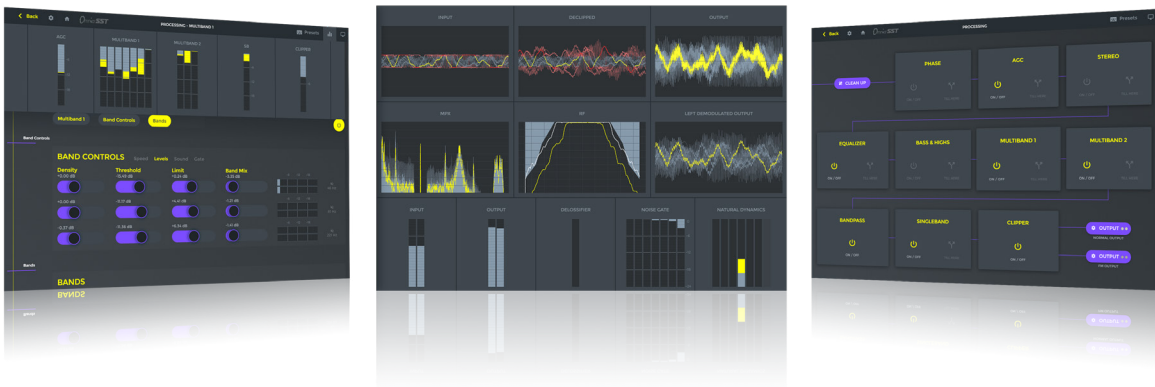# Omnia® SST

Powerful, full featured audio processing software for your PC.

Quick Start Setup Guide

v8.53

For part numbers: 3001-00070, 3001-00071, 3001-00085-000 and 3001-00086-000

ATTENTION!

This quick start guide is intended to aid with basic deployment of the OmniaSST.
For further support and/or questions please contact support@telosalliance.com

Telos Alliance®

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IMPORTANT SAFETY INFORMATION ABOUT YOUR NEW PRODUCT

We know you're eager to get your new gear up and running. But first, The Telos Alliance strongly suggests you use an Uninterruptible Power Supply (UPS), with power line filtering, to prevent damage in case of electrical storms or power surges. Your Product Warranty (found in the User Manual) does not cover lightning damage!

Information about lightning protection can be found at:
http://blogs.telosalliance.com/tech/surge-suppression-pointers

Warranty
TelosAlliance.com/Warranty

24/7 Technical Support
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Manual and Software Downloads
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Creating the Most Exciting and Engaging Audio Experiences Imaginable

Congratulations on your new Telos Alliance product!

The gang here at Telos is committed to shaping the future of audio by delivering innovative, intuitive solutions that inspire our customers to create the most exciting and engaging audio experiences imaginable.

We're grateful that you have chosen audio tools from Telos® Systems, Omnia® Audio, Axia® Audio, Linear Acoustic®, 25-Seven Systems®, and Minnetonka Audio®. We're here to help you make your work truly shine. We hope that you enjoy your Telos Alliance product for many years to come and won't hesitate to let us know if we can help in any way.

Telos Alliance

Quick Start Guide (v8.53) February, 2019

Introduction

Thank you for purchasing Omnia SST, a fully-featured software-based audio processor for FM and digital broadcast. SST offers a powerful suite of tools to both repair and process audio. Omnia SST is the first processor to offer Omnia μMPX®, (Micro-MPX)the first codec, capable of transporting composite audio over IP at an astonishing 320kbps.

Audio cleanup tools in Omnia SST include our acclaimed de-clipping technology, as well as hum and noise removal, and the unique "de-lossifier" to restore life to bit-reduced audio files. Processing sections include AGC to tame inconsistent input levels, equalization to fine-tune the overall spectral balance, stereo enhancement for managing the stereo image, the aptly named "bass in your face" to add low end punch, and two stages of multiband compression (each with up to 9 bands depending on the preset) to further tailor your one-of-a-kind sonic signature.

For FM broadcast, SST includes a fully-featured stereo generator, dynamic RDS generator with UECP, and a final clipper which maximizes loudness while minimizing the typical tradeoffs in distortion, even when driven to extremes. Some excellent sounding presets complete the package, providing you a fast path to a signature sound, or a starting point for you to customize your own settings.

Omnia SST is sold bundled with an integrated Omnia μMPX® encoder and a single μMPX® decoder license. Additional decoder licenses are required to transport composite audio to more than one PC. Omnia SST may also be purchased as a standalone processor (no μMPX® capability). Additionally, Omnia μMPX® send/receive software may be purchased as stand-alone components using command line driven Windows applications. When using component Omnia μMPX® applications, be certain to order both Encode and Decode licenses. Please refer to the user manual for instructions on configuring Micro-MPX.

System Requirements

Omnia SST requires some knowledge of general computer configuration and administration. SST should be run on a dedicated, stable computer that is not shared with other applications. This will, after all, be your on-air audio processor. (You probably don't want the morning guy using it to play Solitaire or looking at videos on YouTube.)

Once you have a stable system up and running, it should be treated like an "appliance". Windows updates should only be applied as absolutely necessary and the machine should be kept well secured behind a firewall. While other applications can co-exist with SST, the fewer variables in your computer environment and the fewer changes you make to your "processor PC", the lower the risk. Standard IT best practices apply here, though you will want to at the very least disable any "power saving" features and set the machine to log in automatically so SST can launch at startup and run in the background. You will also want to assign a static IP address to the system so the Omnia SST interface can be accessed remotely.

Since the software is fully controlled via HTML 5 web interface, you may even consider removing the keyboard, monitor, and mouse after setup—after of course making any necessary BIOS changes to ignore keyboard errors, and testing to make sure the system will reboot properly without operator intervention.

Hardware

The actual requirements for SST are fairly modest but as a general rule, the faster the machine and the more RAM the better (though choosing a relatively modern multiple core processor is far more important here). A 2.4 GHz Core i3 with 4 GB of RAM is a good starting point, though a 3.6 GHz Core i7 with 8 GB of RAM would be even better.

Operating System

SST will work with most modern Windows operating systems, but we recommend Windows 7 Professional. This has proven to be a very stable platform. Windows 10 can also work, but is not currently recommended due to the fact that updates (as well as reboots) are often forced and cannot easily be disabled.

SST and Audio Cards

While any audio interface supported by Windows *SHOULD* work with SST, there are several considerations. There are thousands of choices for Audio cards in the PC world, from state of the art professional gear, to utilitarian junk. While SST will work with just about anything, sound card quality is important, especially in what can be a high noise environment like a PC case, or a high RF environment like a transmitter room. In general, we recommend you buy the best hardware that you can afford. That said, cards using either WDM or ASIO drivers are supported and will work simultaneously, though ASIO is preferred for stability and lower latency.

