Lynx LT-FW

FireWire LSlot Expansion Card for Lynx Aurora 16 & Aurora 8 Converters

User Manual

Lynx Studio Technology, Inc.
www.lynxstudio.com
support@lynxstudio.com

LT-FW

User Manual
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1 Introduction

Thank you for purchasing the LT-FW™! We are proud to provide you with a reliable, professional-quality product for your digital audio requirements.

This manual provides basic information to help you get started. Additional information is available via our web site and email support. Please refer to Section 10, Support, at the end of this manual for support contact information.

The LT-FW is an LSlot expansion interface that is designed to allow the Aurora professional audio AD/DA converters to be used with IEEE-1394a FireWire equipped laptop and desktop computers. The LT-FW can be used with Windows or Mac based systems, with a convenient and easy-to-use software interface for setting parameters, managing volume levels, viewing real-time meters, etc. Up to 16-channels of simultaneous I/O are possible with an Aurora 16, and with an Aurora 8.

1.1 Overview

The Aurora/LT-FW turns your computer into a powerful digital audio workstation, giving you up to 16 total channels of professional AES/EBU digital input and output and mastering quality analog inputs and outputs at sampling rates up to 96 kHz. The included remote control application provides zero-latency monitoring, accurate metering, adapter configuration and flexible routing capabilities. With support for WDM and ASIO on Windows computers and Core Audio with OS X Macintosh computers, virtually all professional audio applications can work with the LT-FW.

The LT-FW features two industry-standard IEEE-1394a FireWire ports, allowing up to two LT-FW equipped Auroras to be daisy-chained off of a single FireWire connection. Installation of the LT-FW into an Aurora is straightforward, as is the driver installation routine (Please note that no driver install is required for OS X – native support is provided by the operating system).

The Aurora Remote Control application includes an LT-FW control panel where important parameters can be established, such as buffer size and channel mode. The LT-FW channel modes allow different configurations of the interface, whereby I/O channel number and type can be defined. This provides access to the physical I/O ports that are required, while optimizing the amount of processing power that is required by the interface. For instance, an Aurora 16 will consume less CPU power when used in an 8 -channel configuration, as opposed to a 16-channel configuration.

1.2   Features

➢ Two FireWire 400 (IEEE-1394a) ports

➢ Up to 16 channels of analog and digital I/O at 96 kHz

➢ Works with Apple and Windows PCs, including laptops, with compatible FireWire ports

➢ Supports ASIO and WDM for Windows and CoreAudio for Mac OS X

➢ All relevant settings, such as sample rate selection, sync source selection, channel routing, latency, and buffer size are enabled, controlled and monitored from the host computer

➢ Full WDM implementation allows multiple channel support of 5.1 and 7.1 surround playback formats

➢ The two FireWire connectors allow daisy chaining of LT-FW equipped Auroras

➢ Easily installed into Aurora

➢ Ideal for in-studio or remote recording applications

2   Before you begin

We recommend that you read through the entire manual to acquire an overview of the installation procedure and use of the LT-FW. This manual will presume a working knowledge of the Aurora converter. For additional information, please refer to the Aurora User Manual.

It is also highly recommended that you have a good working knowledge of Windows and/or Macintosh operating system basics and an understanding of computer hardware basics. This information is widely available on the web and from various computer hardware and software manufacturers.

We also strongly recommend you familiarize yourself with the basics of digital audio and computer recording, and particularly with the basic functionality of your chosen audio software. A solid grasp of the operational fundamentals of your Digital Audio Workstation software and its user interface will go a long way toward enhancing your experience with the LT-FW.

2.1   In the box

The following items are included in your AES16 carton:

➢ LT-FW card in an antistatic bag
➢ One 6' long 4-pin to 6-pin IEEE-1394a FireWire Cable
➢ One 6' long 6-pin to 6-pin IEEE-1394a FireWire Cable
➢ Lynx Installation CD containing current drivers and this manual
➢ Warranty registration card
➢ Quick Start Guide
➢ ½" Standoff Post

If any items are missing or damaged, please contact your dealer or Lynx at
http://www.lynxstudio.com.

2.2   Operational requirements

There are three essential elements that must be met for compatibility with the LT-FW:
1. The host computer must have a compatible and functional FireWire interface.

2. The host computer must meet the system requirements necessary for correct functioning
   of the LT-FW.

3. The Aurora must have firmware revision 18 or above.

It also is important to note that most professional audio applications place significant
demands on your computer's resources, and it is therefore recommended that you meet or
exceed the recommended system requirements for your Digital Audio Workstation software,
which will likely be greater than those listed for the LT-FW. Please refer to your audio
software's documentation for more information.

2.2.1   FireWire Chipsets

The Aurora/LT-FW can be used with most OHCI compliant FireWire adapters and integrated
FireWire ports on laptop and desktop computers. It is a FW400 (IEEE-1394a) device, but
FW800 (IEEE-1394b) interfaces should also work with the appropriate adapter cable, as
backwards compatibility is integral to the IEEE-1394b specification.

2.2.2   Windows

Pentium III class computer or better
➢ 64 MB RAM
➢ One OHCI compliant FW400 (IEEE-1394a) or FW800 (IEEE-1394b) port
➢ Video display with 1024 x 768 minimum resolution
➢ Windows 2000, Windows XP (32-bit or 64-bit), Windows 2003 Server or Windows Vista
   (32-bit or 64-bit)

NOTE: The LT-FW is not supported under Windows 95, 98 or ME.

2.2.3   Macintosh

Apple Macintosh G4 or later
➢ 64 MB RAM
➢ One OHCI compliant FW400 (IEEE-1394a) or FW800 (IEEE-1394b) port
➢ Video display with 1024 x 768 minimum resolution
➢ Macintosh OS X (10.4 or higher)

NOTE: The LT-FW is not supported under OS 9.

2.2.4   Insuring compatible firmware on the Aurora

The LT-FW requires your Aurora converter to have Firmware Version 18 or later. This should be verified prior to installing and configuring the LT-FW card. To determine what firmware revision your Aurora has installed, press the TRIM and POWER buttons at the same time with the power to the Aurora off. If the LED flashes over the numbers 1 on the input row & 8 on the output row or above (i.e. 1&8, 1&9, etc.) in the Aurora Meter Display, then your unit is compatible with the LT-FW. If pressing Power and Trim does not cause any LEDs to flash, causes a sequence lower than 18 to flash, or causes a single number to flash, then your unit needs to be updated.

Updating the Aurora firmware to version 18 may require a Lynx AES16 PCI audio interface. If your Aurora has firmware version 13, it can also be updated by an Apple Macintosh running OS X via MIDI, or by a PC running Windows via MIDI or IrDA. The Aurora firmware updater program and instructions for use are available for download from the Lynx website at Support > Latest Driver Download. If your unit requires an AES16 to update because it has rev 12 or earlier, and you do not have access to one, there are two options for customers within the USA and Canada:

- Option 1: Send the Aurora and LT-FW to Lynx Studio Technology in California. We will update the Aurora, install the LT-FW and do a full diagnostic test within one day of receipt. It will be return shipped via 2-Day Air.
- Option 2: Lynx Studio Technology will loan you an AES16 for updating the firmware in your Aurora. For more information on the procedure and any questions, contact support@lynxstudio.com or call +1 714-545-4700 extension 206.

If you are outside of the USA or Canada, please contact your local distributor for additional firmware update options.

3   Nomenclature Used in this manual

The following typographic conventions are used in this manual:

➢ ALL UPPER CASE TEXT refers to a specific parameter selection control (i.e. SYNC SOURCE) or a cable connection.
➢ Text in quotation marks indicates a parameter selection value or menu option (i.e. "EXT").

Phrases, such as: Start > Programs > Lynx Studio Technology use the greater than symbol (">") to indicate multiple menu options or mouse selections within a software control context.

4   Warranty Registration

Lynx is committed to providing you with the best service possible. To help us serve you better, please be sure to register your LT-FW using one of the following methods:

Fill out and mail the Warranty Registration Card included with your LT-FW.
Register on the web at: http://www.lynxstudio.com/support.html
Once you are registered you will automatically receive notifications of new products and upgrades.

5   Installation Procedures

1. Remove the AC power cord and take the top cover off of the Aurora. There are seven large screws plus one small screw near the center of the front faceplate that holds the top cover on.

2. Before installing the LT-FW card, you must change a jumper setting on the Aurora that corrects the current draw for an Aurora with an LT-FW.

