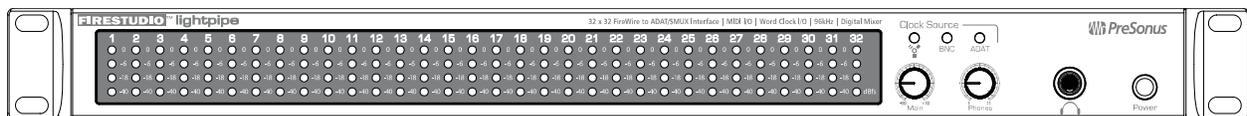


FIRESTUDIO LIGHTPIPE

24-bit, 96 kHz Recording Interface
with 32 channels of ADAT I/O



User's Manual
Version 2.0



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PRESONUS LIMITED WARRANTY

PreSonus Audio Electronics Inc. warrants this product to be free of defects in material and workmanship for a period of one year from the date of original retail purchase. This warranty is enforceable only by the original retail purchaser. To be protected by this warranty, the purchaser must complete and return the enclosed warranty card within 14 days of purchase. During the warranty period, PreSonus shall, at its sole and absolute option, repair or replace, free of charge, any product that proves to be defective on inspection by PreSonus or its **authorized service representative**. To obtain warranty service, the purchaser must first call or write PreSonus at the address and telephone number printed below to obtain a Return Authorization Number and instructions about 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 the PreSonus repair facility postage prepaid, insured, and properly packaged. PreSonus reserves the right to update any unit returned for repair. PreSonus reserves the right to change or improve the design of the product at any time without prior notice. This warranty does not cover claims for damage due to abuse, neglect, alteration, or attempted repair by unauthorized personnel and is limited to failures arising during normal use that are due to defects in material or workmanship in the product. Any implied warranties, including implied warranties of merchantability and fitness for a particular purpose, are limited in duration to the length of this limited warranty. Some states do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply to you. In no event will PreSonus be liable for incidental, consequential, or other damages resulting from the breach of any express or implied warranty, including, among other things, damage to property, damage based on inconvenience or on loss of use of the product, and, to the extent permitted by law, damages for personal injury. Some states do not allow the exclusion of limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you. This warranty gives you specific legal rights, and you may also have other rights, which vary from state to state. This warranty only applies to products sold and used in the United States of America. For warranty information in all other countries please refer to your local distributor.

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SAFE OPERATION GUIDELINES

To avoid damage to your FireStudio Lightpipe and your other audio equipment please review and adhere to the following safety guidelines:

- ❖ Follow the safety guidelines in the manual.
- ❖ Do not drop your FireStudio Lightpipe.
- ❖ Do not install the unit near a heat source (radiators, heat registers, amplifier heat sinks, etc.).
- ❖ Do not expose your FireStudio Lightpipe to liquids. Do not place containers filled with liquids near your FireStudio Lightpipe.
- ❖ Do not allow dust particles to collect in excess on your FireStudio Lightpipe. Keeping the unit covered when not in use is highly recommended and will extend the life of your product.
- ❖ Protect the power cord from being walked on, wheeled over, or pinched. If the power cord becomes damaged, purchase a new one.
- ❖ Unplug your FireStudio Lightpipe when not in use for long periods of time and during electrical storms, hurricanes, tornadoes, and other extreme weather.
- ❖ Use only the attachments/accessories recommended or manufactured by PreSonus for your FireStudio Lightpipe.
- ❖ All domestic PreSonus products should be serviced at the PreSonus factory in Baton Rouge, Louisiana. If your FireStudio Lightpipe requires a repair, contact techsupport@presonus.com to arrange for a return-authorization number. Customers outside the U.S. should contact their local distributor. Your distributor's contact information is available at www.presonus.com

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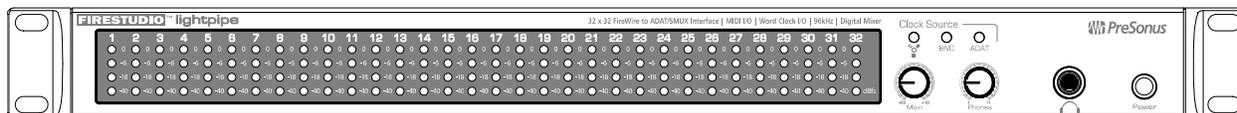
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OVERVIEW

1.1 INTRODUCTION



Thank you for purchasing the PreSonus FireStudio Lightpipe. PreSonus Audio Electronics has designed the FireStudio Lightpipe utilizing high-grade components to ensure optimum performance that will last a lifetime. The PreSonus FireStudio Lightpipe is a 24-bit, 96 kHz ADAT Lightpipe-to-FireWire computer recording system for PC and Macintosh computer systems. The FireStudio Lightpipe allows you to convert up to 32 channels of ADAT optical (“Lightpipe”) input/output to FireWire, providing a multichannel computer interface for digital mixers, AD and DA converters, or ADAT recorders.

FireStudio Lightpipe features JetPLL jitter-elimination technology for ultra-tight synchronization and improved imaging and clarity. It also offers a 34x4 DSP matrix mixer, allowing you to create two zero-latency monitor mixes. Fast-acting input LED meters are located on the front panel for quick and easy visual monitoring of all signals. Whether you’re recording live shows with a mobile rig or an entire orchestra in a studio, the FireStudio Lightpipe is the perfect solution for your professional recording needs.

PreSonus Audio Electronics is committed to constant product improvement, and we highly value your suggestions. We encourage you to contact us at 225-216-7887 or techsupport@presonus.com with any questions or comments you may have regarding your PreSonus FireStudio Lightpipe. We believe the best way to achieve our goal of constant product improvement is by listening to the real experts: our customers. We appreciate the support you have shown us through the purchase of this product.

We suggest you use this manual to familiarize yourself with the features, applications, and correct connection procedure for your FireStudio Lightpipe before trying to connect it to your computer.

Thank you, once again, for buying our product. Enjoy your FireStudio Lightpipe!

OVERVIEW

1.2 FEATURES

The FireStudio Lightpipe is a powerful and affordable computer recording system. The FireStudio Lightpipe comes complete with four ADAT/Dual SMUX ports, MIDI and word clock I/O, rock-solid drivers, expandability, a 34X4 mixer matrix application, and powerful music-recording and -production software.

Summary of FireStudio Lightpipe features

- High-speed FireWire (IEEE 1394)
- 24-bit, 96 kHz sampling
- Word clock I/O
- MIDI I/O
- JetPLL jitter-elimination technology
- Balanced TRS stereo main outputs with volume control
- Headphone amplifier with volume control
- Dual SMUX for transferring 16 channels of 96 kHz audio over ADAT
- Fast-acting LED input metering
- 34 x 4 mixer matrix
- Mac OS X and Windows compatible

The FireStudio Lightpipe includes PreSonus Studio One Artist recording software, which comes with over 4 GB of plug-ins, loops, and samples, giving you everything you need for music recording and production.

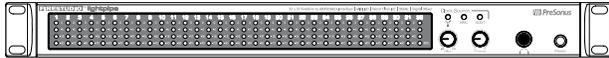
Summary of Studio One Artist features

- Unlimited track count
- Unlimited inserts and sends
- 20 high-quality native effects plug-ins
 - Amp Modeling (Ampire)
 - Delay (Beat Delay)
 - Distortion (Redlight Distortion)
 - Dynamic Processing (Channel Strip, Compressor, Limiter, Tricomp)
 - Equalizer (Channel Strip, Pro EQ)
 - Modulation (Autofilter, Chorus, Flanger, Phaser, X-Trem)
 - Reverbs (MixVerb, Room Reverb)
 - Utility (Binaural Pan, Mixtool, Phase Meter, Spectrum Meter, Tuner)
- Over 4 GB of loops, samples, and instruments, featuring:
 - Presence: Virtual Sample Player
 - Impact: Virtual Drum Machine
 - SampleOne: Virtual Sampler
 - Mojito: Virtual Analog-Modeled Subtractive Synthesizer
- Innovative and intuitive MIDI mapping
- Powerful drag-and-drop functionality for faster workflow
- Mac OS X and Windows compatible

OVERVIEW

1.3 WHAT IS IN THE BOX

Your FireStudio Lightpipe package contains the following:



- FireStudio Lightpipe recording interface



- 6-foot, 6-pin-to-6-pin FireWire cable



- 6-foot, standard IEC power cable



- PreSonus FireStudio Universal driver installation disc
- Studio One Artist installation DVD



- PreSonus warranty card

OVERVIEW

1.4 SYSTEM REQUIREMENTS

Here are the computer-system requirements for FireStudio Lightpipe and Studio One Artist.

