



WAVES

MultiRack

SETUP GUIDE

V9.80

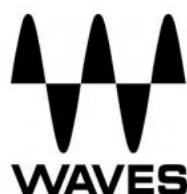
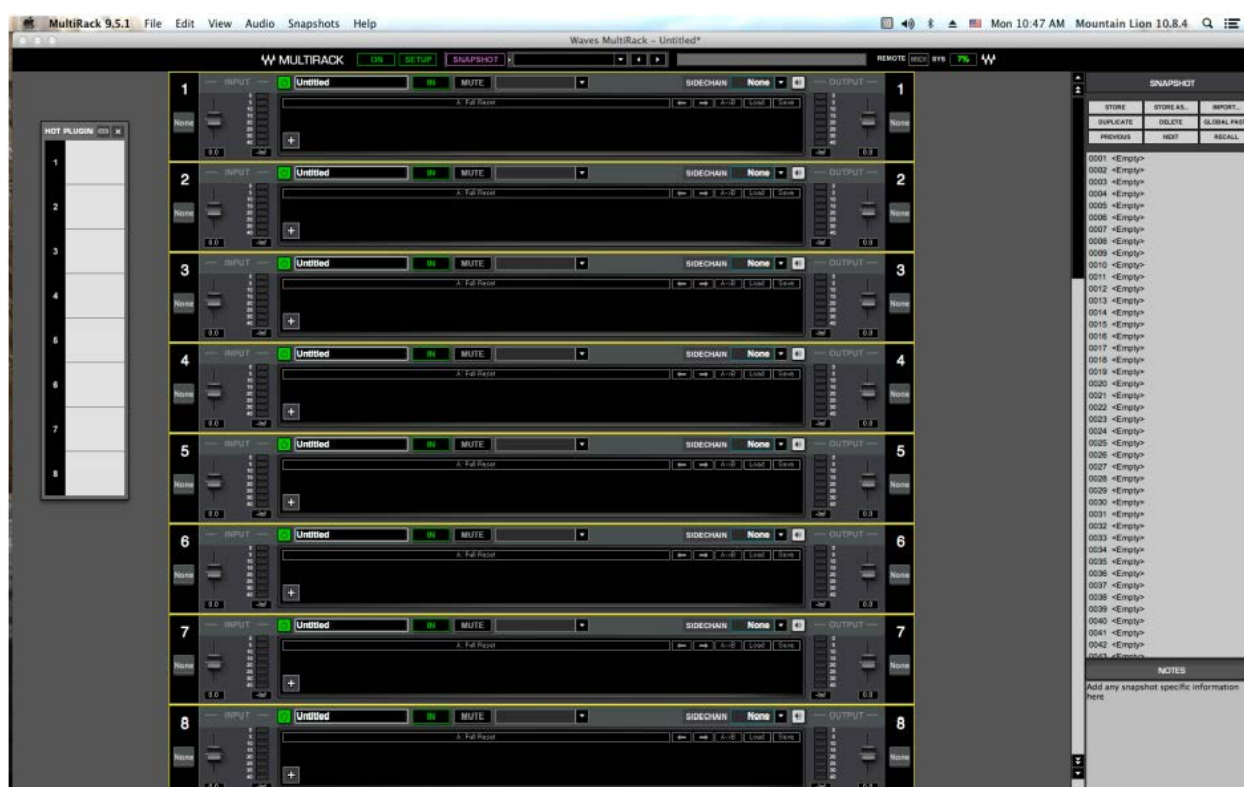


Table of Contents

1. Overview.....	3
2. Basic Requirements.....	3
3. Software	4
4. Required Waves Licenses	4
5. Installing MultiRack.....	5
MultiRack Native/SoundGrid Application Installer	5
Installing SoundGrid Studio with I/O Firmware and Control Panel for DiGiGrid MGB/MGO and Allen & Heath (Standalone Installers).....	6
MultiRack-Compatible Plugin Installer.....	7
6. MultiRack Native.....	8
Hardware Connections	8
Analog Connections.....	8
MADI Native Connections	8
Yamaha Native Connections.....	9
Behringer Native Connections	9
Software Setup	10
7. MultiRack SoundGrid Hardware Connections	11
SoundGrid Requirements	11
8. Yamaha Hardware Connections	12
9. MADI-Enabled Console Hardware Connections.....	13
10. Allen & Heath Hardware Connections.....	14
11. MultiRack SoundGrid Software Setup.....	15
Preferences Window.....	15
Plugin Manager Tab.....	16
Remote Control Tab.....	17
12. SoundGrid Inventory:.....	20
System Parameters	20
I/O Devices	22
SoundGrid Servers	23
13. SoundGrid Connections Window	24
14. Setting Up the SoundGrid Driver.....	25

1. Overview

There are two versions of the MultiRack software: Native and SoundGrid.

Native utilizes the computer's CPU to power the plugin processing. In practice, this means that plugin count and overall system latency depend on the computer's CPU and sound driver capabilities.

SoundGrid uses a dedicated SoundGrid DSP server to power the plugin processing, providing low latency, high plugin counts, a backup DSP server, and networking capabilities.

2. Basic Requirements

- **PC or Mac Host Computer** – The main brain and controller for the system that runs the MultiRack live plugin 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 the Waves License center (when using Multirack Native).

The USB flash drive must be connected to the console at all times 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 a mouse or keyboard.

3. Software

- **MultiRack Native** – Host software for Waves Native plugins; supports MultiRack Native-compatible plugins only.
- **MultiRack SoundGrid** – Host software for SoundGrid-compatible plugins; supports MultiRack SoundGrid-compatible plugins only.
- **MultiRack SoundGrid for DiGiCo offline software** – For preparation of offline MultiRack sessions for SD consoles using DiGiCo's SD offline editor.
- **SoundGrid Studio** – Required for recording and/or playback only (installation optional). Can be installed on a separate computer dedicated to playback/recording.