   If you are updating a Rev A. Aurora, remove jumper W3 from the JP6 header on the Aurora main board.
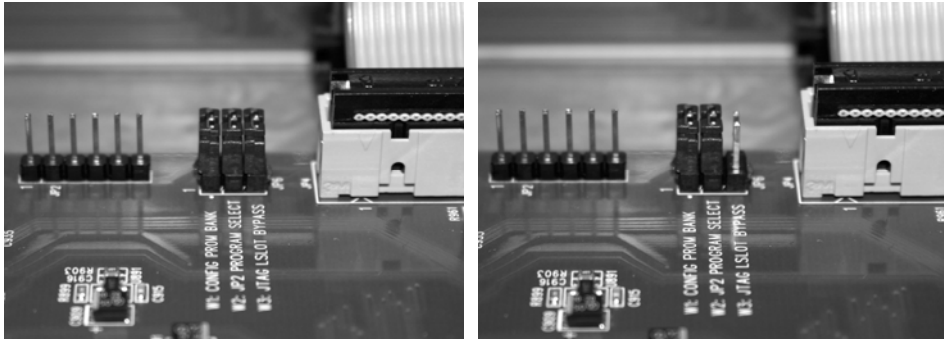
   If you are updating a Rev B Aurora, slide switch 4 (labeled W4 on PCB) of SW1 to the OFF position (towards back panel).
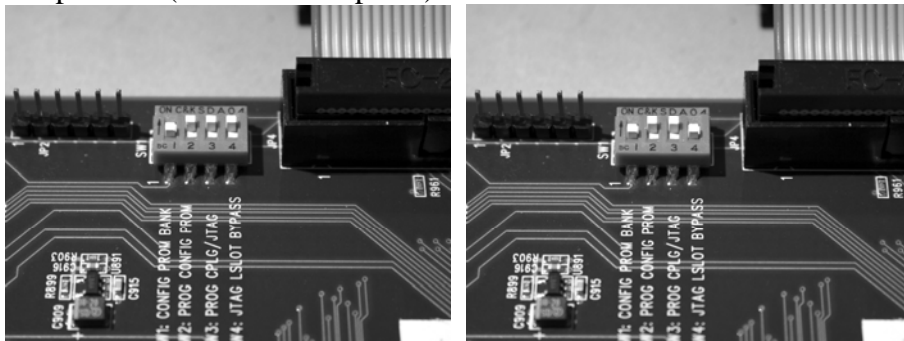
3. Remove the LSlot Expansion Port cover above the AES I/O Ports by removing the two mounting screws. Set these two screws aside, as they will be used to secure the LT-FW after installation.
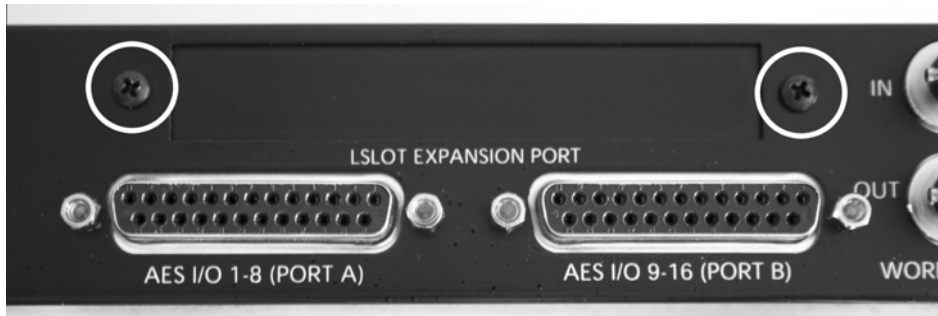
4. Remove the screw from the Aurora circuit board that is adjacent to the JP1 connector and the white serial number/barcode label. Set the screw aside for reuse.
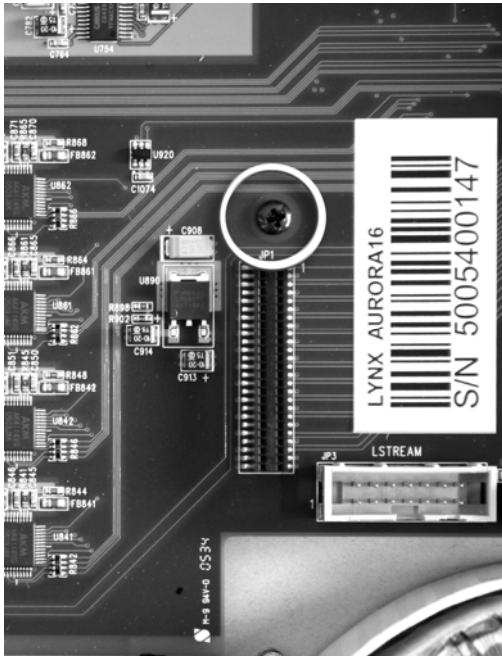
5. Install the standoff post (included with the LT-FW) in this same hole.
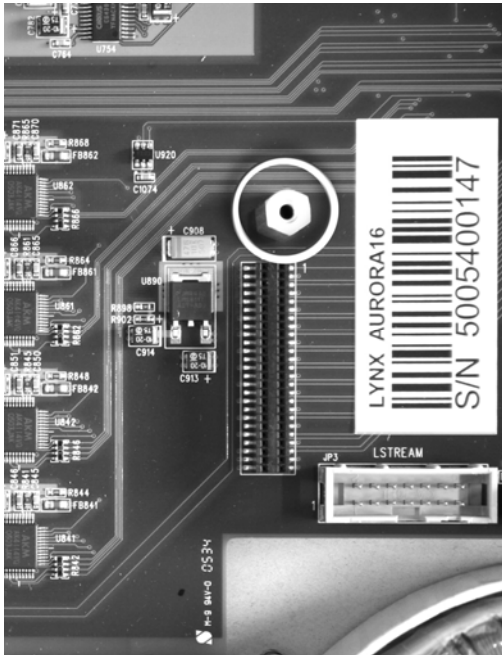
6. Grounding yourself to earth ground, remove the LT-FW from its protective static bag.

7. Attach the multi-pin connector on the back edge of the LT-FW to the LSlot connector (JP1) on the Aurora main board. When the LT-FW connector pins appear to be lined up correctly with the Aurora LSlot connector, press gently until the connector snaps into place. In some cases, the board may need to be gently flexed for the LSlot connector pins to line up correctly with JP1 on the Aurora main board.

⚠️ *Use caution to insure that the pins line up as shown. Incorrect installation could damage the unit*.
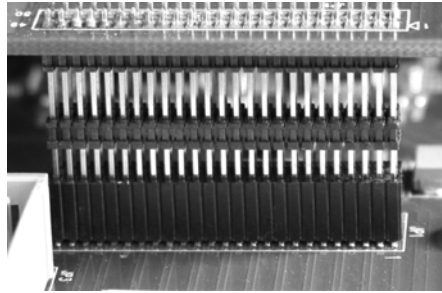
8. Secure the LT-FW with three screws; one on the standoff and two from the back panel of Aurora. Keep screws loose until the LT-FW is properly aligned, then tighten snugly, but do not over tighten.
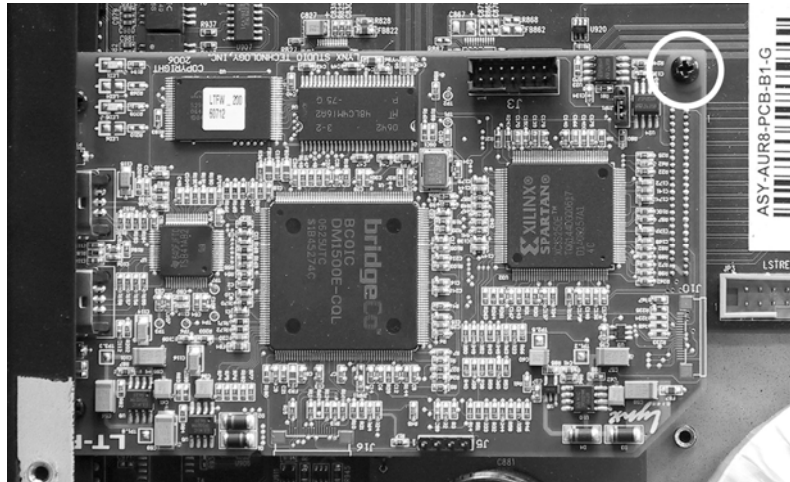
9. Reinstall the Aurora top cover using the eight screws that had been removed in step 1. Do not over tighten the small screw near the center of the front faceplate as it is easily damaged.

10. Plug in and power up the Aurora using the front panel standby switch. You can see the LT-FW from the slits in the Aurora top cover. If the green LED on the LT-FW lights up, the installation was successful. If the LED does not light, unplug the Aurora and re-mount the LT-FW, making sure that it is securely attached. Then plug in and power up again. If the green LED still does not light, please contact Lynx Customer Support.

5.1 Multiple Aurora Configurations

It is possible to use multiple LT-FW equipped Auroras with a single FireWire port. Simply daisy chain units with FireWire patch cables. Either of the two IEEE-1394a FireWire ports can be used to connect to a host computer or to connect to other Auroras. It is important to verify that all Auroras and LT-FWs have the same firmware revision. Please refer to Section 2.2.4 Insuring compatible firmware on the Aurora, for more information about updating the Aurora firmware.

5.2 Clock Settings and Connections

Please see Section 2.6 Clock Settings and Connections, of the Aurora User Manual for information about correct clocking of the Aurora within a digital audio system. When used with an LT-FW, the SYNC SOURCE must be selected from within the Aurora Remote Control application. The Aurora front panel controls are "locked out" when used with a FireWire system.

5.2.1 Using the Internal Clock

We recommend using Internal as the SYNC SOURCE for the best clock performance.

When the Windows MME or DirectSound driver is used, the Aurora will not automatically change to the sample rate of the audio being played. The desired sample rate should be selected from the Aurora Remote Control application prior to initiating playback. If this is not done, then the audio will be sample rate converted by the operating system, which can result in degraded audio quality.

When ASIO is used, the sample rate will change automatically to reflect the rate of the current project.

5.2.2 Using External / AES A / AES B Clock

The Aurora can slave to a master clock / house clock source via Word clock or via its AES inputs. In this state, it is also important to verify that the clock source is operating at the same sample rate as the audio being played, no matter what driver model is being used by the LT-FW. See the Aurora manual for more information about these SYNC SOURCE choices.

PLEASE NOTE: When an external master clock source is used with an LT-FW equipped Aurora, sample rate changes from the clock source can result in a loss of connectivity

between the host computer and the LT-FW. In order to avoid this, it is CRITICAL that the correct sequence is followed when changing sample rates is necessary.

For WDM applications under Windows, the desired sample rate should be selected in the ARC Settings Page prior to changing the sample rate on the master clock source.

For ASIO (Windows) and Core Audio (OS X), one should launch the audio project or audio file at the new rate, then change the rate on the master clock source to match. When the project rate and Aurora rate do not match, audio play and record will not be possible and the Aurora Remote Control application will not operate.

5.2.3   Using LSlot Clock

When an LT-FW equipped Aurora is used with a computer, it is possible to have the Aurora slave to the clock generated by the computer via the FireWire interface. This would be the case when LSLOT is selected as the SYNC SOURCE. As a general rule, we do not recommend this clocking scheme. The clock signal generated by a FireWire adapter can be very inaccurate. Although SynchroLock is capable of regenerating poor quality clock sources, in many cases the FireWire-generated clock can fall outside of SynchroLock's usable range, and the Aurora sound quality will be adversely affected.

5.3   Installing the Driver and Aurora Remote Control Application

The Lynx Installation CD contains all driver files and utilities mentioned in the subsequent installation steps, as well as the LT-FW manual, driver release notes and test files. If you do not have a CD-ROM drive or need a more recent version, these files are available on our website at http://www.lynxstudio.com/download.html.

If you have downloaded more recent drivers than those included on your Lynx Installation CD, the following instructions can still be followed, just launch the driver install file from the download rather than from the CD. If a previous driver version is present, it will automatically be removed as part of the driver installation process.

5.3.1   Windows 2000, XP (32-bit or 64-bit), 2003 Server, or Vista (32-bit or 64-bit)

1. Power on the Aurora. From the front panel, set the TO ANALOG OUT and TO DIGITAL OUT parameters to "LSLOT".

2. The LT-FW driver should be installed prior to connecting the Aurora to the computer. Insert the Lynx Installation CD into your computer's disk drive.

