hear
TECHNOLOGIES ®

WSG bridge ™

64-CHANNEL MODULAR AUDIO CONVERTER
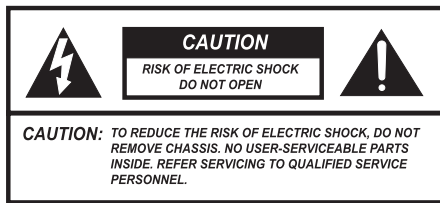
user guide

ENGLISH

Danger
Exposure to extremely high noise levels may cause a permanent hearing loss. Individuals vary considerably to noise induced hearing loss but nearly everyone will lose some hearing if exposed to sufficiently intense noise for a sufficient time.

The U.S. Government's Occupational Safety and Health Administration (OSHA) has specified the following permissible noise level exposures:

DURATION PER DAY (HOURS)	8	6	4	3	2	1
SOUND LEVEL (dB)		90	93	95	97	100	103

According to OSHA, any exposure in the above permissible limits could result in some hearing loss. Ear plugs or protectors in the ear canal or over the ears must be worn when operating this amplification system in order to prevent a permanent hearing loss. If exposure in excess of the limits as put forth above, to insure against potentially harmful exposure to high sound pressure levels, it is recommended that all persons exposed to equipment capable of inducing high sound pressure levels, such as this amplification system, be protected by hearing protectors while this unit is in operation.

CAUTION
RISK OF ELECTRIC SHOCK
DO NOT OPEN

CAUTION: TO REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT REMOVE CHASSIS. NO USER-SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.

AVIS: RISQUE DE CHOC ELECTRIQUE-NE PAS OUVRIR.

THIS SYMBOL IS INTENDED TO ALERT THE USER TO THE PRESENCE OF NON-INSULATED "DANGEROUS VOLTAGE" WITHIN THE PRODUCT'S ENCLOSURE THAT MAY BE OF SUFFICIENT MAGNITUDE TO CONSTITUTE A RISK OF ELECTRIC SHOCK TO PERSONS.

THIS SYMBOL IS INTENDED TO ALERT THE USER TO THE PRESENCE OF IMPORTANT OPERATING AND MAINTENANCE (SERVICING) INSTRUCTIONS IN THE LITERATURE ACCOMPANYING THE UNIT.

IMPORTANT SAFETY INSTRUCTIONS

1. Read all safety and operating instructions before using this product.
2. All safety and operating instructions should be kept for future reference.
3. Read and understand all warnings listed on the operating instructions.
4. Follow all operating instructions to operate this product.
5. This product should not be used near water, i.e. bathtub, sink, swimming pool, wet basement, etc.
6. Only use dry cloth to clean this product.
7. Do not block any ventilation openings. It should not be placed flat against a wall or placed in a built-in enclosure that will impede the flow of cooling air.
8. Do not install this product near any heat sources; such as, radiators, heat registers, stove or other apparatus (including heat producing amplifiers) that produce heat.
9. Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding-type plug has two blades and a third grounding prong. The wide blade or the third prong are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
10. Protect the power cord being walked on or pinched, particularly at plugs, convenience receptacles and the point where they exit from the apparatus. Do not break the ground pin of the power supply cord.
11. Only use attachments specified by the manufacturer.
12. Use only with the cart, stand, tripod, bracket, or table specified by the manufacturer or sold with the apparatus. When a cart is used, use caution when moving cart/apparatus combination to avoid injury from tip-over.
13. Unplug this apparatus during lightning storms or when unused for long periods of time.
14. Care should be taken so that objects do not fall and liquids are not spilled into the unit through the ventilation ports or any other openings.
15. Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way; such as, power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.
16. WARNING: To reduce the risk of fire or electric shock, do not expose this apparatus to rain or moisture.
17. The apparatus shall be connected to a mains socket outlet with a protective earthing connection.
18. Mains plug is used as the disconnect device. It shall remain readily operable and should not be obstructed during intended use.
19. WARNING: To prevent injury, this apparatus must be securely attached to a rack in accordance with the installation instructions.
20. Detailed installation instruction in user manual.

FRENCH

Danger

L'exposition a des niveaux eleves de bruit peut provoquer une perte permanente de l'audition. Chaque organisme humain reagit differemment quant a la perte de l'audition, mais quasiment tout le monde subit une diminution de l'acuite auditive lors d'une exposition suffisamment longue au bruit intense. Les autorites competentes en reglementation de bruit ont defini les expositions tolerees aux niveaux de bruits:

DURE EN HEURES PAR JOUR	8	6	4	3	2	1
NIVEAU SONORE CONTINU EN dB	90	93	95	97	100	103

Selon les autorites, toute exposition dans les limites citees ci-dessus, peuvent provoquer certaines pertes d'audition. Des bouchons ou protections dans l'appareil auditif ou sur l'oreille doivent etre portes lors de l'utilisation de ce systeme d'amplification afin de prevenir le risque de perte permanente de l'audition. Dans le cas d'expositions superieures aux limites precitees il est recommande, afin de se premunir contre les expositions aux pressions acoustiques elevees potentiellement dangeureuses, aux personnes exposees aux equipements capables de delivrer de telles puissances, tels ce systeme d'amplification en fonctionnement, de proteger l'appareil auditif.

ATTENTION

RISQUE DE CHOC ELECTRIQUE
NE PAS OUVRIR

ATTENTION: AFIN DE LIMITER LE RISQUE DE CHO ELECTRIQUE, NE PAS ENLEVER LE CHASSIS. NE CONTIENT PAS DE PIECES POUVANT ETRE REPAREE PAR L'UTILISATEUR. CONFIER LE SERVICE APRES-VENTE AUX REPARATEURS

CE SYMBOLE A POUR BUT D'AVERTIR L'UTILISATEUR DE LA PRESENCE DE VOLTAGE DANGEREUX NON-ISOLE A L'INTERIEUR DE CE PRODUIT QUI PEUT ETRE DE PUISSANCE SUFFISAMMENT IMPORTANTE POUR PROVOQUER UN CHOC ELECTRIQUE AUX PERSONNES.

CE SYMBOLE A POUR BUT D'AVERTIR L'UTILISATEUR DE LA PRESENCE D'INSTRUCTIONS D'UTILISATION ET DE MAINTENANCE DANS LES DOCUMENTS FOURNIS AVEC CE PRODUIT.

IMPORTANTES INSTRUCTIONS DE SECURITE

1. Lire avec attention toutes les recommandations et précautions d'emploi avant d'utiliser ce produit.
2. Toutes les recommandations et précautions d'emploi doivent être conservées afin de pouvoir s'y reporter si nécessaire.
3. Lire et comprendre tous les avertissements énumérés dans les précautions d'emploi.
4. Suivre toutes les précautions d'emploi pour utiliser ce produit.
5. Ce produit ne doit pas être utilisé près d'eau, comme par exemple baignoires, éviers, piscine, sous-sol humides...etc.
6. Utiliser exclusivement un chiffon sec pour nettoyer ce produit.
7. Ne bloquér aucune ouverture de ventilation. Ne pas placer le produit tout contre un mur ou dans une enceinte fermée, cela gênerait le flux d'air nécessaire au refroidissement.

