Waves
MultiRack SoundGrid V9.7
for Allen & Heath Consoles
Troubleshooting Guide

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1. Introduction

The objective of this document is to help you troubleshoot Waves MultiRack SoundGrid for A&H iLive consoles. This guide is written under the assumption that you have read and followed the setup instructions available on our website before attempting to fix your problem.

This guide is divided into five major sections:

1. Illustration of a functioning SoundGrid system
2. Guide to resolving problems with a non-functioning SoundGrid System
3. General information about SoundGrid system components
4. Frequently asked questions
5. Appendices

2. Components Required for Establishing a MultiRack SoundGrid System

- **M-Waves I/O card for Allen & Heath:** Fitted to the Port B expansion slot in iLive fixed format MixRacks (iDR-16, iDR-32, iDR-48 & iDR-64) or expanders (xDR-16), or Port B in iLive modular MixRacks (iDR0, iDR10) fitted with the new RAB-2 standard. The M-Waves card can also be fitted to the I/O module expansion slot in GLD-80 and GLD-112 mixers.

- **Waves-qualified SoundGrid server:** A multi-core PC used for real-time audio processing. See a list of Waves-qualified servers in Appendix A: Servers.

- **Network switch:** See a list of Waves-qualified switches in Appendix B: SoundGrid-Compatible Switches.

- **Ethernet cables:** Standard Cat 5e or Cat 6 Ethernet cables. See a list of supported length per cable type and application in Appendix C: Ethernet Cables for SoundGrid Systems.

- **USB flash drive** with activated licenses for Waves SoundGrid-compatible plugins and the MultiRack SoundGrid application.

SoundGrid Processing and Recording on a Single Computer

SoundGrid Processing and Recording on Multiple Computers

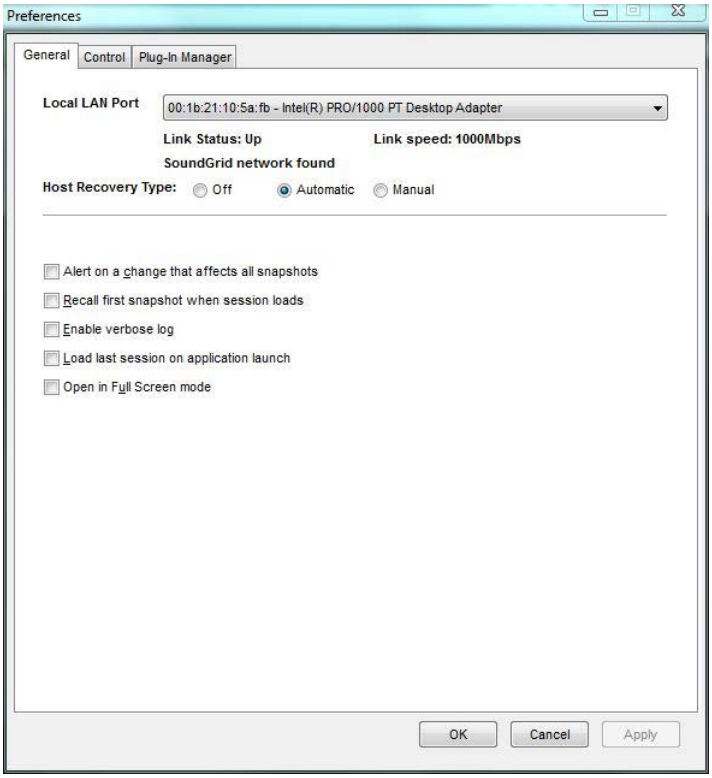
3. Proper System Configuration

This section displays the basic windows and settings of an operational Waves MultiRack SoundGrid system. To establish a proper system configuration, follow the setup instructions below, which are also available online on our Downloads page:

1. Launch the MultiRack SoundGrid application.

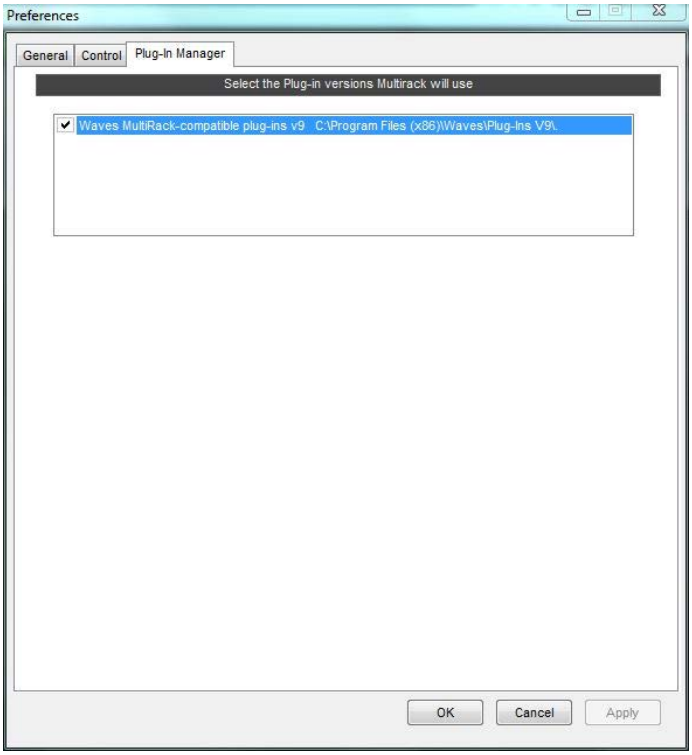
2. Go to the Preferences window.
    a. PC: File > Preferences
    b. Mac: MultiRack SoundGrid > Preferences