3. Locate the Windows\LT-FW folder on the CD. Double-click the LTFWSetup.exe file.

4. When prompted, accept the default destination folder of C:\Lynx and click "Install".

5. Click "Next >" on the welcome screen
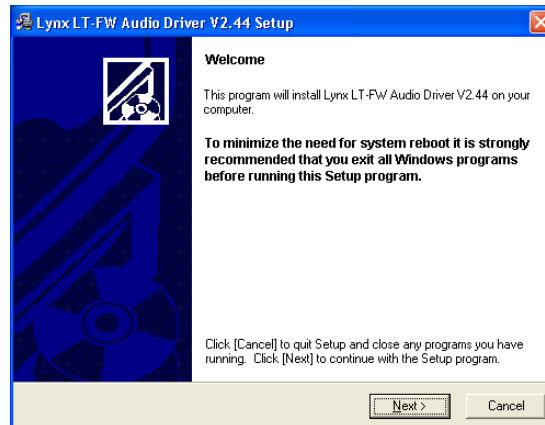
6. Accept the default destination folder for the driver files
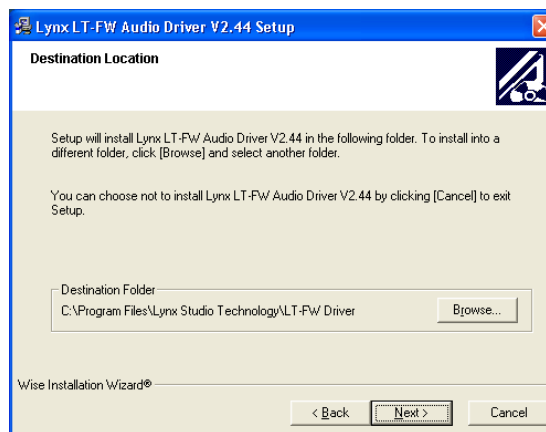
7. Click "Next >"from the driver setup screen to start the installation process.
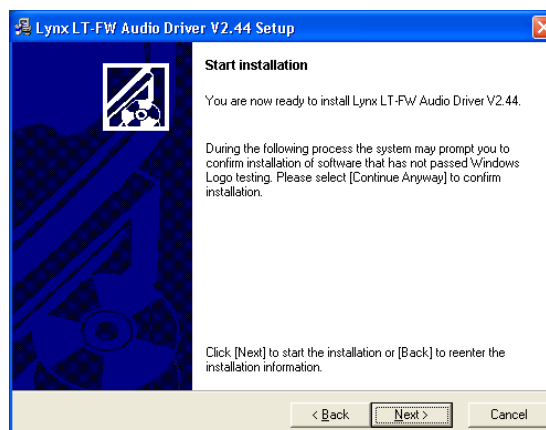
8. At the next screen you'll be prompted to disconnect and reconnect your devices. At this point connect the appropriate FireWire cable between the Aurora and the FireWire port on your computer. Make sure that the Aurora is powered on. Click "Next >".
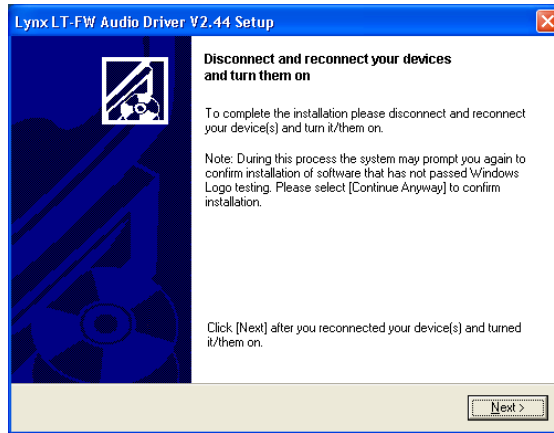
9. You may receive a warning that the driver has not been digitally signed by Microsoft. It is safe to disregard this warning and select "Continue Anyway."

10. When the installation is finished, you can launch the Aurora Remote Control application. For more information, see Section 7, Aurora Remote Control Application Reference.

5.3.2   OS X

1. The LT-FW uses the built-in FireWire audio driver in OSX. No additional driver installation is required. Power on the Aurora. From the front panel, set the TO ANALOG OUT and TO DIGITAL OUT parameters to "LSLOT".

2. Simply connect the appropriate FireWire cable from the Aurora to the computer's FireWire port. The Aurora driver devices will immediately become available to Core Audio applications.

3. To install the Aurora Remote Control application, locate the OS X/LT-FW folder on the CD. Double-click the AuroraRemoteInstaller.pkg file. For more information, see Section 7, Aurora Remote Control Application Reference.

6 Getting Started

With the LT-FW drivers and Aurora Remote Control application installed, the Aurora can now be used with most popular third-party audio applications. However, it is a good practice to verify that the installation was successful and test the Aurora with the following procedure.

6.1 Windows Quick Audio Test

The installation of your LT-FW can be tested using the Aurora Remote Control application and the Lynx Demo application included on the Lynx Installation CD. This is a quick way of verifying that the interface is installed correctly and properly connected to your external equipment.

1. Connect the Analog Outputs of the Aurora to monitoring equipment capable of delivering an audio signal for listening via headphones or speakers. Depending on your external equipment, you may be using the Lynx CBL-AOUT85 or a third party equivalent. Verify that Analog Outs 1 & 2 of the Aurora are connected to your external equipment. These are the outputs used for this test.

2. For this test we will set the Aurora on Internal as the clock source. To do so, launch the Aurora Remote Control application. Click the Digital I/O and Settings tab. Make sure that the SYNC SOURCE is set to "Internal".

3. On the Digital I/O and Settings page of the ARC, verify that TO ANALOG OUT is set to "LSlot In".

4. Open the Lynx Demo application by clicking Start > All Programs > Lynx Studio Technology > Lynx Demo, or locate Windows/Demo32.exe on the Lynx Installation CD and double-click to run it. The Lynx Demo program should appear in the upper left corner of your screen. Make certain that the Play Device is set to Lynx Aurora Analog Out 1-8
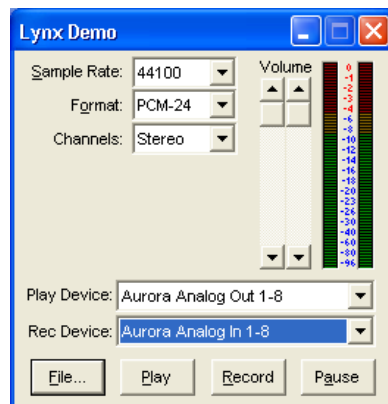
5. Locate "SineWaveMinus16.wav" in the support folder of the Lynx Installation CD. Drag the file to the computer's desktop.

6. In Lynx Demo, click "File" and navigate to the computer's Desktop, then select "SineWaveMinus16.wav" and click "Open."

7. Click "Play." You should see the progress bar move from left to right.

8. Launch the Aurora Remote Control application. Click the Analog I/O tab. Check for meter activity for Analog Outputs 1&2. If you have speakers or headphones connected to your destination device, you should be hearing audio as well.
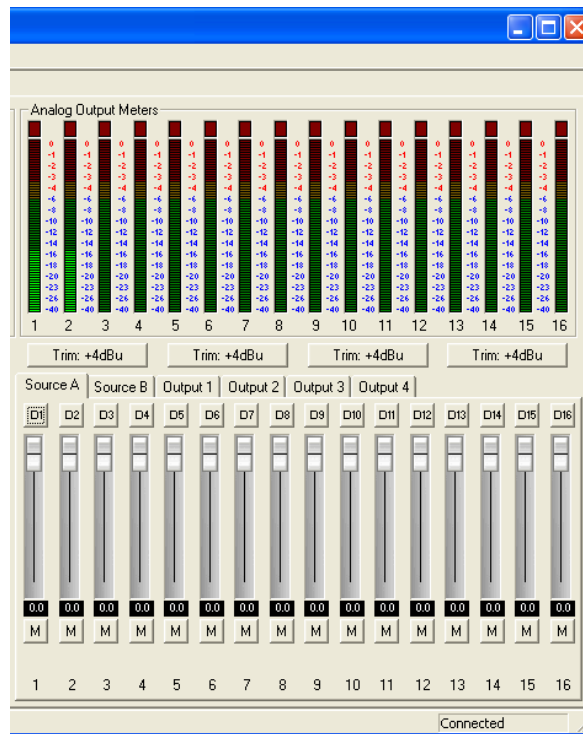
If the test did not operate as described or you received any errors, please refer to Section 09, TroubleshootingTroubleshooting.
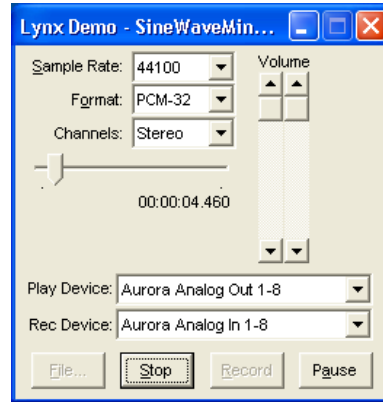
6.2 Macintosh Quick Audio Test

The installation of your LT-FW can be tested using the Aurora Remote Control application and the Bias Peak demo application included on the Lynx Installation CD. This is a quick way of verifying that the interface is installed correctly and properly connected to your external equipment.

1. Install the Bias Peak demo that is included in the "Demos" folder on the Lynx Installation CD, by clicking on the peakTrial.sit file and following the installation instructions.

2. Locate "SineWaveMinus16.aif" in the "support" folder of Lynx Installation CD. Drag the file to the computer's desktop.

3. Connect the Analog Outputs of the Aurora to monitoring equipment capable of delivering an audio signal for listening via headphones or speakers. Depending on your external equipment, you may be using the Lynx CBL-AOUT85 or a third party equivalent. Verify that Analog Outs 1 & 2 from the Aurora are connected to your external equipment. These are the outputs used for this test.

4. For this test we will set the Aurora to Internal as the clock source. To do so, launch the Aurora Remote Control application. Click the Digital I/O and Settings tab. Make sure that the SYNC SOURCE is set to "Internal".

5. Launch the Peak Demo application by clicking the Peak 4 icon in the OS X sidebar, or use Finder to launch Peak. Peak will prompt you to open an audio file. Choose "SineWaveMinus16.aif" on the desktop and click "Open".
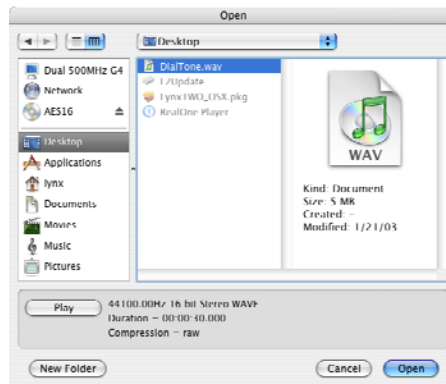
6. In Peak, click "Audio Out" from the Audio menu. Verify that there is a check next to "CoreAudio…"

7. Click "Hardware Settings…" from the Audio menu. Verify that the LynxLTFW appears as the Output device. Click "OK".
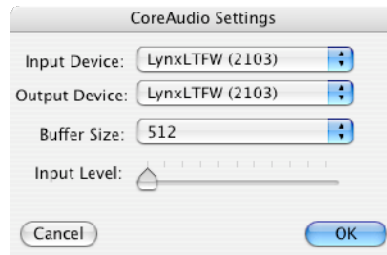
8. Click "Play" from the Peak transport. You should see meter activity and the counter progressing.
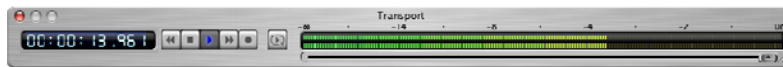
9. Open the Lynx Aurora Remote Control application. Click the Analog I/O tab. Check for meter activity for Analog Outputs 1&2. If you have speakers or headphones connected to your destination device, you should be hearing audio as well.
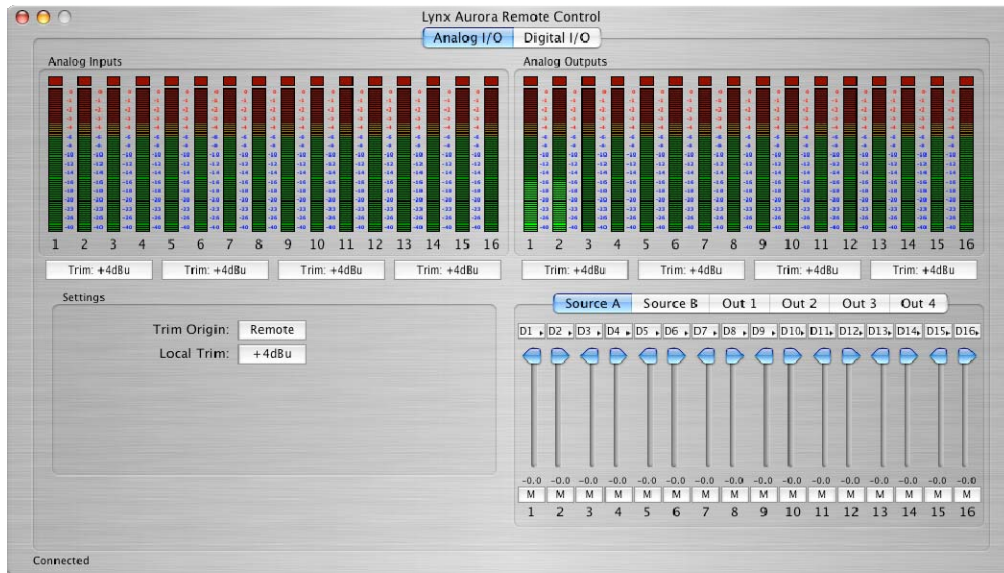
If the test did not operate as described or you received any errors, please refer to Section 0̶0̶, Troubleshooting~~Troubleshooting~~.

