AVCOM EVO GUI
User Guide

TABLE OF CONTENTS

1   GENERAL OVERVIEW

This manual provides general information on the installation, setup, and use of the AVCOM EVO GUI for remote control of Avcom analyzers.

AVCOM EVO Software can be used to control SBS2 and EVO analyzers.

Supported Products:

- SBS2 Spectrum Analyzer
- EVO Spectrum Analyzer
- Older RSA, PSA, SNG, and SBS
- Beacon Receiver

Unsupported Products / Features:

- RSA, PSA, SNG, and SBS network search/change network settings

AVCOM EVO GUI Computer Requirements:

- Windows 7 (32-bit or 64-bit) or later
- Minimum Tested Computer Specifications
    - AMD A9-9425 Radeon R5
    - 8 GB RAM

AVCOM EVO GUI can connect and remotely control analyzers in one of three ways:

1. Directly to a PC via an ethernet crossover cable
2. In an internal network
3. Across networks through the internet

1.1   CONTACT INFORMATION

Need additional information or help please contact us at

Technical Support Group
1-804-794-2500 Extension 305
Email: TechSupport@avcomofva.com

Avcom of Virginia,
Address: 7729 Pocoshock Way, North Chesterfield, Virginia 23235 USA
Website: www.avcomofva.com
Phone: 1-804-794-2500
Fax: 1-804-794-8284

2 REVISION NOTES

Version	Notes
V1 (04/19)	Initial Release
V2 (11/19)	Update table of contents and some links
V3 (04/21)	Update Format, Add Beacon Receiver Details
V4 (04/21)	Add Recording details, Update Menu Features, Update Install and Downloads
V5 (04/23)	Add General Settings features, Add multiple shape alarm notes, Correct average formula, Correct grammar throughout, Update old figure

3 QUICK START

3.1 SOFTWARE ONLY USING ONLINE DEMO ANALYZERS OVER INTERNET

1. Obtain the software for your operating system via download or request the software from the Avcom Sales Department
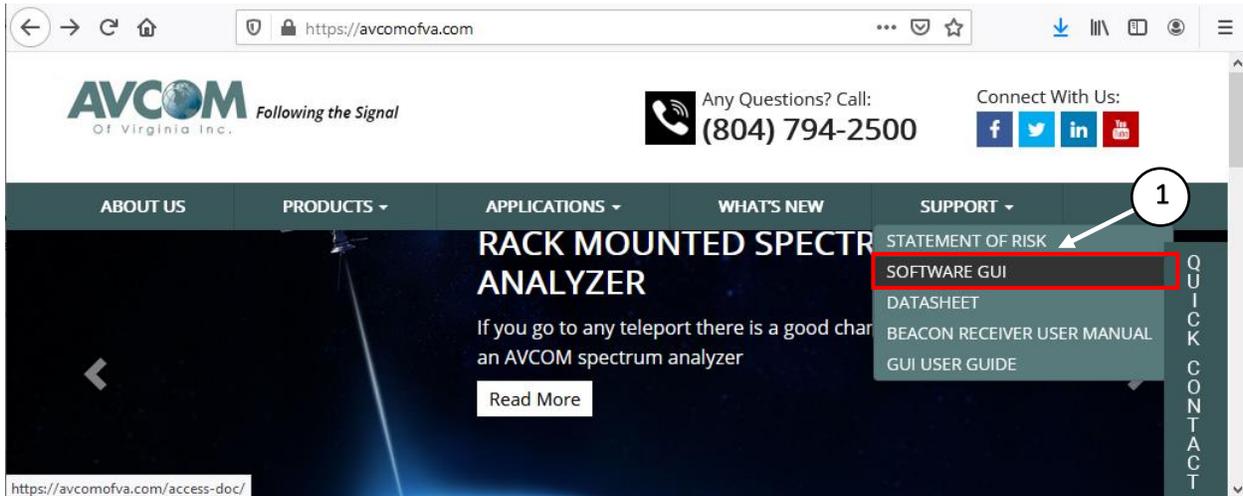   a) Download Link: https://avcomofva.com/download/

Figure 1, Avcom Website Download Menu

2. Install the software and follow the prompts. See **GUI INSTALLATION** for more information.
3. Run the application.
4. Select the analyzer from the analyzer list.
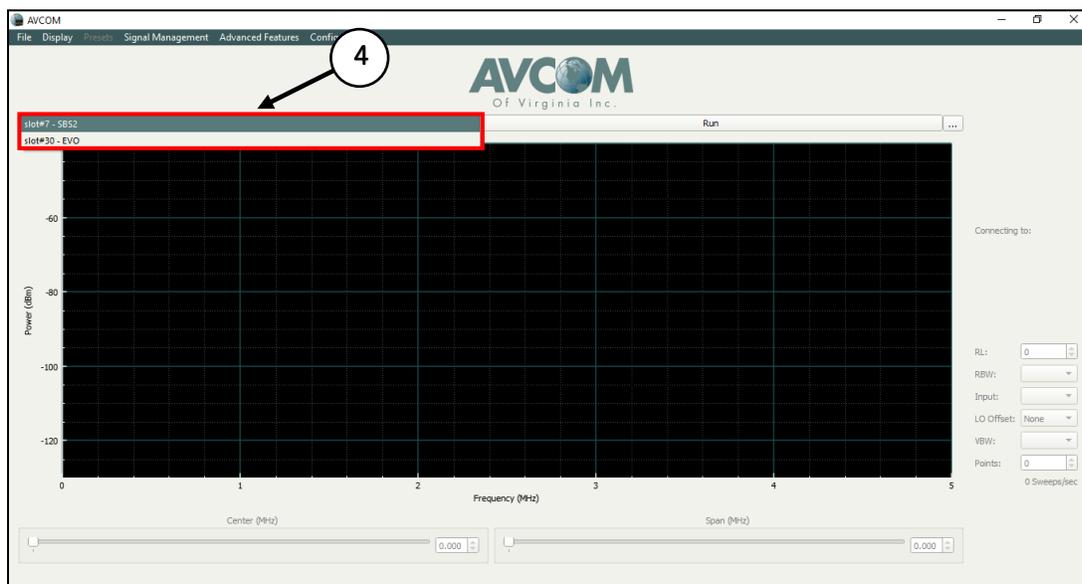   a) The spectrum analyzers are online demos for anyone to test the features of an analyzer.

Figure 2, Select Analyzer from List

3.2 SOFTWARE AND HARDWARE

1. Connect analyzer to local network or directly to PC via ethernet or USB.
   a) Local Network
      i) By default, the analyzer uses DHCP and may obtain an IP address from the network.
         (1) This is not required for the AVCOM EVO GUI to find the analyzer.
   b) Direct Connect over Ethernet
      i) Connect the ethernet port to the back of the analyzer and the opposite side to the ethernet port on the PC.
      ii) In most cases the AVCOM EVO GUI will be able find, configure, and connect to the analyzer.
         (1) For more details see the main section on network configuration.
   c) Direct Connect over USB
      i) Connect the USB to the back of the analyzer and the other end to the back of the PC.
2. Plug in the power cable.
   a) If applicable, turn the power switch to "ON" on the analyzer.
3. Run the application.
4. Go to Configure->Settings
5. If required update network settings
   a) Click on the Configure Ethernet tab
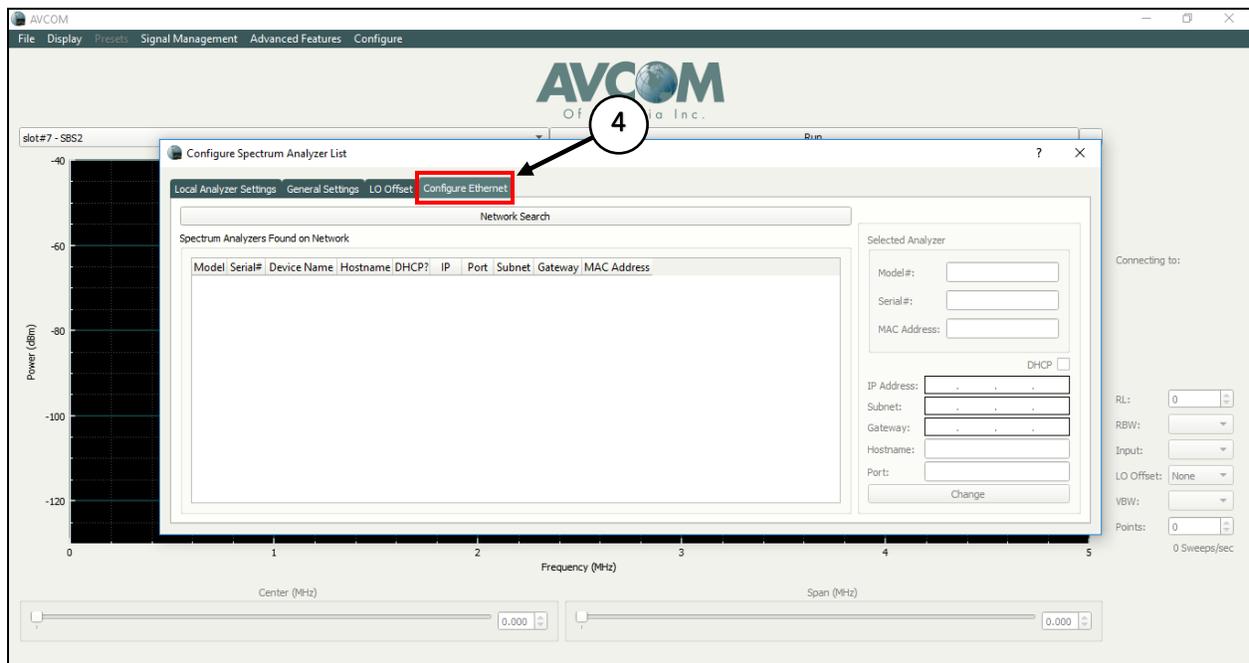
Figure 3, Settings Window Configure Ethernet Tab

   b) Click "Network Search"
      i) Users will need to allow access through the firewall.
         (1) Make sure that UDP ports 26483 and 26482 are permitted through any firewalls.
   c) Double-click on the desired analyzer in the list.
   d) Update and verify that the IP settings are correct.
   e) Click "Change"

6. Click on the Local Analyzer Settings tab.
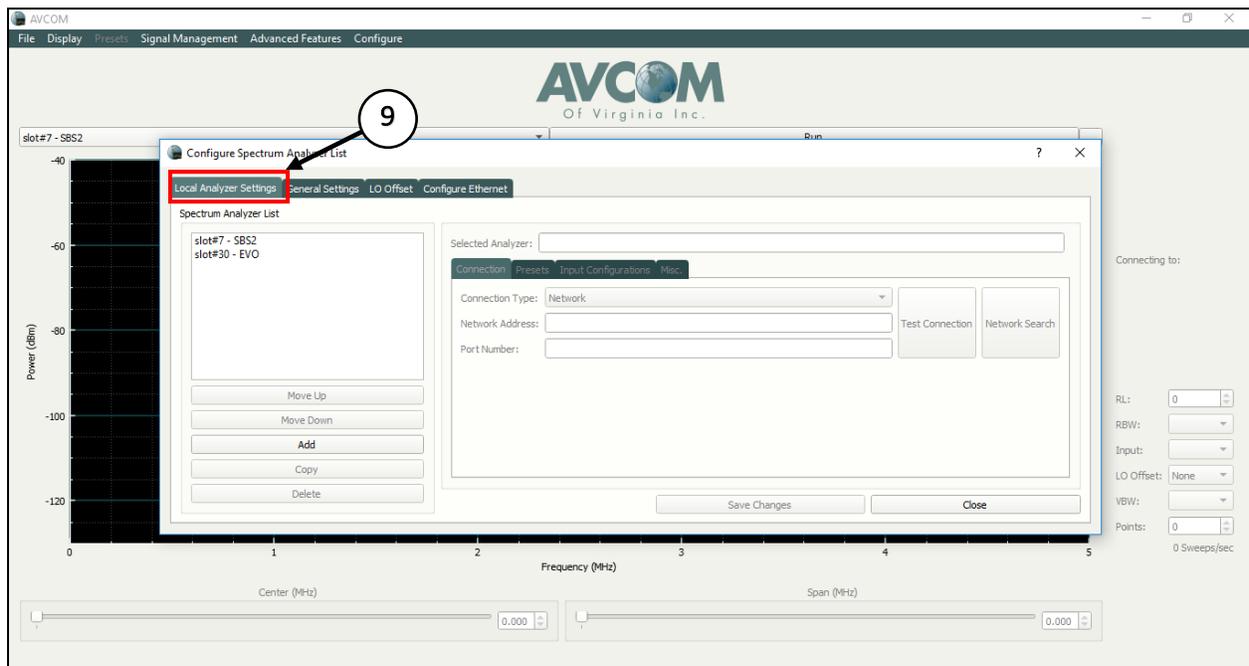
Figure 4, Settings Window Local Analyzer Settings Tab

7. Click "Add"
8. Click on the analyzer in the list.
9. In the Selected Analyzer field, name the new analyzer.
10. Click "Save Changes".
11. Click "Close" to exit the window.
12. Select the new analyzer from the analyzer list.

