

Omnia A/XE

Processed Audio Encoding For Windows



USER'S MANUAL

Manual Version 1.3 for software version 1.12 and later
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Omnia A/XE Manual

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We reserve the right to make improvements or changes in the products described in this manual, which may affect the product specifications, or to revise the manual without notice.

Updates

We routinely release new software versions to add features and fix bugs. Check the Omnia web site for the latest. We encourage you to sign-up for the email notification service offered on the site.

Feedback

We welcome feedback on any aspect of the Omnia A/XE software or this manual. In the past, many good ideas from users have made their way into software revisions or new products. Please contact us with your comments.

We support you...

By email worldwide: support@omniaaudio.com

The Omnia Web site is at <http://www.omniaaudio.com>

By phone/Fax in the USA: Customer service is available from 9:30 AM to 6:00 PM USA Eastern Time, Monday through Friday at +1 216.241.7225. Fax: +1 216.241.4103.

By phone/Fax in Europe. Service is available from Omnia Europe in Germany at +49 81 61 42 467.

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1 Introduction

The audio industry employs dynamics signal processing for many aspects within a broadcast station, recording studio, mastering facility, and numerous other requirements. From simple compression of a microphone channel, to special desired effects in the production studio, and on through the creation of dial-dominance in the transmission path, processing has always been hardware-based. Even with the evolution of digital signal processing (DSP), most processors are still physical boxes that engineers, producers, and program directors tweak as they desire to achieve that signature sound. But where is it all headed as technology moves into more of a software-based world? The personal computer has revolutionized our culture, and it now can provide us with the required machine cycles of power to accomplish many of the tasks we ask DSP chips to perform.

We introduce to you to Omnia A/XE a versatile audio processing and encoding platform that is available as a pure software utility! Our Omnia processors dominate the airwaves the world over. The products that have helped us achieve this success are based upon innovative ideas in the area of dynamics audio processing and Omnia A/XE brings these ideas to your PC.

Omnia A/XE offers what other rack mountable, or PC based hard-card products do, but it doesn't require the overhead of these other products. It makes use of the increased processing power available inside today's faster PC's. Off the shelf PC's now contain more than enough power to perform audio dynamics processing and encoding, serving up multiple processed and encoded streams from within a single computer or web-server.

Motivation

There are thousands of Internet radio-station-like audio webcasters. Like their over-the-air counterparts, these can all benefit from dynamics processing. Every radio station uses audio processing and there is no reason to believe that webcasters wouldn't want it, too. Television stations also employ processing, just as Internet video services will, as they grow in sophistication.

The growing power of PCs makes it possible to have multiple audio processors and encoders on one PC. As network bandwidth increases, there will likely be more webcasters entering the fray – and more concern about audio quality as these services become more mainstream.

Effective processing divides audio into multiple frequency bands and dynamically adjusts levels to be optimum for the following transmission medium. On the surface, this is a simple function. But to get the sound appropriately optimized without adding or aggravating undesirable codec “artifacts” is a tricky blend of art and science involving many trade-offs. Expert ears coupled with audio design expertise are required to get this work accomplished – and these are rare combined skills.

Transmitting audio on the Internet requires bitrate compression (data reduction). Uncompressed stereo audio would require 25x more capacity than possible over a 56kbps modem connection. Even broadband connections require compression so that the audio doesn't take

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up all of the available capacity, leaving nothing for web surfing or companion video content. The perceived quality of audio that undergoes this compression is very much improved with the addition of dynamics processing. The benefit is unambiguously dramatic. Every potential customer who has had a demonstration prefers the sound of processed audio.

Omnia A/XE is a stand-alone software signal processor and MPEG encoder (MP3 and AAC). It does not require a dedicated PC hardware card to operate as it utilizes the host processor inside the computer. Omnia A/XE was designed as a Windows service for 24/7 Internet streaming. The dynamics processing algorithms are based upon the highly successful Omnia.3net, which is a hardware-based DSP audio processor.

Omnia A/XE performs internal calculations with precision sufficient to guarantee 24-bit dynamic range. Omnia A/XE employs the following processing architecture:

- ◆ Wideband AGC
- ◆ 3 Band Combined Compressor/Limiter
- ◆ HF EQ
- ◆ Adjustable Bandwidth Lowpass Filter
- ◆ Final Look-Ahead Limiter
- ◆ A web browser based graphical user interface provides access to all user settings and presents all feedback information.

2 Software Installation

This chapter describes the steps involved in installing Omnia A/XE on your PC. The Omnia A/XE installer includes a Virtual Audio Cable driver and a copy of the Axia IP-Audio driver. The sections below describe when to install the included drivers.

System Requirements

- ◆ Windows XP or later.
- ◆ Minimum 512MB RAM.
- ◆ 20MB free hard-drive space
- ◆ Network Interface Card

The Omnia A/XE application runs on 32-bit or 64-bit versions of Windows XP or later. The Virtual Audio Cable driver and the IP-Audio driver will only work on 32-bit versions of Windows. If you need to use one or both drivers then you will need to install Omnia A/XE on a 32-bit version of Windows.

Starting the Installer

If you received Omnia A/XE on CD-ROM...

If you received the software on CD-ROM, please insert the disk in one of the PC's CD-ROM drives. If autorun is enabled for the drive then the following window will be displayed:



If autorun is not enabled, then use Windows Explorer to view the contents of the Omnia A/XE CD-ROM and double-click the Setup.exe application found on the disk.

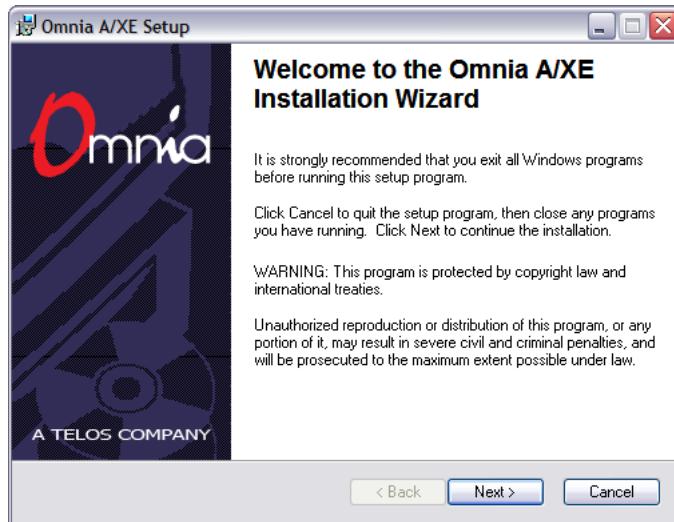
When the above Omnia A/XE Setup window appears, click the Install Omnia A/XE button.

If you downloaded the Omnia A/XE installer...

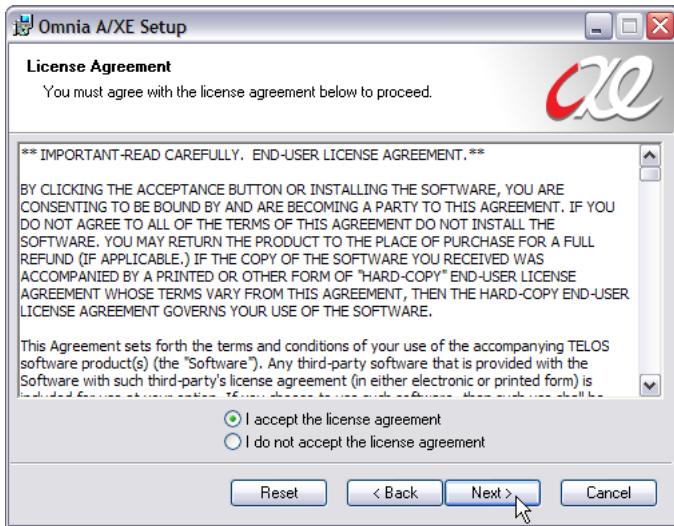
If you downloaded the Omnia A/XE installer then you should have a single file named omniaaxe.msi. Double-click this file to start the installer.

The Installation Process

When you install Omnia A/XE for the first time you will be prompted by the following window:

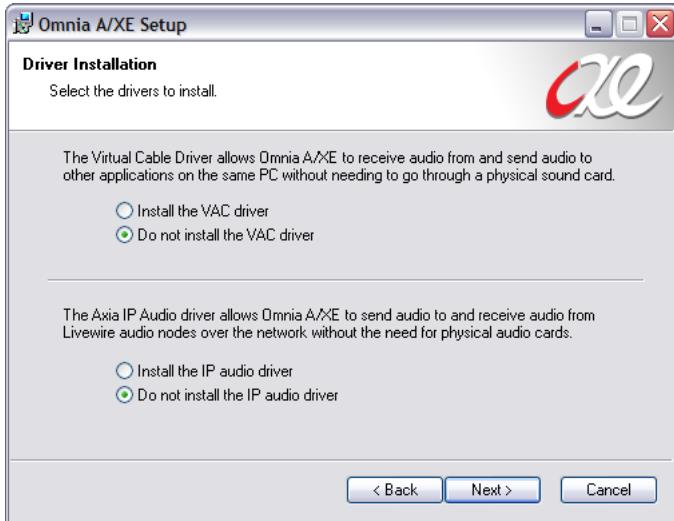


Click the Next button. The License Agreement dialog will be displayed.



Use the scroll bar to review the full text of the license agreement displayed. If you accept the agreement click the "I accept..." radio button then click Next to continue. If you do not accept the license agreement, click Cancel to exit the installer.

Once you click the Next button the driver installation dialog will be displayed:



On this dialog you are given the choice to install the Virtual Audio Cable driver and the Axia IP-Audio driver. Read on to find out if you should install these drivers.

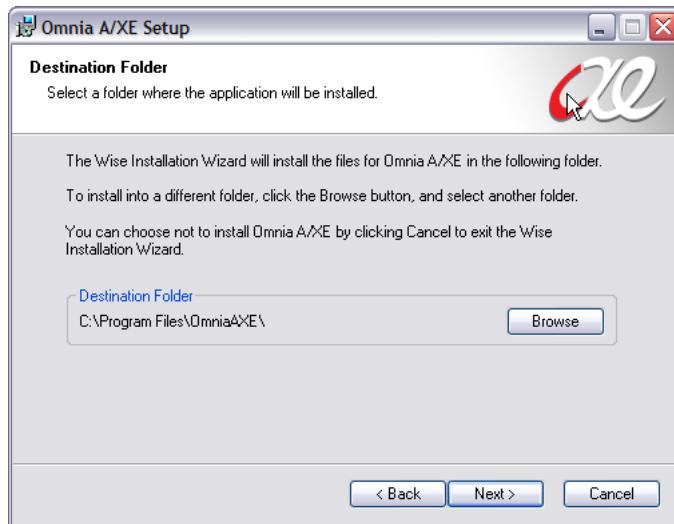
Virtual Audio Cable driver: As the name suggests, the Virtual Audio Cable driver forms “patch” cables that allows Omnia A/XE to exchange audio with other applications on the same PC without the need for a physical sound card. If you plan to send audio to Omnia A/XE from another application or from Omnia A/XE to another application (e.g. a third-party encoder) on the same PC then you should choose to install the Virtual Audio Cable driver.

IP-Audio driver: The Axia IP-Audio driver allows a PC to exchange audio with Livewire-enabled devices directly over the network, without the need for physical sound cards. If you

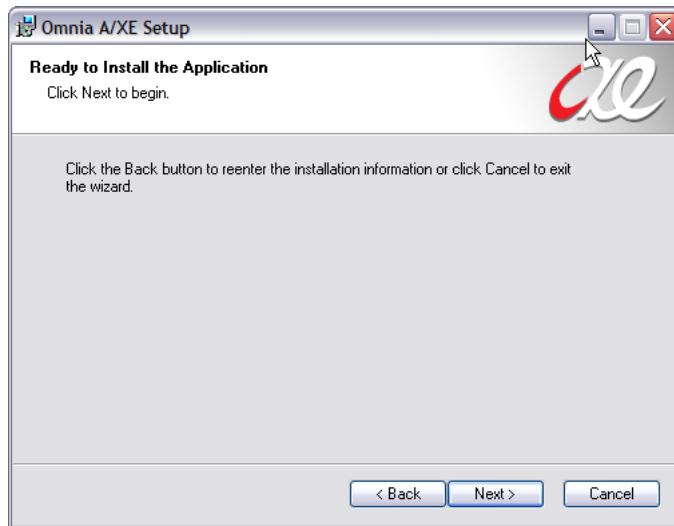
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wish to send audio from a Livewire-enabled audio device to Omnia A/XE or from A/XE to the device then you should install the IP-Audio driver.

Once you have made your driver installation choices, click the Next button to continue with the installation. You will be prompted for the location where the software should be installed.



The default installation location offered in the dialog is appropriate in most cases. If you need to change it, click the Browse button and select a different location. When done, click Next to continue. The final confirmation dialog will be presented:



If you need to make any changes to the choices you have made on the previous dialogs, click the Back button and make the desired changes. Click Next to begin the installation.

A progress dialog will be displayed as the application files are copied to your PC. If you chose to install the drivers, Windows may display a warning dialog similar to the one below:



This warning is from Windows 7. Other versions of Windows may display different looking warning messages. Please select “Install this driver software anyway” to make sure that the drivers are properly installed. Once the installer finishes, your Omnia A/XE software is ready for use.

NOTE: If you need to install a new version of Omnia A/XE, always uninstall the previous version first. Your application settings will be preserved. If you previously had the drivers installed, it is important to reboot the PC after uninstalling A/XE and before you install a new version. This will ensure that the old driver versions are properly removed.

3 Getting Started

This chapter will guide you through the steps required to configure your PC and Omnia A/XE. The information presented illustrates the Windows Vista® operating system but the process should very similar on other versions of Windows.

Application Overview

Omnia A/XE is designed to run as a Windows service. A service is an application that runs in the background without direct user interaction. The benefit of running in the background is improved security and reliability; a user does not need to be logged on the PC for the application to run and as long as the PC is on and Windows is initialized, Omnia A/XE is running in the background.

The application configuration and management is done via an Internet browser (i.e. Internet Explorer, Firefox, Google Chrome, etc.) either from the same computer or from any other computer that can reach the Omnia A/XE PC over the network. If the Omnia A/XE PC has an active firewall you must configure the firewall to allow A/XE to talk to the network. Please take a look at the **Firewall Setup** chapter for details on how to add Omnia A/XE to the firewall's exception list. During the initial application setup, it may be helpful to temporarily disable the firewall until you are able to connect to Omnia A/XE.

Since Omnia A/XE is always running in the background, there may be times that you need to shut it down or restart it. This is accomplished through the Service manager control panel applet. The **Managing Omnia A/XE Service** chapter describes how to accomplish this task.

Program Shortcuts

During installation, Omnia A/XE installs the following shortcuts under **Programs: Configure Omnia AXE, Locate Options.xml file, Locate Logs directory, Locate Presets directory and Documentation**. If you installed the Virtual Audio Cable driver then you will also find a shortcut to **Virtual Audio Cable Control Panel** and if you installed the Axia IP-Audio driver then you will find a shortcut to **IP Audio Driver Control Panel**. Each shortcut (except for Documentation) is described below.

Configure Omnia A/XE

This shortcut opens a browser window pointing to the Omnia A/XE administrative web interface. The shortcut reads the Omnia A/XE configuration information from Options.xml (where all application settings are stored) and passes the port used by A/XE to the browser. Selecting this shortcut should open the browser to the login page of Omnia A/XE. The **Connecting to Omnia** A/XE section later in this chapter describes the login process in more detail.

Locate Options.xml File

Omnia A/XE stores all settings to a single file named Options.xml. This option opens a Windows Explorer window in the directory where the Options.xml file is located. As you may have guessed from the file extension, the file uses the Extensible Markup Language (XML) format for its contents. While you may use a text editor (e.g. Notepad.exe) to view the file contents we recommend that you do not make direct edits to the file unless it is for a special reason.

Once you have setup all your audio sources, encoders and streams, you may want to make a backup copy of the Options.xml file. Also, if you decide to move Omnia A/XE to a different PC moving the Options.xml file will save you some time configuring the application on the new PC.

Locate Logs Directory

This option opens a Windows Explorer window in the directory where Omnia A/XE writes the system log files. A new file is created for each 24 hour period and logs are kept for 30 days. After 30 days the oldest file is deleted to make room for new log files. While you may retrieve the logs through the web interface if you have direct access to the Omnia A/XE it may be more convenient to access the files in the directory where they are stored. When something is not working right, the log files may show you the reason why. If you encounter a problem and need to contact support, sending the log file for the day when the problem occurred will speed up the resolution process.

Locate Presets Directory

This option opens a Windows Explorer window in the directory where Omnia A/XE stores the processing presets. All processing presets are stored in individual presets files. Copies of the default presets that ship with the application and any presets that you may have created will be found in the presets directory. While we do not recommend that you edit the files manually, you may want to access the presets directory for backup or to copy presets from one PC to another.

NOTE: If you need to restore a preset to the default parameters you can find backups of the original presets shipped with the application in the [Program Files\OmniaAXE\Presets](#) directory. Please not modify the presets in this directory. Instead, copy them to the [ProgramData](#) directory.

Virtual Audio Cable Control Panel

The Virtual Audio Cable (VAC) control panel configures parameters for the VAC driver. By default, eight virtual audio device instances (“cables”) are installed. If you need to adjust this number to more or less devices you can use the VAC control panel to adjust this number.

IP Audio Driver Control Panel

The IP-Audio driver control panel configures the Livewire audio channels to send or receive from network. Please see the IP-Audio driver’s user guide under the Documentation shortcut for additional information.

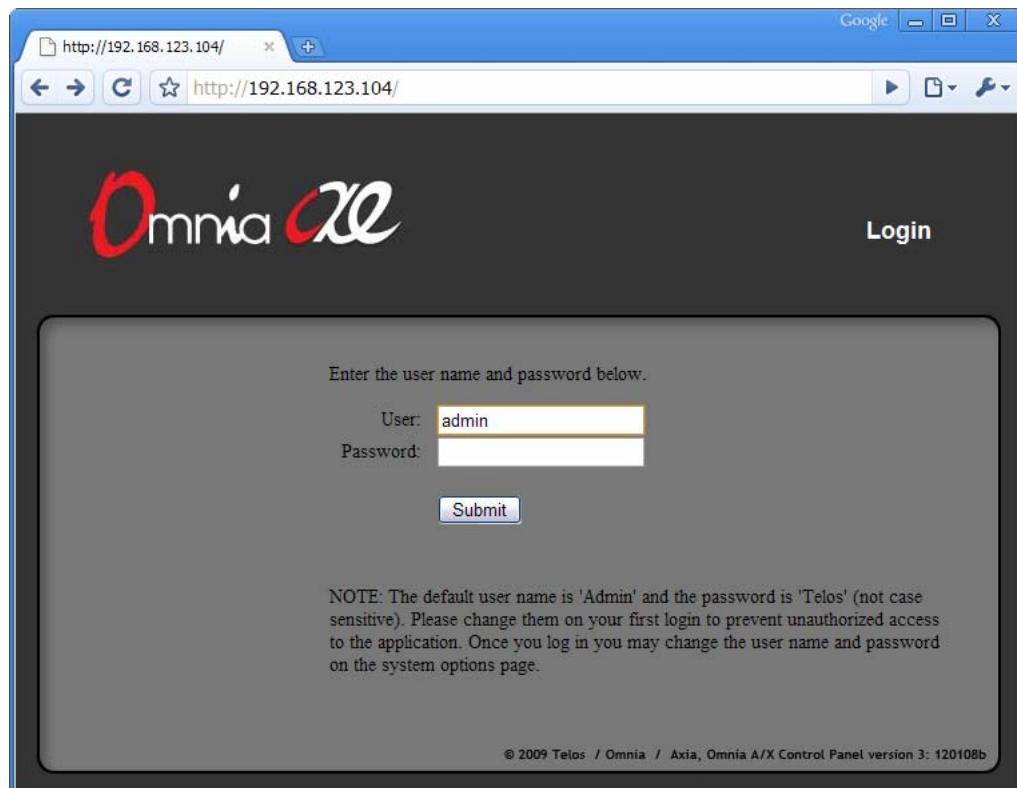
Connecting to Omnia A/XE

By default, Omnia A/XE will use HTTP port 80 for administration. If this port is in use by another application, A/XE will select another available port. For this reason we recommend that for the first time you connect to Omnia A/XE from the same PC where A/XE is installed.