7   Aurora Remote Control Application Reference

The Aurora Remote Control (ARC) application allows control of Aurora parameters from a convenient software interface. It also provides accurate real-time metering for all inputs and outputs, and allows driver parameters such as buffer size and channel mode to be set. The ARC is automatically installed with the Windows driver setup program, and is a separate install under OS X (see Section 5.3, Installing the Driver and Aurora Remote Control Application).

7.1   Starting the Aurora Remote Control Application within Windows

Make sure that the Aurora is powered up, and that the Aurora is connected to the computer by a FireWire cable. From the Start Menu, click Start > Programs > Lynx Studio Technology > Aurora Remote Control.

7.2   Starting the Aurora Remote Control Application within OS X

Make sure that the Aurora is powered up, and that the Aurora is connected to the computer by a FireWire cable. From Finder, click Applications >Aurora.

7.3   General Operation

The Aurora Remote Control Application allows the user to control output levels, route inputs to outputs, establish and save parameters, and view accurate meters for inputs and outputs on a connected Aurora. Parameter changes will be reflected both on the Aurora front panel and within the software application.

Some parameters can be established identically from the software or front panel. Other parameters have extended functionality through the software, particularly routing functions and setting trim levels. When these functions are modified in the software, the Aurora front panel will indicate this by illuminating all the LEDs for that function. For instance, the front panel choices for the button labeled TO ANALOG OUT and TO DIGITAL OUT are "ANALOG IN", "AES IN" and "LSLOT IN". When selecting a choice from the front panel, the LED will be illuminated for the active selection. If custom routing is established in the software, all three LEDs will illuminate.

When the Aurora Remote Control application is run via the LT-FW FireWire connection, the Aurora will enter a "lock-out" mode where some front panel controls will be disabled, and control is restricted to the ARC software. The following table details which front panel functions are impacted by "lock out" mode:
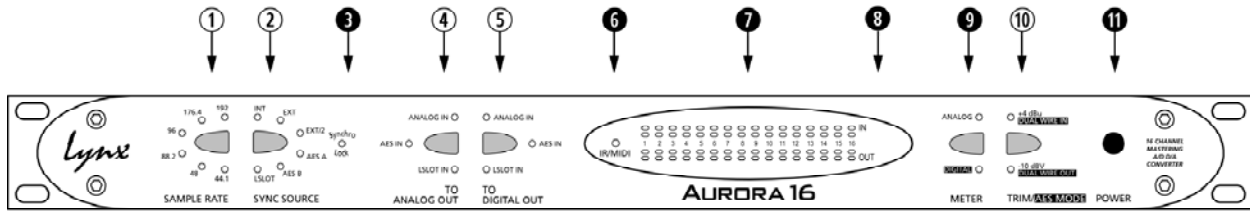
① **SAMPLE RATE**
   This button will not be active. The current operating sample rate will be indicated by the corresponding LED.

② **SYNC SOURCE**
   This button will not be active. The LED for the sync source, which has been selected from within the Aurora Remote Control application, will illuminate. When the computer's FireWire adapter is the clock master, then LSLOT will illuminate as the SYNC SOURCE.

   If no clock signal is available for the **SYNC SOURCE** selected, the LED for the selected source will flash, and the Aurora will operate from its internal clock.

❸ **SynchroLock**
   This LED will function normally. See the Aurora manual a description of SynchroLock. SynchroLock may be disabled from the Aurora Remote Control application.

④ **TO ANALOG OUT**
   This button will not be active. For operation with the LT-FW, either LSLOT IN or Remote Routing mode with LSLOT sources assigned should be selected with the ARC application. LSLOT In routes play streams from the computer, via the FireWire port, to the Aurora's Analog outputs. If any custom routing is initiated from within the ARC application, all three LEDs will be illuminated, indicating that this parameter is being controlled remotely.

⑤ **TO DIGITAL OUT**
   This button will not be active. For operation with the LT-FW, either LSLOT IN or Remote Routing mode with LSLOT sources assigned should be selected with the ARC application. LSLOT In routes play streams from the computer, via the FireWire port, to the Aurora's Digital outputs. If any custom routing is initiated from within the ARC application, all three LEDs will be illuminated, indicating that this parameter is being controlled remotely.

❻ **IR/MIDI**
   This LED will function normally. See the Aurora manual for information.

❼ Peak Meters
   These LEDs will function normally. See the Aurora manual for information.

❽ IR Transceiver

This will function normally. See the Aurora manual for information.

❾ METER

This button will function normally. See the Aurora manual for information.

⑩ TRIM/AES MODE

When the METER select switch is set to "Analog", this button normally allows the nominal trim level to be set for the analog inputs and outputs. In "Lock Out" mode, this button will not be active, and trims can be set for the Analog inputs and outputs from within the Aurora Remote Control application. If the trim value for any analog I/O is altered from within the software, both the +4 dBu and –10 dBV LEDs will be illuminated, indicating that this parameter is being controlled remotely.

When the METER select is set to "Digital", this control allows configuration of the AES/EBU digital I/O. In "Lock Out" mode, the button will not be active, but the LEDs will reflect the dual-wire state for the digital inputs and outputs.

⑪ POWER

This button will function normally. See the Aurora manual for information.

7.3.1   Analog I/O Page

This page is viewable by clicking the "Analog I/O" Tab in the top left corner of the Aurora Remote Control application.
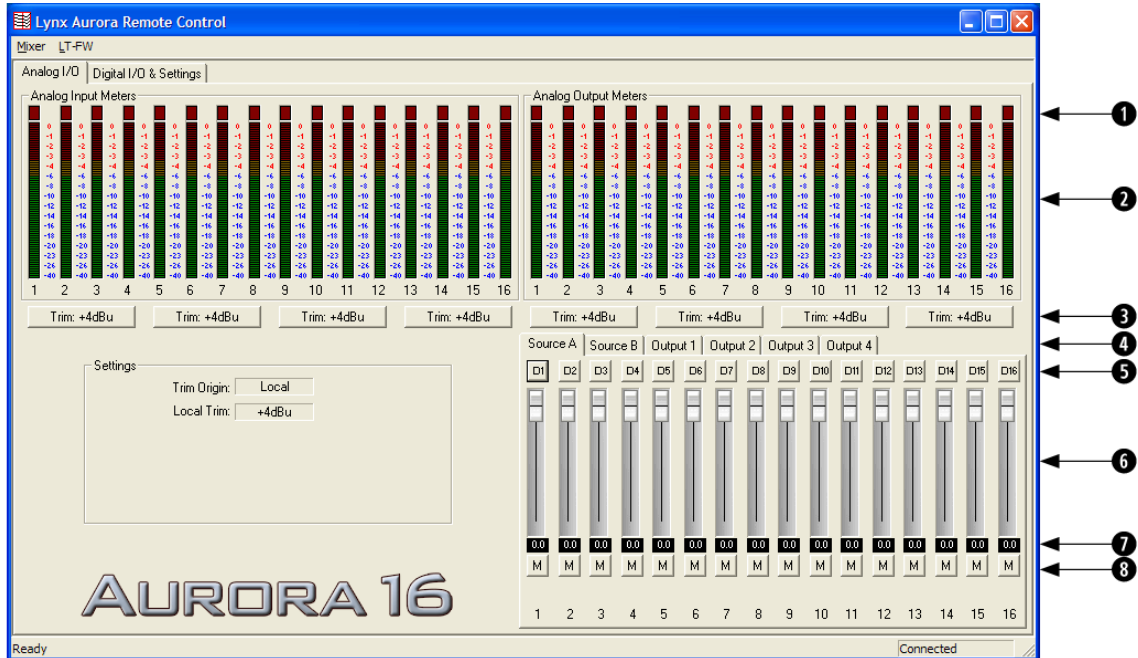
❶   These indicators will illuminate when three consecutive full-scale samples are detected on the Aurora Analog Inputs and Outputs or when a summing overrun occurs on the Aurora Analog Outputs. The indicator will remain illuminated for 250ms.

❷   These meters display the instantaneous peak level of audio being sent to the Aurora Analog Inputs and Outputs.

❸   These buttons allow the Analog input or output trims to be set. Each button allows groups of fours channels to be toggled between +4dBu (the default) and -10dBV.

❹   These tabs allow monitor source groups to be selected for the Analog Outputs when Remote Routing is utilized. The Aurora can be set for global routing (i.e. AES In routes to Analog Out) or Remote Routing. With Remote Routing up to two sources (Source A and Source B) can be established for each output. Analog Outputs 1-4 have 16 additional monitor sources (Sources C – R), which can be accessed from the Output 1-4 tabs. For these custom monitor sources to be active, the TO ANALOG OUT switch on the Digital I/O & Settings page must be set to "Remote". In this state all three LEDs for the TO ANALOG OUT button on the Aurora front panel will be illuminated.

❺   These buttons allow individual monitor sources to be selected for each analog output when using Remote Routing. Clicking a button allows selection of any Analog, Digital or LSLOT input source. Holding down the CTRL key while selecting a source causes the remaining channels to be set sequentially (i.e. if you select LSLOT In 1 as

the monitor source for Analog Out 1 while holding down the CTRL key, LSLOT In 1-16 will be assigned to Analog Out 1-16).

❻ These faders allow control over the output level of each monitor source when in Remote Routing mode. This level attenuation occurs in the digital domain, so it is recommended to leave these faders in their default, maximum position in situations where the highest fidelity is required. Holding down the SHIFT key on the keyboard while adjusting a fader, will cause adjustment of channel pairs.

❼ This display reveals the amount of attenuation, in dB, of a monitor source.

❽ This button enables the mute function for the associated monitor source.