3. General Tab Settings:
    Link Status = Up Link Speed = 1000 Mbps
    SoundGrid Network Found

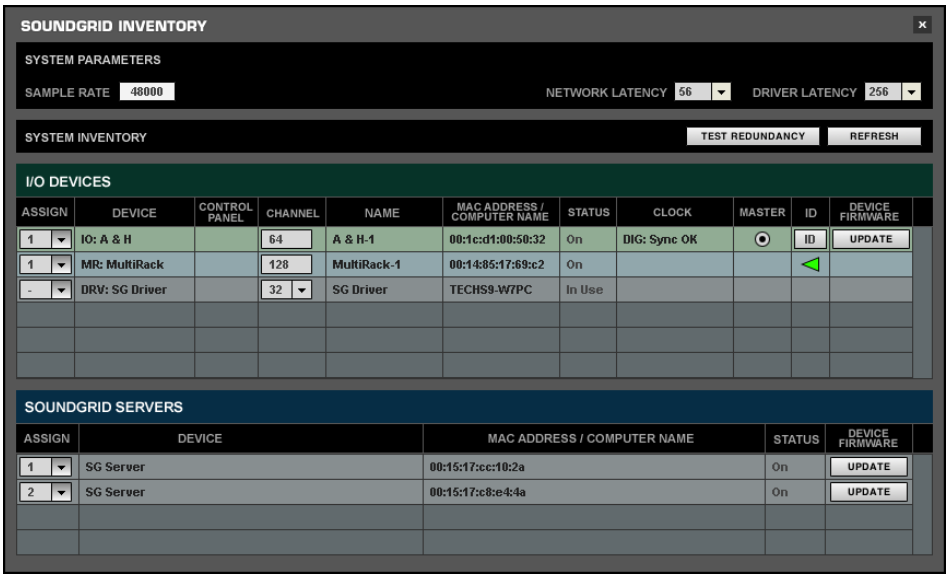


4. Plug-in Manager Tab Settings:

   The plugin version you intend to use and have licenses for is checked.



5. Go to Audio > SoundGrid Inventory



SoundGrid Inventory Settings:

Sample Rate: Matches the state of the console.

Network and Driver Latency: Correct settings depend on the server in use; driver latency depends on the driver (host computer).

IO: A&H is assigned and status is On.

MR: MultiRack is assigned and status is On.

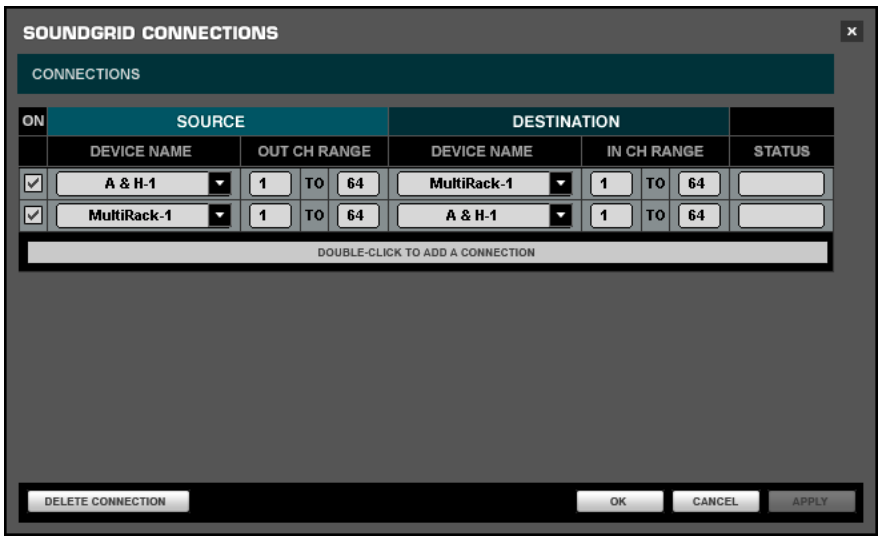
SG Server/s: Assigned and status is On.

Minimum Network Latency Settings

	48 kHz	96 kHz
Extreme Server	40 samples	80 samples
Server One	40 samples	80 samples
Impact Server	56 samples	112 samples
Compact Server	96 samples	N/A

Please Note: *In the SoundGrid Inventory window, the Network Latency range is 40 / 56 / 80 / 96 at a 48-kHz sampling rate, and 80 / 112 / 160 / 192 at a 96-kHz sampling rate.*

6. Go to Audio > SoundGrid Connections.



7. SoundGrid Connections Settings:

   A&H-1 connection to MutliRack is checked.

   MutliRack connection to A&H-1 is checked.

4. Troubleshooting

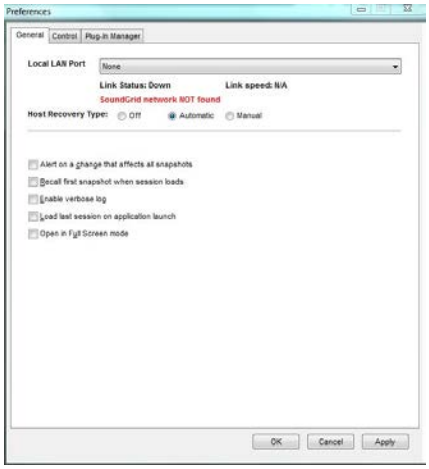
If the message **ERR** appears in the MultiRack SoundGrid status window at any point after MultiRack SoundGrid has loaded, take the following steps to inspect all settings and system components:

SoundGrid Preferences

1. Go to the Preferences window

   PC: File > Preferences

   Mac: MultiRack SoundGrid > Preferences



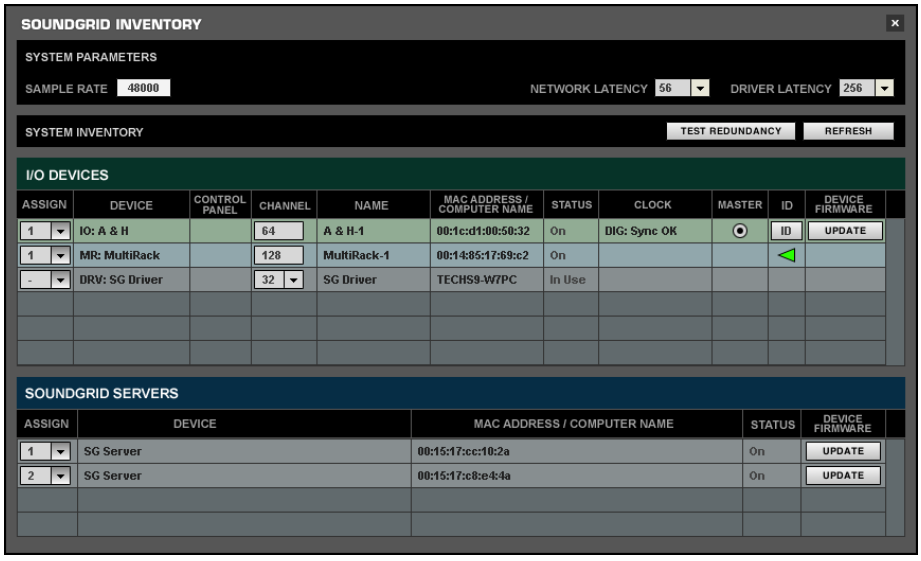
- If you see the **SoundGrid network NOT found** message, and **Local LAN Port** is set to ***None***, open the dropdown menu and set it to the LAN port connected to your SoundGrid network.