- Macintosh
 - Operating Systems:
 - Mac OS X 10.4.11 or Mac OS X 10.5.2 or higher
 - Hardware:
 - Minimum:
 - PowerPC G4 1.25 GHz or Intel Core Solo 1.5 GHz processor
 - 1 GB RAM
 - DVD drive
 - Recommended:
 - PowerPC G5 or better or Intel Core Duo or Intel Xeon processor or better
 - 2 GB or more RAM
 - DVD drive

- Windows PC
 - Operating Systems:
 - Windows XP or Vista
 - Hardware:
 - Minimum:
 - Intel Pentium 4 1.6 GHz processor or AMD Athlon 64 (Turion)
 - 1 GB RAM
 - DVD drive
 - Recommended:
 - Intel Pentium 4 2.8 GHz EM64T or better or AMD Athlon 64 3000+ or better
 - 2 GB or more RAM
 - DVD drive

NOTE: The speed of your processor, amount of RAM, and size and speed of your hard drives will greatly affect the overall performance of your recording system. A more powerful system (faster processor with more RAM) allows for lower latency (signal delay) and better overall performance.

GETTING STARTED

2.1 HARDWARE INSTALLATION

This installer and driver can be used for any interface in the FireStudio Tube family line (FireStudio Mobile, FireStudio Tube, FireStudio Lightpipe, FireStudio, FireStudio Project, and StudioLive 16.4.2). For more information on the Universal Control application and multiple interface integration, please review Sections 3.1 and 4.1.

2.1.1 Installation in Microsoft Windows

After you insert the installation CD into your CD or DVD drive, the FireStudio Lightpipe installer will take you through each step of the installation process. Please read each message carefully, ensuring especially that you do not connect your FireStudio Lightpipe until the installer has finished and you have rebooted your computer.

The FireStudio Lightpipe Installer was designed to be as simple and easy-to-follow as possible. Please read each message carefully to ensure that the FireStudio Lightpipe driver is properly installed.

Before continuing the FireStudio Lightpipe Installation Setup, please close all applications and disconnect your FireStudio Lightpipe from your computer. If you see any Windows Security alerts, click "Install this driver software anyway" (Vista) or "Continue anyway" (XP).

At the end of the installation, you will be prompted to reboot your computer to complete the installation. Click "Finish" to automatically restart your PC. Once your computer has rebooted, connect the FireStudio Lightpipe. When the Found New Hardware wizard launches, follow the recommended steps. When the sync light remains solid blue, your FireStudio Lightpipe is synced to your computer and is ready to use!

2.1.2 Installation in Mac OS X

After inserting the installation CD into your disc drive, browse the disc and run the FireStudio Lightpipe installer, which will take you through each step of the installation process. Please read each message carefully, ensuring especially that you do not connect your FireStudio Lightpipe until the installer has finished and you have rebooted your computer.

To begin installing the FireStudio Lightpipe driver on your Mac, double click on the FireStudio Lightpipe logo. The FireStudio Lightpipe installer requires that your user password be entered as a security measure. Once you have entered your password, click "OK" to proceed with the rest of the installation.

When the Installer has finished, connect your FireStudio Lightpipe to your computer with a FireWire cable. Once the sync light is solid blue, your FireStudio Lightpipe is ready to use.

GETTING STARTED

2.2 STUDIO ONE ARTIST

Every PreSonus interface comes complete with Studio One Artist recording software. Whether you are about to record your first album or your 50th, Studio One Artist provides you with all the tools necessary to capture and mix a great performance. As a valued PreSonus customer, you are also eligible for an upgrade discount for Studio One Pro when you are ready to master your work, create a digital version for the Web, or incorporate third-party VST plug-ins into your recording process. For more details on the Studio One Pro upgrade program for PreSonus customers, please visit www.presonus.com.

2.2.1 Installation and Authorization

Once you have installed the FireStudio Lightpipe drivers and connected your FireStudio Lightpipe, you can use the PreSonus Studio One Artist music-production software included with your FireStudio Lightpipe to begin recording, mixing, and producing your music. To install Studio One Artist, insert your installation disc into your computer's DVD drive. Follow the onscreen instructions to complete the installation process.



Installing Studio One Artist

To Install Studio One Artist, insert your Studio One Artist installation DVD into your computer's DVD drive.

PC Users: Launch the Studio One Artist installer and follow the onscreen instructions.

Mac Users: Simply drag the Studio One Artist application into the Applications folder on your Macintosh HD.



Create a User Account

After installing Studio One Artist, launch the program, and the Activate Studio One menu will appear. If you are a new Studio One user, you will need to create a user account. Follow the Create Account link if your computer is connected to the Internet. Once you have created your account, continue to Activating Studio One Artist Online.

If your computer is not connected to the Internet, visit the Studio One product page at www.presonus.com on an Internet-connected computer to create your account. After you have created your account, skip to Activating Studio One Artist Offline.



Activating Studio One Artist Online

Now that you have created a user account, you can activate your copy of Studio One Artist. Launch Studio One Artist, and the Activate Studio One menu will appear.

Click on the Activate Online link and enter your previously created account Username, Password, and the Product Key you received with the Studio One Artist installation disc. Click on the Activate button to finish the activation process.

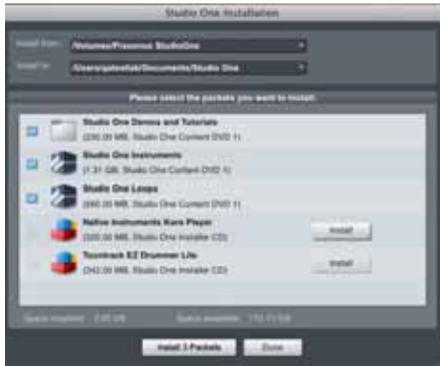
GETTING STARTED



Activating Studio One Artist Offline

Once you have created a user account, launch Studio One Artist. From the Activate Studio One Menu, click on the Activate Offline link. Follow the instructions to log in to your previously created user account, register the product, and obtain a license file.

Next, copy the license file to the computer on which Studio One has been installed, and locate the license file as instructed in the Activate Studio One menu. The activation process is now complete.



Installing Bundled Content for Studio One Artist

Studio One Artist comes bundled with an array of demo and tutorial material, sampled instruments, loops, samples, and unique third-party content. The Studio One Artist bundle includes all that you need to begin producing music.

Upon completing the Studio One Artist installation and activation process, the Studio One Content Installer will appear. If it does not appear, navigate to Help/Studio One Installation.

At the top of the installation menu, select the source from which the content will be installed, as well as the location where you wish to install the content. The source of the content will be the same DVD from which you installed Studio One Artist. By default, Studio One Artist will point to your DVD drive as the content source. Listed in the installation menu are separate entries for each available item. Click in the checkbox next to each item you wish to install, then click on the Install Packages button at the bottom left of the menu to install the selected content.

When finished installing content, click on the Done button to exit the menu.

Studio One Artist content can be installed at any time by accessing the Help/Studio One Installation menu. If you choose not to install any portion of the content, you can install it at a later time.

2.2.2 Enabling the FireStudio Lightpipe Driver

Studio One and Studio One Artist were designed with PreSonus interfaces in mind. Your FireStudio Lightpipe is already integrated into Studio One Artist, so setup is quick and easy. When Studio One Artist is launched, by default you will be taken to the Start page. On this page, you will find document-management and device-configuration controls, as well as a customizable artist profile, a news feed, and links to demos and tutorials from PreSonus. If you have an Internet connection on your computer, these links will be updated as new tutorials become available on the PreSonus Web site.

Complete information on all aspects of Studio One Artist is available in the Reference Manual PDF located on the Studio One Artist Installation disc. The information in this manual covers only the most basic aspects of Studio One Artist and is intended to get you set up and recording as quickly as possible.

GETTING STARTED

- **Start Page: Setup Area**



Shows Active Audio Driver and Sample Rate and Provides Quick Links to Configure Audio and MIDI

In the middle of the Start page, you will see the Setup area. Studio One Artist automatically scans your system for all available drivers and selects a driver. By default, it will choose a PreSonus driver if one is available.



Selecting a Different Audio Driver From the Start Page

If you do not see "PreSonus FireStudio" on the Start page when you launch Studio One, click on the Configure Audio Devices link in the Setup area to open the Audio Setup Options window.



In the Audio Device menu, select "PreSonus FireStudio." Click the Apply button and then OK.

After you have verified that the PreSonus FireStudio Lightpipe driver has been detected, please continue to Section 2.2.3 to set up your external MIDI devices. If you do not have any MIDI devices to connect at this time, please skip to Section 2.2.4.