7.3.2 Digital I/O & Settings Page

This page is viewable by clicking the "Digital I/O & Settings" Tab in the top left corner of the Aurora Remote Control application.
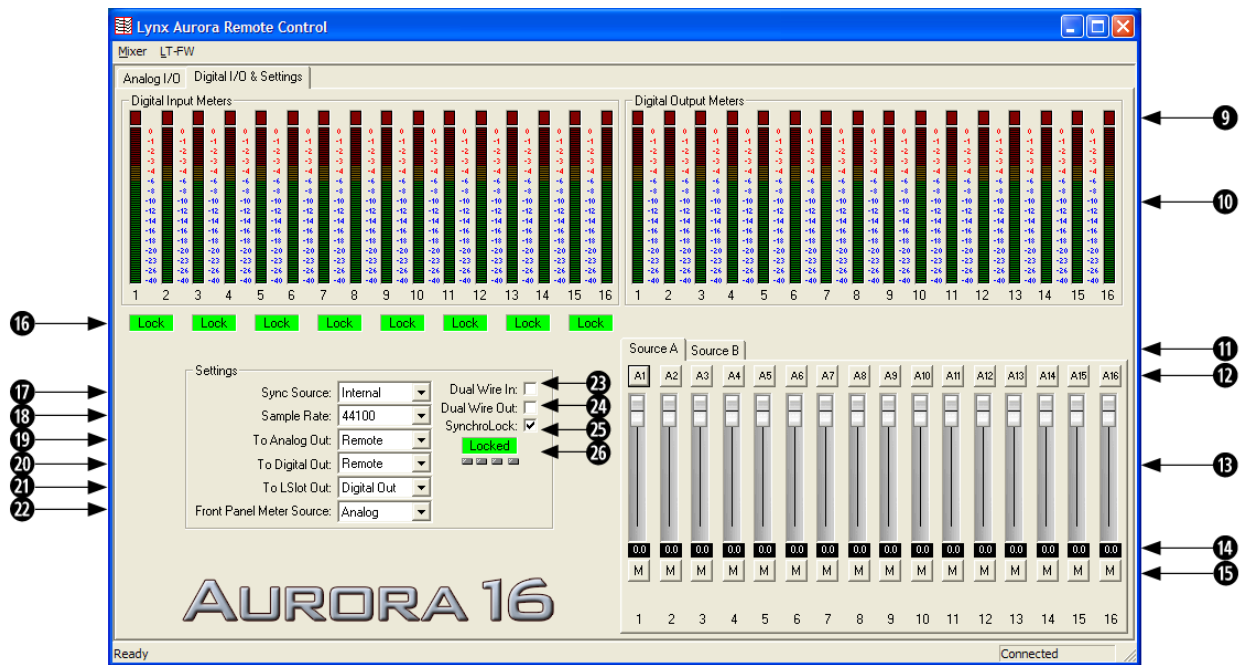

❾ These indicators will illuminate when three consecutive full-scale samples are detected on the Aurora Digital Inputs and Outputs or when a summing overrun occurs on the Aurora Digital Outputs. The indicator will remain illuminated for 250ms.

❿ These meters display the instantaneous peak level of audio being sent to the Aurora Digital Inputs and Outputs.

⓫ These tabs allow monitor source groups to be selected for the Digital Outputs when Remote Routing is utilized. The Aurora can be set for global routing (i.e. AES In routes to Analog Out) or Remote Routing. With Remote Routing up to two sources (Source A and Source B) can be established for each output. For these sources to be active, the TO DIGITAL OUT switch on the Digital I/O & Settings page must be set

to "Remote". In this state all three LEDs for the TO DIGITAL OUT button on the Aurora front panel will be illuminated.

❷ These buttons allow individual monitor sources to be selected for each digital output when using Remote Routing. Clicking a button allows selection of any Analog, Digital or LSLOT input source. Holding down the CTRL key while selecting a source causes the remaining channels to be set sequentially (i.e. if you select LSLOT In 1 as the monitor source for Digital Out 1 while holding down the CTRL key, LSLOT In 1-16 will assigned to Digital Out 1-16).

❸ These faders allow control over the output level of each monitor source when in Remote Routing mode. This level attenuation occurs in the digital domain, so it is recommended to leave these faders in their default, maximum position in situations where the highest fidelity is required. Holding down the SHIFT key on the keyboard while adjusting a fader, will allow adjustment of channel pairs.

❹ This display reveals the amount of attenuation, in dB, of a monitor source.

❺ This button enables the mute function for the associated monitor source.

❻ This display indicates the status of the digital inputs. If a valid digital signal is present the display will indicate "Locked". If a valid digital signal is not present the display will indicate "Unlock".

❼ This drop-down menu allows for selection of the clock source that drives the Aurora sample clock generator from the following options:
INT   Clock derived from the on-board crystal oscillator.
EXT   Clock signal from WORD CLOCK input.
EXT/2   Clock signal from WORD CLOCK input running at half the desired sample rate. Typically used with dual-wire AES/EBU devices.
AES A   Clock signal from the AES I/O Port A Digital Input. Clock is derived from the first valid AES/EBU channel.
              ⎣ AURORA 8 ⎦ *Clock signal from the AES inputs 1-4.*
AES B   Clock signal from the AES I/O Port B Digital Input. Clock is derived from the first valid AES/EBU channel.
              ⎣ AURORA 8 ⎦ *Clock signal from the AES inputs 5-8.*
LSLOT   Clock Signal from the computer's FireWire adapter. Under normal circumstances, this is NOT a recommended clock source.

❽ This drop-down menu allows for selection of the sample rate for the Aurora to operate at. If the Aurora is slaving to an external clock master, the sample rate selected should match the rate generated by the clock source. For more information, see Section 5.2, Clock Settings and Connections.

❾ This drop-down menu allows for selection of the signal source that will be routed to the analog outputs. "ANALOG IN", "AES IN" and "LSLOT IN" are global selections, affecting all analog output channels. "LSLOT" routes signals from the computer via the FireWire connection. Choosing "REMOTE" allows individual sources to be assigned from the Monitor Source section on the ANALOG I/O Page of the Aurora Remote Control application.

㉑ This drop-down menu allows for selection of the signal source that will be routed to the digital outputs. "ANALOG IN", "AES IN" and "LSLOT In" are global selections, affecting all analog output channels. "LSLOT" routes signals from the computer via the FireWire connection. Choosing "REMOTE" allows individual sources to be assigned from the Monitor Source section of the DIGITAL I/O Page of the Aurora Remote Control application.

㉑ The LSLOT Outputs are not typically available independently, but mirror either the Analog or Digital Outputs on the Aurora. This drop-down menu allows selection of whether the Analog Outputs or Digital Outputs are selected to mirror to LSLOT. This is not pertinent for the LT-FW since its driver allows the Aurora I/O to be selected from within the host computer.

㉒ This drop-down menu determines whether the Aurora front panel meters display activity for the digital or analog inputs and outputs.

㉓ This checkbox activates dual-wire mode for the AES inputs. See the Aurora User Manual for information.

㉔ This checkbox activates dual-wire mode for the AES outputs. See the Aurora User Manual for information.

㉕ This checkbox activates the SynchroLock clocking system. See the Aurora User Manual for information.

㉖ This display shows the status of the SynchroLock clocking system. See the Aurora User Manual for information.

7.3.3   Mixer Menu
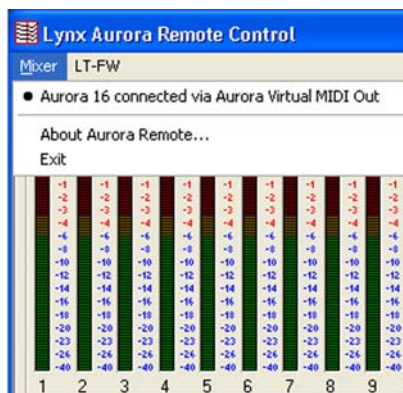
In the Windows version of ARC, the "Mixer" menu in the top left corner identifies the connection medium for the Aurora, and provides access to the "About Aurora Remote..," screen.
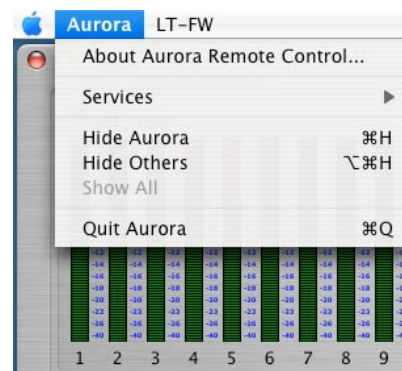
In the OS X version, the equivalent is the "Aurora" menu.

7.3.4 About Aurora Remote Control Window

This dialog box details the version number of the Aurora Remote Control application, and the hardware revisions, serial numbers and board revisions of the Aurora and LSLOT devices. It also displays the Aurora's operating temperature and the connection medium being employed.
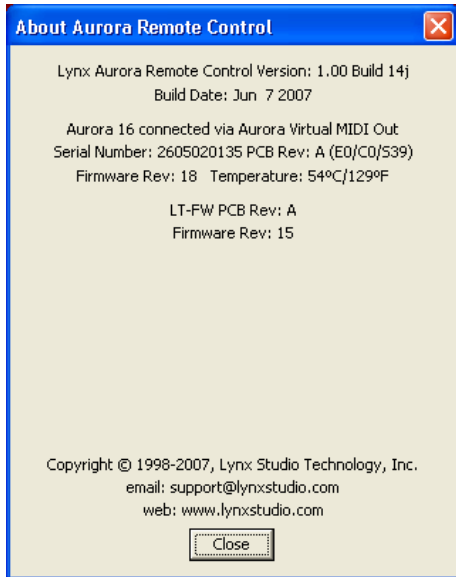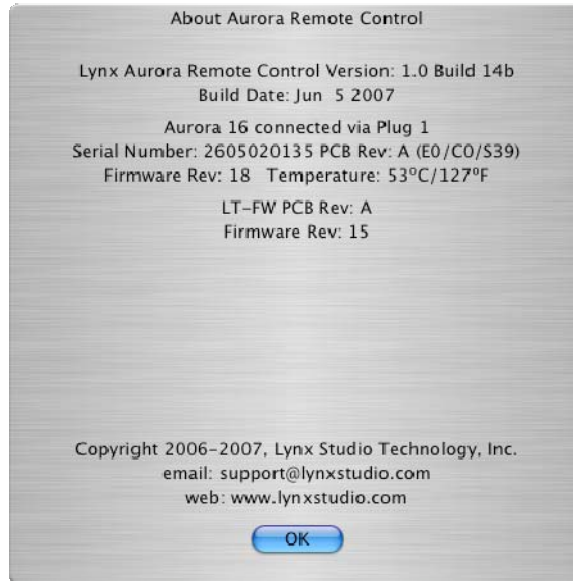
Windows   OS X

7.3.5 LT-FW Menu

The LT-FW menu provides access to controls for configuring the LT-FW adapter, including buffer size, channel modes, etc.
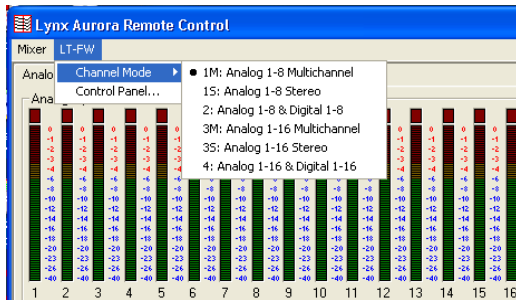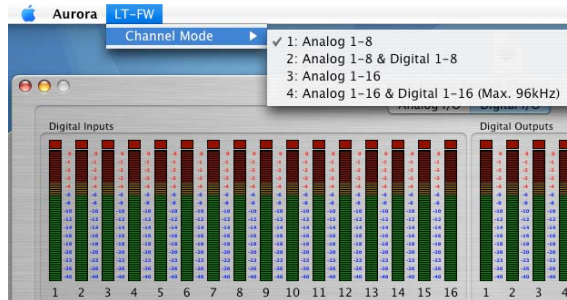
Windows   OS X

In both the OS X and Windows versions of ARC, the LT-FW channel modes can be selected from this menu. Six modes are available in Windows and four modes for OS X. These modes determine the number and type of I/O that will be available to your computer from the Aurora. For the Aurora 16 there are 8, 16 and 32-channel modes. For the Aurora 8 there are 8 or 16 channel modes available. For more information about the LT-FW Channel Modes, please see Section 8.1, Channel Modes.

