

Waves

MultiRack SoundGrid V9.7

For DiGiCo

Troubleshooting Guide



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1. Introduction

The objective of this document is to assist you with troubleshooting Waves MultiRack SoundGrid V9.7 for DiGiCo systems. 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.

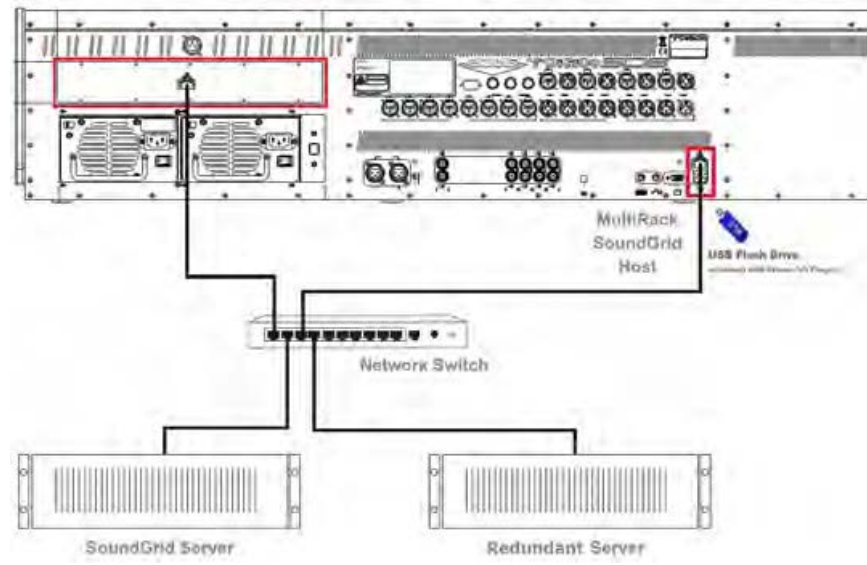
This guide is divided into five sections:

1. Illustration of a functioning SG System
2. Guide to resolve a non-functioning SG System
3. General information about the SG System components
4. Frequently asked questions
5. Appendix



2. Components Required for Establishing a MultiRack SoundGrid System

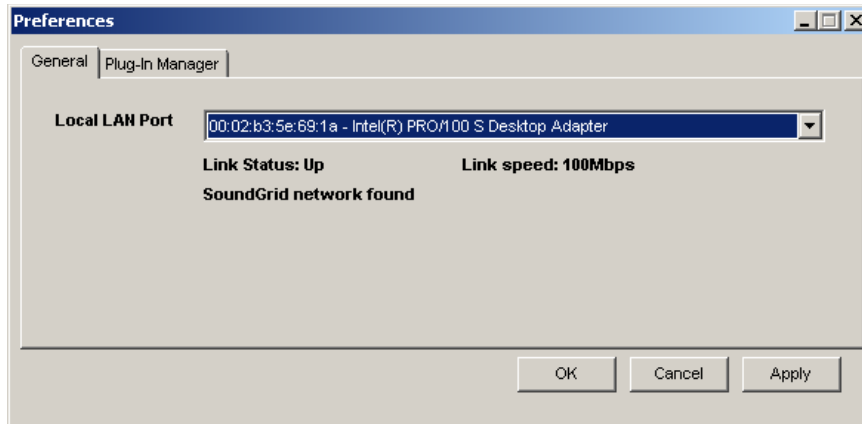
1. **Waves I/O card:** Pre-installed in the console.
2. **Waves qualified SoundGrid Server:** A multi-core PC used for real-time audio processing. [See a list of Waves-qualified Servers in Appendix A – Servers.](#)
3. **Network switch:** [See a list of Waves-qualified switches in Appendix C - SoundGrid Compatible Switches.](#)
4. **Ethernet Cables:** Standard CAT5e or CAT6 Ethernet cables. [See a list of supported length per cable type and application in Appendix D - Ethernet Cables for SoundGrid Systems.](#)
5. **USB Flash Drive/iLok with activated licenses for Waves SoundGrid compatible plugins.**



3. Proper System Configuration

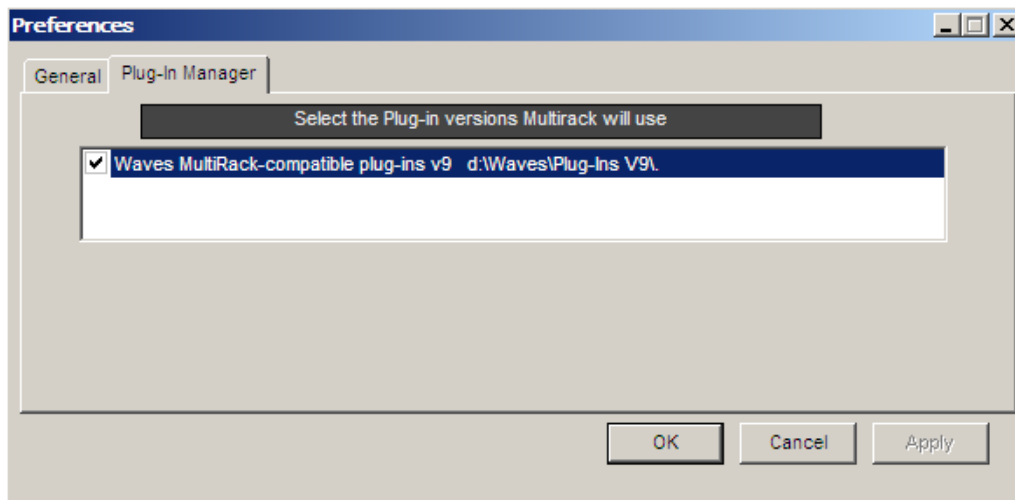
This section displays the basic Windows and Settings of an operational Waves MultiRack SoundGrid System. Establish a proper system configuration by following the “Setup Instructions” below, which are also available online on our Download Page:

1. Launch the SD Software.
2. Select the “Waves” Tab.
3. Go to Window → Preferences.
4. General Tab Settings:
Link Status = Up
Link Speed = 100 Mbps
SoundGrid Network Found



5. Plug-in Manager Tab Settings:

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



6. Go to Window → SoundGrid Inventory

7. SoundGrid Inventory Settings:

Sample Rate: Matches the state of the console.

Network and Driver Latency: Correct settings depend on the Server in use.

I/O: DiGiCo I/O is assigned and Status is On. (Only SD7 consoles can apply 64 channels.)

MR: MultiRack is assigned and Status is On.

SG Server/s: Assigned and Status is On.

SOUNDGRID INVENTORY x

SYSTEM PARAMETERS

SAMPLE RATE NETWORK LATENCY DRIVER LATENCY

SYSTEM INVENTORY TEST REDUNDANCY REFRESH

I/O DEVICES

ASSIGN	DEVICE	CONTROL PANEL	CHANNEL	NAME	MAC ADDRESS / COMPUTER NAME	STATUS	CLOCK	MASTER	ID	DEVICE FIRMWARE
<input type="text" value="1"/>	IO: Digico IO		<input type="text" value="32"/>	Digico IO -1	00:1c:d1:00:2a:cd	On	DIG: Sync OK	<input checked="" type="radio"/>	<input type="text" value="ID"/>	<input type="text" value="UPDATE"/>
<input type="text" value="1"/>	MR: MultiRack		<input type="text" value="128"/>	MultiRack-1	00:e0:4b:22:13:cf	On		<input type="radio"/>	<input type="text" value="▶"/>	

SOUNDGRID SERVERS

ASSIGN	DEVICE	MAC ADDRESS / COMPUTER NAME	STATUS	DEVICE FIRMWARE
<input type="text" value="1"/>	SG Server	00:15:17:c8:da:9e	On	<input type="text" value="UPDATE"/>

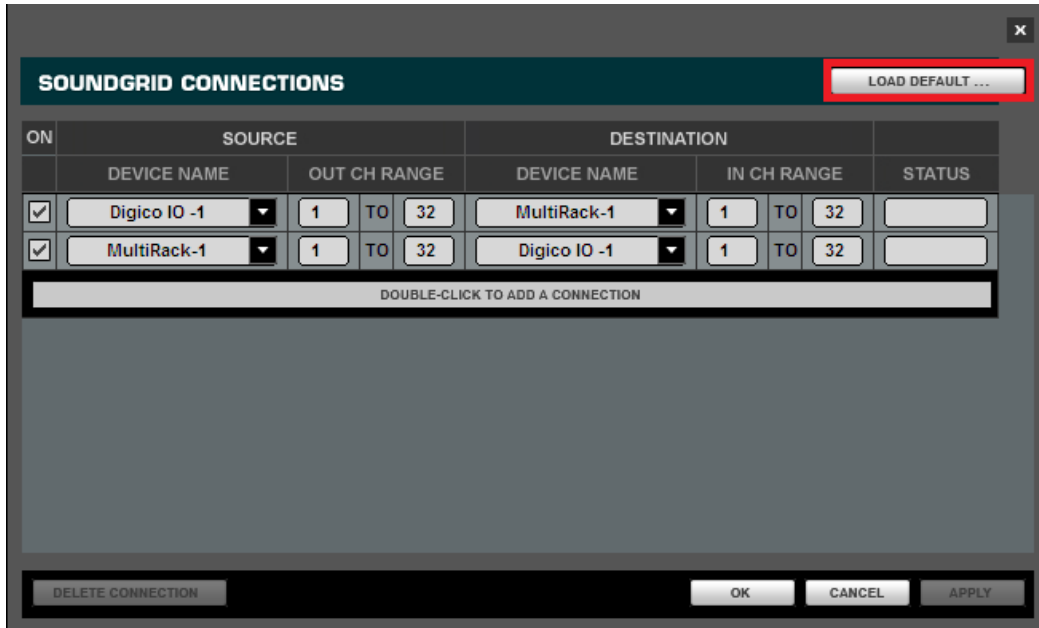
Minimum Network Latency Settings

	48 kHz	96 kHz
Extreme Server	40 Samples	80 Samples
Server One	40 Samples	80 Samples
Impact Server	56 Samples	112 Samples

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



8. Go to Window → SoundGrid Connections.
9. SoundGrid Connections Settings:
 DiGiCo I/O connection to MutliRack is checked.
 MutliRack connection to DiGiCo I/O is checked.
 In/Out CH Range is 1-32 (Only SD7 consoles can apply 64 Channels).