Sample Rate

Since SST is capable of generating an entire composite MPX baseband (including 57 kHz RBDS, as well as 67 and 92 kHz SCA signals) a high-quality sound card should be used. This card <u>must</u> be capable of a 192 kHz sampling rate. Many onboard audio interfaces are in fact capable of 192 kHz operation, but often suffer from poor noise performance and other issues. If you do not plan to generate MPX from SST, any audio card of reasonable quality supporting sample rates below 192 kHz should suffice.

Balanced I/O

Choosing an audio card with professional level (+4 dBu) balanced I/O will offer optimum performance, and ensure that more than enough headroom is available when used to generate MPX or otherwise. Since most MPX inputs are unbalanced on a BNC connector, you will need to wire a cable with XLR pin 2 (or TRS "tip") connected to the center pin of the BNC, and pin 1 connected to the shield of the BNC.

Commercially manufactured adaptors from XLR or ¼" TRS to BNC are available from various sources. Avoid audio cards which only provide miniplug (headphone) outputs if at all possible. These interfaces typically lack shielding or isolation of analog sections and are more prone to noise and interference.

DC Coupling

When used to generate MPX, the card should preferably have "DC Coupled" outputs for best performance. If the card outputs are not DC coupled, overshoots and loss of loudness can occur.

60Hz Square wave - PERFECT.
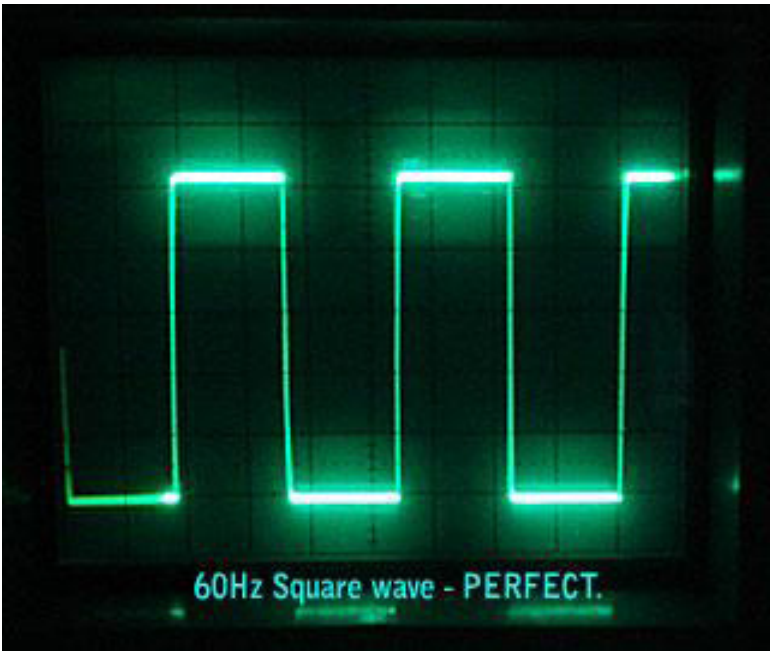
To determine whether or not the outputs of a card are DC coupled, a quick test is to use the test signal generator in SST to produce a 60 Hz square wave (or lower) and look at the output of the audio card on an oscilloscope set to ***DC input coupling***. If the waveform is perfectly square (or relatively close to it) as shown in the image above, your audio card is likely DC coupled and should not need additional correction.

60Hz Square wave - correctable. Adjust tilt.
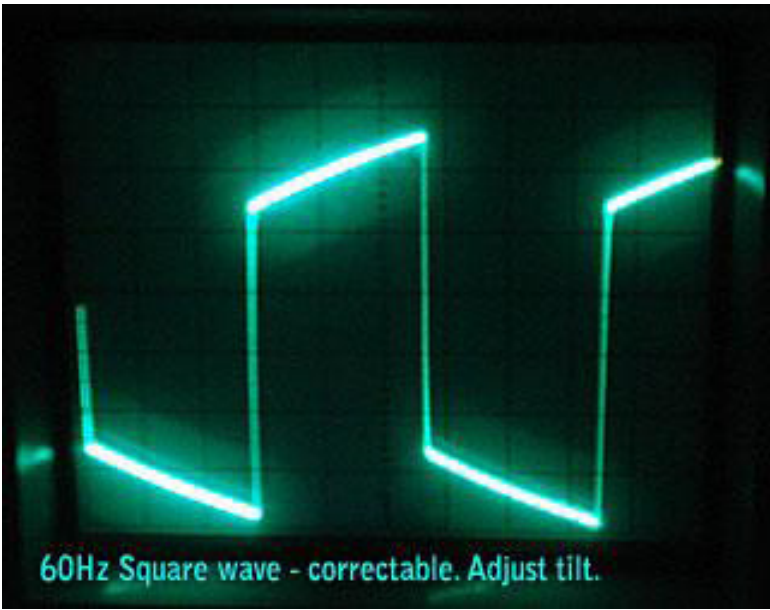
If there is any "tilt" to the square wave as demonstrated in this second image, the card's output is likely NOT DC coupled. Adjust the FM tilt correction as described later in this document until the waveform is square.

If you don't have an oscilloscope handy, you can also measure the modulation level at various frequencies with a modulation monitor, or (as a last resort) the internal modulation metering on your exciter. The modulation level should be fairly consistent with a 15 Hz square wave, as well as sine waves at 15 Hz, 1 kHz, and 60 kHz. If it is not, adjust the tilt correction until modulation levels are consistent at each of these frequencies.

Suggested Cards

SST has been tested and known to work with a DC coupled version of the AudioScience 5810/ 5811 cards. (hardware rev B2 or later). The Marian Trace Alpha and Marian Seraph AD2 have also been tested and known to work well.

192K capable boards from reputable companies such as Lynx have been reported to work decently. Additional cards are being tested and will be added to this list in the near future. Many cards are capable of working with SST, but performance will vary, and it is the responsibility of you, the end user, to qualify audio hardware for your specific facility and setup. As such, Telos can make no warranties regarding audio hardware, nor can we offer customer support for hardware we have neither sold nor seen.