7.3.6 LT-FW Control Panel (Windows Only)

The LT-FW Control panel provides user control over the buffer settings used by the LT-FW, and provides a counter to display if any samples were dropped during ASIO operation. This is a helpful diagnostic tool to determine if an appropriate ASIO buffer size has been selected.

For more information about buffer settings, please see Section 8.2.1.1, Controlling Latency by Changing the Buffer Size.
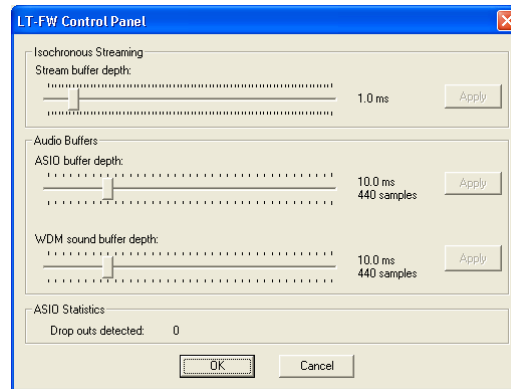
8　Using the LT-FW

With the LT-FW drivers and Aurora Remote Control application installed in your computer, you can begin to use the Aurora with most popular third party audio applications. In this section we will explore setting up your Aurora/LT-FW system for your context of use.

8.1　Channel Modes

One of the first decisions to be made when setting up the Aurora/LT-FW system is which channel mode to use. Channel modes can be selected from the Aurora Remote Control application LT-FW Menu. There are six modes available for Windows and four modes for OS X.

The channel modes will determine which types of inputs and outputs on the Aurora will be accessible from your software. As a general rule, it is wise to choose a mode that uses as few input and output devices as is needed for the intended use. For instance, if you are going to only use the Aurora with analog equipment, then you could choose a mode that only provides access to the analog channels instead of one that provides access to both the analog and digital channels.

The fewer channels that are used, then the lower the CPU usage will be. This in turn can be beneficial in terms of latency or number of audio plug-ins/processes that can be used in a project.

Since changing Channel Modes will potentially alter the type and quantity of Aurora devices available, and cause a reset of the FireWire bus, all audio applications should be closed when a Channel Mode change is initiated. Sync Source and routing settings will remain intact through a Channel Mode change.

The following table describes the modes available in Windows:

Mode	Maximum Channels	Inputs Available	Outputs Available	Multichannel or Stereo devices	Notes
1M	8	8: Analog	8: Analog	Multichannel	One 8-channel device
1S	8	8: Analog	8: Analog	Stereo	Four 2-channel devices
2	16	8: Analog 8: Digital	8: Analog 8: Digital	Multichannel	One 8-channel device for analog, One 8-channel device for digital
3M	16	16: Analog	16: Analog	Multichannel	Two 8-channel devices
3S	16	16: Analog	16: Analog	Stereo	Eight 2-channel devices
4	32	16: Analog 16: Digital	16: Analog 16: Digital	Multichannel	Two 8-channel devices for analog, Two 8-channel devices for digital

In OS X the M and S distinction are irrelevant. The following four modes are available

Mode	Maximum Channels	Inputs Available	Outputs Available
1	8	8: Analog	8: Analog
2	16	8: Analog 8: Digital	8: Analog 8: Digital
3	16	16: Analog	16: Analog
4	32	16: Analog 16: Digital	16: Analog 16: Digital

For Windows users, there are two different types of modes that change the way the Aurora input and output channels are presented to applications that use MME or DirectSound driver models. Some modes present the I/O as 8-channel devices, and other modes present the I/O as multiple stereo devices. The modes that present multi-channel devices are the appropriate choice for playback of multi-channel interleaved audio (i.e. 5.1 or 7.1 surround sound). Modes using stereo devices are the appropriate choice for contexts where independent access to pairs of input and output channels are required. The following table describes how the devices are present for each mode in Windows:

Mode	Device	Input Name	Output Name
1M	1	Aurora Analog In 1-8	Aurora Analog Out 1-8
1S	1	Aurora Analog In 1/2	Aurora Analog Out 1/2
	2	Aurora Analog In 3/4	Aurora Analog Out 3/4
	3	Aurora Analog In 5/6	Aurora Analog Out 5/6
	4	Aurora Analog In 7/8	Aurora Analog Out 7/8
2	1	Aurora Analog In 1-8	Aurora Analog Out 1-8
	2	Aurora Digital In 1-8	Aurora Digital Out 1-8
3M	1	Aurora Analog In 1-8	Aurora Analog Out 1-8
	2	Aurora Analog In 9-16	Aurora Analog Out 9-16
3S	1	Aurora Analog In 1/2	Aurora Analog Out 1/2
	2	Aurora Analog In 3/4	Aurora Analog Out 3/4
	3	Aurora Analog In 5/6	Aurora Analog Out 5/6
	4	Aurora Analog In 7/8	Aurora Analog Out 7/8
	5	Aurora Analog In 9/10	Aurora Analog Out 9/10
	6	Aurora Analog In 11/12	Aurora Analog Out 11/12
	7	Aurora Analog In 13/14	Aurora Analog Out 13/14
	8	Aurora Analog In 15/16	Aurora Analog Out 15/16
4	1	Aurora Analog In 1-8	Aurora Analog Out 1-8
	2	Aurora Analog In 9-16	Aurora Analog Out 9-16
	3	Aurora Digital In 1-8	Aurora Digital Out 1-8
	4	Aurora Digital In 9-16	Aurora Digital Out 9-16

This characteristic is most relevant for Windows multimedia applications. Most Pro Audio applications running Windows use ASIO as the driver model, and Core Audio in OS X. When ASIO or Core Audio is used, the available I/O is always presented as multiple mono channels (this is the reason multi-channel modes are not available in OS X). For ASIO and OS X, the channel modes selected only determine the number and type of I/O that will be

available. For this reason, there will be no difference within ASIO between modes that present the same I/O as multi-channel or stereo devices. For Instance Mode "1M: Analog 1-8 Multichannel" and Mode "1S: Analog 1-8 Stereo" will appear identically within an ASIO application.

8.2   Application Setup

The LT-FW was designed to provide maximum compatibility with the most popular audio and multimedia applications that use the Windows MME, DirectSound, ASIO and OS X Core Audio driver standards. It is crucial that the applications are set up correctly for optimal operation.

8.2.1   Windows

The Windows drivers for the LT-FW support two dominant driver models, WDM (which support both MME and DirectSound) and ASIO. WDM was developed by Microsoft and is used most typically by media playback applications, such as Windows Media Player, iTunes, Quicktime Player, WinDVD, PowerDVD, etc.

ASIO was developed by Steinberg, and was designed to address the low-latency and high channel count needs of Pro Audio and Music Production. ASIO is an option for Audio Production applications such as Cubase/Nuendo, Sonar, Samplitude/Sequoia, Audition, etc. These applications may also support MME or DirectSound, but when the option exists, we recommend using ASIO for the best performance.

8.2.1.1 Controlling Latency by Changing the Buffer Size

Latency in an audio interface can be defined as the time required to process a sample requested from an application to the interface's audio output. A number of factors determine the achievable latency performance of an Aurora/LT-FW system: processor speed, operating system, sample rate, number of utilized record or play channels, system efficiency, etc.

Latency can be manipulated by changing the size of the buffers used to transfer data to and from the LT-FW. The Aurora Remote Control Software provides access to buffer settings from the LT-FW > Control Panel screen, which can define individual buffer and Stream buffer sizes for WDM and ASIO.
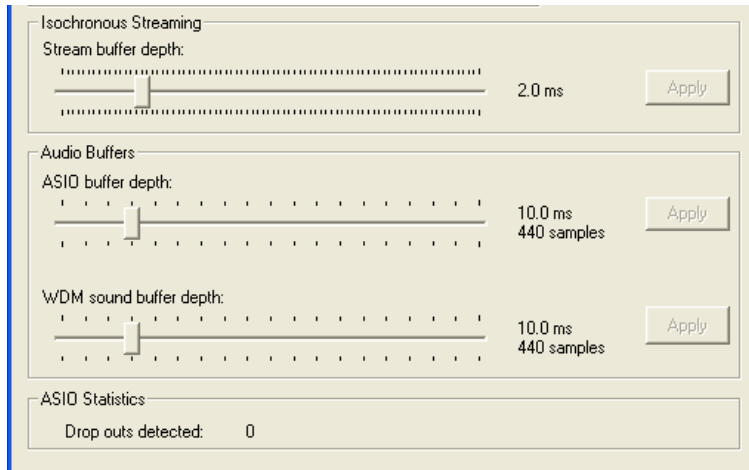
The stream buffer controls the size of audio packets that are used for transfer to the LT-FW hardware. This parameter is important for achieving reliable performance at the buffer size required. A stream buffer size that is ¼ of the ASIO or WDM buffer size is ideal. For instance, when using a 4-millisecond ASIO buffer, it is ideal to use a 1-millisecond stream buffer.

Smaller buffer sizes will give you lower latency. However, if a buffer size is too small for the system or context, audio anomalies such as clicks and pops may occur. It is recommended to become familiar with altering the LT-FW buffer size to best suit the context of use.

In addition to the ARC Control Panel, the ASIO buffer size can be set within an ASIO application through the LT-FW ASIO Control Panel. This allows the buffer size to be changed without needing access to the ARC. For more information, see Section 8.2.1.5, ASIO Applications.

8.2.1.2 Multimedia Applications

The Aurora/LT-FW can be used as a playback device for most popular multimedia, home theater and consumer audio applications. Some such applications allow selection of specific playback devices. In these cases, an Aurora output device can be selected from the appropriate device selection menu. When output device selection is not an option, it can be assumed that the application uses the Windows default audio device. For information on the Windows default play device see Section 8.2.1.4, System Default Audio Device.

