

# MultiRack Setup

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# Overview

There are 2 versions of MultiRack software:

MultiRack Native relies on power of Host Computer to process the audio and uses ASIO/Core Audio Interface to connect to a console.

MultiRack SoundGrid uses an external SoundGrid server to achieve low latency performance, high plug-in count and recording capabilities. MultiRack SoundGrid uses a dedicated SoundGrid I/O Device to connect to a console.

## Basic Requirements

**PC or Mac Host Computer** – The main brain and controller for the system that runs the MultiRack live plug-in host application.

Refer to <http://www.waves.com/support/tech-specs/system-requirements> when choosing your computer.

**USB flash drive (optional):** The USB flash drive key holds the licenses for Waves V9 plugins and provides activated licenses on the go. Alternatively, you can authorize your Host Computer's hard drive through Waves License center (when using Multirack Native).

The USB flash drive must be connected at all times to the console (when using Multirack SoundGrid).

Check USB flash drive compatibility: <http://www.waves.com/support/usb-flash-drive-formats>

**Optional MIDI Controller** – A MIDI controller can be used to remote control MultiRack SoundGrid in real time, without using the mouse or keyboard.

## Software

- **MultiRack Native Application**- the host software required to run Waves Native plugins.
- **MultiRack SoundGrid Application**- the host software required to run Waves SoundGrid compatible plugins.
- **MultiRack SoundGrid for DiGiCo offline software** – the host software required for preparation of Offline MultiRack sessions for SD consoles using DiGiCo's SD offline editor.
- **Waves Plugins** – Waves plugins are the actual audio processors hosted by MultiRack. MultiRack currently supports **Waves** plugins only.
- **MultiRack Native** supports **MultiRack Native-compatible** plugins only.
- **MultiRack SoundGrid** supports **MultiRack SoundGrid-compatible** plugins only.

## Waves Licenses required:

**Native** system: MultiRack Native and native Waves plugins

**SoundGrid** system: MultiRack SoundGrid and Waves TDM/SG plugins.

To learn more about Waves License Center: <http://www.waves.com/support/waves-license-center>

For activation instructions: <http://www.waves.com/support/activate>

### **Important:**

V9 Licenses can be activated on the USB flash drive or Host Computer's hard drive.

V8 Licenses can be activated only on the iLok Key.

# Install MultiRack

MultiRack SoundGrid V9\* and MultiRack Native V9 can run both V9 and V8 plugins.

\* If you upgrade MultiRack SoundGrid to V9 and wish to continue using your current V8 plugins, then you must re-install them using the SoundGrid Compatible Plugins V8 installer. V8 licenses stored on your iLok will continue to work as usual.

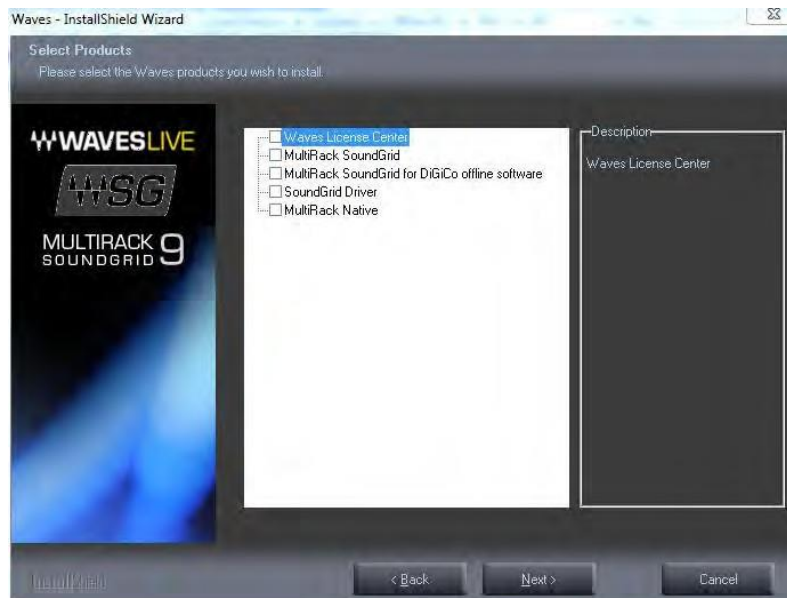
Follow the instructions below to download and install MultiRack SoundGrid and/or MultiRack Native.