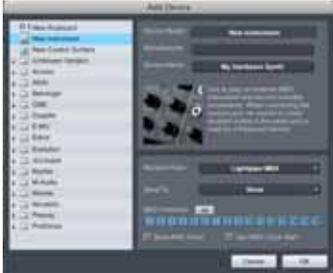
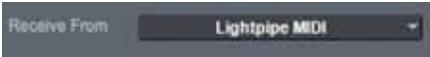
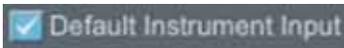
2.2.3 Configuring your MIDI devices

From the External Devices window in Studio One Artist, you can configure your MIDI keyboard controller, sound modules, and control surfaces. This section will take you through setting up your MIDI keyboard controller and sound module with the FireStudio Lightpipe. Please consult the Reference Manual located on your Studio One Artist installation DVD for complete setup instructions for other MIDI devices.

Setting up an external MIDI keyboard controller from the Start page.

A MIDI keyboard controller is a hardware device that is generally used for playing and controlling other MIDI devices, virtual instruments, and software parameters. In Studio One Artist, these devices are referred to as Keyboards, and they must be configured before they are available for use. In some cases, your MIDI keyboard controller is also used as a tone generator. Studio One Artist views the two functions of these types of hardware as two different devices: a MIDI keyboard controller and a sound module. The MIDI controls (keyboard, knobs, faders, etc.) will be set up as a Keyboard. The sound module will be set up as an Instrument.

GETTING STARTED

	<p>1) From the Setup area in the Start page, you can also set up your external MIDI devices. Before we set up a new Song for recording, let's take a moment to configure external devices. Connect the MIDI Out of your external MIDI controller to the MIDI In of your FireStudio Lightpipe. Make sure the breakout cable is securely connected to your FireStudio Lightpipe.</p>
	<p>2) Click on the Configure External Devices link in the Setup area on the Start page to launch the External Devices window.</p> <p>Click the Add button.</p>
	<p>3) The Add Device window will launch.</p> <p>From the menu on the left, select "New Keyboard." At this point, you can customize the name of your keyboard by entering the manufacturer and device names.</p> <p>Specify which MIDI channels will be used to communicate with this keyboard. For most purposes, you should select all MIDI channels. If you are unsure of which MIDI channels to select, we suggest you select all 16.</p>
	<p>4) In the Receive From drop-down menu, select the MIDI interface input from which Studio One Artist will receive MIDI data. In this case, choose "Lightpipe MIDI."</p> <p>In the Send To drop-down menu, select the MIDI interface output from which Studio One Artist will send MIDI data to your keyboard (also labeled "Lightpipe MIDI"). If your keyboard controller does not need to receive MIDI data from Studio One (say, for moving motorized faders and the like), you can leave this unselected. If your keyboard does need to receive MIDI data, you must connect a MIDI cable from the MIDI output of the MIDI breakout cable to the MIDI input of the keyboard.</p>
	<p>5) If this is the only keyboard that you will use to control the virtual instruments and your external synthesizers in Studio One Artist, you should check the box next to Default Instrument Input. This will automatically assign your keyboard to control all MIDI devices in Studio One Artist.</p> <p>Click OK.</p> <p>If you have a sound module you'd like to connect, leave the External Devices window open and proceed to the next part of this section. If not, you can close this window and skip to Section 2.1.4.</p>

Setting up an external MIDI sound module from the Start page:

GETTING STARTED

MIDI instrument controllers (keyboards, MIDI guitars, etc.) send musical information in the form of MIDI data to tone modules, which respond by generating sound, as instructed. Tone modules can be standalone sound devices or can be integrated into a controller, as with a keyboard synthesizer. Studio One Artist refers to all tone generators as Instruments. Once you have set up your MIDI keyboard controller, take a moment to configure your sound module.



- 1) Connect the MIDI In of your external sound module to the MIDI Out of your FireStudio Lightpipe. Make sure the breakout cable is securely connected to your FireStudio Lightpipe.



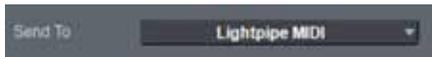
- 2) In the External Devices window, click the Add button.



- 3) The Add Device window will launch.

From the menu on the left, select "New Instrument." At this point, you can customize the name of your sound module by entering the manufacturer and device names.

Specify which MIDI channels will be used to communicate with this keyboard. For most purposes, you should select all MIDI channels. If you are unsure of which MIDI channels to select, we suggest you select all 16.



- 4) In the Send To drop-down menu, select the MIDI-interface output from which Studio One Artist will send MIDI data to your sound module, in this case, choose "Lightpipe MIDI."

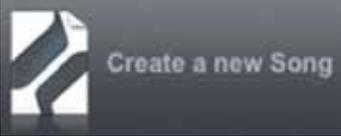
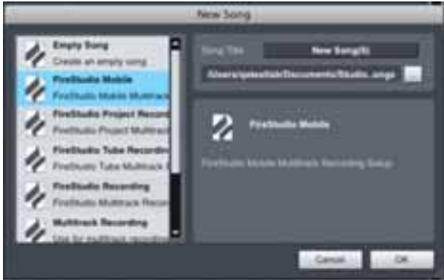
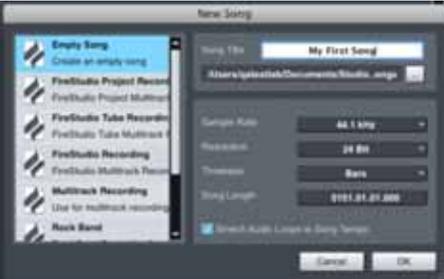
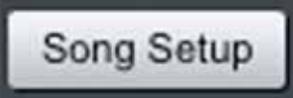
In the Receive From drop-down menu, select the MIDI-interface output from which Studio One Artist will receive MIDI data from your sound module (also labeled "Lightpipe MIDI"). In most cases, your sound module will not need to send information to Studio One, so you can leave this unspecified.

Click OK and close the External Devices window. You are now ready to start recording in Studio One Artist. Sections 2.2.4 through 2.2.6 will go over how to set up a Song and will discuss some general workflow tips for navigating through the Studio One Artist environment.

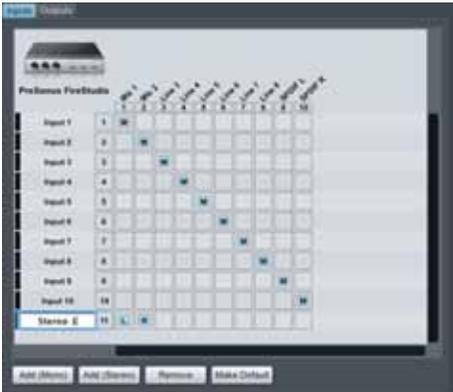
GETTING STARTED

2.2.4 Configuring Audio I/O

Now that you've configured your MIDI devices, let's create a new Song and set up your default Audio I/O.

	<p>1) From the Start page, select "Create a new Song."</p>
	<p>2) In the browser window, name your Song and choose the directory in which you'd like it saved. You'll notice a list of templates on the left. The FireStudio Lightpipe template will create a Song with a track for each of the available inputs. Every track is armed for recording, and no further setup is required. Simply select this template and click "OK."</p> <p>The rest of this section will guide you through creating a Song from an empty session.</p>
	<p>3) To begin a new Song, select "Empty Song" from the Templates list. At this point, you should give your Song a name and select your preferred sample rate and bit depth. You can also determine the length of your Song and the type of time format you would like to use (Notation Bars, Seconds, Samples, or Frames). Click the OK button when you are finished.</p> <p>If you plan on importing loops into your Song, you may want to select "Stretch Audio Loops to Song Tempo" so that any loop of a known BPM (like those in the included content library) will import at the correct tempo.</p>
	<p>4) When the Song window launches, launch the Audio Setup window by going to File Options... (PC) or Studio One Preferences (Mac), and click on the Audio Setup button.</p>
	<p>5) Click on the Song Setup button to open the Song Setup window, then click on the on the Audio I/O Setup icon.</p>

GETTING STARTED



- 6) Click on the Inputs tab in the Audio I/O Setup window, and you will see all of the available inputs on your FireStudio Lightpipe. At this time, you can add the number and type of inputs you plan to use. We recommend that you create a mono input for each of the 32 inputs on your FireStudio Lightpipe. If you plan on recording in stereo, you should also create a stereo bus and assign it to the appropriate set of inputs. You can remove any bus by simply selecting it and clicking the remove button. To customize the name of your buses, double-click on the default name to open a text box. When you have finished typing, hit Enter.

If you would like the same inputs to be available every time you launch Studio One Artist, click the "Make Default" button.



- 7) Click on the Outputs tab, and you will see all of the available outputs on your FireStudio Lightpipe. At this time, you can add the number of output buses to which you would like to have access and can give them custom names.

In the lower right corner, you will see the Audition select menu. This allows you to choose the output from which you will audition audio files prior to importing them into Studio One Artist. In general, you will want this to be the Main Out bus.