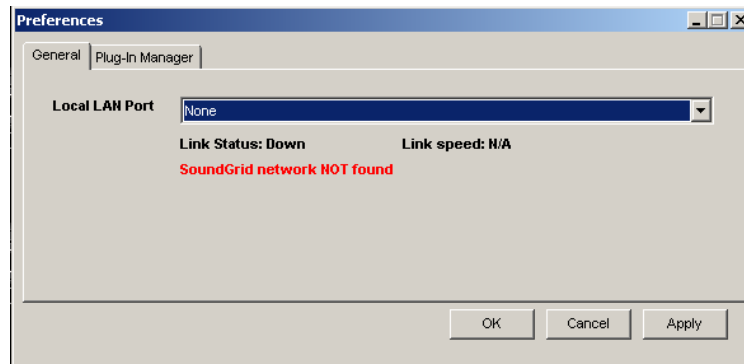


4. Troubleshooting

If an **ERR** appears in the MultiRack SoundGrid status window while the MRSG is loaded, follow these steps to inspect all settings and the system components:

SoundGrid Preferences

- 1) Click on the Waves Tab.
- 2) Go to Window → Preferences.



- 3) 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 your console's Ethernet card.
- 4) If you see the **SoundGrid network NOT found** message, and **Local LAN Port** is already set to your console's Ethernet card, check the following:
 - a) If Link Status is **UP**, and Link Speed is **100Mbps**, it means that the I/O and SoundGrid Server are disconnected.
 - b) If Link Status is **DOWN**, and Link Speed is **N/A**, it might be for one of the following reasons:
 - The Switch is turned off or not compatible - [Please refer to Appendix C - SoundGrid Compatible Switches](#).
 - The Ethernet cable is disconnected or defective on the Console (host) computer.
 - Some of all cables are possibly too long or not compatible – [Please refer to Appendix D - 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 Window → SoundGrid Inventory.

1. Sample Rate:

If the Sample Rate Appears as N/A, it might be for the following reasons:

- DiGiCo I/O is not assigned.
- If DiGiCo I/O is assigned and On, the Internal Data Cable connecting DiGiCo I/O to the console might be unplugged or defective. Another option is that the DiGiCo I/O itself is defective. To resolve the problem please contact DiGiCo.

2. DiGiCo:

- a) If the **DiGiCo I/O** Status is **On**, assign the Device. It should be functional now.
- b) If the **DiGiCo I/O** Status is **NOT On**, un-assign the DiGiCo I/O and **click refresh**.
- c) If the **DiGiCo I/O** appears as **“Not Compatible”**, then click **“Update”**

Once the Firmware update has completed, you will be prompted to turn the Console off.

If the update fails and an error message **"Could not find the appropriate Firmware Updater file"** appears, it means that the I/O Firmware version is old, and you need to download the Firmware Updater Tool.



Instructions for downloading the Firmware Updater Tool:

1. Go to the [Waves For DiGiCo downloads page](#) -> Version 8 tab.
 2. Download the **Firmware Updater Tools required for V1-to-V2.5 Upgrade**. Choose between SD7 and all other models.
 3. Copy this file to your SD console via a USB Flash Drive. **Technical Note:** No need to disable the ReadyOn for this process.
 4. Run ***DiGiCo-firmware-updater-for-sdx-type.zip*** file on your console and follow the instructions.
 5. If this is an SD7 console, repeat the process for the second Engine.
- d) If the DiGiCo I/O has disappeared from the list, it might be for one of the following reasons:
- Ethernet cable is disconnected from I/O or Switch.
 - Ethernet cable is disconnected from Host or Switch.
 - Defective Ethernet Cable.
 - Network Switch is turned off.
 - Network Switch is not compatible (Switch doesn't have 1GB connection).
[Please refer to Appendix C - SoundGrid Compatible Switches.](#)
 - Not a CAT5E or CAT6 cable.
 - Ethernet cables are too long – [Plases refer to Appendix D - Ethernet Cables for SoundGrid Systems.](#)
 - DiGiCo I/O Internal data cable or power supply cable are disconnected or defective:
 - i. If the Network activity led light is ON on your SoundGrid switch port but OFF on the I/O, the problem is in the data cable. To resolve this issue please contact DiGiCo for further instructions.
 - ii. If the Network activity led light is OFF on both the SoundGrid switch port and the I/O, the problem is with the power supply cable. To resolve this problem please contact DiGiCo for further instructions.
 - Defective DiGiCo I/O. To resolve this issue please contact DiGiCo for further instructions.



SoundGrid Servers

Once you have confirmed that the I/O is functioning properly and is not the cause of the problem, check the SG Server/s:

- a) If SG Server Status is On, assign the Device, it should be functional now.
- b) If the SG Server Status is N/A, un-assign it and press refresh.
- c) If SG Server appears as “Not Compatible”, press “Update”.

Once the Firmware update has completed, 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.