Download the multi-platform (MultiRack Native / Yamaha / Allen & Heath /DiGiCo) installer:

**Mac:** <http://www.waves.com/dlrdr?id=v9-mac-multirack>

Or

**Windows:** <http://www.waves.com/dlrdr?id=v9-win-multirack>



Launch the installer and choose to install from the available options:

- **Waves License Center**- lets you activate and manage your V9 plug-in licenses. You may activate to your computer or USB Flash Drive.
- **MultiRack SoundGrid** Application- Installs the Waves host software required to run Waves SoundGrid compatible plugins.
- **MultiRack SoundGrid for DiGiCo offline software** – the host software required for preparation of Offline MultiRack sessions for SD consoles using DiGiCo's SD offline editor.
- **SoundGrid Driver**- An ASIO/Core Audio driver for Windows and Mac. Installation is optional. The driver is required for recording or playback options only, can be installed on separate computer for dedicated playback and/or recording.
- **MultiRack Native** Application- Installs the Waves host software required to run Waves Native plugins.

Follow the steps to complete the installation.

## Install MultiRack compatible Plugins

Download the multi-platform (MultiRack Native / Yamaha / Allen & Heath / ) V9 Plugins installer:

Mac: <http://www.waves.com/dlrdr?id=v9-mac-offline>

Windows: <http://www.waves.com/dlrdr?id=v9-win-offline>

Launch the installer and choose to install:

**'All MultiRack SoundGrid-compatible plugins'.**

And/or

**'All MultiRack Native-compatible plugins'.**

### **Optional: Install V8 Plugins**

if you also need to run V8 plugins, download the multi-platform (MultiRack Native / Yamaha / Allen & Heath) V8 Plugins installer for:

Mac: <http://www.waves.com/dlrdr?id=v8-mac-multirack-plugins>

Windows: <http://www.waves.com/dlrdr?id=v8-win-multirack-plugins>

Launch the installer and choose to install:

**'All MultiRack SoundGrid-compatible plugins'.**

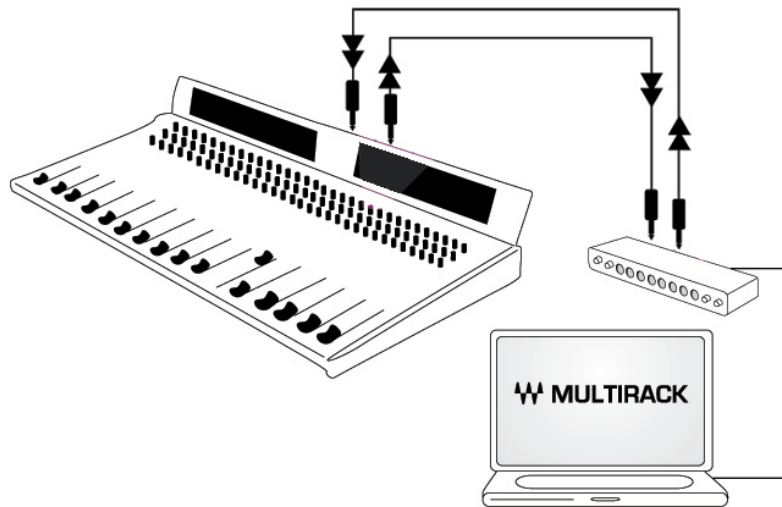
And/or

**'All MultiRack Native-compatible plugins'.**

# MultiRack Native

## Hardware Connections

Connect Core Audio/ ASIO Audio interface to your Host Computer. Depending on your console and Audio interface, use MADI, AES or analog cables to connect between them.



## Software Setup

**Preferences** window: (Ctrl+P in Windows/Cmd + , on Mac). Set the audio I/O device by clicking the Audio Device dropdown menu and choosing from the available devices.

(MultiRack supports Windows ASIO and Mac Core Audio sound cards.)



# MultiRack SoundGrid Hardware Connections

## SoundGrid Requirements

**SoundGrid I/O Card** – The SoundGrid I/O card pipes audio in and out of the console. You can use up to four cards per console. Please refer to the manual of your card for specific instructions regarding setting up.

**SG Server** – The SG Server acts as the main number cruncher for all plugins used in the application.

It is possible to connect a second “Redundant” Server working as a backup.

Check <http://www.waves.com/live-sound/soundgrid-servers> for an updated list of qualified servers.

**Network Switch** – Check <http://www.waves.com/live-sound/soundgrid-switches> for an updated list of certified switches.

**Optional Secondary Computer** –The secondary computer may be used for connecting a DAW (Digital Audio Workstation) application to your network for simultaneous recording and/or playback.

