



LT-USB USB 2.0 LSLLOT Interface User Manual

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LT-USB

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1 Introduction

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

This manual covers operation, product characteristics, and information to help you get started. Additional information is available via our website's support resources. Please refer to [Section 10](#), Support, at the end of this manual for support contact information.

The LT-USB is an LSlot expansion interface that is designed to allow the Aurora professional audio AD/DA converters to be used with USB 2.0 equipped laptop and desktop computers. The LT-USB 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 8 channels with an Aurora 8.

From laptops, to the most powerful servers, USB ports are found on nearly every computer system in production. For the first time ever, Aurora converters can be used with virtually any computer.

1.1 Overview

The Aurora/LT-USB turns your computer into a powerful digital audio workstation, providing up to 16 total channels of mastering quality analog inputs and outputs at sampling rates up to 96 kHz, and up to 8 channels at 176.4 kHz or 192 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-USB.

The LT-USB features a USB 2.0 Device port (Type B) which is typically connected to a computer via a standard high-speed USB 2.0 cable (provided). Installation of the LT-USB into an Aurora is straightforward, as is the driver installation routine (Please note that driver installation is not required for OS X – native support is provided by the operating system).

The Aurora Remote Control application allows control and status of hardware parameters such as Sample Rate, Clock Source, Trim levels, and routing. On Windows systems, an independent LT-USB control applet provides access to other important parameters such as buffer size, device settings and status.

The LT-USB was designed with adaptability in mind. The hardware can be field programmed through simple firmware updates which can be downloaded from the Lynx Studio Technology website. In this way, the product's functionality and feature-set can be easily upgraded by the end-user.

1.2 Features

- USB 2.0 Device port (Type B)
- USB Audio Class 2.0 compliant
- With an Aurora 16, provides 16 channels of I/O at sample rates up to 96 kHz and 8 channels at up to 176.4/192 kHz
- With an Aurora 8, provides 8 channels of I/O at all sample rates
- Supports routing of USB audio streams to Aurora's AES/EBU outputs
- Works with almost any USB 2.0-equipped computer
- Supports ASIO and WDM for Windows and CoreAudio for Mac OS X
- Fully supports current operating systems, Windows 7 and OS X 10.6.4+, as well as Windows XP and Vista
- 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 and Core Audio implementation allows multiple channel support of 5.1 and 7.1 surround playback formats
- Easily installed into Aurora
- Supports external clocking with Windows and OS X
- Field programmable
- Ideal for fixed location or mobile 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-USB. 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-USB.

2.1 In the box

The following items are included in your LT-USB carton:

- LT-USB card in an antistatic bag
- One 6' long Type-A to Type-B shielded USB 2.0 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-USB:

1. The host computer must have a compatible and functional USB 2.0 port.
2. The host computer must meet the system requirements necessary for correct functioning of the LT-USB.
3. The Aurora must have firmware revision 24 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-USB. Please refer to your audio software's documentation for more information.

2.2.1 Windows

- Intel Core 2 @ 1.6 GHz, or AMD equivalent
- PC or laptop manufactured after January 2006
- 1GB RAM
- One functional USB 2.0 port
- Windows XP with **SP3** (32-bit), Windows Vista with **SP2** (32-bit or 64-bit) or Windows 7 (32-bit or 64-bit)

NOTE: The LT-USB is not supported under Windows 95, 98, ME or Windows 2000. Windows installed via BootCamp is not officially supported.

2.2.2 Macintosh

- Any Intel Processor based Mac or MacBook computer running OS X 10.6.4 or higher
- 1GB RAM
- One functional USB 2.0 port

NOTE: The LT-USB is not supported under OS 9 or OS X 10.6.3 or below.

2.2.3 Insuring compatible firmware on the Aurora

The LT-USB requires your Aurora converter to have Firmware Version 24 or later. This should be verified prior to installing and configuring the LT-USB 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 2 on the input row & 4 on the output row or above (i.e. 2&5, 2&9, etc.) in the Aurora Meter Display, then your unit is compatible with the LT-USB. If pressing Power and Trim does not cause any LEDs to flash, causes a sequence lower than 24 to flash, or causes a single number to flash, then your unit needs to be updated.

If your Aurora has firmware version 13 or above, it can be updated by an Apple Macintosh running OS X or a Windows PC with a MIDI interface. The Aurora firmware updater program and instructions for use are available for download from the Lynx website at Support > Downloads. If your unit has rev 12 or earlier, please contact Lynx Technical Support (U.S. or Canada) or your local distributor for firmware update options. Please note that Auroras manufactured in 2006 or later should have firmware revision 13 or above.

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-USB using one of the following methods:

Fill out and mail the Warranty Registration Card included with your LT-USB.

Register on the web at: www.lynxstudio.com > Support > Register Your Product

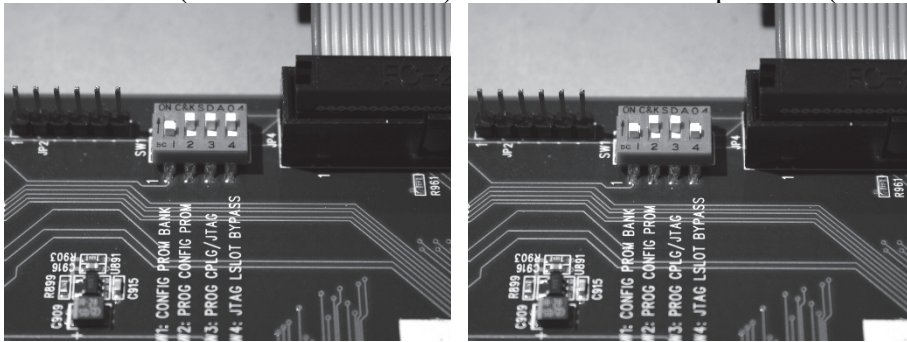
Once you are registered you will automatically receive notifications of new products and upgrades.

5 Installation Procedures

Please insure that the Aurora has firmware 24 or above before proceeding. See [Section 2.2.3](#)

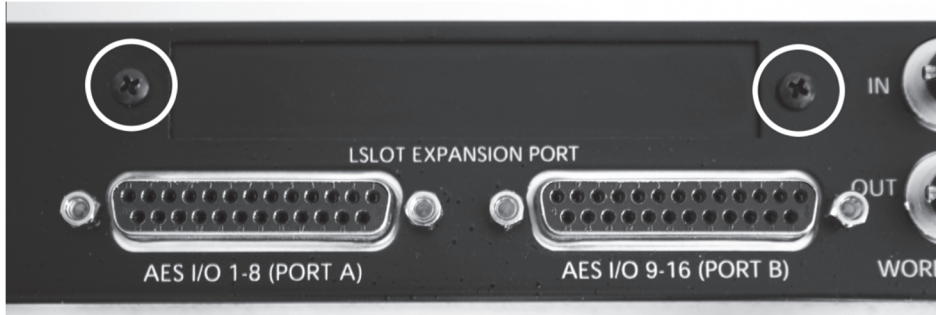
1. Remove the AC power cord and take the top cover off of the Aurora. There are seven large screws plus one small screw near the center of the front faceplate that holds the top cover on.
2. Before installing the LT-USB card, you must change a dipswitch setting on the Aurora that corrects the current draw for an Aurora with an LT-USB

Slide switch 4 (labeled W4 on PCB) of SW1 to the OFF position (towards back panel).

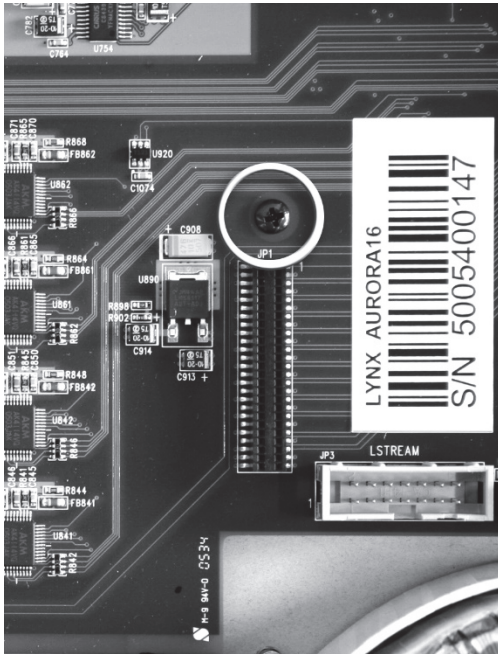


If you are updating an older Aurora that has jumper pins at JP6, instead of the W4 switches, please call Lynx Technical Support for instructions.

