AMBus FireWire

Apogee AMBus Expansion Card

User's Guide
V1.0 - March 2007

SOUND AMAZING

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Warnings

FCC warning

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to take whatever measures necessary to correct the interference at his own expense.

Copyright Notice

The Apogee AMBus FireWire card is a computer-based device, and as such contains and uses software in ROMs. This software, and all related documentation, including this User's Guide contain proprietary information which is protected by copyright laws. All rights are reserved. No part of the software and its related documentation may be copied, transferred, or modified. You may not modify, adapt, translate, lease, distribute, resell for profit or create derivative works based on the software and its related documentation or any part thereof without prior written consent from Apogee Electronics Corporation, U.S.A.

Trademark Acknowledgements

Digidesign, Pro Tools|HD, 192 I/O, SYNC I/O and digiLink are trademarks of Digidesign, a division of Avid Technology, Inc. Prism is copyrighted by Prism Media Products Ltd.

Declarations of Conformity

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:
(1) This device may not cause harmful interference
(2) This device must accept any interference received, including interference that may cause undesired operation. This equipment has been tested and found to comply with the limits of a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful inteference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

    1. Re-orient or relocate the receiving antenna.
    2. Increase the separation between the equipment and receiver.
    3. Connect the equipment into an outlet on a different circuit from that to which the receiver is connected.
    4. Consult the dealer or an experienced radio/TV technician for help.

NOTE: The use of non-shielded cable with this equipment is prohibited.
CAUTION: Changes or modifications not expressly approved by the manufacturer responsible for compliance could void the user's authority to operate the equipment.

Apogee Electronics Corporation, 3145 Donald Douglas Loop South, Santa Monica, CA 90405.
Betty Bennett, CEO.

Industry Canada Notice

This Class B digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations. Cet appareil numérique de la classe B respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

Declaration of Conformity – CE

Apogee Electronics Corporation hereby declares that the product, the AMBus FireWire card, to which this declaration relates, is in material conformity with the following standards or other normative documents:
- EN50081-1/EN55022; 1995
- EN50082-1/IEC 801-2, 3, 4; 1992
  following the provisions of:
- 73/23/EEC – Low Voltage Directive
- 89/336/EEC – EMC Directive

Declaration of Conformity – Japan

Apogee Electronics Corporation hereby declares that the AMBus FireWire card, to which this declaration relates, is in material conformity with the VCCI Class A standard.

Declaration of Conformity – Australia

Apogee Electronics Corporation hereby declares that the AMBus FireWire card is in material conformity with AN/NZS standard requirements.

Registration and Warranty Information

Be sure to register your AMBus FireWire card, either by filling in the enclosed Registration Card or by completing the on-line registration form at our Web site: http://www.apogeedigital.com/support/. If you do so, Apogee can contact you with any update information. As enhancements and upgrades are developed, you will be contacted at the registration address. Firmware updates are free for the first year of ownership unless otherwise stated. Please address any inquiries to your dealer or directly to Apogee at:

APOGEE ELECTRONICS CORPORATION,
1715 Berkeley St. Santa Monica CA, 90404 • TEL: (310) 584-9394, FAX: (310) 584-9385
email: support@apogeedigital.com. Web: http://www.apogeedigital.com/

APOGEE ELECTRONICS CORPORATION warrants this product to be free of defects in material and manufacture under normal use for a period of 12 months. The term of this warranty begins on the date of sale to the purchaser. Units returned for warranty repair to Apogee or an authorized Apogee warranty repair facility will be repaired or replaced at the manufacturer's option, free of charge.
ALL UNITS RETURNED TO APOGEE OR AN AUTHORIZED APOGEE REPAIR FACILITY MUST BE PREPAID, INSURED AND PROPERLY PACKAGED, PREFERABLY IN THEIR ORIGINAL BOX. Apogee reserves the right to change or improve design at any time without prior notification. Design changes are not implemented retroactively, and the incorporation of design changes into future units does not imply the availability of an upgrade to existing units.

This warranty is void if Apogee determines, in its sole business judgment, the defect to be the result of abuse, neglect, alteration or attempted repair by unauthorized personnel.

The warranties set forth above are in lieu of all other warranties, expressed or implied, and Apogee specifically disclaims any and all implied warranty of merchantability or of fitness for a particular purpose. The buyer acknowledges and agrees that in no event shall the company be held liable for any special, indirect, incidental or consequential damages, or for injury, loss or damage sustained by any person or property, that may result from this product failing to operate correctly at any time.

USA: Some states do not allow for the exclusion or limitation of implied warranties or liability for incidental or consequential damage, so the above exclusion may not apply to you. This warranty gives you specific legal rights, and you may have other rights which vary from state to state.

Service Information

The AMBus FireWire card contains no user-serviceable components: refer to qualified service personnel for repair or upgrade. Your warranty will be voided if you tamper with the internal components. If you have any questions with regard to the above, please contact Apogee.

In the event your AMBus FireWire card needs to be upgraded or repaired, it is necessary to contact Apogee prior to shipping, and a Return Materials Authorization (RMA) number will be assigned. This number will serve as a reference for you and helps facilitate and expedite the return process. Apogee requires that shipments be pre-paid and insured — unless otherwise authorized in advance.

IMPORTANT: ANY SHIPMENT THAT IS NOT PRE-PAID OR IS SENT WITHOUT AN RMA NUMBER WILL NOT BE ACCEPTED.

OWNER'S RECORD

The serial number is located on the rear panel of the unit. We suggest you record the serial number in the space provided below. Refer to it whenever you call an authorized Apogee Electronics repair facility or the manufacturer. Please be sure to return your completed warranty card immediately!