- d) If the SG Server has disappeared from the list, it might 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).
 - Defective Ethernet Cable.
 - Network Switch is turned off.
 - Network Switch is not compatible (Switch doesn't have 1GB connection).
[Please refer to Appendix C - SoundGrid Compatible Switches.](#)
 - Ethernet cable is not compatible - Not a CAT5E or CAT6 cable.
 - Ethernet cables are too long – [Please refer to Appendix D - Ethernet Cables for SoundGrid Systems.](#)

We suggest to manually re-flash the SoundGrid Server using a USB Flash Drive only if all possibilities above have been exhausted. [Please refer to Appendix B – How to Re-Flash SG Server Manually.](#)

Once the SoundGrid Inventory window is set up properly, the only thing left to inspect is the SoundGrid connections window.



SoundGrid Connections

1. Go to Window → SoundGrid Connections.



2. Make sure that the following connections are set up properly:
 - a. Source - DiGiCo I/O - to Destination – MultiRack.
 - b. Source - MultiRack - to Destination - DiGiCo I/O.

The channel range 32 Mono/Stereo MultiRacks for all SD console models.

3. Turn Individual Connections On.

You can create connections manually or use the “Load Default” button. Remember to turn individual connections ON.

5. General Information - How Do I Know Which Version Is Installed?

The version of the MultiRackSoundGrid will appear in the “Load Screen” when launching the SD software. There are two other ways for determining which version is installed on the DiGiCo console:

1. Click the “Advanced” tab and select “About MultiRack” and its window will appear



2. Exit to Windows, navigate to D:\SDx folder and right click on the file named MultirackACGI, Next, select “Properties” and check the Version Tab.

Only the latest installer for each major version is available on our website. To determine which installer was used on a current system, you can access the Windows Control Panel, click on Add or Remove Programs and compare your version with the installer version on our download page.

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:

The screenshot shows the 'SOUNDGRID INVENTORY' window. The 'SYSTEM PARAMETERS' section includes 'SAMPLE RATE' (96000), 'NETWORK LATENCY' (80), and 'DRIVER LATENCY' (256). The 'SYSTEM INVENTORY' section has 'TEST REDUNDANCY' and 'REFRESH' buttons. The 'I/O AND PROCESSING DEVICES' table lists two devices: 'IO: Digico IO' and 'MR: MultiRack'. The 'SOUNDGRID SERVERS' table lists two 'SG Server' entries. A tooltip is shown over the second 'SG Server' entry, indicating 'Version: 9.1.0.9(1.1)'.

ASSIGN	DEVICE	CHAN	NAME	MAC ADDRESS / COMPUTER NAME	STATUS	DEVICE FIRMWARE	ID
1	IO: Digico IO	32	Digico IO -1	00:1c:d1:00:28:00	On	UPDATE	ID
1	MR: MultiRack	128	MultiRack-1	00:e0:4b:22:13:cf	On		

ASSIGN	DEVICE	MAC ADDRESS / COMPUTER NAME	STATUS	DEVICE FIRMWARE
1	SG Server	00:15:17:c8:da:9e	On	UPDATE
2	SG Server	00:1b:21:29:af:e6	On	UPDATE

2. Hovering mouse over SoundGrid **I/O** to view Firmware version:

The screenshot shows the 'SOUNDGRID INVENTORY' window. The 'SYSTEM PARAMETERS' section includes 'SAMPLE RATE' (96000), 'NETWORK LATENCY' (80), and 'DRIVER LATENCY' (256). The 'SYSTEM INVENTORY' section has 'TEST REDUNDANCY' and 'REFRESH' buttons. The 'I/O AND PROCESSING DEVICES' table lists two devices: 'IO: Digico IO' and 'MR: MultiRack'. A tooltip is shown over the 'MR: MultiRack' entry, indicating 'Version: 1.10.16' and 'Boot Version: 1.10.4'.

ASSIGN	DEVICE	CHAN	NAME	MAC ADDRESS / COMPUTER NAME	STATUS	DEVICE FIRMWARE	ID
1	IO: Digico IO	32	Digico IO -1	00:1c:d1:00:28:00	On	UPDATE	ID
1	MR: MultiRack		MultiRack-1	00:e0:4b:22:13:cf	On		



6. What Is installed?

After running the installer, files will automatically be placed in their designated locations as listed below. [Do not move files manually.](#)

D:\Waves\V9 Plug-ins

D:\Waves\Caches

D:\Waves\Prefrences

D:\Waves\Waveshells

D:\Waves\Firmware

D:\SDx

Why all MultiRack SoundGrid compatible plugins are installed by default

In the instance where a DiGiCo system is owned by a rental company, we recommend installing all potentially relevant plugins in advance. This should help optimize your DiGiCo system to meet the needs of most users. It is further advisable to avoid any frequent or repeated un-installing and re-installing of plugins as it may render your system more prone to errors. Individual users can access any pre-installed plugins by simply purchasing the respective licenses.

On privately owned systems unlicensed plugins can be manually removed by navigating to **D:\Waves\V9 Plug-ins**, and moving the respective plugin “.bundle” files to a new folder titled “Unused Plugins” (you can create this folder yourself). It is recommended that the location of this folder is within the Plugins Folder for easy access. This action should only be performed after closing the MultiRackSoundGrid..