- If you see the **SoundGrid network NOT found** message, and **Local LAN Port** is already set to the LAN port connected to your SoundGrid network, check the following:
- If Link Status is UP and Link Speed is 1000 Mbps, this means that the I/O and the SoundGrid server are disconnected.
- If Link Status is DOWN and Link Speed is N/A, this may be for one of the following reasons:
- The switch is turned off or not compatible – please refer to Appendix B: SoundGrid-Compatible Switches.
- The Ethernet cable is disconnected or defective on the console (host) computer.
- Some or all cables may be too long or not compatible – please refer to Appendix C: Ethernet Cables for SoundGrid Systems.

If the SoundGrid Preferences are set correctly and the issue persists, check the SoundGrid Inventory window next.

SoundGrid Inventory

Go to Audio > SoundGrid Inventory.



IO: A&H

Sample Rate

If the sample rate appears as **N/A**, this may be for the following reasons:

- **IO: A&H** is not assigned.
- If **IO: A&H** is assigned but appears as **N/A**, the card is not inserted in the slot properly.

To resolve this issue, take one of the following steps:

- If the **IO: A&H Status** is On, assign the device. It should be functional now.
- If the **IO: A&H Status** is NOT On, unassign **IO: A&H** and click Refresh.
- If the **IO: A&H** appears as Not Compatible, click Update. Once the firmware update is complete, you will be prompted to turn off the console.

If **IO: A&H** has disappeared from the list, this may be for one of the following reasons:

- Ethernet cable is disconnected from I/O or switch.
- Ethernet cable is disconnected from host or switch.
- Ethernet cable is defective.
- Network switch is turned off.
- Network switch is not compatible (switch does not have 1GB connection): please refer to Appendix B: SoundGrid-Compatible Switches.
- Ethernet cable is not compatible (not Cat 5e or Cat 6).
- Ethernet cables are too long: please refer to Appendix C: Ethernet Cables for SoundGrid Systems.
- The A&H card is not inserted to the slot properly.
- A&H card is defective.

SoundGrid Servers

Once you've confirmed that the I/O is functioning properly and is not the cause of the problem, check the SoundGrid server/s:

1. If **SG Server** Status is **On**, assign the device. It should be functional now.
2. If the **SG Server** Status is **N/A**, unassign it and press Refresh.
3. If **SG Server** appears as **Not Compatible**, press **Update**. Once the firmware update is complete, the server will automatically restart and the **Server Status** will be **On**. Next, assign **SG Server** to **1**. If a second redundant server is in use, repeat the same update process, and upon completion assign the redundant server to **2**.

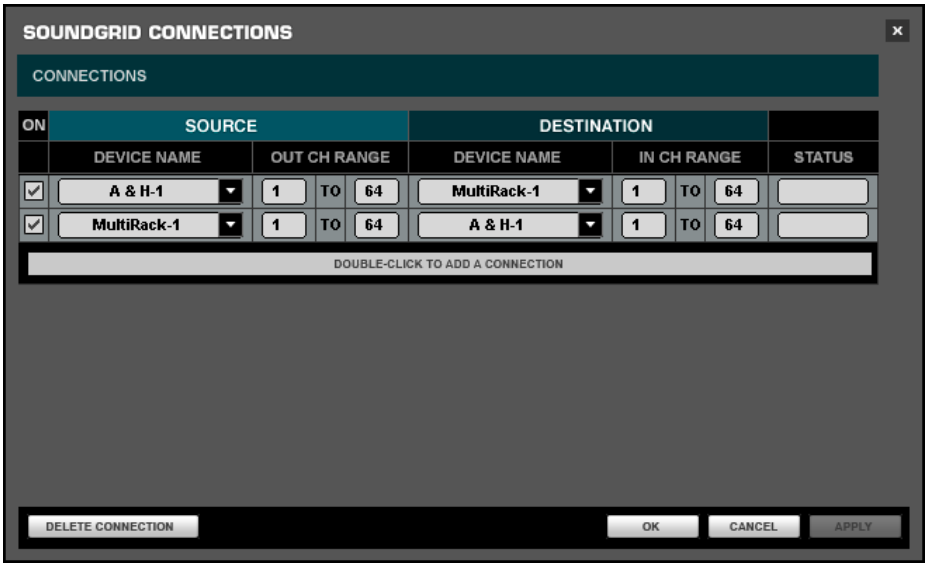
If the SoundGrid server has disappeared from the list, this may be for the following reasons:

- Server is OFF.
- Ethernet cable is disconnected from server or switch.
- Ethernet cable is disconnected from host or switch. (Hint: in this case the I/O status will appear as **N/A**.)
- Ethernet cable is defective.
- Network switch is turned off.
- Network switch is not compatible (switch does not have 1GB connection): please refer to Appendix B: SoundGrid-Compatible Switches.
- Ethernet cable is not compatible (not Cat 5e or Cat 6).
- Ethernet cables are too long: please refer to Appendix C: Ethernet Cables for SoundGrid Systems.

If the SoundGrid server changes status from On to N/A upon assignment, this means that Internet Protocol Version 6 (iPv6) is not checked in the computer's Ethernet Card Preferences. Please refer to Appendix D: Internet Protocol Version 6 (TCP/IPv6).

SoundGrid Connections

Go to Audio > SoundGrid Connections.



1. Make sure that the following connections are set up properly:
    a. Source **A&H-1 (1-64)** to Destination **MultiRack (1-64)**.
    b. Source **MultiRack (1-64)** to Destination **A&H-1 (1-64)**.