4 GUI INSTALLATION

4.1 INSTALLATION

Please follow the prompts from the installer executable.

Figure 5, Installation Prompts

USB: If you use an analyzer with a USB port (SBS2 only), you may need to install the FTDI USB D2XX (dll library) driver from http://www.ftdichip.com/FTDrivers.htm.

5 GUI PRIMARY CONTROLS

5.1 MAIN SPECTRUM ANALYZER SCREEN
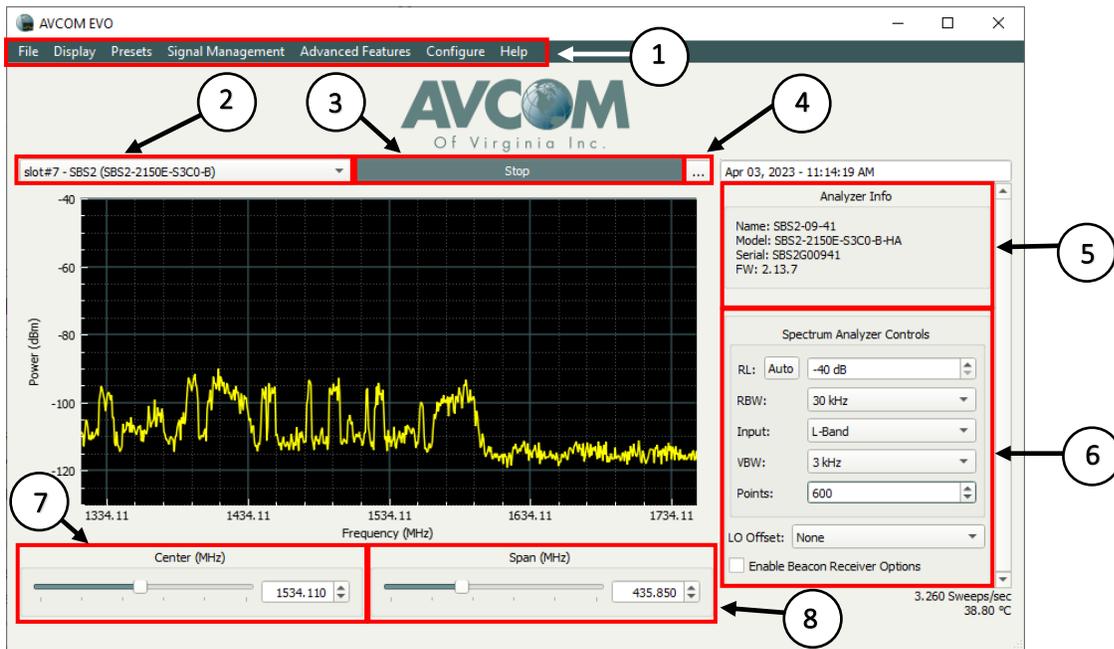
Figure 6, Main Spectrum Analyzer Screen

1. **Main Menu**
   - Used to access most functions. See the GUI MAIN MENU for more information.
2. **Spectrum Analyzer Dropdown Menu**
   - Displays a list of saved Spectrum Analyzers.
3. **Run/Stop**
   - Used to initiate or stop communications with the analyzer.
4. **Multimode Button**
   - Used to switch between single display mode and multiple display mode.
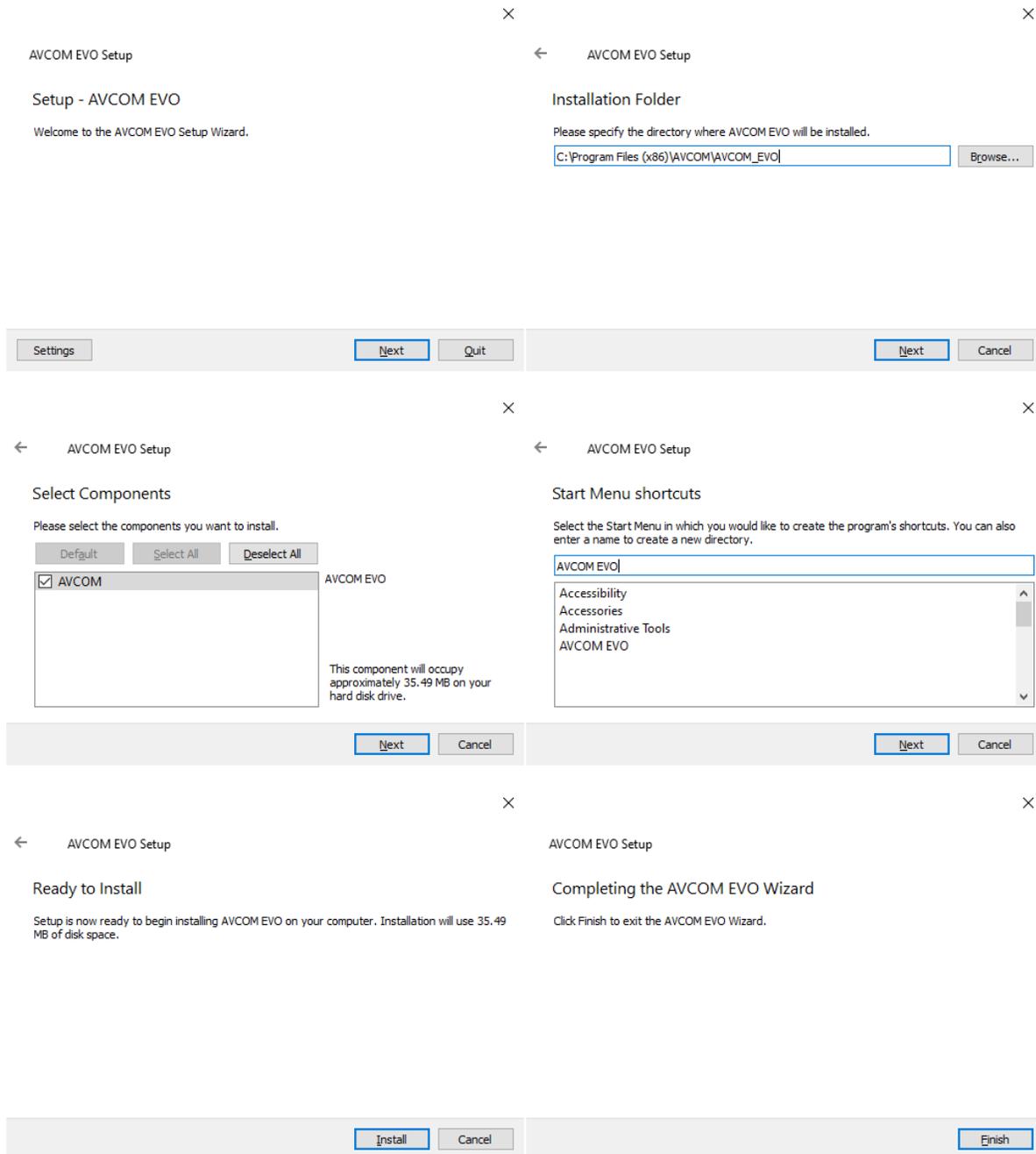5. **Spectrum Analyzer Profile**
   - Provides information about the SA that is currently selected.
6. **Spectrum Analyzer Controls**
   - RL– Spin box for selecting reference level.
   - RBW – Combo box for selecting resolution bandwidth.
   - Input – Combo box for selecting the analyzers' input.
   - LO Offset – Combo box for selecting the Local Oscillator.
   - VBW – Combo box for selecting the video bandwidth.
   - Points – Spin box for selecting and displaying the number of points in the sweep.
7. **Center Frequency (CF) Slider and Numeric Controls**
   - Used to set the desired CF.
8. **Span Slider and Numeric Controls**
   - Used to set the desired span

5.2   MAIN BEACON RECEIVER SCREEN

For beacon receiver units there will be an additional input checkbox called "Enable Beacon Receiver Options" as seen in *Figure 7, Main Beacon Receiver Screen*. When checked will change the view into a beacon receiver mode to see the corresponding inputs and outputs.

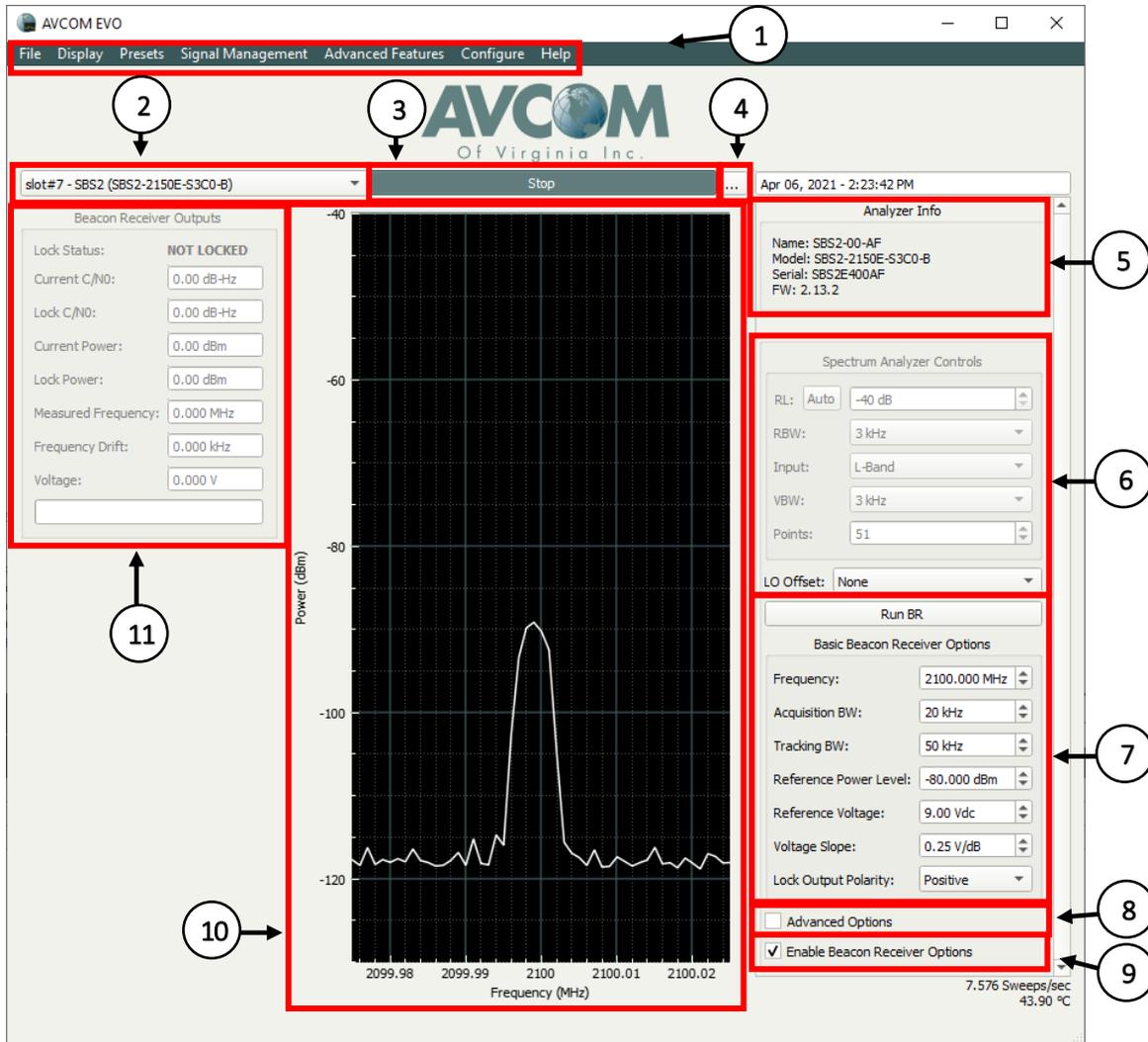*Figure 7, Main Beacon Receiver Screen*

1. **Main Menu**
   - Used to access most functions. See the **GUI MAIN MENU** for more information.
2. **AVCOM Unit Dropdown Menu**
   - Displays a list of saved Avcom units.
3. **Run/Stop Connection**
   - Used to initiate or stop communications with the unit.
4. **Multimode Button**
   - Used to switch between single display mode and multiple display mode.