Installation

Installing SST on your computer is relatively straightforward. The process is much like installation of any other application.
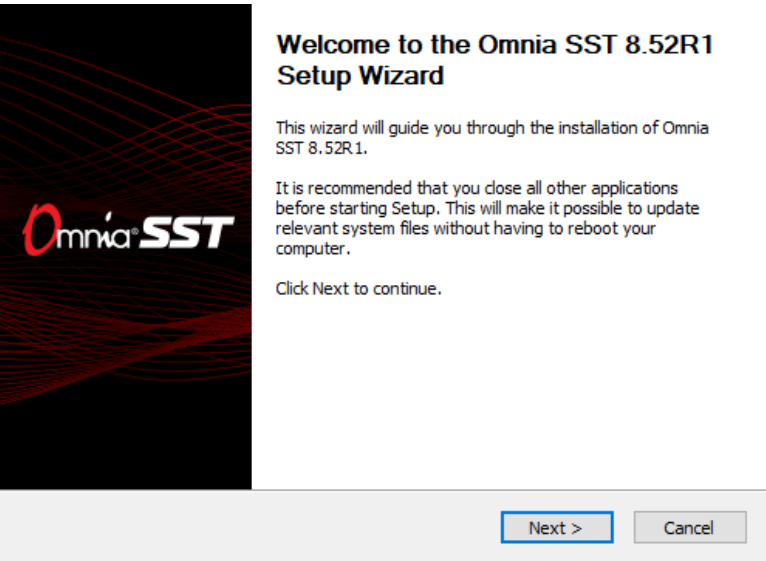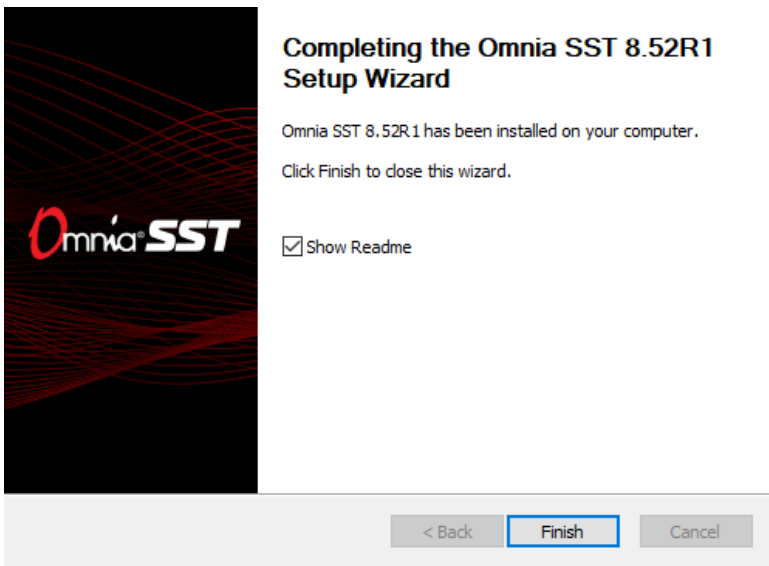

Download and launch the SST installer. Click "Next" to continue.

Note:

Make sure you are installing SST on the system that you intend to run it on. Licensing will be tied to that specific machine. Contact technical support via support@telosalliance.com for additional information on licensing considerations.
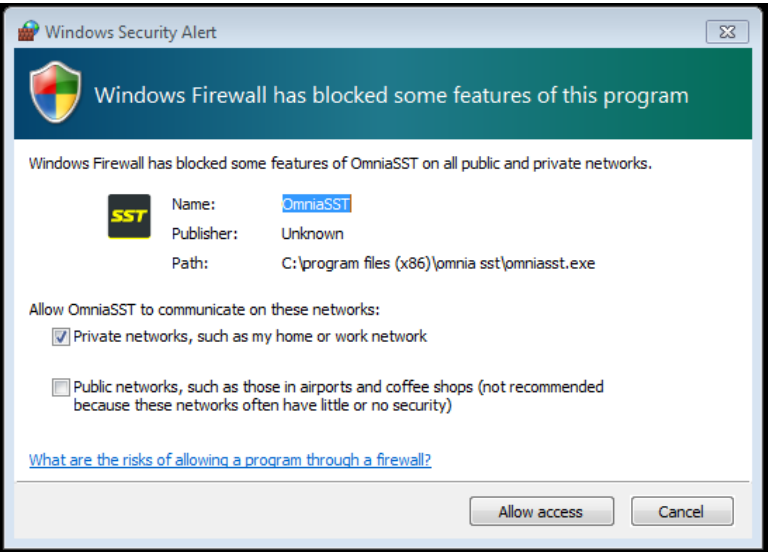
Accept the license agreement and click "Install".

Click "Finish" once again to exit the SST installer. A "Readme" file (this document) will appear.

Getting Started with Omnia SST

Launch Omnia SST from the desktop icon that was created. From this point, all control will be done through the web GUI.

You may receive a prompt requesting that Omnia SST be allowed through the Windows Firewall on the first launch. Click "Allow Access". You may also wish to check the second box if this system is behind an existing firewall. Private network connections can occasionally be mis-categorized by Windows as Public connections.

As Omnia SST launches, a splash screen will appear briefly. The program is minimized to the system tray at launch.
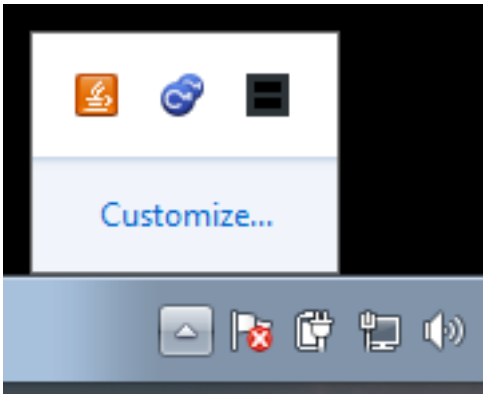
The SST icon is the black box. In some cases, you may need to click the arrow to reveal "hidden" system tray icons. If audio is present at the default input, there will be I/O metering displayed here. Single-click the icon to launch the web GUI or right-click to bring up a menu which will allow you to configure the web interface, launch the web interface, or exit Omnia SST and stop all processing.

Running as a Service or Multiple Instances

In some cases, you may wish to run Omnia SST as a Windows service. Multiple instances are supported, either as a service or as a standalone application. Note that each instance requires a separate license code and a uniquely named executable (OmniaSST1. exe, OmniaSST2.exe, etc).

The following command line switches are supported:

Install service: -i

Uninstall service: -u

Run as service without installing: -run

Install as service, run immediately and at system start: -i -run

*The -run option will also automatically restart the service if it should stop.

Note that when running as a service, the system tray icon will not be available. Omnia SST will be running entirely as a Windows service with only the web GUI for management. You will want to configure the web interface port(s) for each instance appropriately BEFORE installing and running as a service. The Windows service manager can be used to start or stop each instance of Omnia SST running as a service. This can be done from the command line (net start omniasst or net stop omniasst).

