

# AURORA<sup>(n)</sup>



**MASTERING GRADE  
ANALOG TO DIGITAL / DIGITAL TO ANALOG CONVERTER**

## User Manual

Firmware Version 1.9

**Lynx Studio Technology, Inc.**

[www.lynxstudio.com](http://www.lynxstudio.com)

[support@lynxstudio.com](mailto:support@lynxstudio.com)

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Purchase Date: \_\_\_\_\_

Dealer Name: \_\_\_\_\_

Dealer Telephone: \_\_\_\_\_

Aurora<sup>(n)</sup> Serial Number: \_\_\_\_\_

I/O Module 1 Serial Number: \_\_\_\_\_

I/O Module 2 Serial Number: \_\_\_\_\_

I/O Module 3 Serial Number: \_\_\_\_\_

I/O Module 4 Serial Number: \_\_\_\_\_

LSlot Serial Number: \_\_\_\_\_

**Aurora<sup>(n)</sup>™**  
**User Manual**  
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# 1 Introduction

The Aurora<sup>(n)TM</sup> sets the standard for transparency, reliability and economy for a professional AD/DA converter and is a staple of professional recording systems worldwide. The Aurora<sup>(n)</sup> carries on that proud legacy with a complete redesign from the bottom up. This new member of the Lynx converter family expands upon the feature set that made the original Aurora famous and integrates innovative design and programming techniques to produce a result that sounds better, is more flexible, adapts to more contexts of use, and is optimally suited to become the heart of your recording studio. The Aurora<sup>(n)</sup> was designed to provide the detailed recording and playback that you require today, along with an expandable feature set that prepares you for whatever the future holds for your studio.

Lynx designed the Aurora<sup>(n)</sup> to be the last converter you will ever need. It's better because we've been listening to what our customers have been asking for, and built a precision audio tool to meet their needs. Let's take a look under the hood:

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## 1.1 Overview

The Aurora<sup>(n)</sup> is a truly modular converter, computer interface and stand-alone recording system. Rather than a fixed feature set product, it is more accurately perceived as a "platform". With interchangeable LSlot expansion cards, and interchangeable I/O modules, the Aurora<sup>(n)</sup> you own today, and the one you use years down the road, may differ considerably.

Connectivity to the rest of your system can be via one of today's most popular interfacing methods: Thunderbolt, Dante, USB or ProTools|HD. Later, you can change to a different connection method, or even use the Aurora independent of a computer. I/O modules determine the number and type of I/O that your Aurora<sup>(n)</sup> has. To keep the unit suited to your system, you can add and remove I/O modules later on. As an example, you can start with an 8 channel analog USB system today, and upgrade to a 16 analog + 16 digital Thunderbolt system in the future. You won't be left behind as your needs, and the available technology, changes.

The Aurora<sup>(n)</sup> is a single rack space unit that is passively cooled. This means there is no fan noise! Inside there is a main board with logic and processing functions, I/O module boards for up to 32 channels of I/O, an LSlot board and word clock and headphone modules. The back panel is designed to clearly label connectors for any of the numerous combinations available.

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## 1.2 Features

The Aurora<sup>(n)</sup> is loaded with enhancements over the original Aurora. For Analog-to-Digital and Digital-to-Analog conversion, it utilizes next generation components and design techniques to provide the most transparent and low distortion audio performance of any device in its class. With -113dB THD+N and 119dB of Dynamic Range, the Aurora<sup>(n)</sup> carries on the Lynx legacy of high end conversion with low cost-per-channel.

The modular design allows addition of 3-5 I/O expansion boards. An 8 analog I/O board and a 16 digital I/O board are available now with microphone preamp, and analog summing modules available in the near future. The front panel features two reference grade headphone outputs with level control. User controls allow for routing of any input or output signals to the headphone jacks. A 480 by 128 TFT LCD display provides immediate access to all levels and functions – also configurable for future functionality. Customize the display to suit your taste and readability.

The microSD slot allows recording up to 32 channels of broadcast wave files, and supports all available sample rates. This can be for a confidence recording during production, or to use as a standalone recording

device. Single or multi-track recordings can be played back from the micro SD card to the Aurora<sup>(n)</sup> outputs – perfect for installations or live performances requiring prerecorded tracks. microSD cards up to 2TB in capacity are supported.

The Aurora chassis is generous with venting to support the passively cooled design. The rack ears have been reinforced to protect against shock and impact when used within mobile or touring rigs.

On the back, the Aurora<sup>(n)</sup> features a switching, transformer-less universal power supply. A 1 In/3 Out word clock module is perfect for using the Aurora<sup>(n)</sup> as a master clock, delivering first generation clock to downstream devices. The Aurora<sup>(n)</sup> features “mastering grade” clock generation with accuracy greater than 7ppm of drift. SynchroLock II insures that the Aurora maintains this excellent performance even when it is configured as a clock slave.

An LSlot expansion port hosts the available connectivity cards, with options for USB 2.0, Thunderbolt, ProTools|HD, and Dante. Aurora<sup>(n)</sup> will receive regular updates from easy to use firmware updates that can be downloaded from the Lynx Studio Technology, Inc. website. Firmware updates allow the feature set to evolve and adapt for future functionality, expansion cards and I/O modules.

A software mixer for the USB, Thunderbolt and Dante options allow for sophisticated routing and ease of configuration. Save scenes with your most frequently used setups. Front panel and software based metering options insure you have the tools you need to control signal flow and troubleshoot.

Aurora<sup>(n)</sup> is as comfortable in the concert hall and stadium as it is in the recording studio, a great choice for broadcast, remote recording and even audiophile listening environments.

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### 1.3 Is this the only manual?

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For the Aurora<sup>(n)</sup> we’ve decided to try something new to allow users to get the most they can out of the gear, quickly and efficiently while allowing for future updates. This manual will cover the basics, installation, overview, enough to get you up and running.

For the more in depth topics, we are producing pages on our website with a combination of written support materials and instructional videos. This will cover topics like using the software mixer, SD card recording and playback, front panel navigation and operation, and multi-unit operation.

Please visit <https://www.lynxstudio.com/support> for more details.

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### 1.4 In the Box

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Before proceeding with the Aurora<sup>(n)</sup> setup, let’s make sure that you received everything that was included with the purchase. In the box, you should find:

- Aurora<sup>(n)</sup> AD/DA converter
- AC Power Cord
- Aurora<sup>(n)</sup> User’s Manual (this document)
- USB only: One 6’ long Type-A to Type-B shielded USB 2.0 cable

Please verify that the back panel I/O matches the configuration that you ordered before proceeding with installation!

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## 1.5 Power and Safety Information

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This symbol, located on the equipment and in this manual, refers to important instructions. Read this manual thoroughly before operating this equipment.

To prevent fire or shock hazard, do not expose this equipment to rain or moisture. Do not block any of the ventilation openings. Do not defeat the safety purpose of the grounding-type plug. A grounding type plug has two blades and a third grounding prong. The third prong is provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet. Protect the power cord from being walked on or pinched, particularly at the plugs, convenience receptacles, and the point where they connect to the Aurora<sup>(n)</sup>. Unplug this device during lightning storms or when unused for long periods of time.

Aurora<sup>(n)</sup> utilizes a state-of-the-art universal power supply. The power supply will auto-detect the voltage from 100V to 240V and conform appropriately. No manual voltage adjustment is necessary.

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## 1.6 Rack-Mounting

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The Aurora is able to be mounted in standard studio equipment racks. Please note that high performance, high resolution A/D and D/A converters generate substantial heat. The amount of generated heat increases with channel count and sample rate. 8 channel units running at 44.1kHz or 48kHz will generate very little heat while 32 channel units running at 192kHz will produce more heat. For optimal performance and product longevity, it is recommended to leave an empty rack space above and below the Aurora<sup>(n)</sup>.

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## 1.7 Operation Requirements

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To operate Aurora<sup>(n)</sup> successfully with your existing equipment, first let's verify that you have compatible elements for best results.

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### 1.7.1 Audio Equipment Requirements

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Aurora<sup>(n)</sup> PHONES outputs are suitable for driving stereo headphones through a ¼" TRS connection. Any standard set of headphones should work with the Aurora<sup>(n)</sup>.

The Aurora<sup>(n)</sup>'s Analog I/O can operate with balanced or unbalanced, line-level analog audio equipment (power amps, powered speakers, headphone amps, microphone pre-amps, mixing boards, etc.). The default TRIM level is +4 dBu (+20dBu = 0dBFS with 16dB of headroom), and can be toggled to consumer level of -10dBV in banks of four channels. Aurora<sup>(n)</sup> analog I/O uses industry-standard D-Sub connections and can be used with Lynx branded D-Sub to XLR cable sets, or third party cable sets with whatever connector types are required.

Aurora<sup>(n)</sup>'s word clock connector use industry-standard BNC connectors and works with standard 75Ohm word clock cables.

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### 1.7.2 Computer requirements

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Aurora<sup>(n)</sup> is configured to operate with Mac or PC computer systems via USB, Thunderbolt, ProTools|HD (DigiLink) or Dante(Ethernet). Check the system requirements below to insure compatibility with your platform and format.

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 or audio playback software, which will likely be greater than those listed for Aurora<sup>(n)</sup>. Please refer to your audio software's documentation for more information.

- Desktop computer or laptop with at least Intel Core 2 @ 1.6 GHz, or AMD equivalent
- At least 1GB RAM

#### **USB**

- One functional USB 2.0 port (compatible with USB 3 ports)

#### **Thunderbolt**

- One functional Thunderbolt port (Note: With Thunderbolt 3, a TBT3 to TBT2 adapter is required)

#### **Dante**

- Standard wired Ethernet network interface (100Mbps or Gigabit).
- Gigabit (1000Mbps) interface is required for channel counts above 32x32 @48kHz (16x16 @ 96 kHz; 8x8 @ 192 kHz).
- Managed Gigabit switch
- Wireless LAN (Wi-Fi) Ethernet interfaces are not supported

#### **ProTools HD**

- An Avid HD Native or HDX card properly installed and configured.
- ProTools HD software version 8.1 or above
- Note: Check Avid’s system requirements for the version of ProTools that you wish to run

#### **Windows**

- Windows 7, Windows 8, Windows 8.1 or Windows 10

#### **macOS**

- macOS 10.8.5 or higher. Aurora<sup>(n)</sup>-DNT (Dante) requires macOS 10.10.5, 10.11.6 and 10.12

#### **iOS**

##### **USB only**

- iOS 7 or higher
- Apple iPad 2 or newer
- iPad camera kit for USB connection

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## **1.8 Using this manual**

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To insure smooth sailing with your new product, we recommend reading through the entire manual before using Aurora<sup>(n)</sup>. Thereafter, use the manual as a reference as needed when questions arise.

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.
- Underlined Text indicates a parameter selection value or menu option (i.e. Function).
- 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.

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## **1.9 Registration**

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Lynx is committed to providing you with the best service possible. To help us serve you better, please be sure to register your Aurora<sup>(n)</sup>. Register on the web at: <https://www.lynxstudio.com/register>

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

## 2 Getting Started Aurora<sup>(n)</sup>-USB

Aurora<sup>(n)</sup> was designed to be a product that is so easy to use that this section of the manual would scarcely be necessary. However, it is quicker to learn how the device works in one go, than to spend precious minutes figuring things out by randomly pressing buttons. We recommend reading this section thoroughly, before putting the unit to serious use, if you can manage it.

If you can verify functionality before rack mounting the unit that can be helpful. This just keeps our options open if we need to get “under the hood”. We’ll start with our cable connections, turn the unit on, then set it up for use with the computer.

### 2.1 Cable Connections

Due to the modular nature of Aurora<sup>(n)</sup>, the back panel can look very different for different configurations. For the time being, we will show a unit with 16 channels of analog I/O. Your unit may have a different number of channels, but the basic configuration information is still pertinent.

A 16 channel Aurora<sup>(n)</sup> has 2 of the A8IOE 8 in and 8 out expansion modules installed. These have one 25-pin D-Sub connector for 8 channels of analog input, and one D-Sub for 8 channels of analog output. The USB version of Aurora<sup>(n)</sup> supports a maximum of 16 channels of I/O. With the other connection methods, configurations up to 32 channels are available. Let’s take a look at the back panel and explore the cabling considerations for all of the I/O we’ll see here.



- 1 Line In Channels:** Use a 25-pin D-Sub cable to connect this to Line Level analog signal sources. The Lynx CBL-AIN-85 is an appropriate cable choice and has 8 Female XLR connectors to attach to connected equipment. Alternative, third party analog D-Sub cables sets can be used for whatever connector type the signal source requires (D-Sub, 1/4”, RCA, etc.). These inputs support balanced or unbalanced operation. Note: for unbalanced cable sets, 4.5 meters (15 feet) is the longest recommended cable length.
- 2 Line Out Channels:** Use a 25-pin D-Sub cable to connect this to Line Level analog signal destinations. The Lynx CBL-AOUT-85 is an appropriate cable choice and has 8 Male XLR connectors to attach to connected equipment. Alternative, third party analog D-Sub cables sets can be used for whatever connector type the signal source requires (D-Sub, 1/4”, RCA, etc.). These outputs support balanced or unbalanced operation. Note: for unbalanced cable sets, 4.5 meters (15 feet) is the longest recommended cable length.
- 3 Word clock I/O:** Aurora<sup>(n)</sup> features one word clock input and three word clock outputs. This is an ideal configuration if you need to integrate other digital devices into your studio, with the Aurora<sup>(n)</sup> as a master clock. The word clock outputs deliver low jitter, time aligned clock signals to downstream devices. If the Aurora<sup>(n)</sup> is a clock slave, the new LynxSynchroLock II circuitry insures minimal jitter even from compromised clock sources. Use standard 75  $\Omega$  word clock cable with BNC connectors. Recommended maximum length is 9 meters (30 feet).
- 4 USB:** Cable connections may vary by system. Use the included USB cable or equivalent to connect Aurora<sup>(n)</sup> to a USB 2.0 equipped computer. If using a third party cable, make sure that it is USB 2.0 compliant. 5 meters (16.4 feet) maximum.
- 5 IEC Power Connector:** Use the included AC power cord. The Aurora<sup>(n)</sup> has a switching power supply and can be used with 100, 115, 230 or 240V systems without an external transformer.

In Addition to the rear panel jack pack, there are two remaining cable connections on the front panel. The PHONES jacks use a standard ¼” TRS connector, and is capable of driving the full range of stereo headphones available.

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## 2.2 Initial Setup

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Let’s verify primary functionality before racking the unit and connecting audio cables. Before setting up Aurora for use, remove it from the box and verify that the box contents described in section 1.4 are all present.



If all items are present, connect the Aurora AC power cord to a grounded AC Outlet, or power distribution unit. Switch on the power switch on the front panel of the unit (note: the “|” position on the power button is “On” and the “O” is “Off”).

Connect the included USB cable from the USB port on the back of the Aurora<sup>(n)</sup> to a USB 2 port on your computer. Next we’ll install drivers, verify good operation, and then connect up the rest of your equipment.

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## 2.3 Computer Setup

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All driver files and utilities mentioned in the subsequent installation steps are available on our website at: <https://www.lynxstudio.com/downloads>

If a previous driver version is present, it will automatically be removed as part of the driver installation process.

Note: Only Windows requires a driver to be installed. No driver installation is required for macOS or iOS.

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### 2.3.1 Driver Installation for Microsoft Windows 7/8/10

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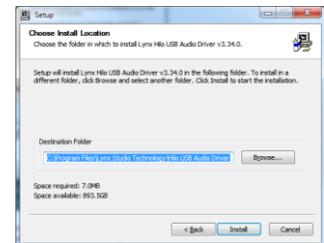
1. Start with the Aurora<sup>(n)</sup> powered up but with the USB cable disconnected. The driver should be installed prior to connecting the cable.
2. Download the most recent driver from the <https://www.lynxstudio.com/downloads> website and save the file to a convenient location.
3. Double-click the downloaded Aurora\_DriverSetup\_vX.XX.X.exe file (where X.XX.X is the version number).



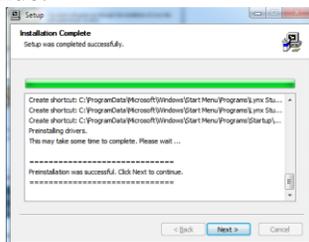
4. When the User Account Control window pops up, press “Yes” to continue.



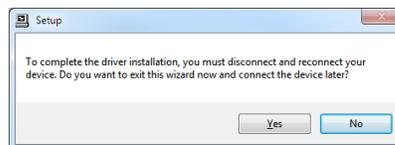
5. Press Next to continue.