2. Turn individual connections ON.

5. How Do I Know Which Version Is Installed?

Which version of MultiRack SoundGrid is installed is noted in the loading screen when you launch the MultiRack SoundGrid application. There are two other ways to determine which version is installed:

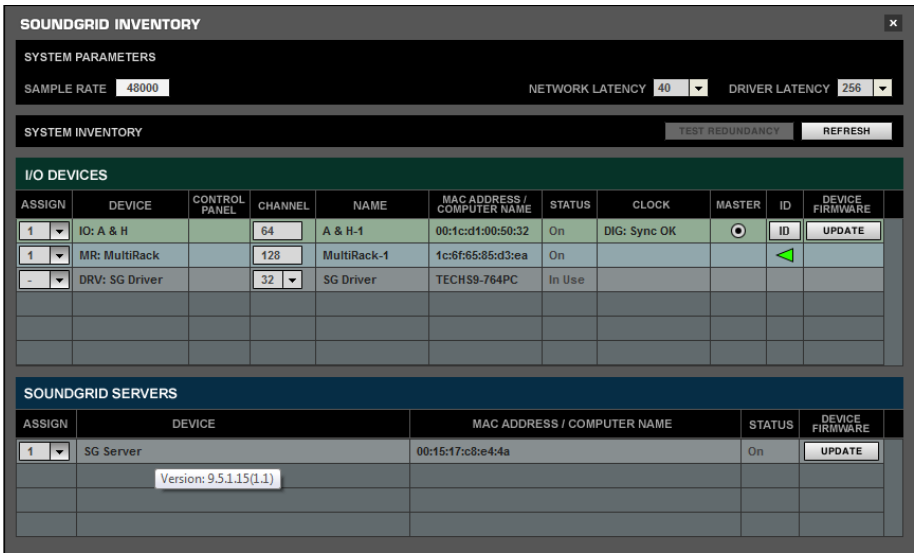
1. Go to the **About** window in the MultiRack SoundGrid application.
   - Windows: Go to Help > About
   - Mac: Go to MultiRack SoundGrid > About

2. Check the properties of the MultiRack SoundGrid application:
   - Windows : Navigate to C:\Program Files(x86)\Waves\ MultiRack folder, right click on the file named MultiRack SoundGrid, select “Properties,” and check the General tab.
   - Mac: Go to Applications > Waves > MultiRack, right-click on the file named MultiRack SoundGrid, and select “Get Info.”

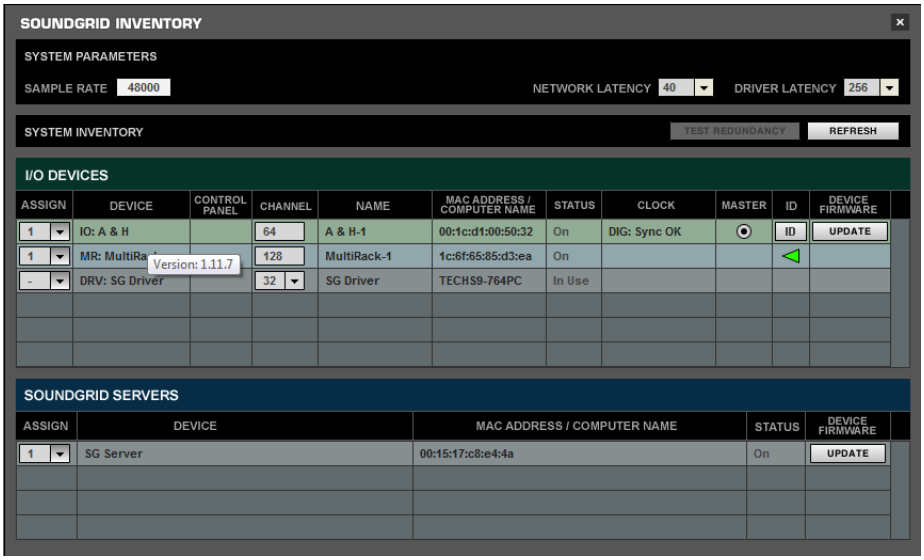
Only the latest installer for each major version is available on our website. To make sure you have the latest version installed on your machine, check at http://www.waves.com/downloads/multirack under the installer’s contents and compare versions.

The images below illustrate how hovering the mouse over a component in the Inventory window displays the current firmware version installed. (It is not possible to see this information if your firmware is listed as incompatible.)

1. Hovering mouse over **SoundGrid Servers** to view firmware version:



2. Hovering mouse over **IO: A&H** to view firmware version:



6. What Is Installed?

After you run both the MultiRack application and the plugin installers, files will automatically be placed in their designated locations as listed below. Do not move files manually.

- Mac
    - Applications > Waves > SoundGrid
    - Applications > Waves > MultiRack
    - Applications > Waves > Plug-Ins V9
    - Applications > Waves > Waveshells
    - Macintosh HD > Users > Your User > Library > Caches
    - Macintosh HD > Users > Your User > Library > Preferences
    - Macintosh HD > Library > Application Support > Waves > SoundGrid Firmware
    - Macintosh HD > Library > Application Support > Waves > SoundGrid IO Modules
- PC
    - C:\Program Files(x86)\Waves\SoundGrid
    - C:\Program Files(x86)\Waves\MultiRack
    - C:\Program Files(x86)\Waves\SoundGrid Firmware
    - C:\ProgramData\Waves Audio\SoundGrid IO Modules
    - C:\Program Files(x86)\Waves\Plug-Ins V9
    - C:\Program Files(x86)\Waves\Waveshells
    - C:\Users\Current User\AppData\Roaming\Waves Audio – Caches & Preferences folders.

Caches

When you load MultiRack SoundGrid for the first time, the application scans the system and creates cache files for the plugins. Cache files are created only when MultiRack SoundGrid is loading and licenses are being recognized. Since the files are created “on the fly,” loading time is longer when MultiRack SoundGrid loads and recognizes new licenses for the first time.

All installed plugins will appear in the plugin list regardless of the licenses recognized by the system. There is a difference between loading and instantiating a plugin. When trying to “instantiate” an unlicensed plugin within a session, the system will issue an authorization prompt. This may happen, for instance, when you add a plugin to a rack or open a session.