Web Interface Configuration (optional)
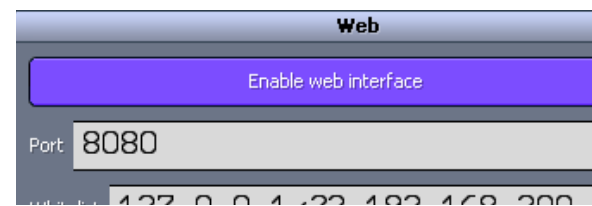
By default, only local access is allowed (127.0.0.1) and the port is set to 8080. You may wish to extend this to allow access via your local area network, particularly if you choose to run your Omnia SST system without a keyboard, monitor, and mouse attached. Right-click on the SST icon in the taskbar and select "Configure web interface" to reconfigure these settings if necessary.

In the above example, in addition to the local system, any host on the 192.168.200.x network will be allowed access. IP addresses for individual machines can be specified here as well. Entries take effect immediately and can be separated by a comma or space. When finished, minimize the window or click the X to close.

Navigating the interface

Click the SST icon in the system tray to open a browser window to the SST user interface. The "home" screen (above) allows quick access to various sections of configuration and metering. This screen allows direct access to I/O configuration by clicking on any of the purple input or output buttons. "Clean up" and "Processing" allow access to comprehensive parameter sections. A "Quick Adjust" panel allows rapid access to the most common processing adjustments.

From various screens, use your mouse or pointing device to click, drag or swipe objects between on/off, or to set various values. Note that if you single-click on a "slider" control, you can use the Left/ Right arrows to increase or decrease values in single increments, instead of dragging with a mouse. You can also click on most values to enter a number directly, then press "enter" to accept.

Shortcuts & Icon Buttons

- The Home 🏠 button is at the top of the window. Click to return here at any time.

- The Settings ⚙ button enters the main configuration screen

- ▢ Presets opens the preset management window

- ⚠ will flash red to indicate the presence of any alarm conditions such as audio card errors. Click to view or clear the alarms.

- 🖥 will open the main metering panel.

- ❓ click on the help icon so it is highlighted in yellow, then you can click on different screen elements to find out more about what they do.

Configuration
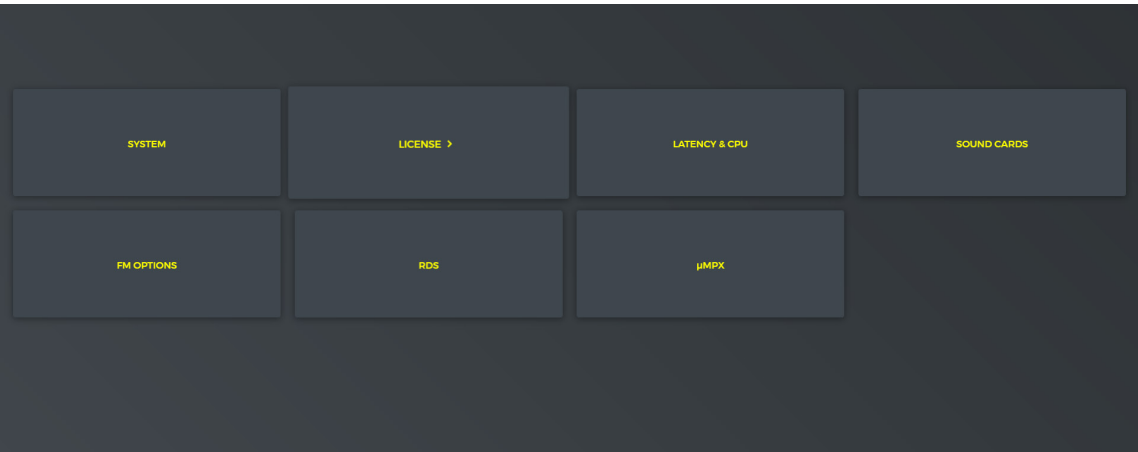
Once SST is up and running, you'll need to do some initial setup. This includes starting the software automatically, applying the license key, configuring the audio I/O, adjusting some MPX settings, and choosing a preset.

This quick start guide covers the basics. The SST graphic user interface is built to be easy to navigate and explore. We encourage you to click on various buttons and screens to get oriented to this powerful software processor.

System
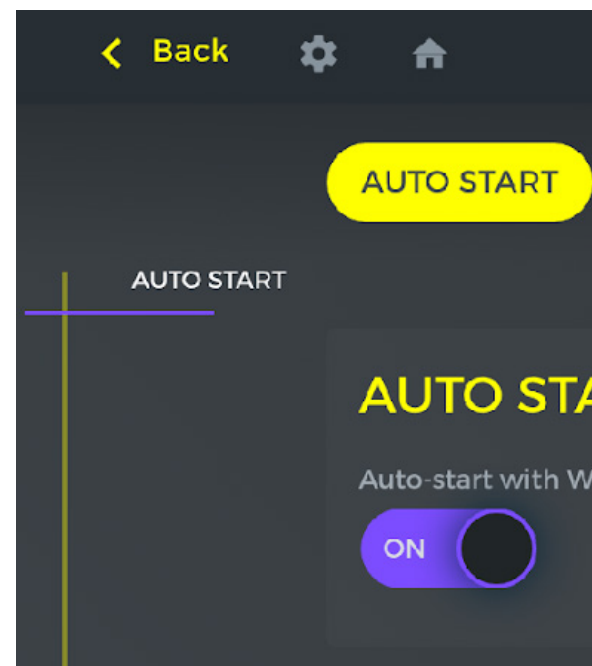
These settings control a few global parameters such as whether or not the software automatically starts with Windows, allows complete bypass of all processing, and disables "Hear" and "Delta" controls in the software that would otherwise interrupt the processed signal on-air when toggled.