SoundGrid Studio includes:

- The SoundGrid Studio Application for routing and setting up SoundGrid Studio
- Waves SoundGrid ASIO/Core Audio driver for Windows and Mac.
- I/O Firmware and Control Panel for the Yamaha WSG-Y16 card.
- SoundGrid Studio with I/O firmware and Control Panel for DiGiGrid MGB/MGO is available on the DiGiGrid MGB/MGO download page as a standalone installer (<http://www.waves.com/downloads/digigrid-mgb-mgo>).
- SoundGrid Studio with I/O firmware and Control Panel for the Allen & Heath M-Waves card is available on the Allen & Heath M-Waves download page as a standalone installer (<http://www.waves.com/downloads/allen-heath>).
- **Waves plugins** – The audio processors hosted by MultiRack.

4. Required Waves Licenses

Licenses can be activated on a USB flash drive or on the host computer's hard drive.

- **Native** systems require the MultiRack Native application and Waves Native plugins.
- **SoundGrid** systems require the MultiRack SoundGrid application and SoundGrid-compatible plugins.

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

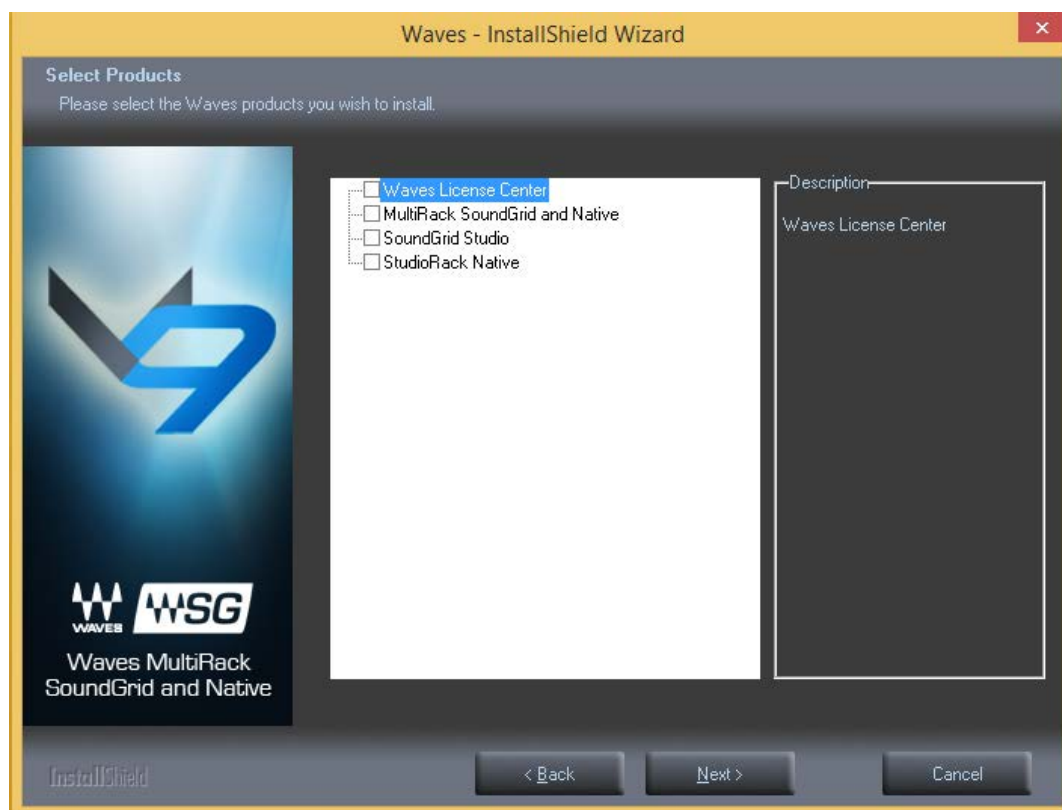
For activation instructions, see <http://www.waves.com/support/activate>.

5. Installing MultiRack

MultiRack Native/SoundGrid Application Installer

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

- Download the multi-platform MultiRack installer at <http://www.waves.com/downloads/multirack> and choose your platform.



- Launch the installer and choose the software to install:
- Waves License Center (for license activation and management)
- MultiRack SoundGrid
- MultiRack SoundGrid for DiGiCo offline software
- SoundGrid Studio I/O firmware and control panel for Yamaha WSG-Y16 card



- SoundGrid Studio with I/O Firmware and Control Panel for DiGiGrid MGB/MGO is available on the DiGiGrid MGB/MGO download page as a standalone installer (<http://www.waves.com/downloads/digigrid-mgb-mgo>).
- SoundGrid Studio with I/O firmware and Control Panel for the Allen & Heath M-Waves card is available on the Allen & Heath M-Waves download page as a standalone installer (<http://www.waves.com/downloads/allen-heath>).
- MultiRack Native
- Follow the instructions to complete installation.

Installing SoundGrid Studio with I/O Firmware and Control Panel for DiGiGrid MGB/MGO and Allen & Heath (Standalone Installers)

1. Download the appropriate standalone installer:
 - Allen & Heath M-Waves V2 – <http://www.waves.com/downloads/allen-heath>
 - DiGiGrid MGB/MGO – <http://www.waves.com/downloads/digigrid-mgb-mgo>
2. Click Next, then follow the instructions to complete the installation.
3. Reboot your computer when installation is complete.
4. Open the SoundGrid Driver Control Panel:

Mac: The Control Panel shortcut is located on the Mac Dock or in Applications > Waves > SoundGrid Studio.