1. Select the **Configure Omnia AXE** shortcut from the Omnia A/XE program shortcuts. This will open your default browser application to connect to A/XE. This shortcut is aware of the port used by the A/XE and will pass this information to the browser.

Troubleshooting Tip: If the browser displays a “Page not found” error, please refer to the Troubleshooting Omnia A/XE Startup section further in this chapter.

2. You should see the following login page in appear in your browser:



3. Enter “admin” for the user name and “Telos” (not case sensitive) as the default password then click the **Submit** button.
4. If the user name and password were entered correctly then you should see the main application control panel:

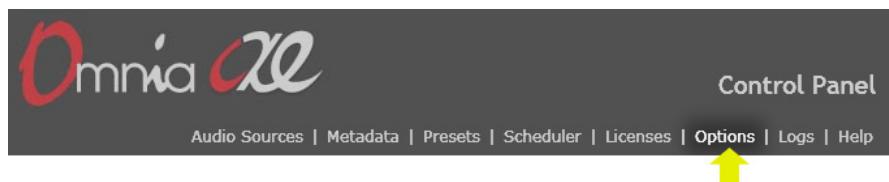


You are now logged in to Omnia A/XE.

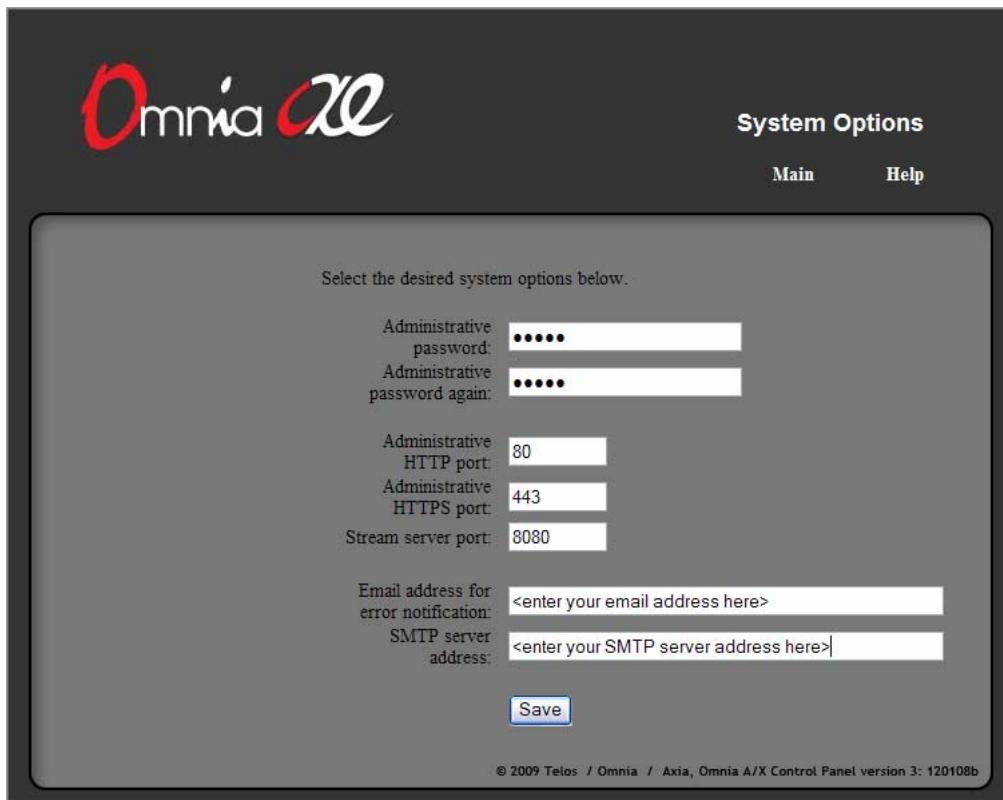
Change the Default Password

One of the first things you should do is change the default password. Skipping this step could give other access to your Omnia A/XE application.

1. Click the **Options** link in the top part of the **Control Panel** window:



2. The **System Options** windows will be displayed:



3. Change the **Administrative password** field to a password of your choice then enter it again in the **Retype password** field.
4. While you are on this page you have the choice of changing the administrative HTTP and HTTPS (secure HTTP) ports as well as the Stream server port¹. The default values should work fine; you should change them only if you need to address a particular problem.

NOTE: The port changes only take effect when the Omnia A/XE service is restarted!

5. The last two fields under **System Options** allow you to enter a notification email address and an SMTP server address. The application uses this information to notify you by email in case of application errors. Fill in these fields if you wish to use the notification feature.
6. Click the **Save** button to make the changes permanent. This will return you to the Control Panel page.

Enter the License Information

Before creating audio sources or encoders you will need to enter the license code(s) you received with Omnia A/XE on the **Licenses** page. The licenses entered limit the number of

¹ The Stream server uses the HTTP protocol to make streams available for playback using most common media players. This lightweight server is intended for monitoring the encoded stream by only a few listeners. It is not intended to serve a large number of streams. Please see the help link on the MP3 or AAC encoder pages for more details.

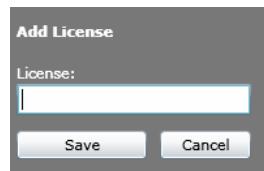
audio sources you can use in the application.

NOTE: When you enter a license code, A/XE will contact a secure Telos server to activate the code on your PC. If the PC is not usually connected to the Internet, you may want to connect it temporarily while you are entering the license code(s). This will allow the activation process to take place automatically. If this is not possible, then you have the option to activate the license from another PC. Please read the Manual Activation section in the License Manager chapter for the full details.

1. Click the **Licenses** link at the top of the **Control Panel** page. The **License Manager** page will be displayed:



2. Click the **Add...** button. Enter your license code in the **License** field then click the **Save** button.



3. The code you entered will show up in the **Licenses** list on the left. Next to the license code you will see additional text describing the state of the license. The text will initially say "Pending activation" then after 10-15 seconds it should change to "OK". Repeat step 2 for each license code you have received. If all license codes have an "OK" status then skip step 4 below and jump to the Create Audio Sources section.
4. If you see an error message next to the license code, please check the license string to make sure it matches the one you received. If the error is "Activation failed" or similar

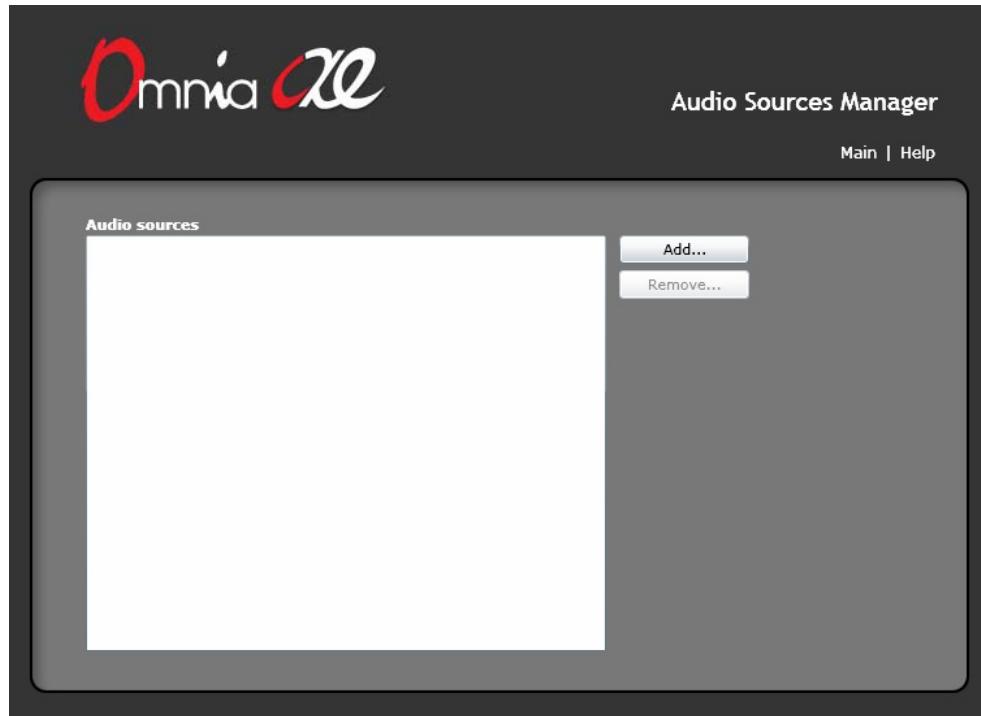
then refer to the License Manager chapter to learn how to activate your license manually.

Create Audio Sources

The **Audio Sources Manager** allows you to select the input audio device(s) you wish to use with Omnia A/XE. Since the Windows audio device names are often not very descriptive, you have the opportunity to assign each audio device a friendly name. This name is then used throughout the rest of the application to refer to the audio source.

NOTE: You will only be able to create audio sources once you have successfully activated your license code on the Omnia A/XE PC.

1. On the **Control Panel** page, click the **Audio Sources** link at the top of the window. The **Audio Sources Manager** page will be displayed:



2. Click the **Add...** button. Select the audio device you wish to use from the **Source device** drop down list. Enter a name for it in the **Friendly name** field then click **Save**.



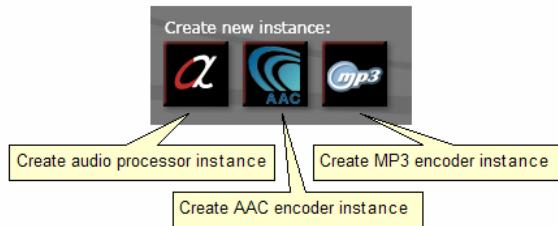
3. Repeat step 2 for each audio source you wish to use. You may see a message indicating that the audio device limit has been reached for the license codes entered in the applica-

tion. If you see this message and still need additional audio sources, please purchase an additional license.

- When done, click the **Main** link or use the **Back** button to return to the **Control Panel** page.

Create an Audio Processor

The three buttons on the Control Panel page allow you to create audio processor instances and AAC or MP3 encoder instances. You may create multiple instances of each to suit your needs.



An audio processor instance accepts audio from an audio source, applies Omnia processing to it then sends it out to an audio device on the PC. If you need to create an audio processor then follow the steps below.

- Click this button  to create an audio processor instance. The following page will be displayed:

Select the input audio source, the desired processing preset and the output audio device.

Audio processor name:

Audio source: My AudioSource

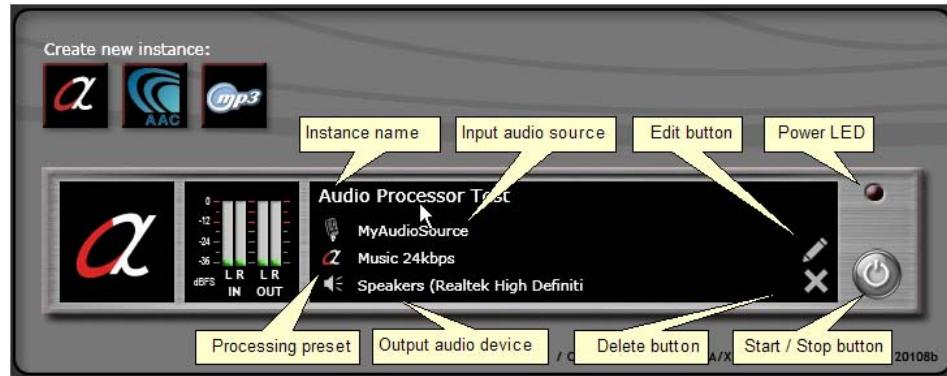
Processing preset: Music 24kbps

Output audio device: Speakers (Realtek High Definition)

Save

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- Enter a name for the audio processor. You may use letters and digits along with underscore characters if needed. Please do not use other special characters in the name.
- In the **Audio source** drop down select the audio source you wish to use. Select the processing preset from the **Processing preset** drop down then the output audio device from the **Output audio device** drop down list.
- Click the **Save** button. You have just created an audio processor instance. When the Control Panel page is displayed you will see the audio processor instance you have just created:



5. Click the start/stop button to start this audio processor instance. The power LED will light up and the meters should show some activity. You should also hear audio being played through the output audio device.
6. Click the edit button to modify the instance's properties. Note that if an instance is active any changes will only take effect when the instance is restarted.
7. Click the icon found next to the preset name if you wish to edit the audio processing parameters (see the **Processing Audio** chapter for more information).
8. Click the delete button if you wish to delete this instance.

Create an AAC or MP3 Encoder



Clicking the **Create AAC instance** button or the **Create MP3 instance** button on the **Control Panel** takes you to the AAC or MP3 encoder configuration page. On this page you create an AAC or MP3 encoder instance for a selected audio source.

NOTE: You may create multiple encoder instances even for the same audio source, perhaps using different encoding parameters or different processing presets.

For each encoder instance you may deliver the encoded stream through the local stream server, to a SHOUTcast-compatible server, a Wowza® media server or Windows Media® server.

NOTE: The AAC and MP3 encoders are described in detail in the AAC Encoder and MP3 Encoder chapters found later in this manual.

Once created, each instance will show up on the **Control Panel** page very similar to the audio processor instance shown above.

Troubleshooting Omnia A/XE

While attempting to connect to Omnia A/XE you may get a “Page not found” error in your web browser. This section describes the steps involved in determining where the problem lies. The main tasks are:

1. Make sure that the Omnia A/XE service is running.
2. Verify that Omnia A/XE is added to your firewall's exception list.
3. Double-check the port number used by Omnia A/XE's web administration.

Each task is described in more detail below. The examples illustrate the steps on the Windows Vista® operating system. If you use another Windows version the steps should be similar.

Verify the Omnia A/XE Service

Omnia A/XE application runs as a Windows service. Services run in the background and present no user interface. You may start and stop Windows services by using the Service Manager control panel applet.

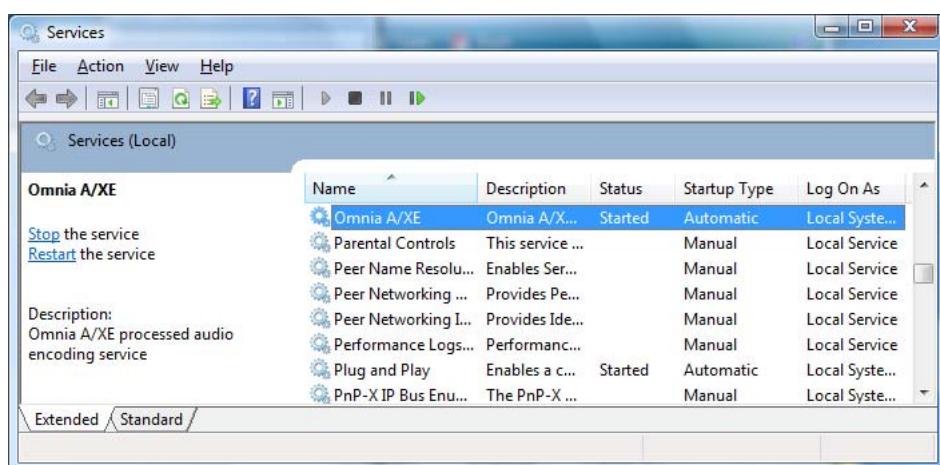
1. Open the **Control Panel** from the **Start** menu on the task bar. Open the **Administrative Tools** applet from the panel:



2. In the **Administrative Tools** window that just opened up, open the **Services** applet:



3. A list of services installed on your PC will show up. Scroll down in the list until you find the Omnia A/XE entry:



4. Check the status for the entry. If it is "Started" then skip the next step and jump ahead to the next section.
5. If the status is not "Started" then we're going to start the service. Right-click the Omnia A/XE entry and select **Start** from the popup menu. Once you see "Started" in the status column we can close the Services window and go on to the next task.

Check the Firewall Exception List

If you have a firewall installed on your PC it may block Omnia A/XE from reaching the network. Omnia A/XE will only be able to function properly once it has been added to the firewall's exception list. If you are using the Windows firewall please see the **Firewall Configuration** chapter for details. If you are using another firewall you will need to consult your firewall's documentation.

Once Omnia A/XE has been added to the firewall's exception list try to connect to the application again (using the **Configure Omnia AXE** shortcut). If the problem still persists read the next section.

Check the Port Number

By default Omnia A/XE uses port 80 for configuration. If port 80 was already in use by another application or Omnia A/XE was previously configured to use another port you may have trouble connecting to the application.

1. Use the **Configure Omnia AXE** shortcut to launch your browser. When the browser comes up you will see either the Omnia A/XE login page or a "Page not found" error.
2. If you see the login page when you use the **Configure Omnia AXE** shortcut but are not able to see it when you connect from another PC then look at the address bar of the browser. You will see the address listed as <http://localhost> or as http://localhost:port_number. When you connect from another PC you will need to enter the address as http://ip_address_of_axe_pc (or http://ip_address_of_axe_pc:port_number if a port number was displayed).
3. If you see a "Page not found" error even when you use the **Configure Omnia AXE** shortcut then you should restart the Omnia A/XE service. It may be possible that the configuration port number has been changed but service has not yet been restarted. Port number changes only take effect when the application is restarted.

The port number, along with all configuration information, is stored in the Options.xml file. If the steps above did not solve the problem, you may want to open the Options.xml file with a text editor. Look for an entry named **httpport** and check the **value** parameter, this will be the administrative port number.

If none of the above steps resolve the problem, please call the 24/7 support line at +1-216-622-0247 or send an email to support@omniaaudio.com.

Can't remember the password?

If the password was changed and now you can't remember it you can find it in the Options.xml file. Open the file with a text editor and look for an entry named **adminpass**. The **value** parameter indicates the password currently set.

MPEG License & Music Copyright

Musical compositions and sound recordings are creative works that are protected by the copyright laws of the United States (title 17, U.S. Code) and other countries. Under U.S. law, the owner of a copyright has the exclusive right to (and to authorize others to) reproduce the work, use parts of the work in a new creation, distribute the work in whole or in part, and to publicly display or perform the work (including on web pages and through webcasting). With few exceptions, it is illegal to reproduce, distribute or broadcast a sound

recording without the permission of the copyright owner. It is your responsibility to comply with the copyright laws of the United States and other countries in which you broadcast and to pay all applicable royalties to the copyright owners when you become a webcaster.