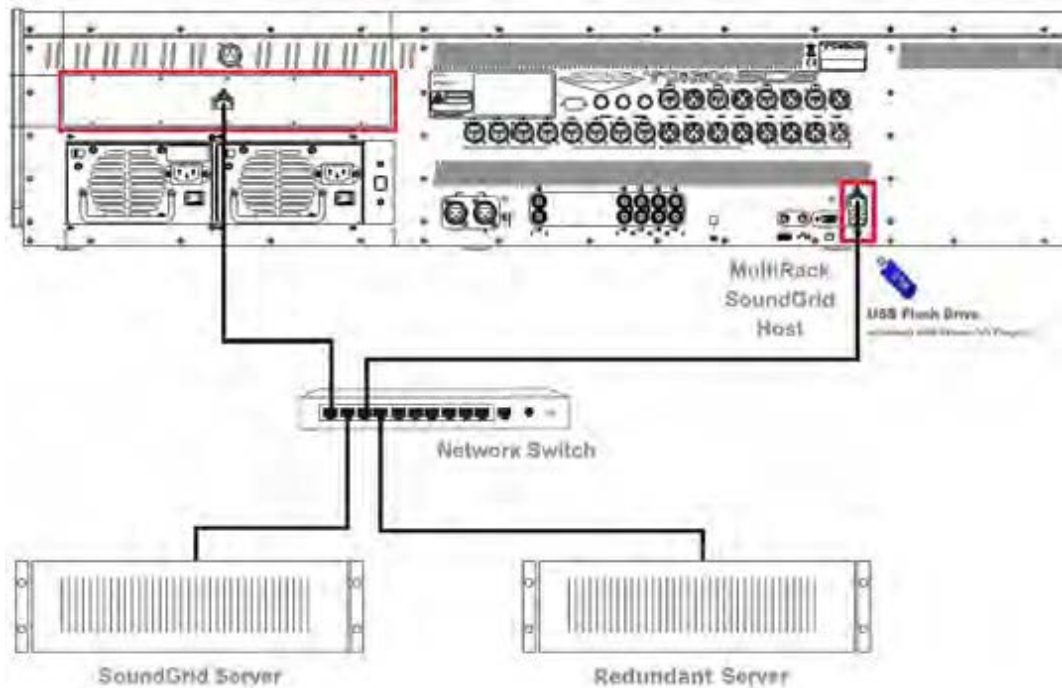
Caches

When loading MultiRack SoundGrid for the first time, the application scans the system and creates cashe files for the plugins.



7. Physical Connections

The basic connections are illustrated in the picture below.



Switch

A 1GB switch is required, due to the amount of information flowing between the I/O and the servers.

The connection of the server to the switch must show a 1 GB link. The Host (DiGiCo embedded computer) will show a 100 MB link. This is a limitation of the onboard Network Adapter and is normal.

Insufficient link speed of different components will result in missing or N/A listings within the Inventory Window.

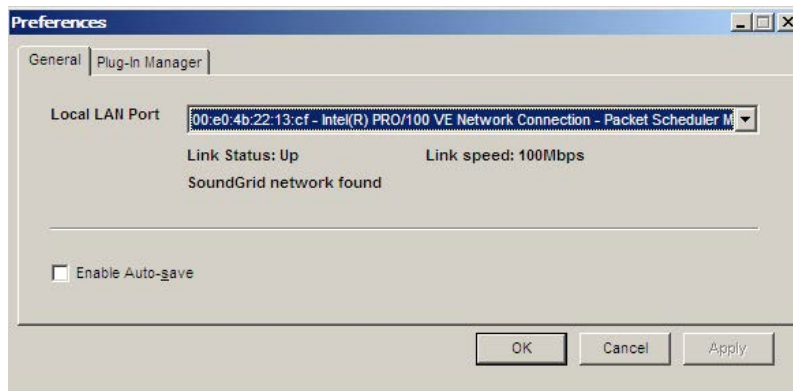
You can determine the link speed by looking at the indicators on the switch itself. There are indications on the Ethernet ports as well.

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 Switch (J9560A) 16 Port Rack Mountable Switch	Link/Act - 10 or 100Mbps Speed ON - 1000Mbps	Blinking

Preferences Window

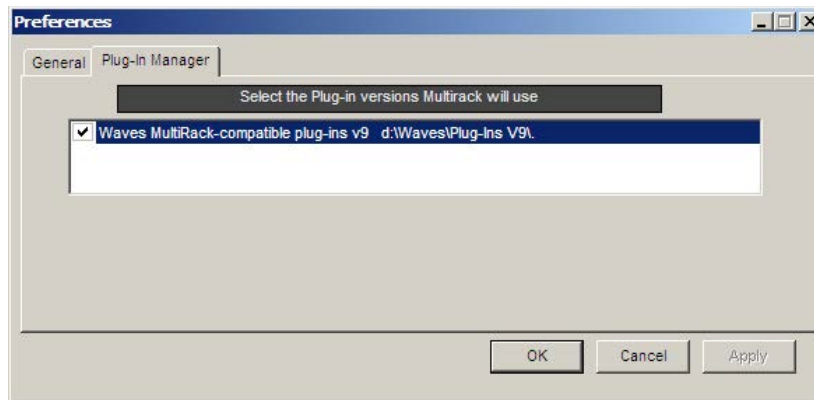
The Preferences Window consists of two sections.

