

IMPORTER PLUS

TECHNICAL INSTRUCTION MANUAL

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The comparisons and other information provided in this document have been prepared in good faith based on publicly available information. The reader is encouraged to consult the respective manufacturer's most recent published data for verification.

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RELEASE CONTROL RECORD

Issue	Date	Reason
0.01	2009-04-08	Initial release of manual
0.02	2010-03-29	Changes to support software release 2.3, including: Section 8: "SPS Processor" procedure - added SPS3 information to Table 8.1; replaced Figure 8.6; edited steps 3 through 7; deleted "Configuring the Importer Plus to Auto-Start"

ABOUT THIS MANUAL

This manual provides information about preparing for the delivery and installation of an Importer Plus. This manual is intended for use by field technicians, site managers, and installation planners.

USING THIS MANUAL

Read the task list provided in [Section 2, “Pre-installation tasks” on page 2-1](#). The task list describes the preparations you must make prior to receiving and installing the Importer Plus.

Later sections of this manual provide information regarding installation, operation and troubleshooting.

PERFORMING PROCEDURES

When using procedures in this manual, perform each step in sequence.

- If you are asked to **see** another section of this manual, or another document, refer to that section or document for additional information, and continue the procedure.
- If you are asked to **go** to another step within the procedure, jump directly to that step without performing the intervening steps.
- If you are asked to **go** to another section or document, stop the procedure and perform the tasks described in the section or document.



CAUTION: FAILURE TO COMPLY WITH RECOMMENDATIONS MAY VOID YOUR MANUFACTURER'S WARRANTY. FOR MORE INFORMATION, REVIEW YOUR WARRANTY DOCUMENTS.

Note: When you have completed a task or a step, put a checkmark beside the step number.

FEATURES OF THIS MANUAL

This manual contains a number of useful features:

ONLINE (PDF FILES)

- Click on blue text (hyperlinks) to jump to a related section or get additional information (for example, to view a definition of a term).
- To find keywords, use **Find** in Acrobat Reader's **Edit** menu.
- To quickly find a specific section, click the section in the PDF file's **Bookmarks** list.

PRINTED

- To find keywords, go to the Index at the end of the manual.
- To find a specific term, go to [Section 8, "List of terms" on page 8-1](#).

IMPORTER PLUS MANUALS

The Importer Plus documentation suite contains the following documents:

IMPORTER PLUS TECHNICAL INSTRUCTION MANUAL, IMPORTER PLUS_PLUS-MANUAL. The Technical Instruction Manual provides instructions and reference information needed when planning and preparing for the installation of an Importer Plus, installing an Importer Plus and operating, maintaining and troubleshooting an Importer Plus. It also provides reference information needed when performing diagnostic procedures.

HD RADIO™ IMPORTER PLUS USERS GUIDE. This guide provides detailed instructions for operating the Importer Plus. It was produced by iBiquity and is provided as a supplement to the Operating and Maintenance manual.

Both Importer Plus documents are also provided in Acrobat PDF format on the Nautel website, in the Nautel User Group (NUG) section.

ONLINE RESOURCES

The Nautel website provides useful resources to keep you up to date on your Importer Plus.

NAUTEL USER GROUP (NUG)

The website includes a special section that customers can log into in order to access the Nautel customer newsletter, product manuals, frequently asked questions (FAQ), information sheets, and information about field upgrades.

ONLINE DOCUMENTATION

The website's NUG section provides online access to all the documentation for your Importer Plus. Documentation is provided in Acrobat (PDF) format. You can use the documentation online or print the sections that you need.

SECTION 1: DESCRIPTION

This section provides a description of the Importer Plus and its associated digital radio system.

- [Overview](#)
- [Physical requirements - see page 1-4](#)
- [Cooling requirements - see page 1-5](#)

OVERVIEW

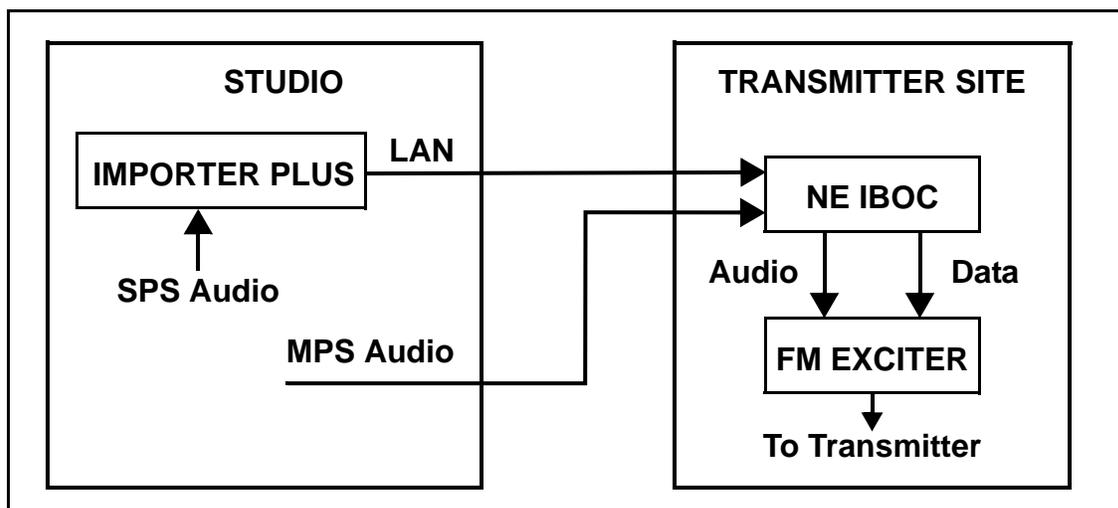
The Importer Plus is used in digital radio transmission systems with Nautel's NE IBOC (In-Band-On-Channel) signal generator (see [Figure 1.2 on page 1-2](#)), Exporter (see [Figure 1.3 on page 1-2](#)) or Exporter Plus (see [Figure 1.4 on page 1-3](#)). The Importer Plus allows multiple broadcasts within a single FM channel. It consists of a PC with compatible audio cards to support the secondary program. The Importer Plus' application software enables partitioning of the available transmitted HD (high definition) data bandwidth, between main program service (MPS) audio and other audio and data services, collectively called advanced application services (AAS). Audio AAS are called secondary program services (SPS), and include and program associated data (PAD).

The front panel has a hinged cover, behind which are LEDs to indicate hard drive activity (HDD) and power, two USB ports and a power switch (see [Figure 1.1](#)). The rear panel has standard PC connections for monitor, mouse, keyboard and a USB port. Installed audio card(s) include cables and connectors for audio, and synchronizing inputs and outputs (specific to the type of audio card).

Figure 1.1: Importer Plus partial front view (behind hinged cover)

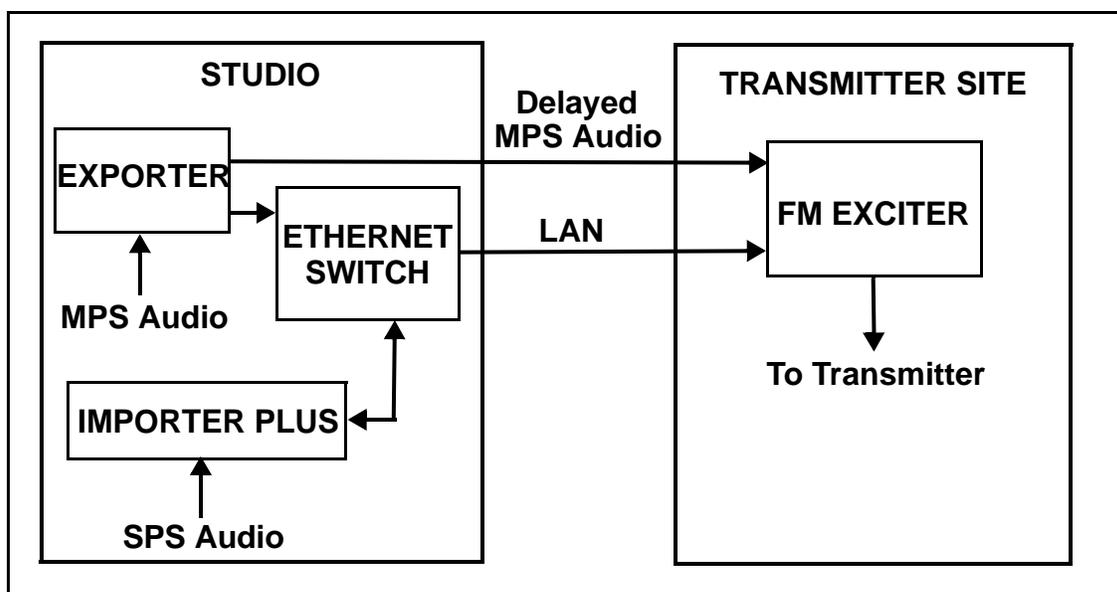


Figure 1.2: Typical system with an Importer Plus and NE IBOC

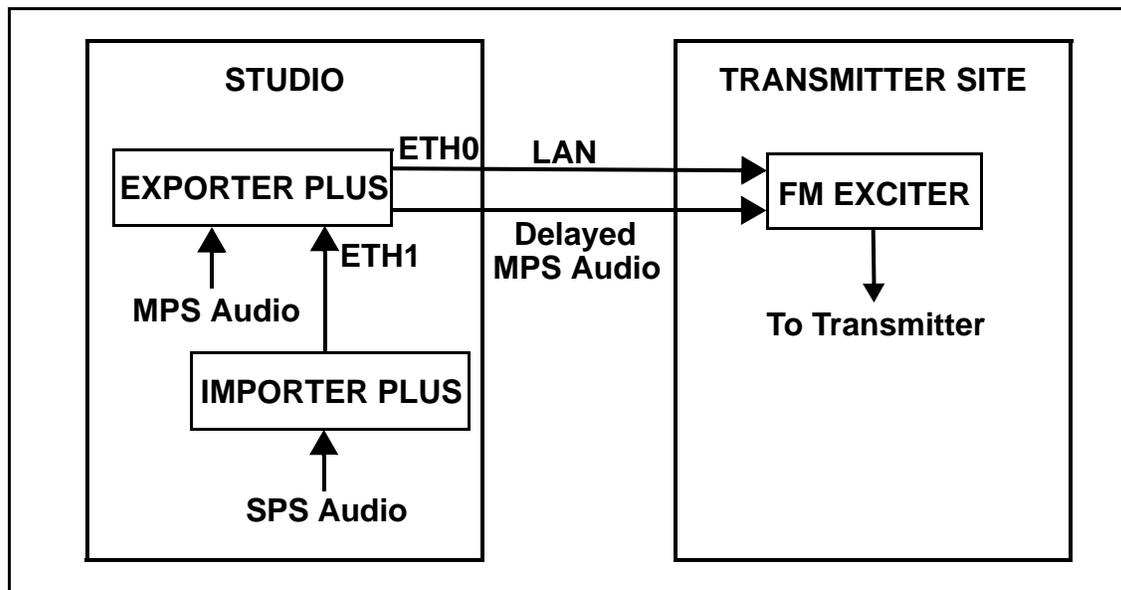


Note: The Importer Plus can also be located at the transmitter site. This requires sending SPS audio to the transmitter site instead of through a LAN connection.

Figure 1.3: Typical system with an Importer Plus and Exporter



Note: The Importer Plus and Exporter can also be located at the transmitter site. This requires sending SPS audio to the transmitter site instead of through a LAN connection.

Figure 1.4: Typical system with an Importer Plus and Exporter Plus

Note: The Importer Plus and Exporter Plus can also be located at the transmitter site. This requires sending SPS audio to the transmitter site instead of through a LAN connection.

