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WSG **SOUNDGRID**
DRIVER
USER GUIDE

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INTRODUCTION

SoundGrid is an audio processing and networking protocol for real-time low-latency audio processing. A SoundGrid network is managed by a SoundGrid application such as SoundGrid Studio or Multirack SoundGrid. These applications assign and remove devices, oversee the network, patch between devices, and provide access to device control panels. The SoundGrid ASIO/Core Audio driver lets you record and play audio to and from your favorite DAW. The driver streams audio via Ethernet through your local LAN port, and lets you stream up to 128 channels of audio in 44.1 kHz–96 kHz sample rates.

To stream audio between I/Os, Waves applications, DAWs or multiple computers, one host computer must control the devices and drivers of all other computers on the network through the Waves SoundGrid application (SoundGrid Studio or MultiRack SoundGrid).

In MultiRack SoundGrid, you can use up to two drivers at the same time, allowing simultaneous recording to a second computer.

With SoundGrid Studio, you can connect up to eight drivers at the same time, allowing simultaneous streaming, recording and mixing from multiple computers.

To get the most from this system, we recommend that you read the user guides for all of your devices and applications. The more you learn about all of the elements that make up a SoundGrid system, the more powerful your system will be.

We at Waves thank you for joining the ever-growing team of sound professionals who are using SoundGrid. By doing so, you are helping bring about a more flexible, efficient, and creative way of making sound happen.

Please feel free to contact Waves Customer Support if you need help or have questions

GETTING STARTED

A SoundGrid network consists at a minimum of a host driver (a computer with the Waves SoundGrid ASIO/Core Audio driver installed) and one or more hardware devices. From the simplest setup to the most complex, the process of connecting and configuring devices is based on the same principles.

This user guide looks at the most common configurations and shows you how to set them up. Since SoundGrid is an open protocol available to all manufactures of audio hardware and software, you may encounter setups not specifically described in this section. Once you understand the basics of using MultiRack or SoundGrid Studio to create and manage a SoundGrid network, integrating other devices should not be difficult

Setting up a SoundGrid network involves six steps:

1. Connect the hardware devices
2. Install the SoundGrid software
3. Assign/claim ownership of Physical I/Os
4. Assign/claim ownership of drivers
5. Patch/connect audio between devices through your SoundGrid application (SoundGrid Studio or MultiRack SoundGrid)
6. Select Waves SoundGrid as the playback engine in your DAW.

IMPORTANT: Your Waves SoundGrid application (SoundGrid Studio or MultiRack SoundGrid) must be open at all times to configure the driver. After installation, the Waves SoundGrid driver will appear as available in your DAW even before you launch the Waves SoundGrid application.

Continue to the relevant chapter describing your configuration and needs.

Multiple Client Core Audio/ ASIO Driver

The Waves SoundGrid ASIO (Windows) or Core Audio (Mac) driver lets you configure multiple hosts with the same local driver. This means you can use multiple DAWs on the same computer simultaneously. This allows you to record the same source to two DAWs on the same computer consecutively; route audio from multiple DAWs to a single I/O; and, if you have a SoundGrid server, route multiple DAWs to the eMotion ST mixer.

Please note the following when using this feature:

1. All hosts must run the same sample rate. If sample rates do not match, each host will behave differently.
2. Driver inputs and outputs can be shared.
Please note: Some hosts, for example Pro Tools and MultiRack Native, automatically claim all driver outputs. Even when using such hosts, however, you can use the same input driver channels to record to multiple DAWs.
3. It is not possible to connect local driver channels to one another. This means you cannot use SoundGrid Studio's device-to-device patch to virtually connect audio between two hosts on the same computer. To do this, you must route through the eMotion ST mixer (which requires a SoundGrid server).
4. You may use up to five hosts on a single computer/driver.

USING THE WAVES SOUNDGRID ASIO/CORE AUDIO DRIVER WITH MULTIRACK SOUNDGRID

This chapter discusses controlling the Waves SoundGrid ASIO/Core Audio driver with MultiRack SoundGrid and a DAW. The purpose is to record a live performance or to play back a recorded performance for virtual soundcheck.

Your DAW of choice can be installed on the same computer as MultiRack SoundGrid, on a second computer, or on both.

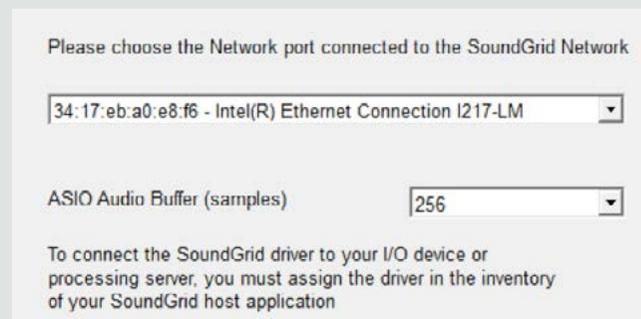
IMPORTANT: This chapter does not refer to MultiRack Native. Multirack Native is considered a native DAW. For more information please go to the next chapter.

When using a DAW on a SoundGrid network, the SoundGrid ASIO/Core Audio driver serves as a bridge between the I/O, MultiRack, and the DAW.

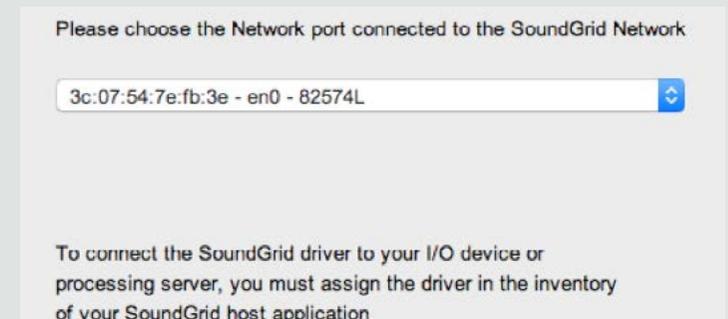
To set up the driver with MultiRack SoundGrid, follow these instructions:

1. Run the Waves Applications Installer and select MultiRack SoundGrid. If you plan to use a DAW on a secondary system, run the Waves Applications installer there as well and select SoundGrid Studio. Either of these applications will install the Waves ASIO/Core Audio Driver.
2. Follow the onscreen Instructions.
3. Reboot your computer when installation is complete.
4. Open the SoundGrid Driver Control Panel here:
Mac: System HD /Applications /Waves /SoundGrid
Windows: C:\Program Files\WavesSoundGridDriver
5. Select the computer network port that is connected to the SoundGrid network.