License
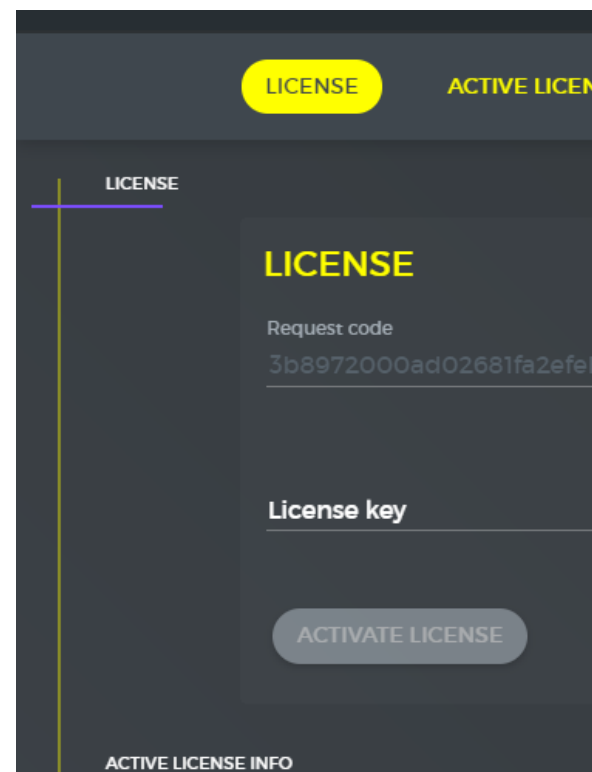
License keys for Omnia SST are generated using the request code from this screen, and are specific to each hardware installation. Once you have purchased the software, copy the request code, and visit the appropriate form for activation.

3001-00070-000 | OmniaSST + _µ_MPX Encoder & Decoder:

https://minnetonkasoftware.com/telosproductregistration/Registration_Omnia300100070000

3001-00085-100: OmniaSST without µMPX:

https://minnetonkasoftware.com/telosproductregistration/Registration_Omnia300100085100

3001-00071-000: OmniaSST + µMPX Encoder & Decoder (Additional Decoder License):

https://minnetonkasoftware.com/telosproductregistration/Registration_Omnia300100071000

3001-00086-100: Omnia µMPX Encoder License:

https://minnetonkasoftware.com/telosproductregistration/Registration_Omnia300100086100

Demo versions:

Omnia SST will install and run without licensing, but recorded "You are listening to Omnia SST" messages will be injected into the audio with increasing regularity. For many, this mode will suffice for off-line evaluation, or for overnight testing. If you need to evaluate OmniaSST over the air without interruption, you may request a limited, short term license at the email address above, or through your Omnia dealer.

Soundcards

This configuration panel contains all parameters related to sound card I/O selection, level adjustments, and tilt correction. These settings can also be directly accessed by clicking the purple "Input" and "Output" buttons from the "Home" screen. Many of these settings appear in multiple places, but will only be covered here once.

Note:

Changing any settings in this section WILL cause a brief audio glitch across all outputs as the buffer is cleared and all I/O devices are reset. All changes take effect IMMEDIATELY.

Sample rate

SAMPLERATE

SAMPLERATE
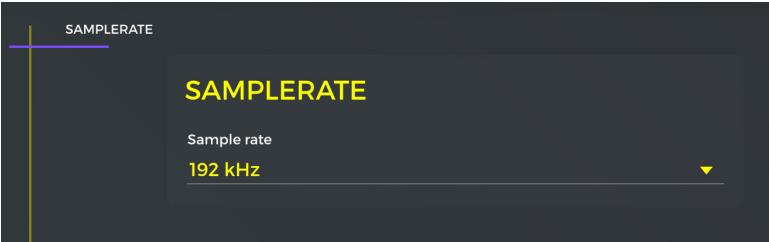
Sample rate
192 kHz

Choose the sample rate you wish to run Omnia SST at. If you plan to generate MPX, this should be set to 192 kHz. If you do not plan to generate MPX with Omnia SST, this can be any valid sample rate supported by your audio hardware.

ASIO

ASIO

ASIO

ASIO
ON

ASIO Device ID
**AudioScience ASIO driver**

Reduce buffer clicking
ON
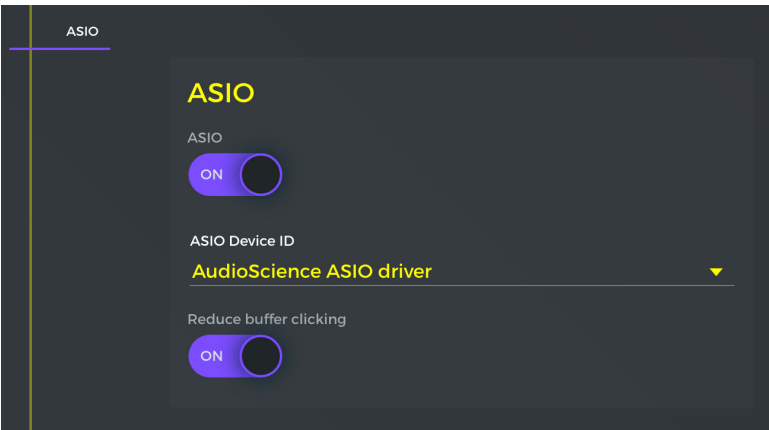
This section will globally enable or disable use of ASIO drivers. It is strongly recommended that you use an ASIO driver with SST if your audio card supports it. This will increase stability, and reduce latency. Only one ASIO device can be selected here. This device will be used in all sections when configuring the ASIO I/O channels in those sections. WDM devices are also supported by choosing "No ASIO" in the appropriate sections, and selecting the desired WDM device ID. Selecting ASIO input or output channels will always override the Input or Output Device ID setting in each section. Other modes supported include Kernel Streaming, WASAPI, and MME. If ASIO is not available, Kernel Streaming would be the preferred selection. It may take some trial and error to determine which selection provides the best stability and lowest latency for your specific audio hardware.

Main Input
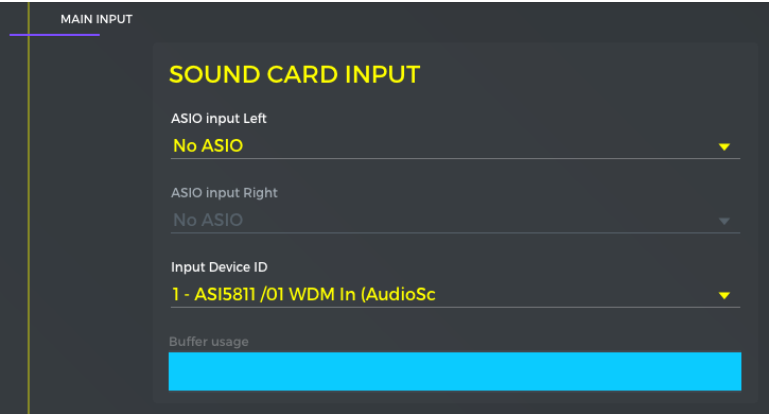
The "Main Input" settings (as you would expect) select what audio device and inputs feed the main program path through SST. If you are using an ASIO device for input, select the appropriate left and right channels. This will automatically disable and override the "Input Device ID" field, which is used for selecting a WDM device. If you wish to use a WDM device, set "ASIO input Left" to "No ASIO" and choose the desired WDM device in the "Input Device ID" menu.