There have been recent amendments to the copyright law regarding webcasting of sound recordings. These new provisions allow webcasting under the terms of a statutory license, as a way to help webcasters get permission without having to go to each sound recording's owner. The statutory license, however, has strict requirements that you must follow. Some of these requirements include the payment of license fees, limitations on the number of songs from the same album or artist that may be played in a three hour period (called the sound recording performance complement); a prohibition on publishing advance playlists; and a requirement to identify the song, artist and album on the website. There are other requirements as well. The Recording Industry Association of America provides quite a bit of information on copyright law as it applies to webcasting, and both ASCAP and BMI have created license agreements that they are willing to grant to webcasters that they believe conform to the provisions of the new copyright rules for webcasting. For additional information on the statutory license and other aspects of webcasting, please visit the following sites:

The U.S. Copyright Office

<http://www.copyright.gov>

The Recording Industry Association of America

<http://www.riaa.com/issues/music/webcasting>

ASCAP

<http://www.ascap.com/weblicense/webintro.html>

BMI

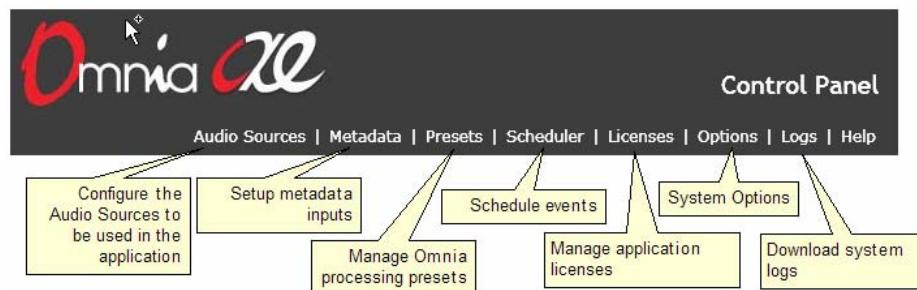
<http://www.bmi.com/iama/webcaster/index.asp>

4 Omnia A/XE Control Panel

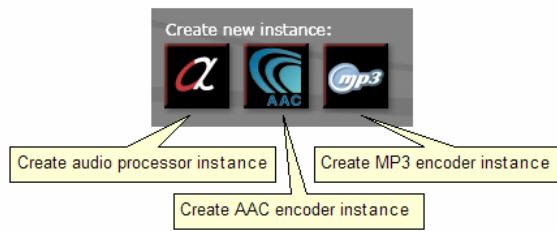
The Control Panel is the main application page. This page displays all audio processing and encoding instances, the audio meters and processing presets assigned. On this page you can create additional audio processing or encoder instances, delete existing ones and start/stop individual instances. When you first start the application it will look like the image below:



The menu at the top of the page allows you to access other application areas:



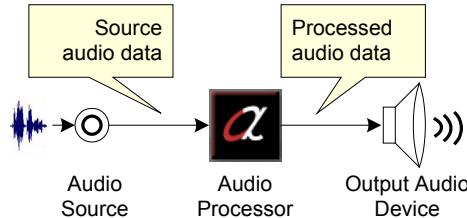
The buttons on the gray panel create new audio processor, AAC or MP3 encoder instances:



The sections below briefly describe the Audio Processor, AAC and MP3 encoder instances.

Audio Processor Instance

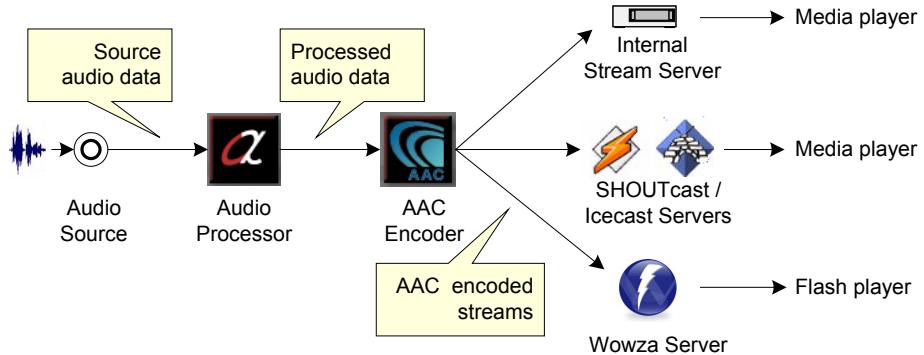
The Audio Processor instance accepts audio from an audio source, processes it then sends the processed audio to an output device:



The output audio device can be either a sound card installed in the PC, a Virtual Audio Cable device or an Axia IP-Audio device. Please see the **Audio Processor Instance** chapter for more details.

AAC Encoder

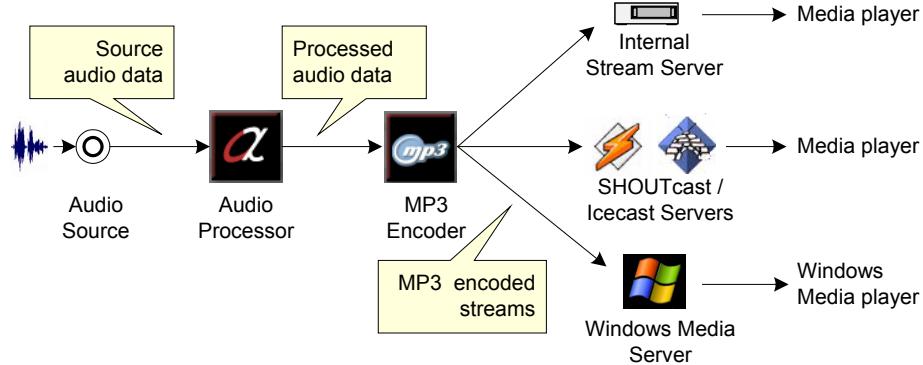
The AAC Encoder instance accepts audio from a source, processes it, encodes it to AAC, then sends the encoded stream to one or more servers you specify:



It is important to note that the encoded stream can be sent simultaneously to multiple servers. The servers then replicate the stream to the clients. The **AAC Encoder** chapter describes in more detail how to create and configure an AAC Encoder instance.

MP3 Encoder

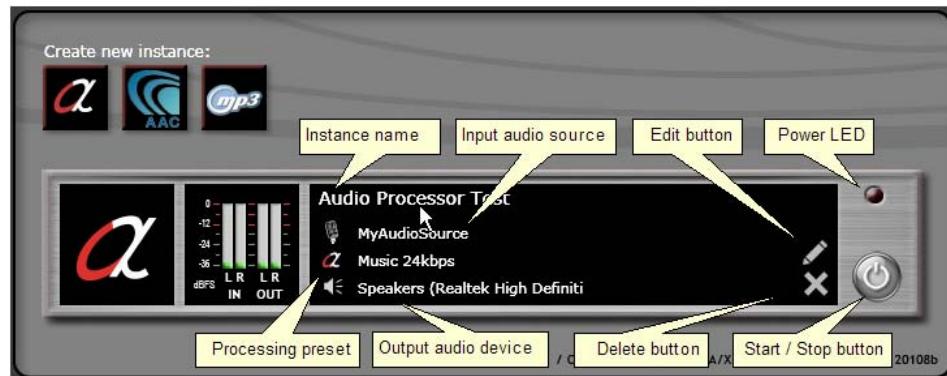
The MP3 Encoder instance is very similar to the AAC Encoder instance. It accepts audio from an audio source, processes it, then encodes it to MP3 and feeds the encoded audio to one or more media servers:



Just as with the AAC encoder, you may send the encoded stream to multiple server simultaneously. The servers then replicate the stream to the end clients. Please see the [MP3 Encoder](#) chapter for more details on creating and configuring MP3 encoder instances.

Instance Functions

Once an instance has been created, it will appear stacked under the buttons as shown in the image below:



This image shows an Audio Processor instance. The AAC and MP3 encoder instances look very similar except for the identifying logo in the box on the left side.

Click the **Start / Stop** button to start or stop an instance. When on, the power LED will light up and the meters will indicate the audio activity if the audio source is receiving audio.

If you need to make changes to an instance then click the **Edit** icon. You may delete an instance by clicking the **Delete** icon.

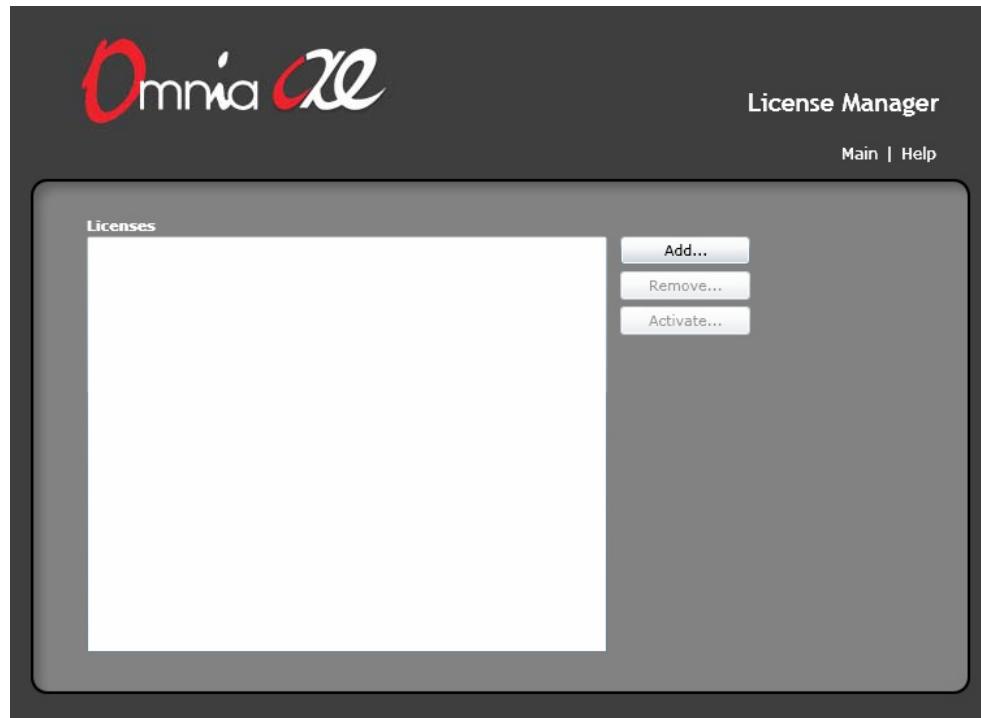
When an instance is active, you may click the **Processing preset** to edit the audio processing parameters.

5 License Manager

The License Manager keeps track of the application licenses and allows you to Add, Remove and Activate them. You may enter more than one license on one PC. The licenses entered limit the number of audio sources you can use in the application. Before creating audio sources or encoders, you will need to enter the license code(s) you received with Omnia A/XE on the **License Manager** page.

Adding a License Code

1. Click the **Licenses** link at the top of the **Control Panel** page. The **License Manager** page will be displayed:



2. Click the **Add...** button. Enter your license code in the **License** field then click the **Save** button.



3. The code you entered will show up in the **Licenses** list on the left. Next to the license code you will see additional text describing the state of the license. The text will initially say “Pending activation” then, after 10-15 seconds, it should change to “OK”. Repeat step 2 for each license code you have received. If all license codes have an “OK” status then you are done. Otherwise keep reading for other options.
4. If you see an error message next to the license code, first check the license string to make sure it matches the one you received. If the error shown is “Activation failed” then refer to the following section to learn how to activate your license manually.

Manual License Activation

The automatic activation may fail if the PC on which Omnia A/XE has been installed is not connected to the Internet. The manual activation method allows you to activate your license from another PC that is connected to the Internet.

1. Select the license number that failed to activate from the list then click the **Activate...** button.
2. The license activation page will be displayed:

Enter your activation code below then click the Save button.

License: XE10C-XXXX-123456-123456

Request Code:

```
pHFHwjIUUD+6sGwoH...LY...n1...0y...0wLfnkI4lcJqZTOv5b
NaIUUD+6sGwoHBIAY...M...L...rjm5KBjdcGTH73Hxi
MUIwDWhqi
```

Enter Activation Code below:

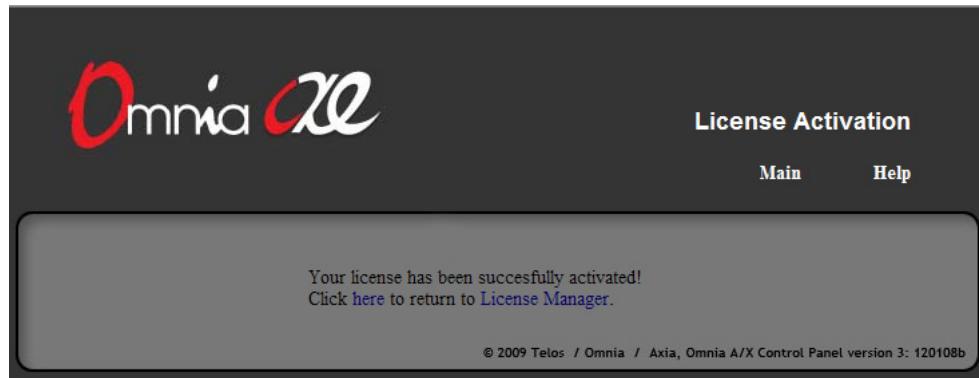
Save

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3. Copy the request code displayed in the first text box. You will need to take this code to a PC that has an Internet connection. A simple way to accomplish this is to select the code text with the mouse, press CTRL-C to copy it to the clipboard then paste it to a text file using Notepad.exe. Then save the file to a USB drive and take it to the PC with the Internet connection.
4. On the PC with the Internet connection, open your browser and point it to <https://secure.telos-systems.com>. Enter the request code you obtained from the A/XE PC on the page that appears then click the **Submit** button. The next page will display your activation code. Copy the activation code displayed. You will need to take the activation code back to your Omnia A/XE PC.

NOTE: The activation code always begins and ends with ##, two pound characters. Make sure to copy these characters as well.

5. On the Omnia A/XE PC, enter the activation code in the second text box on the License Activation page then click the **Save** button. If the activation code was correct you should see the following page:



Your license has now been activated.

Support

If you need assistance, please call the 24/7 support line at +1-216-622-0247 or send an email to support@omniaaudio.com.

6 Audio Source Manager

On the **Audio Source Manager** page, you select the input audio device(s) you wish to use with Omnia A/XE. Since the Windows audio device names are often not very descriptive, you have the opportunity to assign each audio device a friendly name. This name is then used throughout the rest of the application to refer to the audio source. The number of audio sources you may create is limited by the license(s) you have purchased and entered in A/XE. Please make sure to enter your license codes before you attempt to create new audio sources.

Create Audio Source

Follow these steps to create one or more audio sources.

1. On the **Control Panel** page, click the **Audio Sources** link at the top of the window. The **Audio Sources Manager** page will be displayed:



2. Click the **Add...** button. Select the audio device you wish to use from the **Source device** drop down list. Enter a name for it in the **Friendly name** field then click **Save**.



3. Repeat step 2 for each audio source you wish to use. If you attempt to add more audio sources than your license allows, a message indicating this condition will be displayed. If you need additional audio sources, please consider purchasing another A/XE license.
4. When done, click the **Main** link or use the **Back** button to return to the **Control Panel** page.

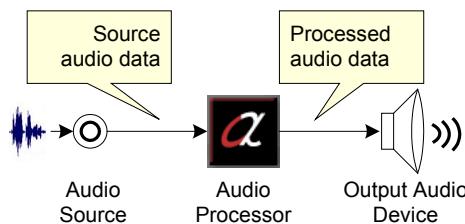
Delete Audio Source

When you no longer need an audio source, you may remove it from the application. Before removing an audio source, make sure it is not being used by an audio processor or encoder instance. To remove the audio source, select it from the list then click the **Remove** button.

7

Audio Processor Instance

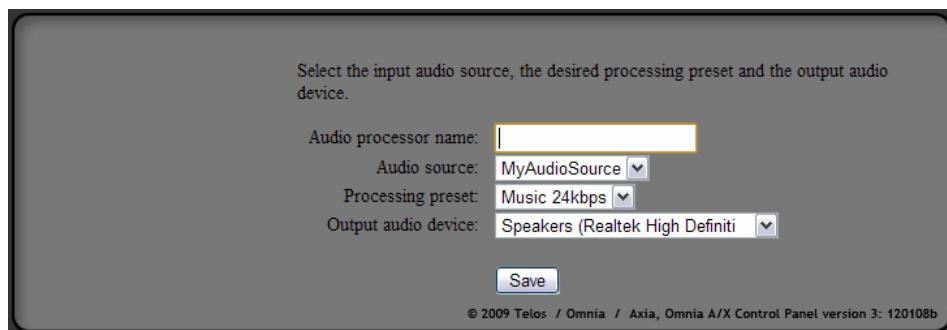
An audio processor instance accepts audio from an audio source, applies Omnia processing to it then sends it out to an audio device on the PC.



This can be used to deliver the processed audio to another device through a physical sound card, to a Livewire device through the Axia IP-Audio driver or to another application on the same PC through the Virtual Audio Cable driver.

Follow the steps below to create an audio processor instance:

1. Click the **Create Audio Processor Instance** button on the control panel  . The following dialog will be displayed:



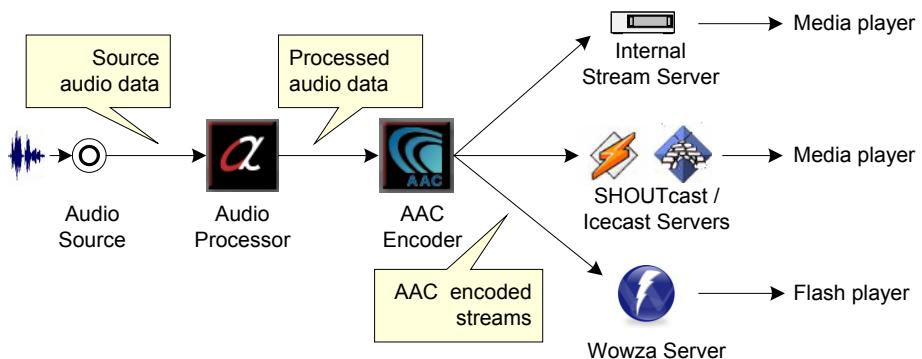
2. Enter a name for the audio processor. You may use letters, digits, space and underscore characters. Please do not use other special characters in the name.
3. In the **Audio source** drop down, select the audio source you wish to use. This will be one of the audio sources previously defined on the **Audio Sources** page.
4. Select the processing preset you wish to apply to this audio stream from the **Processing preset** drop down.
5. Select the output audio device from the **Output audio device** drop down list. Select a sound card here if you wish to monitor the audio or select a Virtual Audio Cable

instance if you wish to send the stream to another application on the same PC. Configure the other application to read the audio from the same Virtual Audio Cable device (you can tell device instances apart by the device number embedded in the device name).

6. Click the **Save** button and you have just created an audio processor instance. It will now be displayed on the Control Panel page.

8 AAC Encoder

An AAC Encoder instance accepts data from an audio source, processes and encodes it, and makes it available to SHOUTcast-compatible or Wowza Media servers.

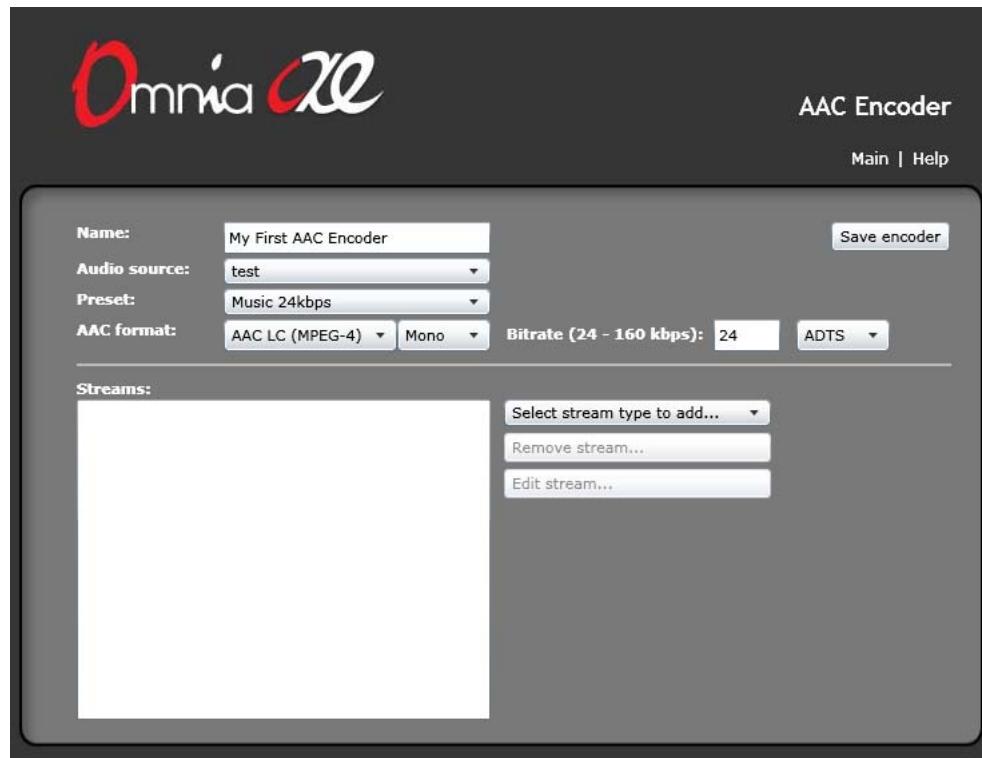


The encoded stream can also be made available through the HTTP stream server built into the application. The internal stream server is intended for monitoring the stream by a very small number of listeners. It is not designed to feed a large number of clients.