6. Press Install to continue.



7. Press Next to complete the installation



8. If this is a driver upgrade, you will be promoted to disconnect the Aurora and reconnected it.

### **2.3.1.1 Verification of successful Installation in Windows**

After driver installation, let's test playback and make sure we get indication of proper performance before claiming victory.

First we will set up the Aurora as the default audio device in Windows. To do so, Navigate to the Sound Section of Windows Control Panel. Set the Aurora Speakers as the default device.

Keep the Aurora in its default state.

Next we will test playback using Windows Media Player. Open a known good file and hit play. Check the meter on the Aurora display – it should be set to the ALL I/O meter. Do we see meter activity?

If not, double check cable connections, refer to the online support resources from the lynxstudio.com website, or contact Lynx Technical support.

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### **2.3.2 Installation for Apple macOS**

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Aurora<sup>(n)</sup> will operate as a Core Audio device under macOS automatically without any driver installation required. Core Audio is the dominant audio driver model for macOS, and is used for media playback applications as well as Pro Audio applications. Simply connect the USB cable from Aurora<sup>(n)</sup> to your macOS computer and it will be immediately available for use. Please note that Aurora does require macOS version 10.6.4 or above.

Let's test playback and make sure we get indication of proper performance before claiming victory.

First we will set up the Aurora as the default audio device in macOS. To do so, from finder click GO > UTILITIES > AUDIO MIDI SETUP. Make sure that the Audio page is open (if not, you can open it from the Windows menu). You will see Aurora<sup>(n)</sup> listed as one of the Audio devices. Highlight Aurora in the list, right-click and choose "Use for sound output", or you can click the Gear icon at the bottom left corner of the window and choose "use for sound output". It should now have the Speaker icon next to it.

Keep the Aurora in its default state.

Next we will test playback using iTunes. Open a known good file and hit play. Check the meter on the Aurora display – it should be set to the ALL I/O meter. Do we see meter activity?

If not, double check cable connections, refer to the online support resources from the lynxstudio.com website, or contact Lynx Technical support.

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### **2.3.3 Now what?**

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Now we're ready to rack it up, connect the cables, and get to work!

## 3 Getting Started Aurora<sup>(n)</sup>-TB (Thunderbolt)

Aurora<sup>(n)</sup> was designed to be a product that is so easy to use that this section of the manual would scarcely be necessary. However, it is quicker to learn how the device works in one go, than to spend precious minutes figuring things out by randomly pressing buttons. We recommend reading this section thoroughly, before putting the unit to serious use, if you can manage it.

If you can verify functionality before rack mounting the unit that can be helpful. This just keeps our options open if we need to get “under the hood”. We’ll start with our cable connections, turn the unit on, and then set it up for use with the computer.

### 3.1 Cable Connections

Due to the modular nature of Aurora<sup>(n)</sup>, the back panel can look very different for different configurations. For the time being, we will show a unit with 32 channels of analog I/O. Your unit may have a smaller number of channels than that, but the basic configuration information is still pertinent.

A 32 channel Aurora<sup>(n)</sup> has 4 of the A8IOE 8 in and 8 out expansion modules installed. These have one 25-pin D-Sub connector for 8 channels of analog input, and one D-Sub for 8 channels of analog output. Let’s take a look at the back panel and explore the cabling considerations for all of the I/O we’ll see here.



- 1 Line In Channels:** Use a 25-pin D-Sub cable to connect this to Line Level analog signal sources. The Lynx CBL-AIN-85 is an appropriate cable choice and has 8 Female XLR connectors to attach to connected equipment. Alternative, third party analog D-Sub cables sets can be used for whatever connector type the signal source requires (D-Sub, 1/4”, RCA, etc.). These inputs support balanced or unbalanced operation. Note: for unbalanced cable sets, 4.5 meters (15 feet) is the longest recommended cable length.
- 2 Line Out Channels:** Use a 25-pin D-Sub cable to connect this to Line Level analog signal destinations. The Lynx CBL-AOUT-85 is an appropriate cable choice and has 8 Male XLR connectors to attach to connected equipment. Alternative, third party analog D-Sub cables sets can be used for whatever connector type the signal source requires (D-Sub, 1/4”, RCA, etc.). These outputs support balanced or unbalanced operation. Note: for unbalanced cable sets, 4.5 meters is the longest recommended cable length.
- 3 Wordclock I/O:** Aurora<sup>(n)</sup> features one word clock input and three word clock outputs. This is an ideal configuration if you need to integrate other digital devices into your studio, with the Aurora<sup>(n)</sup> as a master clock. The word clock outputs deliver low jitter, time aligned clock signals to downstream devices. If the Aurora<sup>(n)</sup> is a clock slave, the Lynx SynchroLock II circuitry insures minimal jitter even from compromised clock sources. Use standard 75  $\Omega$  word clock cable with BNC connectors. Recommended maximum length is 9 meters (30 feet).
- 4 Thunderbolt:** Aurora<sup>(n)</sup>-TB has been tested with standard optical and copper Thunderbolt cables. For Copper cable, cable lengths up to 3 meters (9.8 feet) are supported. Optical cables, while somewhat more difficult to acquire, do promise operation with much longer cable lengths, up to 100 meters. Either port may be used to connect to the computer. The other port may be used to daisy-chain to other Thunderbolt devices (up to 6 total on the Thunderbolt chain).

Note: Using a Thunderbolt 3 computer will require a 3<sup>rd</sup> party adapter like the [Apple MMEL2AM/A Thunderbolt 3 to Thunderbolt 2 Adapter](#).

For connecting an external AC power supply in cases where bus-powered Thunderbolt devices will be connected to the Aurora<sup>(n)</sup>-TB

⑤ **IEC Power Connector:** Use the included AC power cord. The Aurora<sup>(n)</sup> has a switching power supply and can be used with 100, 115, 230 or 240V systems without an external transformer.

In Addition to the rear panel jack pack, there are two remaining cable connections on the front panel. The PHONES jacks use a standard ¼” TRS connector, and is capable of driving the full range of stereo headphones available.

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## 3.2 Initial Setup

---

Let’s verify primary functionality before racking the unit and connecting audio cables. Before setting up Aurora for use, remove it from the box and verify that the box contents described in section 1.4 are all present.



If all items are present, connect the Aurora AC power cord to a grounded AC Outlet, or power distribution unit. Switch on the power switch on the front panel of the unit (note: the “|” position on the power button is “On” and the “O” is “Off”).

Connect a Thunderbolt cable from one of the Thunderbolt ports on the back of the Aurora<sup>(n)</sup> to a Thunderbolt port on your computer. Note: if your computer has a Thunderbolt 3 port, you will need an adapter. Next we’ll install drivers, verify good operation, and then connect up the rest of your equipment.

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## 3.3 Computer Set Up

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All driver files and utilities mentioned in the subsequent installation steps are available on our website at: <https://www.lynxstudio.com/downloads>

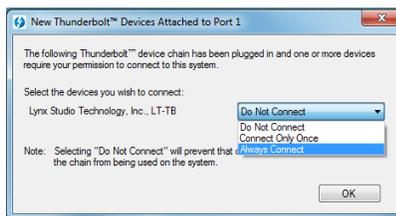
If you are updating an existing driver, it is recommended to remove it before installing the new driver. In Windows, this is done from Start > Programs > Lynx Studio Technology > Uninstall Lynx Driver. From macOS, this is done by running the uninstaller that comes in the folder with the downloaded driver installer. Reboot when prompted after the uninstall is complete. When installing drivers, make sure that all software programs, especially audio applications, are closed.

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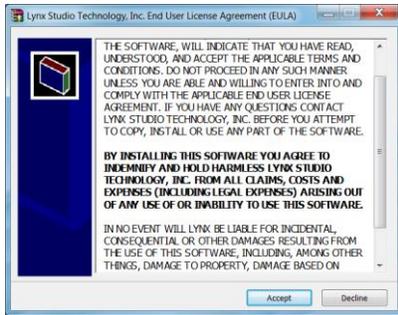
### 3.3.1 Driver Installation for Microsoft Windows 7/8/10

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1. Power up the Aurora<sup>(n)</sup> and connect it to the computer with a Thunderbolt cable.



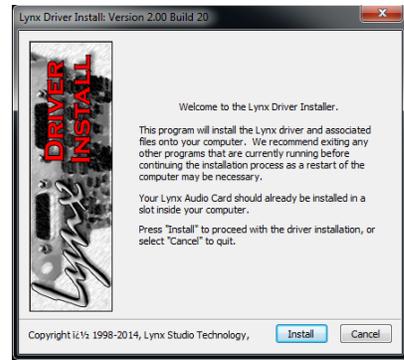
2. On first connection, you may receive a prompt that New Thunderbolt Devices have been attached. Click this window to have the system connect to the Aurora as a Thunderbolt Device
3. When the Select Device to Connect Window comes up, Choose “Always Connect”. If there are multiple Thunderbolt devices connected at install time, you will need to do this for each unit. (If this is a reinstall, you will not see this dialog box. Just continue on with the subsequent steps).
4. Locate the LT-TB driver from your downloaded files. The file name will be V2Setup###.exe (where ### is the version number of the driver).
5. Double-click the installation file to start the driver installation



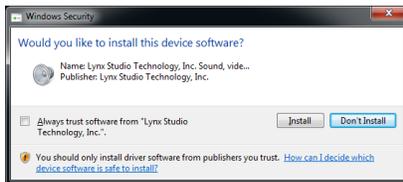
6. Accept the License Agreement by clicking “Accept”



7. The installer will extract the necessary files to the C:\Lynx directory. Click “Extract” from this window



8. If you are prompted to let the program make changes to the computer, select “Yes”. You will next see the driver Install dialog. Click “Install”



9. You may get a Windows Security Dialog Bog. If so, select “Install”. Driver installation will proceed

10. Finally you will receive a confirmation that the install completed successfully.

11. The Aurora TB is ready to use, no reboot necessary.

NOTE: The driver installation process installs both the Windows driver and the Lynx Mixer application. The Lynx mixer application is installed into the Lynx Studio Technology program group.

### 3.3.1.1 Verification of successful Installation in Windows

After driver installation, let’s test playback and make sure we get indication of proper performance before claiming victory.

First we will set up the Aurora as the default audio device in Windows. To do so, Navigate to the Sound Section of Windows Control Panel. Set the Aurora<sup>(n)</sup> Speakers as the default device.

Next we open the Lynx Mixer application from Start >Programs > Lynx Studio Technology >Lynx Mixer. Next we will test playback using Windows Media Player. Open a known good file and hit play. Navigate to the Lynx Mixer and look at the output meters in the bottom row. Do we see meter activity?

If not, double check cable connections, refer to the online support resources from the lynxstudio.com website, or contact Lynx Technical support.

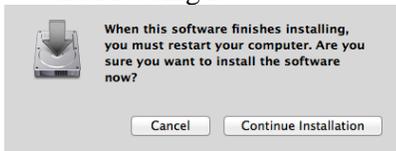
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### 3.3.2 Installation for Apple macOS

1. Power up the Aurora<sup>(n)</sup> and connect it to the computer with a Thunderbolt cable.
2. Locate the LT-TB driver from your downloaded files. The file name will be Lynx\_OSX\_##.zip (where ## is the version number of the driver). Double-click to expand the installer package.
3. Double-click “Lynx\_OSX.pkg” that was expanded from the step above. This will start the driver installation.



4. Click “Continue” for the Software License Agreement after reading it.



7. Type in Password and click “Install”. Click “Continue Installation” for prompt about restarting computer after the installation.



5. Click “Continue” at the “Install Lynx CoreAudio Driver Installer” dialog box..



8. The installation will continue.



6. Click “Agree” from the next window. Click “Install” in the Standard Install Window.



9. When complete, you will be prompted to restart the computer.

10. After restart the driver will be installed and ready for use.

Please note: The Apple macOS installation process installs both the Core Audio driver and the Lynx Mixer application. The Lynx Mixer application is installed in the “Applications” folder.

### 3.3.2.1 Verification of successful Installation in macOS

After driver installation, let’s test playback and make sure we get indication of proper performance before claiming victory.

First we will set up the Aurora as the default audio device in macOS. To do so, from finder click GO > UTILITIES > AUDIO MIDI SETUP. Make sure that the Audio page is open (if not, you can open it from the Windows menu). You will see Aurora<sup>(n)</sup> listed as one of the Audio devices. Highlight Aurora in the list, right-click and choose “use for sound output”, or you can click the Gear icon at the bottom left corner of the window and choose “use for sound output”. It should now have the Speaker icon next to it.

Next we open the Lynx Mixer application from Applications >Lynx Mixer.

Next we will test playback using iTunes. Open a known good file and hit play. Open the Lynx Mixer software and look at the output meters in the bottom row. Do we see meter activity?

If not, double check cable connections, refer to the online support resources from the lynxstudio.com website, or contact Lynx Technical support.

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### 3.3.3 Now what?

Now we’re ready to rack it up, connect the cables, and get to work!

## 4 Getting Started Aurora(n)-DNT (Dante)

Aurora<sup>(n)</sup> was designed to be a product that is so easy to use that this section of the manual would scarcely be necessary. However, it is quicker to learn how the device works in one go, than to spend precious minutes figuring things out by randomly pressing buttons. We recommend reading this section thoroughly, before putting the unit to serious use, if you can manage it.

If you can verify functionality before rack mounting the unit that can be helpful. This just keeps our options open if we need to get “under the hood”. We’ll start with our cable connections, turn the unit on, and then set it up for use with the computer.

### 4.1 Cable Connections

Due to the modular nature of Aurora<sup>(n)</sup>, the back panel can look very different for different configurations. For the time being, we will show a unit with 32 channels of analog I/O. Your unit may have a smaller number of channels than that, but the basic configuration information is still pertinent.

A 32 channel Aurora<sup>(n)</sup> has 4 of the A8IOE 8 in and 8 out expansion modules installed. These have one 25-pin D-Sub connector for 8 channels of analog input, and one D-Sub for 8 channels of analog output. Let’s take a look at the back panel and explore the cabling considerations for all of the I/O we’ll see here.



- 1 Line In Channels:** Use a 25-pin D-Sub cable to connect this to Line Level analog signal sources. The Lynx CBL-AIN-85 is an appropriate cable choice and has 8 Female XLR connectors to attach to connected equipment. Alternative, third party analog D-Sub cables sets can be used for whatever connector type the signal source requires (D-Sub, 1/4”, RCA, etc.). These inputs support balanced or unbalanced operation. Note: for unbalanced cable sets, 4.5 meters (15 feet) is the longest recommended cable length.
- 2 Line Out Channels:** Use a 25-pin D-Sub cable to connect this to Line Level analog signal destinations. The Lynx CBL-AOUT-85 is an appropriate cable choice and has 8 Male XLR connectors to attach to connected equipment. Alternative, third party analog D-Sub cables sets can be used for whatever connector type the signal source requires (D-Sub, 1/4”, RCA, etc.). These outputs support balanced or unbalanced operation. Note: for unbalanced cable sets, 4.5 meters is the longest recommended cable length.
- 3 Wordclock I/O:** Aurora<sup>(n)</sup> features one word clock input and three word clock outputs. This is an ideal configuration if you need to integrate other digital devices into your studio, with the Aurora<sup>(n)</sup> as a master clock. The word clock outputs deliver low jitter, time aligned clock signals to downstream devices. If the Aurora<sup>(n)</sup> is a clock slave, the Lynx SynchroLock II circuitry insures minimal jitter even from compromised clock sources. Use standard 75  $\Omega$  word clock cable with BNC connectors. Recommended maximum length is 9 meters (30 feet).
- 4 Dante Ports:** Use CAT5e or CAT6 Ethernet cable. Cable lengths up to 100m are possible with hi-grade cables. Dante devices can be connected point-to-point, but if more than two devices are involved in a network, it is recommended to use a Network Switch in a ‘star’ configuration. Aurora-Dante can be connected to a computer through a standard Ethernet port for use with the Dante Controller software for routing and configuration, or with the Audinate Dante Virtual Soundcard software to use Aurora<sup>(n)</sup> as a computer audio interface.
- 5 IEC Power Connector:** Use the included AC power cord. The Aurora<sup>(n)</sup> has a switching power supply and can be used with 100, 115, 230 or 240V systems without an external transformer.

In Addition to the rear panel jack pack, there are two remaining cable connections on the front panel. The PHONES jacks use a standard ¼” TRS connector, and is capable of driving the full range of stereo headphones available.

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## 4.2 Dante Connections

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Dante is not just a means for an audio device to communicate with a computer, but also a means for an audio device to communicate directly to other Dante-enabled devices. A design principle with Dante, is that ANY Dante devices will be able to interact, regardless of manufacturer. Clocking is managed automatically between devices, and device names, states and settings are stored on the chip within every Dante device on the market. These chips are manufactured by Audinate, the company that developed the Dante system.