Input Level Correction
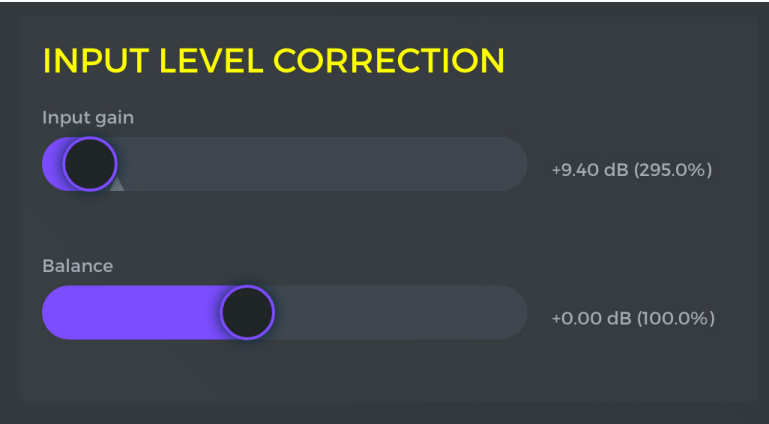
Each audio input has an "Input gain" setting to compensate for low level audio inputs, as well as a "Balance" adjustment to compensate for differences between left and right input levels. Adjust as necessary to achieve sufficient input levels without overdriving the rest of the processing stages. This would typically put the input meter bars between -6 and 0 on the scale. Click the icon at the top of the window if necessary to show the input metering and scope, along with output and MPX displays.
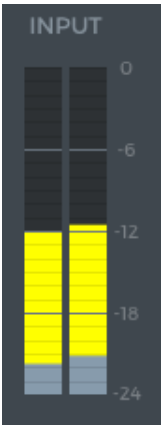
The "grey" portion of the meter is the actual input level, and the "yellow" portion of the meter reflects any additional gain added with the input level correction control.

FM Output


The FM output section controls which audio card output(s) will be used for the MPX signal, and the output level of the MPX signal. Tilt correction for the FM output, as well as a test signal generator, and MPX delay for booster or single frequency network use is also available.

The buffer indicator bar below these settings will indicate the status of the output buffer. This bar should stay at least halfway filled, if it doesn't, the buffer is getting starved and audio dropouts can occur. If your system can not maintain adequate buffers, it may not have enough CPU horsepower to operate at the selected sample rate, buffer size, and latency settings.

Tilt Correction
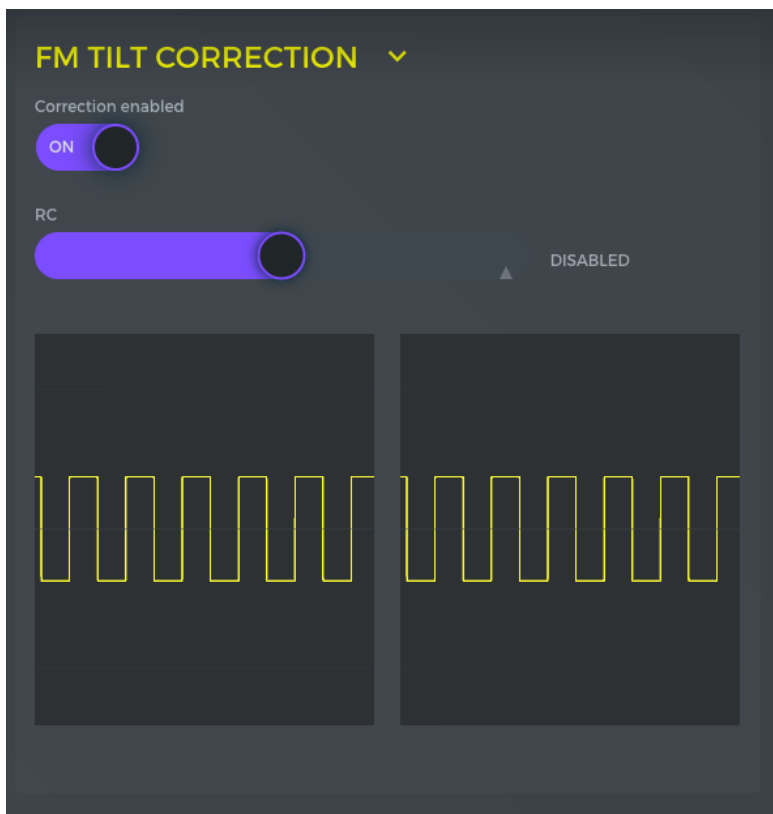
As mentioned earlier, many audio cards are not "DC Coupled". This can result in less than optimum performance when used to generate MPX signals. Tilt on the output can cause overshoots and loss of potential loudness. Tilt on the input can cause loss of bass and slightly reduced de-clipper performance. To compensate for this, SST has built in "Tilt Correction" controls with pre- and post-correction oscilloscope displays.

This example shows the FM output tilt correction settings with the internal square wave generator enabled and correction enabled, but no correction value set. While looking at the output of the card on an oscilloscope, adjust the "RC" control until the square wave is flat. The corrected output will be reflected in the right hand waveform, which will begin to tilt in the opposite direction as it compensates for tilt introduced by the card.

Adjusting for tilt on the input is a similar process, but requires that a square wave be fed into the card from an external (DC coupled) source.

Additional I/O

In addition to the main input and FM output, several other I/O paths are provided. These include a secondary audio input for backup audio, SCA audio, or an external RBDS generator and outputs for Streaming/DAB/HD as well as low latency monitoring. Configuring this additional I/O is similar to configuring the main input and FM output, but is not detailed in this quick start guide.