Create the Encoder



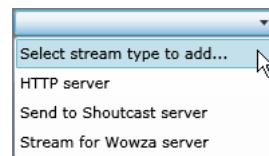
Click the **Create AAC Instance** button on the A/XE control panel page to create an AAC encoder. The AAC encoder dialog page will be displayed. Follow the steps below to create an AAC encoder instance.



1. Enter a name for this AAC encoder instance. The name may contain letters, digits, spaces and underscore characters but it should not contain other special characters.
2. Select the audio source to use from the drop down list.
3. Next, select the audio processing preset you wish to use.
4. Select the AAC encode format and channels (mono or stereo). The choices made limit the minimum and maximum bitrate that can be used. Enter the bitrate in the Bitrate field and select the stream transport mode if needed by the end client used. The default mode of ADTS should work fine in most instances.

Deliver the Encoded Stream

We are now ready to define how this stream will be delivered. Click the **Select stream type to add...** button and from the drop down list select the desired stream delivery method:

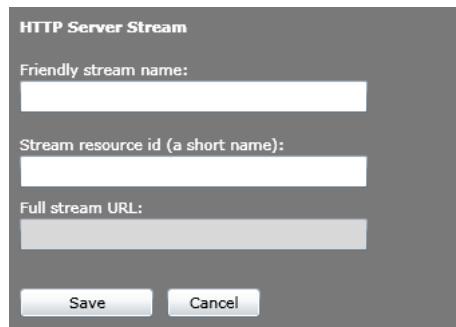


The following sections describe each delivery method in more detail. When you are done adding the stream delivery methods make sure to click the **Save encoder** button to save all your changes.

HTTP Stream Server

The HTTP server choice will send the stream to the Omnia A/XE's built in stream server. This server will allow you to monitor the encoded stream directly from the source PC. This is often helpful in troubleshooting server connections or just as a quick way to test that everything is working as expected. The HTTP server is also useful when adjusting audio processing parameters as the audio delay should be smaller than listening to the stream delivered through an external server. As mentioned previously, the internal stream server is not intended to support large numbers of listeners. Always use a dedicated media server to deliver the streams to large numbers of listeners.

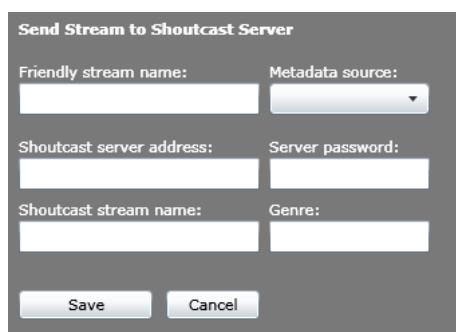
When you select this choice you will see the following **HTTP Server Stream** dialog:



1. Enter a friendly stream name in the first text box. You may use letters, digits, spaces and the underscore character in the name but please avoid special characters.
2. Next, select a resource ID for the stream. The resource ID will become part of the URL you will use to reach this stream. For example, if the stream server is active on port 8080 and you use a resource ID of "stream1" then you would listen to this stream by entering http://ip_address_of_pc:8080/stream1 in your media player. The **Full stream URL** will display an example of the full URL you can use to listen to this stream.
3. When done, click the **Save** button. The stream will appear in the streams list on the left.

Send to SHOUTcast server

This option will send the stream to a SHOUTcast-compatible server.



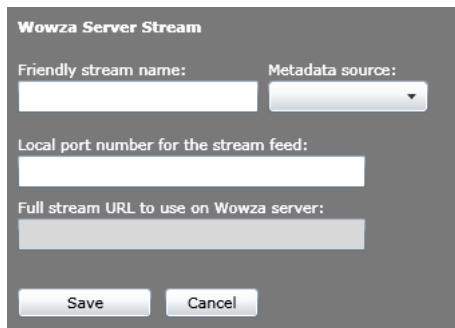
1. Enter a friendly stream name. You may use letters and numbers but please avoid special characters.
2. Select a metadata source from the drop down list. If no metadata sources have yet been

defined then the list will be empty.

3. Enter the address of the SHOUTcast server and a server password if one is used.
4. Next, enter a stream name that will be advertised on the SHOUTcast server and a stream genre if desired.
5. When done, click the **Save** button. The stream will appear in the streams list on the left.

Send to Wowza Media server

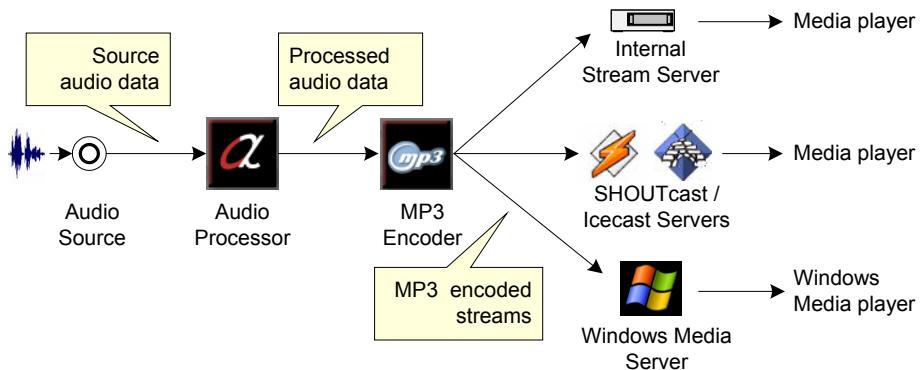
When delivering a stream to Wowza media server, Omnia A/XE acts as a server. The Wowza server is configured to connect to Omnia A/XE, read the stream and then make it available to clients. Please see the **Wowza Media Server** chapter for details on how to configure the Wowza server.



1. Enter a friendly stream name. You may use letters and numbers but please avoid special characters.
2. Select a metadata source from the drop down list. If no metadata sources have yet been defined then the list will be empty.
3. Enter the local port number where the Wowza server will connect to receive the stream. The full stream URL will be displayed below the port number field. This is the URL that has to be configured on the Wowza server to be able to connect to Omnia A/XE.
4. When done, click the **Save** button. The stream will appear in the streams list on the left.

9 MP3 Encoder

An MP3 Encoder instance accepts data from an audio source, processes it, encodes it to MPEG Layer-3 and makes it available to SHOUTcast-style or Windows Media servers.



The encoded stream can also be made available through the HTTP stream server built into the application. The internal HTTP server is intended for monitoring the stream by a very small number of listeners. It is not designed to feed a large number of clients.

Create the Encoder



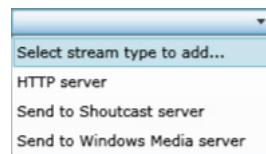
Click the **Create MP3 Instance** button on A/XE's control panel page. The MP3 Encoder page will be displayed. Follow the steps below to create an MP3 encoder instance.



1. Enter a name for this MP3 encoder instance. The name may contain letters, digits, spaces and underscore characters but it should not contain any other special characters.
2. Select the audio source to use from the drop down list.
3. Next, select the audio processing preset you wish to use.
4. Select the MP3 encode format from the MP3 format drop down list.

Deliver the Encoded Stream

We are now ready to define how this stream will be delivered. Click the **Select stream type to add...** button and from the drop down list select the desired stream delivery method:



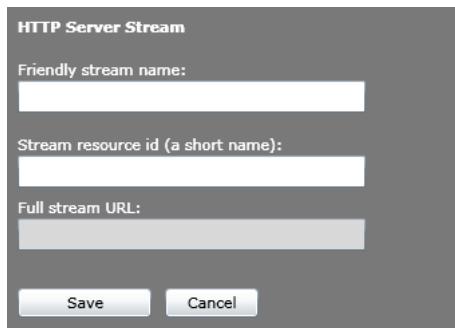
NOTE: If the **Send to Windows Media server** option is not displayed in the drop down list then the Windows Media plug-in failed to load. The most likely cause is that the WMVCORE.DLL is not installed on your PC. Installing the latest version of Windows Media player should resolve this issue.

The following sections describe each delivery method in more detail. When you are done adding the stream delivery methods make sure to click the **Save encoder** button to save all your changes.

HTTP Stream Server

The HTTP server choice will send the stream to the Omnia A/XE's built in stream server. Using this server you can monitor the encoded stream directly from the source PC. This is often helpful in troubleshooting server connections or just as a quick way to test that everything is working as expected. The HTTP server is also useful when adjusting audio processing parameters as the audio delay should be smaller than listening to the stream delivered through SHOUTcast or Windows Media server.

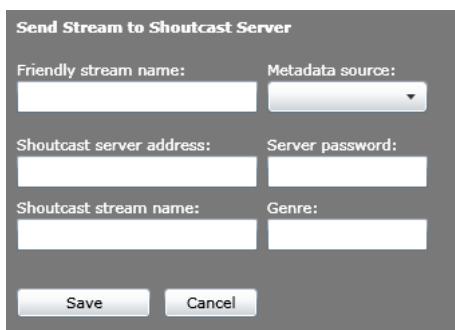
When you select this choice you will see the following **HTTP Server Stream** dialog:



1. Enter a friendly stream name in the first text box. You may use letters, digits, spaces and underscore characters in the name but please avoid other special characters.
2. Next, select a resource ID for the stream. The resource ID will become part of the URL you will use to reach this stream. For example, if the stream server is active on port 8080 and you use a resource ID of "stream1" then you would listen to this stream by entering http://ip_address_of_pc:8080/stream1 in your media player. The **Full stream URL** will display an example of the full URL you can use to listen to this stream.
3. When done, click the **Save** button. The stream will appear in the streams list on the left.

Send to SHOUTcast server

This option will send the stream to a SHOUTcast-compatible server. Please see the **SHOUTcast Streaming** chapter for details on how to configure the SHOUTcast server that will receive the stream.



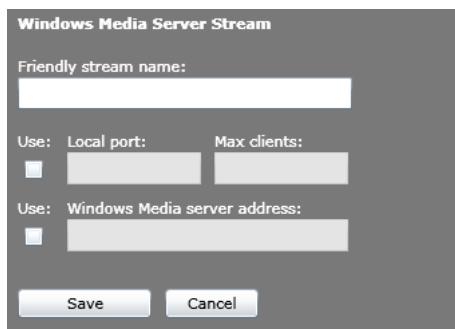
1. Enter a friendly stream name. You may use letters, numbers, spaces and underscores but please avoid other special characters. This name is used internally to refer to this stream.
2. Select a metadata source from the drop down list. If no metadata sources have yet been

defined then the list will be empty. The metadata source will insert stream tags received from an automation system or another application.

3. Enter the address of the SHOUTcast server and a server password if one is used.
4. Next, enter a stream name that will be advertised on the SHOUTcast server and a stream genre if desired.
5. When done, click the **Save** button. The stream will appear in the streams list on the left.

Send to Windows Media server

Windows Media server can accept the stream either in push or pull mode. In push mode the encoder establishes a connection to the server and sends the stream out. In pull mode the encoder accepts connections from the server (or other clients). You may choose either or both delivery methods at the same time.



1. Enter a friendly stream name. You may use letters, numbers and underscores but please avoid other special characters.
2. If you wish to use the pull mode then click the first **Use** checkbox. Enter a local port where the application will accept media requests for this stream. This port number must not already be in use by A/XE or another application. Next, enter the maximum number of clients that can request the stream simultaneously. This should be a small number, perhaps around 5 or 10 or so.
3. If you wish to also push the stream to a Windows Media server click the second **Use** checkbox and enter the address of the Windows Media server.
4. When done, click the **Save** button. The stream will appear in the streams list on the left.

10 Preset Manager

Using Preset Manager you may add, copy, edit, rename and delete presets. A “preset” is simply a table of values for the audio parameters that control the audio processing. When you choose a preset, the control values are loaded into the processing structure, reconfiguring the Omnia A/XE audio processor. Presets allow different processing setups to be quickly loaded into the system. A set of factory presets have been provided for you to use as starting points for customizing your sound.

NOTE: We recommend that you do not modify the factory presets. Instead, make a copy of the factory preset you wish to experiment with, then edit the copy. This way you always have the factory preset available as a reference point.

Managing Presets

Click the Presets menu link to get to the Preset Manager page. The Preset Manager displays a list of all audio processing presets available in Omnia A/XE and the buttons on the right represent the actions you can apply to the presets.



Add Preset

Click the **Add...** button to create a new preset with the default parameter values. Enter the name of the preset at the prompt then click the **Save** button. Once added, you may edit the preset parameters by selecting the preset from the list and clicking the **Edit...** button.

Copy Preset

If you need to create a new preset it may be more convenient to copy an existing preset as your starting point. Select the preset you wish to copy from the list and click the **Copy...** button. At prompt, enter the new name for the preset then click the **Save** button.

Edit Preset

Click the **Edit...** button when a preset is selected to access the Preset Editor. The Preset Editor allows you to modify all preset parameters. Please see the **Processing Audio** chapter for details on adjusting the audio processing parameters.

NOTE: When you edit a preset by clicking the **Edit...** button in Preset Manager the audio meters will not be active since there is no audio data being processed. A better way is to assign the preset you wish to edit to an audio processor instance, start the processor instance then click the preset edit button (E) on the main control panel page. You will be able to edit the preset and get audio and visual feedback on the parameter adjustments.

Rename Preset

Select the preset you wish to rename from the preset list then click the **Rename...** button. Enter the new name for the preset then click the **Save** button. Make sure the preset is not being used by an audio processor or encoder instance before renaming it.

Delete Preset

Select the preset you wish to delete from the preset list then click the **Delete...** button. When prompted, confirm the delete and the preset file will be erased. Please note that there is no UNDO for this option. Once a preset is deleted, it is gone. For this reason, it is a good idea to create backup copies of the preset files.

Backup Presets

After adjusting the audio processing parameters to get the “just right” sound you may want to take a minute and create a backup copy of your processing presets. The presets are stored in separate files in an application data directory. The path of this directory is different for different Windows versions (only Microsoft knows why). To help locate this directory we provide a program menu entry named **Locate Presets Directory**. Clicking this entry will open an Explorer window in the presets directory. Once there, you can make backup copies of your presets to another location: a network drive, USB drive or memory stick.

11 Processing Audio

Omnia A/XE's audio processing is the Omnia3.net processor implemented in software. The algorithms in Omnia A/XE are exactly the same as the rack mountable hardware counterpart. The only difference is the number of parameters to adjust is limited. If you are familiar with Omnia3.net, then Omnia A/XE is even easier to understand.

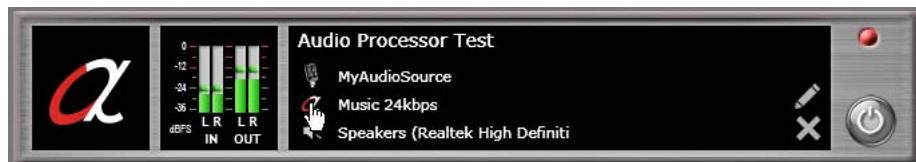
Omnia A/XE's audio processing is intuitive and easy to use. Applying audio will activate movement on the bar graphs, and this is confirmation that processing is occurring. Before making adjustments, it helps to know how to interpret the metering displays.

The Preset Editor

All audio processing adjustments are performed in the Preset Editor. A "preset" is simply a large table of values representing all of the control values for every control listed in the menu tree. When you choose a preset, the control values are loaded into the processing structure, reconfiguring the Omnia A/XE.

Presets allow different processing setups to be quickly loaded into the system. Numerous factory presets have been provided for you to use as starting points for customizing your sound. Omnia/Telos does not warrant in any way that these presets are de facto standards for the names that we used when we designed them. The factory presets were created as starting points, but they are not engraved in stone! Always rely on our factory presets to get you started. Then, once you find the preset that most closely matches the sound you're after, you can customize more to your liking.

You can get to the Preset Editor in one of two ways. The first is by clicking the A/X icon  on an active audio processor or encoder instance:



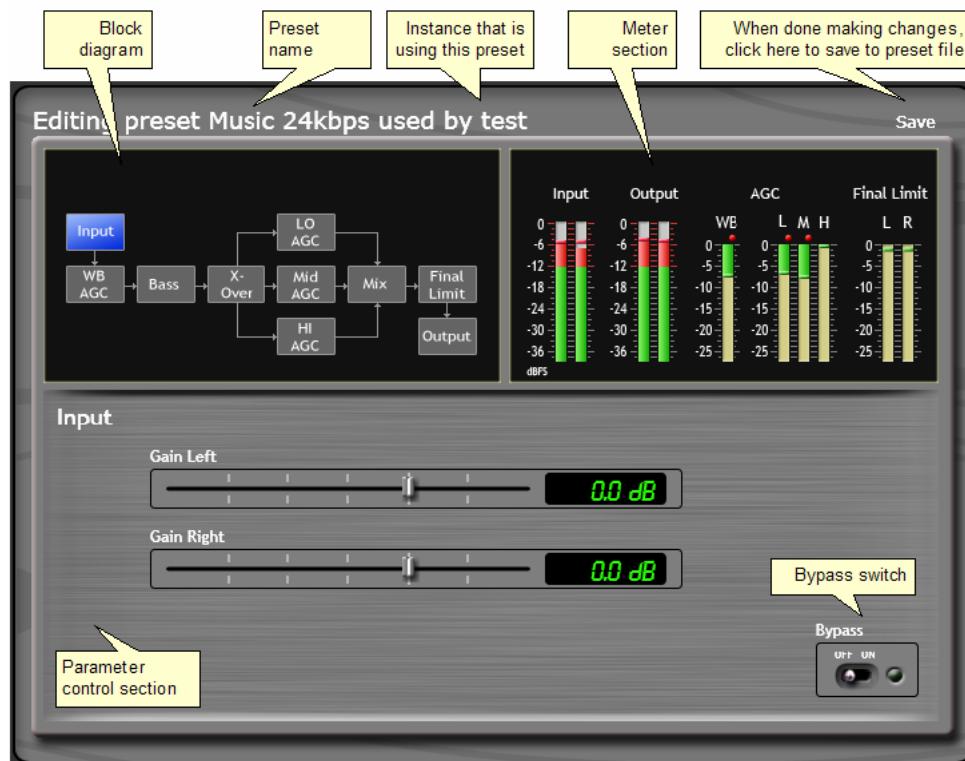
The second is by clicking the Edit button in Preset Manager. Please note that if you edit a preset from the Preset Manager then the meters will not be active since you are only editing the preset file. For this reason we recommend that you always edit a preset that is in use by an active processor or encoder instance. This way you can get both visual and audio feedback in response to your changes.

