid.
6. Edit the information as desired. Click once on the desired entry to edit. Press the **(+)** button to add a new item to the category. Highlight a line and press the **(X)** button to delete the line from a category.
7. Press **Create** to create a new database. The database file is placed into the directory previously set using the Path button.

Set the Sweep Rate

A sweep rate is the time it takes to repeat the measurement cycle.

1. Press the **Sweep Rate** list button.
2. Select the desired time for the measurement cycle to repeat.

Import a Mask

Import a mask file that was originally created in Vision Trace Monitor - Limit Line Editor. It can be used for pass/fail criteria for the updated or new database.

1. On the Mask Definitions bar, press **Masks**. The Open dialog is displayed.
2. Navigate to the desired Mask, .msk, file and select it.
3. Press **Open** to add the mask to the Vision Create Database program.

Chapter 4 — Map Creation

The following instructions are for creating maps used in Vision Trace Monitor. Use the OpenStreetMap web site to download your map.

Once on the OpenStreetMap site:

1. In the search box, located in the upper left, type in the city that you are looking for. Click **Go**.
2. After you have selected the desired area from the displayed list, click **Export** located above the search box.
3. To the left of the screen, below the Export button, click **Overpass API**.
4. The map data will be downloaded to your PC with the extension .osm or with no extension but listed as Type: File.

Now you need to open the map in Vision Trace Monitor:

1. Press the Configuration button on the toolbar
2. Then press **Map Source** followed by **Open Street Maps**. In the Open dialog, navigate to the folder where the map was downloaded.
3. Click the file extension drop-down button next to the Filename entry window and select **OpenStreetMap archive** from the list.
4. Locate the map file, .osm or file Type: File, that was just downloaded by OpenStreetMap.
5. Press **Open**. The OSM 2 Shape File Conversion dialog opens.
6. Enter a City and Country name for that map file and press **Ok**. The map is converted to the format used by Trace Monitor and then opened in the software program. It is placed in the directory \Documents\Anritsu MapFiles.

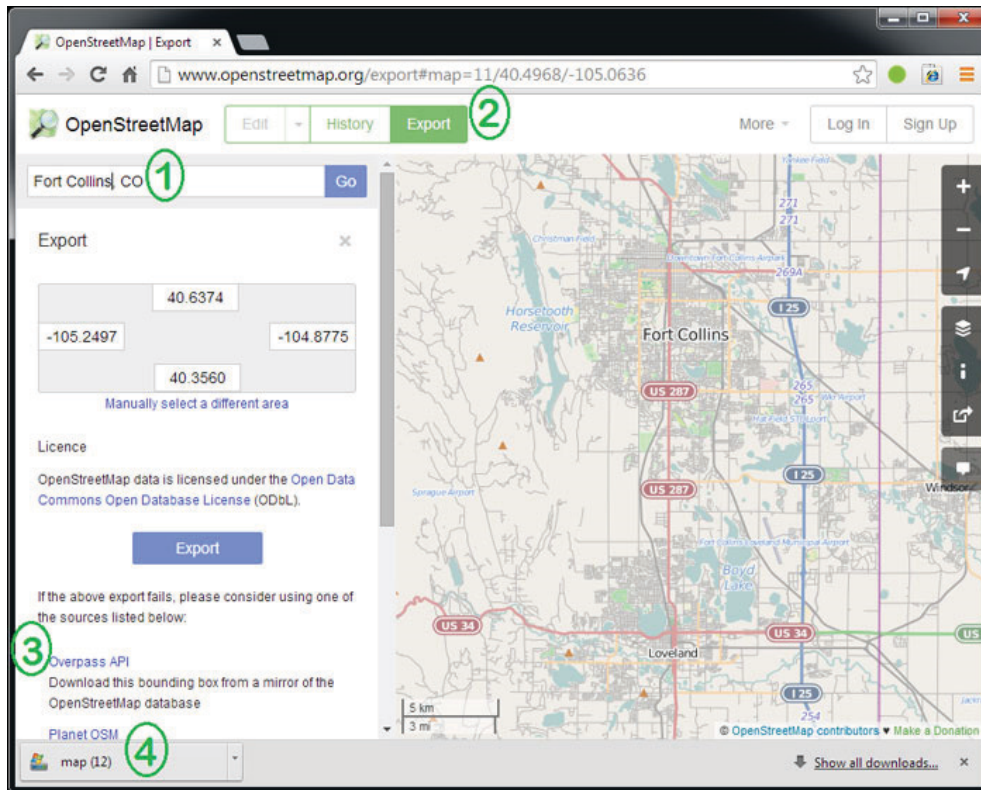



Figure 4-1. OpenStreetMap Setup Page Example

Anritsu



 Anritsu utilizes recycled paper and environmentally conscious inks and toner.

Anritsu Company
490 Jarvis Drive
Morgan Hill, CA 95037-2809
USA
<http://www.anritsu.com>