For this reason, there is nothing about these essential connections that is unique to Lynx Products. If you know how to configure one manufacturer’s device for Dante, you’ll be able to do the same for any other manufacturer’s device. Creating a Dante network involves some IT principles that can be un-charted terrain for musicians and recording engineers; managed switches versus unmanaged switches, multicast versus unicast, flows, packets, etc. When setting up a Dante system it is wise to study the wealth of information that is available on the internet, particularly on [www.audinate.com](http://www.audinate.com)

Of particularly benefit is information on selecting and configuring a network switch that will be the center of your Dante ecosystem. Rather than re-invent the wheel, we recommend that Aurora<sup>(n)</sup>-Dante users consult with the following resources when designing and configuring their system:

<https://www.audinate.com/resources/technical-documentation>: resources for using Audinate software, technical docs, and setup guides

<https://www.audinate.com/resources/faqs>: an extensive collection of Dante FAQs, covering all aspects of latency, clocking, computer integration, etc.

<https://www.audinate.com/resources/networks-switches>: information on network considerations, and switch selection and configuration.

<https://www.audinate.com/products/manufacturer-products/dante-brooklyn-ii>: Information about the Brooklyn II chip used in Aurora<sup>(n)</sup> -Dante

Unlike most multi-component audio systems, we recommend letting the Aurora<sup>(n)</sup> receive its clock from the Dante network whenever possible. For this reason, DANTE will become the default SYNC SOURCE in the Aurora when connected to a Dante network. The Dante controller software will allow the use of external clocking if that is necessary, but otherwise it is good practice to allow all devices in the network to receive clock through their Dante connections. Details about Dante clocking practices can be explored in the support resources above.

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### 4.2.1 Dante computer Set Up

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There are several ways that Dante hardware can be used with computers. As an audio-adapted networking protocol, the computer is just another node in the network, not unlike computers in a business network. Some Dante contexts (live sound for instance) may only use a computer for initial configuration, and never again. With other systems, the computer can be integral to the system as a recording and play device. There are three primary ways to integrate Dante devices in a computer:

#### 4.2.1.1 Dante Controller Software

Dante controller is an application that allows control and configuration of Dante devices. This powerful tool allows users to route signals from any Dante source to any Dante destination on the network. Each device can be configured in terms of clocking, latency, device name, and transmission characteristics. Routing is achieved through a grid system, where “flows” are defined between a transmitter and a receiver.

With Dante Controller installed in macOS, or Windows PC, devices in the Dante network will automatically appear, there are no drivers or utilities to install for this to happen. When an Aurora is connected to the system, it will appear in Dante Controller as LT-DANTE (this can be easily changed from the Device Config page of DCS). Complex systems with dozens of devices in multiple rooms can be managed here, as well as simple home recording setups.

Dante Controller can be downloaded from the Audinate website at: [www.audinate.com](http://www.audinate.com) > products > software: dante controller. In addition to the file download there is a vast array of information here, including documentation and tutorial videos. We strongly suggest diving into these materials to minimize your downtime and allow you to utilize this powerful system to its greatest potential.

Please note: the Dante Controller software does NOT allow your Dante devices to interact with any DAW or audio playback software on your computer. It is strictly for routing and configuration. If you wish to use your Dante system for computer record and play, then you need:

#### **4.2.1.2 Dante Virtual Soundcard**

DVS turns your macOS or Windows computer into a Dante device. You can route to and from your computer with the Dante Controller, once Virtual soundcard is installed. DVS can present up to 64 channels to your audio software, and the streams can come from a variety of Dante Devices. Clocking is handled brilliantly behind the scenes, so manual clock configuration is not necessary.

In its simplest form, if you wish to use Aurora-Dante with your DAW, you need DVS to bridge the two. DVS is an Audinate product and Audinate charges a license fee to download and use it. DVS includes an ASIO and WDM driver for Windows and Core Audio for macOS, with a utility to set device latency and desired number of channels. When installed, the DVS enabled computer will appear in Dante Controller as Transmission (playback) AND Receive (record) devices.

Some users require lower latencies than Dante Virtual Soundcard can achieve through the stock Ethernet port on a computer. For this reason, Audinate has released a PCIe based card that can be installed into a computer, and provides Ethernet ports just like the computer already has, but connects underneath the usual networking protocols within the OS. As a result, using one of these cards can dramatically reduce latency within your audio system. More information is available at [www.audinate.com](http://www.audinate.com)> products > manufacturer products: Dante PCIe-R soundcard.

As with Dante controller, Virtual Soundcard is extensively documented on the Audinate website. To purchase, download and learn to use it, visit [www.audinate.com](http://www.audinate.com)> products > software: Dante virtual soundcard.

But what if you wish to integrate non-Dante devices into your Dante network? Well, there is a solution for that as well:

#### **4.2.1.3 Dante Via**

Via allows you to manage and route audio between Dante-enabled devices, and other PCIe, USB, or Thunderbolt audio devices. Streams can be sent from play software on one computer, through an audio interface connected to a difference computer on the network. In a multi-room system, audio can be delivered from suite to suite without transferring project or audio files, or in a home audio system, different audio sources can be streamed to various rooms, allowing central control of a whole media network.

As with the other software tools, Via can be purchased and explored at [www.audinate.com](http://www.audinate.com)> products > software: Dante via.

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## **4.2.2 Now what?**

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Now we're ready to rack it up, connect the cables, and get to work!

## 5 Getting Started Aurora(n)-HD (ProTools HD)

Aurora<sup>(n)</sup> was designed to be a product that is so easy to use that this section of the manual would scarcely be necessary. However, it is quicker to learn how the device works in one go, than to spend precious minutes figuring things out by randomly pressing buttons. We recommend reading this section thoroughly, before putting the unit to serious use, if you can manage it.

If you can verify functionality before rack mounting the unit that can be helpful. This just keeps our options open if we need to get “under the hood”. We’ll start with our cable connections, turn the unit on, and then set it up for use with the computer.

### 5.1 Cable Connections

Due to the modular nature of Aurora<sup>(n)</sup>, the back panel can look very different for different configurations. For the time being, we will show a unit with 24-channels of analog I/O. Your unit may have a smaller number of channels than that, but the basic configuration information is still pertinent.

A 24 channel Aurora<sup>(n)</sup> has 3 of the A8IOE 8 in and 8 out expansion modules installed. These have one 25-pin D-Sub connector for 8 channels of analog input, and one D-Sub for 8 channels of analog output. Let’s take a look at the back panel and explore the cabling considerations for all of the I/O we’ll see here.



- 1 Line In Channels:** Use a 25-pin D-Sub cable to connect this to Line Level analog signal sources. The Lynx CBL-AIN-85 is an appropriate cable choice and has 8 Female XLR connectors to attach to connected equipment. Alternative, third party analog D-Sub cables sets can be used for whatever connector type the signal source requires (D-Sub, 1/4”, RCA, etc.). These inputs support balanced or unbalanced operation. Note: for unbalanced cable sets, 4.5 meters (15 feet) is the longest recommended cable length.
- 2 Line Out Channels:** Use a 25-pin D-Sub cable to connect this to Line Level analog signal destinations. The Lynx CBL-AOUT-85 is an appropriate cable choice and has 8 Male XLR connectors to attach to connected equipment. Alternative, third party analog D-Sub cables sets can be used for whatever connector type the signal source requires (D-Sub, 1/4”, RCA, etc.). These outputs support balanced or unbalanced operation. Note: for unbalanced cable sets, 4.5 meters is the longest recommended cable length.
- 3 Word clock I/O:** Aurora<sup>(n)</sup> features one word clock input and three word clock outputs. This is an ideal configuration if you need to integrate other digital devices into your studio, with the Aurora<sup>(n)</sup> as a master clock. The word clock outputs deliver low jitter, time aligned clock signals to downstream devices. If the Aurora<sup>(n)</sup> is a clock slave, the Lynx SynchroLock II circuitry insures minimal jitter even from compromised clock sources. Use standard 75  $\Omega$  word clock cable with BNC connectors. Recommended maximum length is 9 meters (30 feet).
- 4 DigiLink Ports:** The two DigiLink connectors are labeled as PRIMARY and EXPANSION, similar to the Avid HD Interfaces. Primary is for a direct connection to an Avid HD Card (TDM, HD Native or HDX) and Expansion is for daisy chaining other interfaces downstream. With a 24-channel or 32-channel Aurora, it is not possible to daisy chain additional devices, as each port of an HD card supports a maximum of 32 channels. The Aurora-HD uses standard DigiLink connectors. When used with an HDX or HD Native card, you must use a standard DigiLink to mini-DigiLink adapter (available from Avid).
- 5 IEC Power Connector:** Use the included AC power cord. The Aurora<sup>(n)</sup> has a switching power supply and can be used with 100, 115, 230 or 240V systems without an external transformer.

In Addition to the rear panel jack pack, there are two remaining cable connections on the front panel. The PHONES jacks use a standard ¼” TRS connector, and is capable of driving the full range of stereo headphones available.

## 5.2 Computer Set Up

When the Aurora-HD is connected to an Avid ProTools card, it will emulate one HD I/O interface (for the 8 or 16 channel Aurora), or two HD I/O’s (for the 24 or 32 channel Aurora). Configuration is simply a matter of connecting the DigiLinkcable from the TDM, HD Native or HDX card to the Primary port on the Aurora. No additional drivers or control applications need to be installed in the computer. Once connected, simply launch ProTools and navigate to the ProTools Hardware Setup page.

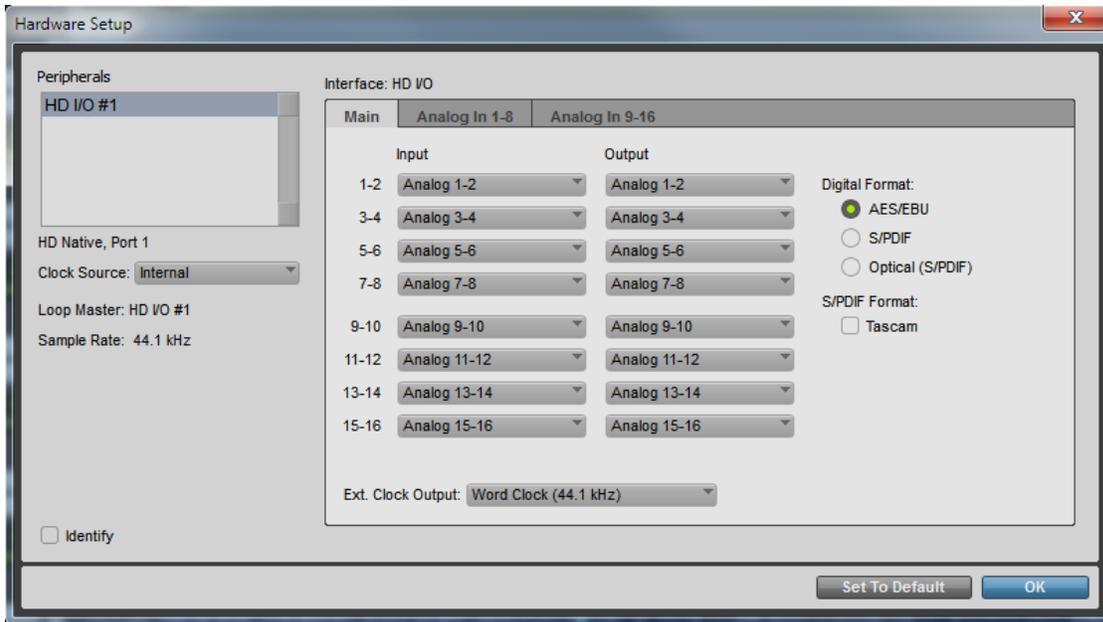
Now you should see the Aurora appearing as a Single HD I/O (8 and 16 channel versions), or as two HD I/Os (24 and 32 channel versions).

Here are how the four possible variations will appear in the hardware setup page:

Aurora <sup>(m)</sup> – HD 8 channel	Aurora <sup>(m)</sup> – HD 16 channel	Aurora <sup>(m)</sup> – HD 24 channel	Aurora <sup>(m)</sup> – HD 32 channel
1-8 Analog inputs (active)	1-8 Analog inputs (active)	1-8 Analog inputs (active)	1-8 Analog inputs (active)
1-8 Analog outputs (active)	1-8 Analog outputs (active)	1-8 Analog outputs (active)	1-8 Analog outputs (active)
1-8 AES inputs (inactive)	9-16 Analog inputs (active)	9-16 Analog inputs (active)	9-16 Analog inputs (active)
1-8 Digital outputs (inactive)	9-16 Analog outputs (active)	9-16 Analog outputs (active)	9-16 Analog outputs (active)
		HD I/O #2 1-8 Analog inputs (active)	HD I/O #2 1-8 Analog inputs (active)
		HD I/O #2 1-8 Analog outputs (active)	HD I/O #2 1-8 Analog outputs (active)
		HD I/O #2 9-16Analog inputs (inactive)	HD I/O #2 9-16 Analog inputs (active)
		HD I/O #2 1-9-16Analog outputs (inactive)	HD I/O #2 9-16 Analog outputs (active)

With the 24 or 32 channel system, the second instance of the HD I/O will carry the channels above 16. For instance, HD I/O #2 Analog Inputs 1-8 will carry signals from Aurora Analog Inputs 17-24. Each port of a ProTools card has a maximum of 32-channels, so when using a 24-channel or 32-channel model, daisy chaining is not possible.

The Aurora was programmed to respond to some of the menu items and switches in the Hardware Setup page. Let’s take a closer look at this page and which settings are implemented, and how to use them:



- ❶ **Peripherals:** This displays connected interfaces. With an 8 or 16 channel Aurora<sup>(n)</sup>, it will be represented here as a single HD I/O. With a 24 or 32 channel version it will appear as two HD I/Os, with one indented in from the other.
- ❷ **Clock Source:** This control can change the SYNC SOURCE on the Aurora<sup>(n)</sup>. Clock sources are implemented in a logical manner, for instance, Internal and Wordclock do precisely what you would expect. Some sources are not implemented, such as AES. The word clock choices include Word clock at project rate or word clock at base rate. Setting the clock source to word clock as the base rate is generally for using LoopSync, whereby the master sends the base rate and connected devices double or quadruple that rate. In general, we recommend using the actual clock rate rather than LoopSync whenever possible.
- ❸ **Sample Rate:** The Aurora supports all of the rates available here. Generally, when a ProTools project is open, the project rate will be sent to all of the interfaces. The only time, the sample rate drop down can be used to select the sample rate, is when a project is not open and one of the interfaces is set to Internal.
- ❹ **Identify:** Causes Aurora<sup>(n)</sup> logo to appear on the front panel for 1 second.
- ❺ **Input:** Displays the input settings for the selected interface. See the chart on the previous page for how this column will look depending on which Aurora<sup>(n)</sup> interface is connected. You can change these settings so that, for instance, analog Input 15-16 appears as in 1-2. Obviously, this can get confusing, but can be helpful in unusual configurations.
- ❻ **Output:** Displays the output settings for the selected interface. See the chart on the previous page for how this column will look depending on which Aurora<sup>(n)</sup> interface is connected.
- ❼ **Digital Format:** This parameter is ignored
- ❽ **S/PDIF Format:** When “Tascam” is selected here, the unit can operate as a Loop Sync device. LoopSync can be required when using an Avid synchronization product like the Sync I/O or SyncHD. When LoopSync is active, then the Aurora should receive the base clock rate (44.1 or 48k) and will double it (88.2 or 96k) or quadruple it (176.4 or 192k) to match the project rate.
- ❾ **EXT Clock Output:** This determines whether the word clock outputs generate the project rate (i.e, 96k in this example) or the “base” rate (i.e. 48k). When using LoopSync, generally you want to output the “base” rate to downstream devices.

## 6 Front Panel Controls

The Aurora<sup>(n)</sup> is designed to give the user operational flexibility: It can be easily and conveniently controlled from the computer, but also from the front panel. In fact, with the micro-SD card option, you could even record or play audio directly with the Aurora<sup>(n)</sup> even if there is no computer connected. In this section we will explore the navigation of the front panel, and what your options are.