The Preset Editor has three main areas:

1. On the upper left side you will find the signal block diagram. Clicking one of the blocks will display the corresponding parameter controls in the main area below.
2. In the upper right side you will see the meter section. The meters will not be active if you

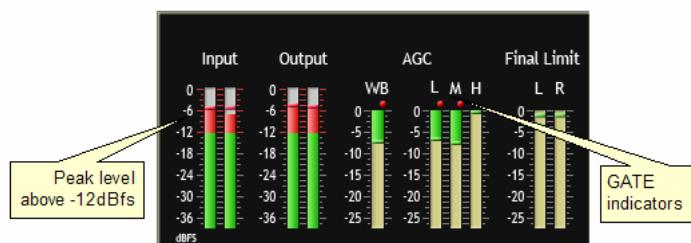
are editing a preset file through the Preset Manager.

- Below the block diagram and the meter section you will find the parameter controls and the bypass switch. Use the sliders, knobs and switches to change the parameter values.



Understanding The Bar graphs and Indicators

The bar graphs are capable of indicating more than just level information. The texture and density of the audio signal can be observed, based upon the dynamic action of the bar graphs, and peak-responding “pills”. Of interest are the “pills” at the end of the input and output meters, as they indicate peak level. The bar section represents the RMS average of the signal. Wide dynamic range will display a separation between the pills and the bar, whereas signal with little peak information will cause the pills to ride on the crest of the bar graph. The bar graphs can indicate up to 25 dB of gain reduction.



The bar graphs provide a wealth of information about the processing control in Omnia A/XE. The algorithms automatically adapt the style of compression/limiting control being employed on a moment-by-moment basis. This can be deduced if the metering is studied

over time. During normal operation, the indicators will have a dynamic “bounce” that you will be able to get a feel for. Every now and then, you will see the processor react quickly and show a larger amount of gain reduction. Notice that the response is very fast. This action will recover very slowly, and return to “rest” with the main bar graph. This action will be easily noticed on material that is very dynamic in texture. More on this below.

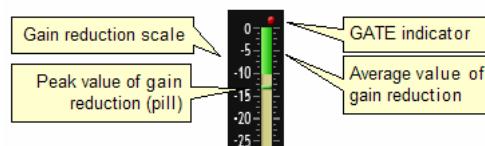
Another feature unique to Omnia A/XE is processor “Hold”. During brief pauses in audio, the bar graphs will “freeze” and the GATE indicators will show the processor has entered the Hold mode of the algorithm. This is most easily noticed when there is a “dry” voice being processed.

The Input/Output level meters will change from green to red whenever the level exceeds -12dBfs. The pills also change color on the Input/Output displays. In the dynamic processing section the pills maintain the same color.

Note: The input and output levels are displayed relative to 0dB full scale (0dBfs). The 0 indicator on the input/output bar graphs means that every available bit of signal level is being used at that time! There is nothing more in the level department, except to create distortion... nasty sounding distortion!

Interpreting the Gain Reduction Meter Displays

Through careful observation of the processing bar graphs, significant information can be acquired and analyzed about the audio signal on a moment-by-moment basis. The bar shows the average value of the gain reduction, while the floating pill indicates the peak value of gain reduction.



Since the processing algorithms in Omnia A/XE ‘adapt’ to the audio, it is capable of performing many different processing functions at different times. The processing display bar graphs may appear to indicate different kinds of operation with different program material. This behavior is primarily based on dynamic range differences in the applied program material. For program material that is already processed or lacking dynamic range, the bar graphs will indicate differently than with material that possesses a high degree of dynamic range. This is because audio signals that lack dynamic range, naturally or by previous processing, will possess a lower peak to average ratio. Conversely, audio signals with a wide dynamic range possess a higher peak to average ratio. The Omnia A/XE adapts differently to each case.

For program material that has low dynamic range (or high RMS and low peak levels), there will be more activity in the WB-AGC sections and less activity in the Multiband Processors. This behavior is due to the WB-AGC response to high RMS energy, while the Multiband section is reacting to lower peak energy. Sometimes the Multiband section may not indicate any action at all. For Omnia A/XE, this is completely normal! Examples of this behavior might be seen with heavily processed commercials or music, or with music passages of sustained level. A good example is the Aerosmith CD “Pump.” This recording has very little dynamic range. Try any up-tempo selection from this disk and you will see the Wideband-AGC section make initial adjustments along with small amounts of limiting.

Once adjusted, the Wideband-AGC section will stay deep in gain reduction, although with little movement, and action within the limiters will be minimal.

When the programming has wide dynamic range (low RMS and high peak levels), the opposite will occur. The Multiband section becomes active, while the WB-AGC section will appear not to respond as much. During these events, the Multiband sections could be working aggressively, while the WB-AGC section indicates little activity. Good examples of programming able to cause this behavior: vocal passages, live voice, classical music, and passages with high transient levels. Good test examples: almost anything classical, as well as almost anything by Steely Dan!

Also keep in mind that the WB-AGC section is designed to operate much more slowly than the Multiband sections, primarily because of the nature of each function. Remember that the WB-AGC section operates on the program's RMS energy. During gain calculations, the incoming program's "average" level is established, and gain adjustments, if needed, are made based on those calculations. This is why the WB-AGC sections will appear to move slower as it makes changes over relatively long time periods.

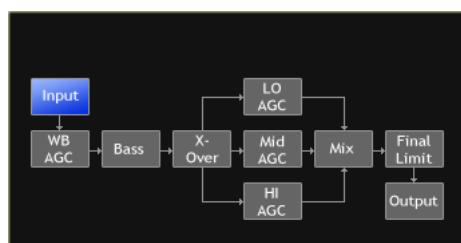
The intent of the Multiband section is to normalize the spectral balance and provide control of the peak levels. Peak energy must be detected and adjusted in a quick and accurate manner while, at the same time, not interfering with the sonic integrity of the audio signal. For this reason, the Multiband sections operate faster, with special background instructions to govern their behavior, and strictly on an as-needed basis.

Since the processing displays are capable of providing a wide range of information, we do not recommend setting up the system based on any specified meter indications. Instead, we recommend setting up the processing by using your ears to judge the sound. We've provided the meters only to analyze the signals and aid you in adjusting the specific parameters needed to achieve your desired sonic results. Like a speedometer, the meters are a guide, not the road!

The red ticks that appear above the WB (Wideband AGC), L (Low-Band AGC), M (Mid-Band AGC), and H (High-Band AGC) bar graphs are the GATE indicators. They display GATE activity. The GATE function is described above in the section titled "Understanding the Bar graphs and Indicators".

Processing Adjustments

Here's where the action is! A block diagram depicts the flow of the audio signal, and illustrates the processing functions that are available to adjust. A mouse-click on button will provide access to that function.



Input

A mouse-click on the Input button displays the input section sub-menu. There are adjustments for the individual Left/Right channels. Drag the slider-bar to adjust the respective

level. There is a 30dB range of adjustment between -20dB and +10dB.



Using normal program audio, a correct gain setting results in peak indications (the “bouncing balls”) hitting -12 dBFS (where the level meters turn red) or a little higher. This corresponds to system headroom of 12 dB. You may adjust for more headroom if you wish (lower indications), but setting the input level for less headroom (higher meter indications) is strongly discouraged.

WB-AGC (WideBand AGC)

A very flexible wideband leveler section provides smooth, transparent control of the input program. This is achieved through two significant Omnia innovations, a dual referenced release gate and a hidden, intelligent “makeup” gain algorithm. The dual gate reference is a unique process that correlates the dynamics of the audio input signal to a “rolling” reference level, and from that information makes conditional decisions affecting the character of the release function.

A hidden, Make-Up Gain, control signal determines when the amplitude of the input program suddenly falls to a reduced level. It then adjusts the side chain gain in order to “fill in” the softer program passages so that the average level is increased. This allows the AGC function to operate with slower time constants, while significantly increasing the average audio level. These slower overall time constants yield lower intermodulation distortion, contributing to Omnia’s trademark sound.

Using Classical music for an example, the orchestra often plays forte, and then enters abruptly into a quiet passage. Conventional AGC algorithms would hold the softer passage down until it was able to slowly recover at the static release time setting, making such passages nearly inaudible at normal listening levels. Omnia A/XE’s makeup gain function allows a hidden, faster time constant to provide quick recovery, but only during the softer passage. As soon as the orchestra starts to play louder, the “makeup” time constant yields control back to the primary AGC circuit, returning gain to the previous platform level. This sophistication preserves the dynamic integrity of the signal while greatly enhancing the listenability of the program.

This is the first processing section within the Omnia A/XE, so the controls in this section affect the overall signal, its density, and hence affect every other processing section following it. The job of the Wideband AGC is to erase long-term audio level fluctuations, while doing so in a very unobtrusive manner. This sub-menu provides a few parameters that tailor the action of this section.



Drive: The sets the audio level that enters the WB-AGC. Increasing the Drive will produce more compression. This control is calibrated between -6dB and +6dB, and adjusts the signal level into the Wideband AGC. It should be adjusted to net approximately 12dB of gain reduction with typical programming. Too little gain reduction can defeat the “leveling” function of the Wideband AGC. Too much gain reduction has little additional benefit. Nominal gain reduction values for the Wideband AGC are between 10 and 15dB.

Release: Controls the speed of recovery for any given amount of gain reduction. Faster action yields less dynamic range and the presence of more density to the audio. The Release control sets the time constants in relative terms using Slow, Medium, and Fast. Because the time constants are program-dependent, calibrating these controls in absolute time values (ms/dB) would be useless—therefore we use simple terminology.

GATE: When set to ON, it will freeze the gain at the last level of processing action that occurred before the audio signal fell below the threshold of operation. This control helps to minimize “pumping”, and the increase of background noise during pauses in programming.

Clicking OK after adjusting any of the parameters in this section will save the change and close the sub-menu.

Bass

This section contains the Bass EQ controls. In the Omnia A/XE’s unique signal processing architecture, these controls are placed in their optimal position — just before the multiband processor sections. Each of the Deep Bass and Phat Bass controls can boost the level up to 12 dB. Be careful here not to overdrive the following sections or over emphasize these lower frequency ranges. When used properly this specialized low frequency enhancement tools can deliver the thunderous bass and warmth that the Omnia is known for, and it can do so without making the sound muddy.



Deep Bass EQ: For those who demand thunderous bass, the Omnia A/XE has it! Up to 12 dB of “thunder” can be added to shake your walls! This is not a simple bass boost, but a rather sophisticated concept that takes into consideration the time alignment of the low frequencies as they pass through the entire system. It allows a loud, clean low end, with absolutely no sacrifice to the overall loudness of your signal. The Deep Bass function is a shelf boost at 85 Hz, utilizing a phase compensated 12dB/octave slope to emulate the EQ function.

Phat Bass EQ: Phat Bass is a unique enhancement that adds filtered harmonics of the lower registers to the upper bass frequencies. The algorithm extracts information contained in the initial attack to do its work, and low frequency texture is therefore emphasized. Older recordings sound fuller (or phatter) with the added illusion of loudness. Phat Bass EQ also helps radios with small speakers sound like they have more bass than they actually do.

X-Over

Phase Linear, Time Aligned Crossover: Most multiband audio processors make a compromise in the crossover area in order to provide a flat dynamic frequency response. This is done to avoid audible peaks or dips in the recombined frequency response as the individual band gains change during processing. In an effort to minimize this problem, most processors use a fixed phase-offset in the crossovers. While such treatment helps to minimize frequency response peaks and dips, it also results in a loss of phase linearity, increasing “smearing”, and reducing musical clarity.

In Omnia A/XE’s implementation, the crossover network is carefully time-aligned so that the recombined spectrum remains flat, regardless of the amount of gain control being applied within any band. This true phase linear response assures that harmonic overtones are not displaced in time. The result: the truer, more natural, and more musical Omnia sound. The crossover frequencies are not adjustable.

Multiband AGC Sections

Similar in character to the wideband AGC described above, but expanded to three bands, this section has the ability to significantly add power and loudness to the audio while tailoring and pre-processing it for delivery to the final limiter section. The system uses different algorithms for each of the bands: The low and mid bands use a feedback configuration, which produces a larger, warmer sound on lower frequencies. The high band utilizes a *feedforward* design that maintains a more open, natural and musical texture on higher frequencies.

As with any multiband processor, improper adjustment can exaggerate noise at high frequencies, particularly with older recordings that possess a good deal of tape hiss. This can especially occur if the highest AGC band is driven so that significant gain reduction occurs, and the band’s gating control is set to the lower end of the scale. During audio segments that have little or no HF content, the AGC will try to increase its gain in an effort to restore treble balance. Even during periods when the gate function is in the default Freeze mode, the problem might still exist with some programming.

Since the user parameters are the same for all three bands, only the LF Band will be detailed here.



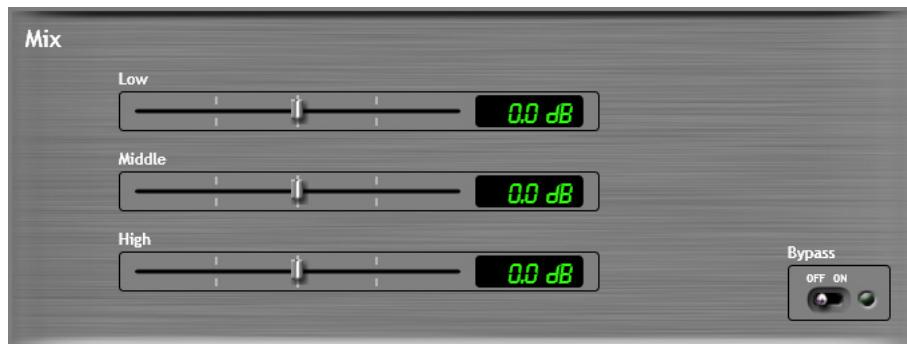
Drive: The sets the audio level that enters the WB-AGC. Increasing the Drive will produce more compression. This control is calibrated between -6dB and +6dB, and adjusts the signal level into the Wideband AGC. It should be adjusted to net approximately 12dB of gain reduction with typical programming. Too little gain reduction can defeat the “leveling” function of the Wideband AGC. Too much gain reduction has little additional benefit. Nominal gain reduction values for the Wideband AGC are between 10 and 15dB.

Release: Controls the speed of recovery for any given amount of gain reduction. Faster action yields less dynamic range and the presence of more density to the audio. The Release control sets the time constants in relative terms using Slow, Medium, and Fast. Because the time constants are program-dependent, calibrating these controls in absolute time values (ms/dB) would be useless—therefore we use simple terminology.

GATE: When set to ON, it will freeze the gain at the last level of processing action that occurred before the audio signal fell below the threshold of operation. This control helps to minimize “pumping”, and the increase of background noise during pauses in programming.

MIX

This is where the three multiband processors are mixed together. Use care in adjusting this section, as too much level from one particular band may cause an excessive amount of emphasis to that range of frequencies. Such adjustment may also drive the final limiter bands in that range of frequencies too hard, causing the sound to become unnatural, dense, and squashed. As explained earlier, if your desire is to “EQ” the sound, you should perform that function using the drive levels in the multiband section. The mixer is primarily intended for minor “EQ” changes to the overall sound. There is a +/-6dB range of adjustment for each band.



Final Limiter

Omnia A/XE employs a lookahead limiter to provide absolute and precision peak control. This limiter has been designed to minimize processing side-affects like IMD, which are usually associated with limiters of this type. Using an innovative design that cancels intermodulation products before they develop, allows this limiter to sound extremely transparent. The limiting function is derived using numerous control signals that monitor one another.

This type of peak controller is used instead of a clipper because it does not generate the same high levels of THD as a Clipper does. THD causes added difficulties in a coded audio system, as the harmonics generated from the clipping action, create added artifacts in the encoder. These are especially annoying at high frequencies.

On the other hand, a lookahead limiter, yields extremely low levels of THD, although it will create some IMD component, and this allows the audio coder to operate with minimal sonic artifacts.

There are tradeoffs in how each of these peak controllers sound when they are set to produce added loudness. When a clipper is pushed, the audio may appear edgier. This is from the added harmonic content. In contrast, the lookahead limiter will appear busier, or dense as the action of the control signal may be heard, when more limiting is applied.



Limiter Drive: Here is where the loudness versus quality is most evident! This limiter's adjustment range is +/-3 dB, in 0.1dB steps. It is advisable to make minor changes, primarily as the 'loudness fine tuner'. Be careful; there is a lot of available power here!

Output

The peak output level adjustment is done using the individual Left/Right output controls. The control range is from -26dB to +6dB of gain. This level is normally set to the maximum input level, or just below it, of the device that the Omnia A/XE is connected to.



Output Filter: For webcasting applications, especially at lower bitrates, it is sometimes desirable to reduce the audio bandwidth. This is particularly useful if you are using a low cost sound card to feed an external encoder as the filtering in many sound cards is inadequate. A pull-down menu provides eight different filter response curves that can reduce the spectrum down to 4kHz.

Bypass

The processing can be bypassed simply by clicking on the BYPASS button located in the lower right hand corner of the processing panels. This is a simple and fast method to compare the before and after affects of the processing.



Fine Tuning Omnia A/XE

Our goal is to provide dramatic sonic improvements by Omnia A/XE right out of the box. We know that you will want to tailor one or more of the presets slightly to create a more “custom” sound, or you might really delve in and significantly modify the parameter settings to create their own unique “signature sound.”

About Loudness and Fatigue

If you’re an audio processing expert, you’ll find what we’ve included within the Omnia A/XE to be powerful tools. If you’re new to audio processing, we recommend proceeding with caution and with knowledge of your goals.

Getting the most out of your Omnia A/XE processor (or any other processor for that matter) starts with knowing your objectives beforehand, and knowing where you can make tradeoffs. If your goal is to create a hot master and obtain extreme amounts of detail and quality, keep in mind that there are limits. Reaching one goal is usually at the expense of the other. There will always be those individuals who feel that louder, at any cost, is better. The added distortion from the endless and pointless pursuit of raw loudness may generate negative effects on listeners. Be careful.

Having said all of this, we firmly believe that Omnia A/XE will get you closer to your ideal than any other processor or combination of processors available today. It is definitely capable of generating moment-to-moment loudness; it has the muscle. It also maintains

that famous Omnia clarity sought after by top engineers all over the world. We encourage all end-users to utilize the power of the Omnia A/XE to create good, competitive loudness while maintaining a higher degree of quality.

Clarify Your Processing Objectives

Whether one is seeking better overall quality or specific spectral improvements, try to articulate and write down your goals. Do you want a little more loudness or “presence” in the final master or stream? Are there certain characteristics of the sound of other recordings that you like, want to emulate, or just surpass? Are there any you want to avoid? When adjusting processing, please give thought—real thought, to how you’d like your final master to sound. What do we mean by that? Well, if your desire is to add loudness, and in most cases it probably will be, decide on the degree of loudness that you want.

The Adjustment Procedure

1. Review your objectives.
2. Once you’re up and running, start with a degree of processing that is similar to what you’d normally use and then, if desired, become more aggressive. A careful approach is less likely to draw hasty, or even negative, opinions.
3. Listen for a while, then adjust, and listen for a while again. Try to avoid the temptation to continuously “fiddle” with adjustments, just moments after getting the system running. Remember that you should evaluate the operation over time, not moment to moment!
4. While making changes to the system, we recommend that you do not make hasty or radical changes. Also, do not make too many different adjustments all at once. If too many parameters are changed at one time, it is hard to determine which change made the difference you may hear. That can be frustrating, whether the change made your station sound better or worse. Take your time. In order for you to become comfortable with your new sound, you should learn the limits of each control. We suggest making changes in increments of no more than +0.5 dB or -1 dB, or in 1 or 2 step increments. Try turning different functions on and off. Working this way, you will be able to get a better feel for the sound that the Omnia A/XE is capable of producing.
5. Use the “sleep on it method.” Spend time adjusting and then listening, and when the system gets to a point where it sounds good, stop! While making changes to processing, there does come a time when the ears become less and less sensitive to the adjustments you’re performing. Ears tire, and that’s why spreading the adjustment period over a number of days is recommended. If what you’ve done still sounds good after you have “slept on it,” stop adjusting. If you’re not quite there yet, continue with small iterations until you’re satisfied. If you are homing in on your goals, you’ll find that each day the discrepancies become smaller and you’re making fewer adjustments.
6. When you get it where you like it, stop and enjoy!