5. **Analyzer/Beacon Receiver Information**
   - Provides information about the unit that is currently selected.
6. **Spectrum Analyzer Settings**
   - This displays the settings that are used on the unit.
   - These settings are not directly settable in beacon receiver mode.
7. **Beacon Receiver Settings**
   - This is where all the beacon receiver settings can be set.
   - Different options are available based on which mode.
   - For more information see the *Basic Controls* section.
8. **Advanced Options Checkbox**
   - When selected will show advanced beacon receiver settings.
   - For more information see the *Advanced Controls* section.
9. **Enable Beacon Receiver Options**
   - This is the checkbox that toggles between spectrum analyzer mode and beacon receiver mode.
   - When check changes the screen to beacon receiver mode and allows the user to set and run different beacon receiver settings.
   - If the beacon receiver is running this option will be checked and disabled because the spectrum analyzer mode is not available when the beacon receiver is running.
10. **Beacon Receiver sweep**
   - If the beacon receiver is not running and the unit is able to be a spectrum analyzer, then it will show a preview of the beacon sweep.
   - If the beacon receiver is running, then will show the sweep that is used for all the beacon receiver calculations.
   - Note, the sweep rate may not reflect the update rate chosen in the beacon receiver settings because the sweep rate is independent of the update rate.

11. Beacon Receiver Outputs

- This displays the applicable beacon receiver outputs based on the algorithm chosen.
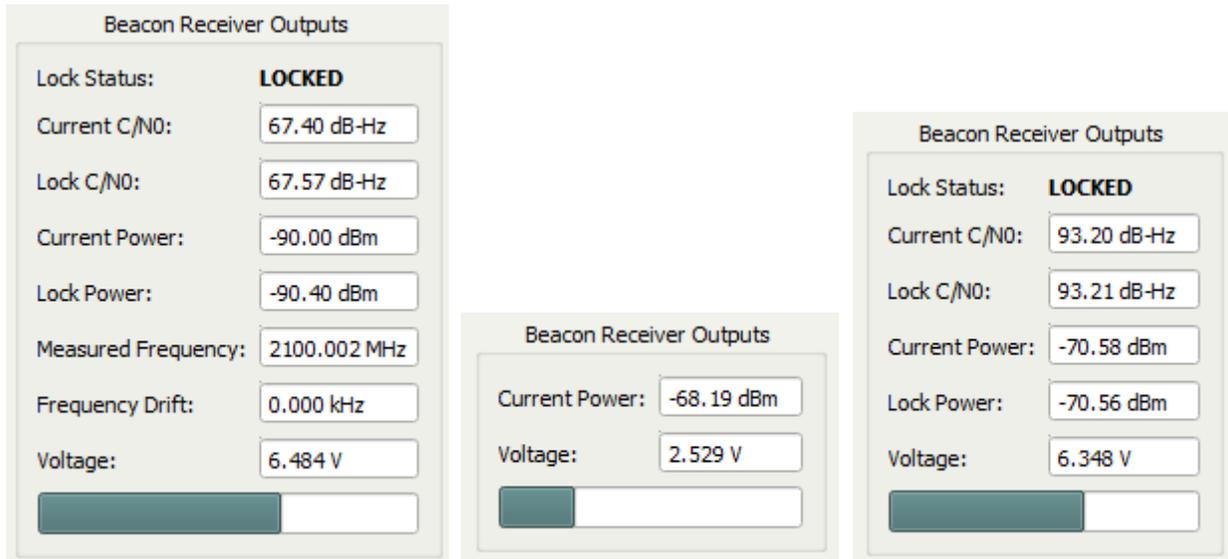
Figure 8, Beacon Receiver Outputs Peak Following and Integrated Power (Left), Tuned Power Tracking (Middle), Carrier Edge Power Tracking (Right)

- Outputs:
  i)   Locked
       - Displays the current lock state of the beacon receiver.
       - To lock all acquisition criteria must be met for at least the time to lock.
  ii) Current C/N0 (dB-Hz)
       - The current carrier-to-noise density ratio.
  iii) Lock C/N0 (dB-Hz)
       - If locked shows the carrier-to-noise density ratio at the time of lock.
  iv) Current Power (dB)
       - Current peak power.
  v)   Lock Power (dB)
       - If locked shows the peak power at the time of lock.
  vi) Measured Frequency (MHz)
       - Shows the measured frequency of the peak power location.
  vii) Frequency Drift (kHz)
       - If locked shows the frequency drift of change from the locked frequency.
  viii) Voltage (V)
       - Shows the voltage that is calculated from settings using the current power.
       - This is the same voltage that is on the analog output voltage.

5.3 MOUSE CONTROLS

Mouse inputs are determined by which selection mode you are in. If selection mode is disabled, no mouse controls will work. These features can be disabled application wide. For more information about disabling graph settings can found in the GENERAL SETTINGS section.

Table 1, Mouse Input Table

MOUSE INPUT	SELECTION MODE	
	Drag and Zoom Mode	**Marker Mode**
Left Click	Change Center Frequency to click position	N/A
Left Drag	Drag the center frequency around until mouse is released	If a marker is selected will drag the marker until mouse release
Right Click	Resets the Y-Axis to start at the reference level	N/A
Right Drag	Draws a box that represents the zoom area when released	N/A
Scroll Up	Decreases the Span Frequency	N/A
Scroll Down	Increases the Span Frequency	N/A

6   INPUT CONTROLS

6.1   ANALYZER CONTROLS

The following are settings that are applied to the analyzer.

1. **Span (MHz)**
   - This is the frequency range that is returned in the sweep trace data.
2. **Center Frequency (MHz)**
   - This is the center or reference frequency for the span.
3. **Reference Level**
   - This sets the reference level on the analyzer.
   - You should not try to view a signal of higher power level than reference level.
     i)   The applications default Y-Axis upper range is set to the reference level.
   - Lower power level signals can be monitored with lower reference levels.
4. **Resolution Bandwidth (RBW)**
   - The RBW value determines how close in frequency two signals can be before being detected.
   - The lower the RBW value (Hz) the closer in frequency two signals can be.
5. **Video Bandwidth (VBW)**
   - Decreasing the VBW improves the resolution of small or weak signals when there is noise.
   - Typically, the lower the VBW the slower the sweep rate.
6. **Input**
   - Set the input on the analyzers.
   - This can be an internal band or be physically different connection on the outside of the analyzer.
7. **Points**
   - Represents the number of points in each sweep.
   - The number of points should be greater than or equal to Span divided by RBW to avoid under sampling.

6.2 BEACON RECEIVER CONTROLS

The following are settings that are applied to the beacon receiver.

6.2.1 BASIC CONTROLS

1. **Run Br/Stop Br**
   - This will start the beacon tracking if not running and stop it if running.
   - Once running most beacon receiver settings cannot be changed.
   - If settings need to be changed stop the beacon receiver and change the settings.
2. **Frequency (MHz)**
   - This sets the center or reference frequency for the acquisition range.
3. **Acquisition Bandwidth (kHz)**
   - This is half of the bandwidth that is used to find the beacon signal.
   - The acquisition range is the frequency +/- acquisition bandwidth.
   - The bandwidth should be set so that the beacon signal is always with the acquisition zone for the worst-case frequency drift.
   - Not used or available in TPT or CEPT algorithm.
4. **Tracking Bandwidth (kHz)**
   - Once the beacon receiver is locked this is half of bandwidth used to track the beacon.
   - If the beacon signal falls outside of the tracking bandwidth the beacon receiver will unlock.
   - Generally, the Tracking Bandwidth should be less than or equal to the Acquisition Bandwidth.
   - Not used or available in TPT or CEPT algorithm.
5. **Reference Power Level (dBm)**
   - This is the reference power used to calculate the analog voltage output.
   - Only used if Reference Power Mode is Fixed.
6. **Reference Voltage (V)**
   - This is the voltage output when the peak beacon signal power is at the reference power level.
7. **Voltage Slope (V/dB)**
   - This slope is used to calculate the analog voltage output.
   - Voltage range is 0 V to 10 V.
   - Equation:

$$Voltage\ (V) = \left(Peak\ Power\ (dB) - Ref\ Power\ Level\ (dB)\right) \times \left(Slope\ \left(\frac{V}{dB}\right)\right) + Ref\ Voltage\ (V)$$

   - Example, if locked and the following are true:
     - i) $Reference\ Power\ Level = -80\ dB$
     - ii) $Reference\ Voltage = 5\ V$
     - iii) $Voltage\ Slope = 1\ V/dB$
     - iv) $Beacon\ Peak\ Power = -82\ dB$
     - v) $Voltage = (-82\ (dB) - (-80\ (dB))) \times \left(1\ \left(\frac{V}{dB}\right)\right) + 5\ (V)$
     - vi) $Voltage = 3\ V$

8. **Lock Output Polarity**
   - This sets the digital output polarity of the lock indicator.
     - i) Disabled – output is always 0 Volts.
     - ii) Positive – if locked output is 3.3 Volts if unlocked output is 0 Volts.
     - iii) Negative – if locked output is 0 Volts if unlocked output is 3.3 Volts.
   - Not used or available in TPT algorithm.
9. **CEPT Bandwidth:**
   - This is the bandwidth used in the Carrier Edge Power Tracking algorithm.
   - This should be wide enough to capture the edge of a carrier, with a mostly flat region on both sides of the sweep.
   - Only available in Carrier Edge Power Tracking algorithm.

6.2.2 ADVANCED CONTROLS

2. **Input/Band**
   - Set the input on the unit.
   - This can be an internal band or be physically different connection on the outside of the analyzer.
3. **Tracking Algorithm**
   - This is the beacon tracking algorithm that is used when the beacon receiver is running.
   - Options
     i) Peak Following
        - This is the primary mode for tracking CW or moderately modulated beacons. It identifies a beacon within the set parameters and will lock on that signal. This mode is often used for validation of correct satellite and peaking functions.
        - The receiver will re-tune to the peak of that signal as it varies gradually over the course of a day while keeping track of the frequency offset. The power returned for calculation of the analog output is the peak power.
     ii) Integrated Power
        - This is functionally like Peak Following. However, the power returned for calculation of the analog output is the calculated Integrated Bandwidth Power. This can be helpful for stronger signals with more aggressive modulation.
        - However, this mode does not provide a linear accurate response when the signal strength is less than 10 dB above the noise floor.
     iii) Tuned Power Tracking (TPT)
        - This mode can be helpful for certain cases:
          (a) There is no beacon on which to lock.
          (b) Need for a simple method to measure signal power and generate a proportional analog signal.
          (c) A high update rate for measuring signal power is needed.
        - The Tuned Power Tracker (TPT) mode provides a way to measure the peak power of a slice of signal spectrum. If there is a signal with generally consistent average power level, this can be used to measure a portion of that signal and use that peak power level to drive the voltage calculation. This can then be used for antenna peaking operations. This mode does not provide retuning but measures a fixed "slice" of spectrum. The algorithm runs at 100 HZ providing 100 updates per second to the analog output. There are two TPT parameters: Bandwidth (slice size), and VBW (smoothing filter strength).
     iv) Carrier Edge power Tracking (CEPT)
        - This algorithm will analyze the edge of a DVB-S2 (or similar) signal, looking at signal and noise level on either side of carrier edge. It uses an average of the carrier and an average of the noise to determine its power level used in the calculation.
4. **Acquisition C/N0 (dB-Hz)**
   - This is the minimum carrier-to-noise density ratio that is required to acquire or lock on to a beacon signal.
   - Not used or available in TPT algorithm.
5. **Tracking C/N0 (dB-Hz)**
   - This is the Carrier-to-noise density ratio that is required to stay locked and track a beacon signal.
   - Not used or available in TPT algorithm.

6. **Reference Power Mode**
   - This is the mode that determines what will be used for the reference power level.
   - Options
     i) Fixed – uses the Reference Power Level (dBm) to determine the reference voltage output.
     ii) Auto – uses the Lock Power as the Reference Power Level (dBm)
   - Not used or available in TPT algorithm.
7. **Voltage Mode**
   - This determines how the beacon receiver sets the analog voltage output.
   - Options
     i) Stop – sets/keeps the voltage output equal to the last locked state.
     ii) Continue – ignores the locked state and sets the voltage output based on the Reference Power Level (dBm), Reference Voltage (V), and Voltage Slope (V/dB).
     iii) Zero – sets the voltage output to 0 Volts when not locked.
   - Not used or available in TPT algorithm.
8. **Low Pass Filter**
   - This is a digital low pass filter that is applied to the beacon receiver sweep.
   - Not used or available in TPT algorithm.
9. **Time to Lock (ms)**
   - A beacon signal must meet all the required locked conditions for at least the Time to Lock time before the beacon receiver is considered locked.
   - Not used or available in TPT algorithm.
10. **Update Rate**
    - This is the update rate of all outputs of the beacon receiver.
    - Options
      i) 10 Hz – ten updates per second
      ii) 25 Hz – twenty-five update per second
    - Not used or available in TPT algorithm.
11. **Reference Level**
    - This sets the reference level on the unit.
    - You should not try to view a signal of higher power level than reference level.
    - Lower power level signals can be monitored with lower reference levels.
    - If the system has a high noise floor a higher reference level is recommended.
12. **Enable on Boot**
    - If enabled, this will always start the beacon receiver on boot using the settings stored on the unit.
13. **TPT Bandwidth**
    - TPT Bandwidth allows setting the TPT spectrum "slice" width.
    - Options
      i) 3kHz, 10 kHz, 30 kHz, 300 kHz, 1 MHZ, 2 MHZ, 4 MHZ, and 8 MHz
    - Only available in Tuned Power Tracking algorithm

14. **TPT VBW**
    - TPT VBW provides smoothing to the measured signal to help eliminate variations in the analog output.
    - Options
        i) 300 Hz, 3 kHz, 30 kHz, and 300 kHz
    - Only available in Tuned Power Tracking algorithm.