7. Physical Connection

The basic connections are illustrated in the image below:

Switch

A 1GB switch is required due to the amount of information flowing between the I/O and the servers. Insufficient link speed of various components will result in missing or N/A listings within the Inventory window. You can determine the link speed by looking at the indicators on the switch itself. There are indications on the Ethernet ports as well.

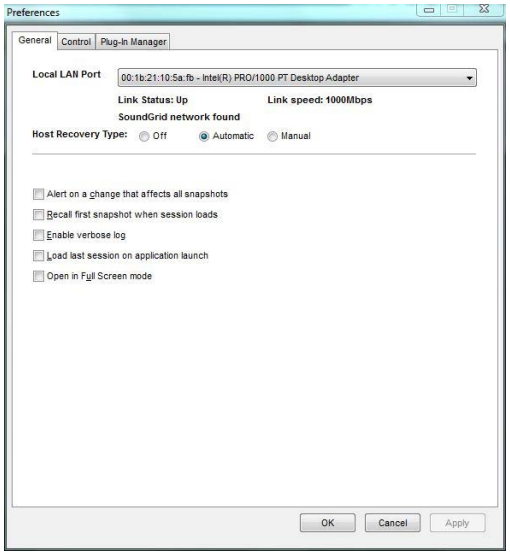
Switch	Led State per Port	Activity
ProSafe 8-Port Gigabit Ethernet Switch GS108v3	Left LED – 100 Mbps link Right LED – 10 Mbps link Both LEDs – 1000 Mbps link	Blinking
HP 1410-16G (J9560A) 16-Port Rack Mountable Switch	Link/Act – 10 or 100 Mbps Speed ON – 1000 Mbps	Blinking

Preferences Window

The Preferences window includes three tabs:

1. **General (Local LAN Port):** Lists all available network adapters. Choose the network adapter that is connected to the SoundGrid network. Network adapters are displayed by MAC

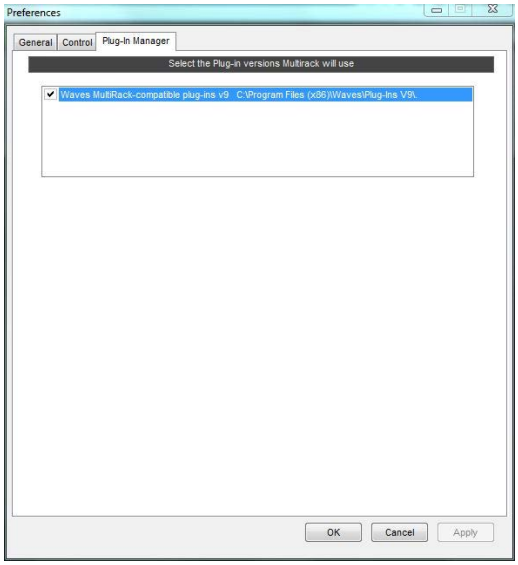
address and port name. When you select the proper port and all components are connected and recognized, the message "**SoundGrid Network Found**" will be displayed.



2. **Control:** MIDI Control the MultiRack SoundGrid via your iLive surface.

3. **Plug-in Manager:**

Please note: MultiRack V9.7 supports V9 plugins only.



Rescan Present Licenses

When you prepare a session and are routing without licenses, the plugin does not process audio, but you can still assign inserts and FX and load the plugin.

To enable a disabled plugin:

- Connect your USB flash drive (V9).
- Go to the **Edit** menu and click on “Rescan Present Licenses.” All disabled plugins will be enabled.
- You can re-enable plugins individually by right-clicking on any disabled plugin and choosing the **Enable** option from the menu.

Inventory Window

The Inventory window lists all of the SoundGrid components on your network and lets you select, assign, and update the devices you are using. The “Device” column lists all available components: I/O card, MultiRack (the processing device) and SG Servers (MultiRack’s processing engine).

Please remember: A device is not usable until it is assigned. Devices may be listed in the inventory window even if they are not connected or recognized. (Previously connected and assigned information is saved to a preference file).

It is important to pay attention to the “Status” column. There are four possible modes:

1. On: Connected and available to be assigned.

2. In Use: A different MultiRack SoundGrid or driver is connected to the same network and is controlling this device. The current instance of MultiRack SoundGrid will not be able to use this particular device.

3. N/A: The device was originally assigned but is currently disconnected or unrecognized.

4. Incompatible: The I/O or server firmware version does not match the version of MRSG installed. In such a case, click the “Update” button on the same device line.

Sample Rate: This field displays the sample rate. MultiRack SoundGrid is slaved to the console's sample rate at all times, and this field cannot be edited. Sample rate information is derived through the M-Waves I/O. If the I/O is faulty, disconnected, unrecognized, or unassigned, the Sample Rate field will display N/A.

Network Latency: The network latency value (40, 56, 80 or 96) sets the buffering delay used by the processing SoundGrid server. For correct latency setting per server, see the list of Waves-qualified servers in Appendix A: Servers.

Plugins can introduce or add latency to the overall system latency. A plugin latency chart can be viewed in Appendix E: Compatible Plugins & Latency Chart.

8. FAQs

Installation

Q: How do I know if I have the latest version of Waves on my system?
A: Refer to "How Do I Know Which Version Is Installed?"

Q: How do I update only MultiRack SoundGrid on my system?
A: Visit the www.waves.com download page for MultiRack. A separate MultiRack SoundGrid installer is available.

Q: A new plugin has been released and I have updated my license. How do I install only this new plugin on my MultiRack SoundGrid?
A: Visit the www.waves.com download page for MultiRack. A separate V9 plugin installer is available.

Usage

Q: How do I rename racks?
A: It is possible to rename racks by clicking on Untitled next to the Rack On button and rename it.

Q: What do I need to do when a **"Please select Waves Public API (WPAPI) Folder"** message window appears?
A: If the file doesn't exist, or if you've selected the wrong folder, MultiRack will load without racks. You need to make sure that the right folder has been selected. Navigate to **PC:** C /Program File (x86)/ Common Files /WPAPI, **Mac:** HD /Library/Audio/Plugins/WPAPI and look for a file named Waveshell WPAPI, then click the "Select" button. If the problem is still not resolved, you will need to reinstall all MultiRack SoundGrid-compatible plugins.