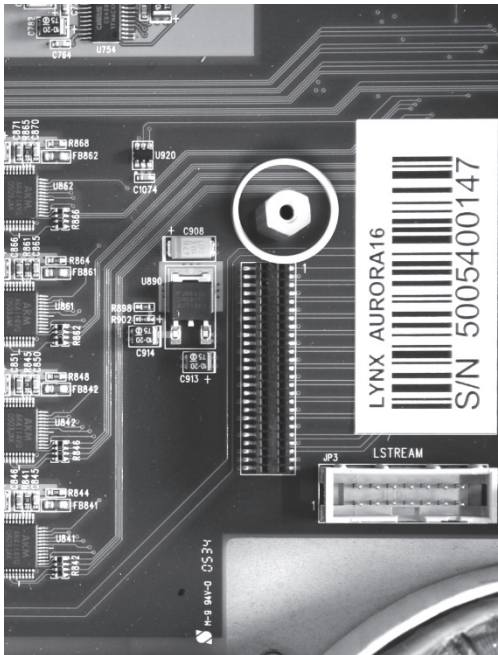
3. Remove the LSILOT Expansion Port cover above the AES I/O Ports by removing the two mounting screws. Set these two screws aside, as they will be used to secure the LT-USB after installation.



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-USB) in this same hole.

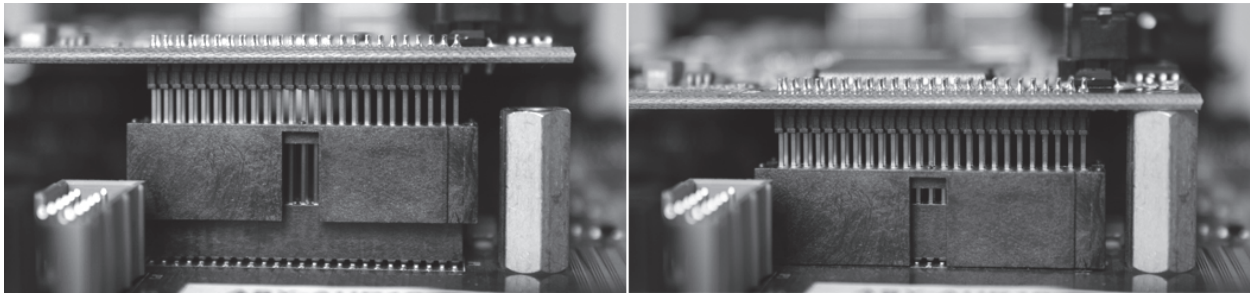


6. Grounding yourself to earth ground, remove the LT-USB from its protective anti-static bag.

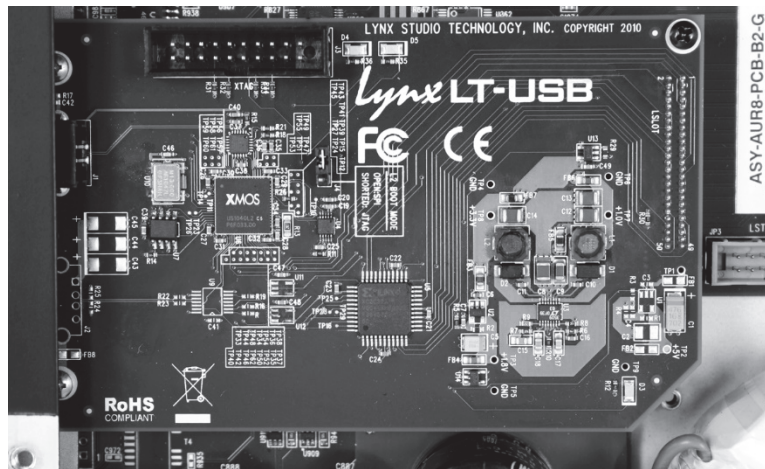
- Attach the multi-pin connector on the back edge of the LT-USB to the L SLOT connector (JP1) on the Aurora mainboard. The LT-USB L SLOT connector has a protective sheath to insure that the pins line up correctly with the Aurora L SLOT connector. When the LT-USB connector pins appear to be lined up correctly with the Aurora L SLOT connector, press gently until the connector snaps into place. In some cases, the board may need to be gently flexed for the L SLOT connector pins to line up correctly with JP1 on the Aurora mainboard.



Use caution to insure that the pins line up as shown. Incorrect installation could damage the unit.



- Secure the LT-USB with three screws; one on the standoff and two from the back panel of Aurora. Keep screws loose until the LT-USB is properly aligned, then tighten snugly, but do not over tighten.



9. Reinstall the Aurora lid 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-USB from the slits in the Aurora top cover. If the green LED on the LT-USB lights up, the installation was successful. If the LED does not light, unplug the Aurora and re-mount the LT-USB, 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 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-USB, the SYNC SOURCE can only be from changed from the front panel of the Aurora *while the USB cable is disconnected*. After the SYNC SOURCE is selected and Synchrolock has achieved full lock, reconnect the USB cable. When the USB connection is active, the Aurora will enter a lock-out mode, where some parameters such as SYNC SOURCE/SAMPLE RATE cannot be altered from either the front panel or Remote Control software.

5.1.1 Using the Internal Clock

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

In this state, the Aurora can respond to sample rate changes from audio software, but not all applications will send these rate change requests.

In all compatible versions of Windows, ASIO applications will generally request sample rate changes to follow the project sample rate, or the rate of the audio being played.

In Windows XP, applications using the WDM/DirectSound or MME/Wave Out driver models will also typically request a sample rate change of the driver to match the project or audio file rate.

In Windows Vista and Windows 7, WDM/DirectSound and WASAPI applications do NOT typically request sample rate changes. Instead they rely upon Sample Rate conversion built into the operating system to convert the play rate to the rate of the audio hardware. If one wishes to avoid the effects of this rate conversion, the sample rate can be changed globally from the Sound section of Windows control panel (Sound > Properties > Advanced). After changing the sample rate, the play application often will need to be restarted.

In OS X, some Core Audio applications will initiate a change of sample rate to match the project or audio file being played, and others will not. For the most part, professional audio recording software does request sample rate changes, and consumer or media playback software does not. Examples of the former would be Logic, ProTools, Cubase, Digital Performer, etc. Examples of the latter would be iTunes, DVD playback software or Quicktime.

When the application does not request a sample rate change, and one wishes to avoid sample rate conversion, the sample rate can be changed from within Audio MIDI setup in OS X to match the desired sample rate. After changing the sample rate, the play application often will need to be restarted.

5.1.2 Using External / AES A / AES B Clock

The Aurora can slave to a master/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-USB. See the Aurora manual for more information about these SYNC SOURCE choices.

If you wish to use the Lynx Synchrolock technology while clocking externally, it is crucial to ensure Synchrolock has fully engaged before connecting the USB cable to the host computer. Synchrolock engaging while the USB bus is active could cause loud, highly distorted signal.

5.1.3 Using LSLLOT Clock

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

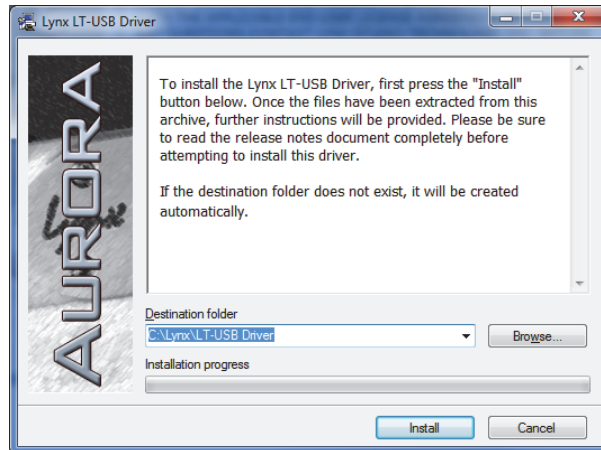
5.2 Installing the Driver and Aurora Remote Control Application

The Lynx Installation CD contains all driver files and utilities mentioned in the subsequent installation steps, as well as the LT-USB 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/> > Support

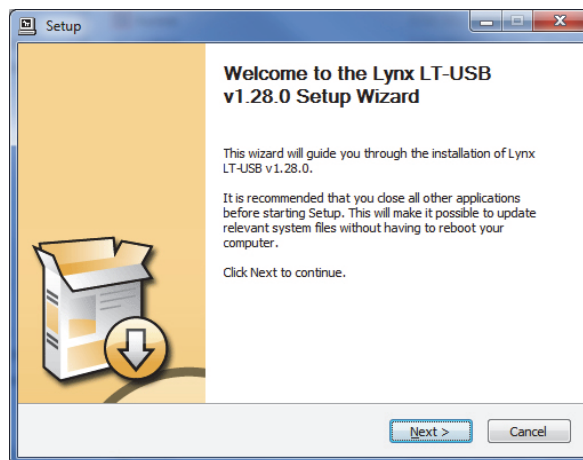
If you have downloaded more recent drivers than those included on your Lynx Installation CD, the following instructions can still be followed. Launch the driver install file from the download rather than from the CD. If a previous driver version is present, it will automatically be removed as part of the driver installation process. Note: no driver installation is required for OS X, only for Windows.