PHYSICAL REQUIREMENTS

Figure 1.5: Importer Plus



DIMENSIONS

The Importer Plus is a rack-mountable unit with the following dimensions:

- **Height:** 1U, or 4.4 cm (1.75 inches)
- **Width:** 48.3 cm (19 inches)
- **Depth:** 44.0 cm (17.3 inches)

CLEARANCES

Ensure there are minimum clearances of 1.3 m (4.0 feet) at the front and the rear of the Importer Plus's host cabinet to allow room for installation, operation and ventilation. Allow several inches of clearance at the sides of the Importer Plus.

WEIGHT

The Importer Plus weighs 18 kg (40 lbs).

COOLING REQUIREMENTS

This section provides information about heating and cooling requirements for the Importer Plus.

- Do not allow the Importer Plus room ambient air temperature to exceed 30°C (86°F) at sea level. De-rate 3°C (5.4°F) per 500 m – or 2°C (3.6°F) per 1,000 feet – above sea level.

Example:

At 1,600 m (1 mile) above sea level, maximum ambient temperature should not exceed 20.4°C (67°F). Cooler temperatures are recommended, in order to improve the reliability of the Importer.

- Do not install the Importer Plus next to other warm equipment.

SECTION 2: PRE-INSTALLATION TASKS

This section provides a list of tasks that you must perform prior to delivery and installation of the Importer Plus.



CAUTION: FAILURE TO COMPLY WITH RECOMMENDATIONS MAY VOID YOUR MANUFACTURER'S WARRANTY. FOR MORE INFORMATION, REVIEW YOUR WARRANTY DOCUMENTS.

PREPARING FOR INSTALLATION

To prepare for installation of an Importer Plus, perform the following tasks:

1. Ensure the correct Importer configuration is ordered. Consider the audio card, SPS (analog or AES), and equipment requirements. For detailed information, see [“Configuring the Importer Plus audio” on page 2-2.](#)
2. Select a location for the Importer Plus in the studio or the transmitter site. For detailed information, see [“Selecting a location for the Importer Plus” on page 2-2.](#)
3. Prepare the network (LAN) connection between the Importer Plus and the NE IBOC, Exporter or Exporter Plus. Consider the Importer Plus's location and the amount of other networked equipment at the transmitter site. For detailed information, see [“Planning the LAN connection” on page 2-3.](#)
4. Consult your network manager to obtain IP address information for the Importer Plus, NE IBOC, Exporter or Exporter Plus, and gateway. For detailed information, see [“IP address information” on page 2-5.](#)
5. If you are going to use SPS sample rate synchronization, determine how it can best be implemented.
For detailed information, see [“Synchronizing the SPS sample rate” on page 2-6.](#)
6. Order any accessories or optional equipment that you may need. See [“Parts and tools” on page 7-1.](#)
7. Train your station technicians and operators on the use of the Importer Plus. For a list of available technical and user documents, see the *About this manual* section at the beginning of this document. For information about Nautel training courses, go to the Nautel website at <http://www.nautel.com/support/training/>

CONFIGURING THE IMPORTER PLUS AUDIO

1. Importer Plus audio card configurations may differ depending on the options specified, but in general, there will be two audio channels.
 2. You must use AES format audio and the sample rate must be set to 44.1 kHz.
 3. For best audio performance, synchronize the 44.1 kHz audio sample rate to the HD system 10 MHz reference. See also [“Synchronizing the SPS sample rate” on page 2-6](#).
-

SELECTING A LOCATION FOR THE IMPORTER PLUS

To ensure that the desired location for the Importer Plus is suitable, perform the following tasks.

1. Determine whether the Importer Plus and its host cabinet will be located in the studio or the transmitter site. Consider the following choices and associated requirements:
 - a) If you install the Importer Plus at the transmitter site with the associated NE IBOC, Exporter or Exporter Plus, you will ease the connection required between the studio and the transmitter site. In this case you will need to send only SPS audio to the Importer Plus rather than a LAN connection. See also [“Planning the LAN connection” on page 2-3](#).
 - b) If you install the Importer Plus at the studio, regardless of the location of the NE IBOC, Exporter or Exporter Plus, you will need to provide a LAN connection over the studio-transmitter link (STL). Ensure the STL can support this capability. See also [“Planning the LAN connection” on page 2-3](#).
 2. Ensure you have a cabinet and room space suitable for installing the Importer. See [“Physical requirements” on page 1-4](#) and [“Cooling requirements” on page 1-5](#).
 3. Ensure the Importer Plus is near a standard ac power outlet, 100 - 240 V ac.
-

PLANNING THE LAN CONNECTION

This section provides information about the LAN connection between the Importer Plus and the NE IBOC, Exporter or Exporter Plus. Assess your existing network's capabilities, or establish a network that meets the requirements of this section. This section includes the following topics:

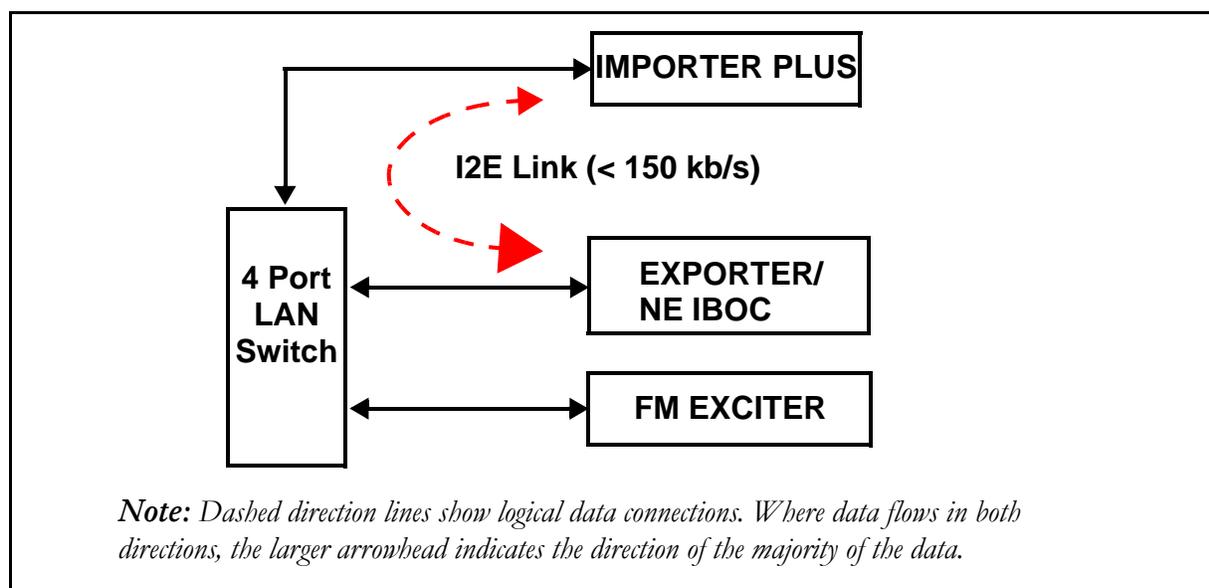
- Managing network traffic
- STL capacity
- IP address information

MANAGING NETWORK TRAFFIC

Network traffic between the Importer Plus and NE IBOC, Exporter or Exporter Plus contains time sensitive information, such as audio, and cannot tolerate variation in transport time. Use network devices such as switches to intelligently route the network traffic. Avoid using network hubs, which are slow in nature. The link between the Importer Plus and Exporter/NE IBOC is called I2E. The link between the Exporter or Exporter Plus and FM exciter with Exgine option is called E2X.

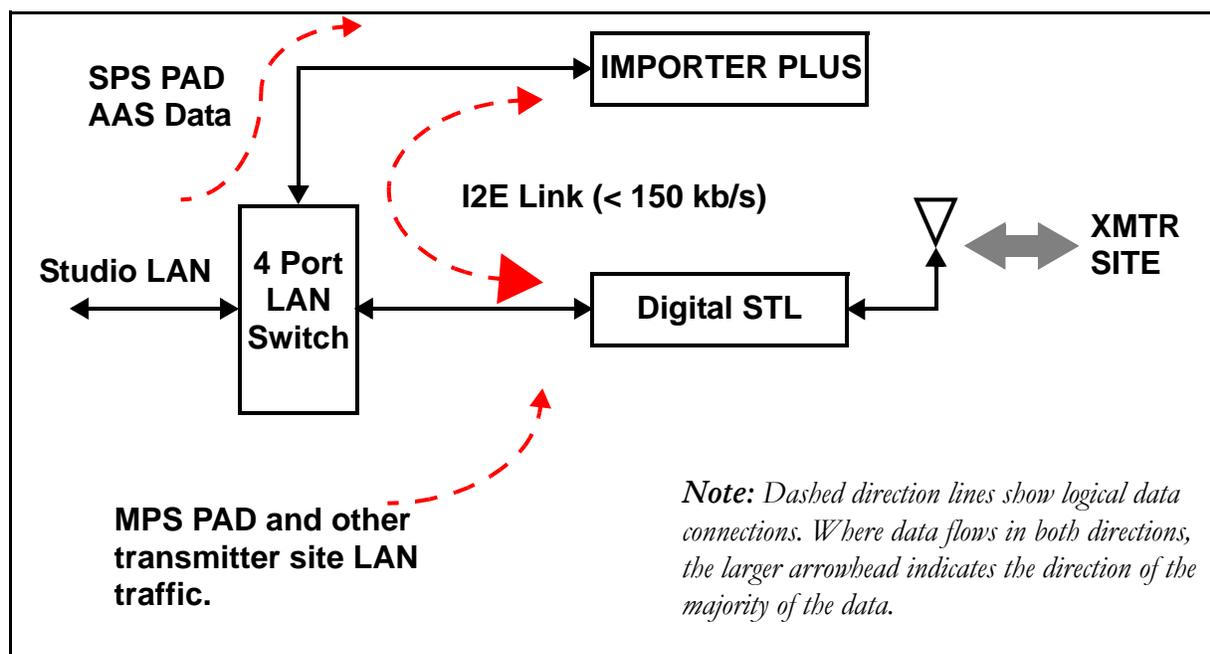
Figure 2.1, Figure 2.2 and Figure 2.3 show examples of LAN configurations using the Importer Plus and Exporter at various locations.

Figure 2.1: Example of Importer Plus and Exporter at the Transmitter Site



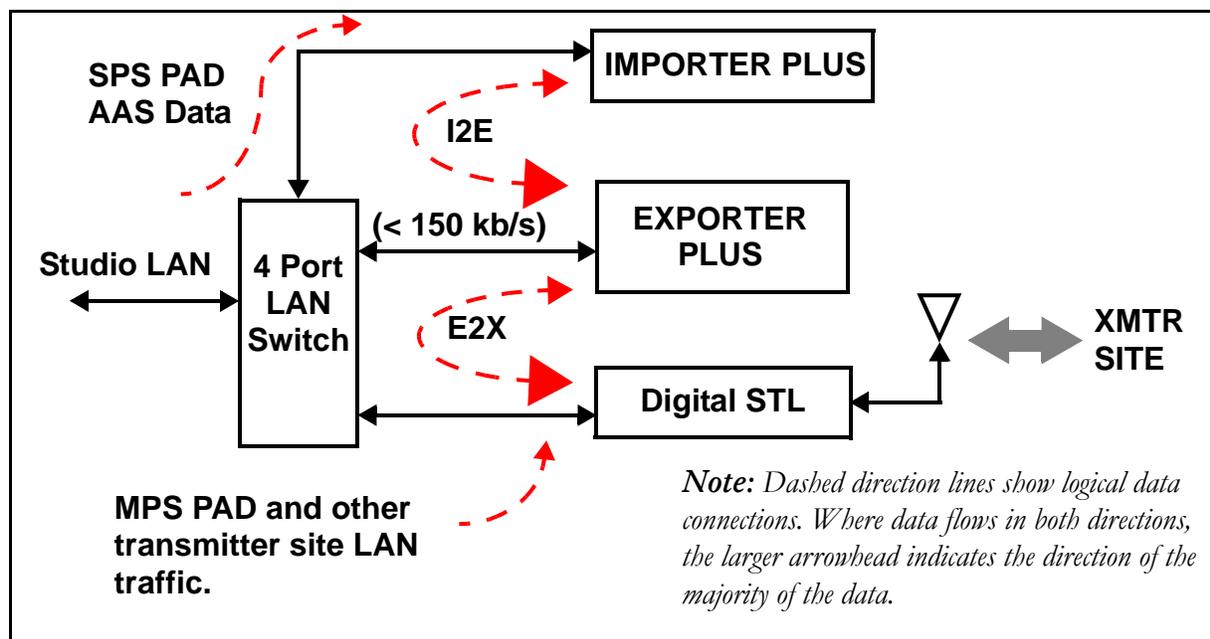
Note: The FM exciter connects to the LAN when the exciter includes the Exgine option. Otherwise it can only connect directly to an Exporter, Exporter Plus or NE IBOC.