6.3   GUI CONTROLS

1. **LO Offset**
    - This is a graphical offset that is applied to the trace data after receiving it from the analyzer.
    - This should be used if there is an external frequency converter to convert everything to the expected frequency ranges.
    - User defined LO Offsets can be created.
        i) For more information about creating custom LO Offsets refer to the LO OFFSET section

7 GUI MAIN MENU

7.1 FILE
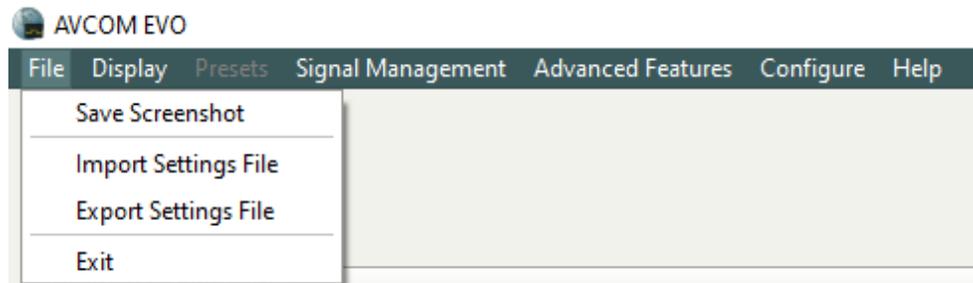
Figure 9, Expanded File Menu

- **Save Screenshot**
  - o Users can capture and save a screen of the plot data that is currently displayed.
- **Import Settings File**
  - o Import settings from a previous export.
  - o When prompted select the folder containing all settings information.
    - ▪ By default, this is "SettingsExport_YYYY_MM_DD_hh_mm_ss"
  - o This will export a backup of the current settings in case something goes wrong.
- **Export Settings File**
  - o Export current settings to save as backup or to import for another user.
- **Exit**
  - o Will close the application.

7.2   DISPLAY
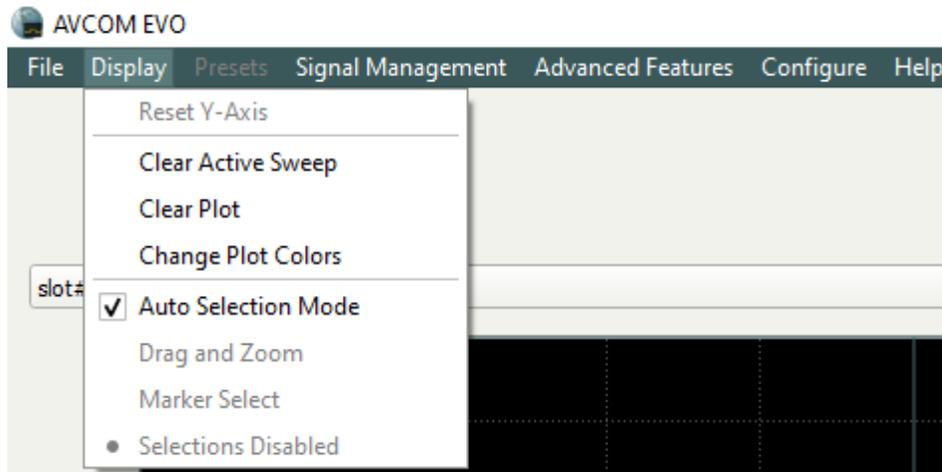
Figure 10, Expanded Display Menu

- **Reset Y-Axis**
  - o Sets the power axis (Y-Axis) screen back to the default which starts at the reference level.
- **Clear Active Sweep**
  - o Clears the sweep that came from the running or previously running unit.
- **Clear Plot**
  - o Clears all objects on the plot.
- **Change Plot Colors**
  - o Shortcut to the settings color and style tab.
  - o For more information see the **COLOR/STYLE** section.
- **Selection Mode**
  - o **Auto Selection Mode**
    - ▪ If enabled will choose the expected selection mode based on the current settings that are selected.
  - o **Drag and Zoom**
    - ▪ Users can use the mouse to change center frequency, span, and Y-Axis.
    - ▪ Note, some advanced features may only allow a change in Y-Axis.
  - o **Marker Select**
    - ▪ Users can use the mouse to select and move items that are considered "markers".
    - ▪ Examples of markers are shape alarm boundaries, delta markers, and plot markers.
  - o **Selection Disabled**
    - ▪ In this mode setting cannot be changed by interacting with the plot.

7.3 PRESETS

Presets are used to quickly switch between multiple user defined settings. Presets are configured within the Configure -> Settings Menu. The AVCOM EVO GUI supports up to 16 presets per analyzer setting.
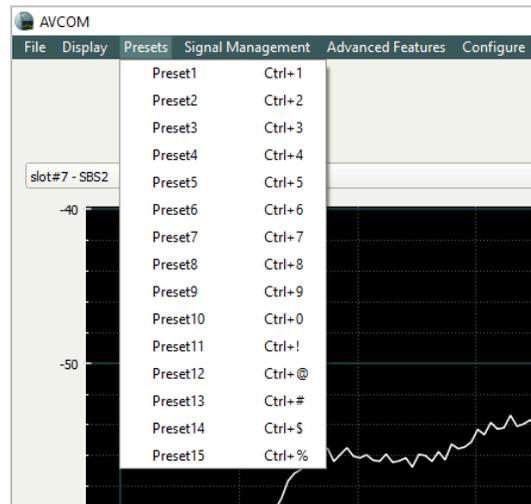

Figure 11, Expanded Preset Menu

NOTES:

- Presets are only available in single mode if configured for the selected analyzer.
- Presets are grayed-out if no presets are set.
- Presets are designed to present a quick reference to where the user wants to go.
- Presets can only be edited when connected to the unit.

7.4 SIGNAL MANAGEMENT
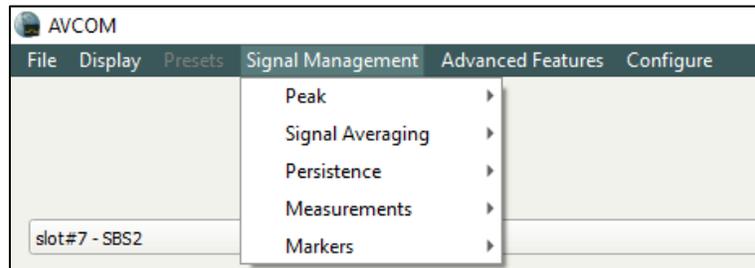
Figure 12, Expanded Signal Management Menu

7.4.1 PEAK MODE

Peak mode is used to plot and display a line at the max or peak power of the signal that is being monitored. In addition, peak mode displays the power level and the frequency of the max power.

- **None**
    - o Clears the peak line and displays no peak line.
- **Ride**
    - o Draws a peak line at the max peak power per sweep.
- **Hold**
    - o Draws a peak line at the max peak power from all sweeps per analyzer.
- **Reset Peak**
    - o Used to reset or clear the Peak Line.
    - o This will reset the max value for hold.

7.4.2 SIGNAL AVERAGING

Computes a moving average on sweeps.

Formula Used for averaging: $Average_i = Average_{(i-1)} + \left(\frac{Data - Average_{(i-1)}}{N}\right)$

- **None**
    - o No average is computed.
- **Avg/2**
    - o N = 2
- **Avg/4**
    - o N = 4
- **Avg/8**
    - o N = 8
- **Avg/16**
    - o N = 16
- **Reset Average**
    - o Used to reset the averaging and start with a new sweep.

7.4.3 PERSISTENCE MODE

Persistence is used to find and plot the extreme values for each point on the graph. Persistence plots will be reset based on the selected persistence clear rate (sec/sweep). Default persistence clear rate is 15 sec/sweep.

- **None**
    - Clears the persistence sweeps and displays no persistence.
- **Peak**
    - Finds and plots the maximum for each point on the graph.
- **Minimum**
    - Finds and plots the minimum amplitude for each point on the graph.
- **Envelope**
    - Performs the operation of peak and minimum at the same time.
- **Reset Persistence**
    - Used to reset or clear the persistence sweeps.
    - This will reset the peak and minimum values for persistence settings.

7.4.4 MEASUREMENTS

- **SNR (Peak – Minimum)**
    - Calculates the "Signal to Noise" difference between the displayed signal peak and minimum value for the selected span.
- **Delta Markers**
    - Green Delta measurement lines can be dragged to the location of your choice on the waveform and the power and frequency difference is calculated.
- **-3dB Delta**
    - Finds and plots the -3dB point based on the signal peak.

7.4.5 MARKERS

Markers are used to find the specific power level at a user specified frequency. AVCOM EVO GUI currently supports up to 8 markers.
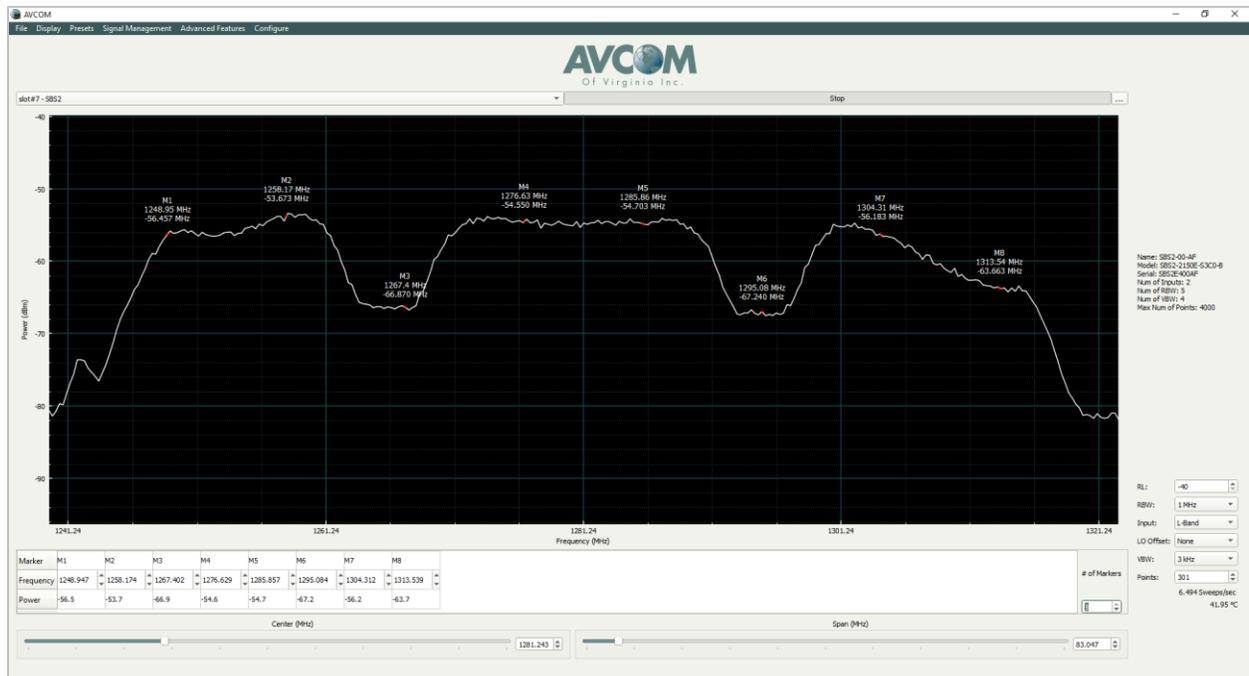

Figure 13, Plot and Table Marker Example

- **None**
  - Clear all markers and display no markers.
- **Plot Only**
  - Displays an adjustable marker on the sweep with a marker name, frequency, and power level (dB).
- **Table Only**
  - Displays a table with the frequency and power label of all markers.
  - Ability to change the number of markers.
  - Displays a marker on the plot with only the marker name.
- **Plot and Table**
  - Performs the operation of plot only while also displaying the table.

7.5 ADVANCED FEATURES
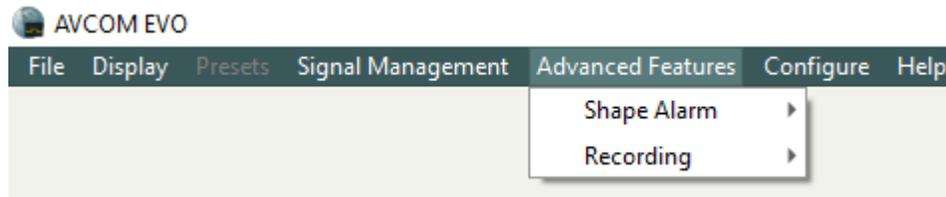
Figure 14, Expanded Advanced Feature Menu

- **Shape Alarm**
  - o Allows users to monitor signals with a certain criteria or shape.
  - o For more information see the SHAPE ALARMS section.
- **Recording**
  - o Allows user to record single or stream of sweeps.
  - o For more information see RECORDING section.