PC: The Control Panel shortcut is located on the desktop or in C:\Program Files (x86)\Waves\SoundGrid Studio.



MultiRack-Compatible Plugin Installer

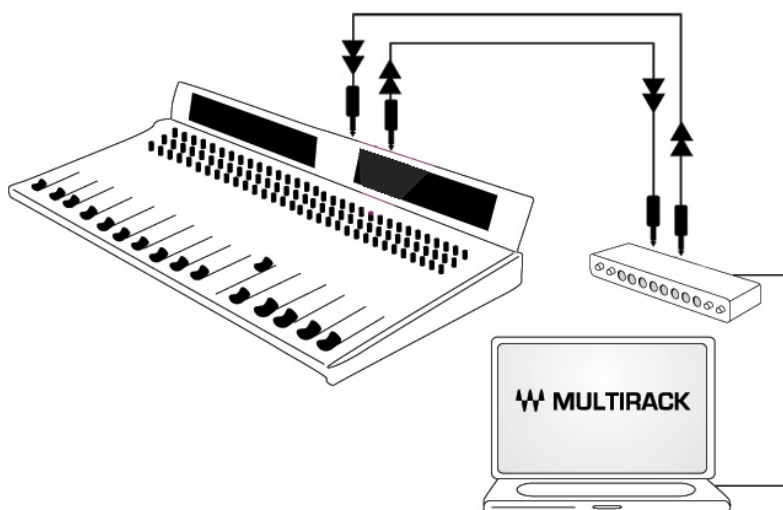
1. Download the multi-platform V9 plugin installer at <http://www.waves.com/downloads/multirack> and choose your platform.
2. Launch the installer and choose your plugins or plugin bundle from the list. Installed plugins support both Native and SoundGrid formats, depending on the licenses you have and on compatibility. To accommodate live users, you can choose to install all SoundGrid-compatible plugins at once by choosing “All SoundGrid Compatible Plugins” from the menu.
3. Follow the instructions to complete installation.

6. MultiRack Native

Hardware Connections

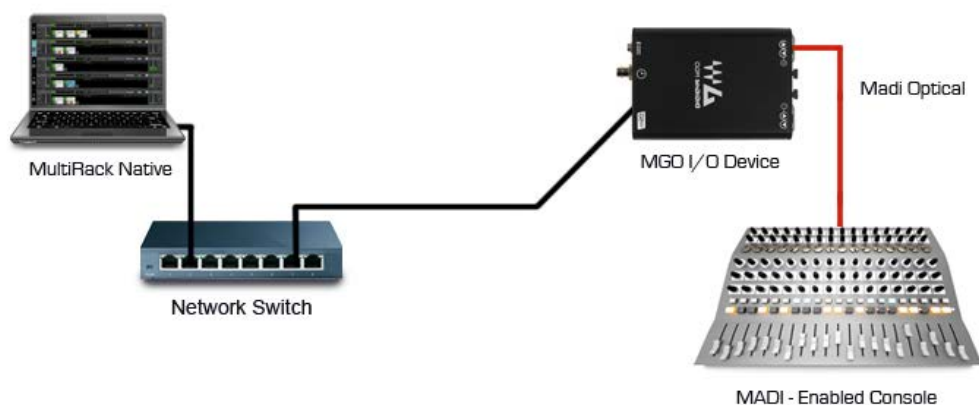
Connect an ASIO / Core Audio interface to your host computer. Use MADI, AES/EBU, or analog cables, depending on your console and audio interface. See examples below.