Windows users – this is also where you can change the ASIO buffer size.



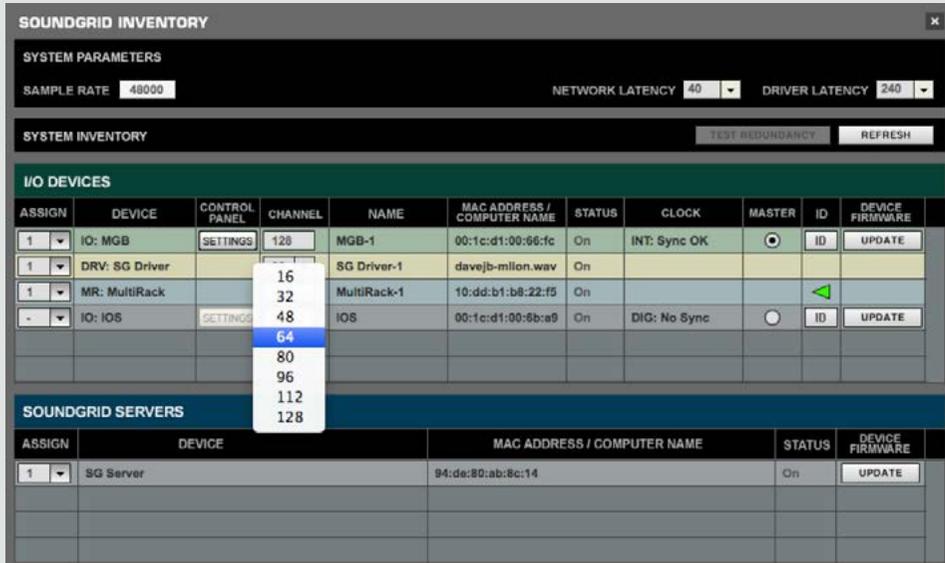
Windows – SoundGrid ASIO Driver Control Panel



Mac – SoundGrid Core Audio Driver Control Panel

6. Launch MultiRack SoundGrid.

7. Open the SOUNDGRID INVENTORY window (press F2 or open from the Audio > SoundGrid Inventory menu).



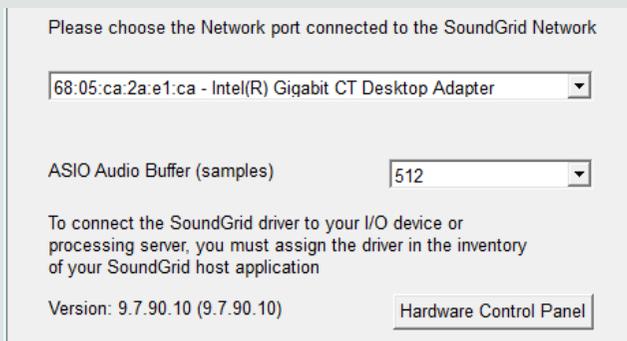
8. Under I/O DEVICES, assign your DRV: SG Driver.

If you have more than one computer connected to your SoundGrid network, check MAC ADDRESS/COMPUTER NAME to verify that you're assigning the computer that runs the MultiRack SoundGrid application.

9. In the CHANNEL column, choose the desired channel count from the dropdown menu on the top right-hand corner. (Please note that Pro Tools Native is limited to 32 input channels.)

10. Set DRIVER LATENCY from the dropdown menu.

11. Close the SOUNDGRID INVENTORY window.



Pressing the "Hardware Control Panel" button on the Driver Control Panel app will open the control panels of all I/O devices assigned to your SoundGrid application. If none are assigned, nothing will happen.

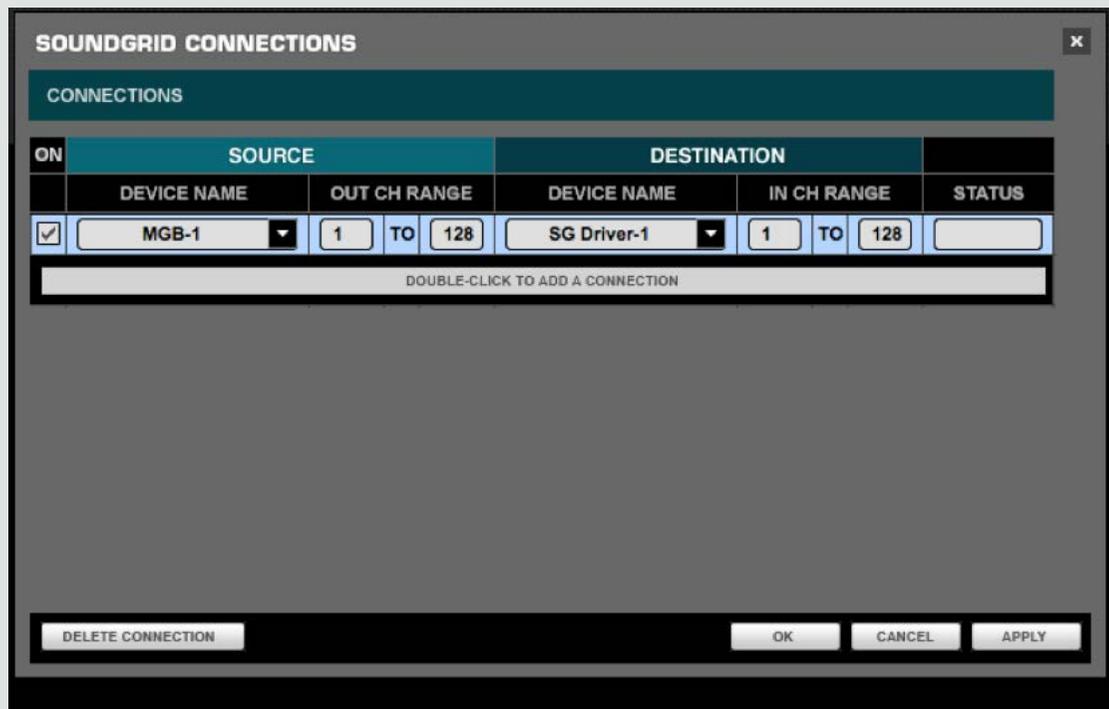
Setting Connections

Open the SoundGrid Connections window (press F3 or open from Audio Menu > SoundGrid Connections).