**CAT6 STP** – Check <http://www.waves.com/1lib/pdf/live/soundgrid-cables.pdf> for an updated list of qualified cables.

## **Software**

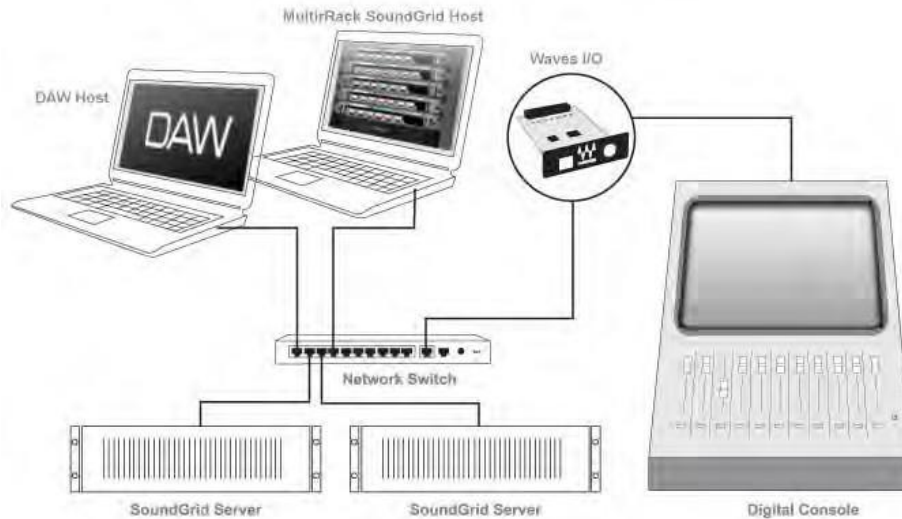
**SG Driver** – An ASIO/Core Audio driver for PC and Mac is required for recording or playback options only.



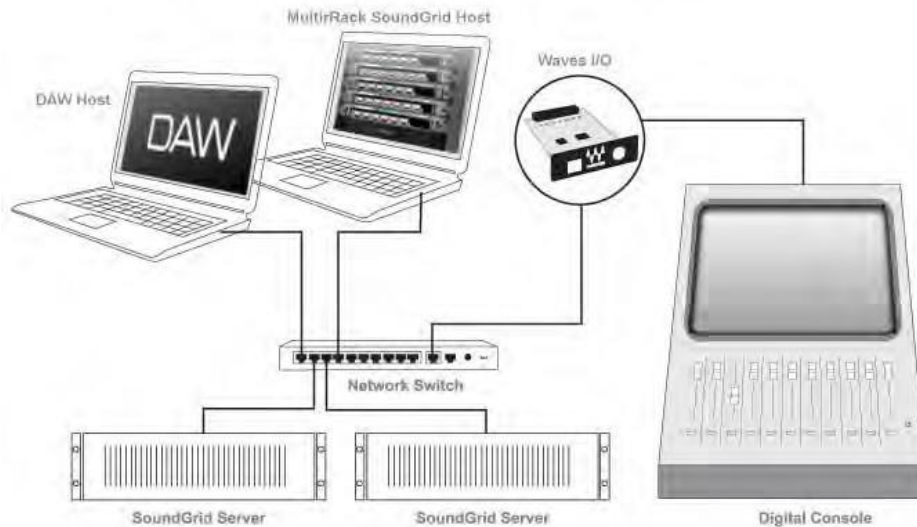
## Yamaha Hardware connections

Begin by connecting your console and all other components to the Network Switch, to create the SoundGrid network.

**Diagram 1: Setting up MultiRack SoundGrid and DAW on the same computer**



**Diagram 2: Setting up MultiRack SoundGrid and DAW on separate computers**



You can connect two Servers. The second SG Server will work as a Redundant Server.

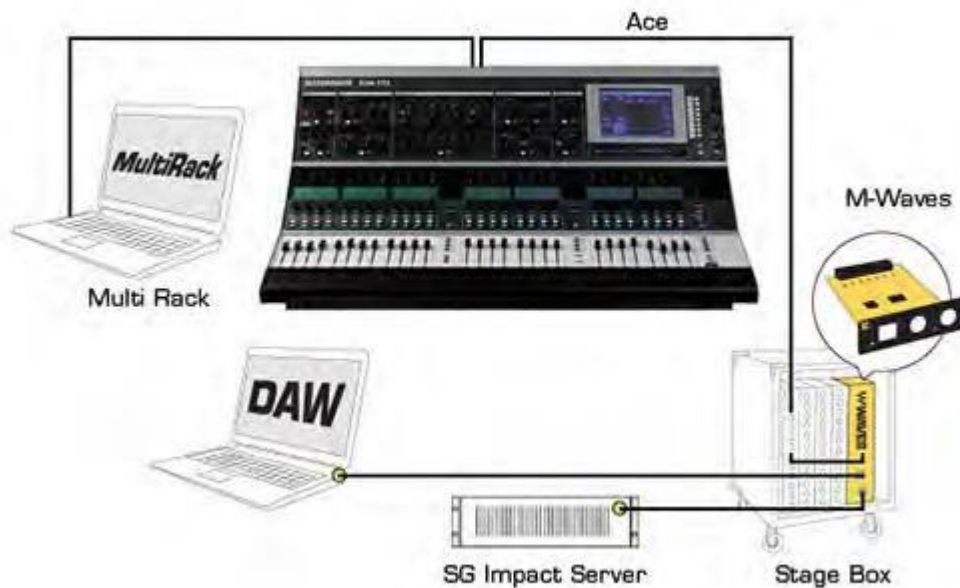
All Components are connected to the Network Switch. CAT6 cables are recommended for use to connect all hardware components.