5.2.1 Windows XP, Vista (32-bit or 64-bit), or Windows 7 (32-bit or 64-bit)

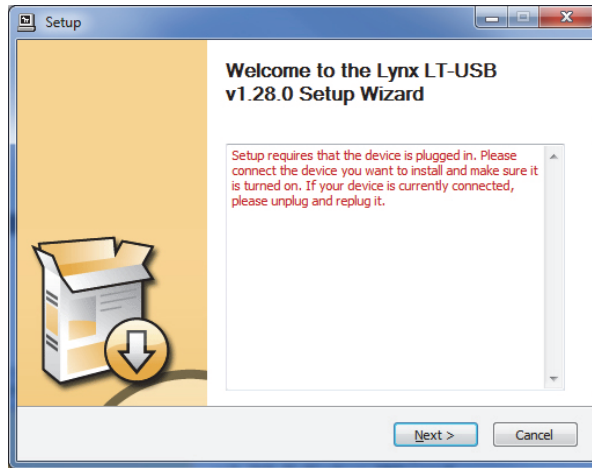
1. Power on the Aurora with the USB cable disconnected. From the front panel, set the TO ANALOG OUT button to “LSLOT IN”.
2. The LT-USB driver should be installed prior to connecting the Aurora to the computer. Insert the Lynx Installation CD into your computer’s disk drive.
3. Locate the Windows\LT-USB folder on the CD. Double-click the LTUSBSetup.exe file.
4. When prompted, accept the default destination folder of C:\Lynx and click “Install”.



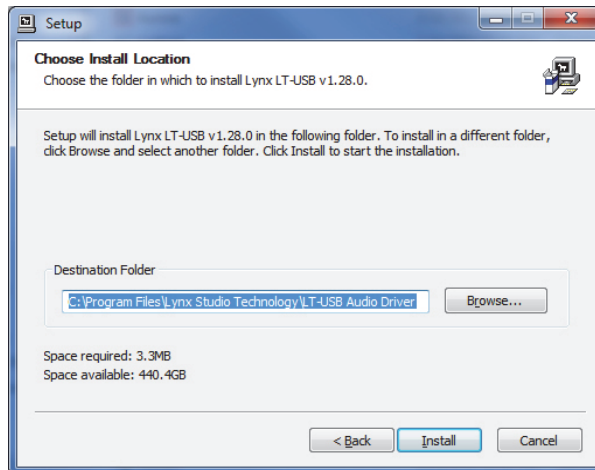
5. Click “Next >” on the welcome screen



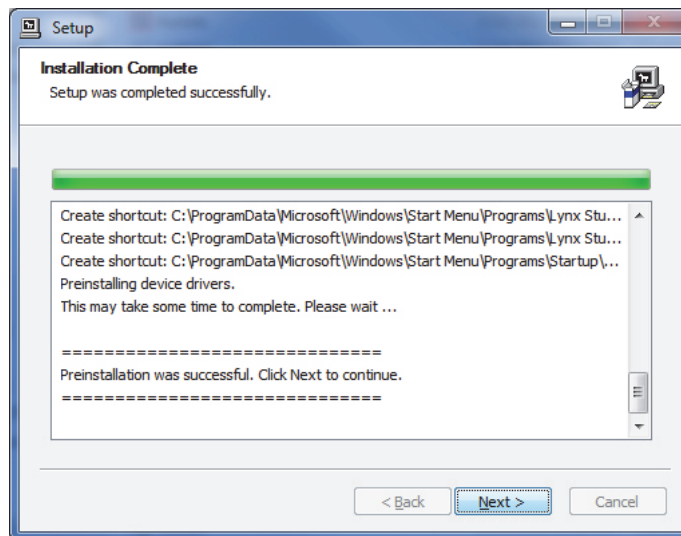
6. The system will search for the LT-USB and should be unable to find it. Connect the LT-USB and click “Next>”



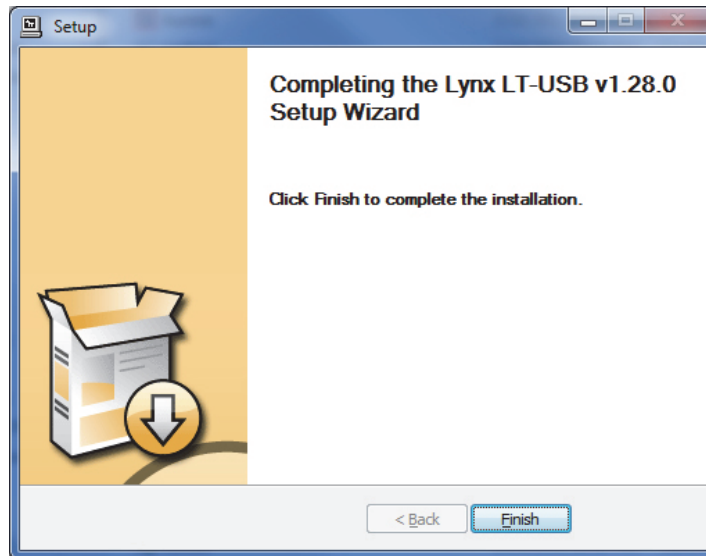
6. Accept the default destination folder for the driver files and click “Install>”



7. After installation has completed, click “Next >”



8. Click “Finish >”.



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. On some systems the Windows hardware wizard will launch post driver installation. In this case, run the wizard using the “Automatic Installation” option, accepting the defaults, until it completes. Skipping this step may cause the driver to function incorrectly.
11. When the installation is finished, you can launch the Aurora Remote Control application from Start > All Programs > Lynx Studio Technology. For more information, see Section 7, Aurora Remote Control Application Reference.

5.2.2 OS X

1. The LT-USB uses the built-in USB 2.0 audio class driver provided in OS X 10.6.4 and up. No additional driver installation is required. Power on the Aurora with the USB cable disconnected. From the front panel, set the TO ANALOG OUT parameters to “LSLOT”.
2. Simply connect the appropriate USB cable from the Aurora to the computer’s USB 2.0 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-USB folder on the CD. Double-click the AuroraRemoteInstaller.pkg file. For more information, see Section 7, Aurora Remote Control Application Reference.

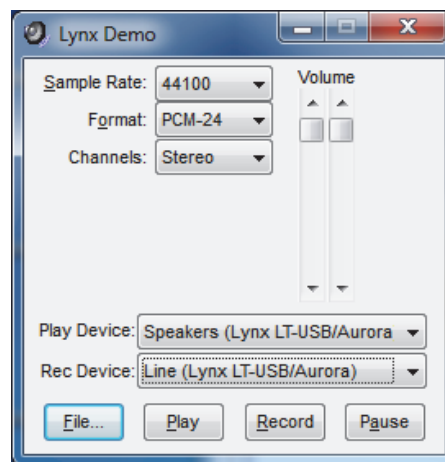
6 Getting Started

With the LT-USB 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.

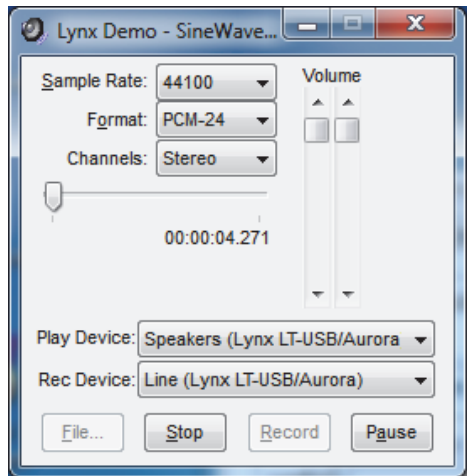
6.1 Windows Quick Audio Test

The installation of your LT-USB 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.

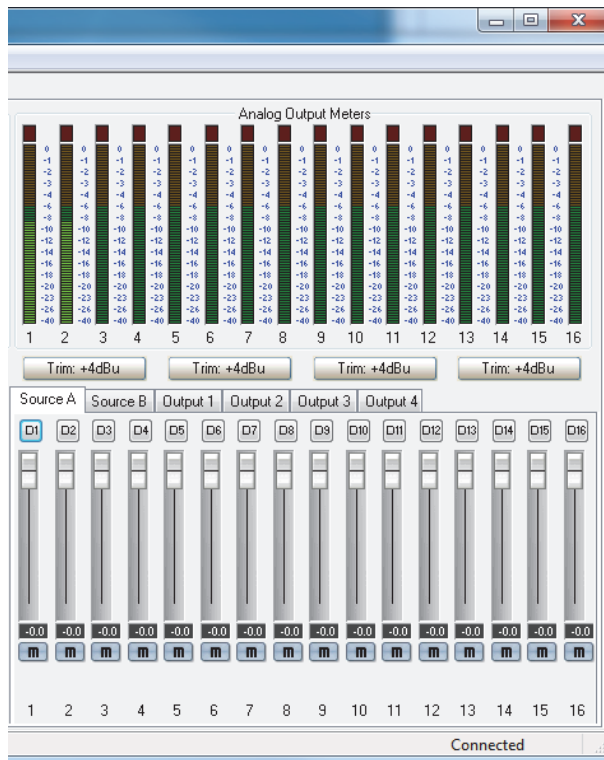
1. Connect the Analog Outputs of the Aurora to monitoring equipment capable of delivering an audio signal for listening via headphones or speakers. Depending on your external equipment, you may be using the Lynx CBL-AOUT85 or a third party equivalent. Verify that Analog Outs 1 & 2 of the Aurora are connected 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. This is the default state of the Aurora. If this has been altered, disconnect the USB cable and select INT from the Aurora front panel and then reconnect the USB cable.
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 LT-USB/Aurora



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.