General Tab (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 addresses and port name. When you select the proper port and all components are connected and recognized, a message “**SoundGrid Network Found**” will be displayed.



Plug-in Manager Tab (only available in V9):

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



Rescan Present Licenses

If you are preparing a session, and routing without licenses (flash drive or iLok key); the plugin won't process audio but you can still assign inserts, FX, and load the plugin.

To enable a disabled plugin:

- Connect your USB flash drive (V9).
- Go to **Advanced** 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 ones, 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 isn't usable until it is assigned.
- Devices might 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 three possible modes:

- **On:** Connected and available to be assigned.
- **In Use:** A different MultiRack SoundGrid or Driver is connected to the same Network and is controlling this Device. The Current MultiRack SoundGrid will not be able to use this particular device.
- **N/A:** The device was originally assigned but it is currently not connected or recognized..

Incompatible: This message will appear if the I/O or Server firmware version doesn't match the version of MRSG installed, which will require you to click the "Update" button on the same Device Line.

Sample Rate: This field displays the sample rate. The MultiRack SoundGrid is slaved to the console's sample rate at all times, and this field cannot be edited. This information is derived through the DiGiCo I/O. If the I/O is faulty or neither connected, recognized, or assigned, the Sample Rate info will display N/A.

Network Latency: The range is 40 / 56 / 80 /96., This value sets the buffering delay used by the processing SG Server. For correct latency setting per server [See a list of Waves-qualified Servers in Appendix A – Servers.](#)

Plugins can introduce and add latency to the overall system latency. A plugin latency chart can be viewed in [Appendix E – Compatible Plugins & Latency Chart.](#)



8. FAQs

FAQs – Installation

Question:

I am unable to extract the installer file to my Flash Drive.

Answer:

Please make sure your Flash Drive has at least 2GB of free space. If you are still not able to extract the installer, try a different USB Flash Drive.(your current drive may be defective). If you are still unable to extract the installer file, it might be that the file is corrupted. In this case, please try to download the file again from:

<http://www.waves.com/downloads/digico#v9>

Question:

How do I know if I have the latest version of Waves on My system?

Answer:

Refer to "[How Do I Know Which Version Is Installed?](#)".

Question:

How do I only update the MultiRack SoundGrid on my system?

Answer:

Visit the www.waves.com download page for DiGiCo. An individual MultiRack SoundGrid installer is available. You can also run the "All-In-One" installer.

Question:

A new plugin has been released, and I updated my license. How do I install only this new plugin on my MultiRack SoundGrid?

Answer:

Visit www.waves.com download page for DiGiCo. An individual V9 MRSG Plugin installer is available. You can also run the "All-In-One" installer.

Question:

I get a blue screen after restarting my system.



Answer:

This happens when a USB device is connected while enabling ReadyOn. Hold the **space bar** upon start up, then choose "**Delete restoration data and proceed to System Boot Menu**" (this will disable ReadyOn, and you will need to enable it again correctly).

Question:

The new hardware wizard doesn't appear when I plug in my iLok or USB Flash Drive.

Answer:

The new hardware wizard doesn't load because ReadyOn is already enabled.

Question:

The installer won't launch or freezes during the installation process.

Answer:

Make Sure ReadyOn is disabled. Try a different USB Flash Drive (your current drive might be defective). If the problem persists, the file might be corrupted. In such case, please try to download the file again from: <http://www.waves.com/downloads/digico#v9>.

Question:

When clicking on Update for the DiGiCo I/O, an Error message appears saying "**Could not find the appropriate Firmware Updater file**".

Answer:

You probably have a very old MultiRack SoundGrid version installed on this console (V7-SGV1, V8-SG2.0) and will need to download a Firmware Updater Tool.

Instructions for downloading the Firmware Updater Tool:

1. Go to the [Waves For DiGiCo downloads page](#) -> Version 8 tab.
2. Download the **Firmware Updater Tools required for V1-to-V2.5 Upgrade**.
Choose between SD7 and all other models.
3. Copy this file to your SD console via a USB Flash Drive. **Technical Note:** No need to disable the ReadyOn for this process.
4. Run ***digico-firmware-updater-for-sdx-type.zip*** file on your console and follow the instructions.

If this is an SD7 console, repeat the process for the second Engine.



FAQs – Usage

Question:

The Waves Tab doesn't appear on the DiGiCo system.

Answer:

Open the DiGiCo interface, go to Options → Console or Session and Enable Waves. If this option doesn't exist, restart your console. If the problem persists, re-install the Waves Software.