If you would like this output configuration available every time you launch Studio One Artist, click the Make Default button.

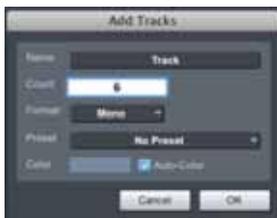
2.2.5 Studio One Artist – Creating a Song

Now that you've configured your MIDI and Audio I/O and have created a new Song, let's go through some of the basics of Studio One Artist so you can start recording!

Creating Audio Tracks

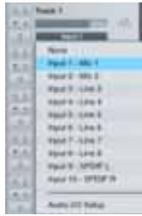


In the upper left corner of the Arrange window, you will notice several buttons. The middle button is the Add Tracks button. Click this button to bring up the Add Tracks window.



In the Add Tracks window, you can select the number and type of Tracks you'd like to create (Mono Audio, Stereo Audio, Instrument, or Automation) and can customize the name and the color.

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Once you have added your Tracks, you can assign the input by simply clicking on the input to which a Track is currently assigned. This will bring up your inputs list. You can also access the Audio I/O Setup from here.

If you would like to add a Track for each of the available inputs and have the routing automatically assigned, simply go to Track|Add Tracks for All Inputs.

To begin recording, create an audio track, assign it to Input 1, and connect a microphone or instrument to Channel 1 on the A/D device (DigiMax FS, DigiMax D8, etc.) that is connected to ADAT Input 1-8 on the FireStudio Lightpipe. Select Record Enable (☑) and Monitor (☑) on your track in Studio One Artist. Turn up the Channel 1 gain knob on your A/D device while speaking/singing into the microphone or playing your instrument. You should see the input meter in Studio One Artist react to the input. Adjust the gain so the input level is near its maximum **without clipping**.

Connect a set of headphones to the FireStudio Lightpipe headphone output. You may also wish to connect monitors to the FireStudio Lightpipe's Main Outs. You are now ready to record. For complete instructions, please consult the Studio One *Reference Manual*, which is located on your Studio One Artist Installation DVD.

Creating MIDI Tracks



Click on the Add Tracks button. When the Add Tracks window launches, select Instrument as the Track Format and click the OK button.



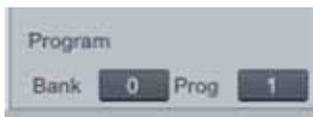
To assign your MIDI input, click on the MIDI Inputs list and select your external sound module.

If you have added Virtual Inputs to your session, you will also see them as available inputs.

If you selected your MIDI keyboard controller as the default keyboard, it will already be selected. If not, choose your MIDI controller from Output menu directly below.



To the left of the Add Track button, you will find the Inspector button. Click it to display more parameters for the selected track.



At the bottom of the Inspector menu, you will see your Bank and Program selections. From here, you can remotely change the patch on your sound module.

GETTING STARTED

Please Note: MIDI data does not contain audio signals. To hear your sound module, you must connect the audio output of the sound module either to an A/D device connected to the FireStudio Lightpipe, or directly to the FireStudio Lightpipe (if your sound module has an ADAT optical output), and then connect the FireStudio Lightpipe's audio outputs to a sound system. (You also can listen on headphones, using the FireStudio Lightpipe's headphone output.) When you are ready to mix your Song, you must convert the recorded MIDI data to an audio waveform by recording a new audio track.

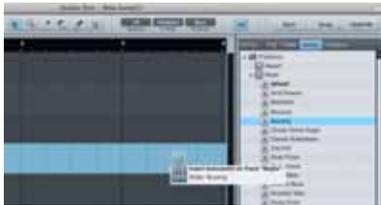
Adding Virtual Instruments and Plug-in Effects to your Song

You can add plug-ins and Instruments to your Song by dragging-and-dropping from the browser. You can also drag an effect or group of effects from one channel to another, drag in customized effects chains, and instantly load your favorite virtual-instrument patch without ever scrolling through a menu.



In the lower right corner of the Arrange window are three buttons. The Edit button opens or closes the Audio editor or the MIDI piano-roll editor, depending on what type of track is selected. The Mix button opens and closes the mixer window.

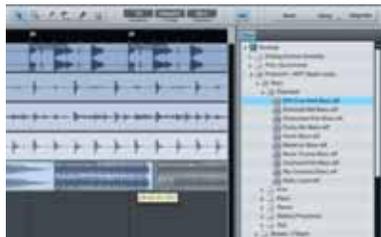
The Browse button opens the Browser window, which displays all of the available virtual instruments, plug-in effects, audio files, and MIDI files, as well as the pool of audio files loaded into the current session.



To add a virtual instrument to your session, click the Browse and Instrument buttons to open the Instrument Browser. Select the instrument or one of its patches from the Instrument Browser and drag it into the Arrange view. Studio One Artist will automatically create a new track and load the Instrument as the input.



To add a plug-in effect to a track, click the Effects button and select it or one of its presets in the Effects Browser, then drag it over the track to which you would like to add it.



Audio and MIDI files can also be quickly located, auditioned, and imported into your Song by dragging them from the File Browser into the Arrange view. If you drag the file to an empty space, a new track will be created with that file placed at the position to which you dragged it. If you drag the file to an existing track, the file will be placed as a new part on the track.

GETTING STARTED

2.3 SAMPLE HOOKUP DIAGRAM

With the FireStudio Lightpipe, you can simultaneously record and play back up to 32 channels. Because the FireStudio Lightpipe can send and receive 32 channels simultaneously via its ADAT optical I/O, it is the perfect solution to connect a 32-channel digital mixer to your computer. It is also ideal for recording live performances. All you need are a few cables and a durable rack.

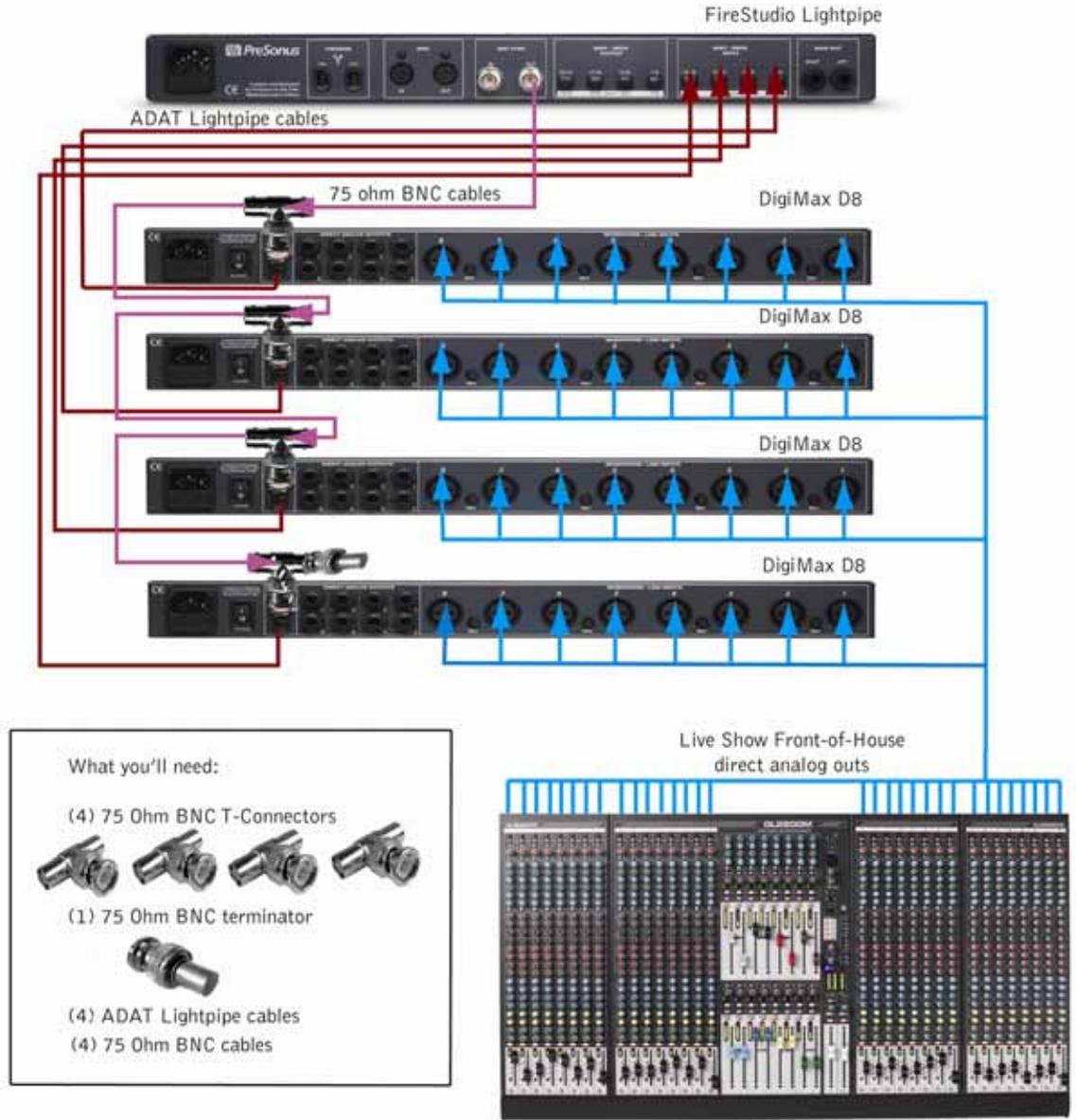
2.3.1 CONNECTING YOUR DIGITAL MIXER

Please note: In this scenario, the digital mixer would be the master clock. In the FireStudio Lightpipe Mixer application, you will need to set the clock source to BNC so that the FireStudio Lightpipe will receive its clock from an external source.