First let's look at the elements involved:



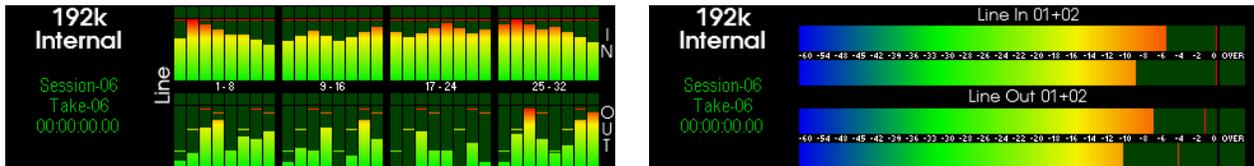
- ❶ **Power Switch:** Turns unit ON and OFF
- ❷ **Record:** This button initiates recording to the microSD card. Which channels will be recorded is managed from the [SD Record Setup](#) page from, the [Function](#) menu. Before recording, a session should be created or selected from the [Sessions](#) page.
- ❸ **Play:** This button initiates playback from the microSD card. The Take that will play back is controlled from the [Sessions](#)>[Take](#) page.
- ❹ **Up/Down:** These buttons will illuminate when active. When green in color, the Up/Down buttons are used moving to the next or previous take. Pressing Down during playback will return the file to the beginning. When cyan in color, the Up/Down buttons are used for navigation in the [Date and Time](#), and [Sessions](#)>[Edit](#) and [Meter Select](#) pages.
- ❺ **Main Display:** This display will show meters, status information, menu items and settings.
- ❻ **Function:** This button switches from the meter page to the [Function](#) menu, and is also used for navigation between groups of items within each menu.
- ❼ **Select:** This button is used for selection of highlighted elements on menu pages. It is the same as pressing in the rotary encoder in most contexts. It also allows selection of the [Meter Select](#) page from the [Horizontal Meters](#) page.
- ❽ **Phones Source:** This button allows selection of which stereo source will be sent to the phone outputs. Once pressed the button will turn yellow to indicate the Phone Source page is active.
- ❾ **Meters/Exit:** This button exits any of the [Function](#) or [Phones Source](#) pages and moves between the meters pages. On the [Functions](#) page, if you are two levels deep, it will return you to the previous page that was displayed.
- ❿ **Rotary Encoder:** This knob can be used for navigation and item selection from any of the Aurora menus. In most cases, pressing in the knob has the same result as pressing the [Select](#) button.
- ⓫ **PHONES 1 and PHONES 2:** Headphone outputs with volume control. Both outputs carry the same signals, operating in parallel.
- ⓬ **microSD card slot:** For direct recording and playback. microSD-XC cards up to 2TB in capacity are supported.

Now let's take a deeper look at the Aurora<sup>(n)</sup> front panel controls and menu items. First, some notes about Navigation:

- The Aurora will dim buttons that are not applicable to the context you are in. For instance, if the up and down buttons do not have a role on the page that appears, then those buttons will dim out.
- The [Up](#) and [Down](#) buttons switch between different takes in the active session. They also can be used for navigation. When these buttons are green they are for Take selection. When they are cyan they are for navigation. When they are dim they are not active for the current state.
- Within a menu, moving from item to item can be done by pressing the [Function](#) button, or using the rotary encoder.

- Selecting a parameter can be done by pressing the Select button, or pressing in the rotary encoder.
- You can close the current page by pressing the Meter/Exit button. If you are at the top level of the menu, then pressing this button will return you to the “Meter” page.
- Pressing the Meter/Exit button while on the “Meter” page will toggle through the different metering options
- Pressing Phones Source button will open the “Phone Source” selection page from any other page.

## 6.1 Meter Page



This is the first page that the Aurora<sup>(n)</sup> will display upon start up. On the Left side of the meters, operational specifics are displayed:

- 1 The current Sample Rate.
- 2 The current Sync Source.
- 3 The SynchroLock Status (if Sync Source is not Internal) or the SD card dropout counter (not shown).

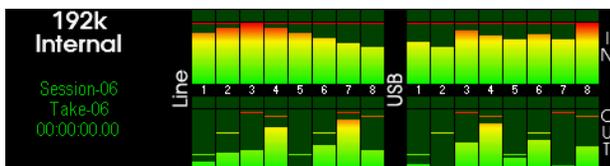
If an SD card is inserted

- 4 The active Session name. This can be a session that’s already been recorded, or just a session that has been named and has not yet been recorded into.
- 5 The active Take. This can be the take that is being recorded, or the take that is selected for playback. When multiple takes are present, you can use the Up or Down arrows buttons to move select the take you wish to play.
- 6 The current file position. When recording or playing back, this counter shows the current record or play position. When idle, the rotary encoder allows shuttling the start position of playback. Turning the rotary encoder slowly allows for changing the position in 0.1 second increments, and turning the rotary encoder faster changes the position faster.
- 7 When recording, this counter increments down the remaining record time available at the current settings and SD card capacity. For playback, this counter increments down the amount of time remaining in the selected take.

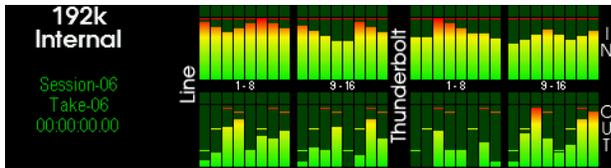
The default meter type is the All I/O page. To change METER types, press the Meters/Exit button.

### 6.1.1 All I/O Meter

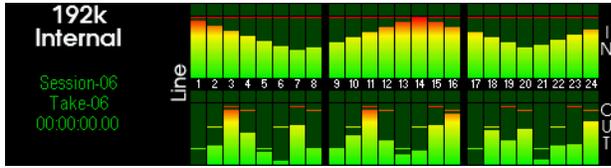
The All I/O page is the ideal place to get a “wide-angle” view of where signals are coming from and going to in the Aurora system. The number of channels that will appear here is relative to the number of channels in your Aurora<sup>(n)</sup>. Individual meter width will vary by total channel count.



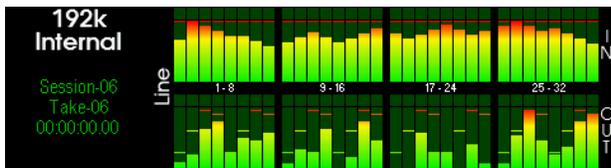
All I/O Meter on an Aurora<sup>(n)</sup> with 8 line i/o and USB.



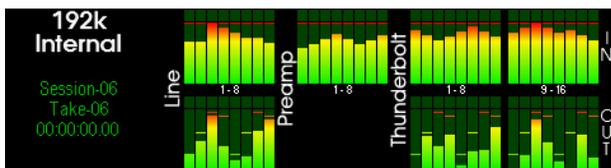
All I/O Meter on an Aurora<sup>(n)</sup> with 16 line i/o and Thunderbolt.



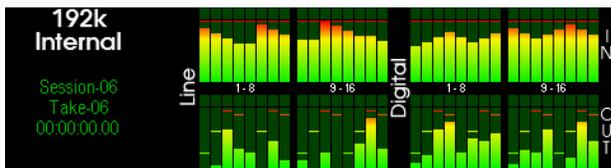
All I/O Meter on an Aurora<sup>(n)</sup> with 24 line i/o.



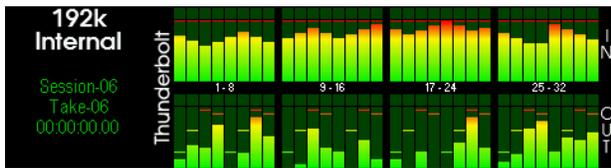
All I/O Meter on an Aurora<sup>(n)</sup> with 32 line i/o.



All I/O Meter on an Aurora<sup>(n)</sup> PRE1608 with Thunderbolt.

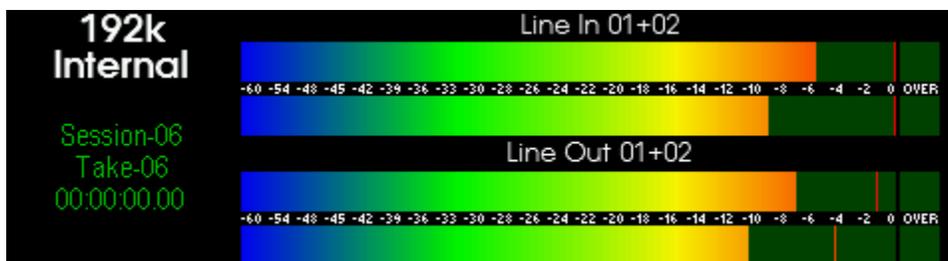


All I/O Meter on an Aurora<sup>(n)</sup> with 16 line i/o and LM-DIG.



Pressing Meter/Exit switches to Thunderbolt/USB/Dante/HD.

### 6.1.2 Horizontal Meter



The horizontal meters show greater detail for two pairs of channels on the Aurora<sup>(n)</sup>. Level markers and clip indicators make this a useful tool for calibration and troubleshooting.

Press the Select button to choose which sources drive both sets of meters:



The “Meter Select” page operates a bit differently from other pages on the Aurora, since there are more options here than other pages. Select between the “Top Meter” and “Bottom Meter” choices with the Up or Down Arrow buttons, respectively. The Function button will allow you to choose the source category, between “Line In”, “Line Out”, “Digital In”, “Digital Out” (if available), “Preamp” (if available), “USB/Thunderbolt/Dante/HD”, and “Phones”. The Rotary Encoder lets you scroll to the specific channel pair you desire, and then press either the Rotary Encoder, or the Select button to make your choice.

Press Meters/Exit button to exit this menu.

---

## 6.2 Function menu

---

This is the logical place to start for primary set up and configuration of your Aurora<sup>(n)</sup>. Opening the “Function” menu is simply a matter of pressing either the Function button the Rotary Encoder when on the meter page.



The “Function” menu provides access to controls for recording and playback, as well as settings and even firmware updates.

To navigate on this page, either use the Function button to increment, OR the rotary encoder to move to the desired menu item. To select that item or page, either press the Select button, OR press in the rotary encoder.

If more menu options are available than the 12 that will fit on one screen, a small down arrow icon will be displayed in the bottom right corner of the screen to show that more options are available. Simply use the rotary encoder to move the desired menu item beyond the last item on the screen and the additional items will scroll into view.

To exit this page, either press the Meter/Exit button to return to the meters, or Phones Source button if you wish to go to that page.

## 6.2.1 Clock Setup



The Clock Setup page is where the Aurora<sup>(n)</sup> can be set up as a clock master, or slave to some other device in your system. The default state is with the Aurora<sup>(n)</sup> on “Internal”, unless using a Dante system, in which case the default SYNC SOURCE is “Dante”. In most cases, having the Aurora<sup>(n)</sup> on “Internal” is the desirable state, so that it can follow the sample rate of audio projects automatically, and also the system can take advantage of Aurora’s Mastering Quality clock generation. When set to “Internal”, generally the Sample Rate will be determined by the computer, either within an audio recording program, or as a global setting in the operating system. When audio is streaming to the Aurora<sup>(n)</sup> from the computer, the sync source and sample rate cannot be changed from the Clock Setup page, so the Clock Setup indicator will go dim. When streaming has stopped, then you can change sample rate to any of the supported rates between 44.1k, and 192k. This is especially pertinent to recording to the SD card.

The “Word clock” option will only be illuminated and selectable when the Aurora<sup>(n)</sup> detects a valid clock signal is being delivered to its WORD CLOCK input. When clocked via “Wordclock”, the Aurora<sup>(n)</sup> will follow whatever sample rate is being generated by the clock master. It is critical that the clock master is generating the sample rate that matches the rate of your audio project, to prevent recording audio at the wrong pitch and speed.



AES In A and AES In B will only be displayed when the LM-DIG board is installed in the Module 4 position. When clocked via AES Input, the Aurora<sup>(n)</sup> will follow whatever sample rate is being generated by the AES device feeding the selected input. It is critical that the clock master is generating the sample rate that matches the rate of your audio project, to prevent recording audio at the wrong pitch and speed.



Dante is a unique case, in that clocking should generally be established from within the Dante network. For this reason, the Aurora will default to “Dante” as the clock source when it is operating in a Dante system. In that case, clock setting are managed from the Dante Controller software. It is possible to use the Aurora Internal clock, or an external word clock source with Dante, but it is necessary to establish the Aurora<sup>(n)</sup> as operating from “external” within the Dante Controller software. See the Lynx Support Video for Aurora<sup>(n)</sup> with Dante for details.

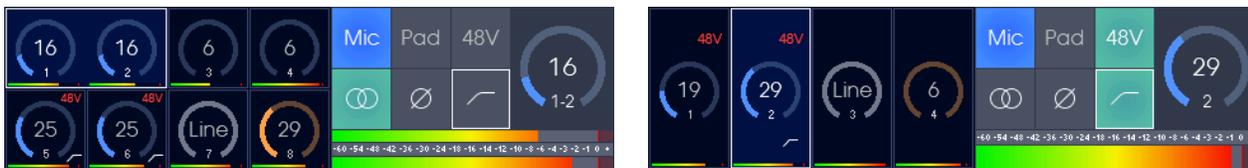
When clocked externally, the Aurora<sup>(n)</sup> uses Lynx’s proprietary SynchroLock II clocking feature to reduce jitter and clocking anomalies. SynchroLock II takes only a few seconds to achieve full lock. While it is locking the SynchroLock indicator will show “Unlocked”, and will show “Locked” when full lock is achieved. SynchroLock will re-engage whenever the Sample Rate changes. SynchroLock can be disabled, by highlighting the SynchroLock indicator and pressing the Select button or pressing in the rotary encoder. In general, it is recommended to keep SynchroLock engaged when using an external clock source.

### 6.2.2 Line Trim



Aurora<sup>(n)</sup> can operate at a nominal trim level of +4dBu (Pro), or -10dBV (consumer). Trims can be switched between these values for the analog inputs and outputs in banks of 4 channels. The Aurora<sup>(n)</sup> has 16dB of headroom, so in the +4 position it operates at +20dBu = 0dBFS, and at -10dBV it operates at +6dBV = 0dBFS. In general, Pro Audio equipment (mixing boards, effects processors, powered monitors, etc.) should have +4dBu selected, and consumer gear (cassette decks, stereo receivers, surround processors) should be set to -10dBV. When in doubt, check the documentation for connected equipment to select the appropriate trim value

### 6.2.3 Preamp



The “Preamp” page can have two different display formats: 8-channel and 4-channel mode, depending on the configuration of the Aurora<sup>(n)</sup>. Use the Up and Down arrow keys to change the currently selected channel. Change the gain for the selected preamp with the Rotary Encoder. Please note that pressing the Rotary Encoder does nothing on this page to prevent inadvertent gain changes. Use the Function button to change between the six controls, and the Select button to change the state of the currently selected control.

The left half of the preamp page shows a summary of all of the preamp channels settings. Let's take a look at one of the preamp channels in detail.



- 1 Pad indicator. On when 13.6dB pad is enabled.
- 2 48V indicator. On when 48V phantom power is applied to this input.
- 3 Gain display and relative position indicator. Will show "Line" when input is set to Line.
- 4 Phase indicator. On when phase reversal is enabled.
- 5 Hi-pass filter indicator. On when 80Hz, 12 dB / octave hi-pass filter is enabled.
- 6 Channel number.
- 7 Level meter with peak hold and overload.

The right half of the preamp page shows the controls of the selected channel(s).



- 1 Input selector control. Switches between Mic / Line / Hi-Z. Mic and Line are both on the XLR jack, Hi-Z is on the TRS jack.
- 2 Pad control. Enables 13.6dB pad. Not available when input is set to Line or Hi-Z. With the Pad enabled and the gain set to "14" the Mic input level will match the Line input level.
- 3 48V control. Enables 48V phantom power for the selected input. Not available when input is set to Line or Hi-Z. See the Preamp Setup page to lockout 48V for specific channels.
- 4 Gain display in dB and relative position indicator. Will show "Line" when input is set to Line.
- 5 Link control. Enables linking of channel pairs. When linked, controls for both channels will be changed together and level meter will show both channels instead of a single channel.
- 6 Phase control. Reverses the phase of the incoming signal.
- 7 Hi-pass control. Applies an 80Hz, 12 dB per octave hi-pass filter.
- 8 Channel number. When channels are linked, both channel numbers are displayed..

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## 6.2.4 Preamp Setup

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The “Preamp Setup” page gives access to two “behind the scenes” features.