For more specific installation instructions, please refer to the relevant audio I/O or server hardware manual.

## Allen & Heath Hardware connections

See [detailed instructions](#):

<http://www.allen-heath.com/UK/Products/Pages/ProductDetails.aspx?CatId=iliveseries&ProductId=MWAVES&SubCatId=AudioNetworkingOptions>



# MultiRack SoundGrid Software setup

## Preferences Window

Enter the Preferences window from the Edit menu (PC) or MultiRack SoundGrid menu (OSX), or by typing “Ctrl+P” (PC) or “Cmd + ,” (Mac).



**Local LAN Port:** This drop-down menu lists the available network adapters on the host machine. Choose the network adapter that is connected to the SoundGrid network. Network adapters are displayed by MAC addresses and port name. When you select the proper port a “SoundGrid network found” message will be displayed.

**Host Recovery Type.** If MultiRack SoundGrid crashes, it will re-launch itself automatically. If you set the recovery type to “Automatic”, MultiRack SoundGrid will load the session to the Server as quickly as possible. When set to “Manual,” MultiRack SoundGrid will re-launch itself but will not load the session to the Server until you press the **Connect** button on the dialog box which will appear.

If MultiRack has crashed, audio streaming and processing will continue without interruption; only user control is lost. When MultiRack SoundGrid re-launches, it synchronizes to the server. At the moment of synchronization, there is a short mute (<1sec, depending on Session size). Setting the recovery type allows control over when this mute occurs – automatically or manually.

**Activate auto-save in Show mode:** You may not want to use MultiRack SoundGrid's auto-save feature during a concert, so as to avoid any processing interruptions, De-select this box to turn off auto-save.

**Show configuration change alert:** Selecting this option will result in a warning each time you attempt to modify any Rack configuration. This is helpful when you are learning the application, but may prove annoying for more seasoned users.

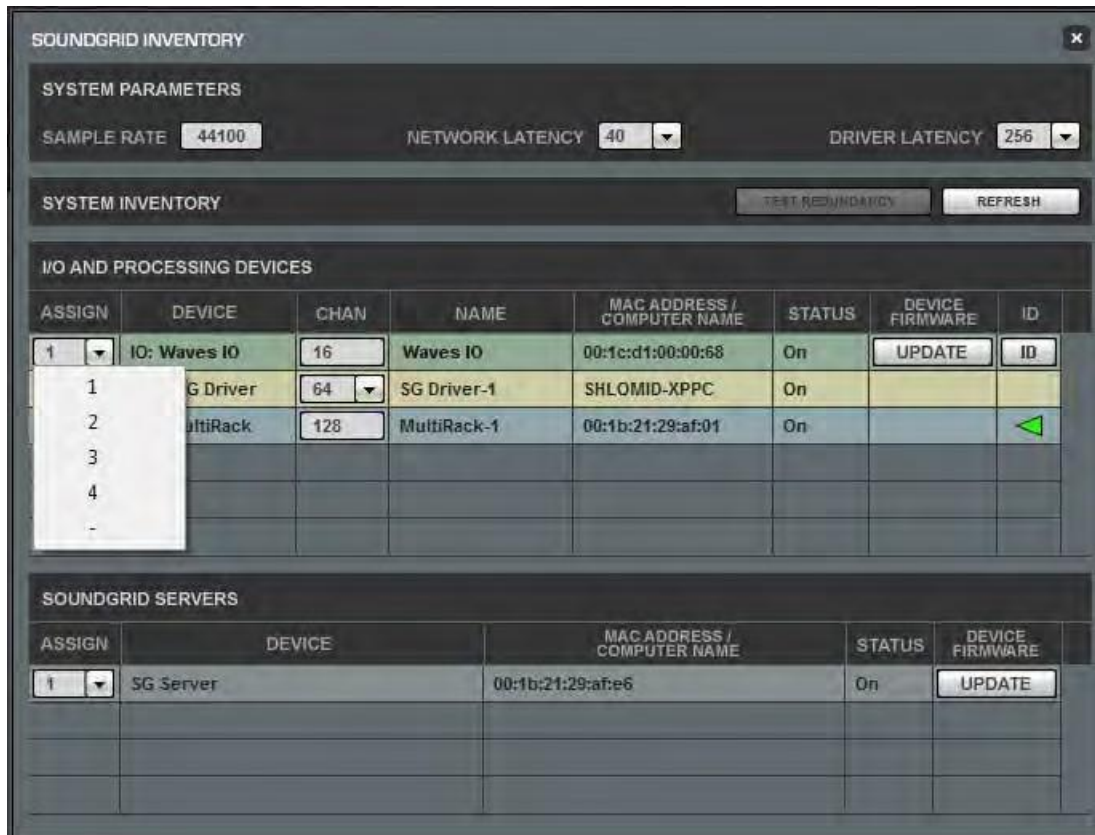
**Recall first Snapshot when Session loads:** It is good practice to regularly start your shows with the first Snapshot