Getting the Sound You Want

If you believe that your desire is to process aggressively, here are some suggestions that should help you achieve that goal. Conversely, if you have the rare luxury to strive for increased sound quality, we have suggestions for you too! Omnia A/XE is designed to minimize the impact of the quality vs. loudness trade-off.

We recommend that before starting the process of cranking it up just for the sake of raw loudness, try to decide what sonic characteristics you feel are lacking in your final sound. In many instances, it's not just about increasing the drive to the limiter. It can be as simple as creating an illusion of added loudness by changing a single time-constant parameter. There are even known instances where the use of stereo enhancement created the necessary apparent loudness. Please don't bite at the first temptation to crank the system. Sometimes the old adage of less is more really applies!

Before delving into alternative processing possibilities, please give the next brief section some thought. It may help provide you with some needed direction in your overall processing plan.

A Word about Loudness

Making this confession is a little like telling your parents you dented the car. But here it goes: It's OK for your final mix to be loud...very loud!

In the past, loudness was a problem due to the limitations of the processors of the day. In the quest for ultimate loudness, you probably either adjusted (or modified) your old processor well outside of its "safe" range, or pushed the 0dBfs ceiling level in the signal chain and accepted the byproducts of the interactions and conflicts among them.

Omnia A/XE has changed all of that! It's been designed to look at the incoming audio, and know how to make your final mix consistently loud, and without the artifacts or grunge created by your current processor. Omnia A/XE makes loudness an effortless exercise.

One more confession. It's also OK for your master to not sound loud, yet sound incredibly musical and grunge-free, because the Omnia A/XE has given you the choice. It is a system that maximizes the audio quality of your signal, yet at the same time satisfies your competitive requirements.

Quality versus Loudness

The trade-off between quality and loudness is primarily determined by how you choose to use the limiting and clipping sections. While each function alone will generate added loudness, they each have different advantages, as well as side effects.

When excessive limiting is used, intermodulation distortion is increased, making the audio sound "mushy", and "smeared." The added short term density can also cause the audio to be "tight", "squashed", or "dense." The "dynamics" artifacts caused by excessive limiting might sound like "pumping," "breathing." The rule for limiting is "a little goes a long way!"

When excessive clipping is used, harmonic distortion is increased. The audio level is in effect "running into the brick wall." Too much clipping can cause the audio to sound "broken-up," "torn," "rough," or "edgy." As you might imagine, the harder the limiters and clippers are driven, the louder the audio perception. However, you are also much more likely to encounter increased intermodulation and/or harmonic distortion.

The following sections are provided to assist you in designing the personality of your sound. As we said earlier, there is no precise recipe for setting up audio processing. While there are some basic fundamentals that you can use to get started toward the sound that you desire, it may require a concerted effort with extended listening and subtle processing changes over time to achieve your ultimate goal. Just remember to know your goals, take your time, and adjust methodically.

Increasing Loudness

Try to resist the temptation to just crank up the aggressive processing sections, like the limiters. Those will add loudness of course, but usually at the cost of quality. Many times, building a little more RMS level in the AGC sections will do the trick instead, and with no obvious sonic penalties. The following are some suggestions on where to begin to make changes. We suggest that you them in the order described.

1. Alter the following parameters in the AGC sections:
 - Increase the ***AGC Drive*** to the **WB** (wideband) AGC section.
 - Increase the ***Drive*** to each band of the Multiband AGC screen.
 - Increase the ***Release*** time settings in each band to make it operate faster.
2. Drive the Final Limiter section harder.
3. A combination of the above steps, but in small increments! It might sound crazy, but it's true! In this situation, resist the temptation to make too many changes at once. When that occurs, it becomes difficult to determine why the result of an adjustment did or did not make sense. Focus on one specific area of your sound at a time. Once that area is satisfactory, then move the focus to the next area, as needed.

Based upon the above suggestions, you can experiment with different styles of processing. Some prefer to have their processing be perceptibly loud, but dynamic. This may give the illusion of loudness, retaining detail and clarity, and reducing listener fatigue. This can be done by centering your efforts in the multiband section, and avoiding heavy use of the final limiter. One trick that works well is to use fast release times in the multiband limiters, but do not let them produce more than 5 dB - 7 dB of gain reduction. This keeps the IM distortion of the limiters to a minimum, and doesn't "over-squash" your sound. Adjusted in this manner, the Limiter sections are relied upon to generate higher long-term RMS levels, which translates into increases in perceived loudness.

If the quest is to produce a "loud and proud" signature, then the limiters should be leaned upon a bit more. Loudness at all costs is usually the reason for moving the processing in a direction like this. Using larger amounts of drive to the multiband limiters, along with faster release times will generate a signal of high short-term density. The effect of the processing set in this manner is that the audio is consistently loud at all times . . . a wall of sound. The drawback is that the density can cause fatigue. While Omnia A/XE is designed to minimize fatigue, it is capable of generating large amounts of density that could eventually lead to fatigue. Be careful!

Adding More Detail—When Loudness Isn't the Last Word

Now that we've "squashed the grape," lets look at what it takes to undo a heavily processed signal. Basically, just reversing the procedures listed above will do the trick:

1. Reduce the drive to the Final Limiter.
2. Back off on the influence of the multiband stages:
 - Reduce the amount of ***Drive*** to each band in the multiband.
 - Reduce the ***Release*** times to slow down recovery.
3. Ease up on the Wideband-AGC sections:
 - Reduce the ***Drive*** to the WB AGC.

- Reduce the ***Release*** time to operate slower.

Backing off the Limiting sections first will allow the processing to retain a level of competitive loudness while enhancing quality, and the overall dynamic texture will be affected less. Start with reducing the Limiter amount in 0.5 dB steps. It's surprising how much detail can be restored from just a small change of 0.5 dB. Generally, changes in the Limiter drives will have the most noticeable effect on quality, but it will also affect the relative loudness level, too. You'll need to find a "happy medium" that's right for you.

Equalization Changes

Tailoring the shape of the overall audio spectrum can be done in three different sections:

1. The relative ***drive*** settings in the multiband AGC menu. These controls set the drive levels of the multiband AGC sections.
2. The settings of the multiband ***Mixer*** controls.
3. Adjusting the Mixer.

The first two options will provide noticeable change in EQ. We suggest you use the first option. In this case, an EQ change is still followed by a dynamically controlled stage. Therefore any excessive EQ change can be 'undone' by the subsequent AGC.

The last option, adjusting the Mixer, is designed to provide a final minor trim to the spectrum. If you've noticed that we calibrated these controls in 0.10 dB steps, then you know what we mean when we say these controls are for fine trim! Since this stage is after all of the dynamic AGC and Limiting, a radical change in level in the Mixer will result in additional and possibly excessive limiting of audio in that band. We suggest that changes implemented here be limited to no more than about 1.0 dB. Naturally, the decrease in mix level can be done to any desired amount.

Thunder Bass

Omnia A/XE has the power to shake the walls with low end! If your source material has it, Omnia A/XE will put it in the mix, and with muscle! Making changes to this characteristic is done using the following parameters, and for maximum effectiveness, in the order listed:

1. In the Enhance Menu, increase the amount of ***Deep Bass*** boost.
2. In the Enhance Menu, increase the amount of ***Phat Bass*** boost.
3. Increase the drive to the ***LFAFC*** with the appropriate control in the ***LOAGC*** screen.
4. Speed up the ***Release*** times of the LF ***LOAGC*** section.
5. Slightly increase the ***Low*** control in the ***Mixer*** section

When it comes to processing, moderation is the key! If all of the above steps are utilized in the pursuit of more bass, then severe low frequency over-enhancement can occur. Excessive bass boost can produce the illusion that the presence and high frequencies have been lost. They are still there, but are being acoustically masked by the lower frequencies.

Generally, an increase in the Enhance Menu's Bass boost functions alone will provide more than sufficient enhancement to the low end.

Reducing Codec Artifacts

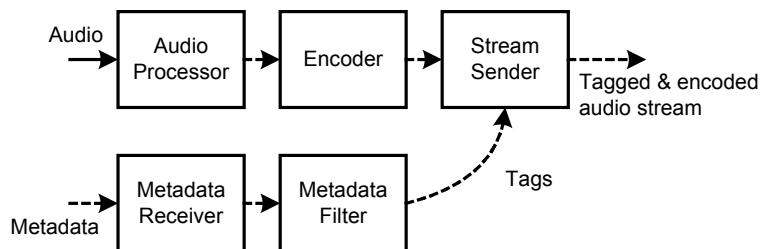
Dynamics processing is an extremely useful tool that will reduce audible artifacts from lossy-compression codecs. High frequencies tend to be the first perceptible annoyances, followed by that swishy-swirly water like sound that's quite common at lower bitrates. These artifacts can be reduced, and in some cases eliminated, when the audio processor is applied as a tool.

Generally, it's understood that as codec bitrates are reduced, so is the audio bandwidth. Omnia A/XE contains selectable low pass filters in the Output section. Reducing the audio bandwidth through filtering will help. Additionally, the upper band of processing can be reduced in the MIX section, which will allow that band to act as a dynamic governor. Operating the HF Band in the slow release time will reduce HF density which improves intelligibility as the encoder masking algorithm is not loaded as heavily with HF content.

12 Metadata

The metadata subsystem gives you the option to tag your audio stream with “now playing” information. Metadata tagging currently works only with internally encoded streams delivered to SHOUTcast and Wowza servers. If you use a third-party encoder with Omnia A/XE then you will need to consult that encoder’s documentation for metadata tagging.

The diagram below shows how the metadata is received and combined with the encoded audio stream:



The metadata is received from an external system over TCP/IP on a specific port. The metadata receiver passes the information to the metadata filter for parsing. Once the filter detects a complete record, it sends the tagging information to the Stream Sender which includes it in the stream being sent out.

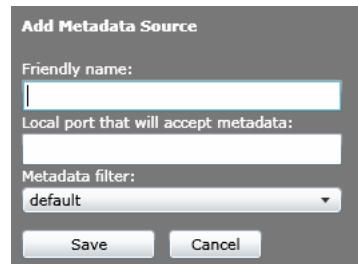
TECH NOTE: Metadata filters are small mini-programs that translate the data received from an external source to tags that the stream sender can understand. Each filter is a separate file stored in the Filters subdirectory under the program’s data directory (the same directory where Options.xml is found). These mini-programs are written using the Lua programming language. If you would like to try your hand at creating a custom filter please start by having a look at the filters that ship with the program. To learn more about the Lua programming language have a look at <http://www.lua.org>.

Metadata Manager

On the Metadata Manager page you configure the metadata receivers you wish to use with Omnia A/XE. The same metadata receiver can be used by multiple streams.



1. Click the **Add...** button to add a metadata receiver. The following dialog will be displayed:



2. Enter a friendly name for this metadata receiver. This is the name that will be displayed in the stream configuration window so use a name that is short and descriptive. Please use only letters, digits, underscore and space characters in the name.
3. In the port field, enter the TCP/IP port number that will accept the metadata connection from other systems.
4. In the filter drop down list, select one of the available filters then click the **Save** button. The metadata receiver should now appear in the list.

The metadata receiver becomes active as soon as it is created and remains active as long as the Omnia A/XE service is running.

13 Scheduler

The scheduler is able to start, stop audio processor instances or encoders and change an instance's processing preset at specified times. This is useful if you want to encode and stream only certain shows. If you need to process one show differently than another, you can use the scheduler to change audio processing presets.

Click the Scheduler menu option on Omnia A/XE's Control Panel page. This will navigate to the Schedule Manager page:



The **Schedule Events** list displays all the events you have created so far. When you select an event from the list, the event commands are displayed in the **Commands** area.

Click the **Add...** button to create a new event. In the Add dialog enter a name for the event. Keep the names descriptive but use only letters, digits, underscore and space characters. Do not use other special characters.

Next, enter the time for the event (in 24-hour, HH:MM:SS format) and click the check boxes for the days of the week when the event should be active.



The scheduler works by executing commands you enter in the **Commands** text box. As of program version 1.11, Omnia A/XE recognizes the following commands:

InstanceStart("instance_name")

Use this command to start the instance named **instance_name**.

InstanceStop("instance_name")

This command will stop the instance named **instance_name**.

InstanceLoadPreset("instance_name", "preset_name")

Use this command to load the preset named **preset_name** into the instance named **instance_name**.

You may add multiple commands by entering each command on a separate line. For example, you could start an instance then load a certain preset for it. Or you could start or stop multiple instances at the same time.

14 System Options

On the System Options page you can change the administrative password, the ports used by the application and the notification email address and server where Omnia A/XE sends messages when it encounters an error.

The screenshot shows the 'System Options' configuration page for Omnia A/XE. At the top right are links for 'Main' and 'Help'. Below the header, a message says 'Select the desired system options below.' The form contains the following fields:

- Administrative password:
- Administrative password again:
- Administrative HTTP port:
- Administrative HTTPS port:
- Stream server port:
- Email address for error notification:
- SMTP server address:

A 'Save' button is at the bottom left, and a copyright notice at the bottom right reads: © 2009 Telos / Omnia / Axia, Omnia A/X Control Panel version 3: 120108b

1. Change the **Administrative password** field to a password of your choice then enter it again in the **Administrative password again** field.
2. You may change the administrative HTTP and HTTPS (secure HTTP) ports as well as the stream server port¹. The default values should work fine; you should change them only if you need to address a particular problem. You will need to restart the Omnia A/XE service for the port change to take effect.
3. In the last two fields under **System Options** you can enter an email address and SMTP server address. Omnia A/XE uses this information to notify you by email in case of application errors.

¹ The Stream server uses the HTTP protocol to make streams available for playback using most media players. This lightweight server is intended for monitoring the encoded stream by a small number of listeners. It is not intended to serve a large number of streams.

4. Click the **Save** button to make the changes permanent. This returns you to the Control Panel page.

15 System Logs

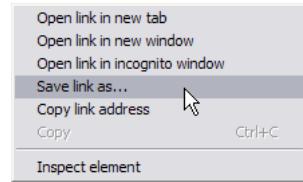
Omnia A/XE writes system messages to log files. A new log file is created for each 24 hour period and the files are kept for 30 days. After 30 days the oldest file is deleted to make room for new log files. You may retrieve the logs through the web interface or, if you have direct access to the Omnia A/XE PC, by directly accessing the files in the directory where they are stored. When something is not working right, the log files may show you the reason why. If you encounter a problem and need to contact support, sending the log file for the day when the problem occurred will speed up the resolution process.

Retrieving a log through the web interface is a rather simple affair. The steps below show you how:

1. On the **Control Panel** page, click the Logs menu option.
2. The **System Logs** page is displayed. The available logs are listed on the page.

The screenshot shows the 'System Logs' page of the Omnia A/XE Control Panel. At the top left is the Omnia A/XE logo. To the right of the logo is the title 'System Logs'. Below the title is a link 'Main'. A message at the top of the main content area says: 'Click one of the log files below to view it. Right-click on the file and select the Save option to save it to your PC.' Below this message is a list of log files, each preceded by a blue circular bullet point. The list includes: Log2009-07-17.log, Log2009-07-20.log, Log2009-07-21.log, Log2009-07-22.log, Log2009-07-23.log, Log2009-07-24.log, Log2009-07-25.log, Log2009-07-26.log, Log2009-07-27.log, Log2009-07-28.log, Log2009-07-29.log, Log2009-07-30.log, Log2009-08-08.log, and Log2009-08-15.log. At the bottom of the page is a copyright notice: '© 2009 Telos / Omnia / Axia, Omnia A/X Control Panel version 3: 120108b'.

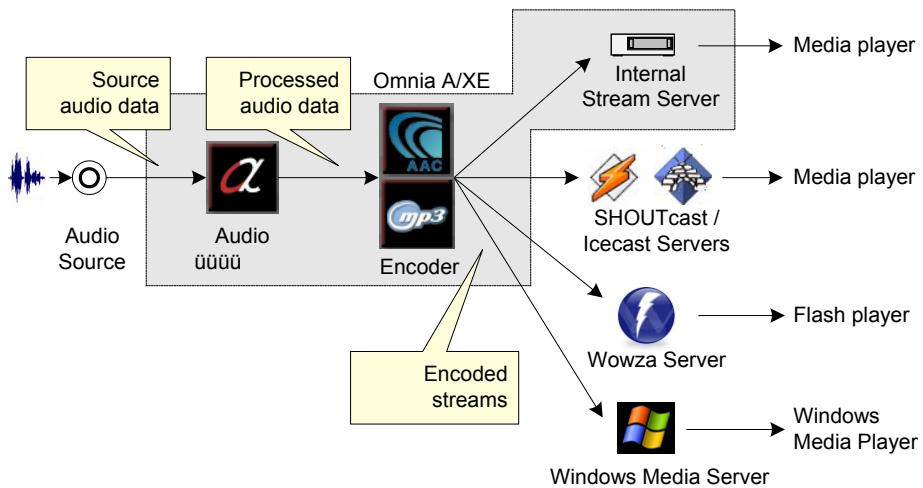
3. Right-click on the log you wish to retrieve and select **Save Link As...** (or **Save As...** on some browsers) to save the file to your PC.



The logs are plain text files and can be opened and viewed with any text editor (e.g. NotePad.exe).

16 SHOUTcast Streaming

Omnia A/XE performs audio processing and encoding and requires a media server to send the encoded stream to large numbers of listeners. While A/XE does have a built-in stream server, it is intended for stream monitoring and can only support a small number of connections. SHOUTcast (yes, that is the way it is spelled), Steamcast, or other SHOUTcast protocol compatible servers are commonly used for this application.



For delivering audio over a LAN or private network, Omnia A/XE and server can run together on the same PC. For public streaming over the Internet, Omnia A/XE typically runs in the place where the audio is generated (e.g. a studio) and the server is in a place where a lot of bandwidth is available such as an Internet collocation site.

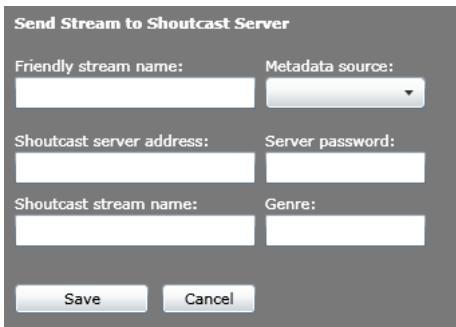
Streams that are served by SHOUTcast protocol servers can be heard on Winamp, Apple iTunes, XMMS, VLC, Foobar, MS Windows Media Player, and many other PC software players. Many hardware players are also on the market. Among the most popular are Logitech's SlimPlayer, and Freecom's network player.

The original idea for the SHOUTcast server is that it was to accept an audio input from the Winamp player which has a special 'DSP' plug-in. But since Nullsoft, the company that designed both Winamp and SHOUTcast, published the specifications for the interface, encoders like the Omnia A/XE can connect, as well. The server 'thinks' A/XE is a Winamp player.

If you are planning to make public broadcasts via the Internet and you don't want the hassle of running your own server, or if you don't have enough network bandwidth, you can host your broadcast through a third party that will handle the streaming for you. You can search the Internet for the streaming host solution that fits your needs. The SHOUTcast forums would be a good place to start.