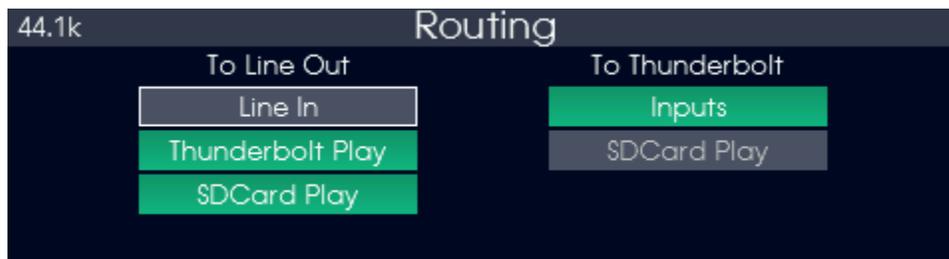
The first is “Preamp 48V Lockout”. When enabled, this prevents 48V from being applied to the selected input for microphones that should never have 48V phantom power applied, such as certain ribbon microphones. This will also disable the 48V control on the “Preamp” page for the selected input.

The second is “Rotary encoder click”. This control determines what happens when you click the rotary encoder when one of the meter pages is displayed. When set to “Preamp”, the click will take the Aurora<sup>(n)</sup> directly to the preamp page. When set to “Function Menu”, the clock will take the Aurora<sup>(n)</sup> to the Function Menu (just like pressing the [Function](#) button).

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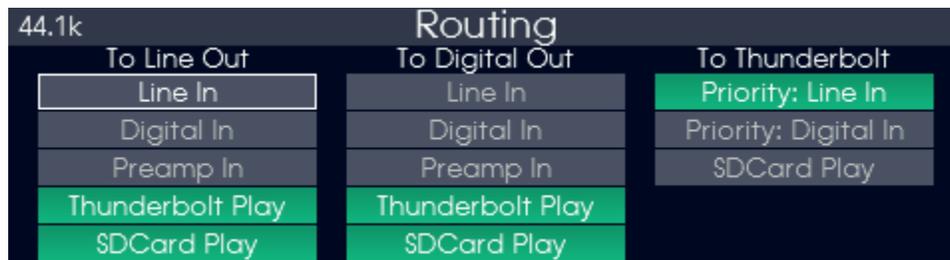
## 6.2.5 Routing

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The “Routing” page is where you control what sources you are able to monitor and record. This page involves “global” routing. You can get more sophisticated, with per-channel routing, using the Lynx Mixer software when using the Thunderbolt connection method. This page, however, is ideal for setting source to destination for all channels quickly, or for setting up the Aurora<sup>(n)</sup> routing independently of the computer.

TO LINE OUT will default to signals from the computer (via Thunderbolt, USB, etc), and signals from playback of the SD card. You can select “Line In” instead of, or in addition to, the default settings if you wish to route analog input signals directly to their corresponding analog outputs (In 1 to Out 1, In 2 to Out 2, etc). Multiple TO LINE OUT sources can be selected, you can even select all inputs if you wish. Please be aware that if multiple sources are all selected and playing at the same time, overloads can occur.



If LM-DIG module is installed, TO DIGITAL OUT will default to signals from the computer (via Thunderbolt, USB, etc), and signals from playback of the SD card. You can select “Line In” instead of, or in addition to, the default settings if you wish to route line input signals directly to their corresponding digital outputs (In 1 to Out 1, In 2 to Out 2, etc). Multiple TO DIGITAL OUT sources can be selected, you can even select all inputs if you wish. Please be aware that if multiple sources are all selected and playing at the same time, overloads can occur.

The TO THUNDERBOLT (or TO USB/TO DANTE/TO HD) selection can be only “Inputs” (the default) or “SD Card Play” as sending multiple sources is not possible for this type of output. Choosing “SD Card Play” sends signals from your active SD Card Session down to the computer for recording or processing. If LM-DIG module is installed, “Inputs” changes to “Priority: Line In” and the option “Priority: Digital In” is added. This setting only needs to be changed if there are too many inputs for the given channel mode of the LSlot device. As an example, if the LM-DIG and LM-PRE4 are both installed along with 16 channels of line i/o, that would exceed the maximum of 32-channels for the LSlot device. In this case, “Priority: Line In” indicates the all line inputs will be routed first, then the digital inputs will be routed leaving room for the preamp channels at the end (in this case, only 12 digital channels will be routed). Selecting “Priority: Digital In” will route the first 12 line inputs, then all 16 digital inputs, then the 4 preamp inputs for a total of 32.

Use the rotary encoder to switch between choices, and the Select button, or press in the rotary encoder, to set the choice. Use the Function button to toggle between TO LINE OUT; TO DIGITAL OUT and TO THUNDERBOLT (or TO USB/TO DANTE/TO HD).

### 6.2.6 Test Tone



The Test Tone page controls the test tone function, which can be used as a good diagnostic tool to test an output, and can even be used to calibrate downstream devices. Any channel output pair that has the tone turned on will have all other sources muted and will generate a 1kHz sine wave. As soon as the tone is turned off, the previous channel routing will be restored for that output pair. By default, the tone will be 40dB down from full-scale, and can be adjusted to the desired level with the rotary encoder by .5dB increments when the volume control is selected.

Pressing the Function button allows you to switch between the main output groups. The Rotary Encoder lets you scroll to the specific channel pair you desire, and then press the Rotary Encoder to turn on/off the test tone. Pressing the Select button allows you to switch between the selected output and the volume control.

### 6.2.7 Digital In Status

192k Digital In Status			
01+02	03+04	05+06	07+08
192k	192k	192k	192k
09+10	11+12	13+14	15+16
192k	192k	192k	192k

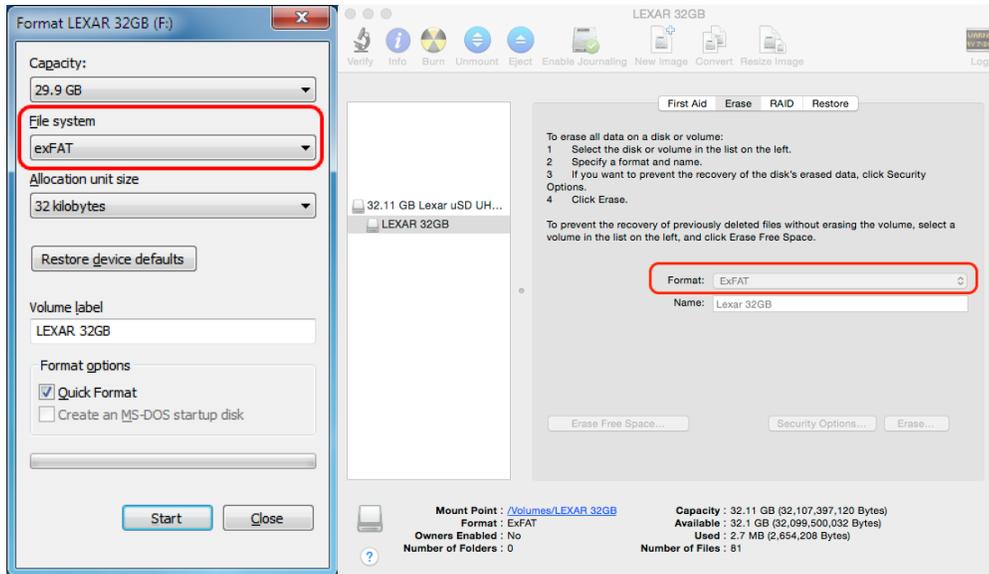
The Digital In Status page is available if an LM-DIG module is installed in Slot 4 and will display the status of all eight digital inputs. Lock / Unlock state is indicated by green /red background under each digital input, and when locked the sample rate of the incoming digital signal is also displayed.

### 6.2.8 SD Card

192k SD card	
Label: 64G Lexar HE	Record speed rating
File system: exFAT	4 ch @ 192k (2250kB/sec)
Capacity: 64020870680	96 / 100 for 00:01:53
Free space: 6140871068	SD card dropout 0
Used space: 57879999612	

The SD card page shows the characteristics of any inserted microSD card. The label assigned to the card, the File system used (FAT32 and exFAT are both supported), Capacity, Free space and Used space are displayed in bytes (for example 17,179,869,184 = 16GB). When the Free space is less than 18,432,000 bytes (one second for 32-channel / 192kHz, just over one minute for 2-channel / 44.1kHz) the Record button will go out and new recordings will not be possible on that microSD card until it is cleared of all files and formatted.

**PLEASE NOTE:** FAT32 has a 4GB file size limitation. Lynx recommends that you always format the microSD card using the exFAT file system to overcome this limitation regardless of microSD card size. Normally a microSD card that is 32GB or smaller will default to FAT32 file system. Using your computer to format the microSD Card, simply select exFAT as your file system from the Format or Erase dialog box. Below are screen-shots showing where those selections are made from Windows (left) and macOS (right).



During recording, the number of record channels and sample rate are displayed, along with the Record speed rating. This gives you the exact performance capabilities of the specific microSD card. “100 / 100” is the best performance rating, and “1 / 100” is the worst and any microSD card showing this poor of performance will be unable to keep up with recording at the selected number of channels and sample rate. If “1 / 100” is displayed, the SD card dropout counter will start to count the number of dropouts or “glitches” in the recording. If this occurs, you should either decrease the number of channels, decrease the sample rate, or select a higher performance microSD card. microSD cards that are labeled “High Endurance” usually perform the best over long periods of time. Lynx recommends testing your microSD card for the length of recording you normally perform to ensure that it can keep up with the demands of streaming high-performance multichannel audio.

## 6.2.9 SD Record Setup



The “SD Record Setup” page is where parameters can be established for recording to the SD card. Aurora<sup>(n)</sup> is capable of recording interleaved files of 2, 4, 8, 16, or 32 channels of audio. The source can be the line inputs, digital inputs, preamp inputs and/or streams played from the computer or through Dante (when applicable). Individual channels can be selected, and the Aurora<sup>(n)</sup> will show how many channels have been selected and the number of recording channels that will be included in the file in the top right corner of the display. For instance, if two channels are selected, “2 of 2 channels” will be displayed. When a third channel is selected, the Aurora<sup>(n)</sup> will switch to 4 channel recording mode and “3 of 4 channels” will be displayed. The “extra” channel will simply contain silence.

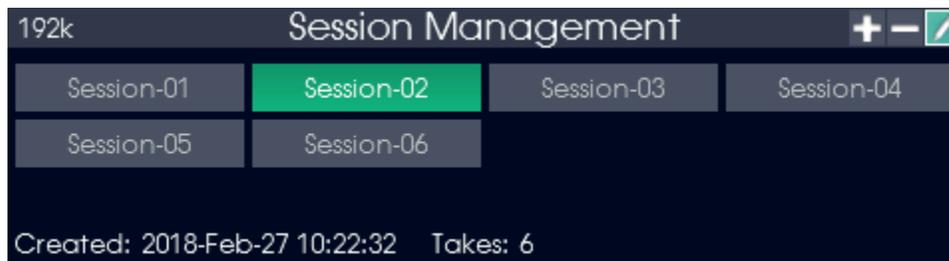
Aurora<sup>(n)</sup> will automatically record in 24-bit PCM broadcast wave format using a WAV file extension. Normally, broadcast wave files have a 32-bit header (RIFF). Since 32-bit header files have a maximum size of 4GB, a 32-channel recording at 96k would only get just over 7 minutes of recording time before this 4GB

limit is reached. To overcome this limitation, the Aurora<sup>(n)</sup> will automatically switch the file to a 64-bit header (RF64) when the 4GB limit is reached. You may need to check with your DAW software to insure it supports RF64 broadcast wave audio files. Details of how to integrate your recordings into a DAW environment are part of the support video for SD card recording on the Lynx Support site.

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### 6.2.10 Sessions

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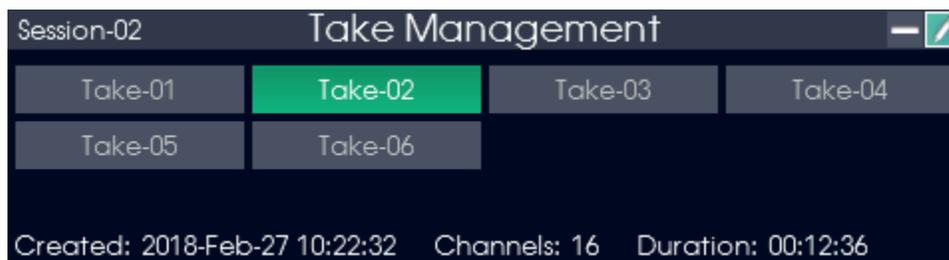
The Session Management page is where SD card recording and playback can be set up and organized. New recordings are grouped by Sessions, within which there are Takes. For Instance, you can create a new session and name it “Band Practice”. If you engage recording with that session active, then all of the channels being recording will be organized as Takes within that Session. If you stop recording and then record another pass, that will also be saved as a new Take within the same Session.

On this page you can create new sessions, hide existing sessions, and rename sessions as well as selecting the current session for recording and playback. When pressing the Aurora<sup>(n)</sup>Play button from any screen, the last session selected will appear in the Aurora Meter display, and that’s what will play. You can also create projects on the computer and save them for playback on the Aurora<sup>(n)</sup>. More on that, in the SD card Recording video on the Lynx website.

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### 6.2.11 Takes

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The TakeManagement page is where individual recordings can be managed. Each time the Record button is pressed, a new take is created in the current session using the settings from the SD Record Setup page. Each take is date and time stamped, and date and time is shown when the take is highlighted along with the number of channels and the duration of the take in HH:MM:SS format.

On this page you can select the current take, rename takes and hide takes from appearing in the take list. You may easily preview each take by simply highlighting the take name and pressing the Play button. The Up and Down arrow buttons select the next and previous take in the list.

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### 6.2.12 Date & Time

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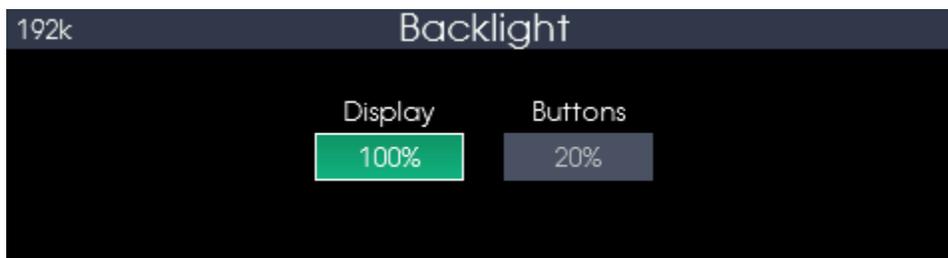


The “Date& Time” page is where the current information can be set and edited. These settings are necessary because the SD recordings are date and time stamped for easier organization.

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### 6.2.13 Backlight

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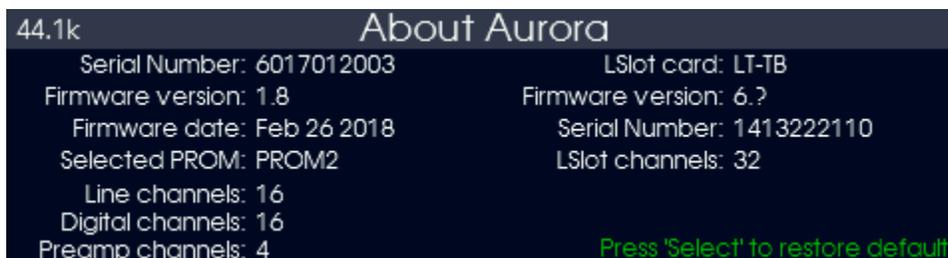


The “Backlight” page is where you can adjust the intensity of the display and front panel buttons.

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### 6.2.14 About

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The “About” page is a convenient way to determine system specifics, such as firmware versions and dates, serial numbers and installed expansion cards. Pressing the Select button will restore the Aurora<sup>(n)</sup> to factory default settings.