AMBus FireWire card Serial No._____

Purchase Date_____

Dealer_____

Phone_____

Address_____

CAUTION:
Any changes or modifications not expressly approved by APOGEE ELECTRONICS CORPORATION could void your authority to operate this equipment under the FCC rules.

Please register this unit by filling in the included registration card, or registering online at http://www.apogeedigital.com/support/register.php Please read this manual – if you call for technical support, we'll assume that you have. There will be a quiz.

AMBus FireWire

User's Guide

Table of Contents

Introduction

The AMBus FireWire card is

Requirements

Windows XP

OS: Windows XP SP1 or SP 2 (Windows 2000 or earlier not supported)
                   Microsoft "hotfix" **http://support.microsoft.com/kb/885222** (if your
                   computer and X-FireWire card are equipped with FW 800 connections).
Hardware :   1.5 gig or greater processor
                   At least 512 megs RAM
                   FW 400 or FW 800 FireWire ports using   aTexas Instruments or Lucent chipset

OS X

OS :   OS X 10.3.7 (10.3.8 not supported)
Hardware :   867 mHz or greater
                   At least 512 megs RAM Apogee AD-8000 or Trak2 interface

Overview

The following steps must be completed before using your AMBus FireWire card. A detailed description of each step may be found further in this User's Guide.

For Mac OS X Users:

• To get started quickly, simply connect your AMBus FireWire equipped Apogee interface to the FireWire port of your Mac, and configure your audio application as specified on page xx (iTunes, Quicktime), xx (Apple Logic Pro) XXX.
• When recording, we suggest downloading our zero latency monitoring software, Firemix, which may be found on Apogee's website here: www,apogeedigital.com/xx

For Windows XP Users:

• Download the Apogee FireWire ASIO driver from Apogee's website here: www. apogeedigital.com/xx. Follow the instructions on pages xx-xx to install the driver.
• Configure
• When recording, we suggest downloading our zero latency monitoring software, Firemix, which may be found on Apogee's website here: www,apogeedigital.com/xx

Before Starting

We've done everything possible to ensure full compatibility between Apogee's FireWire technology and the Legacy interfaces that support the AMBus FireWire card, but there are certain operational limitations of the AMBus FireWire card that users should be aware of.

Sample Rate Selection
The sample rate of both the AD-8000 and Trak2 must be set manually to match the sample rate at which the FireWire driver of the connected computer is running.

Sample Rate Range
The AD-8000 does not support sample rates of 88k2-96k, even though these rates are listed in the FireWire driver's sample rate selection drop-down menus.

Clock Source
The clock source of the Apogee interface must be selected from the AD-8000 or Trak2's front panel. Software switching of clock source is not supported.

Working with OS X

1. Thanks to the class compliant FireWire driver in Apple's OS X, no drivers need to be installed.
2. After installing the AMBus FireWire card in the host interface and connecting the card to your computer, open the Audio Midi Setup utility, found on an OSX Macintosh here: Applications/Utilities/Audio Midi Setup.
3. Click on the Properties For drop-down menu and select Apogee FireWire (xxxx) (the serial number of your card appears in parentheses).

4. Verify that the host interface sample rate matches the sample rate indicated in the Format field.
5. If the OS X audio application you're using doesn't have a sample rate parameter, the sample rate of the system is determined by the setting in Audio Midi Setup. Applications that fall under this category include Apple iTunes, Apple Quicktime and other "audio utilities".
6. If the OS X audio app does include a sample rate parameter, the audio app setting determines the system sample rate and transmits the rate to AMS. Apps that fall under this category include Apple **Logic Pro and other professional digital audio workstations (DAWs).**
7. Thus, if your app includes a sample rate parameter, change the rate from the app; if your app doesn't include a sample rate parameter, change the rate from AMS, as described in steps 2-4. In both cases, set the Apogee interface sample rate from the interface's front panel.

Working with OS X

3 Computer is slave, AMBus FireWire device is master, locked to another external source such as   **word clock.**

1. In OS X's Audio Midi Setup, set **Clock Source** to **Apogee FireWire (xxxx)** Ext **Plug5**.
2. On the Apogee host interface front panel, set the clock source to the desired clock source (such as word clock); (on a Rosetta 200 or 800, set **Sample Rate** to **EXT** and **Sync** to the desired clock source).

General Notes

When power cycling an Apogee host interface connected to a computer via AMBus FireWire, it is essential to allow the operating system sufficient time to first "de-mount" the host interface and subsequently "re-mount" it. With the Audio MIDI Setup window open:

1. Power down the host interface.
2. Wait until the "Apogee FireWire" option is no longer preset under **Default Input** and **Default Output**.
3. Power up the unit; upon power up, "Apogee FireWire" should become once again available under Default Input and Default Output.

Working with Windows XP

Installing the Windows Driver

If your computer and AMBus FireWire card are equipped with FW800 connections and you're using SP 2, it's necessary to run a Microsoft "hotfix" which may be found on the Microsoft website here: http://support.microsoft.com/kb/885222

Without this hotfix the driver will not install correctly.

Before starting the setup.exe driver installation program, disconnect the AMBus FireWire card from the computer. You will be instructed at which point during the driver installation process to connect the AMBus FireWire card. If you have multiple units, be sure to connect them all when instructed to do so.