Question:

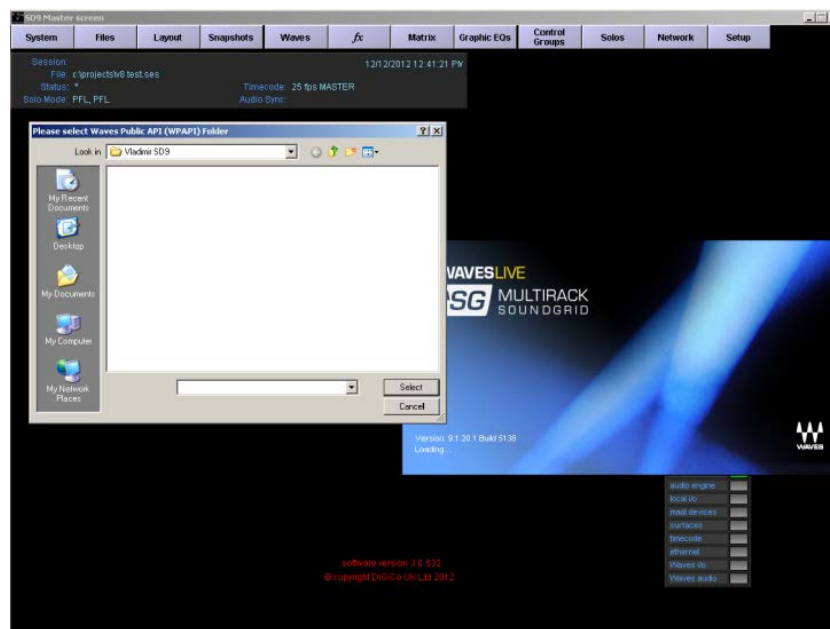
How do I rename racks?

Answer:

It is not possible to rename the racks through the MultiRack. In order to do so, go to Setup → Audio I/O on the left hand side. Under Audio I/O ports choose "Waves". Here you can rename the ports.

Question:

What do I need to do when a "**Please select Waves Public API (WPAPI) Folder**" message window appears?



Answer:

If the file doesn't exist or if you selected the wrong folder, MultiRack will load without racks. You need to make sure that the right folder has been selected. Navigate to D:\Waves\Waveshells and look for a file named Waveshell WPAPI, then click the Select button. If the problem is still not resolved, you would need to reinstall all MultiRack SoundGrid compatible plugins.

Question:

What do I need to do when a "**Please select Waves V9 or V8 Plug-in folder**" message window appears?

Answer:

Navigate to D:\Waves\Plug-ins V9 or V8 (depending on the prompt) and press Select. If your selection is not accepted, reinstall Waves using the All-in-One installer.

Question:

What should my Network Latency be set to?

Answer:

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 below for correct settings.

Minimum Network Latency Settings

	44.1/48 kHz	88.2/96 kHz
Server One	40 Samples	80 Samples
Impact Server	56 Samples	112 Samples

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



Question:

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

Answer:

- Check the Network Latency and try to increase the parameters.
- Check the Transport reading: the highest functional value is 95%.
- Check Processing Server: CPU Load Peak and CPU Load AVR (Average). High values may result in audio drop-outs.

Question:

When I am loading old sessions from DiGiCo, the **MultiRack** software loads up as “OFF”.

Answer:

Go to the Inventory Window and make sure the **DiGiCo I/O** assigned number is set to “1” and not “2”.

FAQ - Licenses

Question:

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

Answer:

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

Question:

How do I remove unlicensed plugins from the Insert list?

Answer:

Please consult with the Console owner before taking any of the actions below:.

1. Exit to Windows.
2. Explore to the following location - **D:\Waves\W9 Plug-ins**.
3. In this location, create an “Unused Plugins” folder.
4. Move the unlicensed plugin files to the “Unused Plugins” folder.

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



Question:

What should I do if I get an Authorization prompt stating that I don't have a license to use the following plugin?

Answer:

First, log into your Waves online account to view which licenses and version you own: .

V8 Licenses can be managed via iLok.com.

V9 Licenses can be managed via the Waves Licenses Center.

Second, verify that the correct USB flash Drive/iLok is connected and recognized within the Windows Device Manager.

Question:

What should I do if my USB Flash Drive holding my V9 licenses is damaged or lost?

Answer:

Open the WLC on a computer connected to the internet and use the "Recover Licenses" option to re-activate to a new device.

Question:

What should I do if my USB Flash Drive/iLok is connected but is not being recognized by the system?

Answer:

Disable "ReadyOn" (if enabled). Try a different USB port and follow the Windows Hardware wizard prompts. Unplug all USB devices and close all windows at the end of process. Enable **ReadyOn**.

Question:

When loading a session some of my plugins are grayed out.

Answer:

Right click on the plugin and select "Activate Plugin".



9. Appendices

Appendix A – Servers

Waves SoundGrid Extreme Server



System Description	RAM	Motherboard	LAN Card
Waves SoundGrid Server One	4GB	Intel DP55WB Media Series LGA 1156	Intel PT Server PRO

The benchmarks below are for general reference and to illustrate how many Racks and plugins can be run on this particular server. The following plugins were used for these tests: C4, SSL E-Channel, IR-Live, and L3 Multimaximizer. Each Rack was fully loaded with a specific plugin until maximum load was reached. WSG-Y16 cards were used as audio interfaces in these tests.