8. Ne pas placer le produit près de toute source de chaleur telle que radiateurs, arrivées d'air chaud, fourneaux ou autres appareils générant de la chaleur (incluant les amplificateurs producteurs de chaleur).
9. Ne pas négliger la sécurité que procure un branchement polarisé ou avec raccordement à la terre. Un branchement polarisé comprend deux fiches dont l'une est plus large que l'autre. Un branchement à la terre comprend deux fiches plus une troisième reliée à la terre. Si la fiche secteur fournie ne s'insert pas dans votre prise de courant. consulter un ´électricien afin de remplacer votre prise obsolète.
10. Protéger le cordon d'alimentation de tout écrasement ou pincement, particulièrement au niveau des fiches, des réceptacles utilisés et à l'endroit de sortie de l'appareil. Ne pas casser la fiche de terre du cordon d'alimentation.
11. Utiliser uniquement les accessoires spécifiés par le constructeur.
12. Utiliser uniquement avec le chariot de transport, le support, le trépied, la console ou la table spécifiés par le constructeur ou vendus avec l'appareil. Lors de l'utilisation d'un chariot, bouger avec précaution l'ensemble chariot/appareil afin d'éviter les dommages d'un renversement.
13. Débrancher cet appareil lors d'orages ou s'il n'est pas utilisé pendant une longue période.
14. Des précautions doivent être prises afin qu'aucun objet ne tombe et qu'aucun liquide ne se répande à l'intérieur de l'appareil par les orifics de ventilation ou n'importe quelle autre ouverture.
15. Pour toutes interventions techniques s'adresser à un technicien qualifié. L'intervention technique est nécessaire lorsque l'appareil a été endommagé de n'importe quelle façon, comme par exemple si le cordon secteur ou sa fiche sont détériorés,si du liquide a coulé ou si des objets sont tombés à l'intérieur de l'appareil,si l'appareil a été exposé à la pluie ou à l'humidité, s'il ne fonctionne pas normalement ou s'il est tombé.
16. ATTENTION: Pour réduire le risque d'incendie ou de choc electrique ne pas exposer l'appareil à la pluie ou à l'humidité.
17. L'appareil sera relié à un socle principal d`électricité muni d'une mise à terre protectrice.
18. Le cordon d'alimentation est utilisée comme dispositif de débranchement. Il restera aisément fonctionnelle et ne devrait pas être obstrué pendant l'utilisation prévue.
19. AVERTISSEMENT Pour raison de sécurité, cet appareil doit être solidement fixé à un rack selon les instructions d'installation.
20. Instruction d'installation détaillée à l'intérieur du manuel d'utilisateur.

ELECTROMAGNETIC COMPATIBILITY

This device complies with part 15 of the FCC Rules and the Product Specifications noted on the Declaration of Conformity. Operation is subject to the following two conditions:

- this device may not cause harmful interference, and
- this device must accept any interference received, including interference that may cause undesired operation.

Operation of this unit within significant electromagnetic fields should be avoided.

- use only shielded interconnecting cables.

⚠ WARNING

The unit produces heat while powered, and therefore requires adequate ventilation to ensure the internal temperature stays within maximum operating temperatures (0° C to 54.5° C, or 32° F to 130° F).

Please ensure that these clearances are met:

- 0.85 inches of clearance on either side of WSG Bridge
- 1 inch of clearance in front of WSG Bridge
- 11 inches of clearance in back of WSG Bridge

Care should be taken so that the Mixer's ventilation holes remain unblocked, allowing adequate airflow through both sides of the unit.
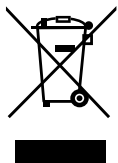
If you want to dispose this product, do not mix it with general household waste. There is a separate collection system for used electronic products in accordance with legislation that requires proper treatment, recovery and recycling.

Private household in the 25 member states of the EU, in Switzerland and Norway may return their used electronic products free of charge to designated collection facilities or to a retailer (if you purchase a similar new one).

For countries not mentioned above, please contact your local authorities for a correct method of disposal.

By doing so, you will ensure that your disposed product under goes the necessary treatment, recovery and recycling and thus prevent potential negative effects on the environment and human health.

DECLARATION OF CONFORMITY

Manufacturer's Name: Hear Technologies

Manufacturer's Address: 991 Discovery Dr.
Huntsville, AL 35806, USA

Declares that the product:

Product Name: WSG Bridge

Product Option: All (requires Class II power adapter that conforms to the requirements of EN60065, EN60742, or equivalent.)

Conforms to the following Product Specifications:

Safety: IEC 60065 -01+Amd 1

EMC: EN 55022:2010

55024:2010

FCC Part 15

Supplementary Information:

The product herewith complies with the requirements of the:
Low Voltage Directive 2006/95/EC
EMC Directive 2004/108/EC
RoHS Directive 2002/95/EC
WEEE Directive 2002/96/EC
EC Regulation 278/2009

With regard to Directive 2005/32/EC and EC Regulation 1275/2008 of 17 December 2008, this product is designed, produced, and classified as Professional Audio Equipment and thus is exempt from this Directive.

Nason Tackett
Senior Design Engineer
Hear Technologies
991 Discovery Drive
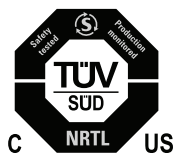Huntsville, AL 35806, USA
Date: August 15, 2014

A FEW NOTES ABOUT THE SYSTEM

- SoundGrid is a private network. Other protocols (Dante/internet etc.) should not be connected to the SG switch/share the same computer network port.

- In cases where a computer must be connected to other networks as well, we direct our users to connect them to different ports of the computer.

- The system is designed to work with suitable CAT6 cable complying with the National authorities (cable with an outer jacket or sleeving rated VW-1 or better). Note, using low-quality cables may result in equipment refusing to link with the WSG Bridge.

- Don't use those old, gray, flat telephone cables (ISDN cables) as those are not gigabit Ethernet cables.

FCC STATEMENT

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a commercial installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Cable complying with the National authorities (cable with an outer jacket or sleeving rated VW-1 or better).

CONTENTS

WSG bridge™

Building on the solid track record for manufacturing great pro audio equipment, Hear Technologies has partnered up with Waves Audio to develop the WSG Bridge. To fill an ever-growing need to give Dante users access to Waves' powerful processing capabilities, the WSG Bridge is the best, most cost-saving solution on the market.

The WSG Bridge simultaneously transmits up to 64 channels of audio from Waves SoundGrid to Dante and 64 channels from Dante to Waves SoundGrid. By providing 64 channels of bidirectional audio between the two protocols with sampling rates from 44.1kHz up to 96kHz, we're providing yet another innovative tool to our innovative customers.

The WSG Bridge comes pre-loaded with one Waves SoundGrid Card and one Dante Card or future Input/Output cards.

ADVANTAGES

- Modular Audio Converter

- Allows Dante, MADI, and other devices to connect to WSG devices

- Allows use of Waves processing with Dante, MADI, and other audio formats

- Converts up to 64 channels of bidirectional WSG audio with another audio format

- Card slots accept 64 Channel Dante, MADI, or other future cards options

- Clock source selectable between Card (A), WSG (B) or external (EXT) clock sources

- 64 Channels of I/O @ 44.1kHz, 48kHz, 88.2kHz, or 96kHz

- Clock Synchronization over Ethernet

FEATURES

- Three switch selectable clock input sources:
  - Input A (Slots 1 & 2)
  - Input B (Slots 3 & 4)
  - External (requires external clock card)

- Six supported sample rates, indicated by LEDs: 44.1 kHz, 48 kHz, 88.2 kHz, 96 kHz, 176.4 kHz, and 192 kHz

- Dante to Waves SoundGrid to Dante round-trip latency @ 96kHz:
  - without SoundGrid Server < 1.04ms
  - with SoundGrid Server < 1.84ms

- 1 RU chassis

- Modular I/O card-slot configurable mainframe

- 48 volt power supply

- Port for redundant power supply

- USB port for firmware upgrades and future features

- Error indicating logo glows red should a fault arise

I/O CARDS

The modular WSG Bridge consists of four card slots, which can be populated with any configuration of input and/or output cards to fit your needs.