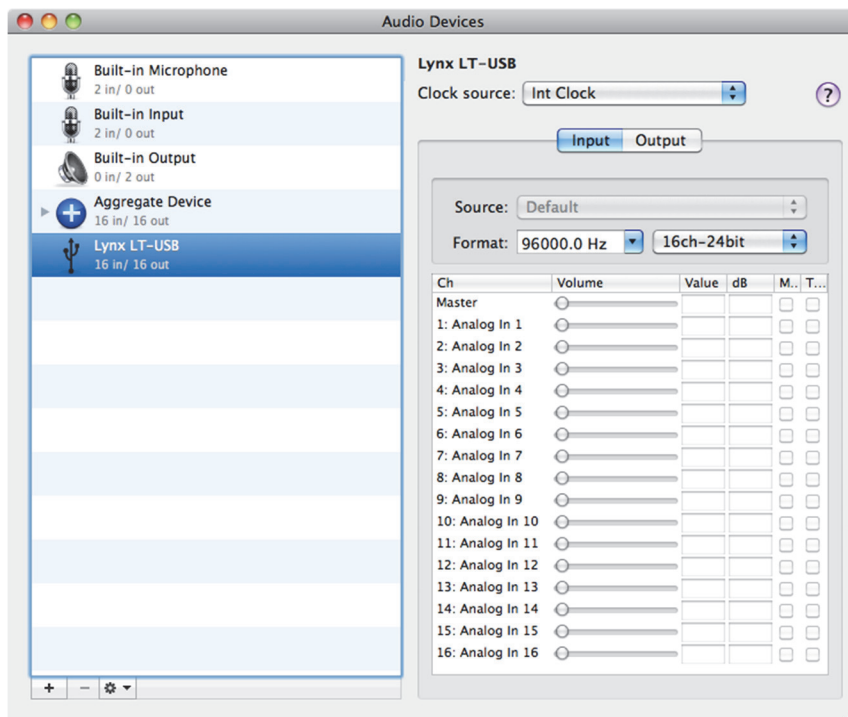
If the test did not operate as described or you received any errors, please refer to [Section 10](#),

Troubleshooting.

6.2 Macintosh Quick Audio Test

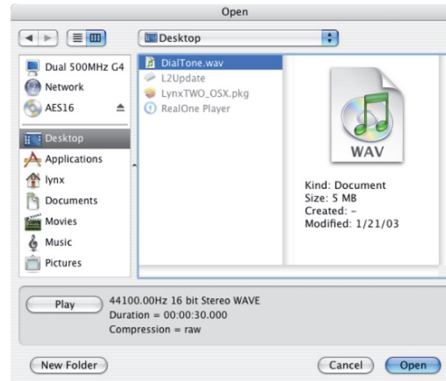
The installation of your LT-USB can be tested using the Aurora Remote Control application and the iTunes software that is included with OS X. This is a quick way of verifying that the interface is installed correctly and properly connected to your external equipment.

1. Open Audio MIDI Setup from Applications > Utilities.
2. If the Audio Devices window does not appear automatically, then select “Show Audio Menu” from the “Window” menu.
3. All available audio devices will appear in the left pane. Locate the Lynx LT-USB from this list.

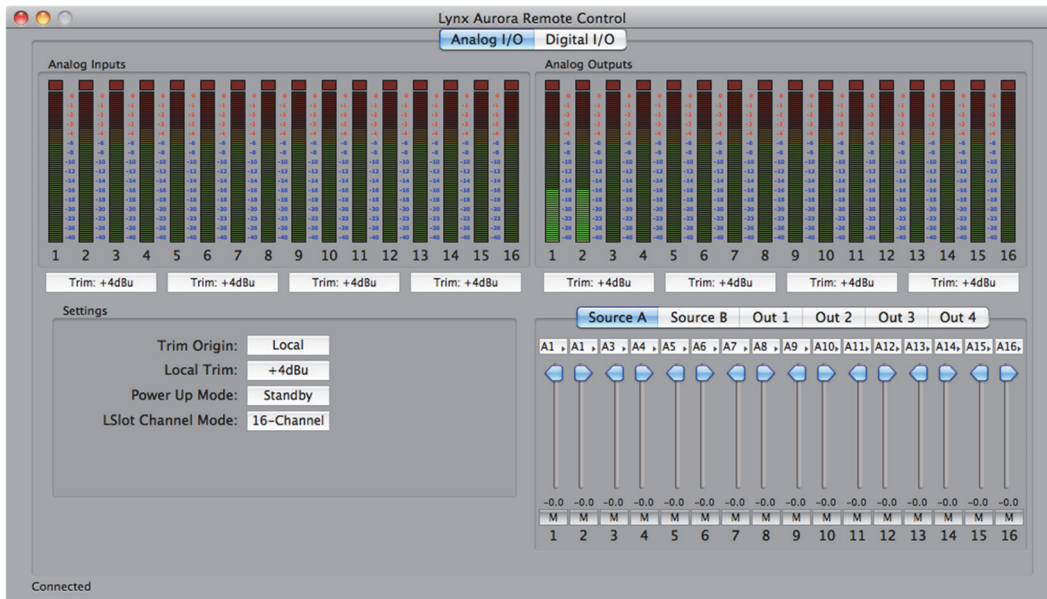


4. Select this device. From the Gear icon in the bottom left corner, click “Use this device for sound output”
5. Locate “SineWaveMinus16.aif” in the “support” folder of the Lynx Installation CD. Drag the file to the computer’s desktop.
6. Connect the Analog Outputs of the Aurora to monitoring equipment 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.

7. For this test we will set the Aurora to Internal as the clock source. This is the default state of the Aurora. If this has been altered, disconnect the USB cable and select INT from the Aurora front panel and then reconnect the USB cable.
8. Launch iTunes from “Applications” or from the OS X dock. Drag the “SineWaveMinus16.aif” file from your desktop into the iTunes songlist



9. Highlight this file from the songlist and click the Play button. Make sure that the iTunes progress bar is moving from left to right.
10. 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 10](#),

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 displays status information such as channel mode, sync source and sample rate. The ARC is automatically installed with the Windows driver setup program, and is a separate install under OS X (see Section 5.2, 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 USB 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

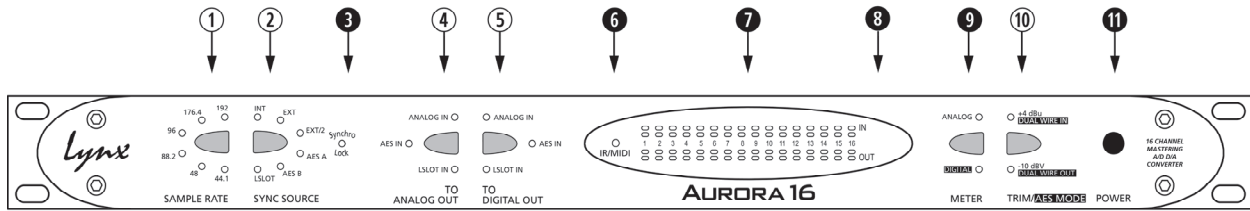
Make sure that the Aurora is powered up, and that the Aurora is connected to the computer by a USB cable. From Finder, click Applications > Aurora.

7.3 General Operation

The Aurora Remote Control Application allows the user to control output levels, route inputs to outputs, alter various parameters, and view accurate meters for inputs and outputs on a connected Aurora. Most 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-USB 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 or from settings within the operating system. 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. Sample rate can only be set from within the host audio application and/or an operating system sound settings page.

② SYNC SOURCE

This button will not be active. The LED for the sync source, which has been selected prior to the connection of the USB cable, will illuminate.

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.

③ SynchroLock

This LED will function normally. See the Aurora manual a description of SynchroLock. The SynchroLock status must be established prior to the connection of the USB cable.

④ TO ANALOG OUT

This button will not be active. For operation with the LT-USB, 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 USB 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-USB, Remote Routing mode with LSLOT sources assigned should be selected with the ARC application. 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.

⑥ IR/MIDI

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

⑦ Peak Meters

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

⑧ IR Transceiver

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

9 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.