Q: What do I need to do when a **"Please select Waves V9 Plug-in folder"** message window appears?

A: Navigate to the **Waves > Plug-ins V9** folder and press “Select.” If your selection is not accepted, you will need to reinstall all MultiRack SoundGrid-compatible plugins.

Q: What should my Network Latency be set to?

A: Network Latency refers to the processing latency. In general, lower settings will reduce the latency. However, keep in mind that lower latency settings will result in higher CPU loads. Please see the correct settings below:

Minimum Network Latency Settings

	48 kHz
Extreme Server	40 samples
Server One	40 samples
Impact Server	56 samples
Compact Server	96 samples

Technical Note: *In the Inventory window, the Network Latency range is 40 / 56 / 80 / 96 at a 48-kHz sampling rate.***.**

Q: What should I do if I hear clicks and pops or audio drop-outs?

A: Check the Network Latency and try to increase the parameters.

- Check the Transport reading: the highest functional value is 95%.
- Check the Processing Server via the System Monitor window: CPU Load Peak and CPU Load AVR (Average). High values may result in audio drop-outs.

Licenses

Q: Why are plugins listed for which I don't have a license?

A: All MRSG-compatible plugins are present by default when installing Waves.

Q: How do I remove unlicensed plugins from the Insert list?

A: Please consult the console owner before taking any of the actions below:

1. Go to the **Plug-ins V9** folder.
3. Mac: Applications > Waves > Plug-Ins V9
4. PC: C:\Program Files(x86)\Waves\Plug-Ins V9
2. In this location, create an **Unused Plugins** folder.
3. Move the unlicensed plugin files to the **Unused Plugins** folder.

Do not delete DLA, IDR, MultiRack, WavesLib or MultiRackLib (if listed).

Q: What should I do if I get an authorization prompt stating that I don't have a license to use a certain plugin?

A: First, log into your Waves online account to view which licenses and version you own. Launch the Waves Licenses Center and make sure the licenses appear on a connected device.

Q: What should I do if the USB flash drive holding my V9 licenses is damaged or lost?

A: Open the Waves License Center on a computer connected to the internet and use the "Recover Licenses" option to re-activate your license to a new device.

Q: Some of my plugins are grayed out when I load a session.

A: Right-click on the plugin and select "Enable Plugin."

9. Appendices

Appendix A: Servers

Waves SoundGrid Extreme Server

System Description	RAM	Motherboard	LAN Card
Waves SoundGrid Extreme Server	8 GB	ASUS Rampage IV Gene	OnBoard Intel

The benchmarks below are for general reference, illustrating how many racks and plugins can be run on this particular server. The following plugins were used for these tests: C4 Multiband Compressor, SSL E-Channel, IR-Live, and L3 Multimaximizer. Each rack was fully loaded with a specific plugin until maximum load was reached. M-Waves cards were used as audio interfaces in these tests.

Server Benchmarks	Test 1
Sample rate	48 kHz
Latency (roundtrip total)	40* samples / 0.83 ms
SSL Channel Stereo	512 instances
IR-Live	30 instances
L3 Multimaximizer	158 instances
C4 Mono	512 instances

Minimum Network Latency Settings

48 kHz
40 samples

Waves SoundGrid Server One

System Description	RAM	Motherboard	LAN Card
Waves SoundGrid Server One	4 GB	Gigabyte GA-H81N	AddOn

The benchmarks below are for general reference, illustrating how many racks and plugins can be run on this particular server. The following plugins were used for these tests: C4 Multiband Compressor, SSL E-Channel, H-Delay, and TrueVerb. Each rack was fully loaded with a specific plugin until maximum load was reached. M-Waves cards were used as audio interfaces in these tests.

Server Benchmarks	Test 1
Sample rate	48 kHz
Latency (roundtrip total)	40* samples / 0.83 ms
SSL Channel Mono	256 instances
H-Delay Mono	244 instances
TrueVerb Mono	160 instances
C4 Mono	256 instances

Minimum Network Latency Settings

48 kHz
40 samples

Waves SoundGrid Impact Server

System Description	RAM	Motherboard	LAN Card
Waves SoundGrid Impact Server	2GB	Gigabyte GA-H81N	Realtek RTL8111E

The benchmarks below are for general reference, illustrating how many racks and plugins can be run on this particular server. The following plugins were used for these tests: C4 Multiband Compressor, SSL E-Channel, H-Delay, and TrueVerb. Each rack was fully loaded with a specific plugin until maximum load was reached. M-Waves cards were used as audio interfaces in these tests.

Server Benchmarks	Test 1
Sample rate	48 kHz
Latency (roundtrip total)	56* samples / 1.2 ms
SSL Channel Mono	321 instances
C6 Mono	72 instances
H-Delay Mono	256 instances
TrueVerb Mono	96 instances
C4 Mono	232 instances

Minimum Network Latency Settings

48 kHz
56 samples

Waves SoundGrid Compact Server

System Description	RAM	Motherboard	LAN Card
Waves SoundGrid Compact Server	1GB	Intel® Desktop Board D525MW	Realtek 8111E Gigabit

The benchmarks below are for general reference, illustrating how many plugin racks and plugins can be run on this particular server. The following plugins were used for these tests: C4 Multiband Compressor, SSL E-Channel, H-Delay, and TrueVerb. Each rack was fully loaded with a specific plugin until maximum load was reached. M-Waves cards were used as audio interfaces in these tests.

Server Benchmarks	Test 1
Sample rate	48 kHz
Latency (roundtrip total)	96* samples / 2ms
SSL Channel Mono	48 instances
H-Delay Mono	28 instances
TrueVerb Mono	16 instances
C4 Mono	36 instances

Minimum Network Latency Settings

48 kHz
96 samples

Appendix B: SoundGrid-Compatible Switches

Since Waves SoundGrid is an Ethernet-based protocol, it requires a network switch to connect all its components. For proper functioning, you will need to use a gigabit switch that supports jumbo frames.