Download the Windows XP driver from our web site here: http://www.apogeedigital.com/downloads/ unzip the downloaded file.
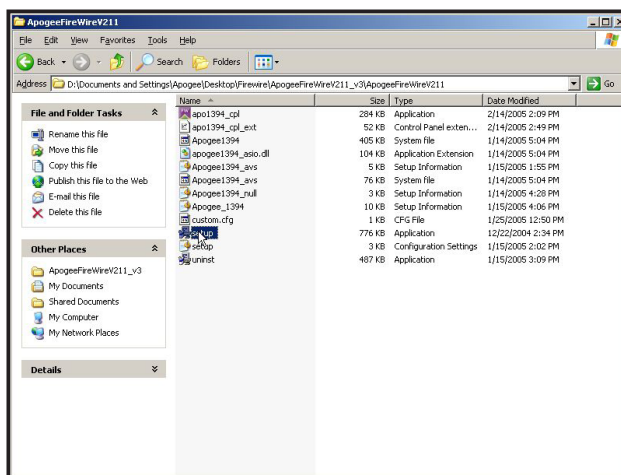

1 Double click on the **setup.exe**.
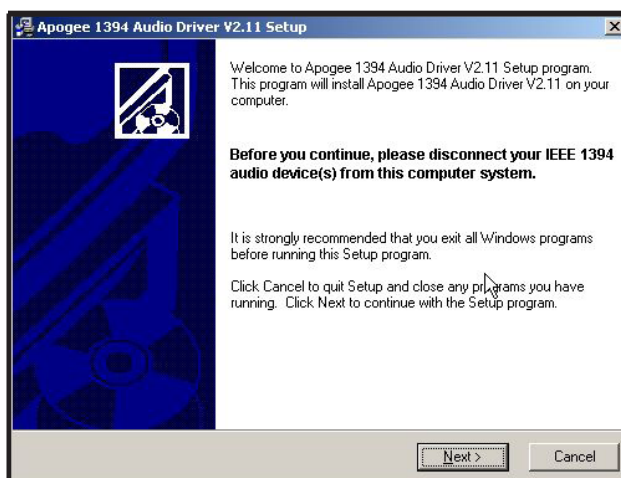
2 As noted onscreen, **disconnect** the X-FW-equipped interface,then click on **Next**.
If a previous version of the driver was installed, this window will be preceded by an uninstallation procedure.

Working with Windows XP
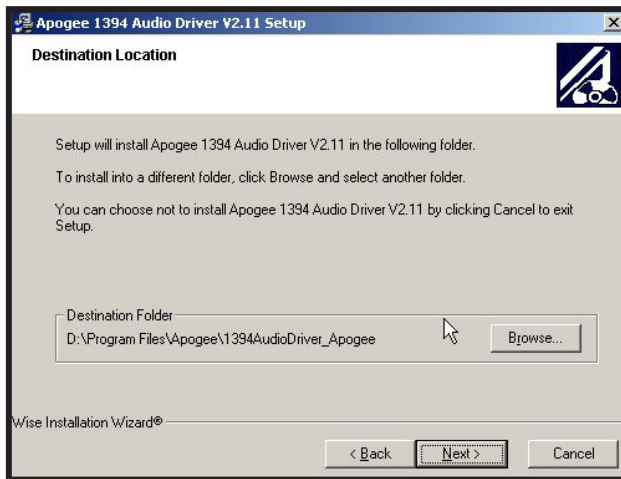
3 Determine the Destination for the installer, and click **Next**. We recommend that you install the driver in the default location.
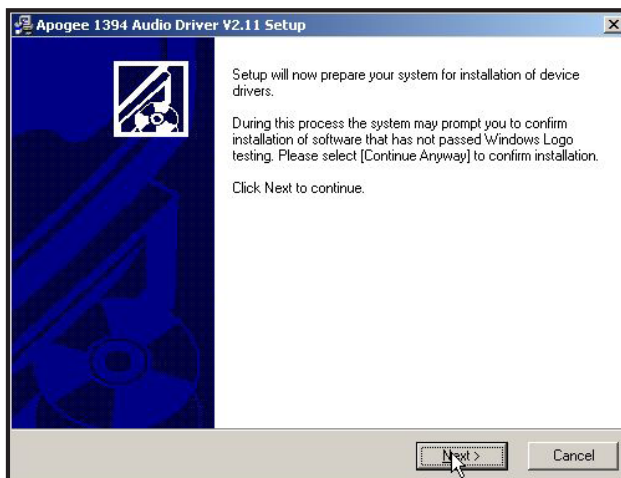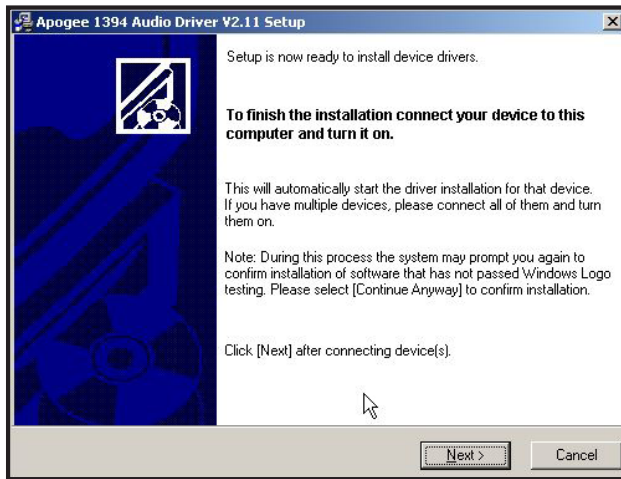

4 Click **Next**.

2 Click **Continue Anyway**. Disregard this message from Microsoft.

Working with Windows XP

3 Now connect the X-FW-equipped interface, and click **Next**.
It may be necessary to wait for the **New Hardware Found** notification pop-up to appear before clicking **Next**.