Analog Connections



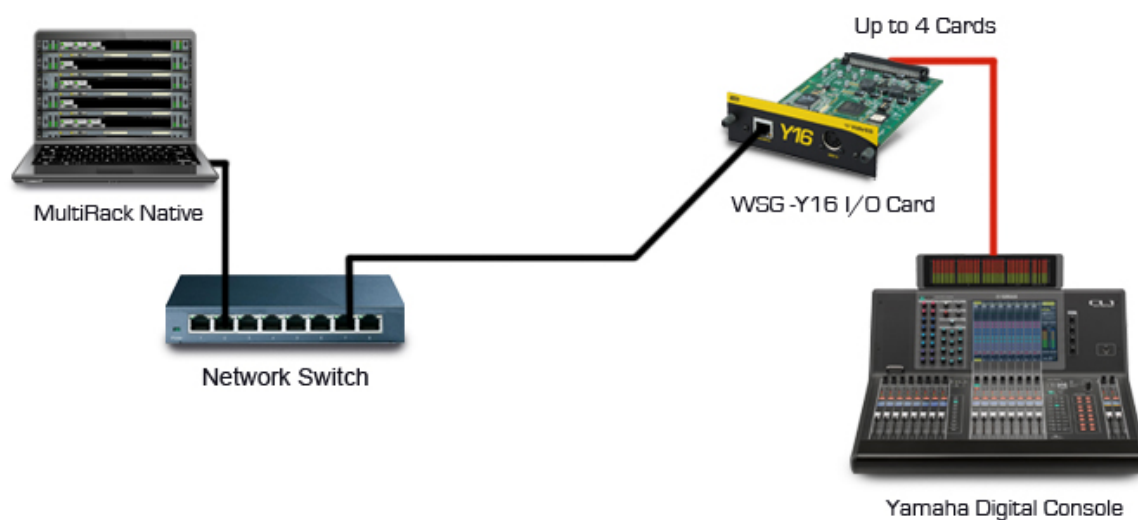
MADI Native Connections

NATIVE PROCESSING



Yamaha Native Connections

NATIVE PROCESSING



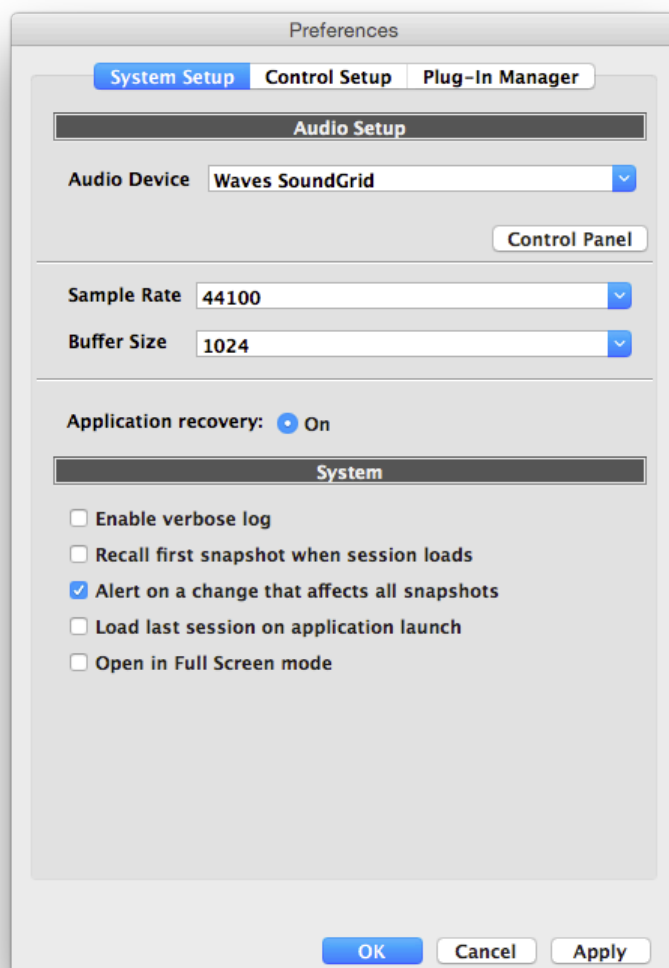
Behringer Native Connections

NATIVE PROCESSING



Software Setup

Open the 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 Native supports Windows ASIO and Mac Core Audio sound cards.)



7. MultiRack SoundGrid Hardware Connections

SoundGrid Requirements

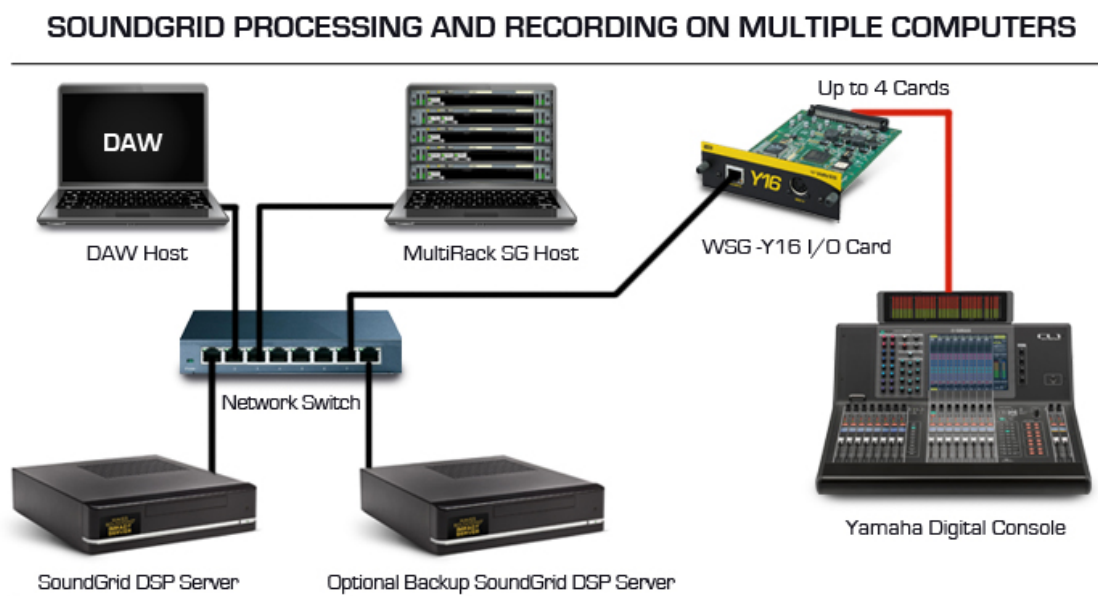
- **The SoundGrid I/O card** pipes audio in and out of the console. Please refer to the manual of your card for specific instructions regarding setup.
- **The SoundGrid DSP server** acts as the “number cruncher” for all plugins used in the application. It is possible to connect a second “redundant” server working as a backup. Check <http://www.waves.com/live-sound/soundgrid-servers> for an updated list of qualified servers.
- **The network switch** connects devices to the network. Check <http://www.waves.com/live-sound/soundgrid-switches> for an updated list of certified switches.
- **An optional secondary computer** may be used for connecting a DAW (Digital Audio Workstation) to your network for simultaneous recording and/or playback.
- **Cat 5e or Cat 6 Ethernet Cables** –
Check <http://www.waves.com/1lib/pdf/live/soundgrid-cables.pdf> for an updated list of qualified cables.

8. Yamaha Hardware Connections

Begin by connecting your console and all other components to the network switch in order to create the SoundGrid network. Your MultiRack SoundGrid and DAW can be installed on the same computer or on separate computers.

- You may connect two SoundGrid DSP servers, in which case the second server will function as a redundant server.
- All components must be connected to the network switch using Cat 5e/Cat 6 cables.