Sending A/XE Streams to SHOUTcast Compatible Servers

It is easy to send an MP3 or AAC encoded stream to a SHOUTcast compatible server. When you define the encoder, create an output stream by selecting the “Send to SHOUTcast server” option. You will be presented with the following dialog:



1. Fill in the friendly stream name in the first text box. This is the name used internally to store the stream information and for display purposes so you can use any name here. The name may contain letters, digits and the space and underscore characters. Do not use other special characters in the stream name.
2. Select a metadata source that will be used to “tag” the stream. A/XE will insert the tags received into the stream so that they may be displayed by compatible players.
3. Enter the server address and port number where the address and port are separated by a colon character. For example, if the address is **192.168.1.25** and the port is **8000**, you would enter **192.168.1.25:8000** in the address field.
4. Enter the server password in the password field.
5. Next, enter the stream name and the genre to be sent to the server.
6. Click the Save button.

The stream output definition is complete. When you start the encoder, A/XE will attempt to connect to the SHOUTcast compatible server and deliver the encoded stream to it.

SHOUTcast Compatible Streaming Servers

Following are the specific set-up details for Steamcast and general information about alternate server possibilities. The website associated with each provides a wealth of information, including user forums and other resources.

Steamcast

We've had the most experience with this server. It runs on both Windows and Linux, does all that usually needs to be done, and is very efficient with regard to both CPU and memory usage.

Steamcast is a freeware streaming media server that extends the capabilities of the Icecast2/SHOUTcast framework. The creators of Steamcast intend for the project to be format/codec agnostic and want to support as many encoding, listening and client systems as possible. Steamcast is currently available for Microsoft Windows, FreeBSD, and Linux.

Steamcast was created by Jay Krivanek of Radio Toolbox and was first introduced in 2004.

The project has been in a beta state ever since, though many users have had success in production situations.

One of the features that sets Steamcast apart from other systems is the included web interface that allows for management of sources and clients. The server also supports a wide variety of source encoders and players that encompass other projects like Icecast2 and SHOUTcast. The server also supports multiple publishing points/mount points which can all stream on the same instance and ports. The support of the Icecast2 YP listing specification also allows the server to list on multiple listing services which helps to promote a web broadcast. Steamcast's backend XML sheets are supported by other services such as LoudCity for royalty requirements and the interface is also utilized by several IRC and PHP projects to include stats in varying listener locations.

Installing and Using Steamcast

Download the server software from www.steamcast.com.

Windows Installation Procedure: Simply extract the .zip file to a folder (C:\Program Files\Steamcast\). Once extracted, you can create a shortcut to steamcast.exe on your desktop and edit the steamcast.conf file with your favorite text editor. The steamcast.conf file must be in the same folder as the steamcast.exe file. Once your changes are made and saved back to steamcast.conf you can start steamcast by double clicking either the shortcut or executable.

Unix Installation Procedure: To extract the tar.gz file you can gunzip the distribution file then un-tar the archive. Using a text editor such as vi or pico, open the steamcast.conf file and edit it to your needs. It does not matter where the server runs or what user the server runs under as long as that user has read/write access to the extracted files and the current working directory. To execute steamcast simply issue the command './steamcast'

Running under Windows, you will see something like the command-line window below:

```
C:\Documents and Settings\User\Desktop\steamcast.exe
 ****
/** Steamcast Distributed Network Multimedia Server/0.9.75 beta <Win32>
/** Written by: Jay Krivanek
/** www.steamcast.com/
/** NOTE: Use of this program indicates that you
/** have agreed to the license contained in the
/** README.txt file.
****

Event Log:
<12/05/2008@03:29:41> [serv] Configuration loaded from C:\Documents and Settings
\user\Desktop\steamcast.conf
<12/05/2008@03:29:41> [serv] Mime types file loaded
<12/05/2008@03:29:41> [serv] WARNING: steamcast.vip could not be loaded, no vips
will be loaded
<12/05/2008@03:29:41> [serv] WARNING: steamcast.ban could not be loaded, no bans
will be loaded
<12/05/2008@03:29:41> [serv] PID: 2784
<12/05/2008@03:29:41> [serv] Listening to 9800 for incoming stat connections...
<12/05/2008@03:29:41> [serv] Listening to ANY:9801 for incoming source connectio
ns...
<12/05/2008@03:29:41> [serv] Listening to ANY:9800 for incoming client connectio
ns...
<12/05/2008@03:29:41> [serv] Starting Thread pool of 5 threads...
<Status> Sources: 0 Nodes: 0 <Unique: 0> Tx: 0.00 bps<->0.00 bps
```

The first line shows that the configuration file has been successfully loaded. The second that the mime types file has loaded. Neither the .vip nor .ban files were present. The PID value was loaded from a .pid file. The encoder has not yet been enabled, so we see that the server

is listening for, but has not yet found a source connection. It is also listening for player connections, but of course there are, as of yet, none.

Steamcast Configuration

You configure Steamcast by editing the .conf text file. Here, we will show you an example configuration to work with a typical A/XE application. The text below is from the author of the software, who includes these comments in his sample .conf file. As you can see, he carefully explains all of the items. Following is a set-up for up to 16-channel streaming.

```
; Steamcast Configuration File
; =====
; This is the default Steamcast server configuration file, feel free to use
; it as a template for your server's configuration. All lines beginning with ;
; or blank are ignored by the server's configuration parser.

; Server Configuration
; =====
; PortBase [*8000]: The port that Steamcast will listen for connections on, generally it is
; acceptable to just leave this at the default, change it if you use port
; 8000 and/or 8001 for some other server. Ports < 1024 are reserved, so try to
; stay above that.
PortBase=9800

; MaxUser: The maximum amount of streaming clients Steamcast should
; handle, this is a global setting for all multimedia connections. Set this
; to a smart number. Setting this too high could cause your network connection
; to be flooded and cause real problems for all end users. In 0.9.7 this configuration
; option became optional. Set this to set hard limits on max listener counts, otherwise
; cumulative SourceUserMax will be used to determine the overall UserMax.
MaxUser=20

; MaxBandwidth: This is the maximum amount of out-going bandwidth allowed by Steamcast
; in units of kilo-bits per second. This is a soft limit so it is possible for the server to exceed this
; limit due to the average bandwidth system some enforcement latency may occur as well. A
; setting of zero disables this feature.
; MaxBandwidth=0

; IPMaxUser [*0]: The maximum amount of streaming clients Steamcast should
; handle per IP, this is a global setting for all multimedia connections.
; A setting of 0 disables this feature.
; IPMaxUser=0

;LogFile [None|*steamcast.log]: The location you would like Steamcast to store
; its log file, setting this to 'None' or blank disables this feature. You can use use variable
; templates to control the name of the log in real time. View the Readme for a full list of
; variables available. Ex: %m-%d-%Y-steamcast.log to have steamcast create a different log
; every day.
LogFile=steamcast.log

; MimeFile [None|*mime.types]: The location of your mime types file. The mime types file is
; critical in the implementation and usage of the on-demand capabilities of the server. This file
; also enables steamcast's auto extension feature so that the server will assign the correct
; extension to your mount points based on the audio format/codec in use.
MimeFile=mime.types

; BanFile [None|*steamcast.ban]: Use this variable to specify the location of your ban file. The
; ban file contains information about pre-existing bans. If the ban file does not exist, steamcast
; will attempt to create it. A setting of None disables saving or loading of ban information.
BanFile=steamcast.ban

; VipFile [None|*steamcast.vip]: The file used to load pre-existing vip information. VIP's are
```

```

; IPs and users designated as having a higher privilege level then average users. A setting of
; None disables saving or loading of ban information.
VipFile=steamcast.vip

; ScreenLog [*Yes|No]: Setting this to Yes will allow steamcast to output log information
; to the screen in CLI environments.
ScreenLog=Yes

; RealtimeLog [*Yes|No]: Setting this to Yes will allow steamcast to output Realtime statistical
; information to the screen in CLI environments.
RealtimeLog=Yes

; YPLog [*Yes|No]: Enable the logging of YP Touches. This setting has no effect on
; YP Errors, or YP Add or YP Removes. It will only hide logging of Successful touches
; when set to No.
YPLog=Yes

; PidFile [None]*steamcast.pid]: The file location you would like Steamcast to store
; it's PID or Process ID, setting this to 'None' or blank disables this feature.
; Regardless of this setting, Process ID's will be stored in the Log on each startup.
PidFile=steamcast.pid

; NameLookups [Yes|*No]: Setting NameLookup to Yes will have Steamcast
; do a reverse dns lookup on each connection made to the server. High Traffic servers
; should leave this setting disabled until I can come up with a better threading method.
NameLookups=No

; ShowLastSongs [*20]: This setting tells steamcast how many stream related meta updates
; to store in history. This capability was added for compatibility with reporting agencies.
; A Setting of 1 through 50 is acceptable.
ShowLastSongs=20

; ClientTimeout [*30]: Number of seconds a listener/viewer should stay connected while no
; source exists for thier mount.
ClientTimeout=30

; User Configuration
; =====
; AdminUser & Admin Pass: This is the credentials that allow full control of the server remotely
; so be very careful in determining what to put here. Essentially with these settings
; a user would be able to connect to the server using a CNTRL application and use
; the server as if they are sitting in front of it. Please make sure that admin passwords are
; different from mount passwords in SHOUTcast compatibility mode. Encoders passwords take
; precedence in the event they are, this is for compatibility and security reasons.
AdminUser=telos1

AdminPass=telos1

; Source Configuration
; =====
; Each source that you wish to allow on the server needs to be configured
; here first. The parser will read strait down the file so if you have
; multiple source mounts and you declare a new mount before finishing
; configuration of another, then those configurations after the new
; declaration will go to the new mount.

; SourceMount: This is the mount you would like to create, if you set
; this to /ghey then you would be able to access this mount by
; going to http://localhost:8000/ghey It is critical that you
; make sure to include the slash at the beginning.
SourceMount=/stream1

; SourceUser: The last SourceMount declared will require this Username
; in order to become a source for this mount. Note: if you are running

```

```

; this mount in shoutcast compatibility mode, this is not required. However
; it's best to set this anyhow as it allows your encoder users to administrate
; their mounts from a CNTRL app or web panel.
SourceUser=telos

; SourcePass: This is the last Source Mount's password, this is required
; for all connecting encoders. Mounts without passwords are invalid.
SourcePass=telos1

; SourceUserMax [*5]: This particular mount's UserMax, if all of your source
; UserMaxes combined exceed the global UserMax then the UserMax takes precedence.
SourceUserMax=5

; SourceRelay: This particular mount will pull data from the location specified below.
; If you publish both servers on yp.shoutcast.com and wish that they cluster at that
; yp server then enter your relay url without http:// or trailing path or slashes
; like the example below. It is now permissible to make a list out of this variable
; to have in effect fallback masters in the event one is unavailable.
; SourceRelay=audio.str3am.com:4080

; SourceDisconnectWait: [*10]: Allows you to control the wait time in seconds between
; reconnect attempts if a relay fails. Values from 1 and up are acceptable.
; SourceDisconnectWait=10

; SourceDirectory: This mount will be an on-demand mount for steamcast. Any directory
; location is acceptable here. This aspect of Steamcast still needs alot of work. So stay tuned.
; SourceDirectory=../content

; SourceGateway: The location of a file you want to be played before the stream begins for each
; listener. Use %s and Steamcast will only look for files with a matching extension. Files must
; be the same in everyway with the stream currently playing.
; SourceGateway=/intro.%s

; SourceBackup: This is the mount you would like listeners directed to in the
; event that this source becomes unavailable. These two mounts must be completely
; identical bitstreams in order for this feature to work properly.
; SourceBackup=/live_back

; SourceBitrateLimit: Set this to have Steamcast choke sources that exceed a
; certain average data rate. This value is based on actual data transfer and not any particular
; format headers. This is a great way to control users in community or hosting
; environments. Default is no limits. Steamcast waits 20 seconds into a connect before
; limiting, the choke takes affect after a source goes 10% over the limit.
; SourceAvgBitrateLimit=128

; SourceIsSC [*Yes|No]: Setting this to Yes will allow source applications
; which do not have a username capability to use the last source
; declared anyway.
SourceIsSC=Yes

; SourceNameFormat: Provides a new Stream name either derived from the source or
; completely replacing the sources option. This title is used in client media players and
; publishing outlets. You can use %s anywhere in the title to have the encoder's option included
; into the final stream name.
; SourceNameFormat=%s powered by Steamcast

; SourceIsDefault [*Yes|No]: Setting this to Yes will make this particular
; mount available globally. There can be only one global mount. This
; is also the only mount that will be able to list at shoutcast.com
SourceIsDefault=Yes

; SourceIP: Setting this to a dotted IP address will make this particular
; mount available at the root of steamcast (much like SHOUTcast) for the IP
; specified here. Note: You must own the IP you place here. Inaccurate
; settings will have no effect. This setting essentially will allow you to
; list multiple source points in the SHOUTcast directory. It is not neccessary

```

```

; to set this setting if you only own one IP. Setting this for any Source will
; disable the SourceIsDefault flag on any mount.
; SourceIP=123.45.67.89

; SourceAuth: [Yes|*No]: Allows you to setup HTTP Basic Authorization on this
; mount point. All Authentication is currently file based. Please see steamauth.txt
; SourceAuth overrides the public bit and will force all SourceAuth'd streams to be
; private.
; SourceAuth=No

; SourceAuthMax: [*0]: Allows you to set the maximum amount of connections per
; authenticated
; user. A setting of 0 is interpreted as unlimited.
; SourceAuthMax=0

; SourceListenerTimer: [*0]: Allows you to specify the amount of time a client can stay
; connected in minutes. A value of 0 disables this feature and allows clients to stay connected
; for an unlimited amount of time.
; SourceListenerTimer=0

; SourcePublic: [*Default|Always|Never]: Allows you to specify whether to override the source's
; public bit setting. When set to Always a source mount will list on directory services regardless
; of the encoder's specified preference. When set to Never the source mount will refuse to list on
; directory services. The default of... Default (heh) sets the source to let the encoder decide
; listing preference.
; SourcePublic=Default

; SourcePublicRelays: [*Yes|No]: Whether servers which relay steamcast should list on directory
; services.
; SourcePublicRelays=Yes

; SourceRawKey: Set this variable to the key you would like passed in a parameter string to
; access the raw data stream in HTTP form. This is great for things such as Flash. If you use
; the example below then access to the raw data stream (unprotected by user-agent filters) can
; be obtained by passing http://localhost:8000/mountname.mp3?rawdata to the player, as always
; substitute the address with your specific implementation. Leaving this option blank or
; commented disables this capability.
; SourceRawKey=rawdata

; SourceBuffUtil [*100]: This value allows you to control the start position
; of connecting clients within the buffer. 0 would effectively set a new connecting
; client to the write point of the buffer giving a more real-time like experience
; although due to the way the internet really works it can never be truly real-time.
; Setting this to 100 would start them all the way at the back of the buffer which
; gives most clients no buffer wait times. It is highly recommended that you not mess
; with this parameter except in instances where the bitrate of the stream is extremely
; low and you require an interactive experience from the users connected to the server.
; (i.e. A talk show or other low bitrate interactive live program) Most other broadcasts
; SHOULD NOT CHANGE THIS SETTING!!! Doing so will make the connecting users
; feel like they are on dialup in 1996 listening to Real Player. :)
SourceBuffUtil=1

; Directory Configuration
; =====
;Directory=http://www.steamcast.com/sbin/yp.php
;Directory=http://dir.xiph.org/cgi-bin/yp-cgi

; Advanced Configuration
; =====
; Do not mess with these configuration values unless you know what you are
; doing, typically these are settings which should not need adjusting. But
; are here for those users who feel they need more control over how the
; server behaves.

; ServIP [*Any]: This option allows you to control which interface or IP Steamcast
; should bind to. Setting this option will limit which IP clients can connect through.
; ANY (case sensitive) will allow steamcast to bind to all and any ip interfaces available.
; ServIP=ANY

```

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```
; SrcIP [*Any]: SrcIP is the IP that Steamcast will listen for source connections. For
; instance setting this option to 127.0.0.1 will limit SHOUTcast source connection attempts
; to only from the the machine steamcast resides on. ANY (case sensitive) will allow
; steamcast to bind to all and any ip interfaces available.
; SrcIP=ANY

; ThreadPool [*5]: Set this to control the amount of available threads for incoming clients.
; Generally you should not have to change this setting. Setting anything below 2 is not allowed,
; due to severe loss of performance. Setting this too high will mean more memory and overhead
; will be needed to load the server, be sensible if you must change this number. While you are
; allowed to set a number as high as 100 anything over 10 is generally considered excessive.
; ThreadPool=5

; MetaInterval [*8192]: Set this to control the meta data interval in bytes for audio types that
; utilize the Icy Meta Data protocol. This is a server wide option. Technical notes: Excessive
; CPU and unlistenable streams may result if you set this value too low. Steamcast will go no
; lower then 1024bytes.
; MetaInterval=8192

; if I could smile I would.

; We've configured one source; now we'll do all the others, following the same pattern...