Choosing a Preset
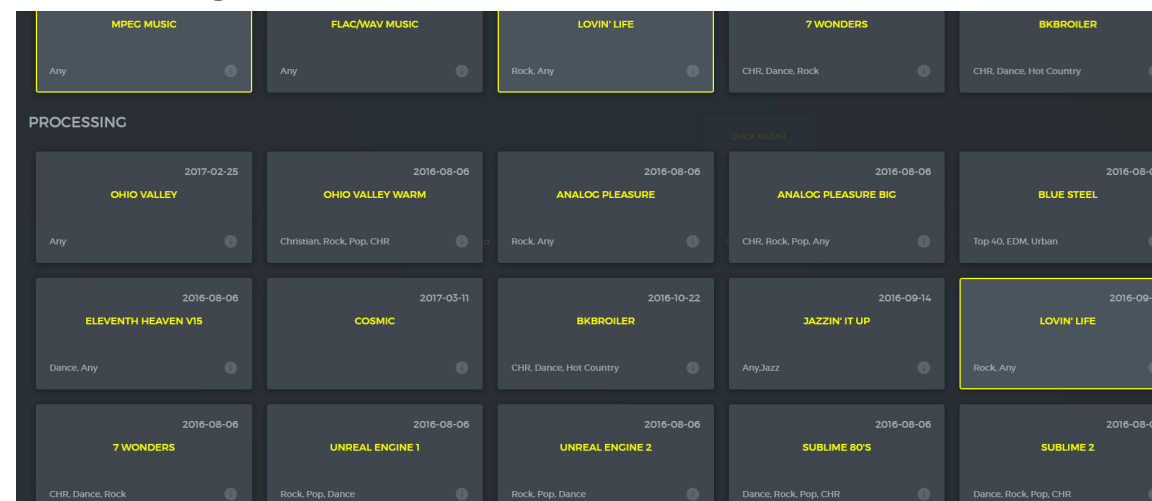
Click the [📷 Presets] button at the top of the window to open the presets panel. This panel is divided into several sections.

1. The first section displays recently selected presets

2. The second section displays factory "Processing" presets which recall "Processing" parameters (not "Cleanup" or other SST I/O settings)

3. The third section will recall parameters specific to the "Cleanup" section of SST (such as de-clipper, "delossifier", and noise removal)

4. The final section will display any "Custom" presets that have been saved. User saved "Custom" presets in the final section allow all parameters to be recalled; e.g. any combination of settings types (I/O, Cleanup, and Processing).

If you aren't sure where to start, pick a preset from the "Processing" section and apply it. Listen. "Analog Pleasure" is a good place to start (although this author is partial to "Lovin' Life"). Once you find a factory preset that is "close" to the sound you're looking for, you can adjust it using either the "Clean Up" and "Processing" panels, or the "Quick Adjust" settings, then save it using the "Save…" command at the top of the window. After saving the preset, it will appear in the "Custom" list.
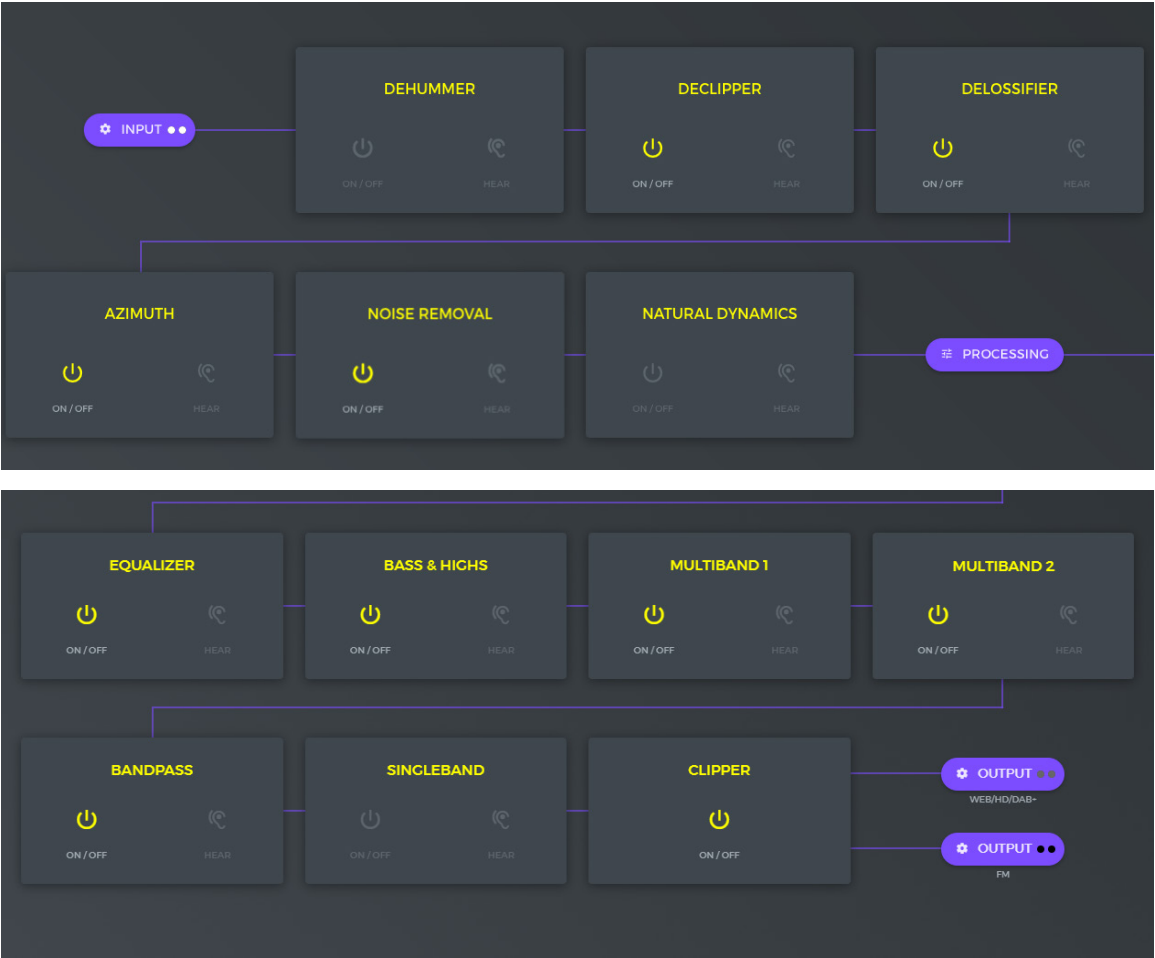
Modifying Presets
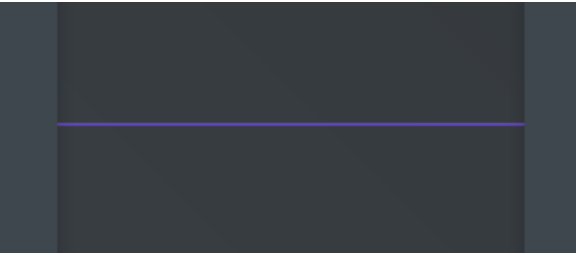
From the "Home" screen, click on the "Clean Up" or "Processing" icon to open the corresponding panel of parameter blocks. You can also navigate between them by clicking the purple "Processing" and "Clean Up" icons in each panel. Click "Quick Adjust" to access the most common processing parameters.