Since these types of programs generally use a Standard Windows driver model, the way that the Aurora appears as a playback option will depend on the Channel Mode that has been selected. When a multi-channel mode is active, the Aurora I/O will appear as one or more 8-channel devices. If stereo material is played in this state, then playback will occur through the first pair of outputs for the device selected. Mono material will play through the 3rd output – the center channel in a surround context.

8.2.1.3 Multi-Channel Surround playback

When a multi-channel mode has been established for the Aurora (Modes 1M; 2; 3M or 4), then surround-sound material can be played and distributed to multiple outputs on the Aurora.

In addition to using an appropriate Channel Mode, the playback software must have an option for decoding and playing back surround-encoded material. The playback software should be set up to use the appropriate Aurora playback device. In some cases, the software will use the Operating System default – please refer to Section 8.2.1.4 for further details.

When multi-channel interleaved material is played, then the audio will be distributed to the Aurora outputs according to the following scheme:

Channel Name	5.1 Output	7.1 Output
Front Left	1	1
Front Right	2	2
Front Center	3	3
Sub (LFE)	4	4
Surround Left	5	5
Surround Right	6	6
Aux Left	N/A	7
Aux Right	N/A	8

8.2.1.4 System Default Audio Device

Some applications do not allow selection of a specific audio playback device. Instead they utilize whichever audio device has been defined as the system default play device. To use the desired Aurora output as the system default:

With Windows XP navigate to:
Start > Control Panel > Sounds and Audio Devices > Audio > Sound Playback: Default Device = Lynx Aurora XX.

With Windows Vista navigate to:
Start > Control Panel > Sound > Playback. Right-Click the desired Aurora output device and choose "Set as default device".

8.2.1.5 ASIO Applications

When using an application that supports the ASIO driver standard, one must specify the Aurora ASIO driver as the appropriate audio device. Once that is established, multiple stereo input and output devices will be available for use within the application. Please note: the channel mode selected for the Aurora will determine the type and number of I/O devices available, but within ASIO they will always be presented as multiple stereo devices, never as 8-channel devices like with WDM.

When using an ASIO compatible program, the appropriate ASIO device must be selected from a settings or options menu in the application. The correct choice would be "ASIO Lynx Aurora".

Many ASIO applications provide access to an ASIO Control Panel for the device being used. For an LTFW equipped Aurora, this button will launch the LT-FW ASIO Control Panel
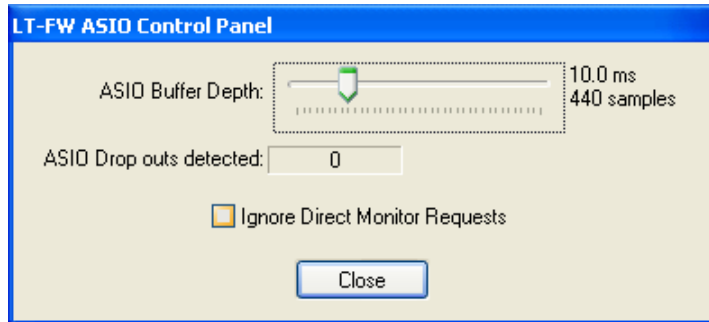
From this panel, the ASIO Buffer size can be established conveniently within the audio software application, and dropped samples are reported. Unlike the buffer controls in the Aurora Remote Control Application, the stream buffer size cannot be set independently from the ASIO buffer size. The stream buffer is set to 1ms no matter what the ASIO buffer is set to.

For information about the Ignore Direct Monitor Requests Switch, see Section 8.2.5.2, Disabling Direct Monitoring.

8.2.2 Macintosh OS X

The Aurora will operate as a Core Audio device under OS X. Core Audio is the dominant audio driver model for OS X, and is used for media playback applications as well as Pro Audio applications.

8.2.2.1 Controlling Latency by Changing the Buffer Size

Latency in an audio interface can be defined as the time required to process a sample requested from an application to the interface's audio output. A number of factors determine the achievable latency performance of an Aurora/LT-FW system: processor speed, operating system, sample rate, number of utilized record or play channels, system efficiency, etc.

Latency can be manipulated by changing the size of the buffers used to transfer data to and from the LT-FW. Core Audio buffer size controls are offered within most pro audio recording applications. With the LT-FW buffer sizes between 32 samples and 16384 samples are available.

Smaller buffer sizes will give you lower latency. However, if a buffer size is too small for the system or context, audio anomalies such as clicks and pops may occur. It is recommended to become familiar with altering the LT-FW buffer size to best suit the context of use.

8.2.2.2 OS X Audio Applications

The Aurora/LT-FW can be used as a playback device for most popular multimedia, home theater and pro audio applications. Some such applications allow selection of specific playback devices. In these cases, an Aurora output device can be selected from the appropriate device selection menu.

The way that the Aurora appears as a playback option will depend on the Channel Mode that has been selected in the Aurora Remote Control software. For instance in Channel Mode 1, 8-channels of analog I/O will be available. In Mode 2, 8 channels of analog and 8 channels of digital I/O will be available.

Some Pro Audio applications allow the Core Audio device clock source to be set from within the application (i.e. MOTU Digital Performer, Steinberg Cubase and Nuendo). The Aurora/LT-FW does not currently support this functionality.

8.2.2.3 System Default Audio Device

In cases where the playback software does not provide access to output selections, then the default output devices for the operating system will be used. In OS X, the audio out default device can be established from Applications > Utilities > Audio MIDI Setup.

8.2.3   Monitoring Theory

The Aurora supports hardware-based low latency monitoring on a global or per-channel basis. Monitoring settings can be established using the Aurora Remote Control software or on Windows PCs with software that supports ASIO Direct Monitoring. These methods avoid delays caused by monitoring through software applications.

Global routing (i.e. Analog Ins routed to Digital Outs) can be established from the Aurora Remote Control software on the Digital I/O & Settings Page. The default routing when an LT-FW is used is LSLOT as the signal source for the Analog and Digital outputs. This is the appropriate setting when the intention is to send play streams from the computer to the Aurora, and to record audio from the Aurora inputs into the computer.

If routing of analog and digital external sources is required, then that can be accommodated with global routing by choosing the desired signal source for TO ANALOG OUT and/or TO DIGITAL Out.

8.2.4   Remote per-channel routing

In addition to global routing, the Aurora is capable of routing individual input sources to specific outputs, and also sending multiple sources to a single output. In order to utilize this functionality, the source for TO ANALOG OUT or TO DIGITAL OUT should be set to "Remote".

In this mode, up to two monitor sources can be defined for each of the Analog and Digital outputs on the Aurora. These are defined in the ARC as Source A and Source B. The default arrangement is for Source A to be digital in 1-16 for the Analog outputs, and Analog in 1-16 for the Digital outputs (1-8 for an Aurora 8). Source B is assigned to LSLOT 1-16 so it can

send and receive signals from the FireWire adapter. LSLOT sources 1-16 on Source B are muted by default. These sources will need to be un-muted in order to pass audio. Any of these monitor sources can be altered to whatever source is desired. It is recommended, however, to keep the LSLOT sources assigned for Source B whenever the Aurora will be used with a computer via FireWire.

In addition to Source A and Source B, Analog Outs 1-4 have 16 additional monitor sources available. These provide an excellent solution for cases where, for instance, all analog inputs need to be monitored through a stereo output. These sources, labeled C through R, are accessed via the Output 1, Output 2, Output 3 and Output 4 tabs on the Analog I/O page of the ARC. It is important to remember that these sources are in addition to the Source A and Source B choices, so that analog outputs 1-4 have 18 possible monitor sources.

If one wishes to monitor all 16 analog inputs of an Aurora 16 through analog outputs 1 and 2, this is one way to achieve that:
- Click the Output 1 tab
- Hold down the CTRL Key, while clicking the first monitor source (C). Select Analog Input > Analog In 1. This should change all of the subsequent monitor sources in series, resulting in Analog In 1-16 being assigned to sources C through R.
- These monitor sources are muted by default, so click the M button underneath each channel strip to un-mute these new sources.
- Perform this same operation for output 2.
- This will send all input signals to the outputs 1 and 2 equally. If the intention is to pan these sources within a stereo field, that can be achieved by attenuating appropriate input sources. For instance, if input 1 should be panned hard left and input 2 panned hard right, just mute analog input 1 from the Output 2 tab, and mute analog input 2 from the Output 1 tab. If you wish to pan input 3 75 degrees to the left, attenuate analog input 3 from the Output 2 tab by 20dB. Sources that you wish to be located in the center of the stereo field should be set to equal levels out of Outputs 1 and 2

An alternative to using the ARC for hardware monitoring is to use ASIO Direct Monitoring.

8.2.5   ASIO Direct Monitoring (Windows Only)

The ASIO Direct Monitoring (sometimes referred to as "hardware monitoring") feature offered in many popular third party applications provides a means to enable low-latency monitoring supported by the Aurora's on-board digital mixer. Instead of using the Aurora Remote Control software to manually enable monitoring as discussed in the previous section, controls within the audio application provide convenient access to this functionality.

Additionally, some applications offer "tape type" monitoring whereby inputs are monitored only when recording is taking place. When utilizing Direct Monitoring from a recording application, it is not possible to use the ARC Mixer simultaneously for routing since the ARC gets disabled when an ASIO app is launched. Please note that any custom routing that had been established in the ARC will be overwritten when an ASIO application is launched, unless Direct Monitoring is disabled – see Section 8.2.5.2, Disabling Direct Monitoring.

When Direct Monitoring is enabled in an application, it can control Sources C through R for analog outputs 1 through 4. These are the monitor sources accessible from the output 1-4 tabs in the ARC Analog Page. Analog outputs 5 and above, and the digital outputs of the Aurora are not accessible via ASIO Direct Monitoring.

When an ASIO application is launched, the following events will occur:
- TO ANALOG OUT on the Aurora will switch to remote mode (all 3 LEDs will illuminate on the front panel)
- For the analog outputs, Source A will switch to Digital Inputs 1-16 (or 1-8 on an Aurora 8) and Source B will switch to LSLOT 1-16 (1-8 on Aurora 8). These sources will overwrite any existing monitor sources in these positions.
- If the ARC software is open, it will automatically close down. The ARC software cannot be open at the same time as an ASIO application when Direct Monitoring is active. See Section 8.2.5.2, Disabling Direct Monitoring, for information about how to disable Direct Monitoring support.
- Any monitor sources that had been defined for sources C through R on analog outputs 1-4 will be cleared.
- Up to 16 sources can be assigned to analog out 1-4 from within the recording software.

8.2.5.1 Panning

Since panning of mono input sources is available with Direct Monitoring, even though pan controls are not a feature of the ARC software, each mono source is assigned to both channels of an output pair (i.e. Output 1 and Output 2). When a mono signal is panned from within the host application, the level sliders under each monitor source will move accordingly. As an example: If Analog In 1 Left is being monitored on Analog Out 1 and Analog Out 2, when you pan the input signal to the left the Monitor Source Volume for Analog Out 1 increases and the Monitor Source Volume for Analog Out 2 decreases.