7.5.1 SHAPE ALARMS

Shape alarms are a way to monitor that the desire signal is within a user specified tolerance. Also, shape alarms can be used to monitor for any interference within the frequency limits.

Shape alarms will remember the settings on reconnect so every alarm should have its own spectrum analyzer list entry. If multiple shape alarms are needed with the same analyzer, please create another spectrum analyzer entry, and apply the desired shape alarm settings for that entry.
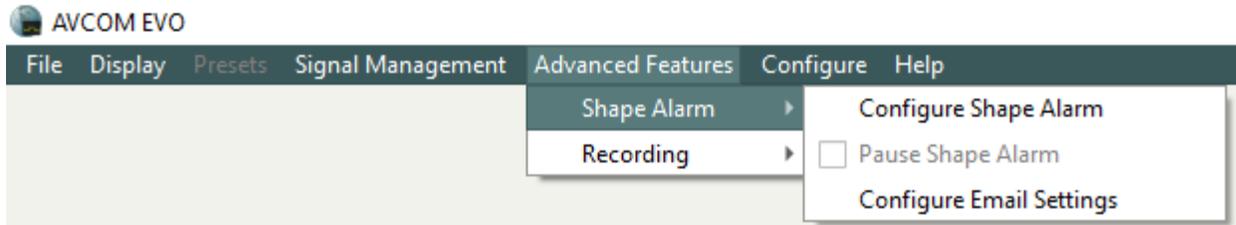

Figure 15, Expanded Shape Alarm Menu

- **Configure Shape Alarm**
    - Opens Shape Alarm Menu to set all shape alarm related settings.
    - Refer to the CONFIGURE SHAPE ALARM section for additional information.
- **Pause Shape Alarm**
    - Once a shape alarm is set the user can pause the shape alarm and use the analyzer as normal.
    - When ready to resume the shape alarm un-pause the alarm and all shape alarm settings will be restored just like before the shape alarm was paused.
- **Configure Email Settings**
    - Opens Shape Alarm Email Configuration Menu.
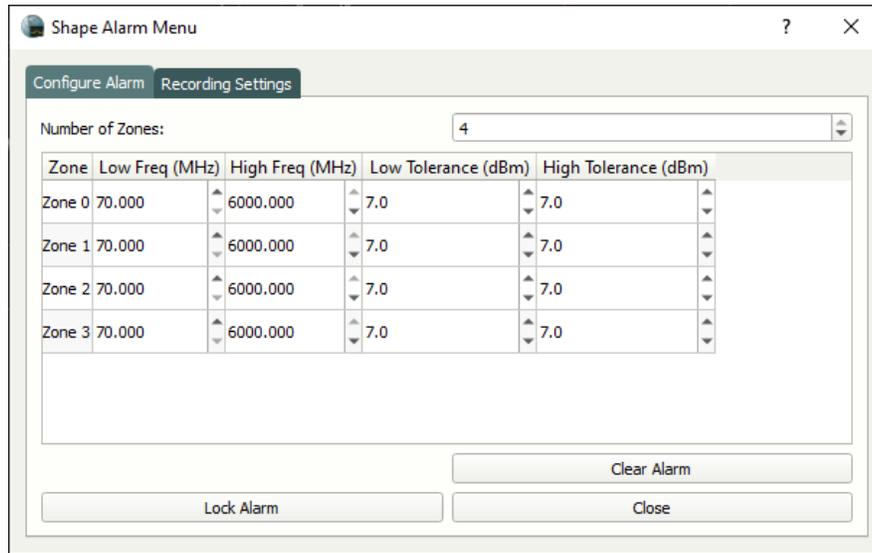   - Refer to the CONFIGURE EMAIL SETTINGS section for additional information.

Figure 16, Shape Alarm Menu

- Users can add and remove alarm zones using the number of zones spin box.
  - Zones are discontinuous frequency ranges.
- Users can change and update low and high frequency ranges using this dialog or by clicking and dragging a shape alarms boundary on the plot.
- Once all alarms are positioned click "Lock Alarm" to set the alarm
  - If alarm is set it will be stored and recalled on that pc when analyzer connection is started.

7.5.1.2   Configure Email Settings

Figure 17, Shape Alarm Email Window

- Fill out the information and if a shape alarm event is triggered will email the picture of the event.
- Notes:
    - o Recommend using the test email button when setting up new email settings.
    - o All windows that have a shape alarm event will use these settings.
        - ▪ Exception: Minimum time between emails is on a per analyzer basis.

7.5.1.3   Record on Shape Alarm Event

If trying to record before or after a shape alarm event, then use the Recording Settings tab in the shape alarm menu.
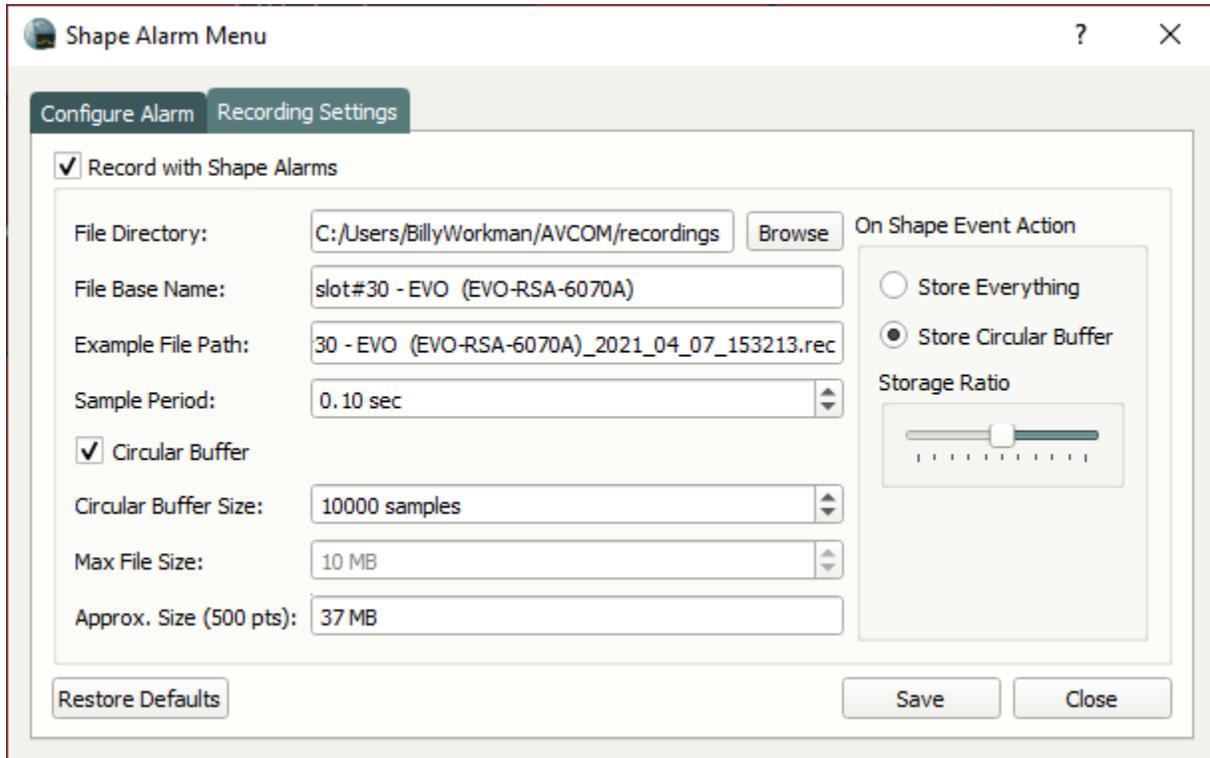

Figure 18, Shape Alarm Recording Window

- For information about most recording settings refer to the CONFIGURE RECORDING SETTINGS section.
- On Shape Alarm Event
  - Store Everything
    - In this mode everything is stored while the shape alarm is running.
  - Store Circular Buffer
    - This is the recommend setting so that only information around a shape alarm event is stored in the file.
    - This setting will only save a recording file if a shape alarm occurs.
      - Note the file should not be stored until the post event buffer has been filled.
    - The Storage Ratio determines how much before and after the shape alarm event is stored.
      - The default is 50% before and 50% after. In the image shown that means 5000 samples before and 5000 samples after.
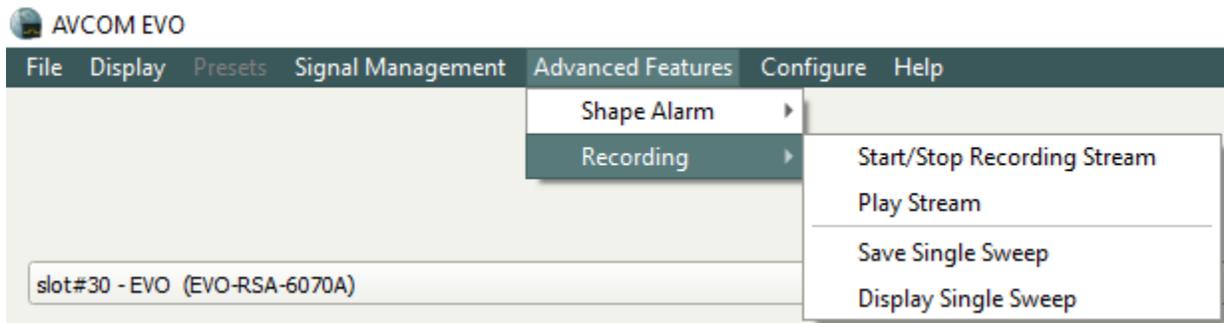
7.5.2 RECORDING

Figure 19, Expanded Recording Menu

- **Start/Stop Recording Stream**
  - o Prompts user to configure recording and then starts recording.
  - o If already record stops recording.
  - o Note, if trying to record on shape alarm events go to the recording tab in the shape alarm configure menu.
- **Play Stream**
  - o Play a previous recording.
  - o Once selected will be prompted to find the recording file to play.
- **Save Single Sweep**
  - o Saves the current sweep on the screen.
- **Display Single Sweep**
  - o Displays a previously recorded sweep to the screen.
  - o Once selected will be prompted to find the single sweep to display.
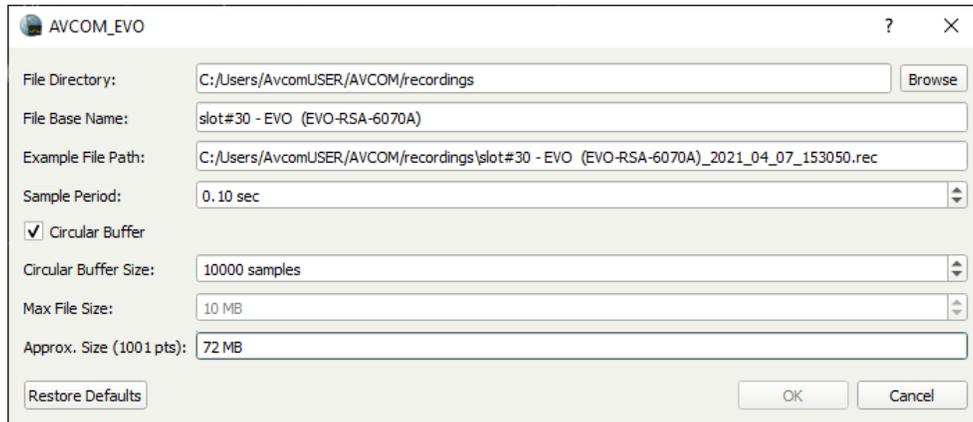 - o To clear the saved single sweep, go to Display -> Clear Plot.

Figure 20, Recording Settings

- **File Directory**
  - The directory that the recording will be stored.
- **File Base Name**
  - The name the start of the recording file will have.
- **Example File Path**
  - Non-editable full path name showing example appended time and date.
- **Sample Period**
  - The period the sweep is stored.
  - Note, the period cannot be faster than the sweep rate of the unit.
- **Circular Buffer**
  - If checked the recording will be a circular buffer with size up to the number of samples.
  - In circular buffer mode the file will not be saved until stopped. Once the number of samples is reached it will start overwriting the oldest samples with new samples.
  - If unchecked will record until stopped. Note the file size and time between samples is still determined by the sample period and Max file size.
- **Circular Buffer Size**
  - The max number of samples in the circular buffer.
- **Max File Size**
  - In save all mode the maximum file size before creating a new file.
- **Approx. Size**
  - Shows an approximate size of either the number of sweeps or the file size in MB based on whether using a circular buffer.
  - Sweeps
- **Restore Defaults**
  - Used to restore default settings.
- **Ok**
  - Click to start the recording.
- **Cancel**
  - Click to cancel and not record.