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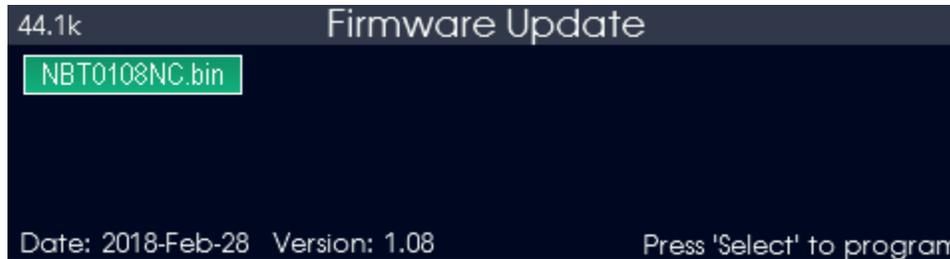
### 6.2.15 Firmware Update

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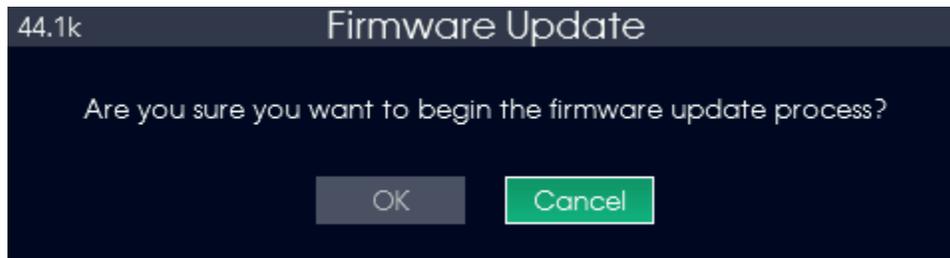
Lynx regularly releases firmware updates for the Aurora<sup>(n)</sup> and its installed expansion cards. Firmware updates add features, improve performance, or expand support for new interfacing methods. It is possible to apply these Firmware updates from the computer via USB, Thunderbolt or Dante. However, with ProTools|HD there is not a way to update the firmware from the computer, nor if the Aurora<sup>(n)</sup> is being used as a stand-alone converter independent of a computer. The Firmware Update page offers an alternative solution. Firmware Updates can be loaded to a microSD card on a computer, and the update can be applied directly without needing a computer. To perform a Firmware Update using only the Aurora<sup>(n)</sup> and a microSD card, first, obtain the firmware “bin” file from the Lynx Studio Technology Download page. Next, place that file in the root directory of the microSD card.



A new menu option Firmware Update should appear on the Function Menu page.



Select Firmware Update and a screen similar to the one above should appear. To proceed with the update, press the Select button and a confirmation page will appear:



Select the “OK” indicator and press Select. The firmware update will progress through four stages: Erasing, Programing, Verifying, Complete



When the firmware update is complete, the following page will appear:



To complete the update process, simply turn the power off using the front panel power switch. Once you turn the power back on the new firmware should be active.

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### 6.2.16 USB Mode

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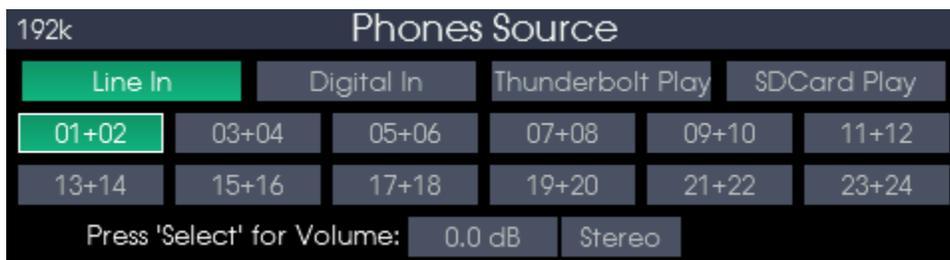


The Aurora<sup>(n)</sup>-16 USB has a unique page to itself. The LT-USB can operate in two different modes, 8-Channel and 16-Channel. In 8-Channel mode, 192kHz operation is possible, however in 16-Channel mode 96kHz is the maximum sample rate. This page allows switching between the two modes. Please note that changing the setting will reset the computer connection.

---

### 6.3 Phones Source

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The Phones Source page can be brought up from any other page on the Aurora<sup>(n)</sup> display by simply pressing the Phones Source button. This is where the source can be selected for the two headphone outputs. Please note: The PHONES have independent level controls, but the source selected will apply to both jacks.

Mixing and individual input volume control are possible for the phones source. Press the Function button to switch between Input Groups (Line In/Digital In/LSlot Play/SD Card Play). Please note the actual input groups shown on the Aurora<sup>(n)</sup> depend on the configuration of the modules and if the SD card is inserted and has playable tracks. The SD Card option will always have 32-channels available for selection, even though the currently selected track may have fewer channels.

Press the Select button to switch between source channels, volume and channel mode. The rotary encoder function changes for each of these modes:



- When selecting source channels:  
 Rotate rotary encoder to switch between channels.  
 Press rotary encoder to switch between muted state and last attenuation.



- When in volume mode:  
 Rotate rotary encoder to change individual input volume (the selected input will have a green outline).  
 Press rotary encoder to switch between muted state and last attenuation.



- When in channel mode:  
 Rotate rotary encoder to change between:  
 Stereo (normal: left goes to left, right goes to right)  
 Sum (left and right summed together and has 6dB gain reduction)  
 Left (left & right headphone channels listen to the left source channel)  
 Right (left & right headphone channels listen to the right source channel)

Press the Up or Down buttons to change between source channels, even when in 'volume' or 'channel mode' to allow for quick change of volume between multiple sources.

## 7 microSD Record and Play basics

The Aurora<sup>(n)</sup> has a very powerful new feature for a professional audio converter, the inclusion of a microSD card reader for recording and playback. To support the throughput required for high channel count, high sample rate recording, a simple limitation was required. The Aurora<sup>(n)</sup> will always record to files that are contiguous, meaning there can be no gaps in the file structure. This is normally not a consideration as long as you always record on a freshly formatted microSD card, and **NEVER** delete any of the files on the microSD card using a computer. Deleting files would create an empty “gap” in the file structure which might cause the Aurora<sup>(n)</sup> to do extra work while recording to skip over this gap. This would cause a delay in recording which would in turn cause an audible glitch in the file, and so deleting files from the microSD card is simply not supported.

If you wish to free up space on the microSD card, simply copy all of the files you wish to save to your computer, then format the card. If you wish, you may copy files from the computer back to the microSD card and this should still result in “no gaps” file system as long as no files are deleted from the microSD card. Once a file is deleted, you risk creating a gap in the file system and the microSD card will need to be freshly formatted to insure glitch-free and error-free operation.

Hiding a session simply moves that session into a new folder called “.HiddenSessions” and does not delete any files or free up any space on the microSD card. Hiding a take simply moves that take into a new folder called “.HiddenTakes” and also does not delete any files or free up any space on the microSD card.

The file system for recordings will be:

Root folder / Session # / Take.wav

Each session is stored in its own folder using the session name, and each take is a WAV file within that folder using both the session name and take name. The take file names will be Session-##.Take-##.wav where the ## are the session and take numbers. Example:

```
Session-01
    Session-01.Take-01.wav
    Session-01.Take-02.wav
Session-02
    Session-02.Take-01.wav
    Session-02.Take-02.wav
The Band
    The Band.Take-01.wav
    The Band.Take-02.wav
```

If you rename a session on the Aurora<sup>(n)</sup>, all of the take files will also be renamed to reflect the new name of the session.

The Aurora<sup>(n)</sup> supports up to 128 sessions per microSD card and up to 256 takes per session.

As stated earlier in this manual, the Aurora<sup>(n)</sup> always records in 24-bit format. The Aurora<sup>(n)</sup> is able to playback 16-bit, 24-bit and 32-bit PCM files with 2, 4, 8, 16 and 32 channels. The Aurora<sup>(n)</sup> supports 32-bit RIFF header wav files as well as 64-bit RF64 header wav files. File names can be any length, but only the first 16 letters of a filename will appear on the Aurora<sup>(n)</sup> [Take Management](#) page. The WAV Take files must be placed into a Session folder. Session folder names may be any length but only the first 16 letters of the Session folder name will appear in the [Session Management](#) page.

## 8 Firmware Updates

Aurora<sup>(n)</sup> contains firmware that is field-programmable via the computer connection or the microSD card. These updates can improve performance and enhance the functionality of the unit. In some cases, the display screen functions and appearance may change dramatically from firmware updates, even adding meter types and other significant functionality. This flexibility does much to add value to the unit, and keeps it future-proof.

Additionally, the USB, Thunderbolt, ProTools|HD and DANTE cards installed into Aurora<sup>(n)</sup> have their own firmware as well. There are also updates for these cards available that, similarly, can improve functionality and expand the feature set. The process for updating these cards will be covered below. First, there are two methods by which you can update your Aurora firmware:

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### 8.1 Update via Computer Connection

---

If your Aurora has a USB, Thunderbolt or Dante connection, you can update the unit straight through that computer connection.

1. Make sure that your Aurora has a valid USB, Thunderbolt or Dante connection to the computer. For USB on Windows, or Thunderbolt for macOS or Windows, current drivers will need to be installed. For USB on macOS, or Dante on either platform, specific drivers are not necessary.
2. Visit [www.lynxstudio.com](http://www.lynxstudio.com) and click Downloads > Aurora<sup>(n)</sup> > firmware: and then the applicable connection method.
3. Download the current Aurora<sup>(n)</sup> Firmware Updater. Double Click to launch it.
4. Follow the prompts (Windows Users need to accept the EULA) until you reach the Firmware Update main screen. Verify that the “New Firmware Version” is higher than the “Current Firmware Version”. If so, click “Update”.
5. You will see the update status with a progress bar.
6. When the Update is complete, you will be instructed to power down the Aurora. Turn off the front panel power switch. Wait three seconds, then power it back up.

Now let's look at the methods for updating the three expansion cards

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### 8.2 Updating the LT-USB

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1. Updating the Aurora<sup>(n)</sup> USB firmware uses the Aurora Update application. Launch the Aurora<sup>(n)</sup> Update application. This time from the “Select Unit to Update” drop-down menu, choose “LT-USB”.
2. Verify that the New Firmware Version is higher than the Current Firmware Version. If so, click “Update”.
3. When the updater is complete, close the pop-up window in your computer. Power cycle the Aurora using the front panel power switch, wait three seconds, then turn the unit back on.
4. After programming, the computer may be prompted to reload the driver. If so, perform an automatic driver installation when prompted.

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### 8.3 Updating the LT-TB (Thunderbolt)

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1. Prior to updating, insure that the Thunderbolt driver has been properly installed and is functional.
2. The LT-TB card has its own firmware update program that can be downloaded from the Lynx website. Visit [www.lynxstudio.com](http://www.lynxstudio.com) > Downloads. Choose Aurora<sup>(n)</sup> > Firmware > Thunderbolt
3. Download the most recent firmware update file for PCIe and Thunderbolt.
4. Make sure that all audio software and the Lynx mixer are closed.
5. Run the updater, and accept the defaults.

6. At the main updater welcome screen, make sure that the drop down menu for SELECT UNIT TO UPDATE is set to “LT-TB”.
7. Verify that the New Firmware Version is higher than the Current Firmware Version. If so, click “Update”.
8. When the updater is complete, close the pop-up window in your computer. Power cycle Aurora using the front panel power switch, wait three seconds, then turn the unit back on.

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## 8.4 Updating the LT-DANTE

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The updater for the LT-DANTE is provided by the manufacturer of the Dante Brooklyn II chip, Audinate. Because of this, the process is quite a bit different from the other L SLOT expansion cards as it relies upon a third party updater program.

1. Prior to updating, insure that Aurora<sup>(n)</sup> appears normally from the Dante Controller application.
2. Next, download the Brooklyn firmware update tool from:  
<https://www.audinate.com/products/firmware-update-manager>
3. Then download the latest Dante firmware update file from [www.lynxstudio.com](http://www.lynxstudio.com)>Support>Downloads. Choose Aurora<sup>(n)</sup>>Firmware>Dante. Save this file to a convenient location on the computer.
4. Launch the Audinate Firmware Updater.
5. Select the network adapter that is connected to the Dante network and press “Next”.
6. Press the “Update Dante Firmware” button.
7. Select the firmware update file downloaded in step 3, then press “Next”.
8. After a few seconds, the LT-DANTE should appear. Check the box next to the LT-DANTE you wish to update.
9. Press Start. The “Ready” column will change to “Updating”.
10. When the updater is complete, close the Dante Firmware Update Manager. Power cycle Aurora using the front panel power switch, wait three seconds, then turn the unit back on.

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## 8.5 Update via microSD card

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Please see Section 6.2.11 above for detailed instructions on how to update the Aurora<sup>(n)</sup> via the microSD card.

## 9 Support

We are devoted to making your experience with Aurora<sup>(n)</sup> 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:

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### 9.1 Lynx Website Support Resources

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Logging on to <https://www.lynxstudio.com>> Support, will provide several options for resolving your support issues:

#### Downloads

A library of current firmware and driver files are available for download and installation. Check back regularly to insure that your Aurora<sup>(n)</sup> is up-to-date. There are also files that are useful for diagnostics and users manual's available here.

#### Ask A Question

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.

#### Answers

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.

#### 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<sup>(n)</sup> operation and troubleshooting.

See <https://www.lynxstudio.com/forum>

#### Facebook Support Information Group

Like us? Then Like us on Facebook to be alerted to the latest support, product and product information. There is a Lynx Studio Technology, Inc group as well as a Lynx Support and Updates page where information about new drivers and firmware updates are announced.

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### 9.2 Telephone Support

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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.

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### 9.3 Registering your Aurora<sup>(n)</sup>

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Lynx is committed to providing you with the best service possible. To help us serve you better, please be sure to register your Aurora<sup>(n)</sup>. Register on the web at: <https://www.lynxstudio.com/register>.

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### 9.4 Return Policy

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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 Troubleshooting & User Tips

Q. I want to change my Sync Source but it is locked out.

A. To change SYNC SOURCE it is important that audio is not streaming to the interface. The method for changing Sync Source varies by connection method:

**USB** – First disconnect USB from the Aurora, then set your SYNC SOURCE, then re-connect the USB cable.

**Thunderbolt** – Set the SYNC SOURCE from the Lynx Mixer application, or from the Aurora<sup>(n)</sup> Function > Clock Setup page

**LT-HD** – The Sync Source should be selected from the ProTools Hardware Setup page or from the Avid Core Audio/ASIO Manager.

**Dante** – Typically it is best to keep the SYNC SOURCE set to “Dante”. If you change it to “Internal” or “Word clock” make sure and select “Enable Sync to External” and “Preferred Master” next to Aurora in the CLOCK STATUS page within Dante Controller.

Q. I am playing audio from the computer but hear nothing from the Analog outputs

A. Check the following elements.

- Insure that the Cable connected to the appropriate analog output port is the Lynx CBL-AOUT85 or adheres to the Tascam DA-88 Analog I/O pin configuration.
- Make sure that the cable connected to your monitoring equipment is plugged into ANALOG OUT 1-8
- Make sure that in the Aurora<sup>(n)</sup> display Function > Routing has the correct source set for TO ANALOG OUT.
- Verify that your monitoring equipment is turned on and the levels are turned up to a safe listening level.

Q. Audio plays back at a faster or slower rate than expected

A. This is usually the result of mismatched clock rates and/or multiple clock masters. For example, if you are playing back audio recorded at 44.1 kHz, but you have set the clock for 48 kHz, the audio will play back faster and at a higher pitch than expected. Make certain you have set only one device as clock master, all other digital devices configured to slave, and that the selected sample rate matches the audio source.

For Playback from SD, you cannot play a file that was recorded at a sample rate other than the current rate of the (n).

Q. I have clicks and pops in my playback

A. Check clock master settings. In any digital audio configuration, there can be one, and only one master clock, or else you will likely experience audible clock errors. 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. If you choose to use another device as the sample clock master, make sure that the Aurora and any other connected devices are set to the appropriate clock source setting.

Also, check try increasing the buffer size in your audio application. This parameter is usually in a settings or preferences menu.

Q. Output is too loud for my monitoring equipment

A. Is your monitoring destination a +4dBu or –10dBV line-level device? Most professional equipment uses +4dBu as the nominal level, and most consumer equipment uses –10dBV as the nominal level. From the Function > Analog Trim menu, you can establish the appropriate input and output trim levels in banks of four for your equipment. At the –10dBV setting, output levels will decrease by 12.2dB.