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



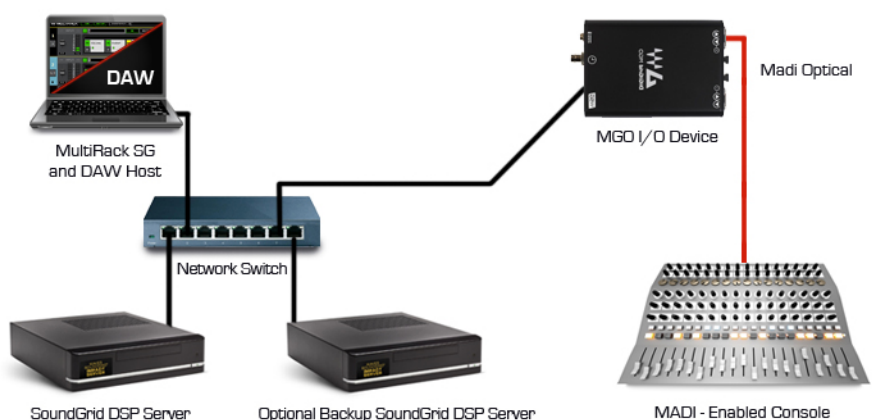
9. MADI-Enabled Console Hardware Connections

Begin by connecting your console and all other components to the network switch in order to create the SoundGrid network. Your MultiRack SoundGrid and DAW can be installed on the same computer or on separate computers.

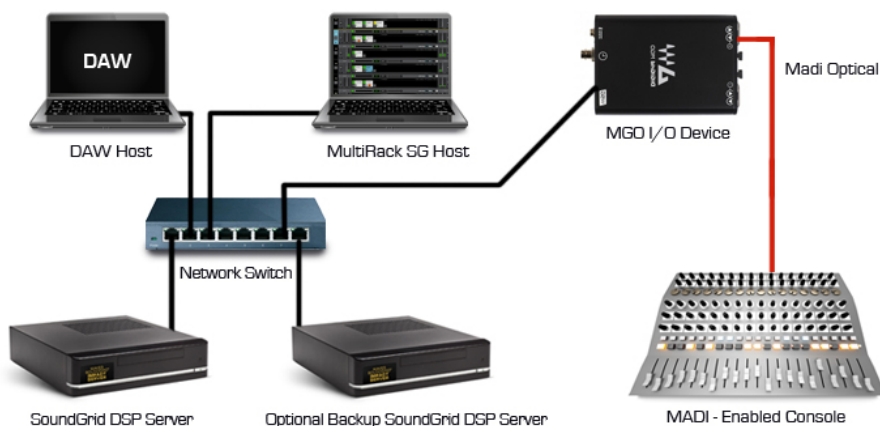
- You may connect two SoundGrid DSP servers, in which case the second server will function as a Redundant Server.
- All Components must be connected to the network switch using Cat 5e/Cat 6 cables.

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

SOUNDGRID PROCESSING AND RECORDING ON ONE COMPUTER



SOUNDGRID PROCESSING AND RECORDING ON MULTIPLE COMPUTERS



10. Allen & Heath Hardware Connections

See [detailed instructions here](#).

SOUNDGRID PROCESSING AND RECORDING ON ONE COMPUTER



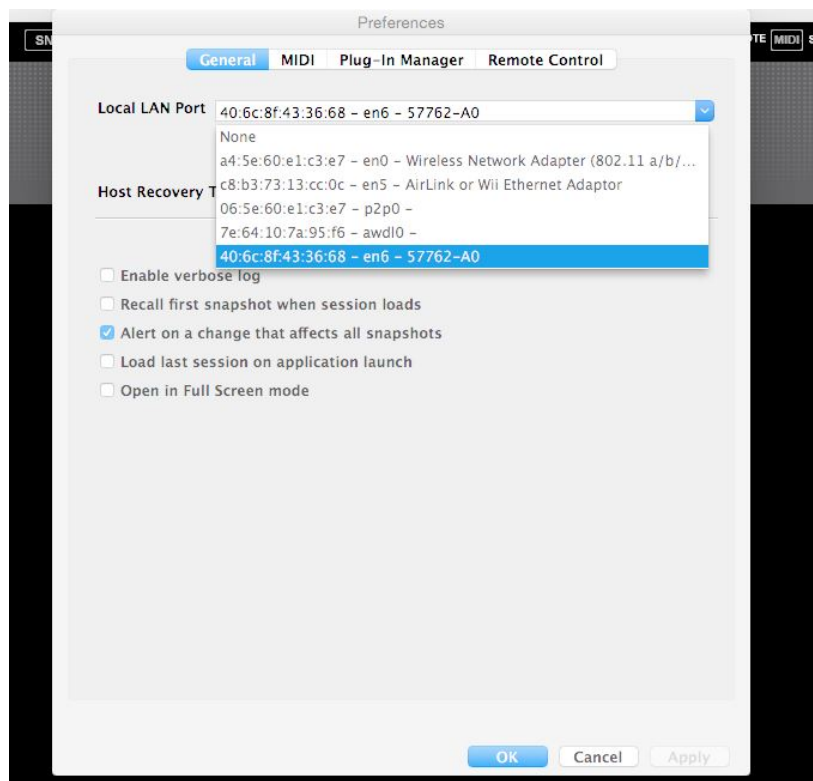
SOUNDGRID PROCESSING AND RECORDING ON MULTIPLE COMPUTERS



11. MultiRack SoundGrid Software Setup

Preferences Window

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



Local LAN Port 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 their 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, audio streaming and processing will continue without interruption, but user control will be lost; MultiRack SoundGrid will relaunch itself automatically. When MultiRack SoundGrid relaunches, it synchronizes to the server. At the moment of synchronization there is a short mute (<1 second, depending on session size). The recovery type allows control over the precise time this muting occurs:

- **Automatic** – When recovery type is set to Automatic, MultiRack SoundGrid will load the session to the server as quickly as possible.