The following switches have been tested and certified for use with SoundGrid systems:

- Prosafe Gs108v3 8-port gigabit switch
- HP 1410-16G s (J9560A) 16-port rack-mountable switch

Switch	Led State Per Port	Activity
ProSafe 8-Port Gigabit Ethernet Switch GS108v3	Left LED – 100 Mbps link Right LED – 10 Mbps link Both LEDs – 1000 Mbps link	Blinking
HP 1410-16G (J9560A) 16-Port Rack Mountable Switch	Link/Act – 10 or 100 Mbps Speed ON – 1000 Mbps	Blinking

Appendix C: Ethernet Cables for SoundGrid Systems

Consult this section to learn which cables and cable lengths can be used to connect the following components of a SoundGrid system:

- **I/Os:**
  - Waves I/O card for DiGiCo
  - WSG-Y16 card for Yamaha
  - M-Waves card for Allen & Heath (features an integrated 3-port switch)
  - DiGiGrid MGB (coaxial) or MGO (optical) MADI interfaces
- **SoundGrid Servers (SGS):** http://www.waves.com/live-sound/soundgrid-servers.
- **Switches:** Use only compatible switches. For a list of compatible switches, see http://www.waves.com/live-sound/soundgrid-switches.

Cat 6 STP (Shielded Twisted Pair)

Node	Length	Remarks
I/O to switch	Up to 70 m	
SGS to switch	Up to 10 m	
MultiRack SG / SG driver to switch	Up to 70 m	With a 1000-Mbps NIC
	Up to 20 m	With a 100-Mbps NIC

Cat 5e STP (Shielded Twisted Pair)

Node	Length	Remarks
I/O to switch	Up to 10 m	
SGS to switch	Up to 5 m	
MultiRack SG / SG driver to switch	Up to 20 m	

CAT5 cables are not supported.

A Note on Using Joints (Cable Extenders)

Joints or cable extenders should be used with care, as some models do not have electrically connected shielding, and using these might cause problems in areas with interference.

Total cable length, including the joint, may not exceed the above maximal cable length per node.

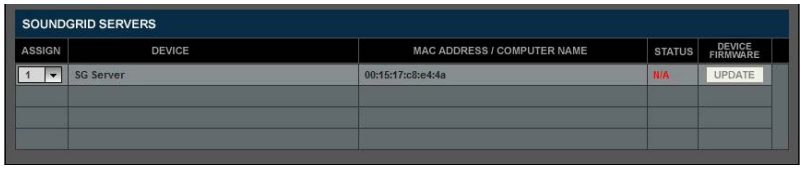
Note: We have tested the above cables with only one joint per line. More joints can possibly be used, but this scenario has not been tested.

Appendix D: Internet Protocol Version 6 (TCP/IPv6)

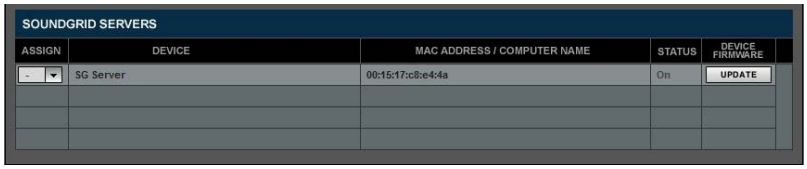
Internet Protocol Version 6 is the latest Internet protocol that needs to be turned on for the SoundGrid server to work.

IPv6-related issues may occur under two circumstances:

1. SoundGrid server is assigned and status is N/A:



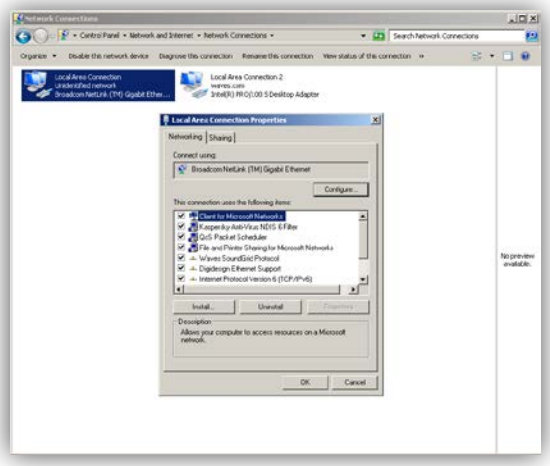
2. SoundGrid server is not assigned and status is ON:



To resolve these issues, follow the instructions below:

Windows:

1. Go to the **Control Panel > Network Connections** window.
2. Right-click on the network adapter connected to your SoundGrid network, then click on **Properties**.
3. Under **Networking Tab**, check the **Internet Protocol Version 6 (TCP/IPv6)** line.

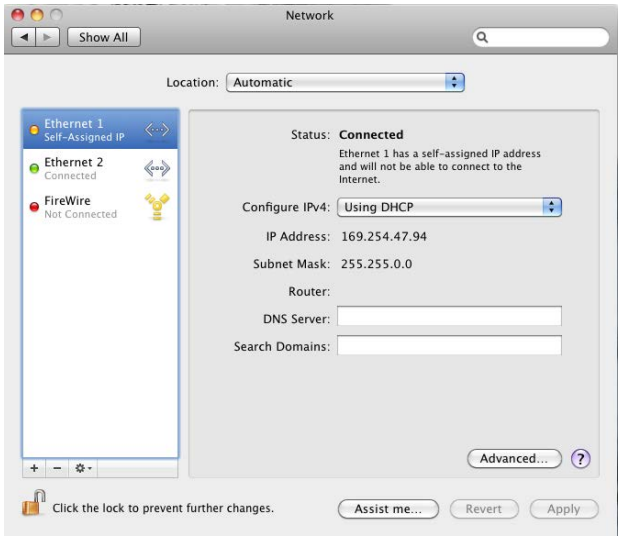


Mac:

Note: The instructions below refer to OSX 10.6.8 (Snow Leopard) or lower. In higher OSX versions, **IPv6** is automatically on.

- Go to System Preferences > Network.

1. Choose the network adapter you are using for your SoundGrid network, and click on **Advanced**.



2. Open the **Configure IPv6** dropdown menu, and change the setting to **Automatically**.

Appendix E: Compatible Plugins & Latency Chart

Certain Waves plugins need to buffer the audio in order to process, resulting in what is known as latency.