**Enable verbose log:** Clicking this button places MultiRack SoundGrid in a "debug" mode that outputs what is called a "verbose data file". It is used to collect data that technical support may require. When selected, the message area of the Status Bar displays a flashing message: "Verbose Output." The output file is titled "Debug MultiRack\_date<dd.mm.yyyy>.txt."

**Load last session on application launch.** Select this option to load the last opened session on next application launch.

**Open in Full Screen Mode.** Select this option to load MultiRack SoundGrid directly in Full Screen mode.

## SoundGrid Inventory Window:



The screenshot shows the SoundGrid Inventory window with the following sections:

- SYSTEM PARAMETERS:** SAMPLE RATE: 44100, NETWORK LATENCY: 40, DRIVER LATENCY: 256.
- SYSTEM INVENTORY:** Includes buttons for TEST REDUNDANCY and REFRESH.
- I/O AND PROCESSING DEVICES:** A table with columns: ASSIGN, DEVICE, CHAN, NAME, MAC ADDRESS / COMPUTER NAME, STATUS, DEVICE FIRMWARE, and ID. It lists Waves IO, SG Driver, and MultiRack devices.
- SOUNDGRID SERVERS:** A table with columns: ASSIGN, DEVICE, MAC ADDRESS / COMPUTER NAME, STATUS, and DEVICE FIRMWARE. It lists an SG Server.

ASSIGN	DEVICE	CHAN	NAME	MAC ADDRESS / COMPUTER NAME	STATUS	DEVICE FIRMWARE	ID
1	IO: Waves IO	16	Waves IO	00:1c:d1:00:00:68	On	UPDATE	ID
1	SG Driver	64	SG Driver-1	SHLOMID-XPPC	On		
2	MultiRack	128	MultiRack-1	00:1b:21:29:af:01	On		
3							
4							
-							

ASSIGN	DEVICE	MAC ADDRESS / COMPUTER NAME	STATUS	DEVICE FIRMWARE
1	SG Server	00:1b:21:29:af:e6	On	UPDATE

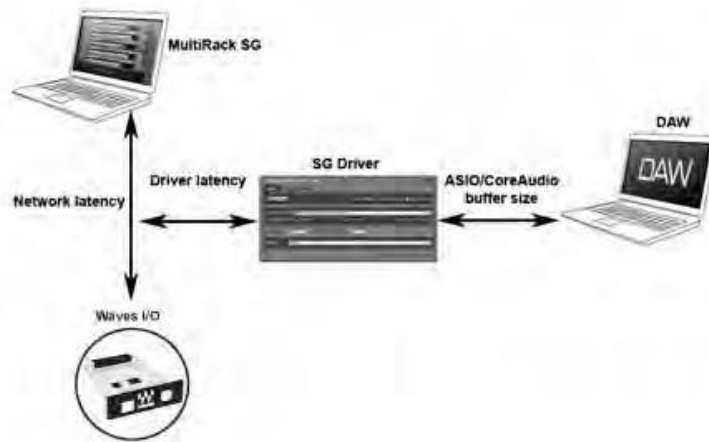
This window is accessed by selecting the “**SoundGrid Inventory**” item in the Edit menu.

Changes in the Inventory window are allowed only in **Setup mode**. In **Show mode** the window opens as display-only and no changes are allowed. Changes made in the Inventory window are applied immediately.

### System Parameters

**Sample Rate:** This field displays the sample rate. In most cases, MultiRack SoundGrid is slaved to the console’s sample rate, and this field cannot be edited.

**Network Latency:** Sets the network latency value. This field allows you to change SoundGrid Network throughput latency. Please refer to <http://www.waves.com/live-sound/soundgrid-servers> for correct settings. This value sets the buffering delay used by the processing engine(s) and affects SoundGrid's end-to-end latency. Plugins that add latency will add to the overall latency (system latency + plug-in latency) of the specific Rack into which these plugins are inserted.



The above diagram explains the various latencies in the SoundGrid system. Network Latency occurs between the I/O Device and the processing engine. Driver Latency is added between the network and the host computer on which the driver is installed. ASIO or Core Audio buffering is usually added between the driver and the DAW software.

**Driver Latency:** This field allows you to change SoundGrid's Driver input latency, which is the latency between the driver's host computer and the network. This value sets the added latency required for recording and playback. A setting of 256 samples will work well on most computers.