- **Manual** – When recovery type is set to Manual, MultiRack SoundGrid will relaunch itself but will not load the session to the server until you press the Connect button on the dialog box that appears.

Alert about changes that affect all snapshots: When this option is selected, a warning will appear 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.

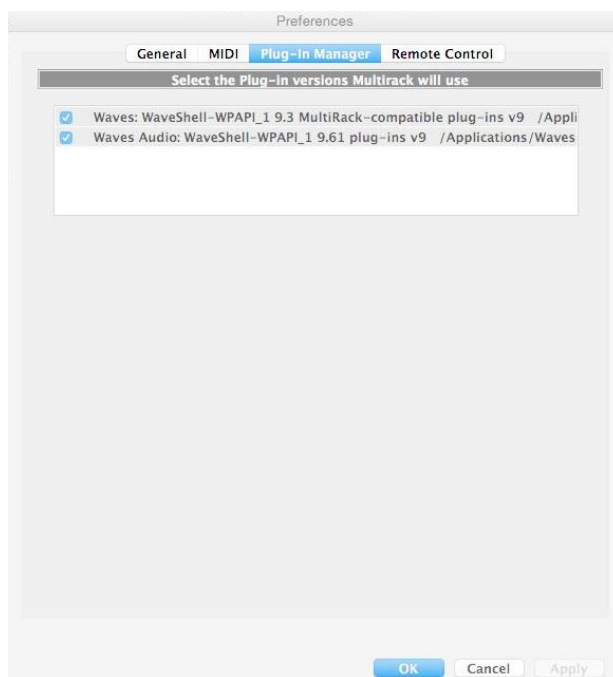
Recall first snapshot when session loads: It is recommended that you start your shows with the first snapshot.

Enable verbose log: When this option is selected, MultiRack SoundGrid goes into a “debug” mode that outputs a so-called “verbose data file.” The file is used to collect data that technical support may require. When selected, the message area of the Status Bar displays the 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 your next application launch.

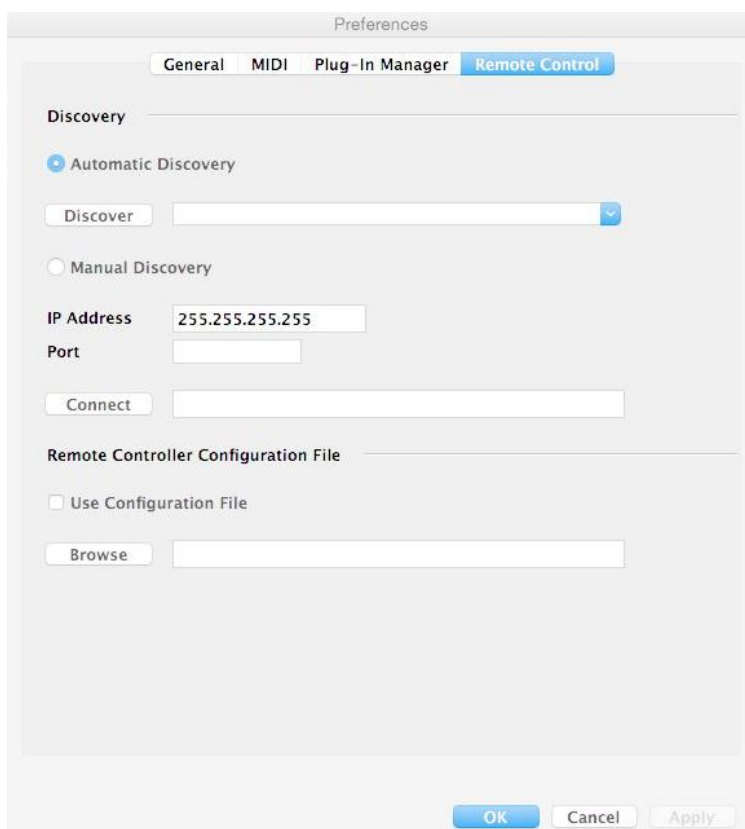
Open in Full Screen Mode: Select this to load MultiRack SoundGrid in Full Screen mode.

Plugin Manager Tab



The plugin-manager allows you to select which versions of Waves plugins MultiRack will work with. Select the version you want to use, click OK, and select the “Rescan present Licenses” menu command to re-scan the plugins and load the version you have selected to use.

Remote Control Tab



The Remote Control tab sets the connection between MultiRack and a console, which remote controls MultiRack through an integrated workflow. In this tab you will discover the console over the network and set up a connection with it, and load the appropriate configuration file that activates the integrated work flow with that console. Through this integrated work flow you are able to:

- Load and save MultiRack session files through the console. When you load, open new, and save files on the console, MultiRack tracks this work and respectively load, open new and saves files with the same names. The files are saved into a specific folder where MultiRack knows to look for them when Remote Control is active.



- Synchronize MultiRack's snapshots with the console's snapshots. When you store and recall snapshots, corresponding snapshots are stored and recalled on MultiRack side, keeping MultiRack's snapshots in sync with the console's.
- Touch and Turn. Select a plugin parameter on MultiRack's interface, and change its values through the console's dedicated control.

More functions are available, depending on each console implementation. For specific description of each remote control functions per console, look for the Read Me file accompanying each configuration file.