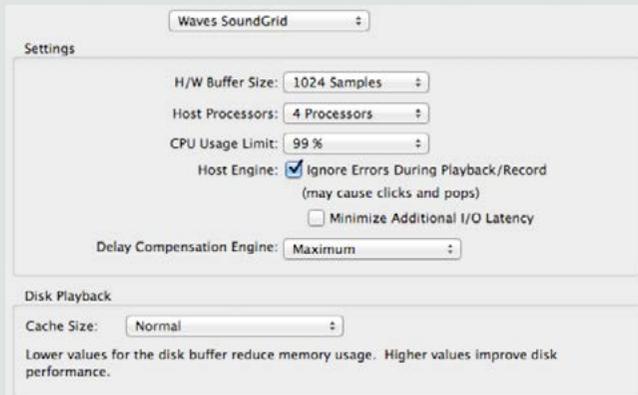
Here are two examples of different routing configurations:

Example 1: Recording to Your DAW

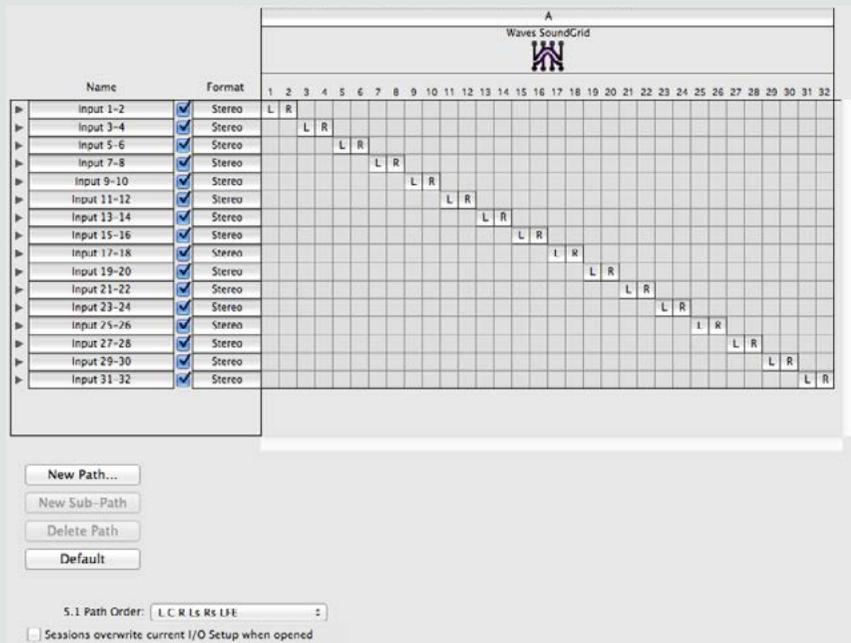
1. Click the area labeled DOUBLE-CLICK TO ADD A CONNECTION.
2. Under SOURCE, choose the appropriate Waves I/O card.
3. Under DESTINATION, choose SG Driver.
4. Set the processing channel range according to the Waves I/O interfaces in your SoundGrid network.
5. Turn the connection ON by ticking the box on the left of each row.



6. Launch your DAW and set audio device to Waves SoundGrid Driver.

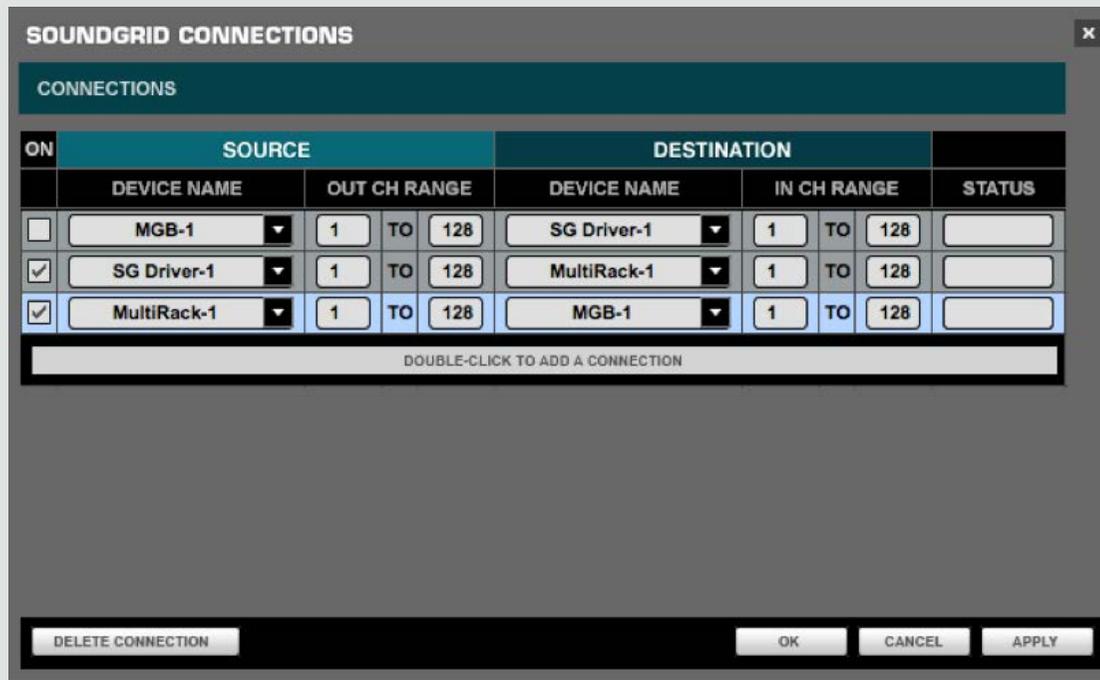


7. Route your DAW session inputs to Waves SoundGrid Driver.



Example 2: Playing Back from Your DAW

1. Turn the connection OFF from the Waves I/O to the SoundGrid driver by unticking the box on the left-hand side of the row.
2. Click on DOUBLE-CLICK TO ADD A CONNECTION.
3. Under SOURCE, choose SG Driver.
4. Under DESTINATION, choose MultiRack.
5. Set the processing channel range according to the Waves I/O interfaces in your SoundGrid network.
6. Turn the the connection ON.



USING THE SOUNDGRID ASIO/CORE AUDIO DRIVER WITH THE SOUNDGRID STUDIO APPLICATION

This chapter explains how to use the Waves SoundGrid ASIO/Core Audio driver with any DAW (Pro Tools, Cubase, Logic, MultiRack Native, etc.).

When you use a DAW on a SoundGrid network, the SoundGrid ASIO/Core Audio driver serves as a bridge between the I/O and the DAW.