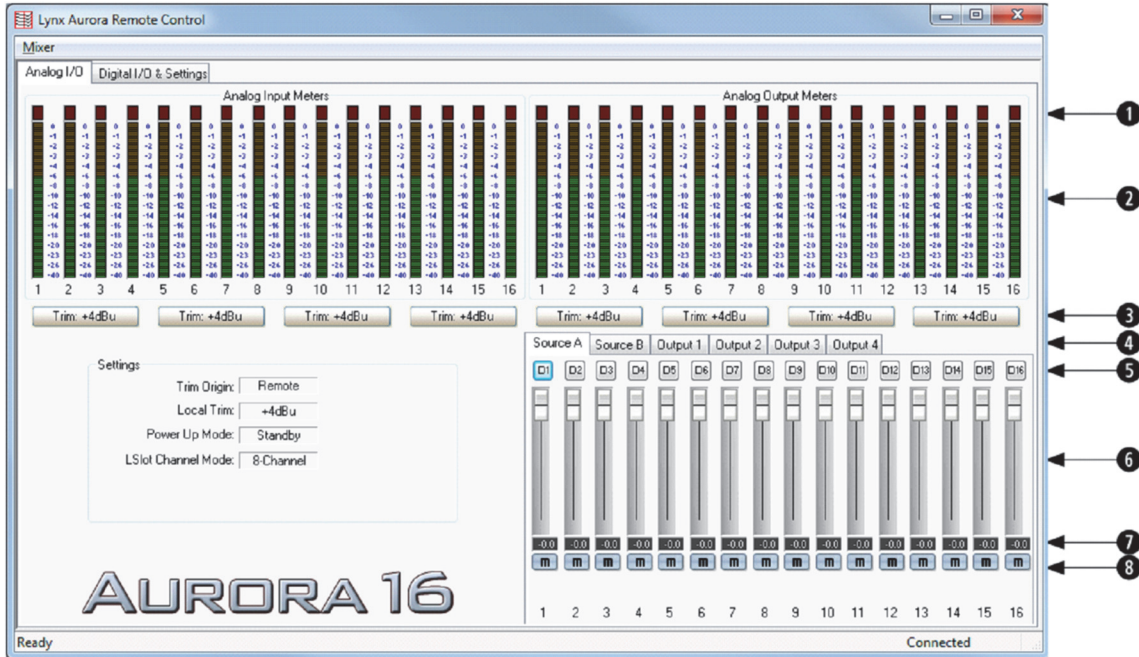
When the METER select is set to “Digital”, this control allows configuration of the AES/EBU digital I/O. In “Lock Out” mode, the button will not be active, but the LEDs will reflect the dual-wire state for the digital inputs and outputs.

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.



- 1 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.
- 2 These meters display the instantaneous peak level of audio being sent to the Aurora Analog Inputs and Outputs.
- 3 These buttons allow the Analog input or output trims to be set. Each button allows groups of four channels to be toggled between +4dBu (the default) and -10dBV.
- 4 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.
- 5 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 LSLLOT 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).

Please note that with an LT-USB installed, LSLOT sources correspond to audio streams coming from the host computer.

- ⑥ 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.
- ⑦ This display reveals the amount of attenuation, in dB, of a monitor source.
- ⑧ This button enables the mute function for the associated monitor source.

Settings

This display reveals the trim, power up, and current channel mode setting of the Aurora.

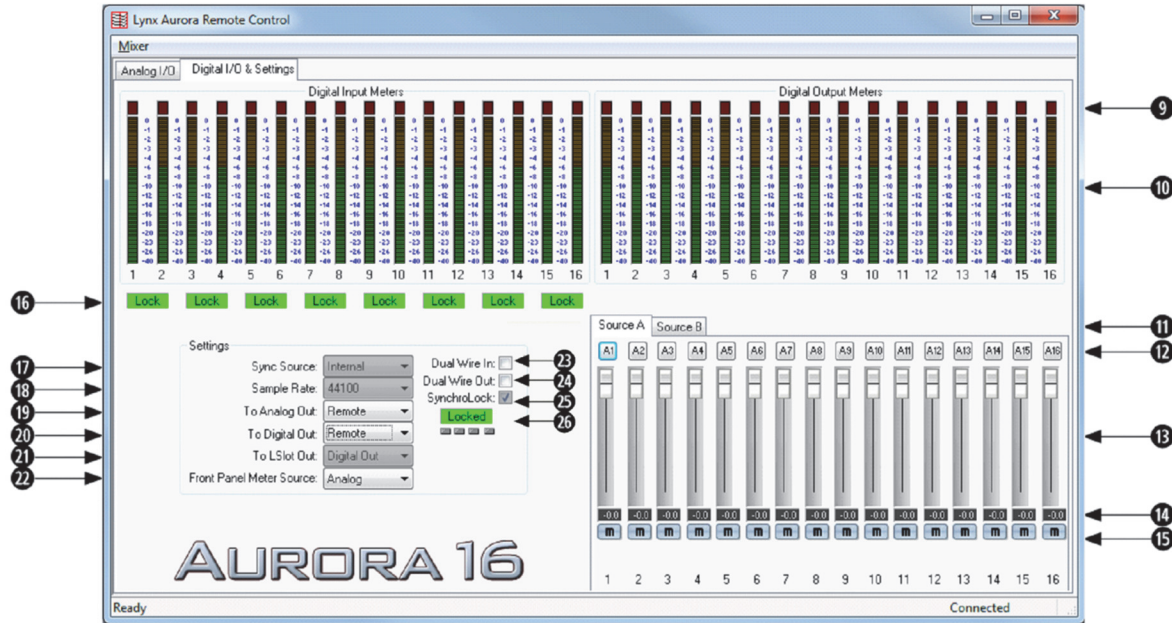


When TRIM ORIGIN is set to “Remote”, the Aurora trim levels are set on a 4-channel per group basis controllable from the ARC. When set to “Local”, the trims follow the value displayed in LOCAL TRIM, which is controllable from the front panel TRIM button.

When POWER UP MODE is set to “Standby”, the Aurora can only come out of standby mode by pressing the black standby button on the Aurora front panel. When set to “On”, applying power to the AC input of the Aurora will immediately power on the Aurora, thereby bypassing standby mode. This control can be toggled by holding down the black standby button as AC power is applied.

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.



- 9 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.
- 10 These meters display the instantaneous peak level of audio being sent to the Aurora Digital Inputs and Outputs.
- 11 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.
- 12 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 L SLOT input source. Holding down the CTRL key while selecting a source causes the remaining channels to be set sequentially (i.e. if you select L SLOT In 1 as the monitor source for Digital Out 1 while holding down the CTRL key, L SLOT In 1-16 will be assigned to Digital Out 1-16).

Please note that with an LT-USB installed, L SLOT sources correspond to USB audio streams coming from the host computer. By default these audio streams are delivered

to the Analog Outputs. By manually assigning LSLOT sources to the Digital Outputs, these signals can be mirrored to the Aurora AES/EBU outputs as well.

For example, to send USB audio streams to the digital outputs, assign LSLOT 1-16 (for an Aurora 8, assign LSLOT 1-8) to the digital outputs as “SOURCE A” and set “TO DIGITAL OUT” to “REMOTE”.

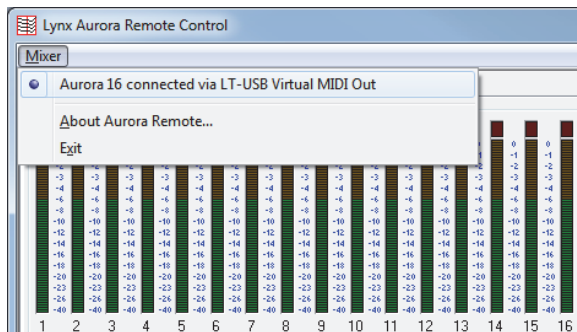
- 13 These faders allow control over the output level of each monitor source when in Remote Routing mode. This level attenuation occurs in the digital domain, so it is recommended to leave these faders in their default, maximum position in situations where the highest fidelity is required. Holding down the SHIFT key on the keyboard while adjusting a fader, will allow adjustment of channel pairs.
- 14 This display reveals the amount of attenuation, in dB, of a monitor source.
- 15 This button enables the mute function for the associated monitor source.
- 16 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”.
- 17 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 USB adapter. Under normal circumstances, this is NOT a recommended clock source.

Please note that when the LT-USB is connected to the computer and active, the SYNC SOURCE cannot be controlled through the Aurora Remote Control software. The SYNC SOURCE must be established from the front panel before connecting the USB cable.

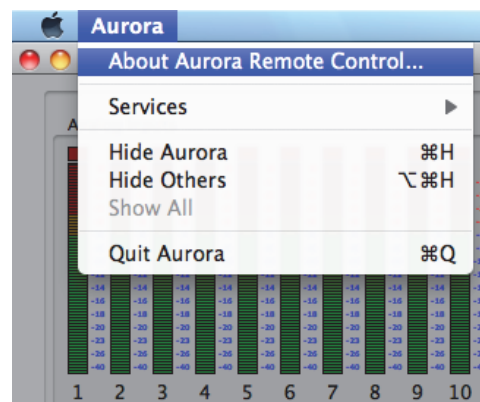
- 18 This drop-down menu normally allows for selection of the sample rate for the Aurora when set to “INTERNAL”, however when using an LT-USB, the SAMPLE RATE drop-down menu is only used to display the active sample rate. The desired rate should always be established from within the host audio software or the OS’s audio settings section (ie. Windows Sound Control Panel or OSX Audio Midi Setup). Even if the Aurora is slaving to an external clock master, the sample rate selected within the DAW and/or OS default should match the rate generated by the clock source. For more information, see Section 5.1, Clock Settings and Connections.