In order for remote control over IP to work, the firewall

Discovery. The Discovery section allows you to discover all of the remote-controlling capable consoles and devices on the local network, either through automatic or manual modes. Once discovered you can select one, and set a connection to it. From that point on, MultiRack will "slave" its workflow to the console or device.

Automatic Discovery. This is the default option and the simpler one. Click the **Discover** button and MultiRack will search the network for possible remote control consoles. The devices it discovers will be listed in the drop-down menu. Select the device you want to act as remote controller, and click the **Connect** button below. MultiRack will establish a connection to that device.

- **Discover button.** Click the button to discover all remote-controlling capable devices and consoles on the network.
- **Remote Controller List drop-down menu.** This menu lists the remote-controlling capable devices MultiRack has discovered on the network.

Manual Discovery. If MultiRack has failed to automatically discover your remote controlling device, then insert the device's **IP Address** and the **Port** number. Refer to the device's manual, your network administrator or customer support to find which IP Address the device is set to and which port the remote control communication with MultiRack the device is set to.

- **IP Address.** Insert the remote controller's IP Address here.
- **Port.** Insert the relevant port number here. This is the port through which the remote controller will communicate with MultiRack. This information may be found on the device's interface, in its manual, or through its customer service.



Connect button and display. Once the remote controller is discovered, clicking the **Connect** button will make MultiRack establish connection with the device. Error messages and alerts will be shown in the **Display** area.

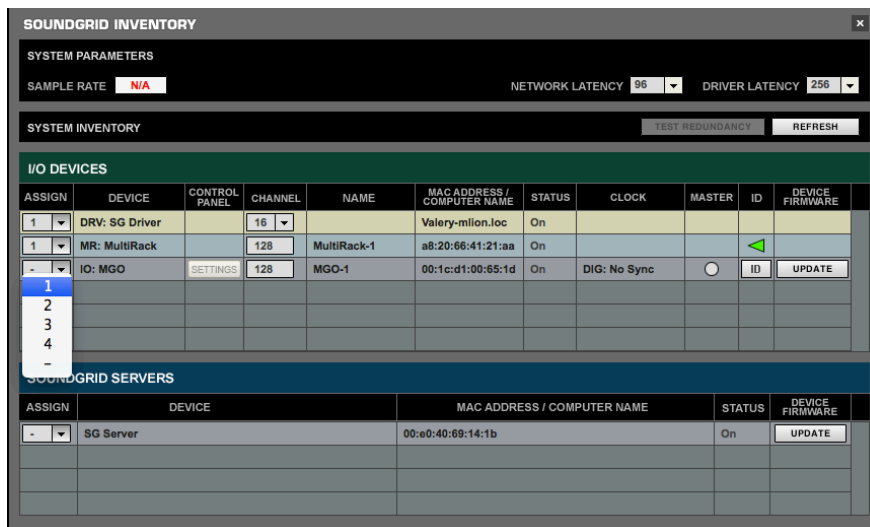
Remote Controller Configuration File. This section allows you to load the file that tells MultiRack which functions to turn off and how to modify its “regular” behavior so that its work flow will integrate with the remote controlling device’s. For example, the configuration file may turn off MultiRack’s session file loading and saving, effectively slaving these operations to the remote controller. What will happen is that file naming, saving and loading, will be initiated solely from the remote controlling device.

Use Configuration File. Turn this on to have MultiRack use the configuration file and respond correctly to the remote controller. If this function remains unchecked, MultiRack will ignore the remote controllers commands.

Browse button and display. Click the Browse button to open an Open dialog, allowing you to browse to the correct configuration file and load it. MultiRack will ask you to restart the application. The remote control configuration will apply only after restarting the application.

NOTE: make sure you select the configuration file that matches your remote controller.

12. SoundGrid Inventory:



ASSIGN	DEVICE	CONTROL PANEL	CHANNEL	NAME	MAC ADDRESS / COMPUTER NAME	STATUS	CLOCK	MASTER	ID	DEVICE FIRMWARE
1	DRV: SG Driver		16		Valery-milion.loc	On				
1	MR: MultiRack		128	MultiRack-1	a8:20:66:41:21:aa	On				
-	IO: MGO	SETTINGS	128	MGO-1	00:1c:d1:00:65:1d	On	DIG: No Sync	<input type="radio"/>	ID	UPDATE
1										
2										
3										
4										
-										

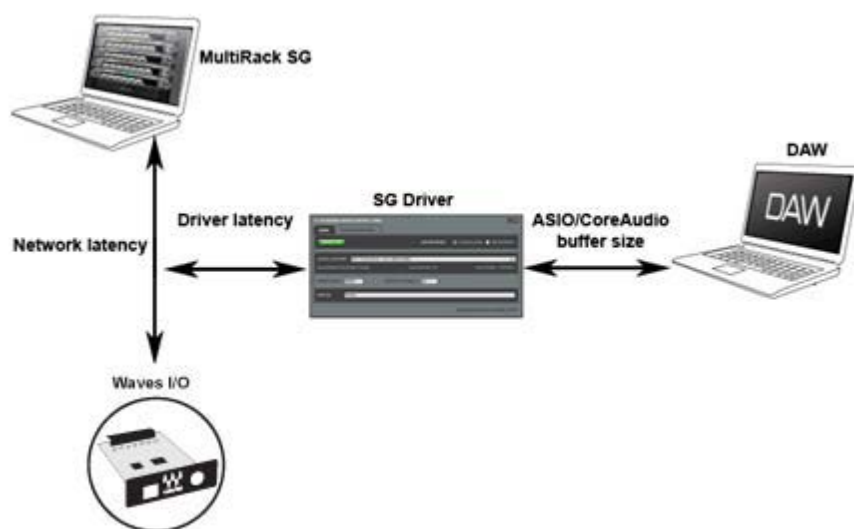
ASSIGN	DEVICE	MAC ADDRESS / COMPUTER NAME	STATUS	DEVICE FIRMWARE
-	SG Server	00:e0:40:69:14:1b	On	UPDATE

This window is accessed by selecting SoundGrid Inventory 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** displays the sample rate. MultiRack SoundGrid is slaved to the console or I/O sample rate; this field cannot be edited.
- **Network Latency** sets the network latency value. This field allows you to change SoundGrid network throughput latency. 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 + plugin latency) of the specific rack into which these plugins are inserted. See <http://www.waves.com/live-sound/soundgrid-servers> for correct settings.