4 Click **Continue Anyway**.

5 During the installation process, you should see these three Found New Hardware Notification pop-ups: **Apogee FireWire, Apogee FireWire WDM Audio**, and **Your new hardware is installed and ready to use**.
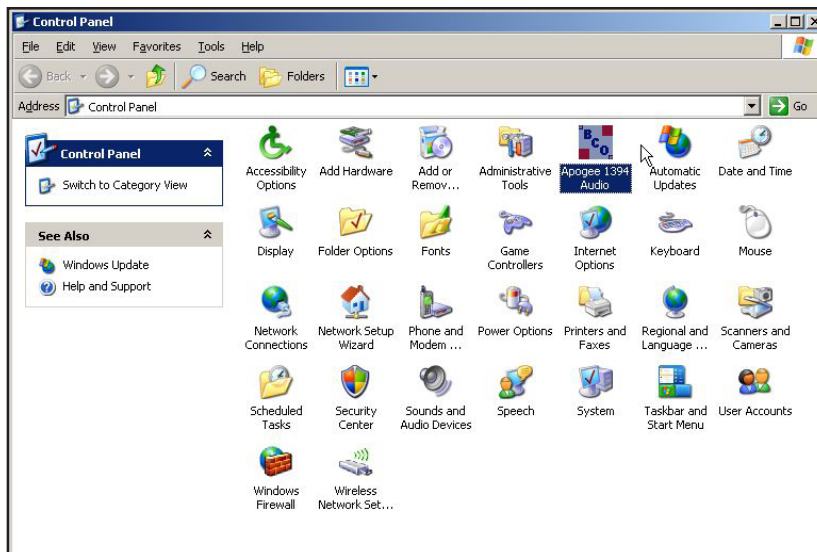
Working with Windows XP
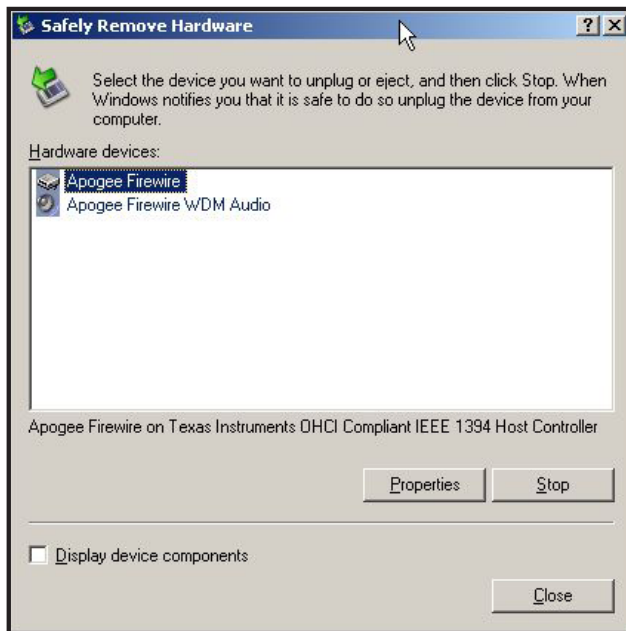
6 To verify that the driver is correctly installed, double click on the **Safely Remove Hardware** icon in the Notification area (usually in the lower right hand corner of your computer screen). If both **Apogee FireWire** and **Apogee FireWire WDM Audio** devices are not displayed, the installation has failed. Go to **Add or Remove Programs** in the control panel, uninstall the driver, power cycle the computer and Apogee host interface, and re-install the driver.

Apogee 1394 Audio Control Panel

Once correct driver installation has been verified, open the Apogee 1394 Audio control panel by double clicking on the **Apogee 1394 Audio** icon found in the Windows XP control panel. While discovering the functionality of the control panel as described below, try a few control panel operations, such as switching sample rates, to verify proper communication between the control panel and the Apogee host interface.
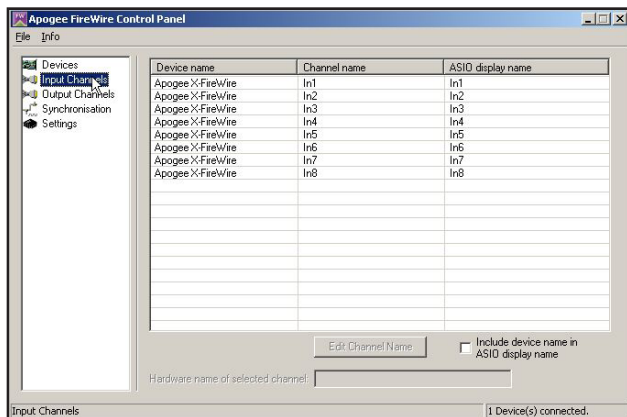
Working with Windows XP

The Apogee 1394 Audio control panel consists of the following 5 windows accessed by clicking on their names in the left hand column of the control panel : **Devices, Input Channels, Output Channels, Synchronization** and **Settings**.

Devices Window
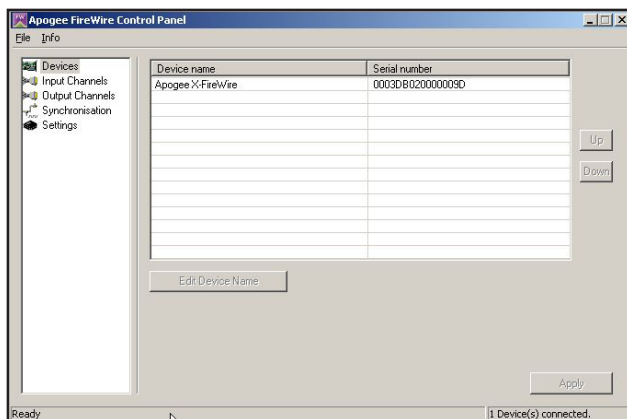
In the **Devices** window, **Apogee AMBus FireWire** should be displayed under **Device name**, and a unique serial number is displayed under **Serial number**. If multiple host interfaces have been installed, they should all appear simultaneously. Press **Edit Device Name** to edit the Device name.
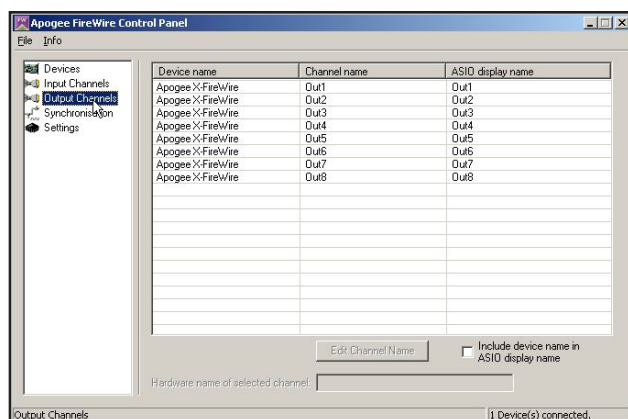
Input Channels Window