To use the driver and routing audio through it involves two steps: patch between the I/O and the driver; then select the correct driver in your DAW as the playback engine.

The first time you launch SoundGrid Studio, the Wizard will open. The SoundGrid Studio Wizard scans the network, inventories its assets, and then configures the devices. If the Wizard does not start automatically, click the SCAN button, which is next to the NETWORK PORT window.

Follow these instructions:

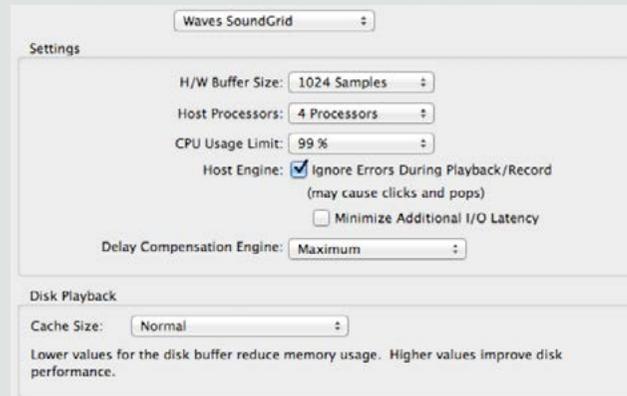
1. Run your Hardware Driver installer to install SoundGrid Studio.
2. Follow the onscreen instructions
3. Reboot your computer when installation is complete.
4. Open The SoundGrid Studio Application
5. Choose the network port connected to the SoundGrid Network or click Scan to run the Wizard.



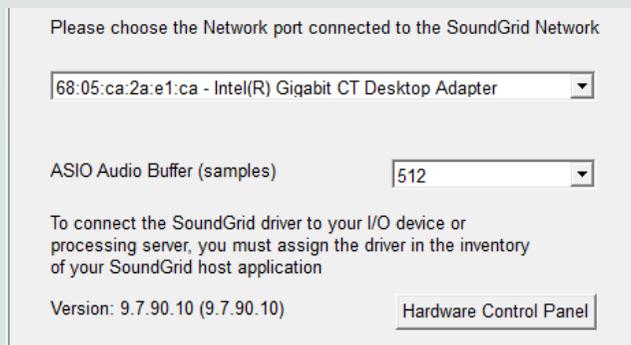
6. Select a template from the list.



7. Open your DAW and select Waves SoundGrid as your playback engine.



For more detailed information about SoundGrid Studio Application, please see the SoundGrid Studio Application User Guide.



Pressing the "Hardware Control Panel" button on the Driver Control Panel app will open the control panels of all I/O devices assigned to your SoundGrid application. If none are assigned, nothing will happen.

The Driver Control Panel app is located here:

PC: C:\Program Files (x86)\Waves\SoundGrid\Driver Control Panel

Mac: System HD/Applications/Waves/SoundGrid

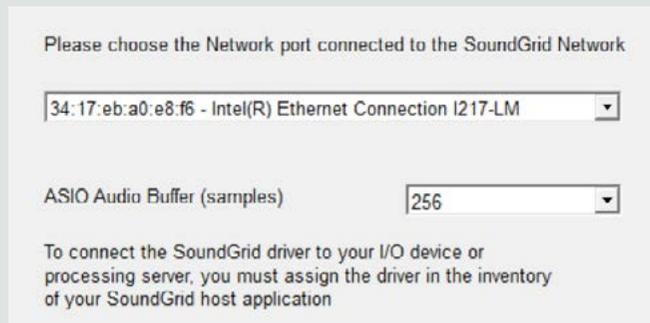
Mac Users:

Mac users with StudioRack (SG Mode) in Pro Tools Native: If you are experiencing audio corruption and sync issues, follow these steps:

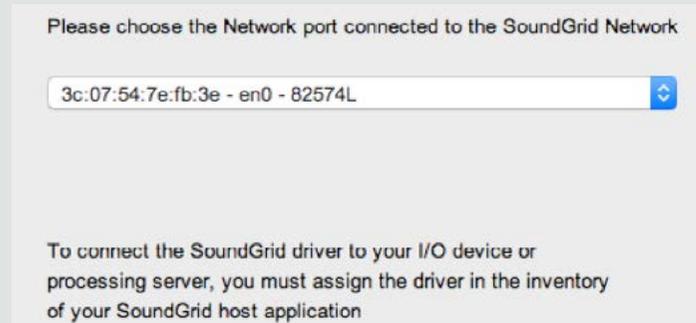
1. Open the SoundGrid Driver Control Panel (Applications > Waves > SoundGrid).
2. Set the buffer size to the same value as you have set in Pro Tools.

Adding Additional Computers

1. On your secondary computer/s, run the Waves Applications Installer and select SoundGrid Studio.
2. Follow the onscreen instructions
3. Reboot your computer when installation is complete.
4. Open the SG Driver Control Panel here:
Mac: System HD /Applications /Waves /SoundGrid
Windows: C:\Program Files\WavesSoundGridDriver
5. Select the computer network port that is connected to the SoundGrid network.
Windows users – this is where you can change the ASIO buffer size:



Windows – SoundGrid ASIO Driver Control Panel

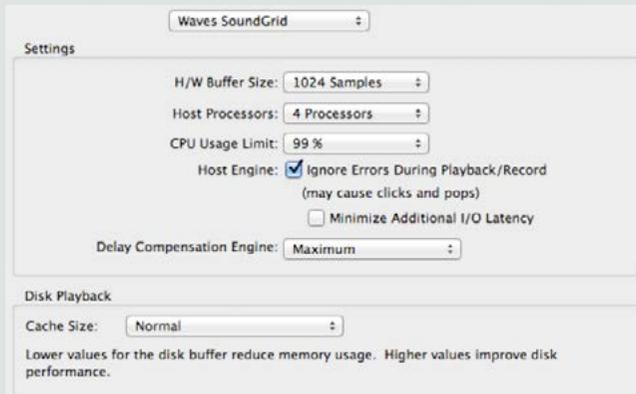


Mac – SoundGrid Core Audio Driver Control Panel

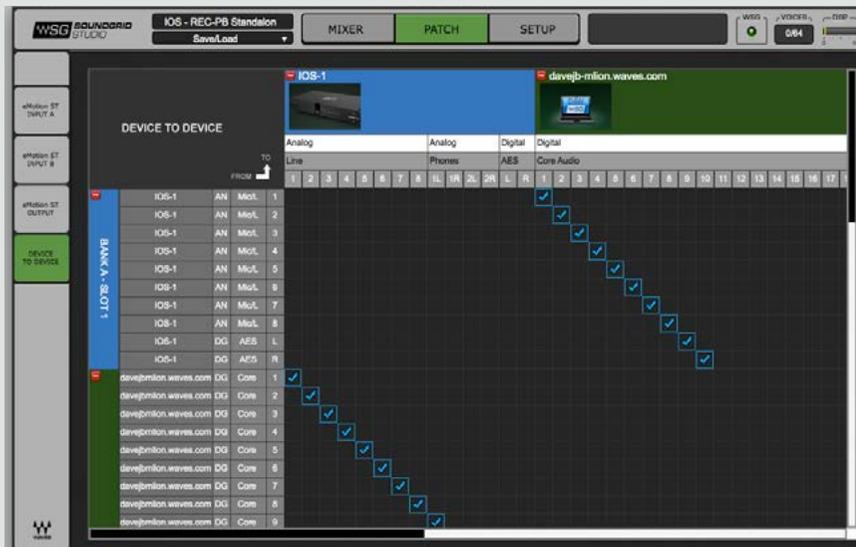
6. Go to the SoundGrid administrator computer.
7. Within SoundGrid Studio, choose the newly detected driver in Rack B.
8. Once selected, you can assign the number of channels from the same menu.
(Please note that Pro Tools Native is limited to 32 input channels.)



9. Open your DAW and select Waves SoundGrid as your playback engine.



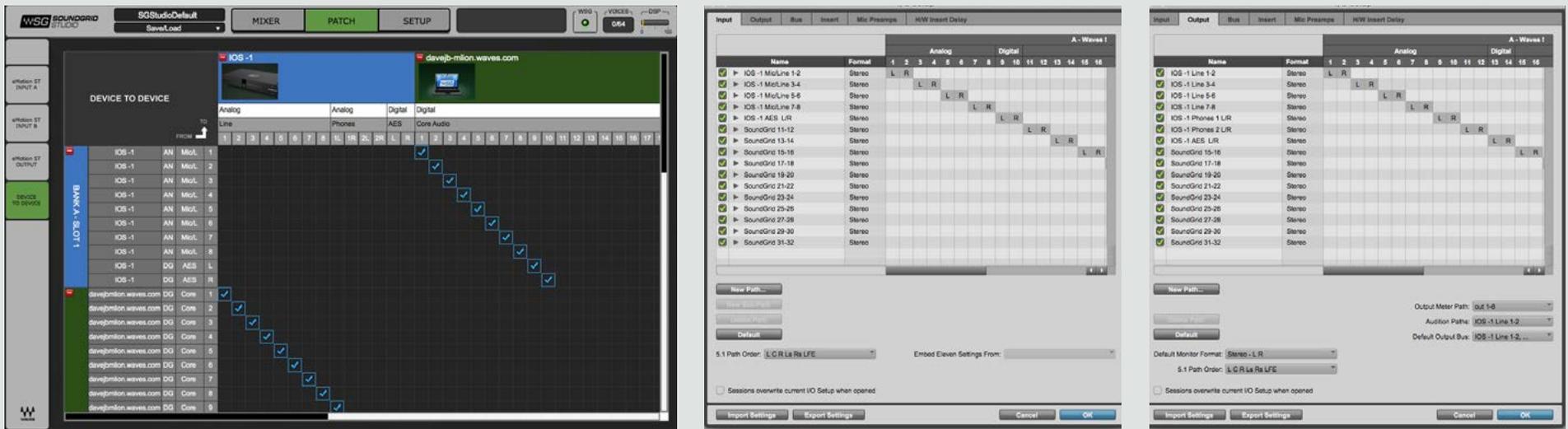
10. The added drivers will now appear available in the PATCH tab. Use the DEVICE TO DEVICE page to connect inputs and outputs and patch between software or hardware I/Os. The patch is populated based on the assigned devices that are listed in the inventory and are active.



Driver Channel Names in your DAW

SoundGrid Studio patches from the Waves SoundGrid ASIO/Core Audio driver to a hardware I/O device, a secondary driver (another computer), or the eMotion ST mixer.

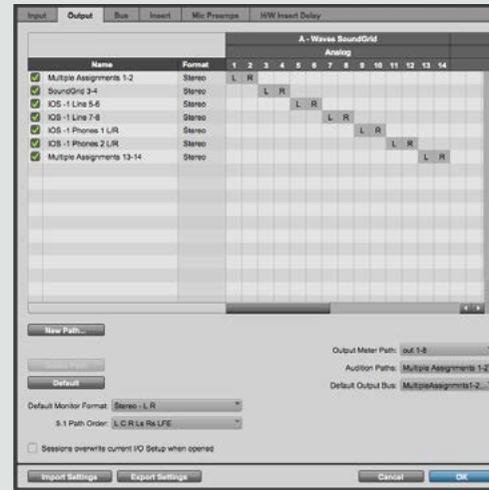
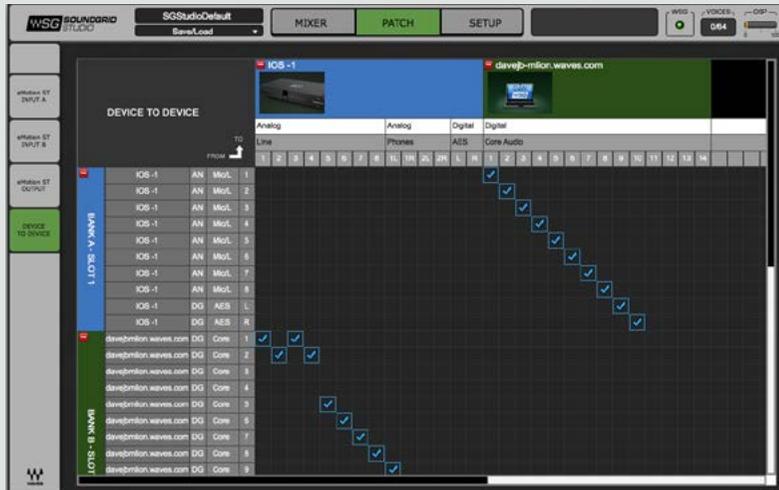
SoundGrid Studio transmits these names through the driver to the DAW. These will appear as the default names within your DAW. Most DAWs allow you to change the naming manually. For example, you may a DiGiGrid IOS with a total of 10 inputs (8 analog, 2 digital) and 14 outputs (8 analog, 2 digital, and 2 stereo headphone outputs). When these inputs and outputs are patched to and from the local driver (I/O to DAW, DAW to I/O), you will see the following in the Connection or IO setup within your DAW:



Local driver channels that are not patched to a hardware device or to the eMotion ST mixer will appear as SoundGrid 1, SoundGrid 2, etc.