WAVES SOUNDGRID CARD
Allows WSG Bridge to communicate with any pro audio equipment that uses Waves SoundGrid.
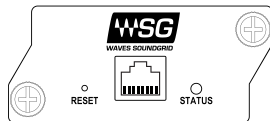
- Connects 64 channels of simultaneous audio input and output with other SoundGrid enabled equipment using a standard Ethernet network connection
- Supports sampling rates of 44.1kHz, 48kHz, 88.2kHz, and 96kHz

DANTE CARD
Allows WSG Bridge to communicate with any audio equipment using Dante protocol.
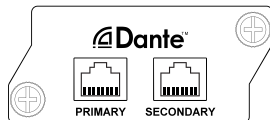
- Connects 64 channels of simultaneous audio input and output with other Dante-enabled equipment using a standard Ethernet network connection
- Supports sampling rates of 44.1kHz, 48kHz, 88.2kHz, and 96kHz
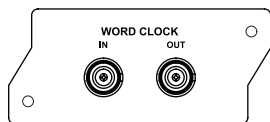
ANALOG OUTPUT CARD
The Analog Output Card provides (8) consecutive balanced channel outputs on a single DB25 connector.
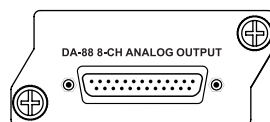
- Install in slot 2 to monitor from the Waves inputs
- Install in slot 4 to monitor from the Dante inputs

WORD CLOCK CARD
Syncs all digital audio devices from multiple sources in one system for word clock synchronization.

- Automatically detects sampling rate and locks onto incoming word clock with a precision PLL circuit
- Supports 44.1k, 48k, 88.2k, 96k, 176.4k, and 192k sampling rates

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MADI and additional I/O cards coming soon!

Quick Start User Guides for interface cards are available at **www.heartechnologies.com > Support**

HBUS
For future expansion.

CLOCK SOURCE SWITCH
The clock selector switch gives the user a simple way to select any one of the three clock sources – A, B, or External.

STATUS INDICATING LOGO
The illuminated logo serves as an indicator for several purposes. Under normal conditions, the logo will be blue, indicating valid clock is present (could be internal or external). A red logo indicates no valid clock is present. If the logo is blinking red, this typically indicates a temperature problem, but could indicate something else. Refer to troubleshooting section for detailed information.

DUAL POWER PORTS
The WSG Bridge supports two external power supplies. The second power supply provides redundancy in case of power failure. On the front of the WSG Bridge, an LED directly above the power switch will be lit if two power supplies are present. This provides an easy way to know if one of the power supplies has failed. On the back of the WSG Bridge, an LED is present directly under each power port, and will be lit if power is present at that port.

DETAIL DIAGRAM

FRONT PANEL
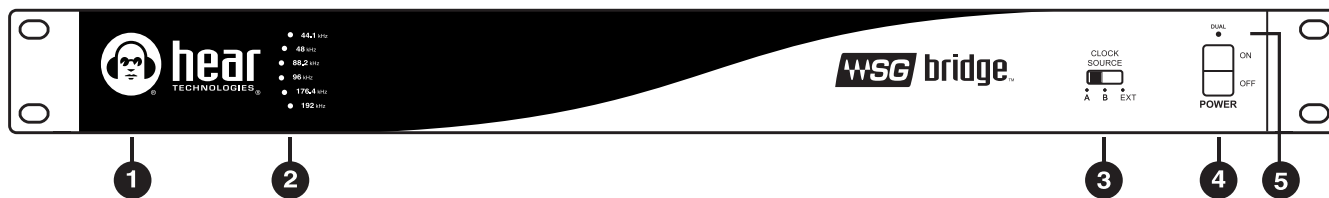
REAR PANEL
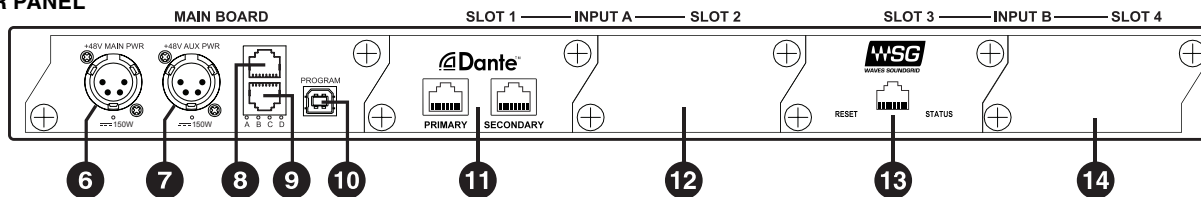
1 LED Status Indicator	6 Main 48V Power Input	11 Card Slot 1 (Dante Card shown)
2 Sample Rate LED Indicators	7 Secondary 48V Power Input	12 Card Slot 2 (shown unpopulated)
3 Clock Source Switch	8 HBus Input (future expansion)	13 Card Slot 3 (Waves SoundGrid Card shown)
4 Power Switch	9 HBus Output (future expansion)	14 Card Slot 4 (shown unpopulated)
5 "Dual" Power LED Indicator	10 USB Connection	

WAVES SOUNDGRID CARD

In order to get the most out of your Waves SoundGrid Card, please take some time to read this user guide. We also suggest that you become familiar with the Waves support site (http://www.waves.com/support), where you'll find an extensive answer base, the latest tech specs, detailed installation guides, software updates, and current information about licensing and registration.

OVERVIEW

SoundGrid is a scalable infrastructure that provides a variety of cost-effective, high-quality solutions for recording studios and live applications. It can be configured in many ways—with many hardware possibilities—to provide a very flexible work environment. This framework is managed by the **SoundGrid Studio Application**, **eMotion LV1**, **MultiRack SoundGrid**, or **SuperRack SoundGrid**. Each of these applications can configure the network, assign and manage I/Os, controllers and servers, and patch audio throughout the system. Any user, anywhere on the SoundGrid network, has access to the network's I/O devices. Adding a SoundGrid DSP server enables recording and monitoring with very low latency and moves processing away from the host computer to the server.

TYPICAL USES

The WSG Bridge SoundGrid Card can be used in both SoundGrid and Native configurations.

SOUNDGRID

In a SoundGrid configuration, the WSG Bridge SoundGrid Card connects to a SoundGrid network that has a SoundGrid DSP server. This provides a high plugin count with super-low latency processing. It also enables other networking capabilities, including the option of adding an additional DSP server for backup.

Please Note: A SoundGrid DSP server is required for SoundGrid configurations.
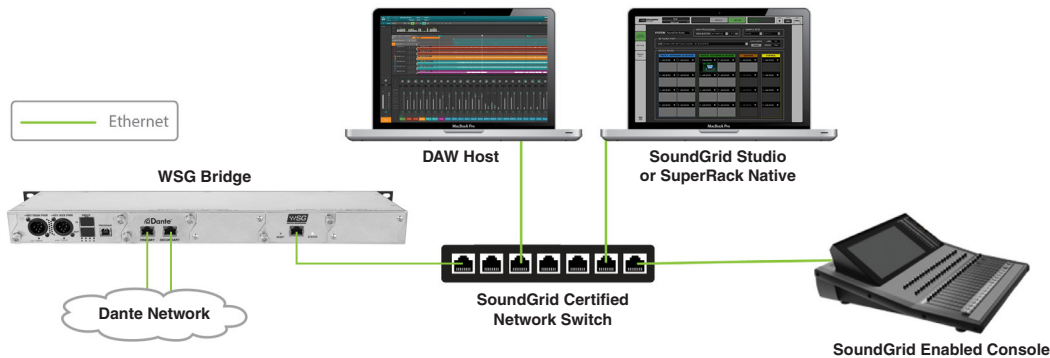
NATIVE

In a Native configuration, the WSG Bridge SoundGrid Card is used to connect to the SoundGrid ASIO/Core Audio driver for plugin processing and/or DAW playback/recording. Since the Native configuration utilizes the computer's CPU to power plugin processing, plugin count and overall system latency depend on the computer's CPU and sound driver capabilities.