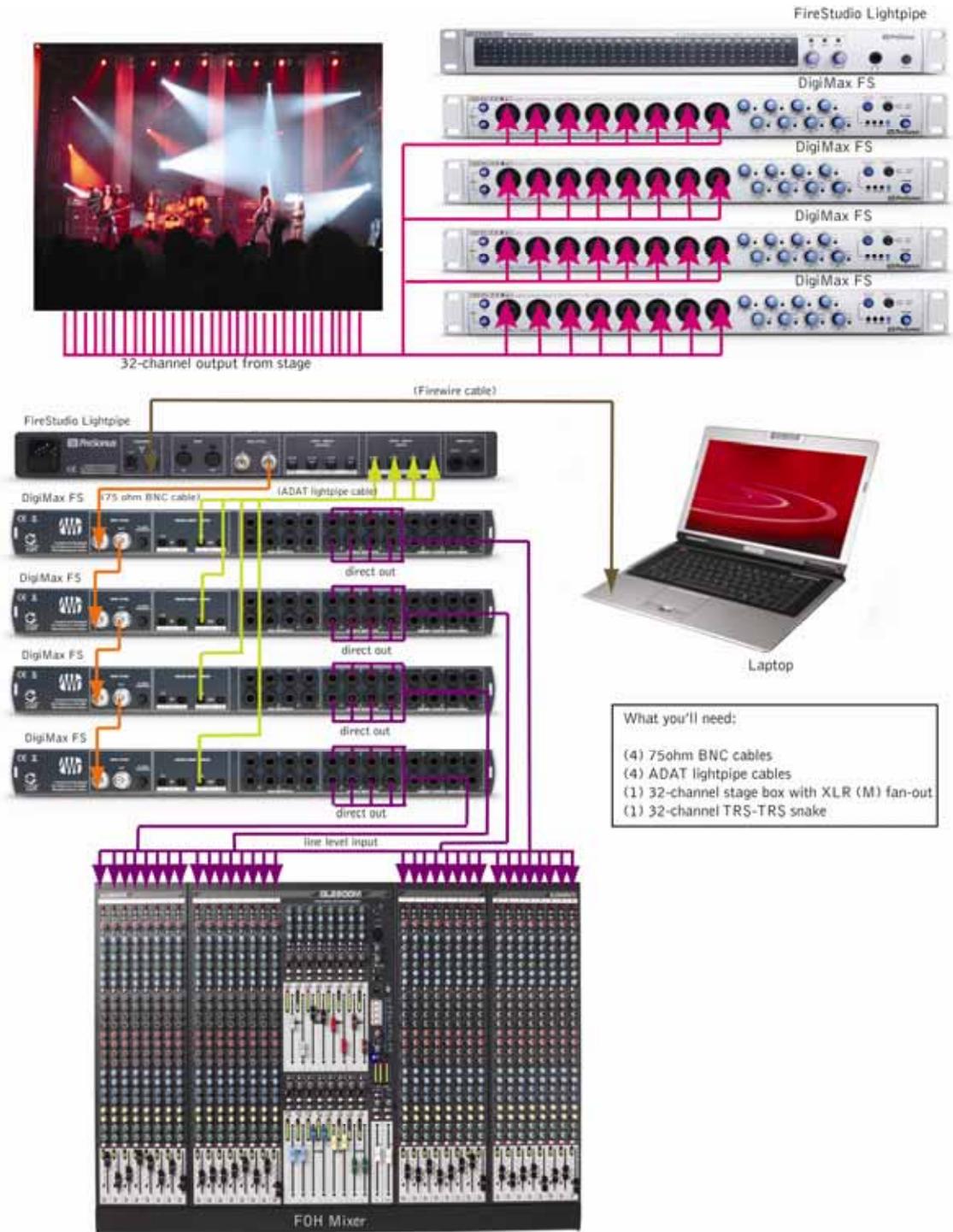
GETTING STARTED

2.3.2 USING THE FIRESTUDIO LIGHTPIPE & MULTIPLE DIGIMAX D8S



GETTING STARTED

2.2.3 MOBILE RECORDING RIG



CONTROLS & CONNECTIONS

3.1 UNIVERSAL CONTROL AND THE FIRESTUDIO LIGHTPIPE



Like all members of the FireStudio family of interfaces, the FireStudio Lightpipe is compatible with Universal Control. Universal Control is a powerful, flexible, and easy to use control-panel application for creating multiple mixes from your input and output signals for two of your FireStudio Lightpipe's output pairs (Main and Headphone). This application also allows you to daisy-chain FireStudio-family interfaces. The FireStudio Lightpipe can be connected to up to 3 other FireStudio-family devices for a total of up to 52 inputs and outputs.

Universal Control consists of the Launch window and the Device window. In the Launch window, you can set basic parameters such as sample rate, clock source, and buffer size. The Device window of the FireStudio Lightpipe is the FireStudio Lightpipe Mixer. The Mixer section of the Universal Control Panel was designed to look and feel like a hardware mixer, so most of the features may already be familiar to you. From this mixer, you can create a zero-latency mix for each output and can route playback streams from your host application.

3.1.1 Universal Control Application Icon



If you are using Microsoft Windows, once you have successfully installed your FireStudio Lightpipe, the Universal Control will be available from the Notification Area of your taskbar (typically at the bottom right corner of your screen, near the clock).

The Universal Control icon is red when your FireStudio Lightpipe is disconnected or not installed and blue when the FireStudio Lightpipe is connected and properly installed.

Open the Universal Control by double-clicking the blue Universal Control icon or by right-clicking the icon and selecting "Open PreSonus Universal Control."

Right-click the Universal Control icon and select "Quit" to exit the Universal Control application and remove it from your taskbar. The Universal Control application can also be accessed from the PreSonus folder in the Start Menu.

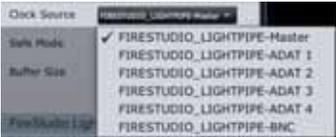
Mac OS X users will find the Universal Control application in the Applications folder. We recommend that you move it to your Dock for easy access.



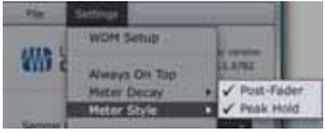
CONTROLS & CONNECTIONS

3.1.2 Launcher Window

From the Launcher Window, you can set all the basic controls for your FireStudio Lightpipe.

<ul style="list-style-type: none">• <u>Sample Rate Selector</u> 	<p>Changes FireStudio Lightpipe Sample Rate</p> <p>You can set the sample rate to 44.1, 48, 88.2, or 96 kHz. A higher sample rate will increase the fidelity of the recording but will increase the file size and the amount of system resources necessary to process the audio.</p>
<ul style="list-style-type: none">• <u>Buffer Size Selector</u> 	<p>Changes the FireStudio Lightpipe Buffer Size (Windows PCs Only)</p> <p>You can set the buffer size from 64 to 4,096 samples. The buffer size determines the latency, which is the roundtrip time it takes audio data to be converted from analog to digital and back to analog. As a general rule, the higher the buffer size, the better the system performance, but the less playable virtual instruments become. In general, 512 samples (11 to 12 milliseconds) will provide you with a buffer that is large enough for optimum system performance, but small enough to be unobtrusive. You should set your buffer size and sample rate prior to launching your host application.</p> <p>On Macintosh, the buffer size is set from inside your host application.</p>
<ul style="list-style-type: none">• <u>Operation Mode</u> 	<p>Changes How the FireStudio Lightpipe Driver's Buffer Size is Set</p> <ul style="list-style-type: none">• Normal Mode. Input and Output buffers are both identical to the Buffer Size setting.• Safe Modes 1-3. Increases the Output buffer size for added stability.
<ul style="list-style-type: none">• <u>Clocksource</u> 	<p>Changes the Clock Source for the FireStudio Lightpipe</p> <p>The Clock Source setting will determine the port from which the FireStudio Lightpipe is receiving word-clock information. This keeps the FireStudio Lightpipe in sync with other digital devices. You can choose between Internal or S/PDIF.</p> <p>In general, you will want the FireStudio Lightpipe to be your master clock, in which case you should set the clock to "FireStudio Lightpipe - Master." This setting also means that your FireStudio is generating word clock and sending this information out of its digital outputs.</p> <p>If you want the FireStudio Lightpipe to receive sync from an external device, choose the digital input to which the external device is connected (S/PDIF, ADAT, or BNC word clock). The FireStudio Lightpipe's sync light will flash blue. When the FireStudio Lightpipe is in sync, the light will be blue.</p> <p>Please note: When slaved to an external clock, the FireStudio Lightpipe will not automatically change its sample rate to match the external clock. As a result, it may fail to sync to the clock source. If your FireStudio Lightpipe is not syncing to an external source, make sure that both your master device and the FireStudio are set to the same sample rate.</p>