- 19 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 USB 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.
- 20 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. 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. With an LT-USB, the “LSLOT IN” selection does *not* route signals from the computer via the USB connection. To assign USB audio sources to the digital outputs, choose “REMOTE” and manually assign the LSLOT sources.
- 21 This parameter is not pertinent for the LT-USB and should be left on the default state of “DIGITAL OUT”.
- 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.

7.3.2 Mixer Menu



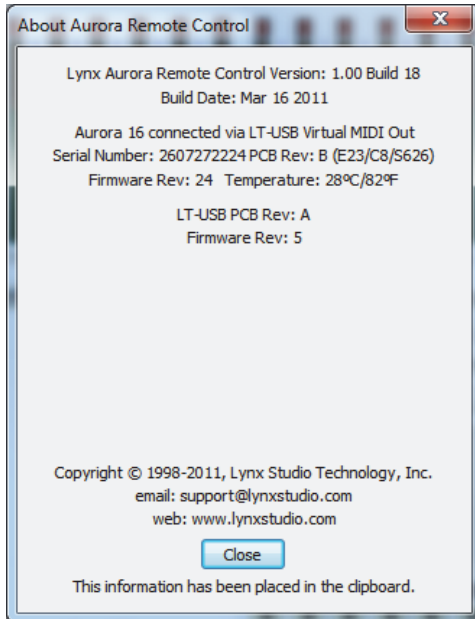
In the Windows version of ARC, the “Mixer” menu in the top left corner identifies the connection medium for the Aurora, and provides access to the “About Aurora Remote...,” screen.



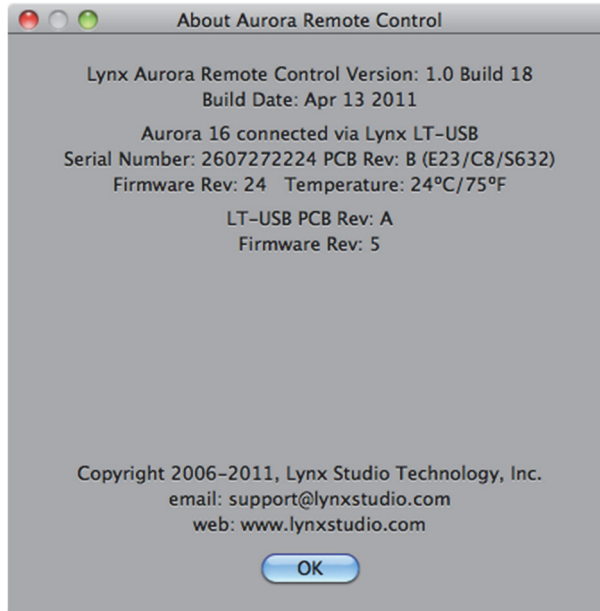
In the OS X version, the equivalent is the “Aurora” menu.

7.3.3 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

8 Using the LT-USB

With the LT-USB correctly 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 the Aurora/LT-USB system for different contexts of use.

8.1 8/16 Channel Modes

The LT-USB supports two channel modes: an 8-channel mode that supports sample rates up to 192 kHz and a 16-channel mode that supports sample rates up to 96 kHz. An Aurora 8 only operates in 8-channel mode, while an Aurora 16 can operate in either mode.

The channel modes can be toggled by holding down the “TO ANALOG OUT” button on the front panel of the Aurora for 500ms until all of the front panel LEDs flash. The USB cable must be disconnected during this operation. The “LSLOT Channel Mode” selection can be viewed from the Analog I/O page within the Aurora Remote Control application.

One reason to operate an Aurora 16 in 8-channel mode would be to lower the overall system CPU usage. The fewer channels a device presents to the host computer, the lower the CPU consumption, regardless of how many channels are actually being used for playback or recording. Lower CPU usage can be beneficial in terms of latency performance or number of audio plug-ins/processes that can be used in a project. For example, if playing back a stereo file while operating in 16-channel mode at 48 kHz, the CPU consumption is equivalent to the playback/recording of all 16-channels at 48 kHz. For this situation it would be recommended to operate in 8-channel mode, thereby significantly lowering the CPU usage.

8.1.1 Operating at 176.4/192kHz

This feature is only available in 8-channel mode. Running the device at these rates in 16-channel mode will result in distorted audio and other unpredictable behavior.

8.2 Use with USB 1.0, USB 2.0 and USB 3.0 systems

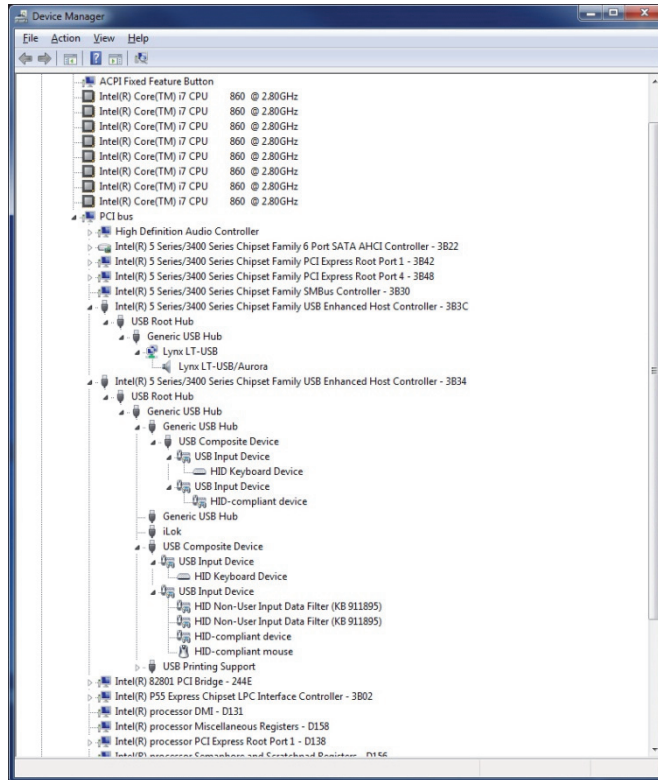
Because USB is a standard written to be backwards compatible with previous versions, all USB 3.0 ports will be able to accept a USB 2.0 device.

USB 1.0 is currently *not* supported.

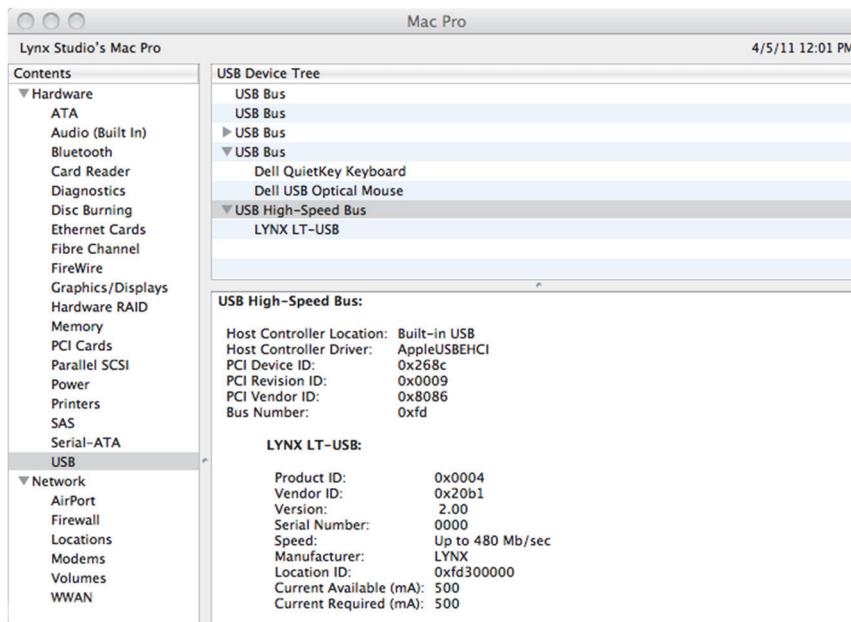
8.3 Choosing a USB Port

USB performance and reliability depends heavily on other traffic that shares the USB bus. In the ideal situation the LT-USB would be the only device connected to one of the computer’s “host controllers”. Each host controller provided by a computer acts as an independent USB bus and allows connections for multiple devices through a “root hub”.

In Windows, to view the USB bus hierarchy, “Start> right click-My Computer> Manage> Device Manager > View> Devices By Connection” and expand the USB Enhanced Controller Tabs.



In OS X 10.6.4+, go to the “About This Mac> More Info...> USB” tab:



Both of the following screenshots show the Lynx LT-USB as the only device on a high-speed USB host controller. This is the recommended configuration for systems that behave poorly when sharing the USB bus with multiple devices.

8.4 Application Setup

The LT-USB 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.

8.4.1 Windows

The Windows drivers for the LT-USB support two dominant driver models, WDM (which include 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 Pro Tools, 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.

8.4.1.1 WDM/Multimedia Applications

The Aurora/LT-USB 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. 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 LT-USB.

With Windows Vista/Windows 7 navigate to:

Start > Control Panel > Sound > Playback. Right-Click the Lynx LT-USB output device and choose "Set as default device".