Figure 2.2: Example of an Importer at the Studio



Note: MPS PAD, SPS PAD, and AAS data are optional HD data services.

Figure 2.3: Example of an Importer and Exporter or Exporter Plus at the Studio



Note: MPS PAD, SPS PAD, and AAS data are optional HD data services.

NETWORK SWITCH. Incorporating a network switch (see [Figure 2.1 on page 2-3](#)) ensures that the connection to the Importer Plus carries only SPS PAD and I2E data, and that the connection to the digital STL carries only exciter link data, MPS PAD (for the NE IBOC, Exporter or Exporter Plus), and any traffic for other devices at the transmitter site.

NETWORK BANDWIDTH. It is assumed that the Importer Plus and NE IBOC, Exporter or Exporter Plus have fixed IP addresses. Because STLs have limited total throughput, the available networking bandwidth depends on how much of the throughput is being used for audio or other services. Determining available bandwidth depends on the type of STL and how it is being used.

STL CAPACITY

The required STL capacity on the LAN channel varies based on protocol, service mode and the number of secondary audio channels. You may require a bandwidth of up to 150 kb/s.

IP ADDRESS INFORMATION

Since the Importer Plus will be connected to the NE IBOC, Exporter or Exporter Plus over a LAN, you will need to determine the IP addresses for the Importer Plus, the NE IBOC, Exporter or Exporter Plus, and the gateway. Consult with your network manager for this information. If they are to be connected together directly, as shown in [Figure 2.1 on page 2-3](#), the choice of IP address is arbitrary. For example the following could be used:

- NE IBOC, Exporter or Exporter Plus IP: 10.10.10.10
- Importer Plus IP: 10.10.10.12
- Gateway IP: 10.10.10.2

SYNCHRONIZING THE SPS SAMPLE RATE

This section aids in assessing the feasibility of synchronizing the SPS sample rate to a 10 MHz reference. This section includes the following topics:

- General considerations
- Methods to achieve synchronization
- Additional equipment

GENERAL CONSIDERATIONS

You can achieve the best SPS audio performance if you synchronize the Importer Plus' 44.1 kHz audio sample rate to the master clock of the HD system. The difference in audio quality may not be perceptible, or even important, given that SPS channels are typically lower quality audio. To synchronize, you may require considerable equipment infrastructure (see [“Using an HD-4 audio card” on page 2-8](#)) depending on the system configuration.

The station manager should review *Methods to achieve synchronization* in this section and determine whether it is a worthwhile investment.

METHODS TO ACHIEVE SYNCHRONIZATION

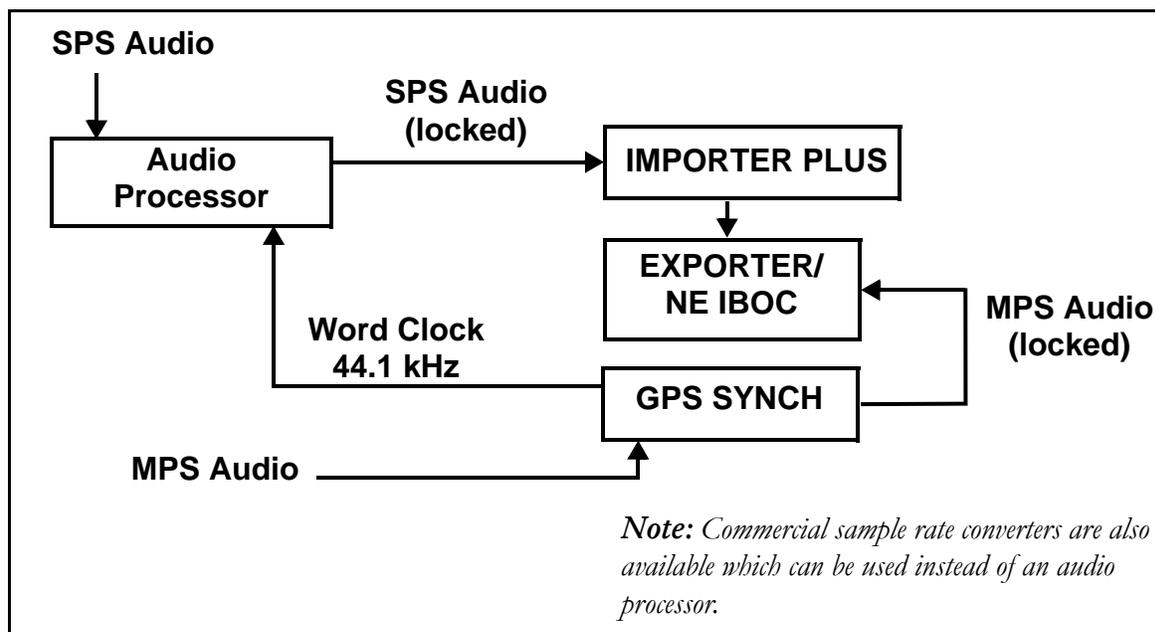
There are different ways to synchronize the SPS audio sample rate, based on the number of channels and the location of the Importer. Consider the following:

USING A GPS SYNCHRONIZATION UNIT FOR SINGLE CHANNEL APPLICATIONS. Nautel supplies either an NAX240 GPS Synchronization Unit, or a built-in GPS synchronization card, with NE IBOC or Exporter. Both of these devices include a 44.1 kHz word clock output that can be used as the synchronization source for an Importer Plus.

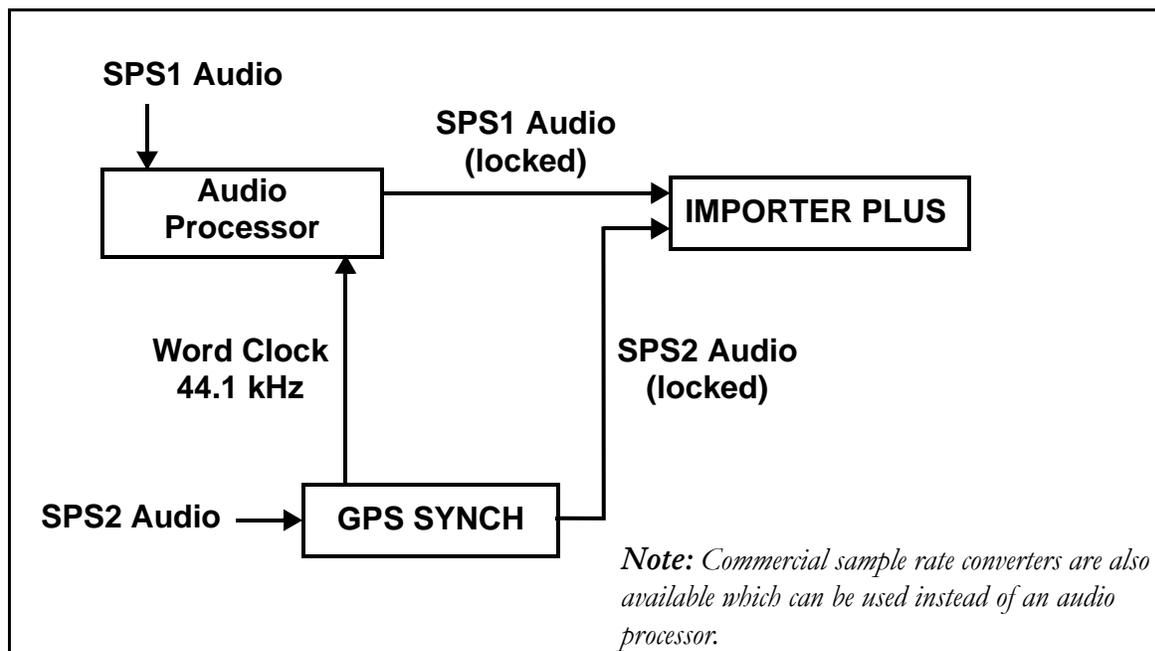
USING AN AUDIO PROCESSOR AS A SAMPLE RATE CONVERTER. Some audio processors can provide the sample rate conversion function. An audio processor must be able to accept either a word clock or another AES input as a synchronizing signal for its output AES sample rate.

IMPORTER LOCATION. If the Importer Plus will be co-located with the NE IBOC, Exporter or Exporter Plus, and a suitable audio processor will be used to condition the SPS audio, the audio processor may be able to perform the synchronization. See [Figure 2.4](#) for a block diagram of this setup.

Figure 2.4: Using an audio processor for SPS synchronization

**Importer Plus and Exporter or NE IBOC co-located**

If the Importer Plus will not be co-located with the NE IBOC, Exporter or Exporter Plus, you can purchase a second GPS synchronization unit to install near the Importer Plus. Both units must be GPS locked to satellite. Since the GPS synchronization unit can only synchronize a single audio source, you will need to use the GPS synch word clock, or a spare AES output, as an input to a sample rate converter (audio processor) if you are using more than one SPS. See [Figure 2.5 on page 2-8](#) for a block diagram of this setup.

Figure 2.5: Multiple SPS

Importer Plus and NE IBOC or Exporter not co-located

USING AN HD-4 AUDIO CARD. Some Importers include a Prodif HD-4 audio card (Nautel Part # UA100). This card has a single BNC type connector which is a word clock input. Applying the 44.1 kHz word clock to this input will synchronize the Importer Plus audio.

ADDITIONAL EQUIPMENT

You need the following additional equipment to synchronize the SPS audio sample rate:

- GPS receiver with a 10 MHz output (also part of GPS synchronization unit/card)
- Word clock generator that accepts a 10 MHz reference (also part of GPS synchronization unit/card)
- Sample rate converter or suitable audio processor (one per channel) that accepts an external sample rate word clock

SECTION 3: PARTS AND TOOLS

This section describes parts associated with the Importer Plus, and tools needed during installation and routine operation.

- Parts supplied by Nautel
- Parts not supplied by Nautel – see [page 3-2](#)
- Tools for installation – see [page 3-2](#)

PARTS SUPPLIED BY NAUTEL

AUDIO CARD ANCILLARIES

With each audio card that is purchased, a plastic bag is provided containing audio cables. You may not require all cables for your Importer Plus installation.

AC POWER CABLE

An ac power cable is included with the Importer Plus.

SOFTWARE

The CD containing the **Microsoft Windows XP Professional** software is included with the Importer Plus. Nautel pre-loads the Importer Plus so you do not need to install it initially. It is provided if you need to re-install it at a later date.

DOCUMENTATION

Nautel includes the following documents with the Importer Plus:

- Importer Technical Instruction Manual, IMPORTER_PLUS-MANUAL.

The *Technical Instruction Manual* provides instructions and reference information needed when planning and preparing for the installation of an Importer Plus, installing an Importer Plus, and operating and maintaining an Importer Plus. It also provides reference information needed when performing diagnostic procedures.

- HD Radio Importer User's Guide.

The *HD Radio Importer User's Guide* provides detailed instructions for operating an Importer Plus. It is provided as a supplement to the *Technical Instruction Manual*.