7.5.2.2 Play Recording/Stream

The play recording screen is very similar to the analyzer screen but there are a few differences. One difference is while playing a recording the user will not be able to change and analyzer settings. All measure signal management tools are still available while playing a recording. Also, the time shown is the time of the recording and not the current time as normally shown.
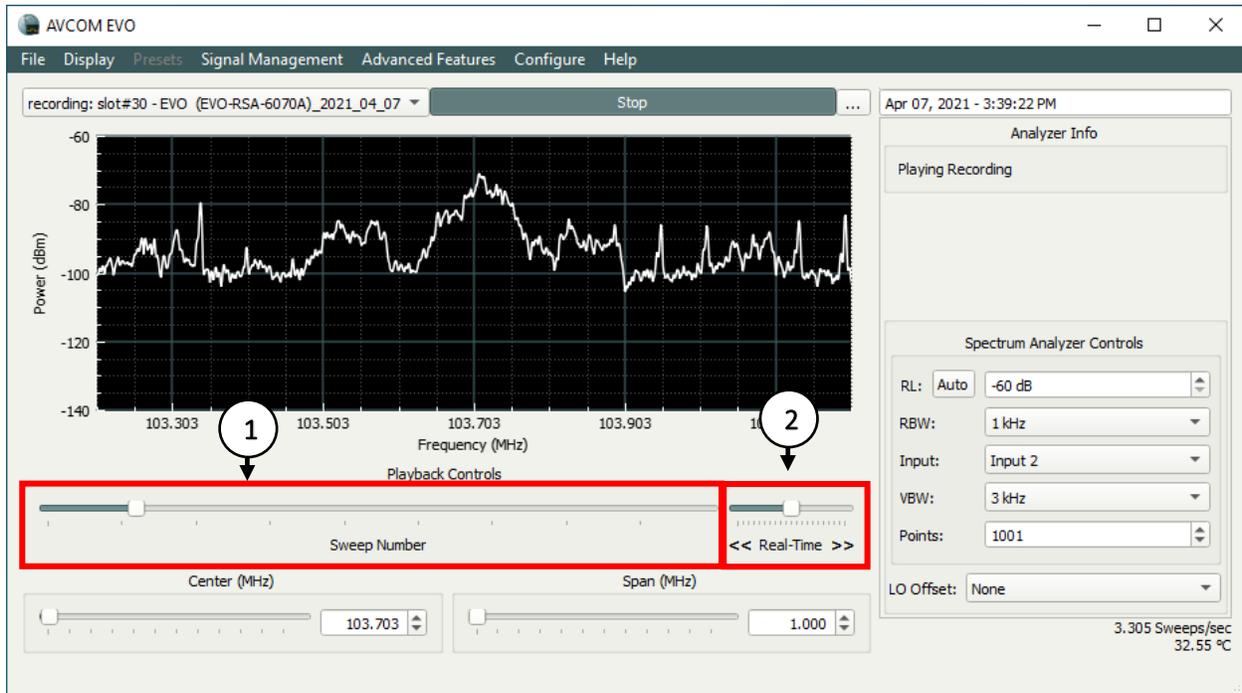

Figure 21, Recording Playback

1. **Sweep Number**
   - This is the playback/progress bar of the recording.
   - This can be used to quickly move around to different points in time of the recording and is very similar to any playback bar of videos.
2. **Real-Time**
   - This bar changes the speed in which the recording is played.
   - Move it to the left to slow down the playback and move it to the right to speed it up.
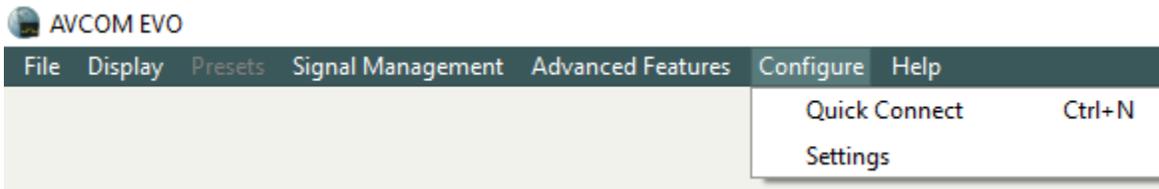
7.6 CONFIGURE

Figure 22, Expanded Configure Menu

- **Quick Connect**
  - o Opens the settings menu and starts adding a new unit.
  - o This can save time when adding a new unit on the same network because it will start the process of adding an analyzer and do a network search.
- **Settings**
  - o Opens the settings menu. Refer to the SETTINGS MENU Section for additional information.
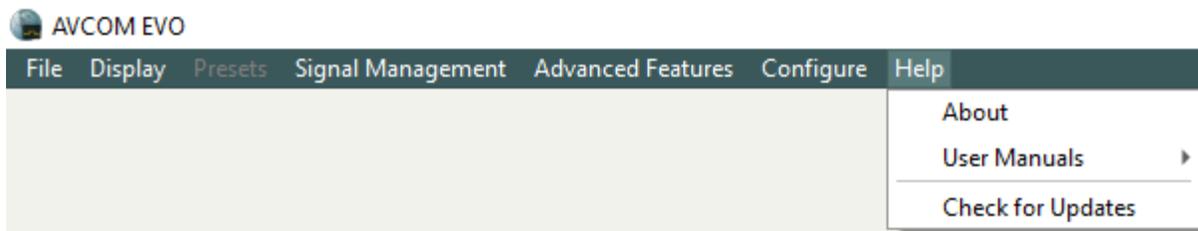
7.7 HELP

Figure 23, Expanded Help Menu

- **About**
  - o Show the user the current version of the application as well as the versions of the libraries that are used.
- **User Manuals**
  - o Quick reference to access this user manual and some other potentially useful manuals.
- **Check for Updates**
  - o If there is an active internet connection, will search to see if there is an update for the application.
  - o If there is an update the application will prompt user and ask if they want to update
  - o If updating, follow the prompts to complete the update process.

8   SETTINGS MENU

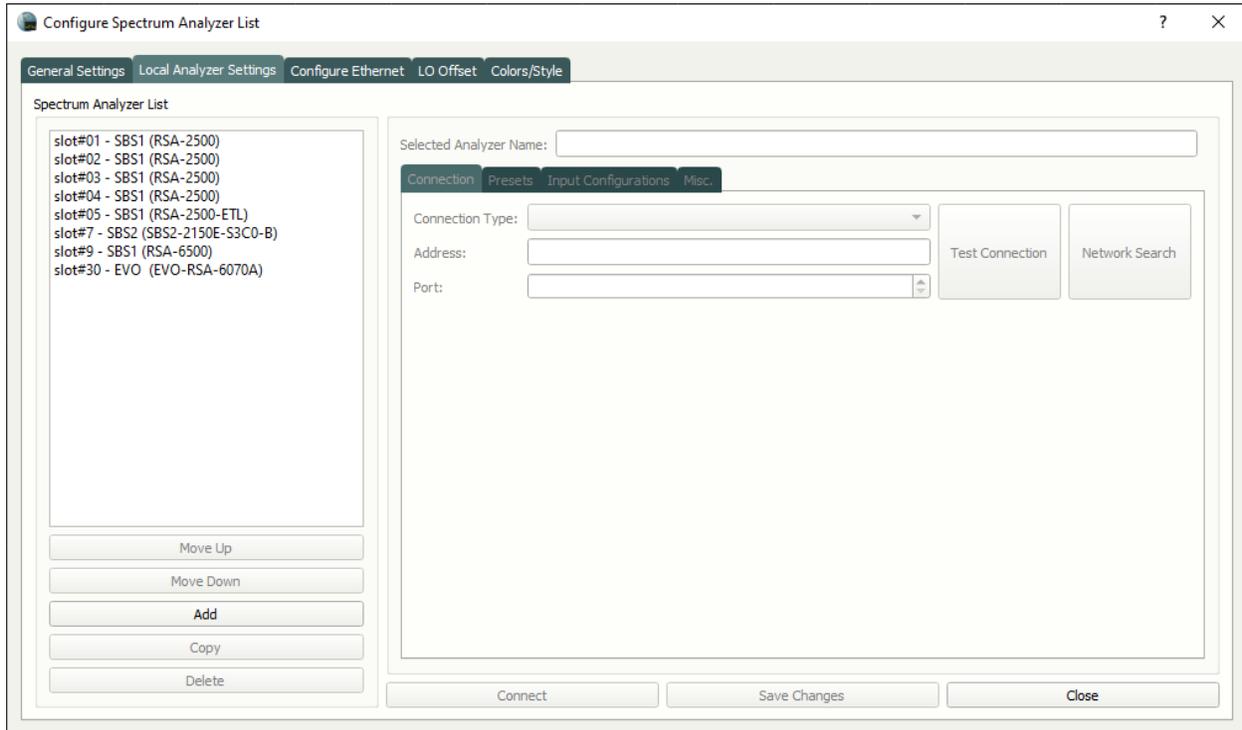## 8.1   LOCAL ANALYZER SETTINGS

Figure 24, Settings Menu Local Analyzer Settings Tab

1. **Spectrum Analyzer List**
   - A list of all analyzers configured and saved for this application.
2. **Local Analyzer Settings**
   - A collection of input options for saving a variety of settings.
   - Reference the following sections for more information: MANAGING SPECTRUM ANALYZER LIST, CONNECTION, PRESETS, INPUT CONFIGURATIONS, and MISC.
3. **Connect and Save and Connect**
   - If an analyzer is selected from the list the user has the option to connect from this settings menu.
   - This option can save time by removing multiple clicks.
   - This only works with the first window and is not recommended for use with multiple windows.
   - If there are changes made the button will become "Save and Connect" and will save the changes before closing the menu and connecting.
4. **Save Changes**
   - Saves any changes for the selected analyzer.
   - Disabled until a setting has changed.
5. **Close**
   - Closes the Settings Menu.
   - Will be prompted to save if there are unsaved changes.

8.1.1 MANAGING SPECTRUM ANALYZER LIST

The Spectrum Analyzer list is the analyzer options that will show up in the dropdown in the order that is specified by the list.
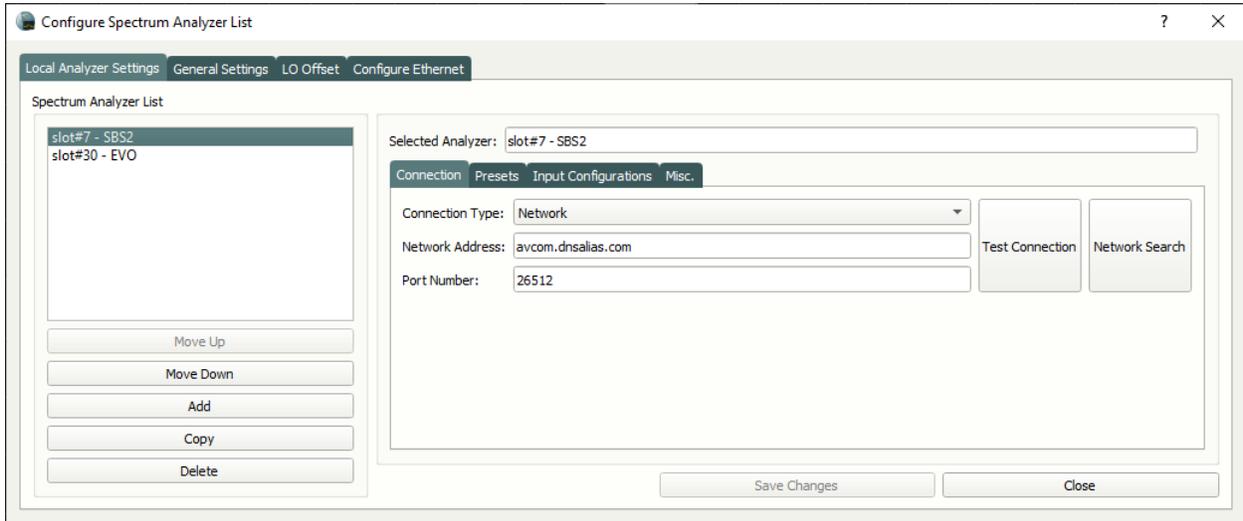