Please Note: A SoundGrid DSP server is not required for Native configurations.

SoundGrid Processing and Recording on Different Computers
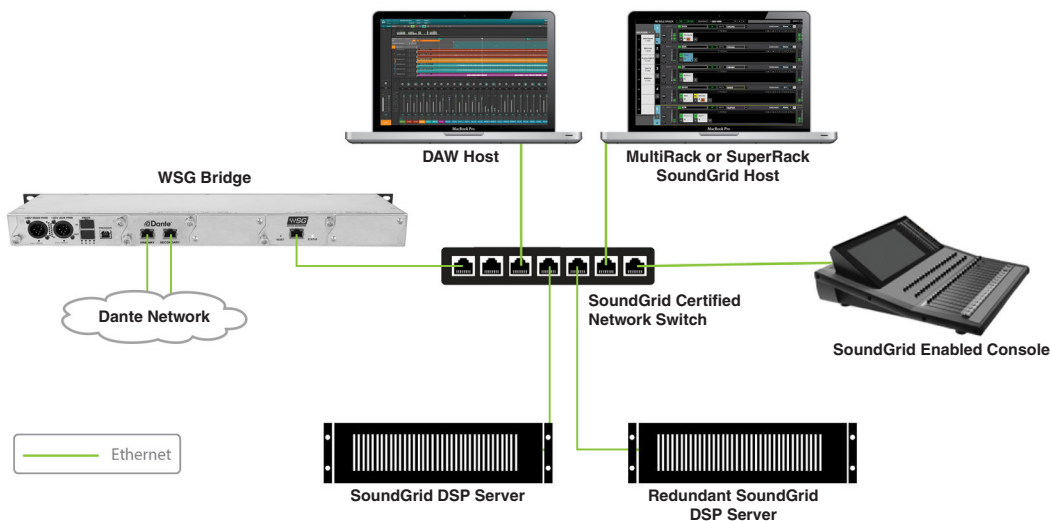
Native Processing and Recording on Different Computers

Features	Native	SoundGrid
Low Latency		✔
Processing	✔	✔
Recording	✔	✔
Simultaneous Recording and Processing	✔	✔
CPU Load	DAW Computer's CPU	Dedicated SoundGrid DSP Server
Backup DSP Server		✔
Networking	✔	✔
I/O Interface	WSG Bridge SoundGrid Card	WSG Bridge SoundGrid Card
Plugin Host Software	MultiRack or SuperRack Native	MultiRack SoundGrid, SuperRack SoundGrid, SoundGrid Studio, or eMotion LV1 Mixer

1. Hardware and Connectors

The card's SoundGrid port (Ethernet) connects to the SoundGrid Network.

There are two LEDs on the port itself, and a third LED to the right of it.

The two LEDs on the port itself indicate **network status**:

- **Link/Activity**: Flashing green
- **GigE Connection**: Solid orange

The LED to the right of the port ("STATUS") indicates **card status**:

- **Blue**: Card is recognized by the SoundGrid network.
- **Flashing Red**: Card is not recognized by the SoundGrid network.
- **Yellow**: While updating – Card is updating properly
        Other conditions – Firmware did not load properly, or the unit did not boot properly.
- **Cycling through colors**: The LED is also used to identify the card from the control panel. The **ID** button on the SoundGrid device rack activates the card status LED. When the ID button is pressed, the card status LED changes colors repeatedly to help identify the card.

1.1 Resetting the Unit

If, after an unsuccessful firmware update, the WSG Bridge SoundGrid Card is not recognized by MultiRack, SuperRack, or SoundGrid Studio (that is, the device does not appear in the inventory panel), you can use the Reset button to try to recover the unit. The Reset button is on the front panel of the WSG Bridge SoundGrid Card. Follow these steps:

- Turn off the unit.
- Press and hold the Reset button.
- Restart the unit while holding the button.
- Release the Reset button once the device has fully booted.

The unit is now in "force update" mode, and a new firmware update can be performed.

2. Installation and Configuration Overview

The ASIO/Core Audio drivers and control panel for the WSG Bridge SoundGrid Card interface—as well as most other Waves products—are installed using the Waves Central application. When you download the drivers and interface, Waves Central also installs the latest version of the SoundGrid driver and the SoundGrid Studio Application, which are required for DAW recording and playback.

IMPORTANT! BEFORE USE, YOU MUST <u>ACTIVATE YOUR LICENSE</u>. **Then download and install the Waves SoundGrid Driver.**

STEP 1: Register at: http://www.waves.com/create-account

    1. Login or Create Account

    2. Select "Register New Products" or scan the QR Code on the Activation Card or bottom of unit

STEP 2: Install SoundGrid Driver:

    1. Download and install **Waves Central**: http://www.waves.com/downloads/central

    2. Launch Waves Central and login

    3. Click "Easy Install & Activate"

    4. Select "**Hear Back PRO SG Card Driver**"

   5. Click "Install & Activate" in the bottom right corner

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Need additional assistance?

ℹ️ **To learn how to install and activate** your Waves products, visit: www.waves.com/support/activate

❓ **For technical assistance**, please visit: www.waves.com/support

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2.1 Configuring the WSG Bridge SoundGrid Card in MultiRack or SuperRack SoundGrid

Access the WSG Bridge SoundGrid Card control panel from the **Inventory** window in the MultiRack or SuperRack SoundGrid application.

1. Launch the MultiRack or SuperRack SoundGrid application.

2. Enter the **Preferences** window by typing **Ctrl+P** (Windows) or **Cmd+**, [comma] (Mac), or from the appropriate application menu.

3. Under **Local LAN Port** (shown right), choose the adapter connected to the SoundGrid network and the WSG Bridge SoundGrid Card. Network adapters are displayed as MAC addresses and port names.

4. When you select the correct port, the message "SoundGrid Network Found" will appear on the panel. Close this window.

5. Open the **SoundGrid Inventory** window from the **Audio** Menu (F2). The **SoundGrid Inventory** window displays all SoundGrid I/O devices connected to your network.

6. Assign SoundGrid drivers in the **Assign** column. Use consecutive numbers for multiple devices, with the first unit assigned as number 1.

7. Assign SoundGrid DSP servers in the **Assign** column (shown below). The primary SoundGrid DSP server will be assigned as number 1. If you are using a redundant SoundGrid DSP server, assign it as number 2.

8. Assign your WSG Bridge SoundGrid Card card(s) in the **Assign** column. Use consecutive numbers for multiple devices, with the first unit assigned as number 1.