In the **Input Channels** window, it's possible to edit the input Channel names for the devices connected.
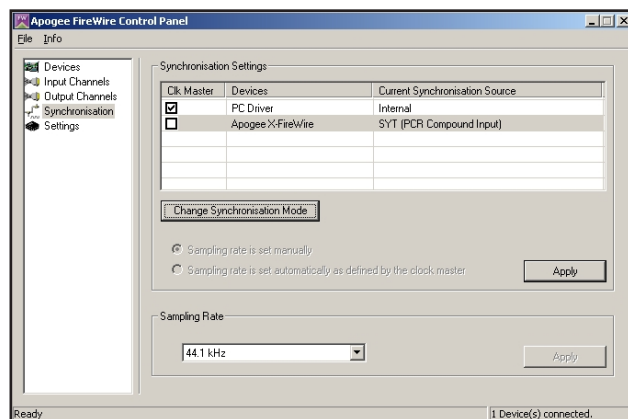
Working with Windows XP

Output Channels Window

In the **Output Channels** window, it's possible to edit the output Channel names for the devices connected.

Synchronization Window

In the **Synchronization** window, synchronization parameters for each device may be set as described below.

Sampling Rate
The sample rate for the selected master device is set with this drop-down menu. Ensure that the sample rate of the audio application matches the setting made here.

Working with Windows XP

To set the clock source for each device connected, it's necessary to first specify whether the computer or the AMBus FireWire device is clock master by checking the appropriate box in the **Ck Master** column. Next, it's necessary to set the clock source of each AMBus FireWire device connected by selecting the interface and clicking the **Change Synchronization Mode** button. With these controls, it's possible to set up the following three clock configurations:

1 Computer is master, AMBus FireWire device is slave, locked to the AMBus FireWire card.
2 Computer is slave, AMBus FireWire device is master, locked to it's internal clock.
3 Computer is slave, AMBus FireWire device is master, locked to another external source such as word clock.
Following are the precise steps to achieve each of these three clock configurations:

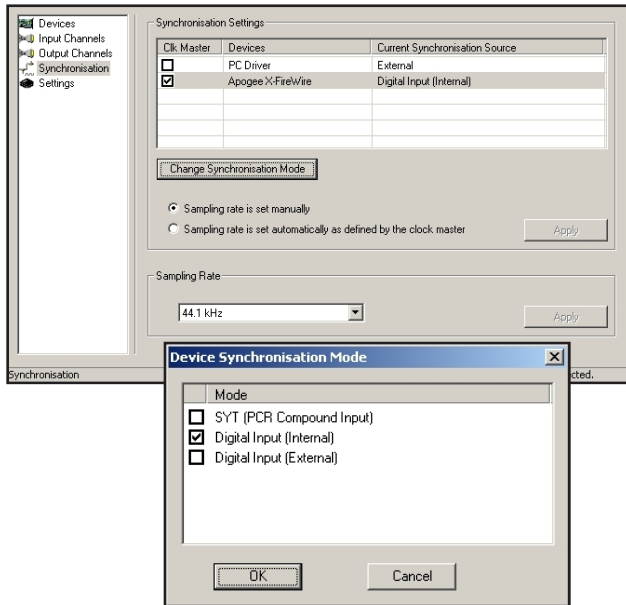**1 Computer is master, AMBus FireWire device is slave, locked to the AMBus FireWire card.**
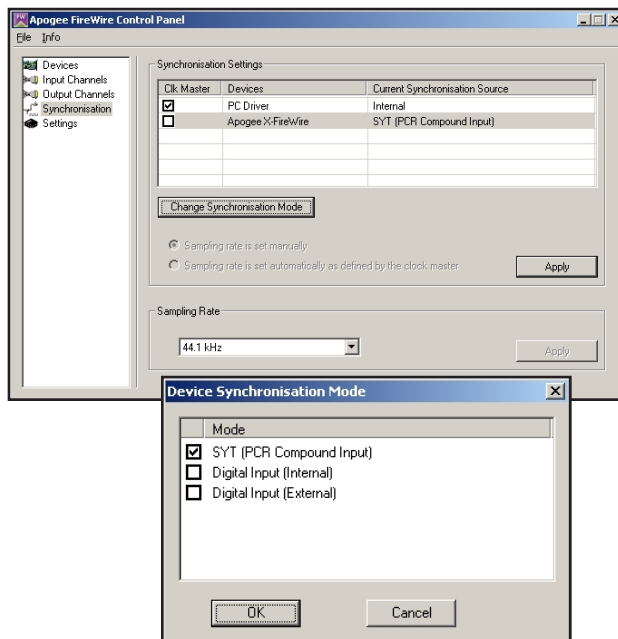
1 Under **Ck Master**, check **PC Driver**.
2 Select the **Apogee AMBus FireWire** device and click **Change Synchronization Mode**.
3 Check **SYT (PCR Compund Input)**, and click **OK**.
4 Click **Apply**.
5 On the Apogee host interface front panel, set the clock source to **Option** (on a Rosetta 200 or 800, set **Sample Rate** to **EXT** and **Sync** to **Option**).