Figure 25, Settings Menu Local Analyzer Settings Managing Spectrum Analyzers

1. **Move Up**
   - Moves the selected analyzer up the list.
   - It is not required to save changes to change the Spectrum Analyzer List order.
2. **Move Down**
   - Moves the selected analyzer down the list.
   - It is not required to save changes to change the Spectrum Analyzer List order.
3. **Add**
   - Add a new analyzer to the end of the Spectrum Analyzer List with blank settings and a default name.
4. **Copy**
   - Copies a selected analyzer and adds it to the end of the Spectrum Analyzer List.
   - Copied analyzers will have all the same connection, preset, input configuration, and misc. settings of the source analyzer.
   - After analyzer is copied update any desired settings.
   - Note settings of the copied analyzer are independent and will not change the settings of the source analyzer.
5. **Delete**
   - Removes the analyzer and all its settings from the list.
6. **Selected Analyzer (Name)**
   - Use this field to update the local name of the analyzer.
   - The following characters are not allowed in name: ^ " / \ , : ; < > * | ?
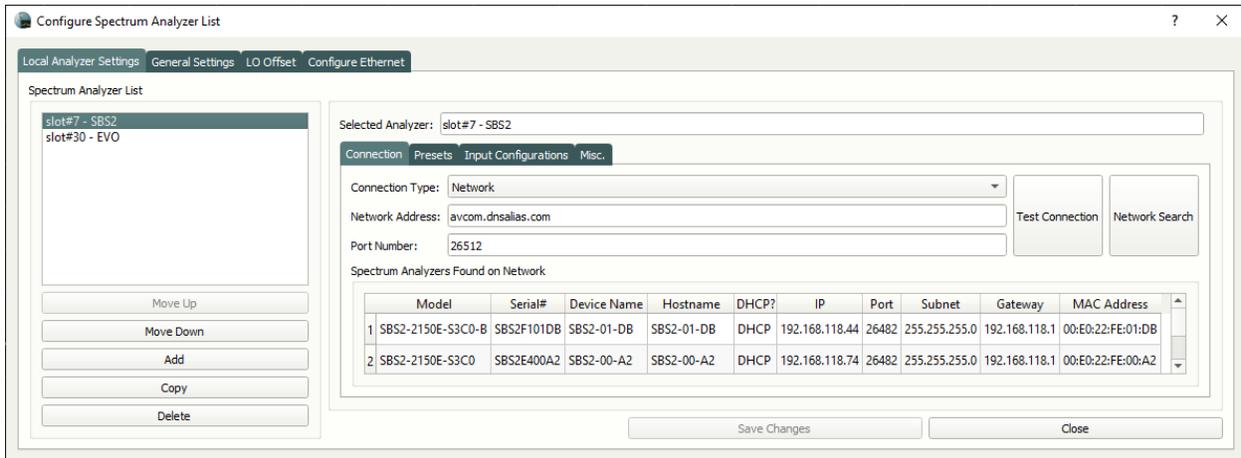   - Name may not be blank or start with a space.

8.1.2 CONNECTION

Figure 26, Settings Menu Local Analyzer Settings Connection

1. **Connection Type**
   - Select the type of connection from the dropdown list.
2. **Network Address**
   - Type in the desired hostname or IP address for the selected analyzer.
3. **Port Number**
   - Type in the desired port number for the selected analyzer.
4. **Test Connection**
   - A button that will test that a supported AVCOM spectrum analyzer is available using the Network Address and Port Number specified.
5. **Network Search**
   - Searches the network for any AVCOM spectrum analyzers that are supported by this application.
   - Once the button is clicked a table titled Spectrum Analyzers Found on Network will appear.
   - Note, if a PC has multiple network adapters enabled the search may not be broadcasting on the right network. To fix this the user may need to disable the other network adapters temperately or disable and reenable the network adapter the unit is on.
6. **Spectrum Analyzers Found on Network**
   - Provides a list of AVCOM spectrum analyzers that are found on the network.
   - If a row is double clicked it will automatically update the Selected Analyzer Name, Network address, and Port Number using the selected analyzer's information.
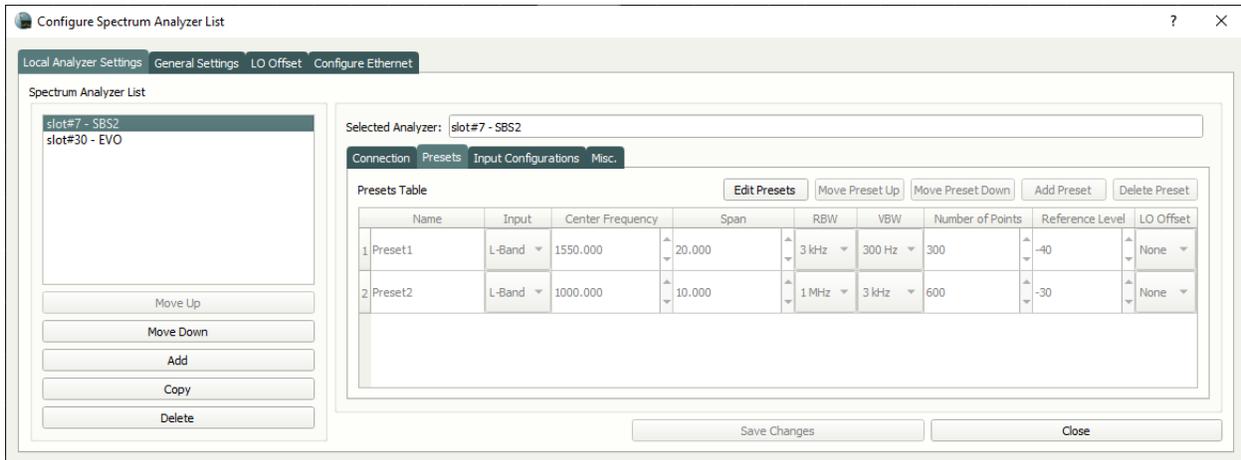
8.1.3   PRESETS

Figure 27, Settings Menu Local Analyzer Settings Presets

1. **Edit Presets**
   - To enable editing the user must click "Edit Presets" and the analyzer must be online.
   - If previously connected from another tab user will not need to use the "Edit Preset" button.
2. **Move Preset Up**
   - Will move the selected preset up the list.
   - The preset order in the table is the order used from the Main Menu.
3. **Move Preset Down**
   - Will move the selected preset down the list.
   - The preset order in the table is the order used from the Main Menu.
4. **Add Preset**
   - Will add a preset to the end of the list using default values.
5. **Delete Preset**
   - Will delete the selected preset.
6. **Preset Table**
   - A list of all created presets and settings for that preset.

For more information about what each setting means refer to INPUT CONTROLS and GUI PRIMARY CONTROLS sections
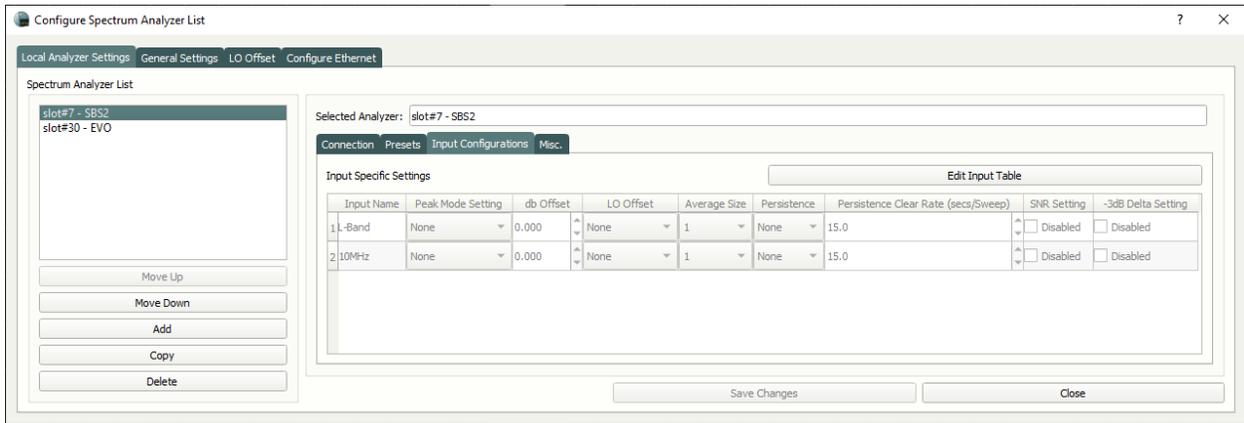
8.1.4   INPUT CONFIGURATIONS

Figure 28, Settings Menu Local Analyzer Settings Input Configurations

1. **Edit Input Configurations**
   - To enable editing the user must click "Edit Input Table" and the analyzer must be online.
   - If previously connected from another tab, the user will not need to use the "Edit Input Table" button.
2. **Input Specific Settings Table**
   - A list of all inputs for the selected analyzer and the settings for that input.
   - This is a quick way to see all the per analyzer per input settings and adjust them if needed.
   - dB Offset
     - i) This is a math offset that is applied to the selected analyzers input.
     - ii) This is used to compensate for a known external loss or gain.
   - Persistence Clear Rate
     - i) This is the rate the persistence plots will clear.
     - ii) If set to 0 the persistence plots will not clear automatically.
   - For more information about what each setting means refer to GUI MAIN MENU section.
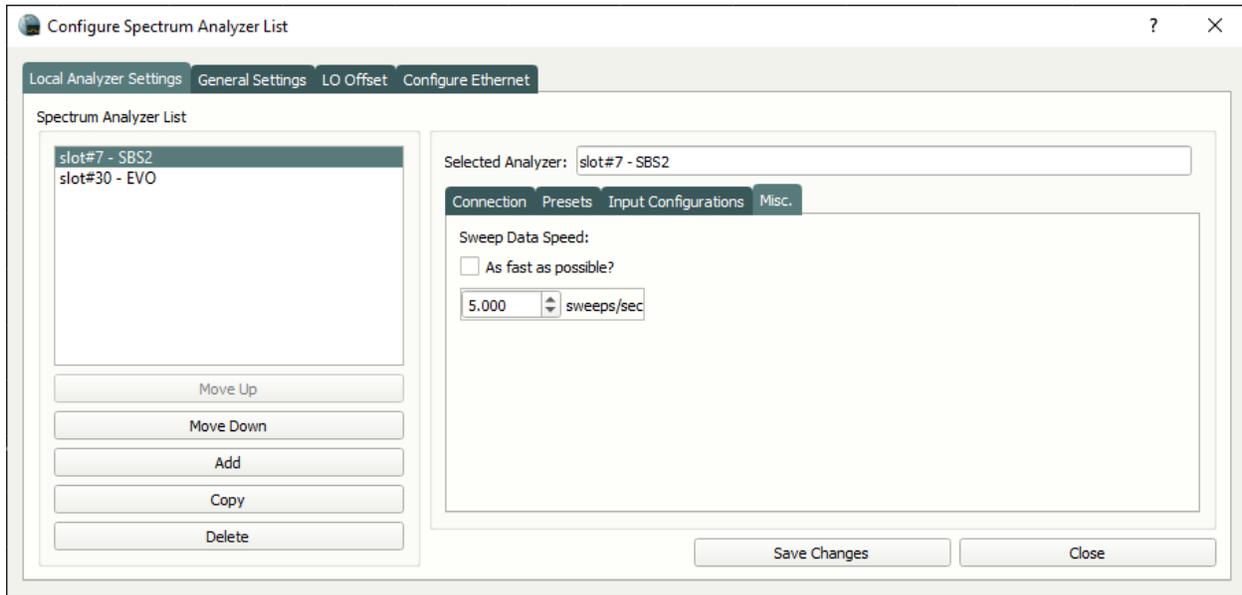
8.1.5   MISC.

Figure 29, Settings Menu Local Analyzer Settings Misc.