; Stream 2 is MPEG AAC. We have to use the .aac suffix so that player will know what decoder
; to use
SourceMount=/stream2.aac
SourceUser=telos2
SourcePass=telos2
SourceUserMax=5
SourceIsDefault=No

SourceMount=/stream3.mp3
SourceUser=telos3
SourcePass=telos3
SourceUserMax=5
SourceIsDefault=No

SourceMount=/stream4.mp3
SourceUser=telos4
SourcePass=telos4
SourceUserMax=5
SourceIsDefault=No

SourceMount=/stream5.mp3
SourceUser=telos5
SourcePass=telos5
SourceUserMax=5
SourceIsDefault=No

SourceMount=/stream6.mp3
SourceUser=telos6
SourcePass=telos6
SourceUserMax=5
SourceIsDefault=No

SourceMount=/stream7.mp3
SourceUser=telos7
SourcePass=telos7
SourceUserMax=5
SourceIsDefault=No

SourceMount=/stream8.mp3
SourceUser=telos8
SourcePass=telos8
SourceUserMax=5
SourceIsDefault=No
```

```

SourceMount=/stream9.mp3
SourceUser=telos9
SourcePass=telos9
SourceUserMax=5
SourceIsDefault=No

SourceMount=/stream10.mp3
SourceUser=telos10
SourcePass=telos10
SourceUserMax=5
SourceIsDefault=No

SourceMount=/stream11.mp3
SourceUser=telos11
SourcePass=telos11
SourceUserMax=5
SourceIsDefault=No

SourceMount=/stream12.mp3
SourceUser=telos12
SourcePass=telos12
SourceUserMax=5
SourceIsDefault=No

SourceMount=/stream13.mp3
SourceUser=telos13
SourcePass=telos13
SourceUserMax=5
SourceIsDefault=No

SourceMount=/stream14.mp3
SourceUser=telos14
SourcePass=telos14
SourceUserMax=5
SourceIsDefault=No

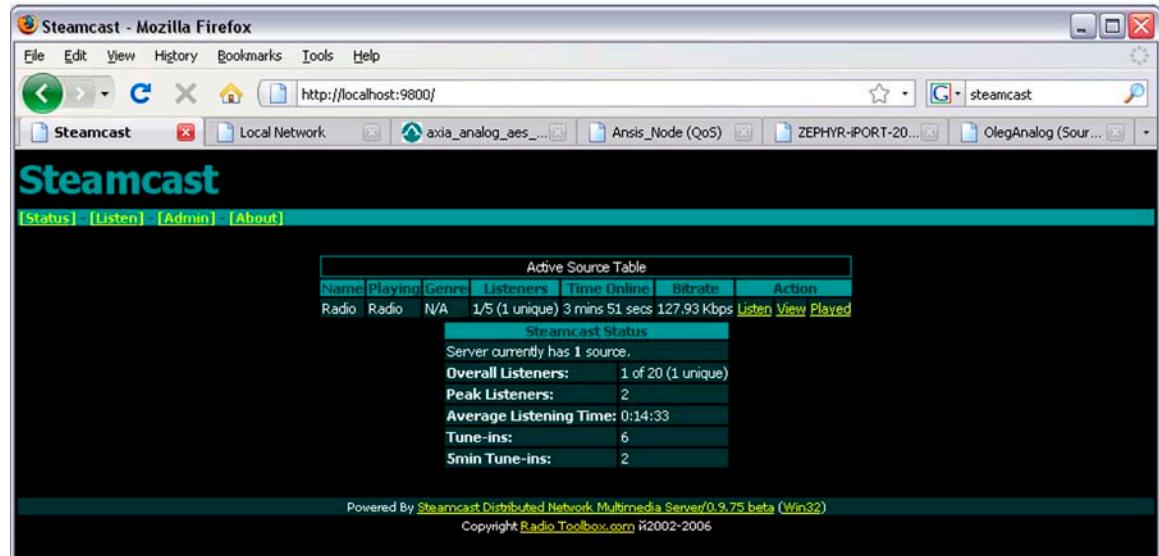
SourceMount=/stream15.mp3
SourceUser=telos15
SourcePass=telos15
SourceUserMax=5
SourceIsDefault=No

SourceMount=/stream16.mp3
SourceUser=telos16
SourcePass=telos16
SourceUserMax=5
SourceIsDefault=No

```

Web Interface

To use the Web interface on the same PC where Steamcast is running, open a Web browser and point it to: <http://localhost:9800>. The number after the colon is the IP port number, which we have set via the Steamcast configuration file to 9800 in our example. You can also use a browser on a remote machine, by entering the host PC's IP number in place of 'localhost'. Here is a screenshot of the Steamcast Web interface, showing one stream and one active listener:



For administration, you will need to enter a user name and password. These are the ones you entered in the steamcast.conf file.

SHOUTcast

The SHOUTcast DNAS (Distributed Network Audio Software) server is available for Windows, Linux, and Mac OSX at: www.shoutcast.com. It is freeware, but not open source. This was the server that started it all, developed by Nullsoft, the people who created Winamp. The software is now in the hands of AOL, who don't seem to be investing much in its continued development. Nevertheless, it gets the job done.

Here are the user instructions, taken from the SHOUTcast site:

Windows 95/98/ME/NT/2000/XP:

1. Download the SHOUTcast DNAS application for Windows.
2. Once the download has finished, extract all the files into a folder and create a shortcut for SC_SERV.EXE on the Desktop.
3. Start up the SHOUTcast Radio server by double-clicking on SC_SERV.EXE
4. Click on the “Edit Config” menu option located at the top. This will start the default text editor, opening the configuration file for SHOUTcast DNAS application. Follow all the directions that are written into the configuration file.
5. Once you are done making changes, save the file, close the editor, and restart the SHOUTcast Radio DNAS application.

UNIX, LINUX, FreeBSD and MAC OSX:

1. Download the SHOUTcast DNAS application version appropriate to your system by proceeding to this link.
2. Unzip the distribution and un-tar the archive.
3. Use a text editor to configure the sc_serv.conf file

4. Note that the user you run the server as requires read access to the config file, and write access for the files you define for file storage and log storage.

Configuration File

Like Steamcast, the SHOUTcast Radio Server configuration file contains several options that can be changed. See the SHOUTcast website for details.

Icecast

Icecast is a free streaming media project maintained by the Xiph.org Foundation. It also refers specifically to the server program which is part of the project. The main website for information and download is: <http://www.icecast.org>. Kerry Cox offers an excellent online “book” devoted to Icecast at: <http://www.gnuware.com/icecast/>.

Icecast was created by Jack Moffitt and Barath Raghavan to provide an open source audio streaming server that anyone could modify, use, and tinker with. Version 2 was started in 2001, a ground-up rewrite aimed at multi-format support and scalability.

The Icecast server is capable of streaming MP3 and AAC over the SHOUTcast protocol. (AAC is only supported in version 2.2.0 and newer.) It runs on both Linux and Windows.

Icecast is generally regarded as being the most sophisticated and capable of the streaming servers, especially for users who want to use Linux and are comfortable with command-line interfaces. It supports detailed reporting of audience statistics. For simple in-house distribution applications, Icecast might be over-the-top. But for serious public Internet radio station-like streaming, this might be just what you need.

As of the writing of this manual, we have not yet tested Icecast in our lab, but there is no reason why it shouldn't work. W. Cox, an A/XE customer, sent us the following details on configuring Icecast:

Short version is you have to tell IceCast that you are sending it a ShoutCast style stream. I did that by adding this to my main icecast config file:

```
<listen-socket>
    <port>8000</port>
    <shoutcast-mount>/example.aac</shoutcast-mount>
</listen-socket>
```

The mount and port obviously have to match what you have the encoder [A/XE] setup to output...

Here is the long version: a big copy and paste from the icecast manual describing this in more detail:

The following shows how we can extend a single listen-socket to work with shoutcast style source clients. There are two issues shoutcast source clients have over icecast source clients, one is the lack of mountpoint and the second is the requirement of two ports. Both of these issues are handled by a simple addition in the listen-socket.

```
<listen-socket>
```

```

<port>8000</port>
<shoutcast-mount>/live.mp3</shoutcast-mount>
</listen-socket>
```

As before, the port specified is allocated but this time the shoutcast-mount implicitly defines a second listening socket whose port number is always one higher than the port defined, this also informs icecast of which mountpoint the shoutcast source client on this socket will be using. Using this approach you can allow multiple shoutcast source clients to connect at the same time.

The following is just to show the longer approach to defining shoutcast compatibility.

```

<shoutcast-mount>/live.nsv</shoutcast-mount>

<!-- You may have multiple <listen-socket> elements -->

<listen-socket>
    <port>8000</port>
</listen-socket>

<listen-socket>
    <port>8001</port>
    <shoutcast-compat>1</shoutcast-compat>
</listen-socket>
```

Note that multiple listen-socket sections may be configured in order to have icecast2 listen on multiple network interfaces or multiple ports. If a bind-address is not specified for a particular listen-socket, then the socket will be bound to all interfaces (including IPv6 if available).

For most people, the bind-address option will not be required and often confuses people.

Configuration Options

port

The TCP port that will be used to accept client connections.

bind-address

An optional IP address that can be used to bind to a specific network card. If not supplied, then it will bind to all interfaces.

shoutcast-mount

An optional mountpoint setting to be used when shoutcast DSP compatible clients connect. The default global setting is /stream but can be overridden here to use an alternative name which may include an extension that some clients require for certain formats. Defining this within a listen-socket group tells icecast that this port and the subsequent port are to be used for shoutcast compatible source clients. This is an alternative to the shoutcast-compat approach as this implicitly defines the second listening socket and allows for specifying multiple sockets using different mountpoints for shoutcast source clients. The shoutcast-mount outside of a listen-socket group is the global setting of the mountpoint to use.

shoutcast-compat

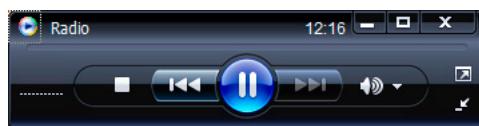
This optional flag will indicate that this port will operate in 'shoutcast-compatibility' mode. Due to major differences in the source client connection protocol, if you wish to use any of the shoutcast DJ tools, you will need to configure at least one socket as shoutcast-compatible. Note that when in this mode, only source clients (and specifically shoutcast source clients) will be able to attach to this port. All listeners may connect to any of the ports defined without this flag. Also, for proper Shoutcast DSP compatibility, you must define a listen socket with a port one less than the one defined as 'shoutcast-compat'. This means if you define 8001 as shoutcast-compat, then you will need to define a listen port of 8000 and it must not also be defined as shoutcast-compat. See the example config file in the distribution for more info.

Using a PC Player to Listen

We will use the Windows Media Player 11 for our first test with the Steamcast server configured as above. Open the player, right click, go to the **File** menu and select **Open URL....** This window will appear:



Enter the IP and port, then the stream name. Because the player is running on the same machine as the server in this case, 'localhost' is entered as the IP number. Were you to be listening on a another machine, you would enter the server's IP number, like this: <http://198.168.1.107:9800/stream1.mp3>. The stream name is the one that was configured in the steamcast.conf file. Click **OK**.



After some buffering time, you should have audio. Normally, a user would not have to enter the URL. Rather, this would be a link embedded in a web page.

We have tested MP3 streams with the WM player, Winamp, VLC player, Foobar, and iTunes. AAC streams will work on the players that support AAC decoding, which are all of the above except WM player.

(We've noticed that Winamp seems to have a bug playing 'localhost' URLs, but it works fine on a remote machine.)

Hardware Players

You can also play the streams on a variety of hardware devices. We've tested with the Logitech 'Slimplayer' and a few others. The device needs to support the codec you have chosen. MP3 has universal support, with AAC decoding being available on only a subset of

devices.

Most hardware players are unable to open URLs directly. They need an intermediate server that drives the program listing on the device and translates the audio stream format, if necessary. The Logitech needs ‘Slimserver’ and many others need a server that conforms to the UPnP standard. This software could run on the same machine as the streaming server.



17 Wowza Media Server

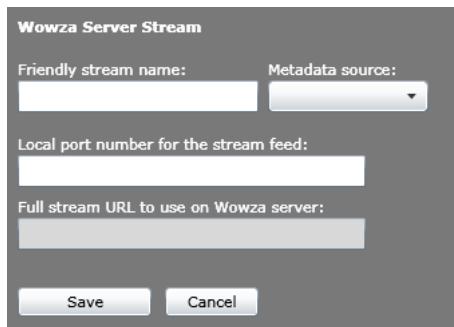
The Wowza Media server is a robust and high performance server capable of streaming AAC to Adobe Flash clients. This means that the end listener does not need to have a specific audio player installed on their PC but can listen to the audio stream using the Flash browser plug-in.

When streaming to a Wowza server, Omnia A/XE uses the ICY protocol acting as a SHOUTcast server. The Wowza server is then configured for SHOUTcast stream replication as shown in the image below:



Configure Omnia A/XE

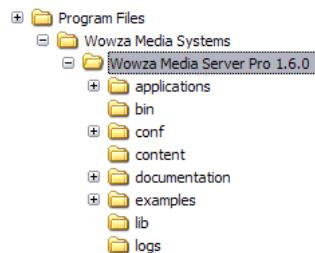
When creating an AAC stream you can specify Wowza as a stream destination. When you select this option, the following dialog is displayed:



1. Enter a friendly name for the stream. This name is used internally and for display purposes so you may use any name. Please use only letters, digits, space and underscore characters in the name.
2. Select a metadata source to tag the stream.
3. Enter a local port number that is not already in use. This is the port number that the Wowza server will use to receive this stream.
4. Click the Save button when done. When this encoder is started, the stream will be made available to your Wowza server for replication.

Configure Wowza Server

Configuring the Wowza server involves copying a number of configuration files to specific locations within the application folder. By default, the Wowza server (v1.6.0) is installed to the following location:



Follow the steps below to configure your Wowza server to read a stream from Omnia A/XE:

5. Stop the Wowza server, if running.
6. In the **conf** directory, create a directory named **omniaaxe**.
7. Copy the **Application.xml** file from the **examples\SHOUTcast\conf\shoutcast** directory to the **conf\omniaaxe** directory you created in the previous step.
8. In the **application** directory, create an empty directory named **omniaaxe**.
9. Restart the Wowza server. Configuration is done.

Test the Connection

We're now going to test the newly created stream. The Wowza server also comes with flash player examples that you can modify to suit your needs. We're going to use the SHOUTcast example player to test the connection from Wowza to Omnia A/XE.

1. Open (double-click) the **shoutcast.html** file found in the **examples\SHOUTcast\client** directory. The following page will be displayed:



2. In the Server field, enter rtmp://wowza_server_ip\omniaaxe. Replace the wowza_server_ip with the address of the Wowza server. Since we are testing on the same PC as the server, we can just enter localhost for the server address as shown in the screen image above.
3. In the URL field, enter http://axe_ip_address:axe_port where axe_ip_address is the IP address of the PC where Omnia A/XE is running. The port is the port you configured in Omnia A/XE when you created the Wowza stream output.
4. Click the Play button. If all is configured properly you should be able to hear the audio stream processed and encoded by Omnia A/XE. The large white box above the Server field will display the metadata information if you supply this to Omnia A/XE.

Additional information about Wowza is available on the Wowza Media web site at <http://www.wowzamedia.com/>. A quick start guide is available from <http://www.wowzamedia.com/quickstart.html>. The forums are always a good source of information at <http://www.wowzamedia.com/forums/>.

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Managing the Omnia A/XE Service

Omnia A/XE runs as a Windows service. Services run in the background and present no user interface as regular applications would. Windows services are started and stopped by using the Service Manager control panel applet.

The steps below illustrate how to use the Service Manager applet to start and stop the Omnia A/XE service. The screen images are from Windows Vista® but the steps should be very similar for other versions of Windows.

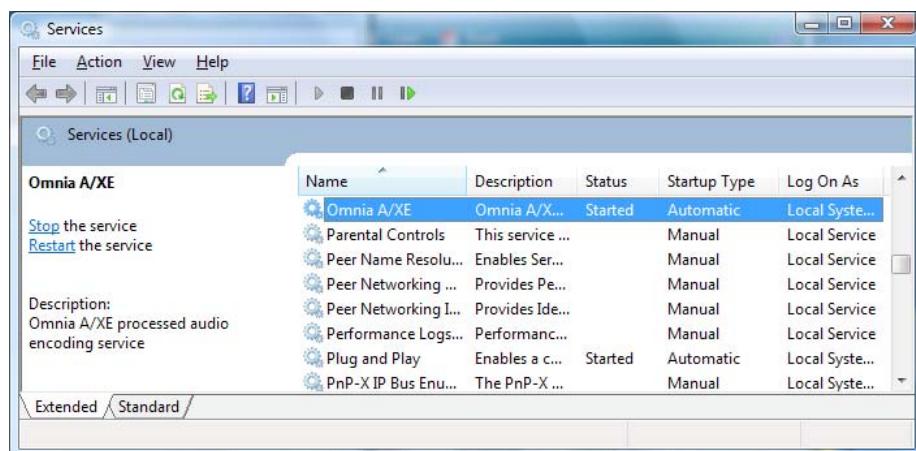
1. Open Windows **Control Panel** from the **Start** menu on the task bar. Double-click the **Administrative Tools** icon on the panel:



2. When the **Administrative Tools** window just opens up, double-click the **Services** applet:



3. A list of services installed on your PC will show up. Scroll down in the list until you find the Omnia A/XE entry:



4. Right-click the Omnia A/XE entry. From the popup menu displayed you may choose the **Start** or **Stop** options to control the service.

19 Firewall Setup

Omnia A/XE requires access to the network for configuration and to deliver the encoded audio streams. If your PC has an active firewall, you will need to configure the firewall to not block Omnia A/XE.

The example below describes the firewall configuration on Windows Vista®. If you use a different firewall, the steps should be similar but please consult your firewall's documentation for details.

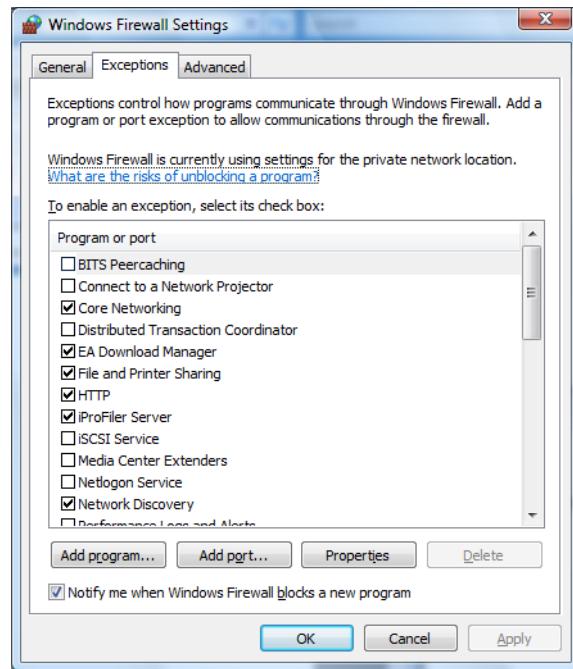
1. Go to Windows' **Control Panel** and open the **Windows Firewall**:



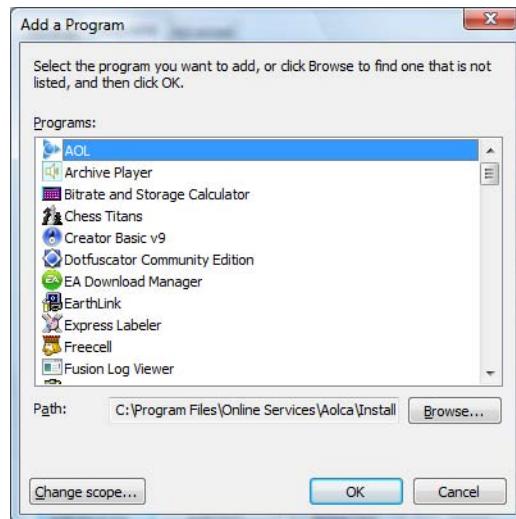
2. In the Windows Firewall dialog, click the **Allow a program through Windows Firewall** link on the left side of the window:



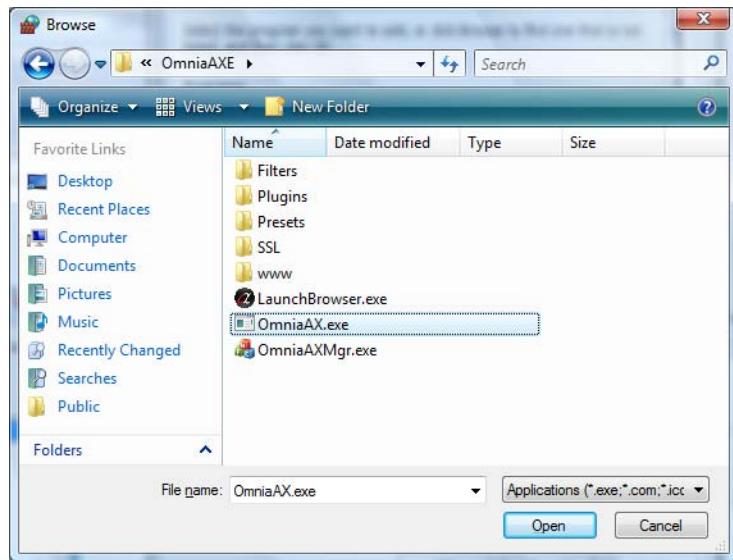
3. If you see a security prompt, select **Continue**. The Windows Firewall Settings dialog will be displayed. Select the **Exceptions** tab (if not already selected):



- On the Exceptions tab, click the **Add program...** button. The a program list will be displayed:



- The first time you open this dialog Omnia A/XE will not appear in the list. Click the **Browse...** button and the Browse dialog will be displayed:



6. Navigate to the folder where Omnia A/XE is installed. The default folder is **Program Files\OmniaAXE**. In this folder select the **OmniaAX.exe** file and click the **Open** button.
7. Click the **OK** button on the following dialog and now you will be back at the **Windows Firewall Settings** dialog. You should now see a new entry labeled **OmniaAX.exe** with a checkmark next to it. You are now done. Click **OK** to close the dialog and close the Windows Firewall applet. Omnia A/XE should now be able to access the network.