9. Click **Settings** to open the WSG Bridge SoundGrid Card Control Panel window.
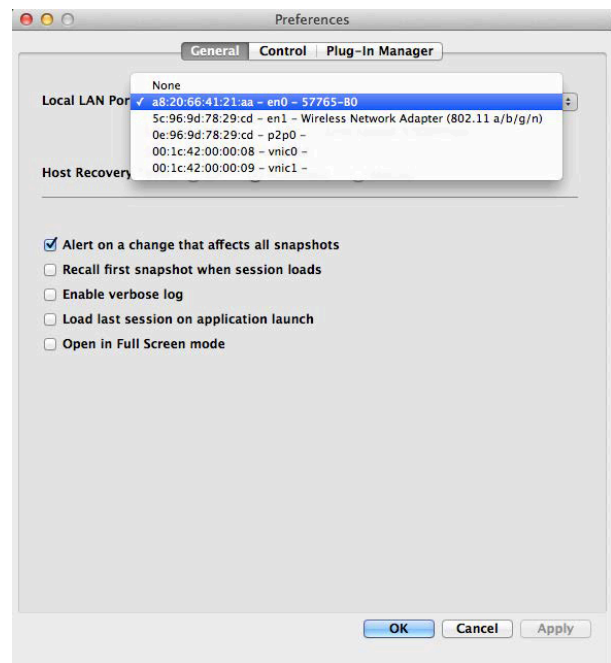
2.2 Configuring the WSG Bridge SoundGrid Card in SoundGrid Studio

This is a quick overview of what you need to know about SoundGrid Studio software to get your network up to speed. There's enough information here for you to configure a simple network, assess network status, and set up your I/O devices.
For more complex configurations, please refer to the MultiRack SoundGrid, SuperRack SoundGrid, and SoundGrid Studio user guides.

2.2.1 Setting up SoundGrid Studio

The SoundGrid Studio Application oversees the SoundGrid network and manages all network devices. To maintain network effectiveness, the SoundGrid Studio Application is always running in the background. Bring SoundGrid Studio to the front by clicking on the SoundGrid icon (**SG**) in the Mac Top Bar or the Windows System Tray. Select a SoundGrid window from the drop-down menu.

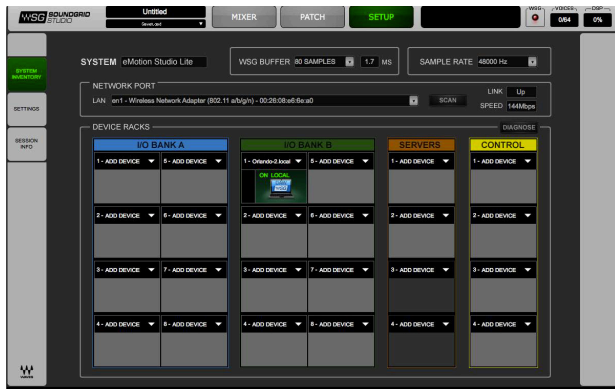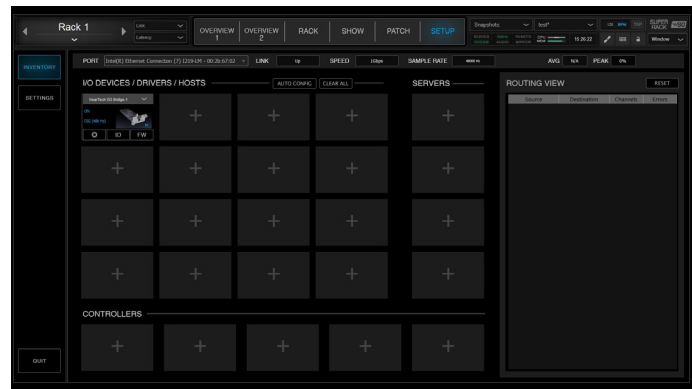*Mac*   *Windows*   *Drop-down Menu*

When SoundGrid Studio opens you will see the System Inventory page, which is part of the Setup window.


*SoundGrid Studio Setup Window*

SuperRack Setup Window

The first time you launch SoundGrid Studio, the Wizard will open. It scans the network, inventories its assets, and then configures the devices. If the Wizard does not start automatically, click the "Auto Config Start" button, which is next to the Network Port. Choose "NEXT" to start automatic configuration. This will take a few moments. Choose "CANCEL" to configure manually.
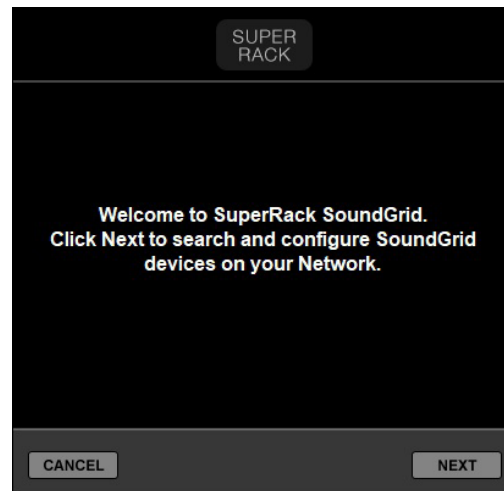

SoundGrid Network Port Window
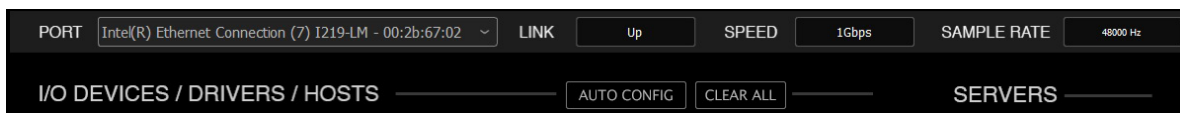
SuperRack Network Port Window
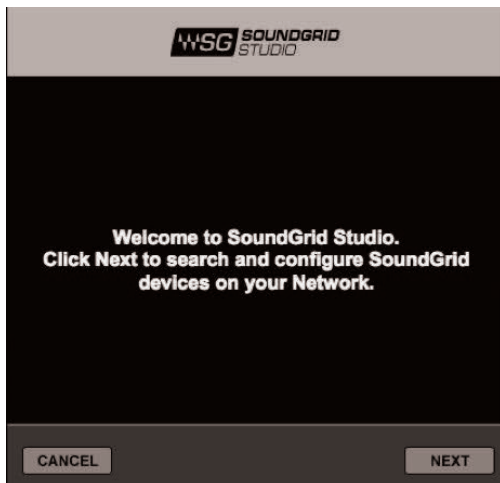
SoundGrid Welcome Window

SuperRack Welcome Window

If the Wizard cannot locate the requested SoundGrid network devices, this may mean that the devices might be off or are not connected properly. In such a case the Wizard will allow you to rescan the network or work as a Driver node slaved to another system. For more information please refer the SoundGrid Studio User Guide.

When configuration is complete, close the window. If there's still a problem, you can use the System Inventory page to assign devices, control the network, and manage clock. To learn how to use this page, please refer to the SoundGrid Studio Application user guide.

SoundGrid Studio uses Ethernet to stream audio between devices on a SoundGrid network. Clock synchronization is also carried over Ethernet. This method of providing clock is called Sync over Ethernet (SoE). SoundGrid I/O devices can clock by other means as well, but SoE is by far the most common (and convenient) way to provide clock information to network devices.

In the SoundGrid Studio Setup page you will see racks containing all of the devices assigned to your system: physical and virtual I/O devices, drivers, and servers. Each I/O rack slot displays the device's mode, clock status, and sample rate.

The first device added to a rack is designated as the Sync-over-Ethernet clock master and is placed in the first rack slot. A populated device slot displays the mode, clock status, and sample rate of the I/O. The clock master device is indicated by its blue color and the icon text: On, Master Clock, INT (48 kHz).

To add another SoundGrid device, click on the arrow in an empty rack slot. From the list of available devices, choose the one that you want to add. In the image below, the first I/O device is grayed out (and therefore unavailable), since it is already claimed.