Server Benchmarks	Test 1	Test 2
Sample Rate	48kHz	96kHz
Latency (roundtrip total)	40* samples / 0.83 ms	80* samples / 0.83 ms
SSL Channel Stereo	512 instances	288 instances
IR-Live	30 instances	18 instances
L3 Multimaximizer	158 instances	64 instances
C4 Mono	512 instances	288 instances

Minimum Network Latency Settings

44.1/48 kHz	88.2/96 kHz
40 Samples	80 Samples



Waves SoundGrid Server One



System Description	RAM	Motherboard	LAN Card
Waves SoundGrid Server One	4GB	Intel DP55WB Media Series LGA 1156	Intel PT Server PRO

The benchmarks below are for general reference and to illustrate how many Racks and plugins can be run on this particular server. The following plugins were used for these tests: C4, SSL E-Channel, H-Delay, and TrueVerb. Each Rack was fully loaded with a specific plugin until maximum load was reached. WSG-Y16 cards were used as audio interfaces in these tests.

Server Benchmarks	Test 1	Test 2
Sample Rate	48kHz	96kHz
Latency (roundtrip total)	40* samples / 0.83 ms	80* samples / 0.83 ms
SSL Channel Mono	256 instances	128 instances
H-Delay Mono	244 instances	128 instances
TrueVerb Mono	160 instances	64 instances
C4 Mono	256 instances	128 instances

Minimum Network Latency Settings

44.1/48 kHz	88.2/96 kHz
40 Samples	80 Samples



Waves SoundGrid Impact Server



System Description	RAM	Motherboard	LAN Card
Waves SoundGrid Impact Server	2GB	Gigabyte GA-H67N	Realtek RTL8111E

The benchmarks below are for general reference and to illustrate how many Racks and plugins can be run on this particular server. The following plugins were used for these tests: C4, SSL E-Channel, H-Delay, and TrueVerb. Each Rack was fully loaded with a specific plugin until maximum load was reached. WSG-Y16 cards were used as audio interfaces in these tests.

Server Benchmarks	Test 1	Test 2
Sample Rate	48kHz	96kHz
Latency (roundtrip total)	56* samples / 1.2 ms	112* samples / 1.2 ms
SSL Channel Mono	321 instances	176 instances
C6 Mono	72 instances	36 instances
H-Delay Mono	256 instances	104 instances
TrueVerb Mono	96 instances	48 instances
C4 Mono	232 instances	120 instances

Minimum Network Latency Settings

44.1/48 kHz	88.2/96 kHz
56 Samples	112 Samples



Appendix B – How to Re-Flash SG Server Manually

First, make sure that the server is connected to the network switch.

1. Download the zip file named **SGSUpdater_2.1 Windows.zip** from our FTP:
<ftp://WavesTech:Hr2W2v6x@public.waves.com>

If asked for a username / password, use this information:

Username: WavesTech

Password: Hr2W2v6x

2. Extract the file, inside you will find a file named **SGSUpdater_2.1**.
3. Run the **SGSUpdater_2.1** file.
4. Plug in the USB flash drive.

Please note: this process will erase all the information on the flash drive.

5. Click **Scan** in the **SG Server Updater** window.
6. Select your USB device from the dropdown menu.
7. Click **Install**.
8. Connect the USB flash drive to the SG server USB port.
9. Reboot the server.
10. Launch MultiRack SG and open the SoundGrid Inventory (F2)
11. Now you should see the server, its **Status** might be Incompatible.
12. Click on the **Update** button next to the Server.
13. You will be given an option to re-flash the USB or Server.
14. Select the SG Server hard drive (SATA DRIVE) and proceed to install.

Now the server is up to date.



Appendix C – SoundGrid Compatible Switches

Waves SoundGrid is an Ethernet-based protocol, so it requires a network switch to connect all its components. In order to function properly, you need to use a gigabit switch that supports jumbo frames.

If you wish to use a wireless router for iPad control, please connect the wireless router to the SoundGrid network switch, and the SoundGrid network switch to the console.

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

- [ProSafe GS108v3 8-Ports Gigabit Switch](#)
- [HP 1410-16G Switch \(J9560A\) 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 Switch (J9560A) 16 Port Rack Mountable Switch	Link/Act – 10 or 100Mbps Speed ON – 1000Mbps	Blinking



Appendix D – Ethernet Cables for SoundGrid Systems

The following information refers to which cables and cable lengths can be used in 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 three port Switch).

- **SGS:** SoundGrid Server
<http://www.waveslive.com/html/SoundGrid>

- **Switch:** Use only compatible switches
<http://www.waveslive.com/html/SoundGrid-switches.aspx>

- **Using 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

- **Using 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.**



Using joints

Joints or cable extenders should only 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 only tested with one joint per line. Possibly more joints can be used, but this scenario has not been tested.

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	48 kHz	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-2A	0	0
CLA-3A	0	0
CLA-76 Blacky & Bluey	0	0
DeEsser	0	0
Doppler	0	N/A
Doubler	0	0



Enigma	0	0
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
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
MaxxBass	0	0



MaxxVolume	64	128
MetaFlanger	0	0
MondoMod	0	0
MV2	64	128
MV360°	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
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
S1 Stereo Imager	0	0
SoundShifter	6946	13,858



SSL E-Channel	1	1
SSL G-Channel		
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