PARTS NOT SUPPLIED BY NAUTEL

Nautel does not supply some parts and materials required to complete installation. The parts you need vary with the installation requirements. The list of parts you normally provide yourself during installation include:

- 19-inch cabinet space
- USB PC keyboard and mouse
- Monitor
- Cat-5 cable
- SPS audio sources

TOOLS FOR INSTALLATION

The tools you need during Importer Plus installation include the following:

- Philips screwdrivers, sizes # 1 and # 2

SECTION 4: UNPACKING AND INSTALLATION

To install an Importer Plus, perform the following tasks:

1. Unpack the Importer Plus from shipping box. Make sure that all shipped items are available - check your packing list.
2. Inspect all crates and packages for damage. Report any damage immediately to your Nautel sales representative.
3. Assemble your parts and tools. For a list of required tools, see [“Parts and tools” on page 3-1](#).
4. the Importer Plus at the studio or transmitter site in the cabinet space you have prepared.
5. **Do not** connect ac power to the Importer Plus at this time.

SECTION 5: CONNECTING TO THE IMPORTER

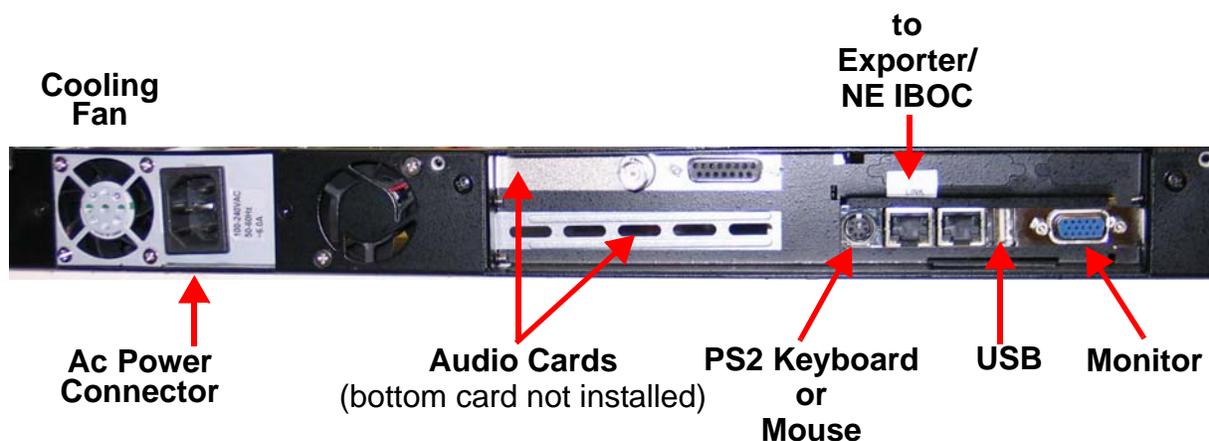
To connect the Importer Plus audio cable, perform the following steps:

1. Locate the cable harnesses supplied in plastic bag.

Note: The audio card(s) shipped in the Importer Plus are optional item(s) and, as such, may differ between Importer Plus units. Audio cable(s) that are designed to work with the installed audio card will be shipped with the unit; the audio channels are indicated on these cables.

2. Connect the USB keyboard and mouse, and the monitor to the Importer Plus (see [Figure 5.1](#)).

Figure 5.1: Importer Plus rear panel connections



SECTION 6: TURNING ON THE IMPORTER

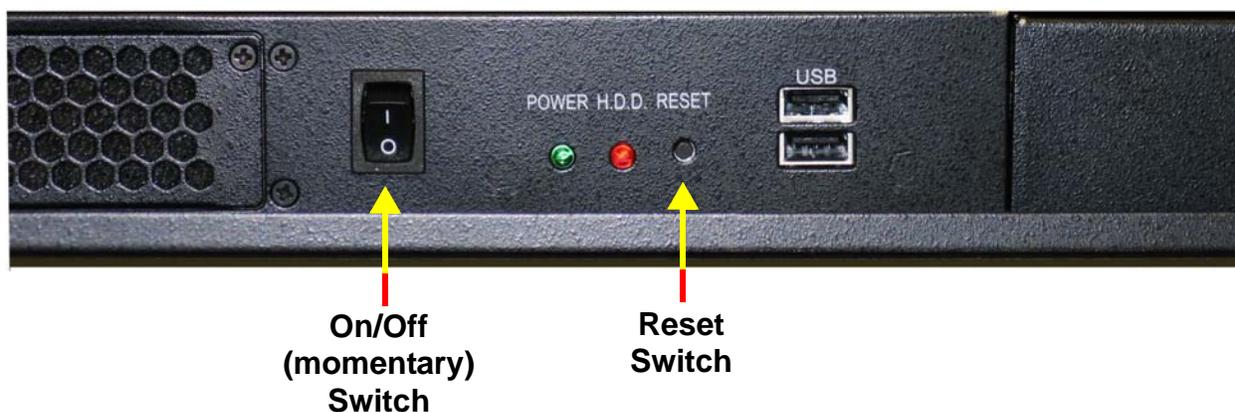
To turn on and boot up the Importer Plus, perform the following steps:

1. Connect ac power to the back of the Importer Plus. The Importer Plus will begin booting up.

Note: There is a momentary I/O switch on the front panel that turns the Importer Plus on and off. When the Importer Plus is on and the switch is pressed, Windows XP will routinely shut down and turn off the power supply. When the Importer Plus has been shut down in this manner and the switch is pressed again, the Importer Plus will turn on.

2. Ensure the monitor is turned on and that Windows XP starts up properly.

Figure 6.1: Importer Plus partial front view (shown without cover)



SECTION 7: CONFIGURING THE LAN

Perform the steps in this section to configure the Importer Plus' IP addresses.

Note: IP address information for the Importer Plus and NE IBOC, Exporter or Exporter Plus, based on LAN configuration, was determined in "Planning the LAN connection" on page 2-3. The equipment has been factory pre-configured with a default NE IBOC, Exporter or Exporter Plus IP address of 10.10.10.10. Even if modifications are not required, you should verify that the IP addresses are correct.

Modify the Importer Plus' IP address for the NE IBOC, Exporter or Exporter Plus as follows:

1. From the Importer Plus' control panel:
 - Select **Setup > Importer**
 - Enter the Exporter IP address in the **Exporter IP** field (see [Figure 7.1](#)).

Figure 7.1: Importer Setup screen

The screenshot shows the 'Importer Setup' dialog box with the following fields and values:

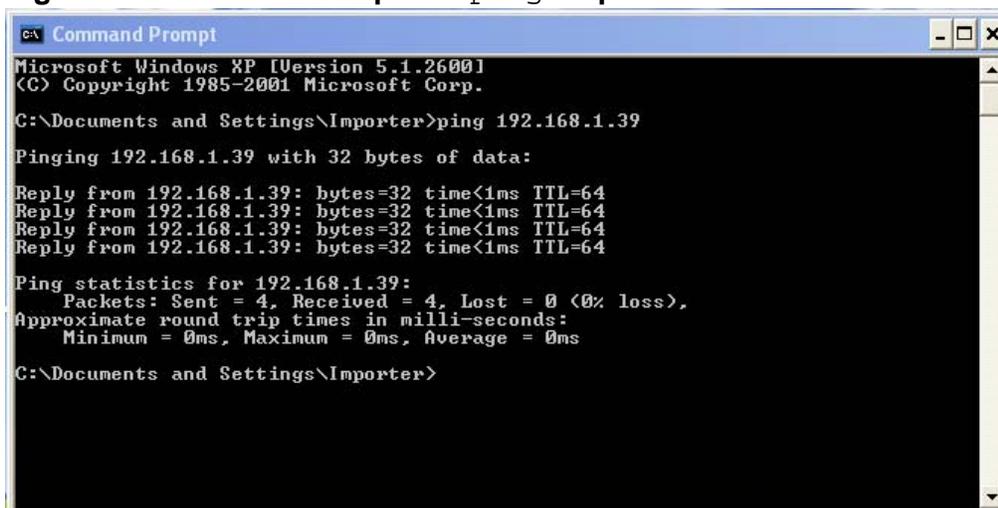
- Exporter:**
 - IP: 10 . 10 . 10 . 10
 - Tx Port: 8025
 - Rx Port: 1700
 - Protocol: TCP
- Database:**
 - IP Address:
 - Machine Name: (local)
 - Catalog: IMPORTER_DB_2_0
- Administrator:**
 - IP: 127 . 0 . 0 . 1
 - Port: 1600
- Logistics processor:**
 - IP: 127 . 0 . 0 . 1
 - Port: 1000
- Connection Manager:**
 - Port: 1010

Buttons: OK, Cancel

2. Modify the IP address of the Importer Plus as follows:
 - Select the **Network Connections** icon.
 - Right click on *Local Area Connection*.
 - Select *Properties*.
 - Scroll to and highlight *Internet Protocol*.
 - Click on *Properties*.
 - In the **Properties** window, click the *Use the following IP address* option.
 - Enter the importer's IP address in the **IP address** field (see your network manager).
 - Check the *Subnet mask*. It should be: 255 : 255 : 255 : 0
 - If necessary, enter the gateway IP address in the **Default gateway** field (see your network manager).
 - Click **OK**.
 - Click **OK** again.

3. Verify the IP address of the Importer Plus as follows:
 - Using another PC that is directly or indirectly (via a switch) network connected to the importer, select: *Start > All Programs > Accessories > Communications > Command Prompt*
 - At the command prompt, type: ping importer IP address
 - The *ping* command should show the status of four packets sent to the Importer Plus. If the connection is OK, a response similar to [Figure 7.2](#) should appear.
 - Type *exit* to close the **Command Prompt** window.

Figure 7.2: Successful importer ping response



```
Microsoft Windows XP [Version 5.1.2600]
(C) Copyright 1985-2001 Microsoft Corp.

C:\Documents and Settings\Importer>ping 192.168.1.39

Pinging 192.168.1.39 with 32 bytes of data:

Reply from 192.168.1.39: bytes=32 time<1ms TTL=64

Ping statistics for 192.168.1.39:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\Documents and Settings\Importer>
```

SECTION 8: OPERATING THE IMPORTER PLUS

This section provides information about operating the Importer Plus:

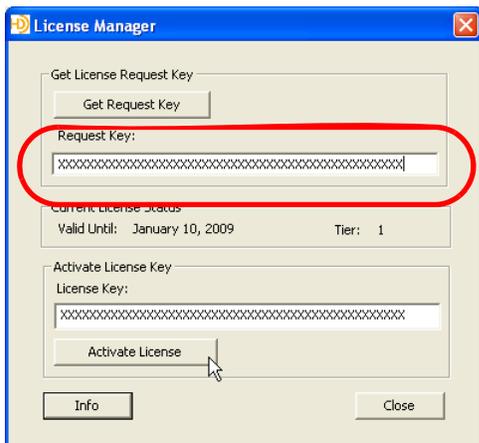
- License key - see [page 8-1](#)
- Control panel- see [page 8-3](#)
- SPS processor - see [page 8-6](#)
- WebAdmin client- see [page 8-9](#)
- Backing up the configuration database - see [page 8-17](#)

Note: *The procedures in this section allow you to quickly configure the importer for standard operation. For detailed procedural and reference information, refer to **Section 8, Operating Procedures of the HD Radio™ Importer User's Guide** provided with this documentation.*

LICENSE KEY

The Importer Plus will not function without a valid license key issued by iBiquity Digital. The following steps describe how to check and renew your license key.

1. You can check the expiry date of the Importer Plus license by opening the LicenseMgr application from the **Start** menu.
 - From the **Start** menu:
Click on **Start > Programs > iBiquity Digital > Importer > LicenseMgr**.

Figure 8.1: License Manager

2. If your license is about to expire, click on the **Get Request Key** button. A 48-character code – the **Request Key** – will appear in the box below the button.
3. Email the **Request Key** to importerkey@ibiquity.com. A 48-character activation code – the **License Key** – will be provided via return email.
4. Enter the **License Key** in the **License Key** box, then click on the **Activate** button.