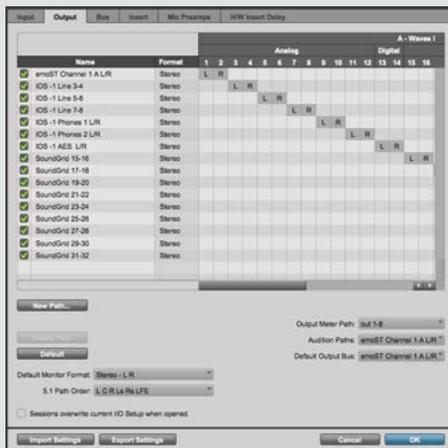
Note: This transmission occurs while you launch your DAW and the driver handshakes with it. This means that any change of I/O name or eMotion ST channel name will not be visible in your DAW until you relaunch it. Some DAWs, such as Cubase, will let you reset the connection to the driver, saving you the need to relaunch the application.

Important: DAW outputs through the driver can be patched to multiple destinations; for example, the DAW's Main out can go to your Hardware Channel 1 & 2 as well as to Hardware Channel 3 & 4. In such a case, the name of the driver channel will be "Multiple Assignments." In this case we suggest you manually name these driver channels.

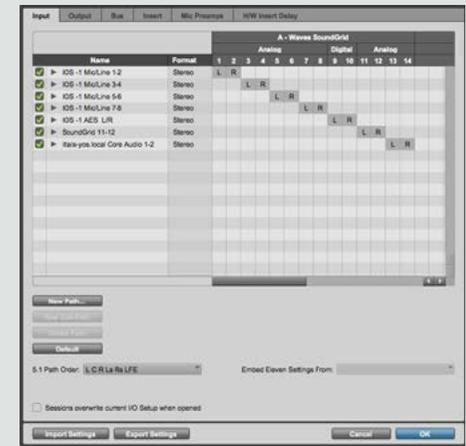
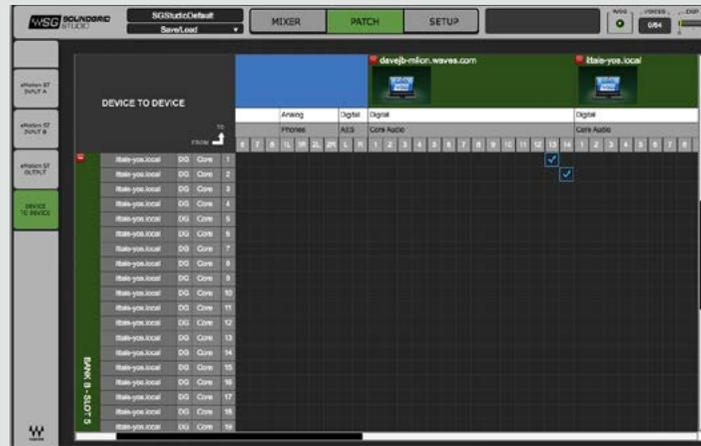


As mentioned above, driver channels can be connected to the eMotion ST mixer or to a secondary remote driver.

Here is an example of the DAW outputs patched to the eMotion ST mixer:



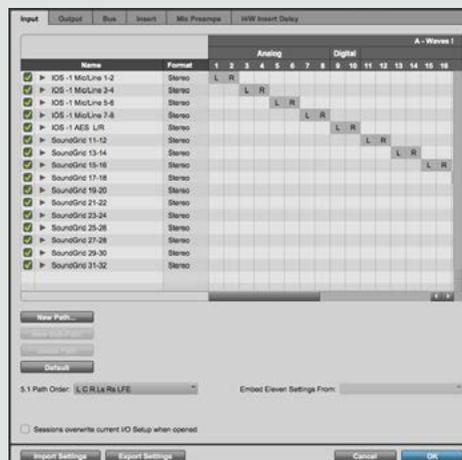
Here is an example of your DAW receiving input from another DAW on a secondary computer via networking:



To ensure that the names have been updated in your DAW, you may need to follow certain steps, depending on your DAW. Here are a few examples.

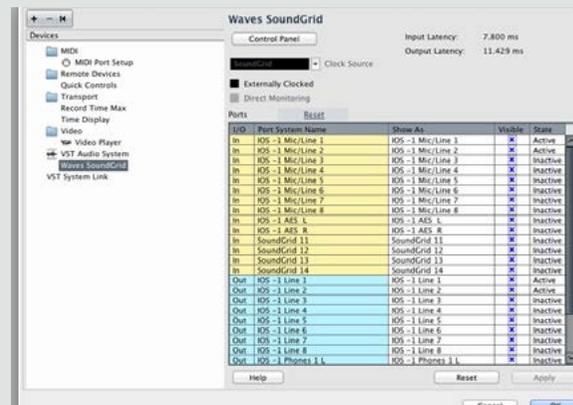
Pro Tools

Go to Setup > I/O
Delete and reset all I/O configurations to DEFAULT.



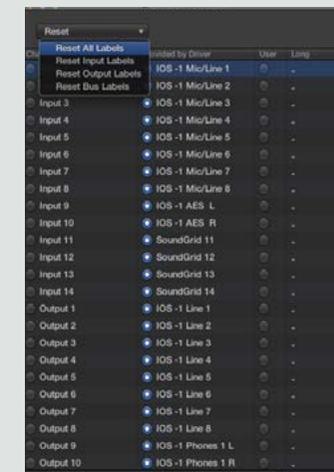
Cubase

Go to Devices > Device Setup > Waves SoundGrid.
Select RESET above the PORT System Name table.



Logic

Go to Mix > I/O Labels.
Select Reset All Labels.