Since this feature relies upon code within a third party application to operate, different software versions may behave differently than described

8.2.5.2 Disabling Direct Monitoring

In some cases it is desirable to disable the Direct Monitoring features of the LT-FW. For instance, if an ASIO application is used that does not support Direct Monitoring then it may be necessary to establish hardware monitoring from the ARC, or in cases where monitoring schemes not supported by the LT-FW Direct Monitoring implementation are required.

To disable Direct Monitoring open the LT-FW ASIO Control Panel from within the ASIO recording software. Put a check next to "Ignore Direct Monitor Requests". This switch is application specific, so if different ASIO apps are used this would need to be done in each application.

If the ARC software does not launch when an ASIO application is open after disabling DM Requests, then check to see if the Aurora MIDI driver is active within the application. If it is, disable it from the applicable hardware setup menu, then try launching the ARC again.

9 Troubleshooting

Continuous Clicking, popping or crackling noises in your audio:
1. Check clock master settings. In any digital audio configuration, there can be one, and only one master clock. All other digital audio devices must be configured as slaves to the designated master clock. Since the Aurora's SynchroLock™ technology provides an extremely stable and jitter-resistant clock, we recommend setting the Aurora as the master clock in your digital audio system.
2. Check buffer settings in your audio application software. Smaller buffer sizes are preferred because they reduce latency (the time it takes for an audio signal to travel through your audio software). In some cases, however, setting too small a buffer size can overtax your computer's processor, particularly when running multiple tracks and/or a number of DSP plug-ins. This can result in clicks and pops in your audio playback. Try increasing the buffer size from the ARC software or from an ASIO Control panel if applicable and see if your playback performance improves.

Single clicks at regular intervals are heard during audio playback:
In some cases, there can be a conflict between FireWire devices as active sync master that can result in this symptom. To resolve, close any open audio software and the ARC and reset the LT-FW either by removing then reinserting the FireWire cable, or by turning the Aurora off for 5 seconds, then turning it back on.

The Aurora shows up in the Operating System as a usable device, but will not pass audio:
1. Make sure that the Aurora has been assigned as the active device in the application being tested. Many audio applications allow a specific audio device to be selected from a configuration menu. Other applications will use whatever the operating system default device is. In this case verify that the Aurora has been configured as the default playback device for the system.
2. Check the ARC software and see if there is meter activity for the appropriate outputs being used. If there is, check the cable connections from the Aurora analog or digital outputs to the monitoring equipment.
3. Close the ARC and any audio applications and reset the LT-FW either by removing then reinserting the FireWire cable, or by turning the Aurora off for 5 seconds, then turning it back on.
4. Verify that the Aurora has firmware revision 18 or above. To determine what firmware revision your Aurora has, press the TRIM and POWER buttons at the same time with the power to the Aurora off. If the LED flashes over the numbers 1 on the input row & 8 on the output row or above (i.e. 1&9, 2&0, etc.) in the Aurora Meter Display, then your unit is compatible with the LT-FW. If pressing Power and Trim does not cause any LEDs to flash, causes a sequence lower than 18 to flash, or causes a single number to flash, then your unit needs to be updated.
5. Try the Aurora LT-FW hardware test from the Lynx Support Website.

"LSLOT" is selected as the Aurora SYNC SOURCE but SynchroLock will not engage. The SynchroLock status Says "Range" in ARC:
When LSLOT is used as a clock source, the computer's FireWire interface provides the clock signal that the Aurora slaves to. Many FireWire devices output clock signals that are too inaccurate to be used as a reference by the SynchroLock clocking system. For this reason, we recommend selecting "Internal" as the clock source instead of "LSLOT".

There is an error message during the driver installation:
1. Verify that the LT-HD has been installed correctly and there is an LED illuminated on the LT-FW board. See Section 5, Installation Procedures.
2. Verify that the FireWire cable is connected correctly and that the computer FireWire ports are active and the drivers are functional.
3. Verify that your Aurora has firmware revision 18 or above

With ASIO Direct Monitoring some channels are not responding:
ASIO Direct Monitoring is only implemented on the LT-FW for Analog Outputs one through four. If Direct Monitoring is attempted for any other outputs then it will not function.

Aurora Remote Control does not respond to parameter changes or is not responding as expected:
1. If there is an AES16 card connected to the Aurora on the same computer as the LT-FW FireWire connection, than the ARC will not function correctly. Disconnect the AES16 from the Aurora and re-launch the ARC.
2. If the Aurora MIDI Ports are connected to a MIDI interface on the host computer, disconnect the MIDI cables in the back of the Aurora and re-launch the ARC.
3. What is the connection medium described from the "About Aurora Remote Control" Dialog box? If connection via IRDA is indicated, disconnect or disable the Infrared transceiver on the host computer.
4. Close the ARC and any audio applications and reset the LT-FW either by removing then reinserting the FireWire cable, or by turning the Aurora off for 5 seconds, then turning it back on.

Surround sound material is only playing back through 2 channels:
Windows:
1. Verify that a multi-channel mode has been selected for the LT-FW from the ARC LT-FW menu.
2. Verify that the playback software has been selected for multi-channel, or surround sound playback.
3. Download the ChannelPlacement.zip file from http://www.lynxstudio.com/drivers/. Unzip it to the desktop. Open the Lynx Demo application (Start > Programs > Lynx Studio Technology > Lynx Demo), and set the play device to the appropriate Aurora multi-channel output, click "File" and open the CehannelPplacement.wav file on the desktop. You should see playback meter activity sequentially through the fist 6 channels of the selected, multi-channel output.

OS X:
1. Check Applications > ~~Ultilities~~Utilities > Audio MIDI Setup. Click Configure Speakers > MultiChannel. Choose a surround mode and verify that a different LTFW device output is assigned to each channel.
2. Insure that your media player supports surround sound, and is configured for surround sound operation.

The Sample rate on the Aurora front panel does not match the sample rate of the audio material being played:
If the Aurora is operating on an Internal, External, or AES input SYNC SOURCE, you must manually select the rate of the audio material to be played from the ARC before initiating playback. With external clocking you must also set the sample rate to the desired rate on the clock master device. Otherwise, the playback streams may be sample rate converted by the operating system, compromising playback quality.

With applications that use the ASIO driver model, the sample rate will change automatically to reflect the project sample rate when the Aurora is operating off of its internal clock.

10 Support

We are devoted to making your experience with the LT-FW trouble-free and productive. If the troubleshooting and operational sections of this manual did not help resolve your questions, several support options are available to you:

10.1 Lynx Website Support Resources

Logging on to http://www.lynxstudio.com/support.html will provide several options for resolving your support issues:

Support Ticket

For direct attention from the Lynx Technical Support Staff, registered users can submit a support ticket online that details their problem and steps they've taken to resolve it. Most Support Ticket submissions are responded to within 24 hours.

Frequently Asked Questions

An extensive catalog of FAQs derived directly from our most common tech support inquiries. Our FAQ section is updated regularly and designed to allow users to find the answers to their most common questions quickly.

Firmware and Driver Downloads

A library of current firmware and driver files is available for download and installation. Check back regularly to insure that your Aurora and LT-FW are up-to-date.

Lynx Support Forum

An online Lynx users support forum provides a venue for customers to post questions and issues and receive responses from other users as well as Lynx technical administrators. Searching previous posts is often an excellent way to uncover valuable information about Aurora operation and troubleshooting. See http://www.lynxstudio.com/forum

10.2 Telephone Support

Telephone support is available by calling +1 (714) 545-4700 extension 206 from 9AM to 5PM Pacific Time, Monday through Friday, excluding United States Holidays.

10.3 Registering your LT-FW

Lynx is committed to providing you with the best service possible. To help us serve you better, please be sure to register your Aurora using one of the following methods:

Fill out and mail the Warranty Registration Card included with your LT-FW.
Register on the web at: http://www.lynxstudio.com/support.html
Once you are registered you will automatically receive notifications of new products and upgrades.

10.4 Return Policy

If you have a unit that you suspect is defective or is malfunctioning, contact Lynx technical support via one of the means described above for diagnosis. If the technician determines that the unit is faulty, they will issue an RMA number so you can send the unit in for repair. Units received without a valid RMA number will be refused. All RMA numbers are valid for 30 days from the date of issue.

10.5 Locating the Serial Number of Your LT-FW

To register your LT-FW, you must supply its serial number. The serial number is located   on a label attached to the back of the card, and on the shipping carton.

11 License Agreement

This legal document is an agreement between you and Lynx Studio Technology, Inc. By opening the sealed board package, or written materials, you are agreeing to become bound by the terms of the agreement, which includes this License and Limited Warranty (collectively the "Agreement"). This Agreement constitutes the complete agreement between you and Lynx Studio Technology, Inc. If you do not agree to the terms of the Agreement, DO NOT OPEN the anti-static bag containing the LT-FW board. Promptly return the unopened package and all other items using the original packaging to the location of purchase.

12 Warranty Information

<div align="center">

One year Free Labor / One year Parts Exchange
This product must be returned to the factory for repair.

</div>

Who Is Covered?

You must have proof of purchase to receive warranty service. A sales receipt or other document showing when and where you purchased the product is considered proof of purchase. This warranty is enforceable only by the original retail purchaser. To be protected by this warranty, the purchaser must complete and return the enclosed warranty card or register online within 14 days of purchase.

What Is Covered?

Warranty coverage beings the day you buy your product. *For one year thereafter*, Lynx shall, at its sole and absolute option, either repair or replace free of charge any product that proves to be defective on inspection by Lynx or its authorized service representative. In all cases disputes concerning this warranty shall be resolved as prescribed by law. All parts, including repaired and replaced parts, are covered only for the original warranty period. When the warranty on the product expires, the warranty on all replaced and repaired parts also expires.

What Is Excluded?

You warranty does not cover:

- Labor charges for installation or setup of the product.
- Product repair and/or part replacement because of misuse, accident, unauthorized repair or other cause not within the control of Lynx.
- A product that requires modification or adaptation to enable it to operate in any country other than the country for which it was designed, manufactured, approved and/or authorized, or repair of products damaged by these modifications.
- Incidental or consequential damages result from the product, damage to property, damage based on inconvenience or on loss of use of the product, and, to the extent permitted by law, damages for personal injury. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you.
- A product that is used for rental purposes.

To Get Warranty Service…

To obtain warranty service, the purchaser must first call or email Lynx at the email address or telephone number printed in Section 0 to obtain a Return Authorization Number and instructions concerning where to return the unit for service. All inquiries must be accompanied by a description of the problem. All authorized returns must be sent to Lynx or an authorized Lynx repair facility postage prepaid insured and properly packaged. Proof of purchase must be presented in the form of a bill of sale, canceled check or some other positive proof that the product is within the warranty period. Lynx reserves the right to update any unit returned for repair. Lynx reserves the right to change or improve design of the product at any time without prior notice.

Lynx Studio Technology and the Lynx Logo, LT-FW and the LT-FW Logo, Aurora and the Aurora Logo are all trademarks of Lynx Studio Technology, Inc. All other product or company names are the trademarks or registered trademarks of their respective owners.

LT-FW™ User Manual, January 31, 2011.