Note: *The request code is based on the Importer Plus' present date as well as the MAC address of the Importer Plus' Ethernet port. Only the request code that was emailed to Ibiquity will work with the assigned License Key. You may need to manually re-enter the request code if License Manager is closed and the date advances prior to entering the new key.*

5. Verify that the date in the **Current License Status** box has advanced by approximately one year.

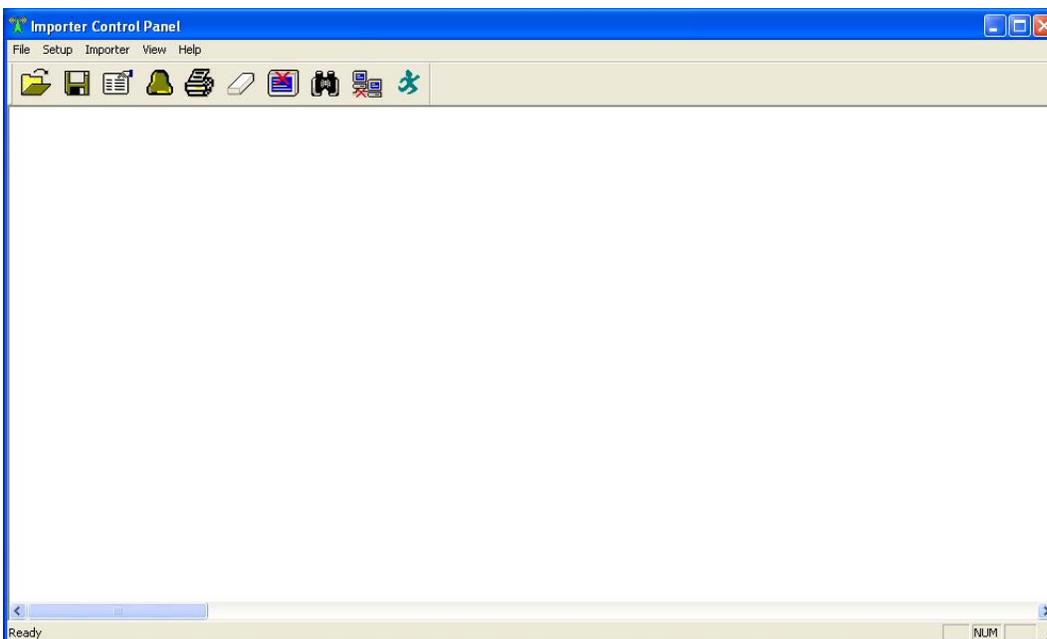
CONTROL PANEL

The Importer Plus software consists of a number of modules. These modules may be started and run individually, but the preferred method is to run the **Importer Control Panel** application. This manual contains information on running the Importer Plus software through the **Importer Control Panel**. For detailed information on the individual modules, see the *HD Radio Importer User's Manual*.

Start up the **Importer Control Panel** as follows:

1. Ensure the Importer Plus is connected to the NE IBOC, Exporter or Exporter Plus via Ethernet.
2. From the Windows desktop, double click the **Importer Control Panel** icon. The control panel application will start. See [Figure 8.2](#)

Figure 8.2: Importer Control Panel



CONTROL PANEL FUNCTIONS

The **Importer Control Panel** allows the user to start and stop the Importer Plus, set various Importer Plus configuration options and control the Importer Plus' logging functions.



Starting the Importer Plus: Click the start icon to start the Importer Plus. A properly configured and connected Importer Plus will display a number of log messages indicating that the various modules have started successfully.



Stopping the Importer Plus: Click the stop icon to stop the Importer Plus. The icon appears in place of the start icon once the Importer Plus is started.



Importer Plus Setup: Click the setup icon to enter the Importer Setup screen. See [Figure 8.3](#). Typically the only setting which may be altered on this screen is the Exporter IP address.

Figure 8.3: Importer Setup Screen

Importer Setup

Exporter
IP Address: 10 . 10 . 10 . 10
Conduit: I2EDataIn

Administrator: Core Port# 8010 DLMX Port# 8011

Logistics processor: Core Port# 8030 DLMX Port# 8031 Link Delay 20 x 1.486 Sec

Connection Manager: Core Port# 8020 DLMX Port# 8021 CA Port# 8022

Importer ControlPanel: DLMX Port# 8040

DLMX: DLMX Port# 8050

OK Cancel



Log Service Setup: Click the log service icon to set up the event logging parameters of the Importer Plus. The screen shown in [Figure 8.4](#) should appear. Log levels, log file sizes and log file locations can be specified from this screen.

Figure 8.4: Log Service Setup Screen

The image shows a Windows-style dialog box titled "Log Service Setup" with a blue title bar and a close button (X) in the top right corner. The dialog is divided into several sections:

- Log Connection:** Contains two text input fields. The "IP:" field contains "127 . 0 . 0 . 1" and the "Port:" field contains "8000".
- Log Level:** Contains five rows, each with a component name, a log level dropdown menu, and an "Exclusive" checkbox. The components and their settings are:
 - Administrator: INFO, Exclusive (unchecked)
 - Logistics Processor: INFO, Exclusive (unchecked)
 - Connection Manager: INFO, Exclusive (unchecked)
 - DLMX: INFO, Exclusive (unchecked)
 - Control Panel: INFO, Exclusive (unchecked)
- Log Forward to Control Panel:** Contains a checked "Enable" checkbox, an "IP:" field with "127 . 0 . 0 . 1", and a "Port:" field with "8001".
- Log File:** Contains three spinner boxes for "Max. file size: (MB)" (set to 200), "Files per day:" (set to 10), and "# of day to log:" (set to 4). Below these is a "Location:" text field containing "C:\Documents and Settings\IMPORTER\Desktop\importer\1.log" and a browse button ("...").

At the bottom of the dialog are two buttons: "OK" and "Cancel".



Disable Log Message Display: Click the print log icon to enable or disable the printing of log messages on the **Importer Control Panel**. When enabled, normal log messages are displayed in blue text. Error messages are displayed in red text. Warning messages are displayed in yellow text. Debug messages are displayed in black text.

Other functions: Additional icons exist that allow for saving, printing, erasing and searching log files.

SPS PROCESSOR

Use the **SPS Processor** application as follows:

1. From the Importer Plus' desktop, double click on the **SPS Capture 1** icon. The **SPS Capture** application will start and the screen shown in [Figure 8.5](#) will appear.

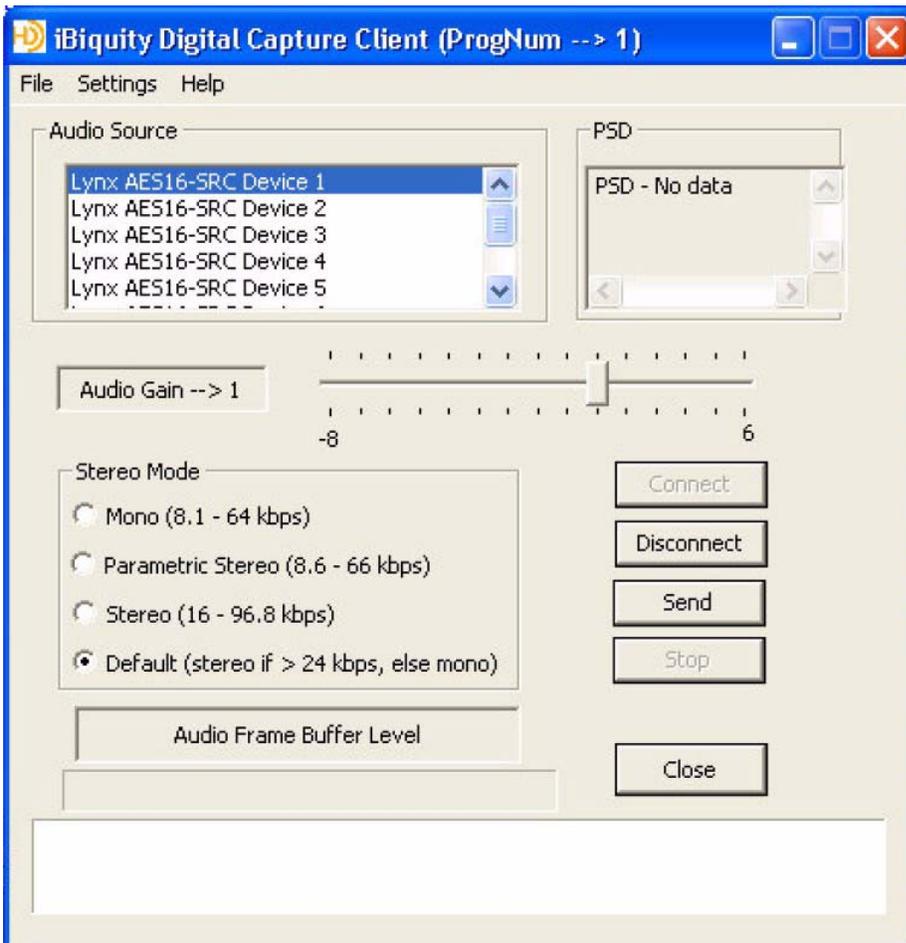
Figure 8.5: SPS Capture screen



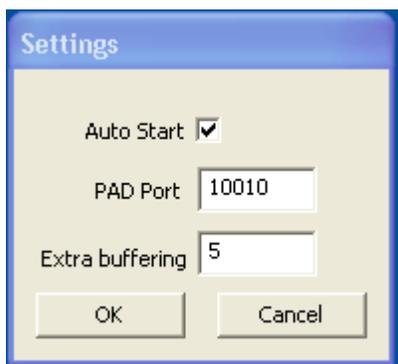
2. Enter the **User name** and **Password** and click **OK**. The screen shown in [Figure 8.6](#) will appear. The **User name** and **Password** are non-volatile and will not need to be entered every time the SPS processor is started up. The default **User names** and **Passwords** for the two secondary channels are shown in [Table 8.1](#).

Table 8.1: Default User Names and Passwords

Channel	User Name	Password
SPS1	sps_one	sps_one_pwd
SPS2	sps_two	sps_two_pwd
SPS3	sps_three	sps_three_pwd

Figure 8.6: SPS Configuration screen

3. Select **Lynx AES16-SRC Device 1** for SPS1.
4. Select **Lynx AES16-SRC Device 2** for SPS2.
5. Select **Lynx AES16-SRC Device 3** for SPS3.
6. Use the Settings pull-down menu to configure several parameters of the SPS Capture Client (see [Figure 8.7](#)).