Note that this is not possible with an AD-16X, which cannot lock to an installed AMBus FireWire Card. Also, note that Apogee does not recommend this configuration.

Working with Windows XP

2 Computer is slave, AMBus FireWire device is master, locked to it's internal clock

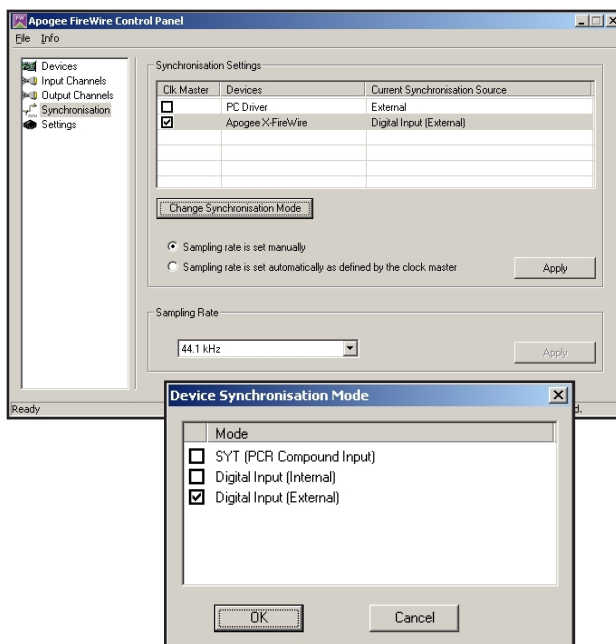**1** Under **Ck Master,** check **Apogee AMBus FireWire**.
2 Select the **Apogee AMBus FireWire** device and click **Change Synchronization Mode**.
3 Check **Digital Input (Internal)** and click **OK**.
4 Click **Apply**.
5 On the Apogee host interface front panel, verify that the clock source is set to **INT**.

3 Computer is slave, AMBus FireWire device is master, locked to another external source such as word clock.

1 Under **Ck Master**, check **Apogee AMBus FireWire**.
2 Select the **Apogee AMBus FireWire** device and click **Change Synchronization Mode**.
**3** Check **Digital Input (External)** and click **OK**.
4 Click **Apply**.
5 On the Apogee host interface front panel, set the clock source to the desired clock source (such as word clock) (on a Rosetta 200 or 800, set **Sample Rate** to **EXT** and **Sync** to the desired clock source).

Working with Windows XP

When multiple Apogee AMBus FireWire cards are connected, we recommend that one interface be designated as the clock master and configured as in example **2**, that the remaining units be configured as clock slaves as in example **3**, and that word clock be distributed from the clock master to the clock slaves.

Settings Window
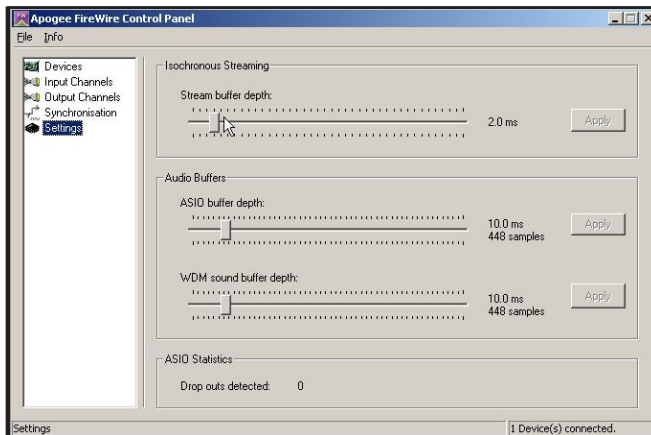
Three buffer settings are provided in this window, **Stream buffer depth**, **ASIO buffer depth**, and **WDM sound buffer depth**. Found below are a few general guidelines for setting buffer depths - please note that the right setting depends on the speed of your computer's processor and the amount of processing needed for a particular session in your audio application (as determined by the number of I/O, the number of DSP plug-ins, soft synths, etc.).

- Lower buffer depths result in lower latency from input to output, but can result in buffer overruns which cause clicks and pops. Buffer overruns occur when the computer's CPU runs out of processing power and cannot provide data quickly enough to the driver. If clicks and pops do occur, either the buffer depth must be increased to give the CPU more time, or the CPU's load must be reduced by removing plug-ins, tracks or other DSP.
- Higher buffer settings result in higher latency but allow the use of more DSP (plug-ins, soft synths) without clicks and pops.
- During the recording phase of a session, it's best to compromise DSP usage in order to minimize latency, so the performers being recorded are not disturbed by latency. To eliminate latency in performer's cue mix, use Apogee's Firemix Software Mixer.
- During the mixing phase of a session, latency is in most cases not an issue, thus it's possible to increase buffer depths so more DSP may be used without clicks and pops.

Stream buffer depth
This is an **expert** setting, and should be left at 2.0 ms in most cases. If your processor is exceptionally fast, you may try lowering the buffer depth for lower latency. If the Apogee host interface is locking intermittently to FireWire, Stream buffer depth should be increased..

ASIO buffer depth
This setting controls buffer depth when using the AMBus FireWire card with ASIO-compatible applications (Steinberg Nuendo-Cubase, Sonar 4 (not 3), Samplitude, and others.

WDM sound buffer depth
This setting controls buffer depth when using the AMBus FireWire card with applications which employ WDM.

Working with Windows XP

General Notes
If you change the Apogee AMBus FireWire hardware connected to your computer in any way (i.e. you add interfaces or change AMBus FireWire cards), it's necessary to uninstall and re-install the Windows XP driver.