CONTROLS & CONNECTIONS

<ul style="list-style-type: none">• <u>Device Window Button</u> 	<p>Opens the Device Window</p> <p>Click on this button to open the FireStudio Lightpipe Mixer.</p> <p>To give your FireStudio Lightpipe a custom name, double-click on the default label (FireStudio Lightpipe) to open a text field. When you have finished entering your custom name, hit the Enter key.</p>
<ul style="list-style-type: none">• <u>File Menu</u> 	<p>Opens and Closes Launcher and Device Windows</p> <p>From the File menu of the Launch Window, you can open and close both windows, as well as quit the Universal Control application.</p> <ul style="list-style-type: none">• Close Window. Closes just the Launcher window.• Show All Devices. Opens the Device window for all of the connected FireStudio-family interfaces.• Close All Devices. Closes the Device window for all of the connected FireStudio-family interfaces.• Quit. Quits the Universal Control application.
<ul style="list-style-type: none">• <u>Settings: Check Firmware</u> 	<p>Automatically Scans Your FireStudio Lightpipe and Updates the Firmware</p> <p>A firmware updater is built into the Universal Control application. Periodically, a driver update will require that the firmware on your FireStudio Lightpipe be updated. Whenever you install an update for the Universal Control or add a new FireStudio-family product to your system, you should use this feature to ensure that the firmware is up to date. If the firmware needs to be updated, the update application will launch automatically.</p>
<ul style="list-style-type: none">• <u>Settings: Run at Startup</u> 	<p>Launches the Universal Control Application Automatically on Startup (Windows PCs Only)</p> <p>When this is enabled, the Universal Control application will automatically launch each time you boot your Windows PC.</p>
<ul style="list-style-type: none">• <u>Settings: Meter Style</u> 	<p>Provides options for Metering in the Device Window.</p> <p>From the Launcher Window, you can determine how your Inputs and DAW streams are metered in the Device Window.</p> <ul style="list-style-type: none">• Post-Fader. Displays the metering for any signal after it has been boosted or attenuated by the channel fader. By default, all metering is pre-fader position.• Peak Hold. When this is enabled, the clip indicator on any given channel will remain illuminated until manually cleared, even if the signal is no longer clipping. This is enabled by default.

CONTROLS & CONNECTIONS

<ul style="list-style-type: none">• Settings: Meter Decay 	<p>Sets the Response Time for the Meters in the Device Window</p> <p>The Universal Control gives you the option to set the response time for the meters in the Device Window. By default, this is set to Normal. Enable Slow Meter Decay for more accurately meter the peaks and falls of the signal. Enable Fast Metering to monitor your signal in real time.</p>
<ul style="list-style-type: none">• Settings: Always On Top 	<p>Allows the Launcher Window to Stay in View When Other Applications Are in Use</p> <p>When this is enabled, the Launcher window will remain in the foreground when other applications are active, rather than being in the background behind the current application's window.</p>

3.1.3 WDM Settings (PC only)

Like the rest of the FireStudio family of interfaces, the FireStudio Lightpipe features advanced WDM features that enhance its use as an audio interface. In the Settings menu of the Launcher window, you will find the WDM Setup option. From here you can configure your WDM input and output streams.

	<ol style="list-style-type: none">1) In the Lancher window, go to Settings WDM Setup.
	<ol style="list-style-type: none">2) The WDM Channel Mapper window will open. By default, WDM Outputs 1 and 2 are routed to the FireStudio Lightpipe main outputs. To change the default routing, simply select WDM Output 1 and 2 and drag them to your preferred output pair.

CONTROLS & CONNECTIONS

3.1.4 The Device Window: FireStudio Lightpipe Mixer

The FireStudio Lightpipe's Device window allows you to create two stereo monitor mixes. The mixes can be renamed and saved. You can also rename your inputs and playback streams.

These mixes have no effect on what is being recorded in your host application. This has obvious advantages. However, it is vital to remember that lowering the fader in the Device window on a channel strip that is clipping will not lower the signal that may also be clipping in your host application. You must set the level for the recording using the gain knobs the A/D devices connected to your FireStudio Lightpipe. If your signal is too hot in your DAW, lower them with these gain controls.

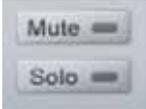
A quick note on playback streams: Wherever you see "DAW" in the FireStudio Lightpipe Device window, this is a playback stream from your host application (or DAW). Traditionally, if you want to route a track in your DAW to a physical output on your interface, you assign this output in your host application. Because the FireStudio Lightpipe Device window provides much more flexible routing, you can now route this same track to one output or every output, by itself or as part of a mix.

Output Select Section

<ul style="list-style-type: none">• <u>Output Select Buttons</u> 	<p>Changes the Output Mixer Displayed</p> <p>The FireStudio Lightpipe mixer has two output mixes: one for each of the FireStudio Lightpipe's analog outputs: Main and Headphones.</p>
<ul style="list-style-type: none">• <u>Mixer On/Off Button</u> 	<p>Enables or Disables the Associated Output's Mixer</p> <p>When the Mixer On button is illuminated blue, you will be able to create a zero-latency mix for that output. When the button is off, the DAW streams for that output will be patched directly to the output.</p>
<ul style="list-style-type: none">• <u>Post Fader Output Meters</u> 	<p>Displays the Output Level of Each Stereo Pair</p> <p>These meter postfader levels, which means they represent the actual audio output levels of your FireStudio Lightpipe.</p>

CONTROLS & CONNECTIONS

Master Output Section

<ul style="list-style-type: none">• Master Output Fader  The image shows a vertical fader control labeled 'OUT 1-2' and 'Main'. It features a central slider with a blue indicator bar and two virtual LED meters on the right side.	<p>Changes the Selected Output's Audio Level</p> <p>Move the Master Fader up and down to increase and decrease the level of the selected output's audio.</p> <p>The amount of boost or attenuation, measured in decibels, is displayed below the Channel Fader. The range is from $-\infty$ to 0 dB.</p> <p>Two virtual LED meters to the right of the Master Fader display the prefader levels of the audio signal.</p> <p>The peak value in dBFS of the channel's audio is displayed directly above the Master Output's virtual LED meter.</p> <p>NOTE: If the peak values display "CLIP," then your mixer channels and/or your DAW playback levels should be reduced. The clip indicators clear when the mouse pointer hovers over them.</p>
<ul style="list-style-type: none">• Master Mute and Solo Clear  The image shows two buttons: 'Mute' and 'Solo'. Each button has a small indicator light to its right.	<p>Clears All Active Channel Mutes or Solos</p> <p>The Master Mute and Solo Clear buttons are only active when a channel's mute or solo button is active.</p>

Mixer Section

<ul style="list-style-type: none">• Channel Pan Sliders  The image shows a horizontal slider control with a 'C' icon above it, used for panning audio in a stereo field.	<p>Moves the Channel's Audio Left/Right in the Stereo Field</p> <p>Double-clicking the slider returns the pan to center.</p>
<ul style="list-style-type: none">• Link Buttons  The image shows two circular buttons with 'L' and 'R' icons, used for linking adjacent channels as a stereo pair.	<p>Links the Adjacent Channels as a Stereo Pair</p> <p>When channels are linked, changing either channel's level changes both channels' levels, and the signals are panned hard left and right.</p>
<ul style="list-style-type: none">• Channel Faders  The image shows two vertical fader controls labeled 'C-13' and 'C-12'. Each has a slider, a blue indicator bar, and a virtual LED meter on the right.	<p>Changes the Channel's Audio Level</p> <p>Move the Channel fader up and down to increase and decrease the channel's audio level.</p> <p>The amount of boost or attenuation, measured in decibels, is displayed below the Channel Fader. The range is from $-\infty$ to +6 dB.</p> <p>A virtual LED meter to the right of each fader displays the postfader level of the channel's audio.</p> <p>The peak value, in dBFS, of the channel's audio level is displayed directly above each channel's virtual LED meter.</p>

CONTROLS & CONNECTIONS

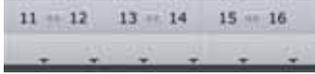
- **Channel Mutes and Solos**



Adds the Channel to the Mute or Solo Bus

Muting a channel silences the channel's audio. Soloing a channel mutes all other unsoloed channels.