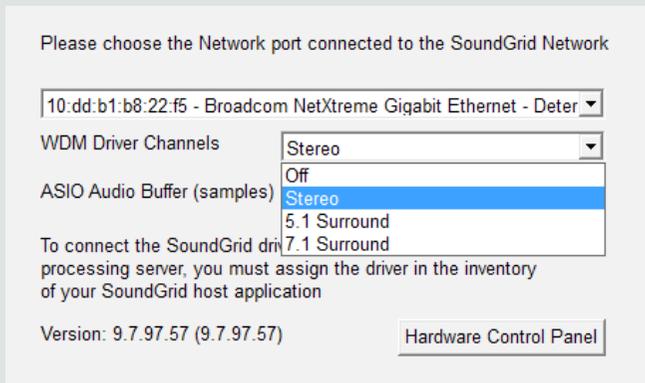


WDM DRIVER

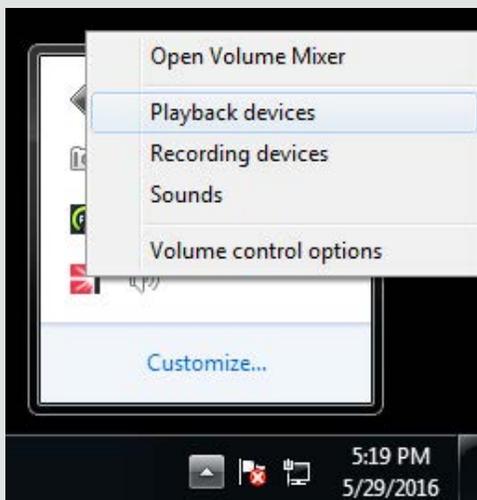
By adding the WDM driver to the SoundGrid ASIO Driver, Windows users can monitor audio from applications such as web browsers (e.g., YouTube), Windows Media Player, and other WDM hosts through SoundGrid-compatible interfaces. This also allows for audio recording through these WDM channels to a WDM host.

To enable this functionality, open the SG Driver Control Panel by clicking the Shortcut on your Desktop, or open the app here: C:\Program Files (x86)\Waves\SoundGrid\Driver Control Panel.

The WDM Driver can be configured for either Stereo or Surround purposes. Once the number of driver channels is selected, the audio will be streamed to the first channels of the SG Driver.



Stereo	SG Driver Channels 1–2
Surround 5.1	SG Driver Channels 1–6
Surround 7.1	SG Driver Channels 1–8



To activate the driver within your operating system, click on Volume Control (Speaker icon) in your system taskbar, and select “Playback Devices.”



From this window set the Waves SG Driver as “Default” and restart your browser and other WDM hosts. If you want to record sound in this manner, do the same on the “Recording Devices” tab.

All Audio will now be streamed into the driver.

Note: Audio can be streamed directly to your interface or, if you are using a using a SoundGrid server, it can be streamed through the eMotion ST Mixer.

If you use an ASIO Host in parallel, the WDM channels will use the first driver channels. If ASIO Driver and WDM channels are both routed to the same channels, their content will be mixed. For example, if your main DAW output is routed to channels 1 and 2, and you are listening to YouTube in parallel, this content will also be routed to channels 1 and 2. To have the ability to mute one of these sources, route your DAW output to different channels, for example driver channels 3 and 4.

Important Note to Win 8 and 10 Users

If the sample rate changes, or if you change the WDM Driver Channels settings in the SoundGrid Driver Control Panel (or both), you must reset the Waves Driver as the default driver.

This is required only on the first of instance of such a change in status. After that, the OS registers the parameters of the settings and the Waves SoundGrid driver will remain the default driver when those settings are again encountered.

For Example: By default the Channel Type selected is Stereo and SoundGrid Studio is running 44.1 kHz.

Changing the channel type to Surround 5.1 will require you to access OS Playback Devices window and set Waves Driver as default again. If you change the sample rate on the current 5.1 configuration you will need to repeat this step. This is true for all channel type/sample rate combinations.

SOUNDGRID CONNECT

SoundGrid Connect makes it possible for non-SoundGrid ASIO/Core Audio I/O devices to join a SoundGrid network. This means that an ASIO/Core Audio driver can patch to SoundGrid I/Os and work with SoundGrid applications. The non-SoundGrid I/O device remains under the control of its own driver and control panel, so its setup doesn't change. Once you set up the SoundGrid network, the ASIO/Core Audio driver appears as a local device in the System Inventory Device Rack A or B, and behaves like all other SoundGrid I/O devices.

SoundGrid Connect provides server-based DSP processing to audio applications such as DAWs and mixers.

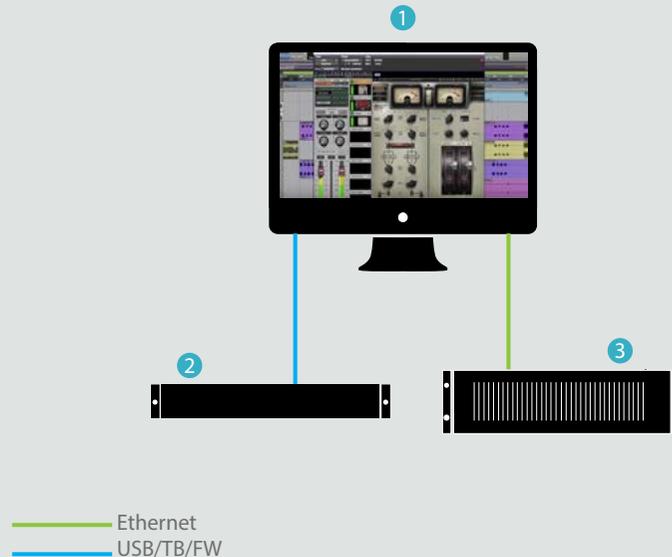
Common Uses

SoundGrid Connect offers two benefits:

- Offload plugin processing to a SoundGrid server
- Add more I/Os to your SoundGrid network

ADD SOUNDGRID PROCESSING TO A DAW

Use SoundGrid Connect to offload plugin processing from the host computer to a SoundGrid server. This vastly increases your plugin count. The non-SoundGrid I/O device is controlled by its ASIO/Core Audio driver. SoundGrid Connect bridges between the non-SoundGrid driver and the network. This makes the server available to the DAW for plugin processing. SoundGrid I/Os can easily be added later.