The new device is visible in the rack slot. Unless changed by the user, it remains the clock slave and is colored green. Use the same menu to change the assignment of clock master from one device to another, or to remove the device from the rack slot.

Clock Master Rack Slot 1 and
Adding another SoundGrid Device

Clock Slave Rack Slot 2 and Menu Options

Now you know how to assign I/O devices and designate a device as the clock master. Click on the **Gear** symbol in the device slot to open the WSG Bridge SoundGrid Card control panel in order to set up clock details. See **section 3.1** for details.

2.2.2 Firmware Status and Updates

In the device slot are two buttons next to the Gear symbol: **FW** and **ID**.

FW indicates the status of the device's firmware. The user is given the choice to update it. Status indications are color-coded:

Gray: Compatible firmware

Blue: Compatible firmware, but a newer version exists

Red: Firmware not compatible and must be updated in order to use

Click on the **FW** button to launch the Reflasher. This will initiate a scan of the hardware and then offer options. Do not disconnect device or turn off your computer until you see "Done."

When the **ID** button on the SoundGrid device slot is pressed, the status LED on the card's front panel change colors repeatedly to help identify the device.
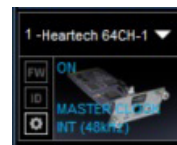
SoundGrid
Device Icon

SuperRack
Device Icon

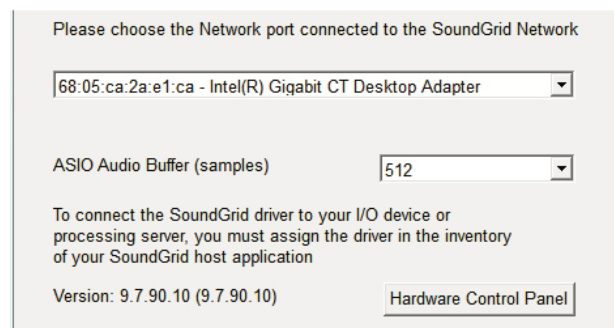## 3. WSG Bridge SoundGrid Card Control Panel

If you are working with MultiRack or SuperRack SoundGrid, access the WSG Bridge SoundGrid Card Control Panel via the Inventory window.

If you're you are using SoundGrid Studio, click on the Gear symbol in the device slot to open the WSG Bridge SoundGrid Card Control Panel.

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

The Driver Control Panel app is located here:

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

Mac: System HD/Applications/Waves/SoundGrid

SoundGrid Control Panel

3.1 Clock Page

When you launch the WSG Bridge SoundGrid Card control panel, it loads the Clock Settings tab. The following settings are available here:

SOURCE sets the clock source.

|	
Internal:	The interface itself provides the clock.
Digital:	Syncs via the WSG Bridge SoundGrid Card connection to Dante Card.
Sync-over-Ethernet:	Syncs to the master I/O of the SoundGrid network.

SAMPLE RATE sets the sample rate when Clock Source is set to Internal.

STATUS displays synchronization status (Sync or No Sync).

CURRENT CLOCK SOURCE IS displays the current sync method.

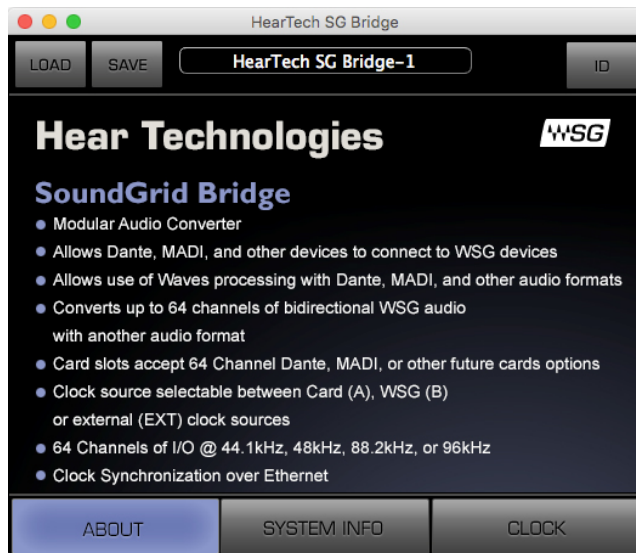**SOE** displays Sync-over-Ethernet status (On or Off).

LOAD and **SAVE** (at the top left corner of the control panel window) allow you to save and load your WSG Bridge SoundGrid Card settings.
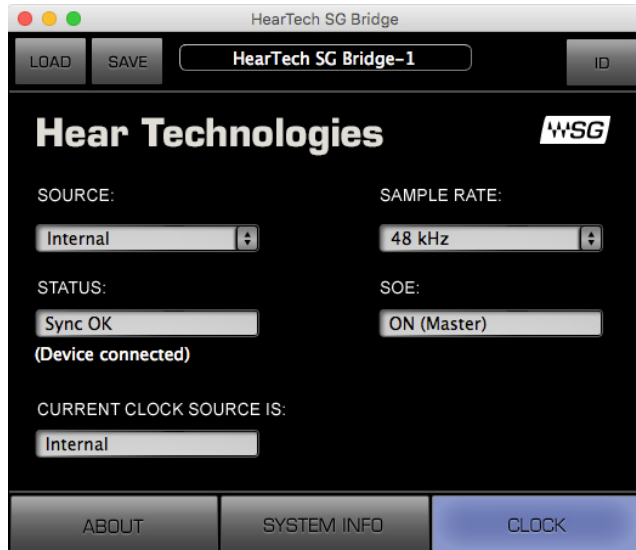
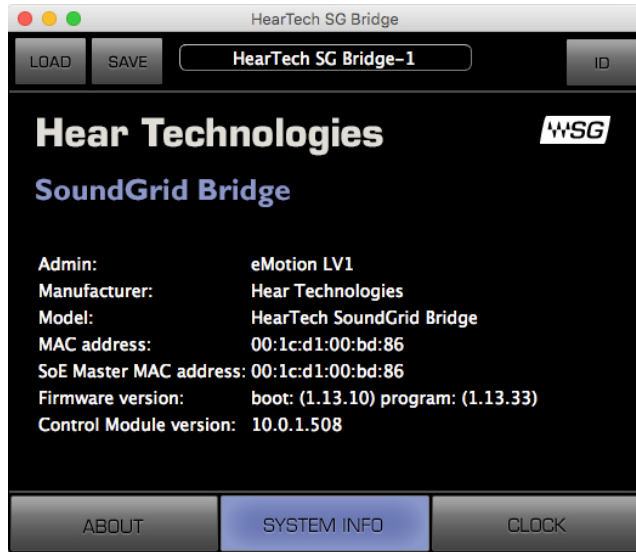*Bridge Clock Settings*

3.2 About Page

The **About** page displays an overview of the device's specifications.

Bridge About Page

3.3 System Info Page

The **System Info** page displays the device's connection status, manufacturer, model, MAC and SoE Master MAC addresses, and firmware version.

Bridge System Info

3.4 Saving, Loading, and Identifying

LOAD and **SAVE** (at the top left corner of the Control Panel window) allow you to save and load your WSG Bridge SoundGrid Card settings.

IDENTIFY (at the top right corner of the Control Panel window) allows you to identify connected devices. When the ID button on the SoundGrid device rack is pressed, the status LED on the card's front panel change colors repeatedly to help identify the device.


LOAD, SAVE, and ID Buttons

3.5 Routing

To route audio to and from the WSG Bridge, using the SoundGrid Studio or SuperRack Software, click on **PATCH** at the top and then **DEVICE TO DEVICE** on the left side. This will open the **DEVICE TO DEVICE** routing view (shown below). You will see devices that can receive SoundGrid audio along the top (columns) and you will see devices that can transmit SoundGrid audio along the left side (rows).