- **Input Selectors**



Changes the Source of the FireStudio Lightpipe Mixer Channels

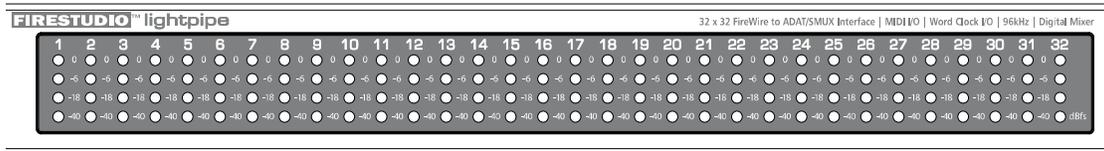
Choosing "No Input" will hide the channel.

"Inputs" are your hardware inputs (ADAT 1, ADAT 2, etc.).

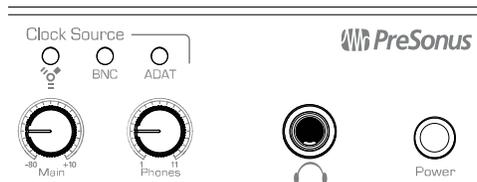
"Playback" are your software DAW outputs.

CONTROLS & CONNECTIONS

3.2 FRONT PANEL LAYOUT



- **LED Meters/Clip Indicator.** Each channel features four LED level indicators. The green LEDs will light up when your input signal reaches -40 dBFS and -18 dBFS respectively. The yellow LED will light up when the channel's input signal reaches -6 dBFS (+4 dBu). The red clip indicator LED will illuminate when the channel's input signal reaches 0 dBFS. At this level, the mic preamp/line trim signal of your external A/D will exhibit signs of clipping, and undesirable type of distortion. Do not allow your converters to clip.



- **Main.** The Main knob controls the output level for the main outputs on the back of the FireStudio Lightpipe and have a range of -80 dB to +10 dB.
- **Phones.** The Phones knob controls the output level of the headphone output on the front of the unit. Notice that the volume indicator goes to 11; use this setting with extreme caution.
- **1/4" Headphone Jack.** This is where you connect your headphones to the FireStudio Lightpipe.
- **Power button.** This button turns your FireStudio Lightpipe on and off. The button will illuminate blue when the unit is powered on.
- **FireWire Sync Light.** This indicator lets you know whether your unit is communicating properly with your computer.
 - **Blue.** FireStudio Lightpipe is correctly synced via FireWire.
 - **Flashing Blue.** Sync invalid or not present.
- **External Sync Indicators.** The FireStudio Lightpipe has two external clock-source (sync) indicators on the front panel to let you know at glance if your FireStudio Lightpipe is receiving a stable sync source from either BNC or ADAT. If you assign an external clock source in the FireStudio Lightpipe Mixer application, these lights will tell you if your unit is receiving word clock correctly. Word clock is the manner by which digital devices sync frame rates. Proper word-clock sync prevents digital devices from having pops, clicks, or distortion in the audio signal due to mismatched digital audio transmission.
 - **Blue.** FireStudio Lightpipe is correctly synced via BNC or ADAT.
 - **Flashing Blue.** Sync invalid or not present.

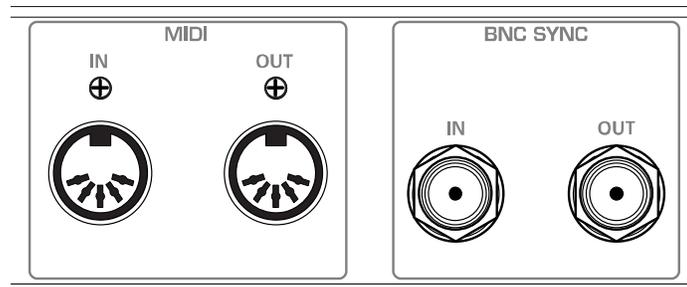
CONTROLS & CONNECTIONS

3.3 BACK PANEL LAYOUT



- **Power Adapter Input.** This is where you plug the provide IEC power cable into the FireStudio Lightpipe.
- **FireWire Ports.** There are two standard 6-pin FireWire ports on the back of the FireStudio Lightpipe. Either (and only one) should be used to connect your FireStudio Lightpipe to a FireWire port on your computer. If your computer has a 4-pin connector (commonly found on laptops), you will need a 4-to-6-pin adapter to connect your FireStudio Lightpipe to your computer.

You can use the “extra” FireWire port to connect additional FireWire devices to you computer (such as external hard drives).



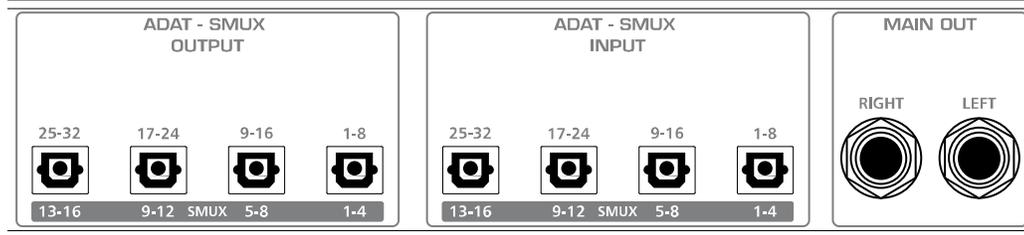
- **MIDI In and Out Ports.** MIDI stands for “Musical Instrument Digital Interface.” However, MIDI can be used for many things other than instruments and sequencing. The MIDI inputs and outputs allow connection to a variety of MIDI-equipped hardware, such as keyboard controllers, and can be used to send and receive MIDI Machine Control and MIDI Time Code.

***Note: MIDI does not carry audio signals** but is frequently used to trigger or control an audio source, such as a virtual instrument or hardware synthesizer. You should ensure that MIDI data is correctly sent and received by the appropriate hardware or software. You may also need to route hardware sound sources’ audio to the FireStudio Lightpipe. Please consult the user’s manuals of your DAW and MIDI devices for help with MIDI setup and usage.*

- **BNC Input and Output.** These allow the FireStudio Lightpipe to receive and transmit word clock to and from other digital audio devices.

You should select “BNC” as the Clock Source and set the sample rate to correspond to the external device in the Universal Control when using the BNC input.

CONTROLS & CONNECTIONS



- **Main Output.** These are balanced analog outputs and are normally used to connect your FireStudio Lightpipe to your studio monitors.
- **ADAT-S/MUX Input and Output** These are the ADAT-S/MUX connections for your external digital devices. When recording or playing back at 44.1 kHz or 48 kHz, each ADAT port will send or receive 8 of the 32 channels, numbered consecutively from right to left. When recording or playing back at 88.2 kHz or 96 kHz, each connection will provide 4 of the 16 channels.
 - **ADAT 1:** Channels 1-8 (44.1/48 kHz), 1-4 (88.2/96 kHz)
 - **ADAT 2:** Channels 9-16 (44.1/48 kHz), 5-8 (88.2/96 kHz)
 - **ADAT 3:** Channels 17-24 (44.1/48 kHz), 9-12 (88.2/96 kHz)
 - **ADAT 4:** Channels 25-32 (44.1/48 kHz), 13-16 (88.2/96 kHz)

Any of the ADAT inputs can be used to receive word clock from an external device. You should select the appropriate ADAT input as the Clock Source and set the sample rate to correspond to the external device in the Universal Control when using an external ADAT device for word clock sync.

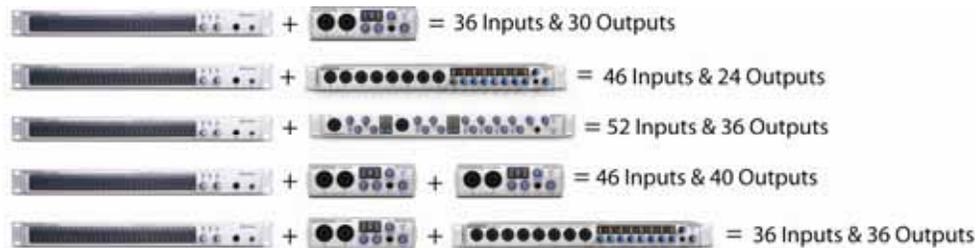
CASCADING UNITS

4.1 USING MULTIPLE FIRESTUDIO FAMILY INTERFACES

The Universal Control allows you to connect your FireStudio Lightpipe to any member of the FireStudio family of interfaces. Once you have installed the Universal Control and FireStudio-family driver on your computer, no further installation is required for any FireStudio product to connect to your system.