- (1) Host computer with SoundGrid Studio, SoundGrid Connect, host application
 - a. DAW: playback engine = SoundGrid
 - b. StudioRack processing = SoundGrid
- (2) Non-SoundGrid I/O device
- (3) SoundGrid server

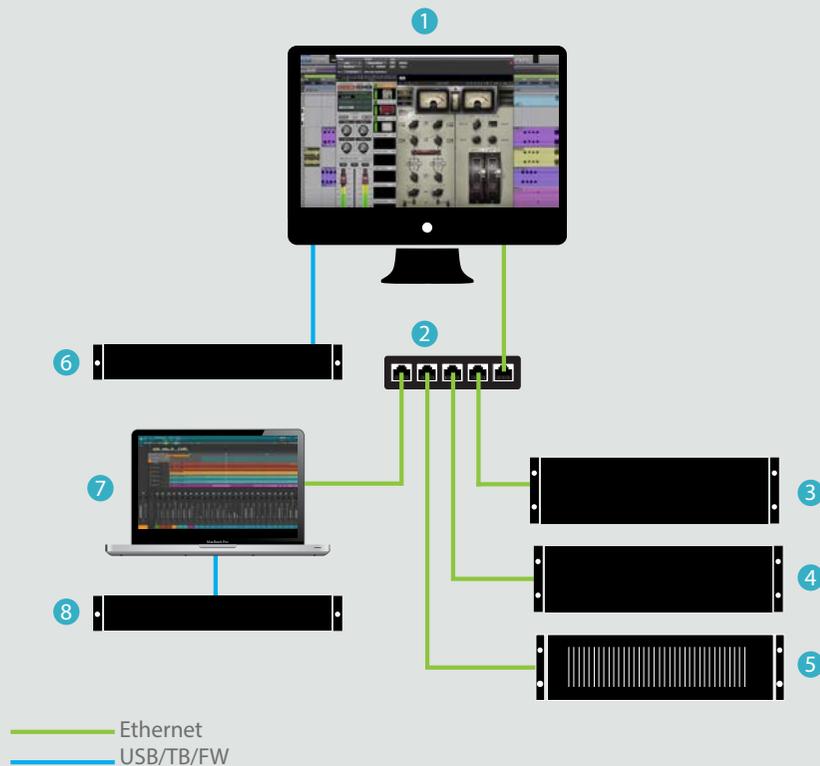
In this setup you work on the DAW as you always do. The only difference is that channels are routed through the StudioRack plugin, which is a chainer that adds up to eight plugins per instance. When StudioRack is operating in SoundGrid processing mode and is inserted on a DAW channel, it sends the channel's plugin processing to the server and then returns the signal back to the channel.

Setup

1. Install the most recent version of the SoundGrid Studio application on the host computer. The installer will also install the SoundGrid driver, which includes SoundGrid Connect.
2. Connect the non-SoundGrid I/O device to the host computer and configure it as normal.
3. Connect the server to the computer, using Cat 5e or Cat 6 Ethernet cables.
4. Open SoundGrid Studio. It automatically loads the device's ASIO/Core Audio driver in the I/O Device Rack. The driver and server can also be assigned or removed manually.
5. You will likely want to continue using the existing device as the DAW playback engine.
6. To offload processing to the server, insert the StudioRack plugin on a DAW channel and set StudioRack processing to "Waves SoundGrid." For more details, please refer to the StudioRack user guide.

ADD NON-SOUNDGRID I/Os TO A SOUNDGRID NETWORK IN A STUDIO OR LIVE SETTING

One or more non-SoundGrid I/O devices can be integrated into to a SoundGrid network that includes a DAW, several SoundGrid I/Os, and a SoundGrid server. This adds more I/Os for the network and enables the non-SoundGrid I/O to patch to the SoundGrid devices or to an eMotion LV1 mixer.



- (1) Primary host computer with SoundGrid Studio, SoundGrid Connect, host application
 - a. DAW playback engine = Waves SoundGrid Driver
 - b. StudioRack processing = SoundGrid
- (2) SoundGrid 1Gb Ethernet switch
- (3-4) SoundGrid I/Os
- (5) SoundGrid server
- (6) Non-SoundGrid I/O device (attached directly to primary host computer and controlled by its own ASIO/Core Audio driver)
- (7) Secondary host computer for additional non-SoundGrid I/O device (can also host a recorder or other application that does not require server processing).

Setup

1. Use the SoundGrid Studio installer to install the SoundGrid Studio application and the SoundGrid driver on each computer. Control the SoundGrid network from the SoundGrid Studio application running on your primary computer. You do not need to run SoundGrid Studio on the secondary computers: use the SoundGrid Connect control panel to set up theASIO/Core Audio drivers.
2. Connect all components to the 1 Gb Ethernet switch.
3. Connect the non-SoundGrid I/O devices to their respective host computers and configure them as normal. Switch on all devices.
4. Assign devices in the SoundGrid Studio Device Racks. Devices are organized by category:
 - a. Network devices (part of the Ethernet network): SoundGrid devices and secondary computers with SoundGrid Connect. The name of the secondary computer appears in the assignment list. Hover above to see the driver name.
 - b. Local devices: Drivers of a device connected to the host computer. SoundGrid I/Os and servers can be assigned automatically with the Auto Configure function. Non-SoundGrid devices must be assigned by the user.
5. Assign the server. If there is more than one server, it will be assigned as the redundant server.
6. If needed, patch I/Os and device-to-device connections.
7. Set the DAW playback engine to "SoundGrid."
8. Configure the DAW inputs and outputs, if needed.
9. Insert StudioRack on channels that will use offloaded processing.

This example shows SoundGrid and non-SoundGrid I/Os in a studio setting. A similar setup can be used in a live environment. The physical placement of the I/Os will differ, and the host will be an eMotion LV1 or a computer associated with a live console. Aside from that, the setup is identical.

SOUNDGRID CONNECT CONTROL PANEL

When a non-SoundGrid device is connected directly to the main computer and is bridged to the SoundGrid network with SoundGrid Connect, its driver is controlled from SoundGrid Studio. But a device driver in a secondary computer must be configured from its own control panel.



Mode SoundGrid Connect On/Off.

Engaged automatically when the ASIO/Core Audio device driver is selected in the SoundGrid Inventory > Local Device menu.

Native (local) Devices Selects which ASIO/Core Audio device is controlled by the driver..

Control Panel Opens the specified driver's control panel.

Sample Rate Sets/displays the sample rate of the specified device.

Buffer Size Sets/displays ASIO/Core Audio buffer size.

Status Describes status of the driver: mode enabled, connected, bridged input/output channels. The SoundGrid Connect control panel sets up the connection between the device and the SoundGrid network.

LATENCY

A non-SoundGrid I/O device operating in a SoundGrid network exhibits more latency than SoundGrid I/Os.

This is how latency is calculated for an A → D → A round trip through the server:

- Hardware device input delay (A/D)
- 4 x ASIO/Core Audio driver buffer delay
- Server network buffer size
- Hardware device output delay (D/A)

Taken together, non-SoundGrid I/O latency may exceed 7 ms, so these devices are best suited for paths that are not as delay sensitive as others.