## 11 Specifications

### Line Input on LM-AIO8 and LM-PRE Modules

<b>THD+N</b> <i>1kHz, -1dBFS, 20kHz filter, +20dBu trim</i>	-113dB(0.00022%)
<b>Dynamic Range</b> <i>A-weighted, -60dBFS method</i>	119dB
<b>Frequency Response</b> <i>Deviation over 20-20kHz band, -1dBFS</i>	±0.010dB maximum
<b>Crosstalk</b> <i>Adjacent channel, -1dBFS, 1kHz</i>	-130dB maximum
<b>Common Mode Rejection</b> <i>-1dBFS, 60Hz and kHz</i>	75dB min.
<b>Full-scale trim settings</b>	+6dBV, +20dBu, software selectable on LM-AIO8 +20dBu fixed on LM-PRE4
<b>Input impedance</b>	200k Ohm balanced, 100k Ohm unbalanced

All line input measurements made with 40 ohm source applied to input

### Line Output on LM-AIO8 Module

<b>THD+N</b> <i>1kHz, -1dBFS, 20kHz filter, +20dBu trim</i>	-108 dB (0.0004%)
<b>Dynamic Range</b> <i>A-weighted, -60dBFS method</i>	120 dB
<b>Frequency Response</b> <i>Deviation over 20-20kHz band, -1dBFS</i>	± 0.025 dB
<b>Crosstalk</b> <i>Adjacent channel, -1dBFS, 1kHz</i>	-130 dB maximum
<b>Full-scale trim settings</b>	+6dBV, +20dBu, software selectable

### Headphone Output

<b>THD+N</b> <i>1kHz, -1dBFS, 20kHz filter, volume at maximum</i>	-107 dB (0.00045%)
<b>Dynamic Range</b> <i>A-weighted, -60dBFS method</i>	120 dB
<b>Frequency Response</b> <i>Deviation over 20-20kHz band, -1dBFS</i>	± 0.025 dB
<b>Crosstalk</b> <i>-1dBFS, 1kHz</i>	-120 dB maximum
<b>Output level at max volume</b>	+18.4dBu maximum
<b>Connector</b>	¼" phone jacks on front panel

### Mic Input on LM-PRE4 Module

<b>THD+N</b> <i>1kHz, -1dBFS, 20kHz filter</i>	-111dB (0.00028%) -99dB (0.0011%) -80dB (0.010%)	@ 21.6dB gain @ 41.6dB gain @ 61.6dB gain
<b>EIN</b> <i>Equivalent input noise</i>	-127dBu -129dBu	@ 61.6dB gain, 20kHz filter @ 61.6dB gain, A-weighted
<b>Dynamic Range</b> <i>A-weighted, -60dBFS method</i>	116dB	@ 21.6dB gain
<b>Frequency Response</b> <i>Deviation over 20-20kHz band, -1dBFS</i>	+0.01 / -0.08dB max.	@ all gain settings
<b>Crosstalk</b> <i>Adjacent channel, -1dBFS</i>	-127dB max. -117dB max.	@ 41.6dB gain, 1kHz @ 41.6dB gain, 10kHz
<b>Common Mode Rejection</b> <i>-1dBFS</i>	75dB min.	@61.6dB gain, 60Hz and 1kHz
<b>Full-scale Input Levels for A/D</b>	28.7dBu (max level) 20.7dBu 15.1dBu -0.9dBu -47.9dBu	@5.6dB gain, pad enabled @ 13.6dB gain, pad enabled @5.6dB gain, pad disabled @21.6dB gain, pad disabled @68.6dB gain, pad disabled
<b>Input impedance</b>	2.1k Ohm	
<b>Gain Settings</b>	5.6dB or 13.6dB to 68.6dB in 1dB steps, pad disabled -8dB or 0dB to 55dB in 1dB steps, pad enabled	
<b>Pad attenuation</b>	13.6dB	
<b>High-pass Filter</b>	80Hz, 12 dB / octave	
<b>Connector</b>	Female XLR on Neutrik Combo Jack	

*All mic input measurements made with 150 ohm source applied to input*

### Hi-Z Input on LM-PRE4 Module

<b>THD+N</b> <i>1kHz, -1dBFS, 20kHz filter</i>	-109dB (0.00035%)	@ 21.6dB gain
<b>EIN</b> <i>Equivalent input noise</i>	-113dBu -115dBu	@ 21.6dB gain, 20kHz filter @ 21.6dB gain, A-weighted
<b>Dynamic Range</b> <i>A-weighted, -60dBFS method</i>	114dB	@ 21.6dB gain
<b>Frequency Response</b> <i>Deviation over 20-20kHz band, -1dBFS</i>	+0.01 / -0.05dB max.	@ all gain settings
<b>Crosstalk</b> <i>Adjacent channel, -1dBFS</i>	-132dB max. -125dB max.	@ 21.6dB gain, 1kHz @ 21.6dB gain, 10kHz
<b>Full-scale Input Levels for A/D</b>	14.9dBu (max level) -1.1dBu -18.1dBu (96mV) -48.1dBu (3.0mV)	@5.6dB gain @21.6dB gain @38.6dB gain @68.6dB gain
<b>Input impedance</b>	1M Ohm unbalanced (TS), 2M Ohm balanced (TRS)	
<b>Gain Settings</b>	5.6dB and 13.6dB to 68.6dB in 1dB steps	
<b>Connector</b>	TRS on Neutrik Combo Jack	

*All hi-z input measurements made with 600 ohm, balanced source applied to input*

**Digital I/O on LM-DIG Module**

<b>Number</b>	Eight inputs and eight outputs
<b>Type</b>	24-bit AES/EBU format, transformer coupled
<b>Channels</b>	16 inputs / outputs

**General**

<b>Processing</b>	32-bit RISC processor in field programmable FPGA
<b>Sample Rates</b>	All standard rates up to 192 kHz using SynchroLock II sample clock generator
<b>Synchronization Options</b>	Internal clock, external word clock, or AES/EBU (with LM-DIG module)
<b>Word Clock I/O</b>	1 input and 3 outputs (without LM-PRE4 installed) 1 input and 1 output (with LM-PRE4 installed) BNC connectors 75 ohm input impedance, 2.0–3.3VPP measured at input required 75 ohm output impedance, 4.5VPP open circuit typically
<b>LSlot™ Expansion Port</b>	Supports Lynx LSlot expansion cards with up to 32 input and outputs simultaneously
<b>LCD Display</b>	480 X 128 TFT LCD
<b>AC Power</b>	100 to 240 VAC, 70 watts maximum
<b>Size</b>	19" wide; 1.7" tall; 10.00" deep 483mm wide; 44.5mm tall; 254mm deep
<b>Shipping Weight</b> <i>Depending on I/O configuration</i>	7-7.3 pounds 3.6–3.9kg

# 12 Aurora<sup>(n)</sup> Performance Measurements

Test Setup:

- Aurora<sup>(n)</sup> with two AIO8E modules and LM-DIG
- Analyzer: Audio Precision SYS-2722, S/N SYS2-32376

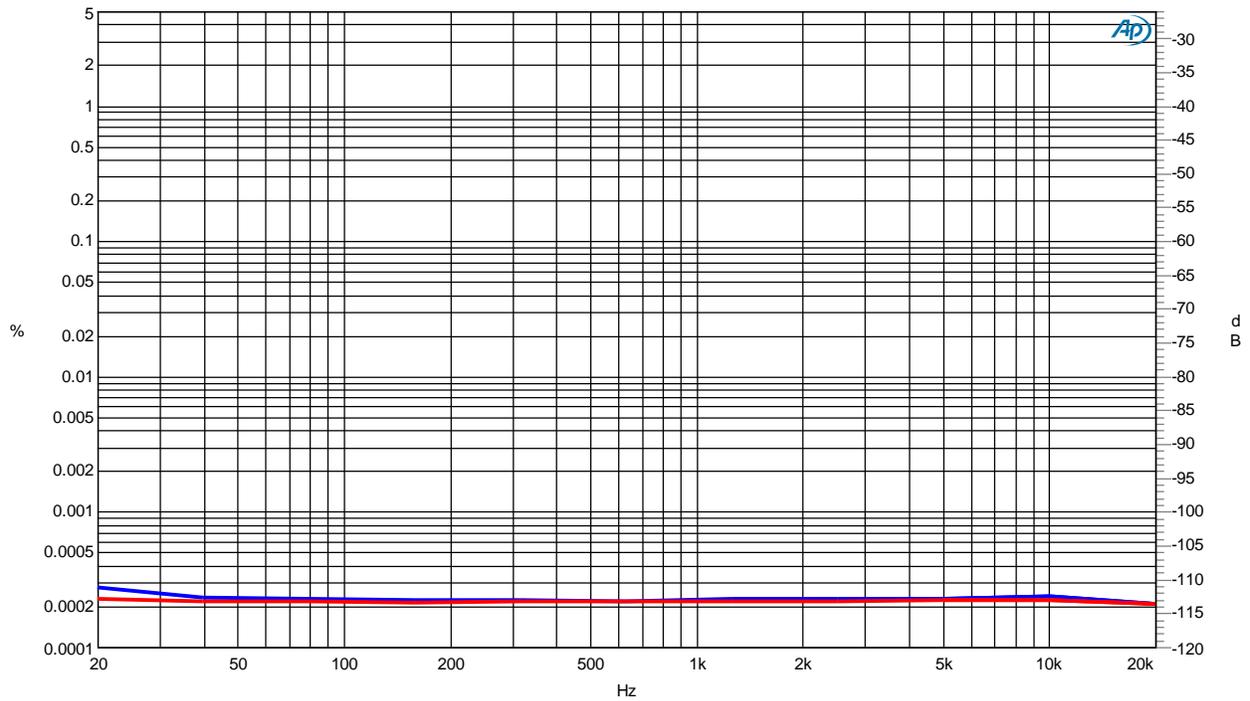
## 12.1 A/D THD+N Ratio vs Frequency

Sample Rate: 44.1 kHz    Signal Level: -1dBFS    Trim: +4 dBu    Channels: 1/2  
 Analyzer BW 22Hz – 20kHz    Filter: None    Output impedance: 40 ohms

Lynx Studio Technology

AIDO THD+N RATIO VS FREQUENCY

10/11/17 14:34:59



Sweep	Trace	Color	Line Style	Thick	Data	Axis	Comment
1	1	Blue	Solid	3	DSP Anlr.THD+N Ratio A	Left	
1	3	Red	Solid	3	DSP Anlr.THD+N Ratio B	Left	

A-D THD+N VS FREQ SINGLE CHANNEL +4.at2c

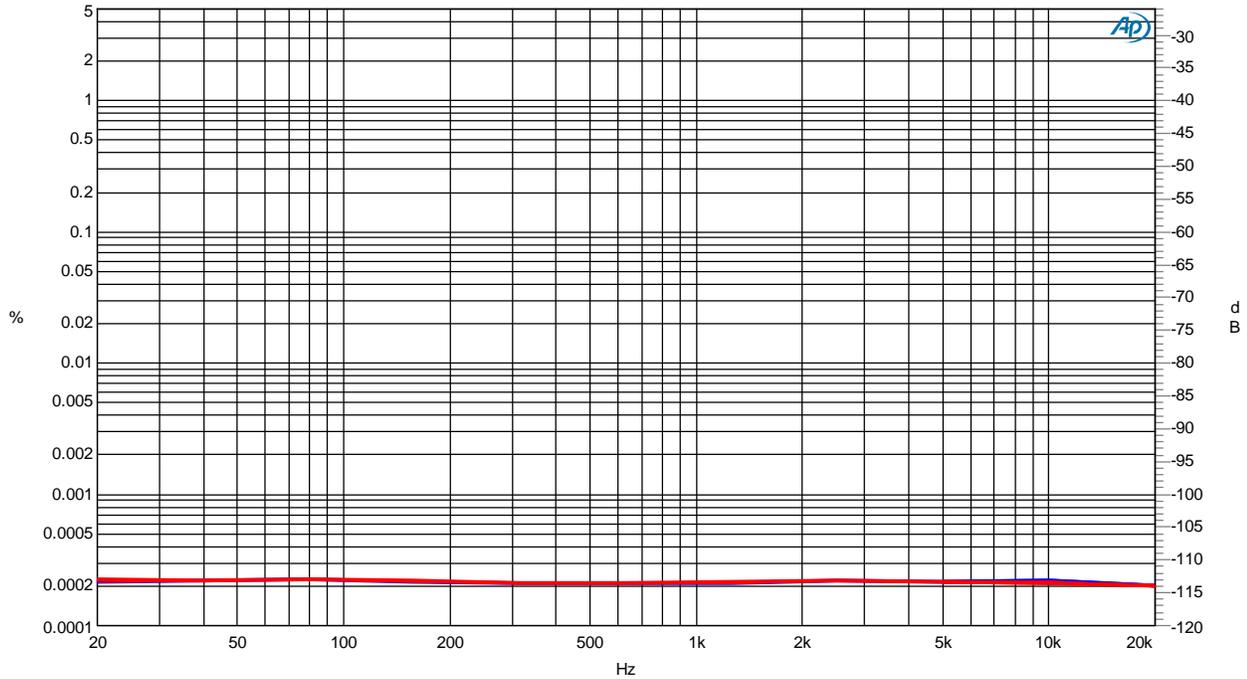
## 12.2 A/D THD+N Ratio vs Frequency

Sample Rate: 48 kHz      Signal Level: -1dBFS      Trim: +4 dBu      Channels: 1/2  
 Analyzer BW: 22Hz – 20kHz      Filter: None      Output impedance: 40 ohms

Lynx Studio Technology

AIDO THD+N RATIO VS FREQUENCY

10/11/17 14:48:02



Sweep	Trace	Color	Line Style	Thick	Data	Axis	Comment
1	1	Blue	Solid	3	DSP Anlr.TH+D+N Ratio A	Left	
1	2	Red	Solid	1	DSP Anlr.TH+D+N Ratio A	Right	
1	3	Red	Solid	3	DSP Anlr.TH+D+N Ratio B	Left	

A-D THD+N VS FREQ SINGLE CHANNEL +4.at2c

## 12.3 A/D Dynamic Range

Sample Rate: 48 kHz      Signal Level: -60dBFS      Signal Frequency: 1 kHz      Trim: +4 dBu  
 Channels: 1/2      Analyzer BW: 22Hz – 22kHz      Filter: see below      Output impedance: 40 ohms

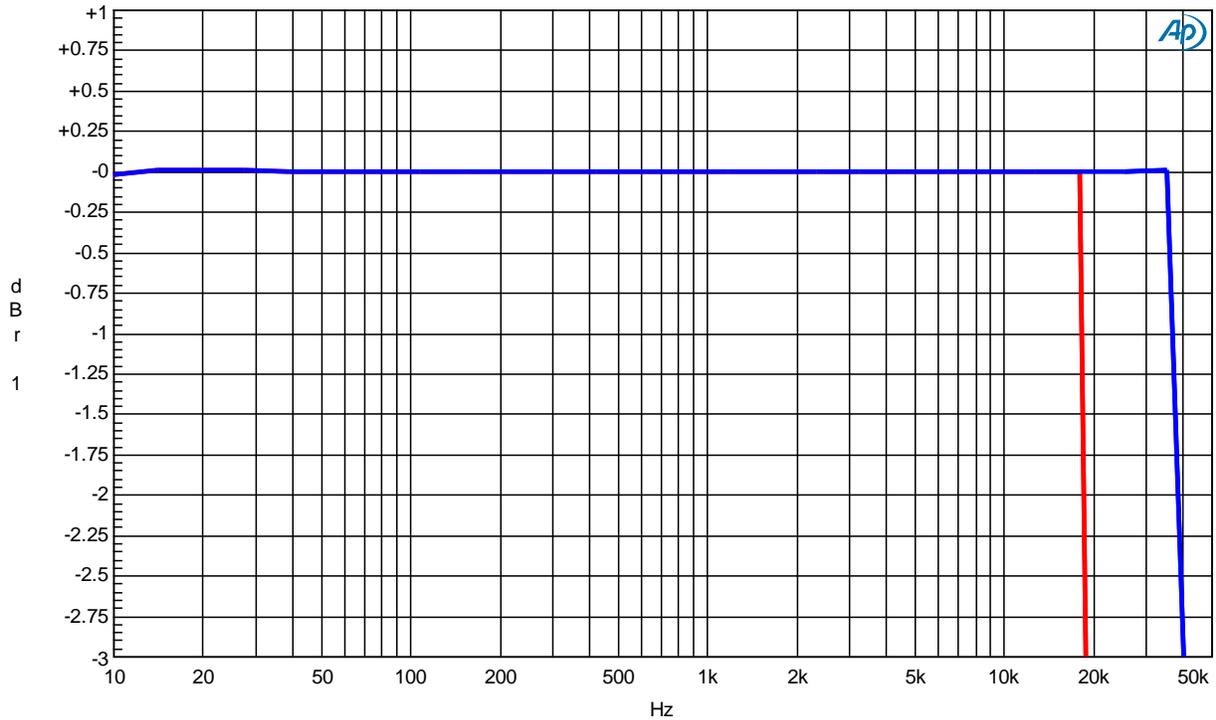
**Channel 1: 119.3dB A-weighted, 117.2dB 22Hz – 20kHz**

**Channel 2: 119.3dBA-weighted, 117.1dB 22Hz – 20kHz**

## 12.4 A/D Frequency Response at 48 kHz and 96 kHz Sample Rates

Sample Rate: 48 kHz / 96kHz    Signal Level: -1dBFS    Trim: +4 dBu    Channel: 1  
 Analyzer BW: <10Hz – Fs/2    Output impedance: 40 ohms

Lynx Studio Technology    A-D FREQUENCY RESPONSE 48kHz and 96    10/11/17 15:10:42  
 kHz Sample Rate