SoundGrid Studio:

- Clicking on the "+" next to each device will expand the device to show all of its inputs or outputs.

- Clicking a cross-point box (as shown) will route audio from a transmitter to a receiver.

- To route multiple transmitters to receivers quickly, click and drag your mouse diagonally down and to the right.
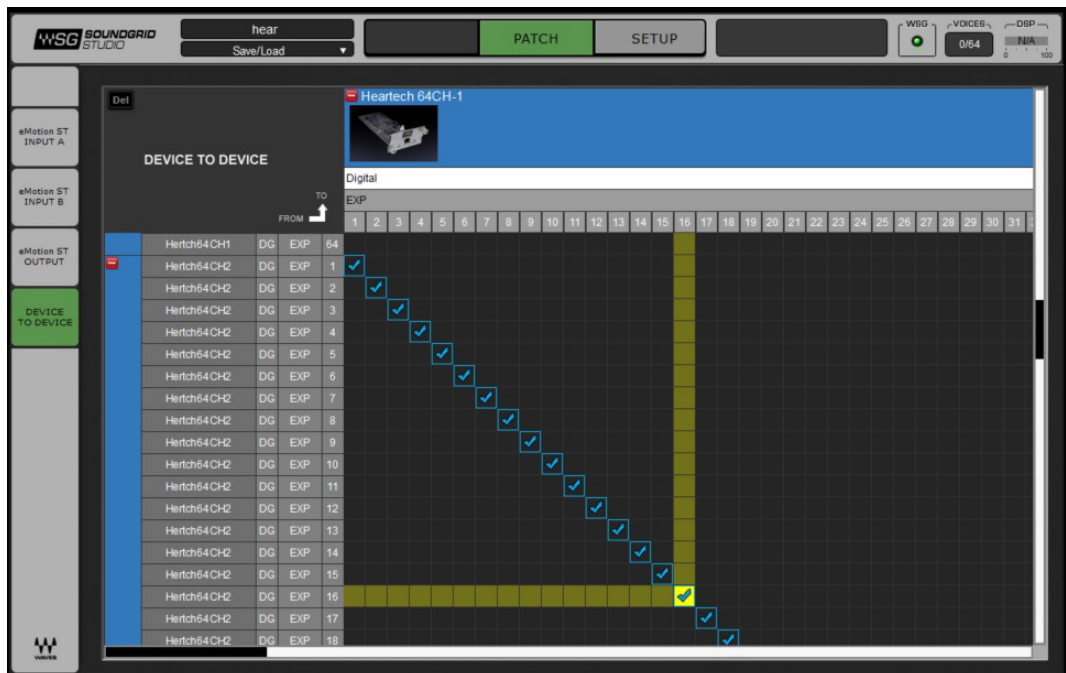
SoundGrid Studio Routing Screen

SuperRack SoundGrid:

- Clicking on a device along the top (columns) will show all of its inputs.

- Clicking on a device along the left side (rows) will show all its outputs.

- Clicking a cross-point box (as shown) will route audio from a transmitter to a receiver.

- To route multiple transmitters to receivers quickly, click and drag your mouse diagonally down and to the right.
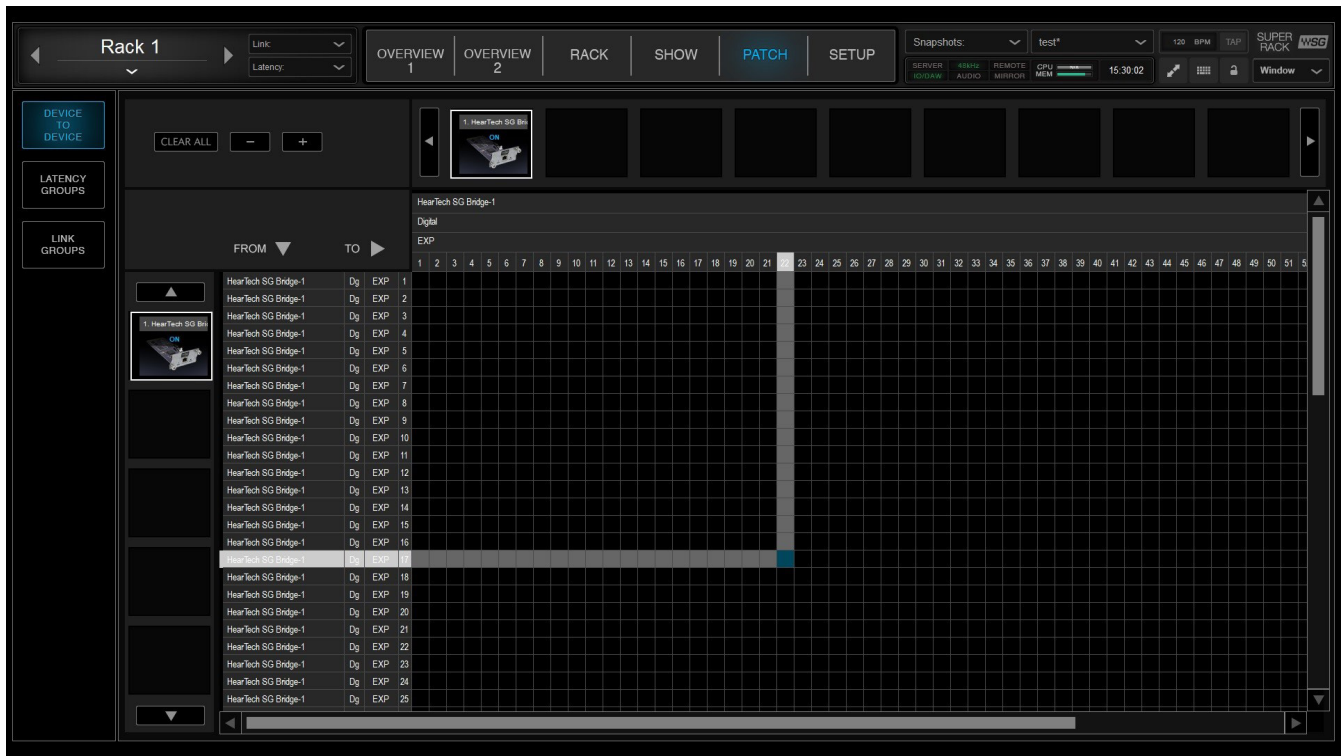
SuperRack SoundGrid Routing Screen

DANTE CARD

OVERVIEW

With hundreds of professional audio manufacturers now supporting Dante, it is an easy way to route multiple channels of high quality audio at a very low latency between two or more pieces of equipment (including directly out of a PC or Mac using only its Ethernet port.) Dante (Digital Audio Network Through Ethernet) is a standard audio-over-Ethernet protocol developed and supported by Audinate Pty Ltd.
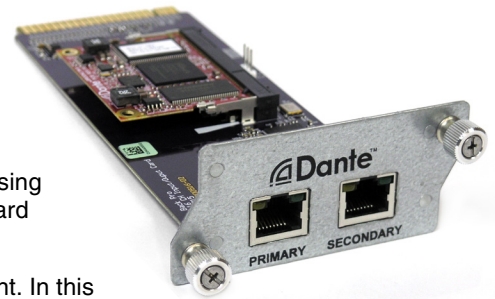
Please note that we did not develop the Dante protocol. We are simply an end-point. In this manual, we will just barely scratch the surface of Dante's capabilities. The creators of Dante know their protocol better than anyone! Please visit **www.audinate.com** for a vast wealth of training videos, example setups, and documentation.