**Test Redundancy:** In a Redundant setup, a second Server is connected to the main audio processing Server. If the main Server fails, then the secondary backup server automatically takes over and begins processing.

Click the **Test Redundancy** button to make sure that the redundant Server is capable of holding the session being handled by the main Server. This is important when the two servers are not identical.

**Refresh:** Click this button to refresh the inventory list if you have changed devices or settings.

The Inventory table displays all SoundGrid devices available on the network, allowing you to select/assign the devices you are using.

**Assign:** Assigning a device means you are selecting it for usage in your setup. The number you assign the device is its index number in the Inventory list. For an I/O device, setting 1 means this is the first I/O device and its channels will be the first listed in the routing menus.

**IO:** An I/O device that streams audio to and from the SoundGrid network.

**DRV:** A SoundGrid driver installed on another computer connected to the network, or on the same computer MultiRack SoundGrid runs on.

**MR:** MultiRack, SoundGrid's audio processing device. MultiRack is the device which receives audio for processing. MultiRack utilizes SoundGrid Servers as its "DSP" engines.

**Device:** Displays the type and description of the device. When you hover with mouse over a device row, the device's software/firmware version is displayed as a tool-tip.

**Chn:** Displays the number of channels available on the device. I/O and MultiRack channels cannot be set and are display-only. SoundGrid Driver channels can be set by the user – for example, if you set 32, your driver will have 32 recording and playback channels.

**Name:** Double click in this field to rename the device.

**MAC address / Computer Name:** Displays the device's MAC address or computer name.

**Status:** Displays the device's status in real-time.

**Device Firmware:** This column holds an **Update** button for each I/O or server device. Click the button to update the device's firmware if incompatible with the MultiRack version you are using. To perform the update, the Server and I/O must be Un-Assigned in Assign Left column. The Update process will display a progress bar and status messages. Follow the status messages and instructions carefully. At the end of the process reboot the updated devices, let them boot and then click the window's Refresh button.

**ID:** Applicable for IO-type devices only. Clicking this button will temporarily turn on the selected I/O's link and activity LEDs while turning all other I/O devices' LEDs off to allow you to identify the device in the network.

The Servers table is very similar to the inventory table and is used in the same way. This table is separated from the other device's table since servers are "black box" processing engines and as such do not receive audio connections and don't have channels.

Set "1" for the server you intend to use as your main processing engine. Set "2" for the server you intend to use as a redundant server.

## SoundGrid Connections Window

Go to **Edit** menu and select the **SoundGrid Connections** menu item, or press F3.

The Connections window table allows you to virtually connect the devices in your network and route audio between them.

Each row in the table represents a connection between a **Source device**, the device that sends the audio, and a **Destination device**, the device that receives the audio.

Components that are not assigned in the Inventory section will not appear in the list and cannot be used.





**The Connections table:** The Connections table allows you to create audio connections (routes) between Source and Destination devices. In the table's left side, select the Source or sender device and its output channels that will be routed to the Destination device's channels. Channels are set in ranges, e.g. setting Source channels 1 to 8 means you are routing the device's channels 1 through 8 to send audio to a Destination device.

A new connection is created by double-clicking in the **"Double-Click to add a Connection"** area.

The Connections table controls are:

<b>On/Off</b>	Turn the connection on and off by check-marking it. Note that if a connection becomes invalid it is automatically un-checked.
<b>Source: Device Name</b>	Use the pull-down menu to select a Source device by its name (as set in the Inventory window), i.e. the device that will send audio in this audio connection.
<b>Source: Output Chn Range</b>	The channels of each connection are set by ranges. Use the two edit fields to set the range of channels the Source device will send. Note that the values are limited by the number of channels the device supports and by your Inventory settings.
<b>Destination: Device Name</b>	Use the pull-down menu to select a Destination device by its name (as set in the Inventory window), i.e. the device that will receive audio in this audio connection.
<b>Destination: Output Chn Range</b>	The channels of each connection are set by ranges. Use the left edit field to set the range of channels the Destination device will receive – the right field is display-only and will change according to your setting in the left field. Note that the values are limited by the number of channels the device supports and the number of channels set in the Source device (Source and Destination channel count must match).

A few notes:

- Channel settings start with an odd number and the connection must have an even number of channels. E.g. the channels range can be set as 1-8, 3-6, 7-14, and so on. Connections set to 4-7, 2-11 or similar are invalid.
- Channel settings can be done by direct value entry or by dragging the mouse up or down.
- If a device or channel(s) used in a Connection become unavailable, the connection is automatically deactivated but is not removed.
- If, while setting up a connection, a conflict in connection arises, the connection will be **marked as invalid in red and italics** (and are turned off) and you cannot apply the window's setting. Overlapping connections are marked in **blue**.