Quick Adjust

Clean Up/Processing

These parameter blocks are laid out in the order of signal flow within the software. Click the title of each block to bring up the controls for that parameter block, click the ⏻ icon to enable or bypass each block, or click the ✆ button to hear all processing up to that point, bypassing subsequent blocks.

Note:

The "Hear" buttons WILL affect your signal on the air. These buttons can be disabled through the system section of the configuration page.

Adjusting Processing Parameters
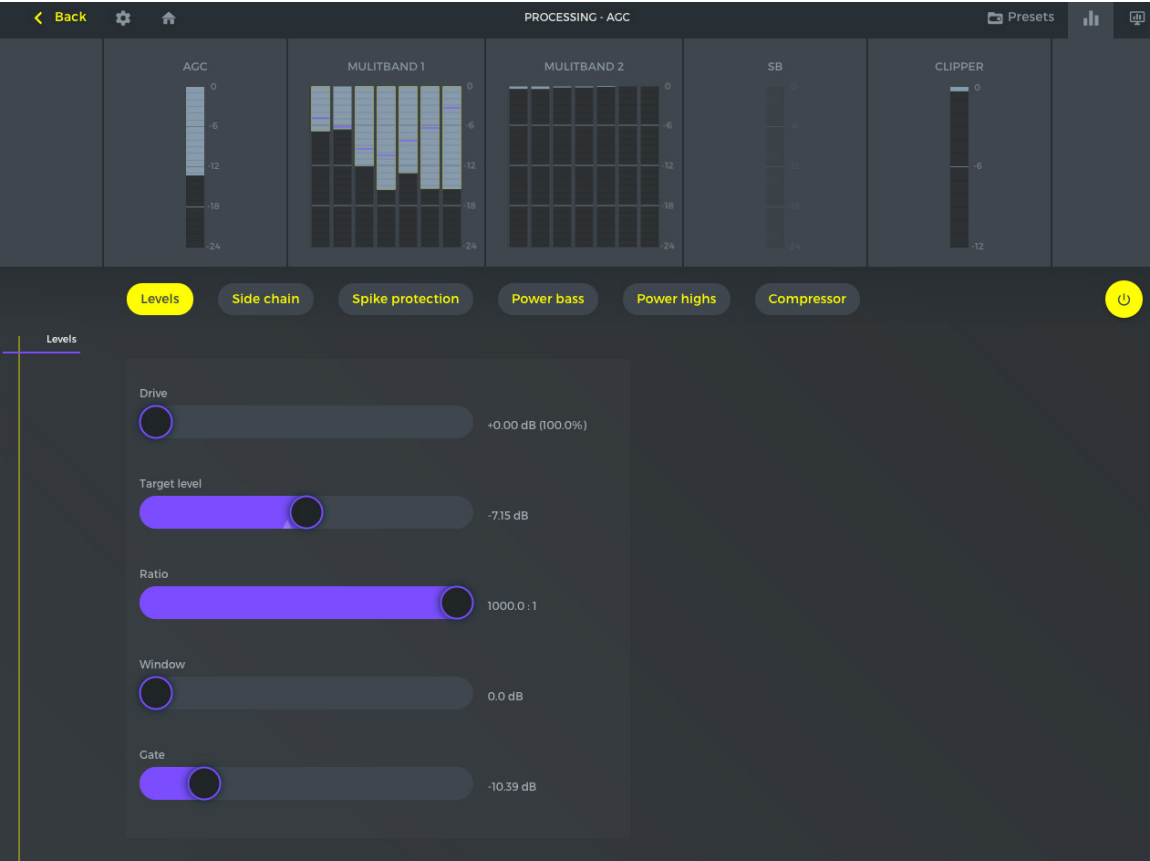
Each parameter block will open a set of controls for that particular block. Metering information for the selected block and related blocks will be displayed across the top. This metering display can be toggled using the ▐▋ button near the top right corner of the window. To display metering for all blocks simultaneously, click the ▐▋ button. Click **‹ Back** to select a different block of parameters.

As with any processing, make SMALL and INCREMENTAL changes. Don't try to change too much at once. Change a few things, listen, try again. The professionals know that intense listening and preset tuning for many hours can be fatiguing. A great preset strategy is often to get to a good point, save your settings, sleep on it and come back the next day with "fresh" ears. You can always save multiple versions for comparison during adjustment. Once you've got a sound you like, sit back and enjoy!

Frequently Asked Questions

What exactly is SST?

Omnia SST is a completely software-based audio processor. It can turn a PC into a high-performance FM audio processor when coupled with an appropriate audio interface.

Can I really turn my PC into an FM processor with it?

YES! All it takes is an audio interface capable of 192 kHz operation (preferably with DC coupled outputs).

Can I use any PC?

You can use a wide variety, but don't waste your time trying to use old, under- powered single core computers with unsupported Windows versions that are being retired by the front office. A quad core Intel i3 at 2.4gHz is a good start, and 4GB ram is minimum. A clean software environment (not running lots of background programs) is recommended. SST will be doing some important work at your facility; it should be run on a dedicated machine that can be left to do its primary job.

Does SST support multiple audio paths (Studio monitor, HD, SCA, etc)?

Absolutely. In addition to the FM (MPX) output, Omnia SST provides outputs for both digital (Streaming/HD/DAB) and low latency monitoring. It also features dual internal SCA generators to support analog SCA applications.

What about backup audio paths?

SST has full support for external backup audio sources. The secondary input can be either continuously mixed with the main audio path, or switched after a specified period of time when silence is detected.

How about RDS/RBDS?

Omnia SST includes a fully-featured dynamic RDS/RBDS generator, complete with UECP support.

What makes Omnia SST different from other FM processors?

Omnia SST is the FIRST FM processor to incorporate Omnia µMPX®! "Micro MPX" technology allows you to transmit a complete MPX baseband in less than 384 kbps!

Do I have to use a 192 kHz audio card?

If you are generating MPX for FM, yes. The MPX baseband can extend out slightly beyond 92 kHz. (Warning: Math alert) Our good friend Nyquist tells us that to faithfully reproduce a given audio frequency when sampled digitally, the sampling rate must be at least twice that frequency…That gives us an audio frequency response out to 96 kHz at a 192 kHz sampling rate, or just enough to cover the MPX baseband.

Is there a list of recommended audio cards?

At this time the only "tested and approved" cards are the ones mentioned earlier (AudioScience 5811 Hardware rev B2 or later, various models from Marian). While any card capable of 192 kHz operation should work, quality varies. We will make additional recommendations available as cards are tested.

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