1. **Sweep Data Speed**
   - To reduce network traffic the sweep data speed can be limited.
   - To set a maximum speed uncheck "As Fast as Possible?" and type in the desired sweep rate.
   - Note sweep rate may be slower than setting if the analyzer input configurations are not able to produce sweeps at the desired speed.
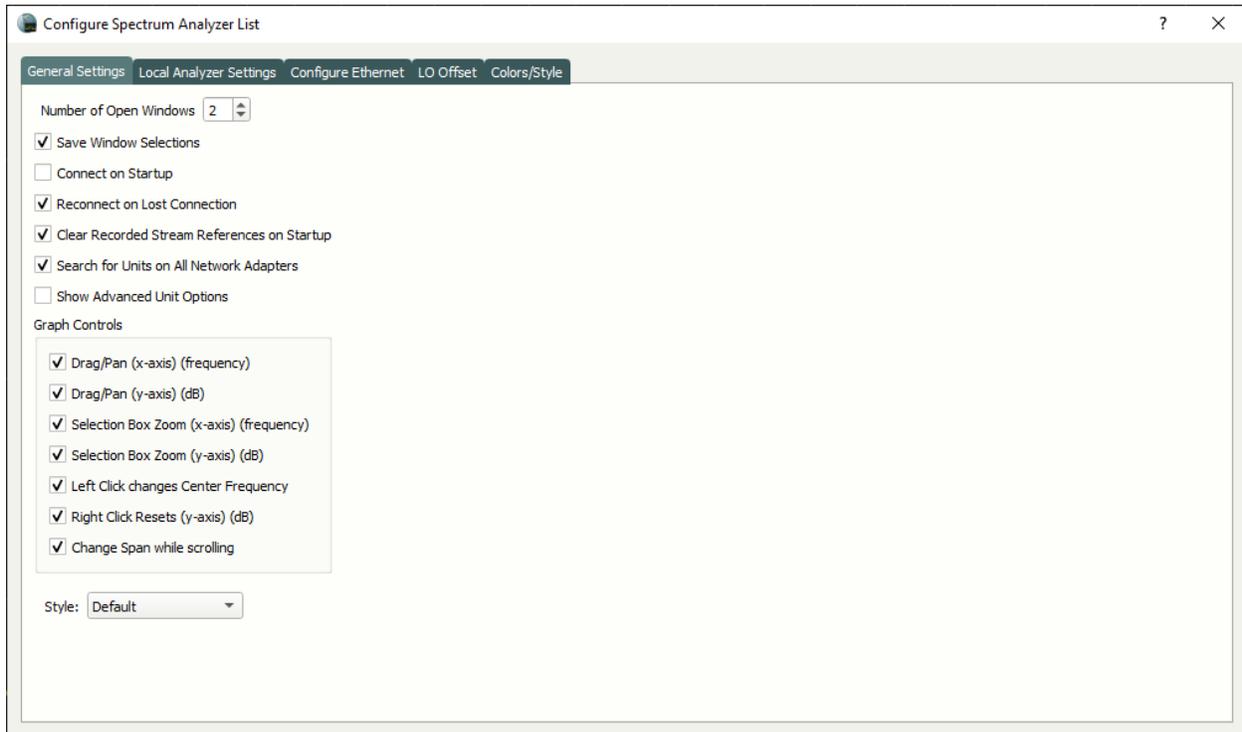
8.2 GENERAL SETTINGS

Figure 30, Settings Menu General Settings Tab

1. **Number of Open Windows**
   - Sets the number of windows that are shown in multimode.
   - Each window can be connected to a different analyzer.
2. **Save Window Selections**
   - If enabled, on startup of the application will remember the number of windows when closed and which analyzer was selected.
3. **Connect on Startup**
   - If enabled, the application will automatically try to establish a connection to the analyzer on startup of the application.
4. **Reconnect on Lost Connection**
   - If enabled, the application will automatically try to re-establish a connection to the analyzer if the connection is lost.
5. **Clear Recorded Stream Reference on Startup**
   - If enabled, the application will automatically remove any recording entries from the local analyzer list.
   - This is used if the recording playback is not something that is needed for quick reference in the future.
   - Note that the recording file itself will not be changed or deleted.

6. **Search for Units on All Network Adapters**
   - If enabled, the network search will broadcast on all active network adapters on the user's device to find all AVCOM units.
   - If disabled, the search analyzer feature will only search on the last active network adapter. This setting can be used if network security does not allow the broadcast on all network adapters.
7. **Show Advanced Unit Options**
   - If enabled an advanced options group shows up in the spectrum analyzer controls on the main screen. Note not all analyzers have advanced options.
   - Current advanced options include:
     i. Sweep Optimization
        1. Low Noise
           a. This mode attempts to remove as much noise and as many spurs as possible.
        2. High Speed
           a. This mode is the fastest the unit can run with the given settings.
8. **Graph Controls**
   - Application wide settings that change how the graph can be interacted.
   - Options
     i. Drag/Pan (x-axis) (frequency)
     ii. Drag/Pan (y-axis) (dB)
     iii. Selection Box Zoom (x-axis) (frequency)
     iv. Selection Box Zoom (y-axis) (dB)
     v. Left Click changes Center Frequency
     vi. Right Click Reset (y-axis) (dB)
     vii. Change Span while Scrolling
9. **Style**
   - A dropdown option that allows the user to choose between AVCOM's color palette and using the system color palette.
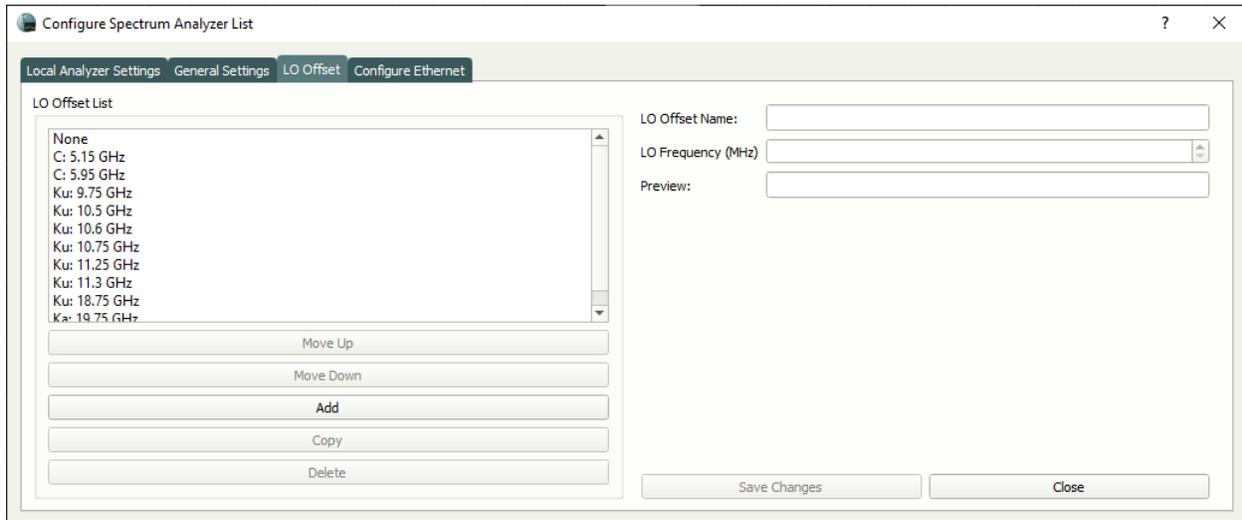
8.3 LO OFFSET

Figure 31, Settings Menu LO Offset Tab

1. **Move Up**
   - Will move the selected LO Offset up the list.
   - The LO Offset order in the table is the order used in the LO Offset input control.
2. **Move Down**
   - Will move the selected LO Offset down the list.
   - The LO Offset order in the table is the order used in the LO Offset input control.
3. **Add**
   - Will create a new LO Offset with default values.
4. **Copy**
   - Will copy the selected LO Offset.
5. **Delete**
   - Will delete the selected LO Offset.
6. **LO Offset Name**
   - Type a custom name for the LO Offset.
7. **LO Frequency (MHz)**
   - The frequency value in MHz that the sweep data will be offset by.
8. **Preview**
   - Text Preview of how the LO Offset will look in the LO Offset input control.
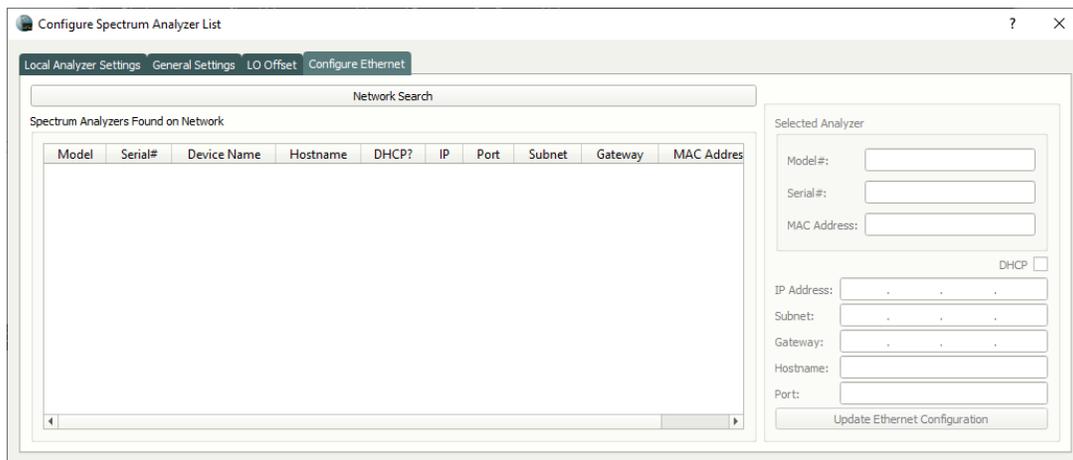
8.4   CONFIGURE ETHERNET

Figure 32, Settings Menu Configure Ethernet Tab

1. **Network Search**
   - Searches the network for any AVCOM spectrum analyzers that are supported by this application.
2. **Spectrum Analyzers Found on Network**
   - Provides a list of AVCOM spectrum analyzers that are found on the network.
   - If a row is double clicked the selected analyzer settings will populate the Selected Analyzer box for editing.
3. **Model #**
   - Non-editable field to display the current selected analyzer Model #.
4. **Serial #**
   - Non-editable field to display the current selected analyzer Serial #.
5. **MAC Address**
   - Non-editable field to display the current selected analyzer MAC Address.
6. **DHCP**
   - Turn on/off DHCP for the selected analyzer.
7. **IP Address**
   - If static IP allows the user to type in an IP Address.
8. **Subnet**
   - If static IP allows the user to type in a Subnet.
9. **Gateway**
   - If static IP allows the user to type in a Gateway.
10. **Hostname**
    - Input to give analyzer a custom hostname.
11. **Port**
    - Input to give the analyzer a custom port number.
12. **Update Ethernet Configurations**
    - Button to send the newly defined settings.
    - Once pressed a network search will automatically be performed to verify settings.

8.5   COLOR/STYLE

In this settings tab all the plot colors can be changed to meet the needs or preferences of different users.
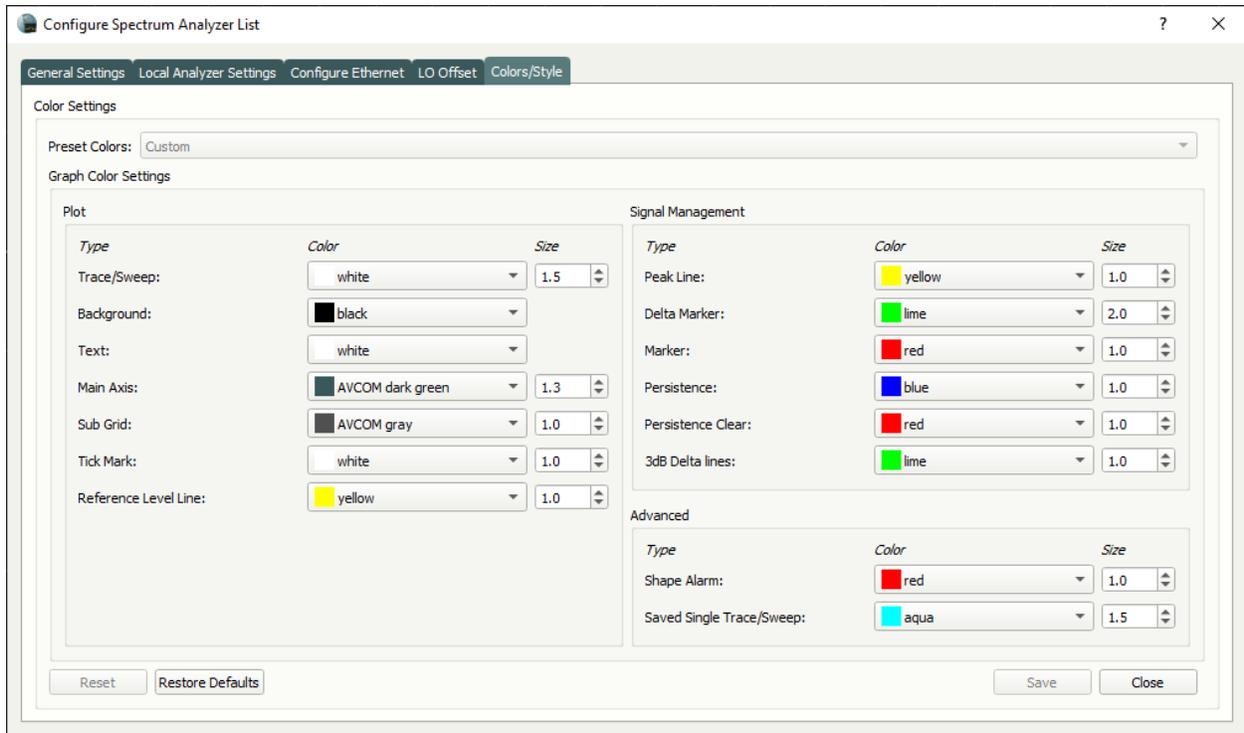

Figure 33, Settings Menu Colors/Style Tab

1. **Change a Color or Style**
   - Select a new color from the dropdown of color options for the specific setting.
   - If the setting creates a line or trace the size or thickness of the line can be updated to change its visibility.
   - Once complete click Save.
   - Note if the setting is visible before going to this screen the user can see the changes in real time if the menu is not blocking the screen.
2. **Restore Defaults**
   - If the colors no longer make since the user can restore defaults.
3. **Reset**
   - If experimenting with new colors and the result is not as expected the user can click reset to restore their previous settings.