Troubleshooting

Symptom – When the driver instructs me "To finish the installation connect your device to this computer and turn it on", I connect the device but nothing happens; the Apogee hardware is not recognized.
Solution – This indicates some sort of hardware problem:

• If you're computer and AMBus FireWire care are equipped with FW800 connections, be sure you're connecting the AMBus FireWire card to the computer with a FW800 cable.
• Test the host interface on another computer if possible
• Verify the chipset of the computer FireWire connections. We have had the most reliable operation with Texas Instruments or Lucent chipsets.

Symptom – The driver installation seems to have gone well, but the interface(s) don't appear correctly in the"Safely Remove Hardware" window. Also, I don't see I/O in the **Input Connections** and **Output Connections** windows of the Apogee 1394 Audio control panel.

Solution - If you're using SP2 and using FW800, run the Microsoft hotfix found here: http://support. microsoft.com/kb/885222. After that, go to **Add or Remove Programs** in the Windows control panel, uninstall the driver, power cycle the computer and Apogee host interface, and re-install the driver.

Symptom – I'm getting clicks and pops in my audio software.
Solution – Go to the Apogee 1394 Audio control panel's **Settings** window and increase the buffer setting sizes.

Symptom – My AD16X, DA16X or Big Ben won't lock to the FireWire connection.
Solution – Increase the **Stream buffer depth** in the Apogee 1394 Audio control panel.
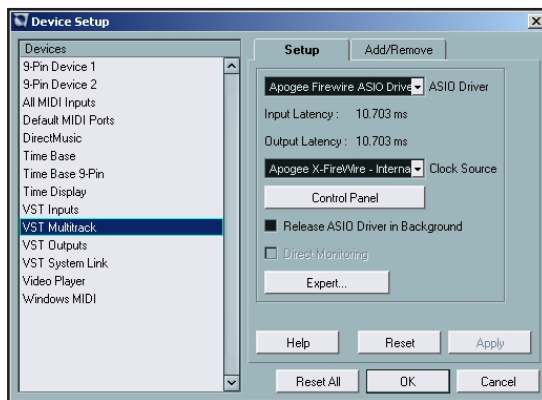
Configuring Audio Applications for use with AMBus FireWire equipped Apogee Interfaces

In general, configuring the "major" audio applications (such as Apple Logic, Steinberg Nuendo or Cubase,MOTU Digital Performer or Cakewalk Sonar 4) consists of identifying a Device Setup window in the app and selecting the Apogee host interface as the hardware device providing I/O. On the other hand, configuring "utility" audio applications such as Windows Media Player (on Windows XP) or iTunes (on OS X) consists of selecting the Apogee host interface in an operating system control panel. The following four configuration examples are given below:

> **Configuring Steinberg Nuendo on Windows XP**
> **Configuring Windows Media Player on Windows XP**
> **Configuring Apple Logic on OS X**
> **Configuring iTunes on OS X.**

From these examples it should be possible to deduce configuration details for the specific audio application you're using. Please consult operating instructions for the audio application.

Configuring Steinberg Nuendo on Windows XP

After verifying proper operation of the AMBus FireWire card with the Apogee 1394 Audio control panel, open Nuendo.
Under Nuendo's **Devices** drop-down menu, select **Device Setup** then **VST Multitrack**.Set **ASIO Driver** to **Apogee FireWire ASIO Driver**.
It's possible to access the Apogee 1394 Audio control panel by clicking on the **Control Panel** button.
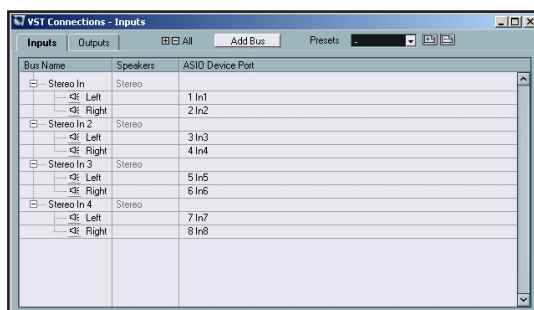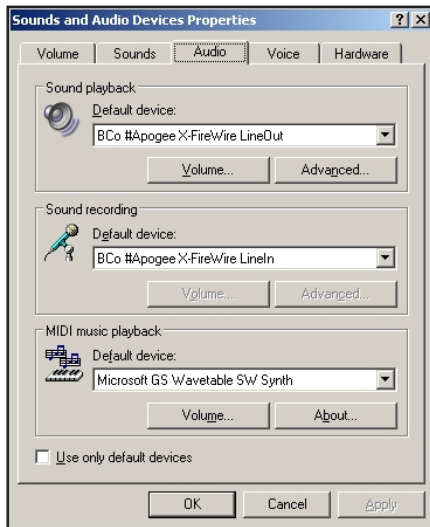

Under Nuendo's **Devices** drop-down menu, select **VST Connections**.
Create Input and Output busses as needed and assign **ASIO Device Ports** to the newly created busses.

Configuring Audio Applications for use with AMBus FireWire equipped Apogee Interfaces

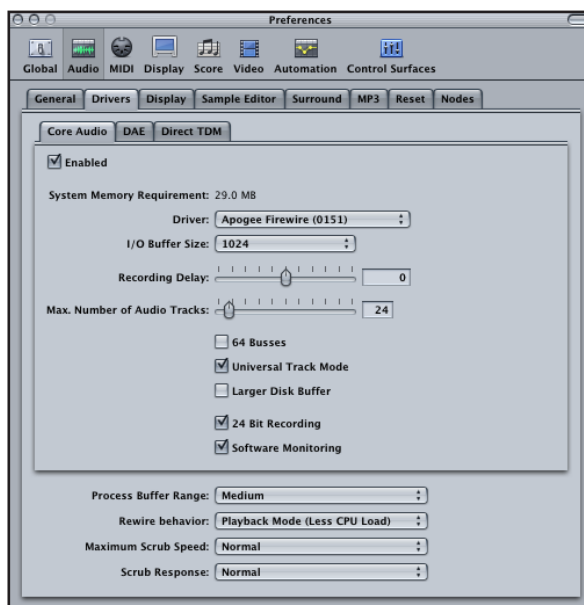## Configuring Windows Media Player on Windows XP

From the Windows XP control panel, open the **Sounds and Audio Devices** control panel.
Select the **Audio** tab.
Set **Sound playback** and **Sound recording Default devices** to **Bco#Apogee AMBus FireWire LineOut** and **LineIn**, as depicted below.
Open Windows Media Player and….play!