PreSonus supports the connection of up to four devices or a limit of 52 inputs and outputs (whichever comes first) to any one system at a time. However, the ability to use more than two units simultaneously depends on your computer's specifications and optimization. If you plan to use three or more units at the same time, installation of a dedicated FireWire bus with a tested and approved FireWire chipset and at least 2 GB of RAM is highly recommended. A list of approved chipsets can be found in Section 5.1 of this manual. Updated lists are available at www.presonus.com.

Below is a diagram showing the possible device combinations that you can use with your FireStudio Lightpipe and the resulting input and output count.



How to Cascade Multiple FireStudio Interfaces:

The first time you add any FireStudio-family interface to your system, please follow these guidelines:

1. Go to www.presonus.com and check for the latest build of the Universal Control application.
2. Connect and sync each of your FireStudio-family interfaces to your computer separately before cascading them.
3. Once a unit is individually connected, launch the Universal Control application. In the Launch window, go to Settings|Check Firmware and verify that each unit has the latest firmware.
4. When the last unit has been updated, connect a second unit to the auxiliary FireWire port on the back of the first unit. Allow the second unit to sync to your computer.
5. Connect additional units to your computer in this manner, one at a time, allowing each to sync before connecting another FireStudio-family interface.
6. Once all your units are connected and synced, launch the Universal Control application. The individual Device Window Buttons will be shown in the Launch window in the order of their internal ID number. The unit with the lowest ID number will always be at the top of the list. This unit will also be the first set of inputs and outputs your DAW application sees. The unit with the next highest ID number will be

CASCADING UNITS

the next set, and so on. Because of this, it is important to cascade your FireStudio interfaces in the proper order from your computer so that you know which input belongs to which unit.

Please note: The order of the inputs and outputs in your FireStudio chain cannot be altered.

You may wish to give each unit a custom name. To do so, simply double-click on the name badge on each unit's Device Window button to open a text box. Once you have typed the custom name, hit the Enter key.

If you are using two or more different FireStudio family interfaces, make sure to reconnect them in the order that their individual Device Window Buttons appear in the Launch window. Connecting your units in this order will produce the best performance and will put your inputs and outputs in the correct order.

It is important to mention that the inputs and outputs on each unit in the chain are independent from one another. This means that you cannot monitor the inputs from the first unit in the chain through the outputs on the second unit in the chain unless you create a mix from within your DAW application. To easily maintain zero-latency mixing between the daisy-chained units, dedicate a set of outputs and a set of inputs from each device in the chain to send and receive a mix in the Universal Control application.

TECHNICAL INFORMATION

5.1 TROUBLESHOOTING

Many technical issues can arise when converting a standard computer into a digital audio workstation (DAW). PreSonus can only provide support for issues that directly relate to the FireStudio Lightpipe interface and Studio One Artist software. It may be necessary to contact the manufacturer of the computer, operating system, and third-party DAW software to obtain additional technical support. PreSonus does not provide support for issues regarding operating systems, additional hardware, or non-PreSonus software. Please check our Web site, www.presonus.com, regularly for software information and updates, firmware updates, and technical support. You also can get technical assistance by calling PreSonus at 225-216-7887 Monday through Friday between the hours of 9 a.m. and 6 p.m. Central Time. PreSonus Technical Support can also be contacted during the same hours via email at techsupport@presonus.com.

Pops and Clicks

Pops and clicks in either your input or playback audio are typically caused by momentary losses of synchronization between the FireStudio Lightpipe and its clock source. This can be due to a FireWire card that is not suited for FireWire audio devices or to a lack of CPU power or available memory. Try closing all unnecessary programs, increasing the buffer size in the Universal Control, and optimizing your operating system for audio.

Pops and clicks exclusive to the digital inputs or outputs are typically caused when the FireStudio Lightpipe is not digitally synced to the external digital device. If this is the case, ensure your FireStudio Lightpipe and external digital device are properly synced. *Please consult your external device's user manual for details on syncing it to your FireStudio Lightpipe.*

Flashing Sync Light

The FireStudio Lightpipe's Sync light flashes blue when it is not synced. Check the FireWire cable to ensure that it hasn't become disconnected.

Audio Dropouts

Audio dropouts can occur when the speed of your processor cannot process the audio buffer fast enough. Increase your buffer size in the Universal Control and try the different Operation Modes.

TECHNICAL INFORMATION

Recommended FireWire Chipsets

The FireStudio Lightpipe will work with a wide range of FireWire cards and configurations. However, due to the plethora of FireWire chipsets currently on the market, it is not possible to thoroughly test each one for compatibility. Most users will not need to alter their current PC configuration to use their FireStudio Lightpipe. The following FireWire chipsets, however, have been tested and approved for use with the FireStudio Lightpipe:

- Agere/LSI FW323-06
- TI TSB43AB23
- VIA VT6308
- VIA VT6306 (On some older motherboards this chipset will only support a limited number of playback channels: 32 channels at 44.1 or 48 kHz; 16 channels at 88.2 or 96 kHz.)

These chipsets are available on a wide range of motherboards and PCI/PCMCIA FireWire cards. Here is a brief list of manufacturers and models of PCI FireWire cards:

- Lucent IEEE 1394a
- Syba SD-LUD-4F
- HP PA997A
- Eforcity PCRDFW31CON1
- Sabrent SBT-VT6306
- Micropac Technologies SBT-VT6306
- SIIG NN-400012-S8

Please note: manufacturers may change chipsets at any time, so it is recommended to verify these models still employ a chipset in the above list prior to purchasing.

At the time of the publication of this manual, PreSonus only recommends the following Express cards:

- ADS Pyro 1394a
- StarTech EC13942

Known Incompatible Hardware

- **ATI RADEON 9000/9001 IGP video chipset.** Symptoms are consistent click and pops during audio playback. This video chipset is only found in PC laptops and is entirely integrated as the computer's only video controller. PreSonus strongly recommends that users do not purchase a system with this chipset as there is currently no workaround for this incompatibility.
- **USB/FireWire and s400/s800 combo cards.** Symptoms usually include no audio recording/playback, even though the device will install and sync, and erratic audio performance. Rarely, combo cards will prevent the device from installing or achieving a stable sync. We recommend FireWire cards that have S400 FireWire connections only.
- **FireWire cards with NEC chipsets.** Symptoms include installation issues, erratic audio, and static and noise.
- **Motherboards with nForce4 chipsets.** Symptoms include reduced to very poor performance, especially if using the onboard FireWire connection. Installing a PCIe (not PCI) FW400-only card with an approved chipset is a known workaround but might not allow full performance.

TECHNICAL INFORMATION

5.2 SPECIFICATIONS

Analog Outputs

Type ¼" TRS Balanced
Output Impedance 51Ω

Headphone Output

Type ¼" TRS Active Stereo
Maximum Output 200 mW
Frequency Response (+0, -0.5 dB) 20 Hz to 24 kHz
THD + N (unwtd, 1 kHz @ +4 dBu Output, Unity Gain) < 0.003%

Digital Audio

DAC Dynamic Range (A-wtd, 48 kHz Sample Rate) 118 dB
Bit Depth 24
Reference Level for 0 dBFS +10 dBu
Digital Audio Output (4 Toslink connectors)
32 channels ADAT/16 channels SMUX
Digital Audio Input (4 Toslink connectors)
32 channels ADAT/16 channels SMUX
Internal Sample Frequency Selections 44.1, 48, 88.2, 96 kHz
External Sample Frequency Inputs BNC, ADAT (SMUX)
BNC Word Clock Output Level (75Ω load) 4.5V
BNC Word Clock Input Level Range 3.0 to 5.5V
Signal-Level LEDs
 Red/Clip (±0.5 dBu) +10 dBu (0 dBFS)
 Yellow (±0.5 dBu) +4 dBu (-6 dBFS)
 Green (±0.5 dBu) -8 dBu (-18 dBFS)
 Green (±0.5 dBu) -30 dBu (-40 dBFS)

Clock

Jitter <20 ps RMS (20 Hz–20 kHz)
Jitter Attenuation >60 dB (1 ns in => 1 ps out)

Power

Input-Voltage Range 85 to 240 VAC
Power Requirements (continuous) 24W
Internal Switch Power Supply 90-230 VAC

As a commitment to constant improvement, PreSonus Audio Electronics, Inc., reserves the right to change any specification stated herein at any time, without notification.