## Setting Up the SoundGrid Driver

The SG Driver is an ASIO (PC) and Core Audio (Mac) driver. As such, any standard pro audio DAW software can use this driver to record or play audio.

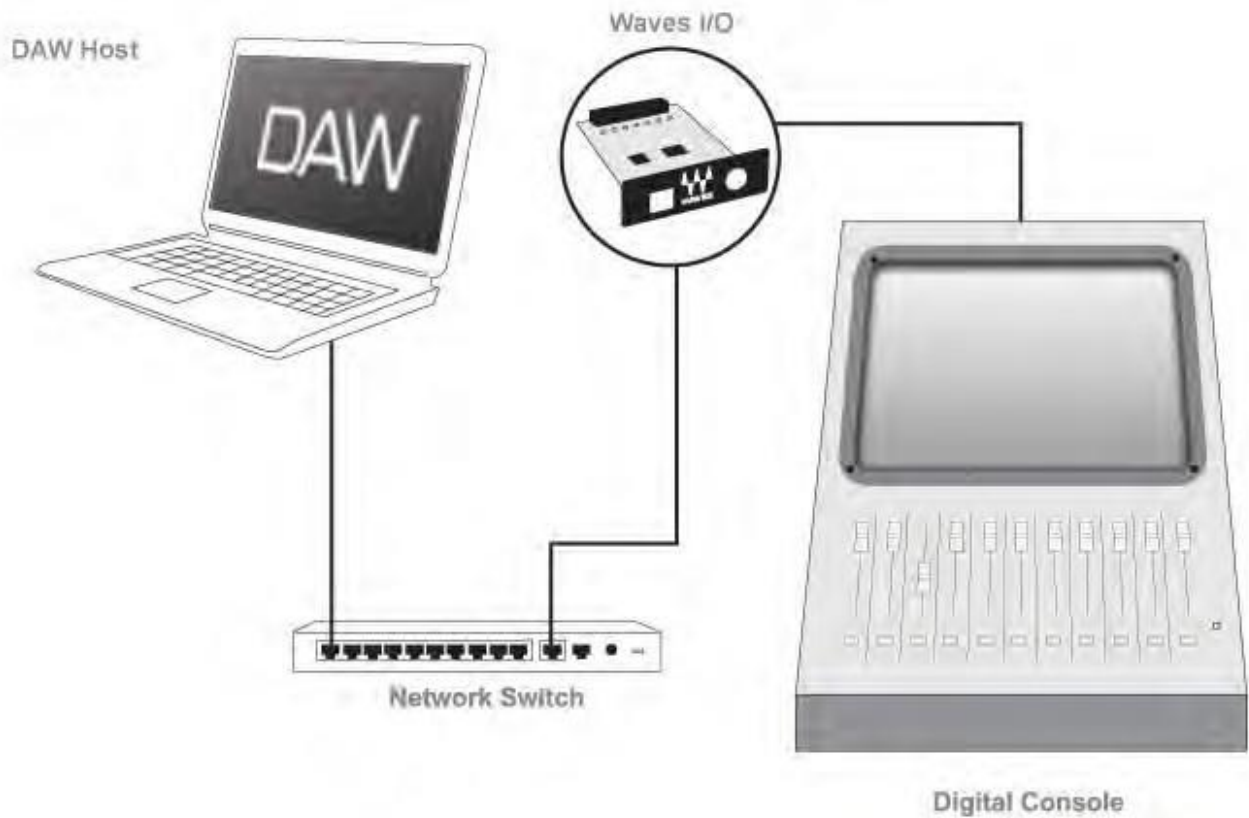
1. Install the driver. The driver can be installed on the same computer running MultiRack SoundGrid or on a separate computer.
2. Open the **SoundGrid Driver Control Panel** after connecting it to the network and turning all devices on.
3. Open the **Main** tab and set Driver Mode to **Networked** (If you are using SG MultiRack on this setup).
4. From the **Local LAN Port** menu, select the port that the network is connected to. The LAN port is identified by its MAC address and name. When you select the correct port, the driver will scan the network and display "**SoundGrid Network found**".