Since these types of programs generally use a Standard Windows driver model, the way that the Aurora appears as a record/playback option will depend on the Channel Mode that has been selected. In 8-channel mode, the Aurora I/O will appear as one 8-channel device. If stereo material is played in this state, then playback will occur through the first pair of outputs for the device selected. In 16-channel mode, the Aurora I/O will display four additional playback devices as well as one additional record device. Each of these additional devices corresponds to stereo pairs of channels 9-16.

8.4.1.2 Multi-Channel Surround playback

Surround-sound material can be played and distributed to multiple outputs on the Aurora. 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 audio device set in the Windows Sound control panel.

In OSX, the distribution of surround channels can be set by the user from Audio MIDI setup > Configure Speakers > MultiChannel.

When multi-channel interleaved material is played in Windows, 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

8.4.1.3 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 LT-USB”.

Many ASIO applications provide access to an ASIO Control Panel for the device being used. For an LT-USB equipped Aurora, this button will launch the Lynx LT-USB Control Panel.

From this panel, the ASIO buffer size and system latency can be established conveniently within the audio software application.

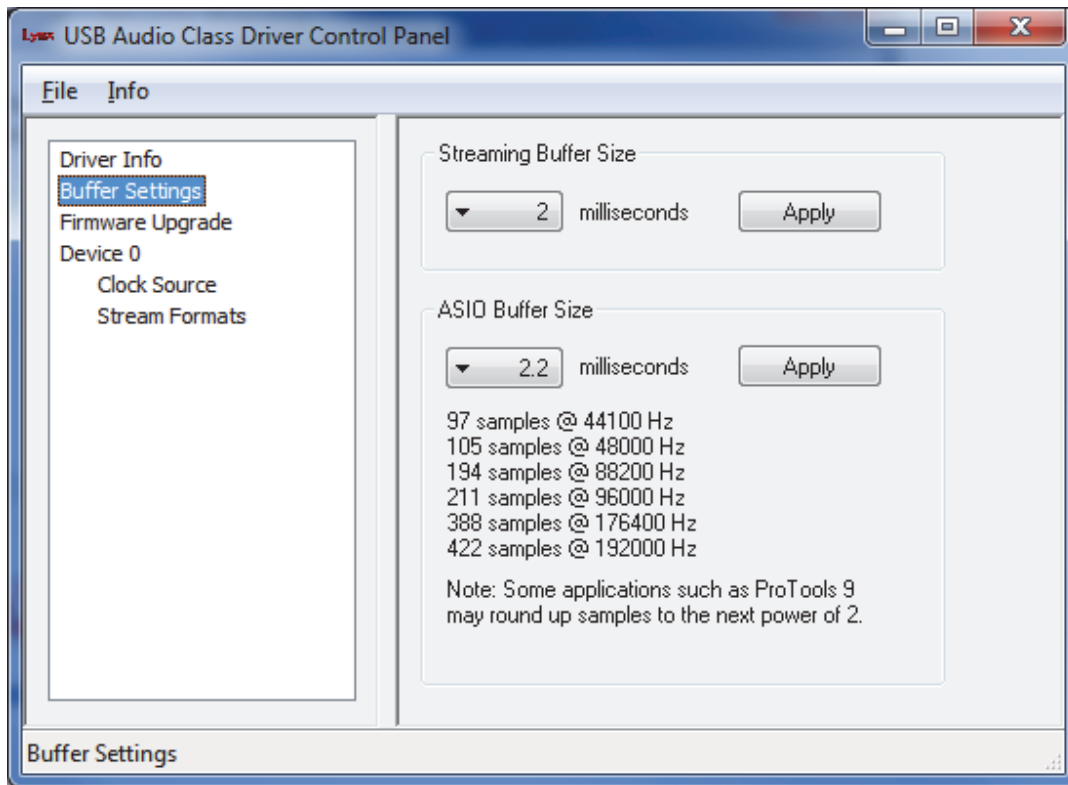
8.4.1.4 Controlling Latency by Changing the Buffer Size

Latency in an audio interface can be defined as the time required to process a sample from an application to the interface’s audio output. A number of factors determine the achievable

latency performance of an Aurora/LT-USB 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-USB.

For Windows, the Lynx LT-USB control panel provides access to buffer settings, which can define individual buffer and stream buffer sizes for WDM and ASIO. This control panel can be launched from either the ASIO control settings within most audio applications or from “Start> All Programs> Lynx Studio Technology > LT-USB Control Panel”.



In the “Buffer Settings” tab, the Streaming and ASIO buffer parameters control the size of the audio packets that are used to transfer audio to the LT-USB hardware. 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-USB buffer size to best suit the context of use.

When using ASIO based applications, both the Streaming and ASIO buffer sizes contribute to the overall latency of the system and interact in a cumulative fashion. For instance, a “Streaming” buffer size of 2 ms with an “ASIO” buffer size of 2.2 ms will result in an overall one-way latency of 4.2 ms. It is not possible to set the stream buffer to be larger than the ASIO buffer.

When using WDM based applications, only the Streaming buffer size parameter contributes to the overall latency of the system. The ASIO buffer size is ignored. Most WDM applications also add a large amount of additional latency to ensure clean playback. For this reason, ASIO is the preferred driver model for pro-audio and low-latency situations.

In order to modify the latency, the “Streaming” buffer size must first be set. Choose the desired size and click “Apply”. Once the Streaming size is set, you will have various options for the “ASIO” buffer size. Choose the appropriate size and click “Apply”. Once you have determined the smallest supported Stream Buffer size, you typically *will not* have to change this again. The ASIO buffer size, however, may need to be increased or lowered from time to time depending on the context of use.

Typical values empirically found to work on modern day machines include:

- Streaming: 1 ms, Asio: 2 ms
- Streaming: 2 ms, Asio: 3 ms
- Streaming: 2 ms, Asio: 4 ms
- Streaming: 2 ms, Asio: 6 ms

If a system is not capable of supporting these values, please see the [Troubleshooting](#) section of this manual.

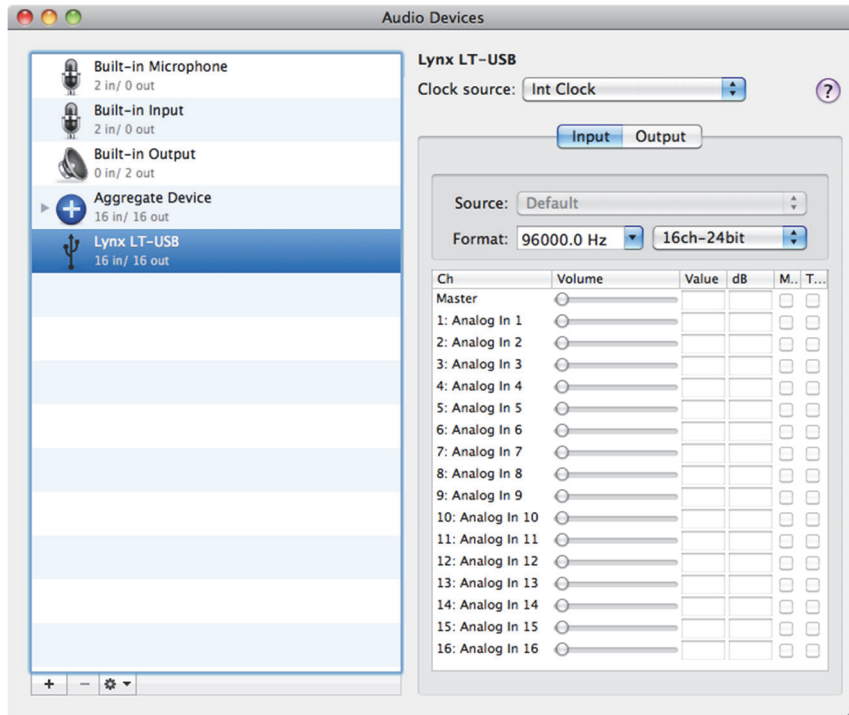
8.4.2 Macintosh OS X

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.

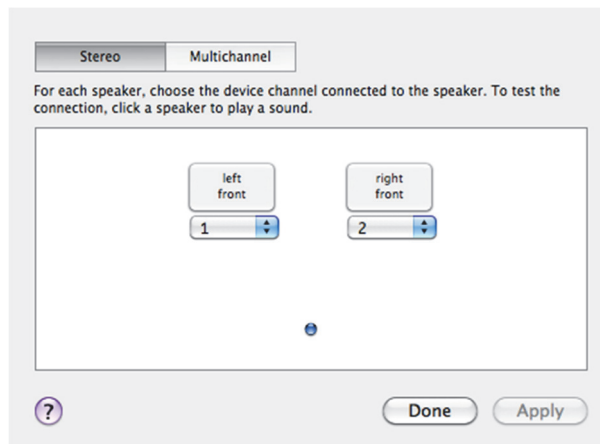
8.4.2.1 OS X Audio Applications

The Aurora/LT-USB 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.

In cases where the playback software does not provide access to output selections, 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.