Figure 8.7: Settings Pull-down Menu

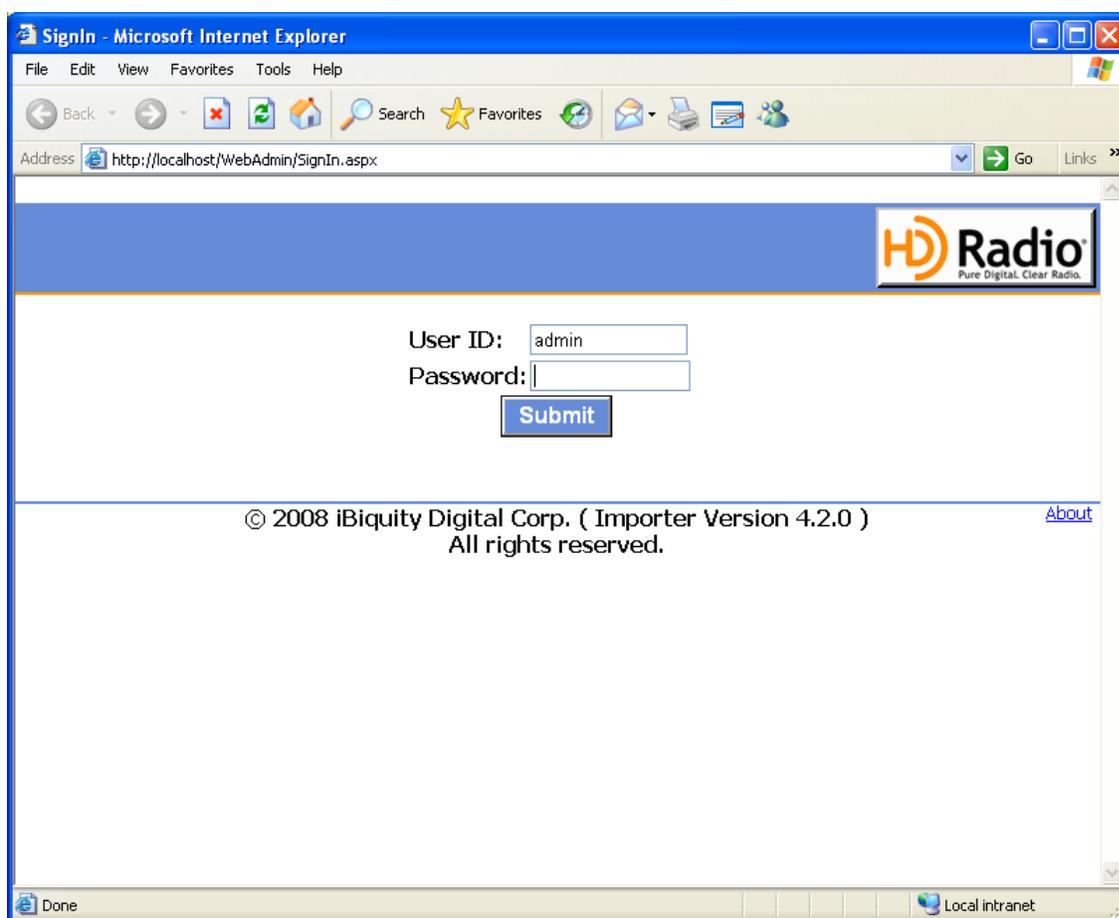
- Checking the Auto Start checkbox will cause the capture client to bypass the Username/ Password dialog and directly enter the Capture Client.
 - You can change the PAD Port value for the Client. Typically, SPS1 uses port 10010, SPS2 uses port 10020 and SPS3 uses port 10030.
 - You can add additional packet buffering if there are dropouts on the link between the Importer Plus and Exporter. This may occur on a link between an Importer Plus located at the studio and an Exporter located at the transmitter site.
7. Click on the **Send** button to start the process.

WEBADMIN CLIENT

The importer WebAdmin client is an application used to perform administration functions - such as service provider registration, service definition and configuration management - on the Importer Plus.

Figure 8.8 shows the **SignIn** screen for the WebAdmin client. The Importer Plus is shipped with a default **User ID** (“admin”) and a **Password** (“admin”). You can change the password from within the WebAdmin client.

Figure 8.8: WebAdmin SignIn screen



Once you enter the WebAdmin **User ID** and **Password**, the page shown in Figure 8.9 will appear. There are five tabs at the top, each of which opens a different WebAdmin page.

EXPORTER PAGE

The **Exporter** page (see [Figure 8.9](#)) displays the current exporter configuration including present service mode as well as the channel configuration. It will also indicate if the Importer Plus and Exporter are not synchronized.

Take care to ensure that the exporter is synchronized whenever a change is made to an Importer Plus configuration. Do this before attempting to broadcast any AAS services. If the Importer Plus and Exporter need synchronization, a message indicating the reason, as well as a **Synchronize** button, will also appear (see [Figure 8.10](#)).

Figure 8.9: Exporter page

The screenshot shows a Microsoft Internet Explorer browser window displaying the 'Exporter Configuration' page. The browser's address bar shows 'http://localhost/WebAdmin/Default.aspx'. The page features a blue header with the 'HD Radio' logo and a navigation menu with tabs for 'Main Menu', 'Exporter', 'Importer', 'Monitor', 'Administration', and 'Client Configuration'. The 'Exporter' tab is selected. The main content area displays the following information:

Exporter Configuration

Current Exporter Mode: MP1 Dynamic

Current Exporter Channel Configuration

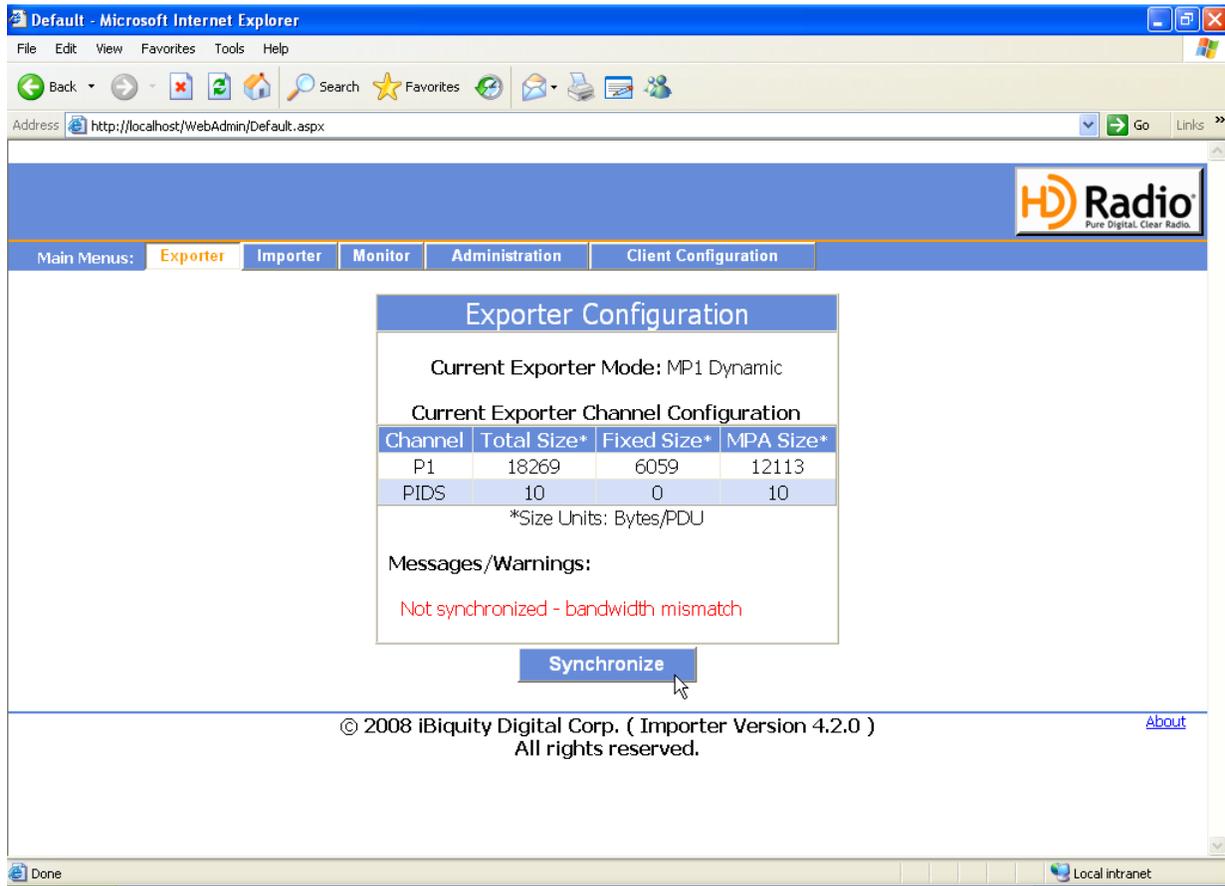
Channel	Total Size*	Fixed Size*	MPA Size*
P1	18269	64	18033
PIDS	10	0	10

*Size Units: Bytes/PDU

Messages/Warnings:

At the bottom of the page, there is a copyright notice: '© 2008 iBiquity Digital Corp. (Importer Version 4.2.0) All rights reserved.' and an 'About' link.

Figure 8.10: Synchronize page



IMPORTER PAGE

The **Importer** page (see [Figure 8.11](#)) displays current configuration and allows the user to change the active configuration.

Figure 8.11: Importer page (view configurations)

The screenshot shows the 'Importer Configuration' page in a Microsoft Internet Explorer browser. The browser's address bar shows 'http://localhost/WebAdmin/EOC.aspx'. The page has a blue header with the 'HD Radio' logo and a navigation menu with 'Importer' selected. The main content area is titled 'Importer Configuration' and contains two tables. The first table, 'Channel configuration (Bytes/PDU)', shows columns for Channel, Total Size, Fixed Size, and MPA Size. The second table, 'Services (Bits/Sec; mouseover for Bytes/PDU)', shows columns for Channel, Service Name, BW, and Stream. Below the tables are buttons for 'Next', 'Previous', 'Jump To ID:', and 'Set'. The 'Set' button is highlighted, and a 'Dynamic' checkbox is checked. The footer of the page includes copyright information for 2008 iBiquity Digital Corp. and version 4.2.0.

Channel	Total Size	Fixed Size	MPA Size
P1	18269	6059	12113
P3	0	0	0

Channel	Service Name	BW	Stream
P1	audio MPS	65211	Core
P1	audio SPS1	15940	Core
P1	audio SPS2	15940	Core
P1	data SIG	581	Standard-Packet

The **Next**, **Previous** and **Jump To ID** buttons are used to cycle through all of the available configurations. The **Set** button is used to change the configuration.

MONITOR PAGE

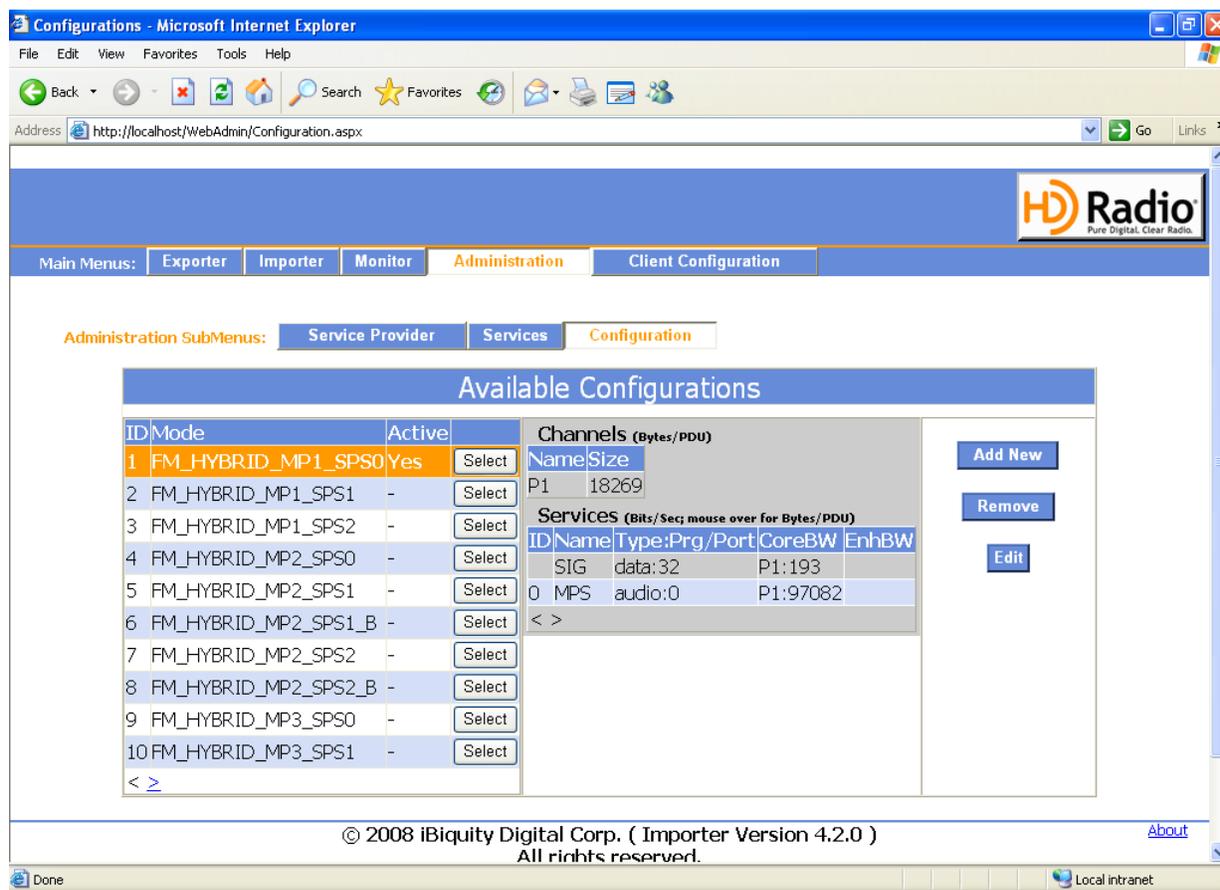
The **Monitor** page is simply a placeholder for future features.