5. Turn the driver on. The driver is now ready.

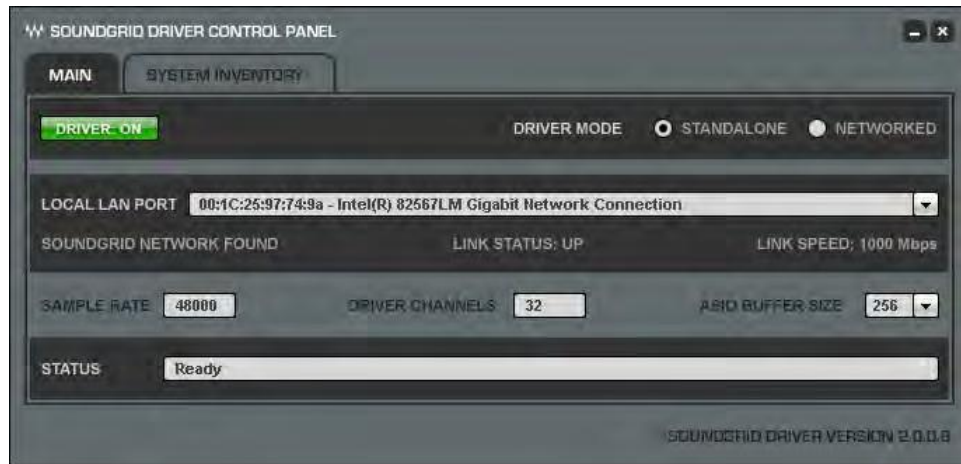
# Using the Standalone Driver

Using the SoundGrid Driver in its Standalone mode allows you to use SoundGrid I/Os devices as regular sound cards with standard off the shelf Digital Audio Workstations. The Standalone Driver also allows you to use Waves MultiRack Native for processing audio natively (at higher throughput latency than MultiRack SoundGrid).

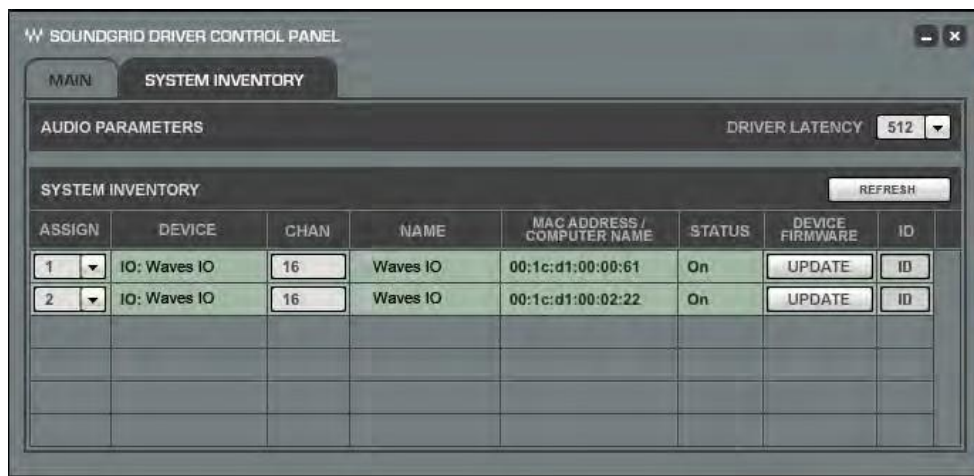


## Setting up the Driver

1. Make sure your I/O devices are powered and connected to your computer via Ethernet.
2. Open the **SoundGrid Driver Control Panel**.
3. In **Driver Mode** area, select **Standalone Mode**.
4. From the **Local LAN Port** drop down menu select the LAN port to your connected device. Note that when you select the correct port a “**SoundGrid Network found**” message is displayed.



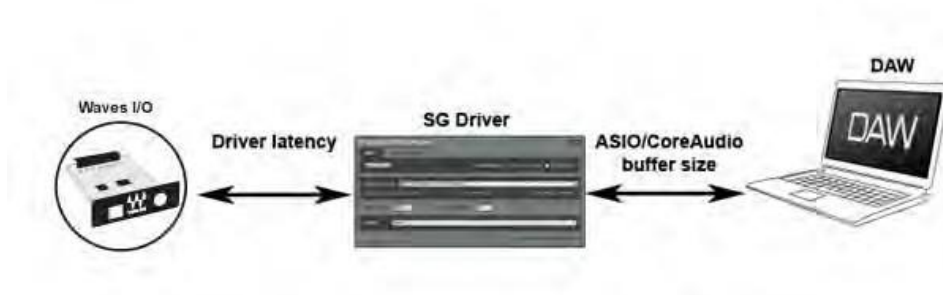
5. Select the **System Inventory** Tab. This tab displays all SoundGrid I/O devices connected to your network.



6. In the **Assign** column, assign the devices you intend to use by numbering them, same as you've done in MultiRack SoundGrid's **Inventory** window:

1. for the first I/O device
2. for the second I/O device

Pressing the **ID** button will cause the respective I/O device to light its network Link and Activity LEDs to allow you to identify it easily. Set the **Driver Latency** value you intend to work with. Usually higher values result in higher latency and higher performance, lower values in lower latency and lower performance, depending on your host computer capabilities. A setting of 256 samples will work well on most computers.



**Driver Latency** indicates latency between I/O and the Driver.

**ASIO Buffer Size** indicates latency between DAW and the Driver.

Overall Native Latency (I/O + DAW) is the sum of Driver Latency and ASIO Buffer Size.