Sweep	Trace	Color	Line Style	Thick	Data	Axis	Comment
1	1	Red	Solid	3	DSP Anlr.Level AI\Normalize	Left	48 kHz
2	1	Blue	Solid	3	DSP Anlr.Level AI\Normalize	Left	96 kHz

19 dBu, 96kHz

A-D FREQ RESP.at27

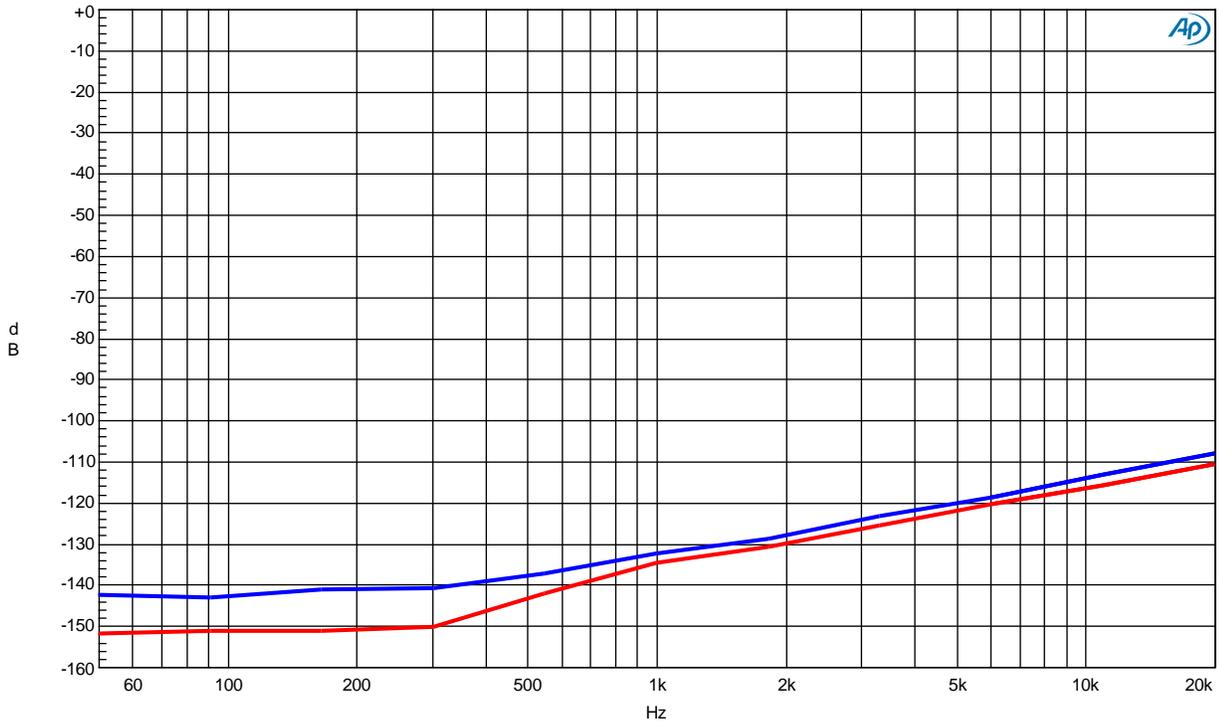
## 12.5 A/D Crosstalk

Sample Rate: 48 kHz    Signal Level: -1dBFS    Trim:+4 dBu    Channel: 1/2  
 Analyzer BW: <10Hz – Fs/2    Filter: Narrow    Output impedance: 40 ohms

Lynx Studio Technology

A-D CROSSTALK or SEPARATION VS FREQUENCY

10/11/17 15:27:55



Sweep	Trace	Color	Line Style	Thick	Data	Axis	Comment
1	1	Blue	Solid	3	DSP Anlr.Crosstalk B	Left	
1	2	Red	Solid	3	DSP Anlr.Crosstalk A	Left	

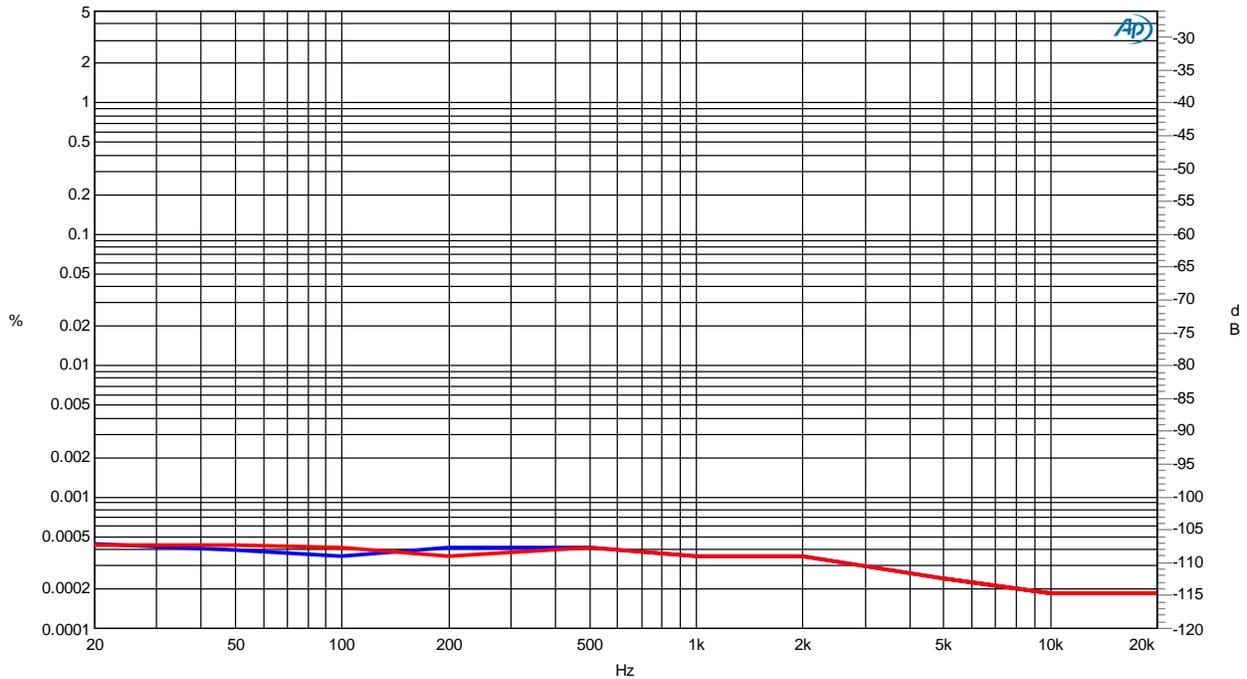
## 12.6 D/A THD+N Ratio vs Frequency

Sample Rate: 48 kHz    Signal Level: -1dBFS    Trim: +4 dBu    Channel: 1(blue) / 2(red)  
 Analyzer BW: 22 – 22 kHz    Filter: None

Lynx Studio Technology

D-A THD+N VS FREQUENCY

10/11/17 16:17:35



Sweep	Trace	Color	Line Style	Thick	Data	Axis	Comment
1	1	Blue	Solid	3	Anlr.THd+N Ratio	Left	
1	3	Red	Solid	3	Anlr.THd+N Ratio	Left	

## 12.7 D/A Dynamic Range

Sample Rate: 48 kHz    Signal Level: -60dBFS    Signal Frequency: 1 kHz    Trim: +4 dBu  
 Channels: 1/2    Analyzer BW: 22Hz – 80kHz    Filter: see below

**Channel 1: >120 dB A-weighted, 119 dB 22-22kHz**

**Channel 2: >120 dB A-weighted, 119 dB 22-22kHz**

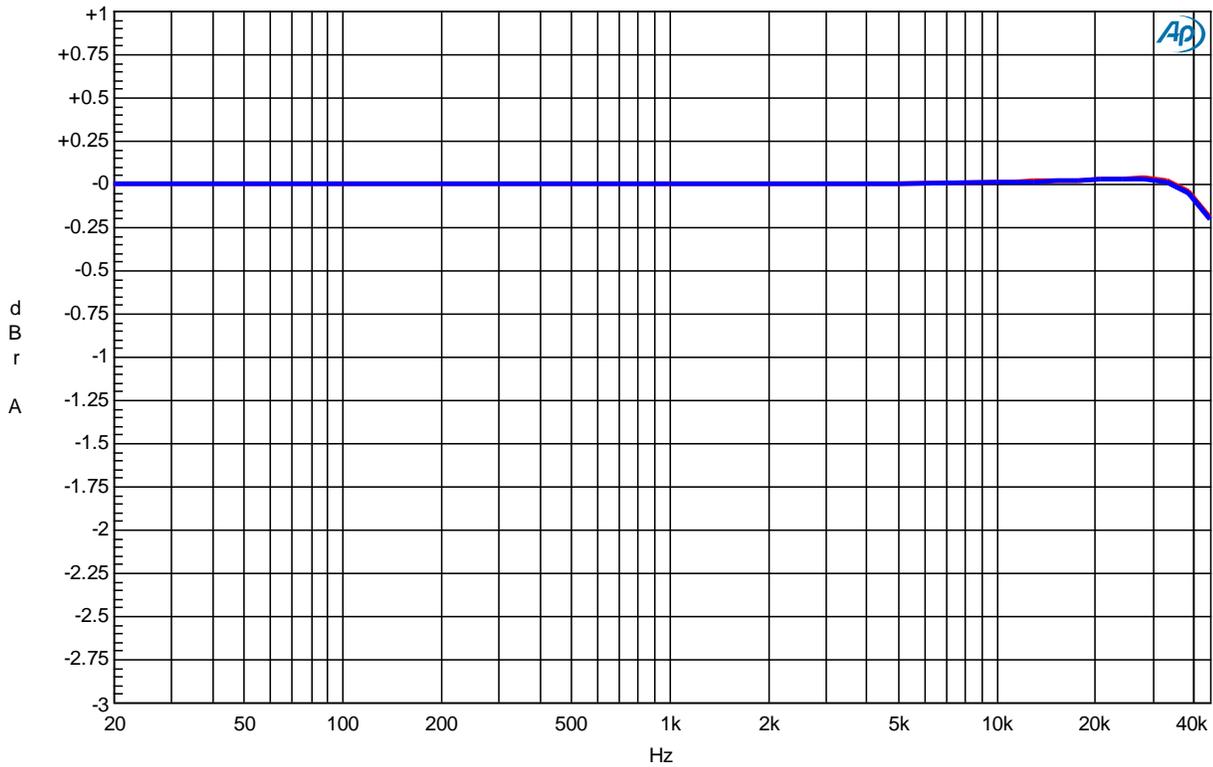
## 12.8 D/A Frequency Response at 96 kHz Sample Rate

Sample Rate: 96kHz    Signal Level: -1dBFS    Trim: +4 dBu    Channel: 1/2  
 Analyzer BW: <10Hz – 500kHz Filter: None

Lynx Studio Technology

D-A FREQUENCY RESPONSE

10/11/17 16:38:31



Sweep	Trace	Color	Line Style	Thick	Data	Axis	Comment
1	1	Blue	Solid	3	Anlr.Level A!Normalize	Left	
1	2	Red	Solid	3	Anlr.Level B!Normalize	Left	

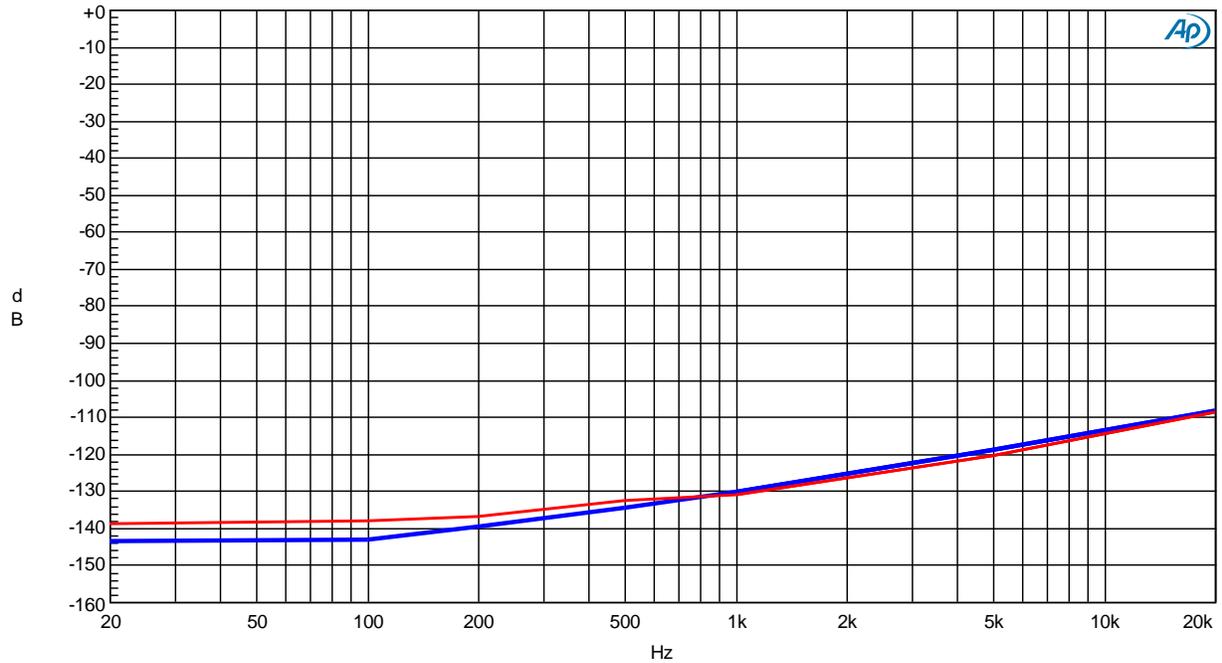
## 12.9 D/A Crosstalk

Sample Rate: 48 kHz    Signal Level: -1dBFS    Trim: +4 dBu    Channel: 1/2  
 Analyzer BW: <10Hz – 500 kHz

Lynx Studio Technology

D-A CROSSTALK or SEPARATION

10/11/17 16:50:52



Sweep	Trace	Color	Line Style	Thick	Data	Axis	Comment
1	1	Blue	Solid	3	Anlr.Crosstalk	Left	
1	2	Red	Solid	2	Anlr.Crosstalk	Left	

## 13 Certifications

### 13.1 FCC DECLARATION OF CONFORMITY

MANUFACTURERS NAME:	Lynx Studio Technology, Inc.	
MANUFACTURER ADDRESS:	190 McCormick Avenue Costa Mesa, CA 92626, U.S.A.	
TELEPHONE	(714) 545-4700	
TYPE OF EQUIPMENT:	Professional A/D and D/A Converter	
MODEL NUMBER:	Aurora <sup>(n)</sup>	
COMPLIANCE TEST REPORT NUMBER:	Covered by CE Report # D80420Q3	
COMPLIANCE TEST REPORT DATE:	April 20, 2018	
YEAR OF MANUFACTURE:	2018	

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.

### 13.2 CE EMI / EMC DECLARATION OF CONFORMITY

MANUFACTURERS NAME:	Lynx Studio Technology, Inc.	
MANUFACTURER ADDRESS:	190 McCormick Avenue Costa Mesa, CA 92626, U.S.A.	
TELEPHONE	(714) 545-4700	
TYPE OF EQUIPMENT:	Professional A/D and D/A Converter	
MODEL NUMBER:	Aurora <sup>(n)</sup>	
COMPLIANCE TEST REPORT NUMBER:	D80420Q3	
COMPLIANCE TEST REPORT DATE:	April 20, 2018	
CONFORMS TO THESE STANDARDS:	EN55032, EN55035	
YEAR OF MANUFACTURE:	2018	

### 13.3 CE SAFETY DECLARATION OF CONFORMITY

MANUFACTURERS NAME:	Lynx Studio Technology, Inc.	
MANUFACTURER ADDRESS:	190 McCormick Avenue Costa Mesa, CA 92626, U.S.A.	
TELEPHONE	(714) 545-4700	
TYPE OF EQUIPMENT:	Professional A/D and D/A Converter	
MODEL NUMBER:	Aurora <sup>(n)</sup>	
COMPLIANCE TEST REPORT NUMBER:	D80430S1	
COMPLIANCE TEST REPORT DATE:	April 9, 2018	
CONFORMS TO THESE STANDARDS:	EN 62368-1: 2014	
YEAR OF MANUFACTURE:	2018	

## 14 Warranty Information

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

### 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.

### 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 9 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, Aurora<sup>(n)</sup> and the Aurora<sup>(n)</sup> Logo are trademarks of Lynx Studio Technology, Inc. All other product or company names are the trademarks or registered trademarks of their respective owner.







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