ADMINISTRATION PAGE

The **Administration** page (see [Figure 8.12](#)) provides access to multiple pages - Service Providers, Services and Configuration.

The following section describes how to change audio bandwidth allocation in a configuration. Refer to the *Importer HD User's Guide* to change other parameters such as modifying service provider or services.

Figure 8.12: Administration page



CHANGING SERVICE BANDWIDTH ALLOCATION

One of the primary functions which can be performed from the **Administration** page (see [Figure 8.12](#)) is the allocation of bandwidths for the various services.

Change your bandwidth allocation as follows:

1. From the **Administration** page select a **Configuration**. It will be highlighted orange. The currently active configuration will also be highlighted in orange (see [Figure 8.13](#)).

Figure 8.13: Edit Configuration

The screenshot shows the 'Administration' tab selected in a navigation bar. Below it, the 'Available Configurations' section contains a table with 7 rows. Row 3, 'MP1_SPS2', is highlighted in orange and has its 'Active' status set to 'Yes'. To the right of this table is a 'Channels' table with one row: 'P1' with a size of '18269'. Below the channels table is a 'Services' table with 4 rows: '1 MPS audio:0 P1:65211', '2 SPS1 audio:1 P1:15940', '3 SPS2 audio:2 P1:15940', and '4 SIG data:32 P1:1022'. On the far right, there are three buttons: 'Add New', 'Remove', and 'Edit'.

Available Configurations			
ID	Mode	Active	
1	MP1_SPS0	-	Select
2	MP1_SPS1	-	Select
3	MP1_SPS2	Yes	Select
4	MP2_SPS0	-	Select
5	MP2_SPS1	-	Select
6	MP2_SPS2	-	Select
7	MP3_SPS0	-	Select

Channels				
Name	Size(bits/sec)			
P1	18269			

Services				
ID	Name	Type:Prg/Port	Core	Enh
1	MPS	audio:0	P1:65211	
2	SPS1	audio:1	P1:15940	
3	SPS2	audio:2	P1:15940	
4	SIG	data:32	P1:1022	
< >				

2. Select the blue **Edit** button to move to the next dialog. Each of the audio services is displayed as shown in [Figure 8.14](#). The additional available bandwidth is also indicated.

Figure 8.14: Bandwidth Allocation for Audio Services

Service Provider		Manage Services						
Services		ID: 3 (MP1_SPS2)						
Configuration		4. Select Data Services and allocate bandwidth						
		BW allocation for Audio Services in Configuration						
Prg ID	Audio Service	Service Provider	Service	CoreChnl	CoreBW(Bits/Sec)	EnhChnl	EnhBW (Bits/Sec)	
0	MPS	Self	MPS	P1	<input type="text" value="65211"/> Range:48156-79510 AvailBw: 0			Change
1	SPS1	Self	SPS1	P1	<input type="text" value="15940"/> Range:9394-40748 AvailBw: 0			Change
2	SPS2	Self	SPS2	P1	<input type="text" value="15940"/> Range:9394-40748 AvailBw: 0			Change

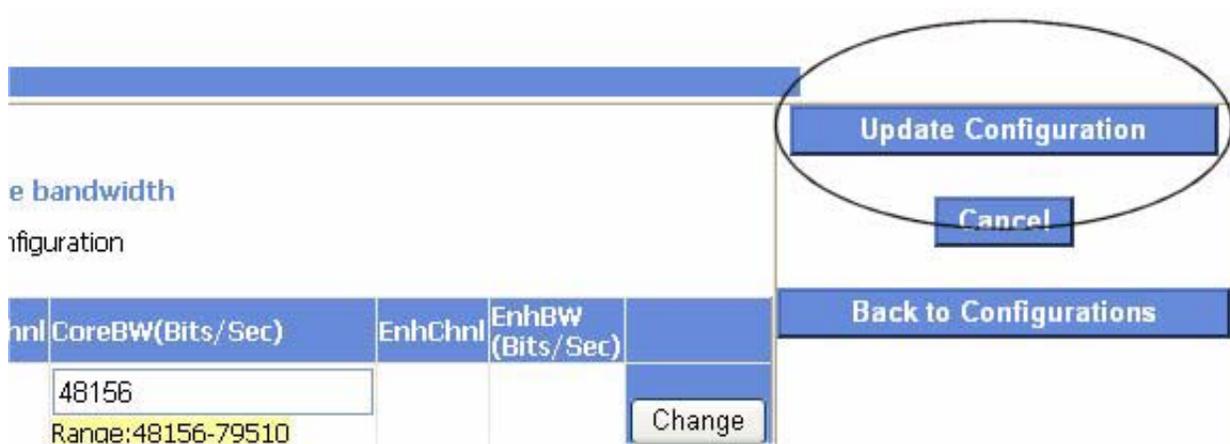
3. Select the **Change** button associated with the service to be changed. Change the bandwidth by editing the value in the **CoreBW (Bits/Sec)** column. Once a new value has been entered, select the **OK** button. The available bandwidth (**AvailBw**) numbers for the various channels will update (see [Figure 8.15](#))

Figure 8.15: Available Bandwidth after Change

Service Provider		Manage Services						
Services		ID: 3 (MP1_SPS2)						
Configuration		4. Select Data Services and allocate bandwidth						
		BW allocation for Audio Services in Configuration						
Prg ID	Audio Service	Service Provider	Service	CoreChnl	CoreBW(Bits/Sec)	EnhChnl	EnhBW (Bits/Sec)	
0	MPS	Self	MPS	P1	<input type="text" value="65211"/> Range:48156-79510 AvailBw: 0			Change
1	SPS1	Self	SPS1	P1	<input type="text" value="15940"/> Range:9394-40748 AvailBw: 0			Change
2	SPS2	Self	SPS2	P1	<input type="text" value="15940"/> Range:9394-40748 AvailBw: 0			Change

4. Select the **Update Configuration** button in the upper right portion of the page (see [Figure 8.16](#)).

Figure 8.16: Update Configuration



5. To implement this changed configuration, return to the **Importer** page (see [Figure 8.11](#)).

BACKING UP THE CONFIGURATION DATABASE

It is important that any changes made in the Importer Plus configuration (service providers, service bandwidths, contracts, etc.) are saved in a safe location. This will allow system restoration if a hardware failure occurs, or a mistake is made while modifying the configuration.

The Importer Plus includes an application, the **DB (database) Administration Wizard**, for backing up or restoring the database.

1. Run the application by double clicking the **DBAdmin** icon on the Importer Plus desktop. The screen shown in [Figure 8.17](#) will appear.

Figure 8.17: DB Administration Wizard Welcome screen



2. Select **Backup Importer Database** and click on **Start**.
3. Enter a path and name for the backup database. Click **Next**. The screen in [Figure 8.19](#) will appear.
4. Click the **Backup Now** button. When the backup process is complete, click **Finish** to exit.

Figure 8.18: DB Administration Set Backup Database screen

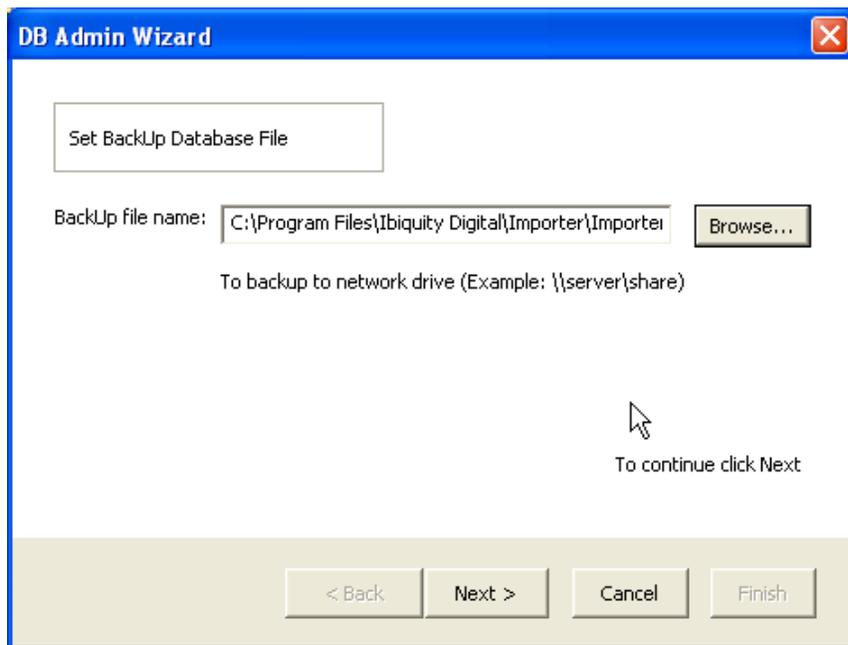
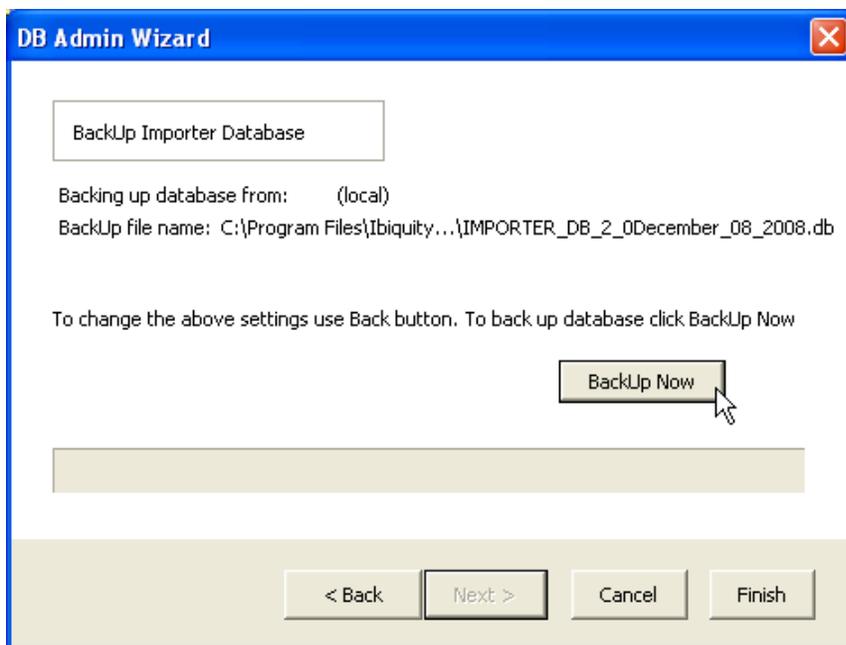


Figure 8.19: DB Administration Backup and Finish screen



SECTION 9: TROUBLESHOOTING

This section provides instructions you need when responding to an Importer Plus or system fault. This section includes the following topics:

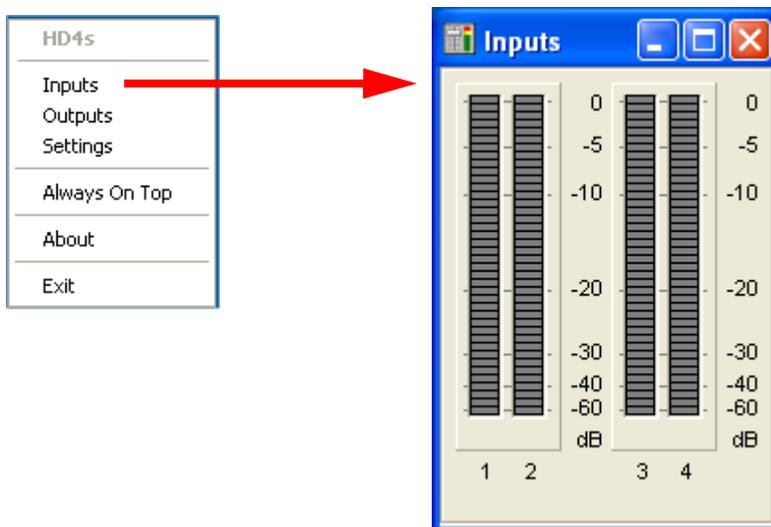
- Checking audio - see [page 9-1](#)
- Checking cable connections - see [page 9-2](#)
- Parts information - see [page 9-4](#)

CHECKING AUDIO

Use the Windows XP software associated with the audio card to troubleshoot potential audio problems as follows:

1. Click on the icon at the bottom of the **Windows XP** taskbar that displays the HD4 settings dialog (see [Figure 9.1](#)). Select **Inputs** from the list.