Configuring Apple Logic on OS X

1 Connect the Apogee interface and open Apple Logic.
2 In Logic, select **Audio > Audio Hardware & Drivers** to open the Core Audio driver page.
3 First click on the **Drivers** tab, then the **Core Audio** tab.
4 Check the **Enabled** checkbox (click **OK** when the "Reboot Logic" message is displayed").
5 Select **Apogee FireWire (xxxx)** in the **Driver** field (click **Try (Re)Launch** when the "Reboot Logic" message is displayed").
6 Set **I/O Buffer Size** to **512**; once the proper operation of the Apogee hardware is verified, this value may be reduced to lower latency.
7 Though it's not specific to Apogee hardware, you'll probably want to check the **24 Bit Recording** as well as **Software Monitoring** check boxes.
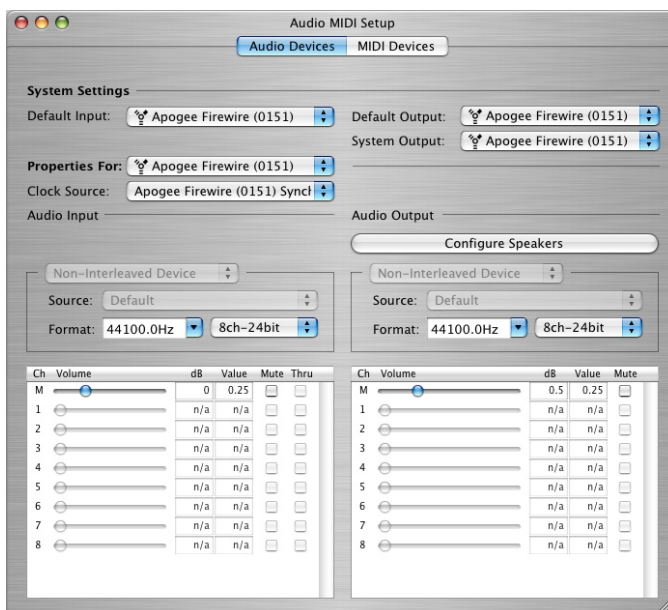
Configuring Audio Applications for use with AMBus FireWire equipped Apogee Interfaces

Configuring Apple Logic on OS X *(continued)*

8 In Logic's **Track Mixer**, set the inputs and outputs of **Audio** objects to the desired hardware I/O channels, as shown below.

Configuring iTunes on OS X.

1 Open the Audio Midi Setup ultility, found on an OS X Macintosh here: Applications > Utilities > Audio MIDI Setup.
2 Set **Default Input, Default Output**, and **System Output** to **Apogee FireWire (xxxx)** The AMBus FireWire serial number is displayed in parentheses.
3 In Audio Midi Setup, set **Properties For** to **Apogee FireWire (xxxx)**, set **Clock Source** to **Apogee FireWire (xxxx) Synch** and **Format** to **44100.0Hz**.
**4** Open iTunes, and play!

Installing the AMBus FireWire Card

**Your AMBus FireWire card should include the following:**

       1 AMBus FireWire card
       1 user's guide

1   Remove the plate cover of an available Ambus slot.

2   Locate the card between the guides.

3   Gently press on the back panel of the card until you feel it mate with the AMBus connector.

4   Fasten the card in place with the included screws.
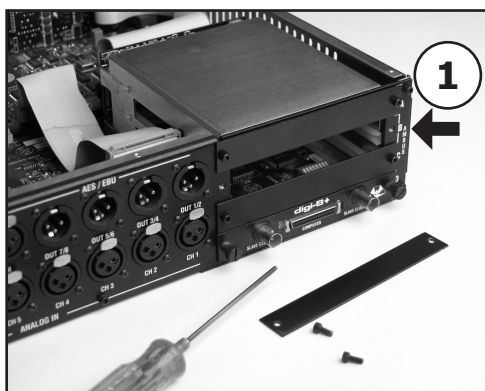
A NOTE ABOUT UPDATING THE AMBus FireWire CARD
Due to the space constraints associated with AMBus card slots, the MIDI connector necessary for performing firmware upgrades on the AMBus FireWire card was removed prior to shipping. Please contact Apogee in the event that you need to update your card. Additionally, do not forget to register your AMBus FireWire card so that you may be notified of any updates.

FireWire 400

APOGEE AMBus Expansion Card
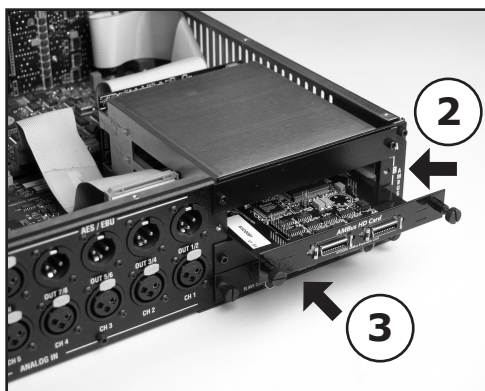
AMBus FireWire card USER'S GUIDE - v1.0 - March 2007

SOUND AMAZING