The table below indicates how much latency (in samples) is produced by each Waves plugin.

Plugin	44.1/48 kHz	88.2/96 kHz
Aphex Vintage Aural Exciter	0	0
API 550A	0	0
API 550B	0	0
API 560	65	65
API 2500	0	0
AudioTrack	0	0
Bass Rider	48 kHz: 2016	96 kHz: 4032
Bass Rider Live	48 kHz: 240	96 kHz: 480
C1 Compressor	0	0
C1 Gate	0	0
C1 Comp-Gate	340	96 kHz: 720
C1 Comp-SC	340	96 kHz: 720
C4 Multiband	64	128
C6 Multiband	64	128
Center	48 kHz: 48	96 kHz: 96
CLA Bass	44.1 kHz: 133 48 kHz: 134	267
CLA Drums	65	129
CLA Effects	44.1 kHz: 68 48 kHz: 69	138
CLA Guitars	44.1 kHz: 100 48 kHz: 106	88.2 kHz: 208 96 kHz: 211
CLA Unplugged	128	256
CLA Vocals	193	385
CLA-2A	0	0
CLA-3A	0	0

CLA-76 Blacky & Bluey	0	0
DeEsser	0	0
Doppler	0	N/A
Doubler	0	0
Dugan Automixer	0	0
Eddie Kramer Bass Channel	44.1 kHz: 493 48 kHz: 500	88.2 kHz: 602 96 kHz: 618
Eddie Kramer Drum Channel	44.1 kHz: 410 48 kHz: 417	88.2 kHz: 562 96 kHz: 578
Eddie Kramer Effects Channel	0	0
Eddie Kramer Guitar Channel	64	128
Eddie Kramer Vocal Channel	149	170
Enigma	0	0
GEQ Graphic Equalizer	3	3
GTR3 Amps	48 kHz: 40	96 kHz: 81
GTR3 Stomps	0	0
H-Comp	64	128
H-Delay	0	0
H-EQ	65	0
InPhase & InPhase LT	48 kHz: 960	96 kHz: 1920
InPhase & InPhase LT Live	0	0
IR-Live Convolution Reverb	0	0
J37 Tape	101	33
JJP Bass	44.1 kHz: 409 48 kHz: 417	88.2 kHz: 561 96 kHz: 577
JJP Cymbals & Percussions	44.1 kHz: 557 48 kHz: 565	88.2 kHz: 730 96 kHz: 746
JJP Drums	44.1 kHz: 622 48 kHz: 630	88.2 kHz: 859 96 kHz: 875
JJP Guitars	44.1 kHz: 622 48 kHz: 630	88.2 kHz: 859 96 kHz: 875
JJP Strings & Keys	532	88.2 kHz: 1046 96 kHz: 1104
JJP Vocals	44.1 kHz: 473 48 kHz: 481	88.2 kHz: 689 96 kHz: 705
JJP PuigChild 660 & 670	0	0
JJP PuigTec MEQ5	149	170
JJP PuigTec EQP1A	149	170

Kramer HLS Channel	161	161
Kramer Master Tape	48 kHz: 64	96 kHz: 128
Kramer PIE Compressor	0	0
L1 Ultramaximizer	64	128
L2 Ultramaximizer	64	128
L3 Multimaximizer	48 kHz: 3840	96 kHz: 7680
L3 Ultramaximizer	48 kHz: 3840	96 kHz: 7680
L3-LL Multimaximizer	64	128
L3-LL Ultramaximizer	64	128
Linear Phase Equalizer Broadband	2679	5360
Linear Phase Equalizer Lowband	2047	4095
Linear Phase Multiband	48 kHz: 3840	96 kHz: 7680
LoAir	0	0
Maserati ACG	64	128
Maserati B72	68	132
Maserati DRM	1	1
Maserati GRP	44.1 kHz: 621 48 kHz: 629	88.2 kHz: 858 96 kHz: 874
Maserati GTi	197	389
Maserati HMX	1	1
Maserati VX1	44.1 kHz: 408 48 kHz: 415	88.2 kHz: 560 96 kHz: 576
MaxxBass	0	0
MaxxVolume	64	128
MetaFlanger	0	0
MondoMod	0	0
MV2	64	128
NLS	4	4
NS1	0	0
OneKnob Brighter	0	0
OneKnob Driver	48 kHz: 5	10
OneKnob Filter	0	0

OneKnob Louder	64	128
OneKnob Phatter	0	0
OneKnob Pressure	0	0
OneKnob Wetter	0	0
PAZ Analyzer	0	0
PS22 Split / X-Split	4	4
PS22 Spread	2	2
Q10	0	0
REDD.17	0	0
REDD.37-51	65	0
Renaissance Axx	64	128
Renaissance Bass	0	0
Renaissance Channel	65	129
Renaissance Compressor	64	128
Renaissance DeEsser	64	128
Renaissance Equalizer	0	0
Renaissance Reverb	0	0
Renaissance Vox	64	128
RS56 Passive EQ	65	0
S1 Stereo Imager	0	0
Scheps 73	65	0
SoundShifter	6946	13,858
SSL E-Channel SSL G-Channel	1	1
SSL G-Equalizer	0	0
SSL G-Master Buss Compressor	0	0
SuperTap	0	0
The King's Microphones	48 kHz: 352	96 kHz: 448
TransX Multi	64	128
TransX Wide	64	128
TrueVerb	0	0

V-Comp	0	0
V-EQ3 / V-EQ4	0	0
Vocal Rider	0	0
WNS Waves Noise Suppressor	0	0
WLM Loudness Meter	0	0
W43 Noise Reduction	0	0

10. Contact Waves Tech Support

Email Tech Support

Phone: 1-865-909-9200, ext. 1

Fax: 1-901-328-6358

Monday–Thursday: 4:00 am–Midnight (EST)
Friday: 9:00 am–Midnight (EST)
Saturday–Sunday: 11:00 am–6:00 pm (EST)

Saturday: Urgent live sound requests only, also via VIP line +1-865-909-9277

Waves Tech Support is reserved for customers whose products are currently covered by the Waves Update Plan.