Figure 9.1: HD4 Dialog and HD4 Inputs Screen



2. When the SPS application is running, the audio level bars on the inputs screen (see [Figure 9.1](#)) will indicate the audio levels.

CHECKING CABLE CONNECTIONS

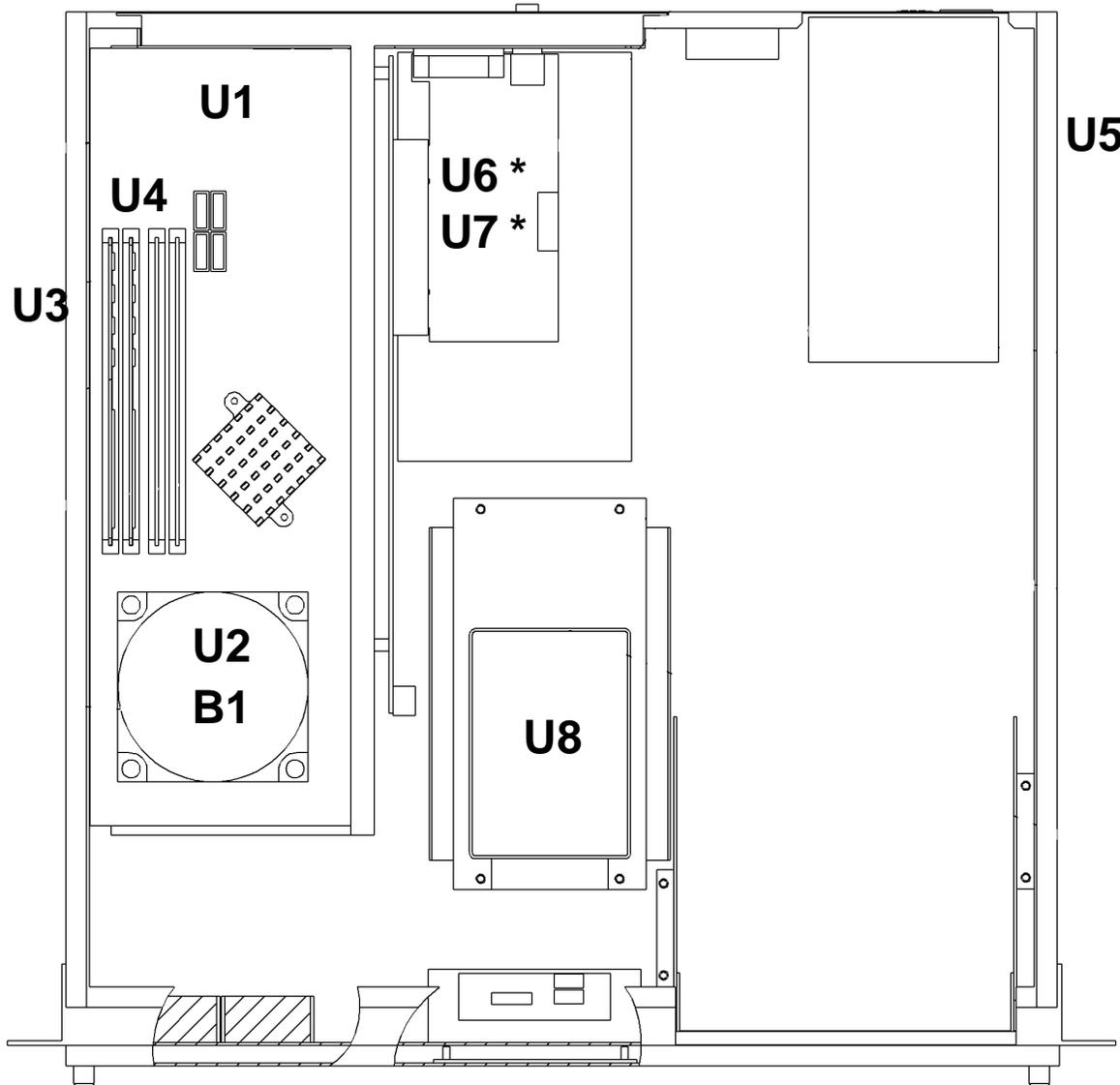
Verify that the Importer Plus' internal cables are connected properly as follows:

1. Remove the Importer Plus' top cover.
2. Inspect the cables and connections. If a connector is unseated or disconnected, ensure it is reconnected to its mate as identified in [Table 9.1](#). If necessary, see [Figure 9.2 on page 9-3](#) to identify the importer's sub-assemblies.

Table 9.1: Internal Connector Mating Information

Connector	Mate	Notes
P1	U1 CPU12V1	
P2	U8 Power	
P3	U1 F_PANEL1-RESET	Red 12 Black 14
P4	U1 F_PANEL1-PWR BUTTON	Red 7 Black 9
P5	U1 F_PANEL1-PWR LED	Red 1 Black 5
P6	U1 F_PANEL1-HDD LED	Red 11 Black 13
P7	CPU_FAN1	
P8	U1_USB00	Red Pin 1
P9	U1_USB01	Black Pin 2
P10	U5_BP_ATXCTL1	
P11	U1_ATXCTL1-PS-ON	Yellow 2
P12	U1_ATXCTL1-5VSB	Red 3
W1P1	U1 SATA1	
W1P2	U8 SATA	

Figure 9.2: Importer Plus Sub-assemblies



* - Audio cards U6 and U7 are optional items

PARTS INFORMATION

For the purposes of identifying and possibly ordering replacement parts, the Importer Plus' internal assemblies are identified in [Table 9.2](#). The table provides the reference designation, a description, and the Nautel part number for each item.

Table 9.2: Importer Plus Parts List

Reference Designation	Description	Nautel Part #
B1	Fan, 1U LGA775 Side Blow CPU Cooler	ZAP49
U1	SBC, PICMG 1.0, LGA775, Core2/P4	UA140
U2	IC, CPU, Core 2 Duo, LGA775,SLA99, E4300	UR104
U3	Memory, 1G, DDR2, 667MHz	UX117
U4	Memory, 1G, DDR2, 667MHz	UX117
U5	1U Rackmount Chassis, PCI BP, 250W	UW107
U6	Sound/Audio Card, Optional	UA100, UA141, UA142, etc.
U7	Sound/Audio Card, Optional	UA100, UA141, UA142, etc.
U8	HardDrive, Solid State, 32G,SATA	UX111
W1	Cable, SATA, .5m, Straight to Straight	UA90

SECTION 10: ROUTINE MAINTENANCE

This section provides instructions for performing routine maintenance on the Importer Plus. This section includes the following topics:

- Checking the fans - see [page 10-1](#)
 - Cleaning the fan filter - see [page 10-2](#)
-

CHECKING THE FANS

The Importer Plus contains three operational cooling fans (see [Figure 2.4 on page 2-6](#)). In order to maintain your Importer Plus warranty and prevent premature component failures, check the fans periodically.

INTERVAL

- Every six months in typical environments.
- Every three months in dusty, humid or harsh environments.

PROCEDURE

Take the following steps to check the fans:

1. Remove the Importer Plus' top cover. If possible, allow the Importer Plus to continue normal operation.
2. Verify that the three cooling fans are turning at an acceptable speed and that there are no visible obstructions.
3. If you need to closely inspect a fan, clear an obstruction, or replace a fan, you must turn off the Importer Plus. You should also remove the ac power connection at the back of the Importer Plus.

CLEANING THE FAN FILTER

In order to maintain your Importer Plus warranty and prevent premature component failures, clean your importer's fan filter periodically.

INTERVAL

Every six months in typical environments. Every three months in dusty, humid or harsh environments.

PROCEDURE

Take the following steps to clean the Importer Plus' fan filter:

1. Open the Importer Plus' front cover.
2. Remove the four Philips screws, which hold the fan cover, on the left side of the Importer Plus' front panel, in place.
3. Clean the fan filter using soap and warm water. If the fan filter is damaged, replace it immediately.
4. Reinstall the fan filter.
5. Close the front cover if desired.

SECTION 11: LIST OF TERMS

This section defines some of the terms that are used in Nautel documentation.

AAS. Advanced Application Services

AES-EBU. Audio Engineering Society/European Broadcasting Union (AES/EBU) is the name of a digital audio transfer standard. The AES/EBU digital interface is usually implemented using 3-pin XLR connectors (the same type of connector used in professional microphones). One cable carries both left- and right-channel audio data to the receiving device.

CAT-5. Short for Category 5. Network cabling that consists of four twisted pairs of copper wire terminated by RJ45 connectors.

GPS SYNCHRONIZATION UNIT. The GPS synchronization (or synch) unit accepts the studio feed audio in AES/EBU format and converts it to the 44.1 kHz sampling rate used throughout the system. The GPS synch unit also contains the GPS receiver that locks onto the Global Positioning System, and determines the site location and time. This information is then passed onto the NE IBOC to be transmitted as part of the station information. The GPS receiver also provides 10 MHz and 1 PPS signals that are used within the NE IBOC for synchronization purposes.

EOC. Ensemble Operations Center.

EXGINE. An HD™ Radio component which resides in the exciter. The Exgine decodes the Exciter link data and produces the appropriate I/Q modulation.

GPS. The Global Positioning System is a system of satellites and receiving devices used to compute positions on the Earth.

GUI. Graphical User Interface

HD™ RADIO. High definition (HD) Radio is another term for In Band On Channel (IBOC) technology. HD Radio is a trademark of the Iqity Digital Corporation.

IBOC. Nautel In-Band-On-Channel technology provides high quality digital audio over existing AM and FM radio channels.

LAN. Local Area Network.

MPS. Main Program Service

NE IBOC. Nautel's In-Band-On-Channel signal generator. See IBOC. Required for XR series IBOC installations.

PAD. Program-Associated Data.

SPS. Supplemental Program Service. Sometimes called SAC. In initial tests, NPR called this Tomorrow Radio.

STL. Studio-transmitter Link. A studio-transmitter link sends a radio station's audio signals from a broadcast studio to a transmitter located some distance away from the studio.

TSL. Transmitter-studio Link. A transmitter-studio link returns data (e.g., monitoring information) from a transmitter site to a broadcast studio located some distance away from the transmitter.

UDP. User Datagram Protocol. A core internet protocol whereby programs on networked computers can send short messages between one another.

VNC. Virtual Network Connection.

XLR. A 3-pin connector used for a balanced audio cable. Used in pro-audio equipment and AES/EBU digital audio.

IMPORTER PLUS

TECHNICAL INSTRUCTION MANUAL

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