The above diagram illustrates 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** determines the SoundGrid's driver's input latency, i.e., 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 setup using a redundant server, a second server is connected to the main audio processing DSP server. When the main server fails, the secondary backup server automatically takes over and begins processing. Click the **Test Redundancy** button to make sure 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** is used to refresh the inventory list after 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** selects devices for usage in your setup. The number you assign to 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.



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

I/O Devices

- **I/O**: An I/O device that streams audio to and from the SoundGrid network.
- **DRV**: A SoundGrid driver installed either on another computer connected to the network, or on the same computer on which MultiRack SoundGrid is running.
- **MR**: MultiRack, SoundGrid's audio processing device. MultiRack is the device that receives audio for processing.

Control Panel: Contains a setting button for configurable devices, for example DiGiGrid MGO/MGB. Click the button to access the control panel of each device.

Channel: 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 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.

Clock: Displays I/O devices' clock status. Sync OK indicates that the device is synced internally or to another device.

Master: The Radio button lets you choose the I/O device as Clock Master. (Yamaha WSG-Y16 and Allen & Heath M-Waves cards are automatically set as Clock Master.)

ID: Applicable for I/O-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, allowing you to identify the device in the network.

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.



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, then click the window's Refresh button.

SoundGrid Servers

The **Servers** table is very similar to the **Inventory** table and is used in the same way. This table is separate from the I/O Device table, since servers do not have channels and do not receive audio connections.

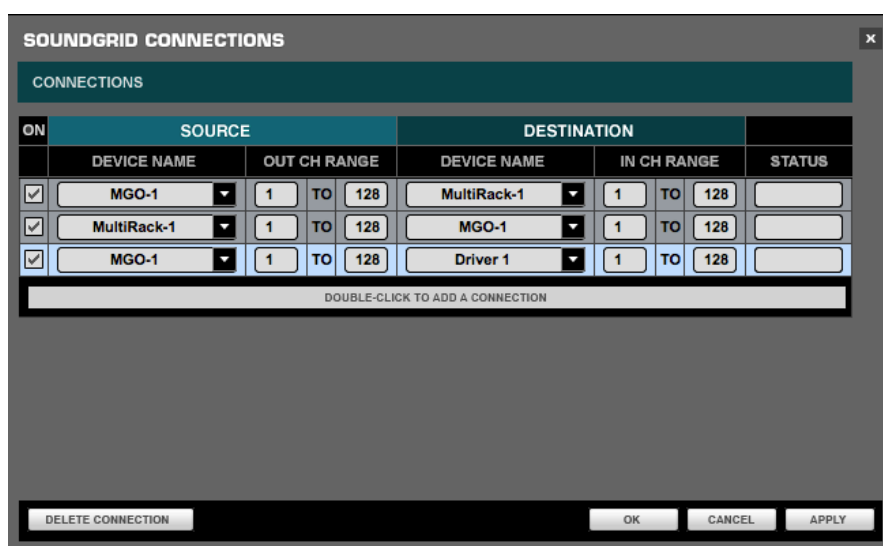
Choose "1" for the server you intend to use as your main processing engine; choose "2" for the server you intend to use as a redundant server.

13. SoundGrid Connections Window

The **Connections** table allows you to create audio connections (routes) between source and destination devices.

Go to **Edit** menu and select the **SoundGrid Connections** menu item, or press F3. On the left-hand side of the table, select the source device and its output channels that will be routed to the destination device's channels. Channels are set in ranges; for example, setting Source channels 1 to 8 means you are routing the device's channels 1 through 8 to send audio to a destination device

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



ON	SOURCE		DESTINATION		
	DEVICE NAME	OUT CH RANGE	DEVICE NAME	IN CH RANGE	STATUS
<input checked="" type="checkbox"/>	MGO-1	1 TO 128	MultiRack-1	1 TO 128	
<input checked="" type="checkbox"/>	MultiRack-1	1 TO 128	MGO-1	1 TO 128	
<input checked="" type="checkbox"/>	MGO-1	1 TO 128	Driver 1	1 TO 128	

DOUBLE-CLICK TO ADD A CONNECTION

DELETE CONNECTION OK CANCEL APPLY

A new connection is created by double-clicking the Double-click to Add a Connection area.

The **Connections** table has the following controls:

On/Off	Turn the connection on and off by check-marking it. Note that if a connection becomes invalid it is automatically un-checked.
Source: Device Name	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.

Source: Output Chn Range	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.
Destination: Device Name	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.
Destination: Input Chn Range	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).

Please note:

- Channel settings must start with an odd number, and the connection must have an even number of channels. For example, channel ranges can be set 1-8, 3-6, 7-14 and so on. Connections set to 4-7, 2-11 or similar are invalid.
- Channels can be set 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 italics and will be turned off; you will not be able to apply the window's setting. Overlapping connections are marked blue.

14. Setting Up the SoundGrid Driver

Please refer to the Waves SoundGrid Studio User Guide.