When the LT-USB is selected as the output sound device, channels 1&2 are active by default. To change this, highlight the LT-USB, choose “configure speakers” from the gear icon, and then select the desired stereo output channels from the drop-down menus.



8.4.2.2 Controlling Latency by Changing the Buffer Size

Latency in an audio interface can be defined as the time required to process a sample from an application to the interface’s audio output. A number of factors determine the achievable latency performance of an Aurora/LT-USB 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-USB. Core Audio buffer size controls are offered within most pro audio

recording applications. With the LT-USB, buffer sizes typically range between 32 and 2048 samples.

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-USB buffer size to best suit the context of use.

Once you determine the lowest achievable buffer size, *you will typically have to double the size each time you double the sample rate, but the effective latency will remain constant.* For example, if a system is capable of operating at a buffer size of 128 samples at 48 kHz, then for a 96 kHz project, the buffer size will likely need to be increased to 256 samples.

8.4.3 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. These methods avoid delays caused by monitoring through software applications.

8.4.3.1 Global Routing

Global routing can be established from the Aurora Remote Control software on the Digital I/O & Settings Page. The choices for routing to the analog and digital outputs are “ANALOG IN”, “AES IN”, “LSLOT IN” and “REMOTE”.

Setting TO ANALOG OUT to “LSLOT IN” 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.

Setting TO DIGITAL OUT to “LSLOT IN” does *not* route USB-audio streams to the digital outputs. To send play streams to the digital outputs, one must route on a per-channel basis.

8.4.3.2 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 and/or TO DIGITAL OUT should be set to “Remote”.

In this mode, up to two monitor sources can be assigned to 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). By default, Source B is unassigned. Any new sources assigned must be un-muted in order to pass audio.

To send USB-audio streams to the analog or digital outputs, one must assign LSLOT In sources to the desired output channels. In this context, it is important to remember that LSLOT Inputs correspond directly to LT-USB play devices on the host computer. For instance, LSLOT In 3 corresponds to the play device labeled “Analog Out 3”.

Although LT-USB streams cannot be globally routed to the Aurora's Digital Outputs, they can be manually assigned to the digital outputs as "SOURCE A" or "SOURCE B" if TO DIGITAL OUT is set to "REMOTE".

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

8.5 Updating Firmware

The LT-USB contains firmware that is field-programmable via the USB bus. These updates can improve performance and enhance functionality of the LT-USB. Please visit www.lynxstudio.com for the latest firmware updates and programming instructions.

9 Troubleshooting

There is an error message during the driver installation:

1. Verify that the LT-USB has been installed correctly and there is an LED illuminated on the LT-USB board. See Section 5, Installation Procedures.
2. Verify that the USB cable is connected correctly and that the computer USB ports are active and the drivers are functional.
3. Verify that your Aurora has firmware revision 24 or above

The LT-USB does *not* show up in the Operating System as a usable device:

1. Check that the LT-USB is correctly installed and verify that the green LED (D3) on the LT-USB is illuminated.
2. Close the ARC and any audio applications and reset the LT-USB either by removing then reinserting the USB cable, or by turning the Aurora off for 5 seconds, then turning it back on.
3. Verify that the Aurora has firmware revision 24 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 2 on the input row & 5 on the output row or above (i.e. 2&5, 2&6, etc.) in the Aurora Meter Display, then your unit is compatible with the LT-USB. If pressing Power and Trim does not cause any LEDs to flash, causes a sequence lower than 24 to flash, or causes a single number to flash, then your unit needs to be updated.
4. Check that the LT-USB is connected to a compatible High-Speed USB 2.0 port.
5. Check that the LT-USB is connected via a High-Speed USB 2.0 cable (provided).
6. Check that the OS is compatible with the LT-USB. One must be running OS X 10.6.4+ or Windows XP with **SP3** (32-bit), Windows Vista with **SP2** (32-bit or 64-bit) or Windows 7 (32-bit or 64-bit).
7. Remove all other USB devices from the bus and retry.

The Aurora shows up in the Operating System as a usable device, but will *not* pass audio:

1. Make sure that the LT-USB 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 that the source for TO ANALOG OUT is set to “LSLOT IN”.
3. 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.
4. Close the ARC and any audio applications and reset the LT-USB either by removing then reinserting the USB cable, or by turning the Aurora off for 5 seconds, then turning it back on.
5. Verify that the Aurora has firmware revision 24 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 2 on the input row & 5 on

the output row or above (i.e. 2&5, 2&6, etc.) in the Aurora Meter Display, then your unit is compatible with the LT-USB. If pressing Power and Trim does not cause any LEDs to flash, causes a sequence lower than 24 to flash, or causes a single number to flash, then your unit needs to be updated.

6. Check that the LT-USB is connected via a High-Speed USB 2.0 cable (provided).
7. Check that the OS is compatible with the LT-USB. One must be running OS X 10.6.4+ or Windows XP with **SP3** (32-bit), Windows Vista with **SP2** (32-bit or 64-bit) or Windows 7 (32-bit or 64-bit).
8. Remove all other USB devices from the bus and retry.
9. Close the ARC and any audio applications and reset the LT-USB either by removing then reinserting the USB cable, or by turning the Aurora off for 5 seconds, then turning it back on.

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 and other distortion in your audio playback. Try increasing the buffer size from within the audio application or via the LT-USB control panel and see if your playback performance improves.
3. If other USB devices are connected on the same bus as the LT-USB, try disconnecting them and see if your performance improves.
4. Disable Wi-Fi, Bluetooth, or other background devices that maybe be draining the CPU performance.

“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 USB interface provides the clock signal that the Aurora slaves to. Many USB 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”.*

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-USB 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-USB either by removing then reinserting the USB cable, or by turning the Aurora off for 5 seconds, then turning it back on.
5. Please note that certain applications under OS X (ie Logic) do not allow other MIDI applications to run simultaneously. If you are encountering an error in launching the ARC, try to close all running audio applications and re-launching the ARC. The ARC must be launched prior to opening such an application.

Surround sound material is only playing back through 2 channels:

Windows:

1. Verify that the playback software has been selected for multi-channel, or surround sound playback.
2. 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 Lynx LT-USB, click “File” and open the channelplacement.wav file on the desktop. You should see playback meter activity sequentially through the first 6 channels of the Aurora.

OS X:

1. Check Applications > Utilities > Audio MIDI Setup. Click Configure Speakers > MultiChannel. Choose a surround mode and verify that a different LT-USB 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 External or AES input SYNC SOURCE, you must manually select the rate through either the audio application settings page, or globally through the OS’s sound control settings. 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. Please see Section 5.1, [Clock Settings and Connections](#) for more information.

10 Support

We are devoted to making your experience with the LT-USB 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-USB 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

Complimentary 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-USB

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-USB.

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-USB

To register your LT-USB, 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 End-User License Agreement (this “Agreement”) is a legal contract between you, as either an individual or a single business entity, and Lynx Studio Technology, Inc. and its affiliates (“Lynx”).

READ THE TERMS AND CONDITIONS OF THIS AGREEMENT CAREFULLY BEFORE INSTALLING LYNX’S SOFTWARE (THE “SOFTWARE”). THE SOFTWARE IS COPYRIGHTED AND IT IS LICENSED TO YOU UNDER THIS AGREEMENT, NOT SOLD TO YOU. BY INSTALLING OR DOWNLOADING THE SOFTWARE, YOU ACKNOWLEDGE THAT YOU HAVE READ THIS AGREEMENT, THAT YOU UNDERSTAND IT, AND THAT YOU ACCEPT AND AGREE TO BE BOUND BY ITS TERMS. IF YOU DO NOT AGREE TO THE TERMS OF THE AGREEMENT, DO NOT OPEN THE ANTI-STATIC BAG CONTAINING THE AES16E BOARD. PROMPTLY RETURN THE UNOPENED PACKAGE AND ALL OTHER ITEMS USING THE ORIGINAL PACKAGING TO THE LOCATION OF PURCHASE.

BY INSTALLING THE SOFTWARE YOU AGREE TO INDEMNIFY AND HOLD HARMLESS LYNX STUDIO TECHNOLOGY, INC. FROM ALL CLAIMS, COSTS AND EXPENSES (INCLUDING LEGAL EXPENSES) ARISING OUT OF ANY USE OF OR INABILITY TO USE THIS SOFTWARE.

IN NO EVENT WILL LYNX BE LIABLE FOR INCIDENTAL, CONSEQUENTIAL OR OTHER DAMAGES RESULTING FROM THE USE OF THIS SOFTWARE, INCLUDING, AMONG OTHER THINGS, 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.

12 Warranty Information

One year Free Labor / One year Parts Exchange

This product must be returned to the factory for repair.

This warranty is valid in the United States of America and Canada.

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 register online within 14 days of purchase.

What Is Covered?

Warranty coverage begins 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?

Your 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.
- A product that is exported from the United States of America or Canada to another country.

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 11 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.

For customers outside the United States of America and Canada

If you purchased your product from an authorized dealer outside the United States of America or Canada, please contact your dealer or distributor for warranty service.

Lynx Studio Technology and the Lynx Logo, LT-USB and the LT-USB 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.

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