Our **WSG Bridge Dante Card** connects 64 channels of simultaneous audio input and output with other Dante enabled equipment using a standard Ethernet network connection. Dante will work with standard network switches and routers and is safe to combine with your existing computer network, if necessary. Both 100BaseT and 1000BaseT network speeds are supported. However, 1000BaseT (gigabit) Ethernet is highly recommended due to the lower latency that it offers. Our system supports sampling rates of 44.1kHz, 48kHz, 88.2kHz, and 96kHz.

A Dante network requires at least two devices that support the Dante protocol and a single Cat5e or Cat6 network connection between the two devices. Note that the cable does NOT need to be a cross-over cable. Before you can send audio over the Dante network, you must first connect a Windows PC or Mac running the Dante Controller software (download from **www.audinate.com**) in order to configure audio channel routing. You must choose what you want to send to each of the 64 channels of the WSG Bridge. Whatever is assigned to channels one through 64 in the Dante Controller software is what will show up on channels 1 through 64 on the WSG Bridge.

After configuration, the computer can be disconnected. To connect the PC or Mac, you can connect the computer's Ethernet cable directly into the WSG Bridge Dante Card (or into a network switch that the other Dante devices are also connected to.) The card has two Ethernet ports: "PRIMARY" and "SECONDARY." By default, these ports are configured as "switched," meaning that are both interchangeable and Dante equipment can be connected to either port. *For example:* a sound board with Dante could be plugged into the "PRIMARY" port, and your PC or Mac could be plugged into the "SECONDARY" port.

NOTE*:* Alternatively, these two ports can be reconfigured (using the Dante Controller software) to function as redundant ports. When the ports are used in redundant mode, two Cat5e or Cat6 cables connect to each Dante device. This provides redundancy and protection from audio interruption in case one network cable gets damaged or a network switch fails. (*More on redundant mode later.)*
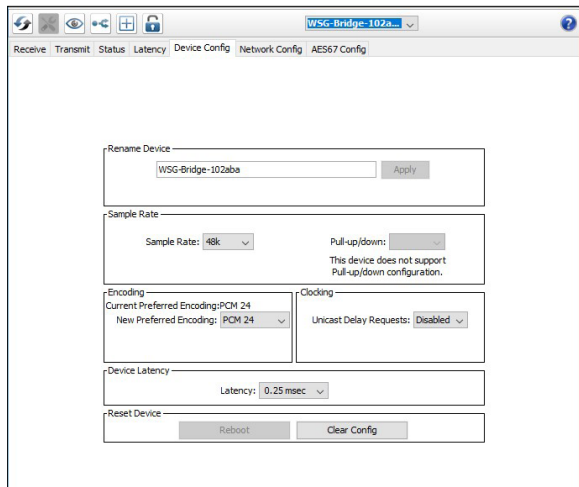
DANTE CONTROLLER

Once you download and install the Dante Controller software and connect your PC or Mac to the Dante network, the Dante devices will automatically show up in the routing view. Note that it is not necessary to assign any special IP address to your computer in order to communicate with the Dante devices. Dante uses broadcast messages to automatically detect and communicate with the devices on the network regardless of your network settings.

In the routing view (shown above), you will see devices that can receive Dante audio along the left (rows) and you will see devices that can transmit Dante audio along the top (columns). Clicking on the "+" next to each device will expand the device to show all of its inputs or outputs. Clicking a cross-point box (as shown in the image above where the two grey lines meet) will route audio from a transmitter to a receiver. If two devices are running at different sampling rates, you will not be able to route audio between them. To view and change the sampling rate of a device, double click the name of the device in the routing view of the Dante Controller software; a Device View will open up in a new window showing settings and information for that device. Clicking on the Device Config tab will allow you to view and change the current sampling rate.
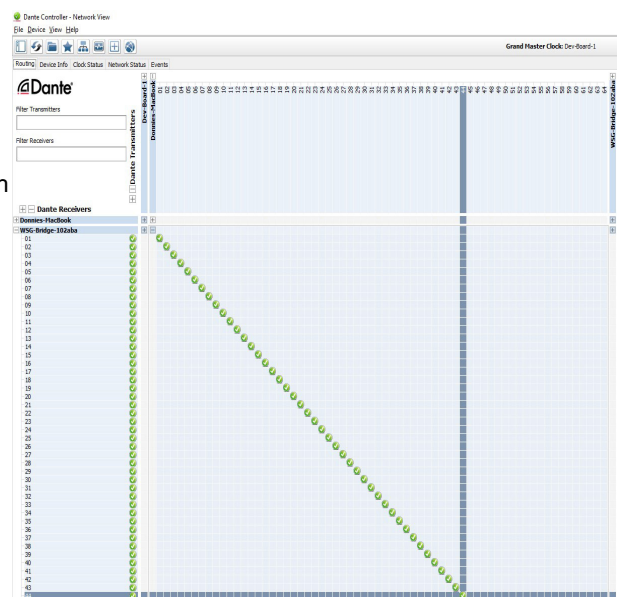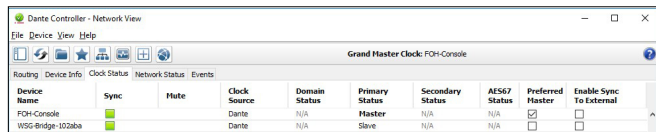

Dante Controller Software – Routing View

NOTE*:* The Network Config tab (not shown) is another tab on the Device View window which will allow you to change the function of the "SECONDARY" port on the Dante card from switched mode to redundant mode if you are running a second (redundant) Dante network to all your devices.

Dante Controller Software – Device Config Tab

MASTER CLOCK SOURCE

The Dante network must have a master clock source. This is chosen using the Dante Controller Software under the Clock Status view tab (shown below). Usually, the device that is the source of the audio is chosen as the preferred master clock source.

Dante Controller Software – Clock Status Tab

NOTE: If the clock source switch on the front of the WSG Bridge is selected to input "A," the Dante or whichever card is in the first slot will be chosen as the clock source. If the Waves SoundGrid card is chosen as the WSG Bridge's clock source, you would want to choose the WSG Bridge Dante Card as the preferred master clock source in the Dante Control software because the audio is originating from an entirely different clock domain. If you don't do this, you will likely hear digital pops and clicks.

NOTE: Do not populate the Dante card in slots 2 or 4 on the WSG Bridge. These slots are reserved for External Clock cards.

It is important to understand that the Dante card does NOT automatically set the sampling rate of the Dante network. Due to the Dante architecture, you MUST choose the correct sampling rate (as previously discussed) on the WSG Bridge Dante card in the Dante Controller software so that it matches the current sampling rate of the WSG Bridge. Otherwise you will hear some very strange things! Also notice that when the Dante card is not selected as the input on the Hub, the Dante Controller software automatically checks the box "Enable Sync To External" under the Clock Status view. This is because when sending out audio, the clock source must come from the WSG Bridge in order to keep the clocks synchronized.

If you hear anything unusual, the first place to check is the Clock Status view. Verify that the correct Preferred Master clock source is selected, and "Enable Sync To External" is selected on that device if applicable. Next, make sure that each device (under the Device View) has the correct sampling rate selected. Remember that due to the Dante architecture, changing the sampling rate on one device does NOT change the sampling rates on all the other devices. You must use the software to make the changes on all connected devices!

VIRTUAL SOUND CARD

Dante also offers a "Virtual Sound Card" driver for both PC and Mac that can be purchased and downloaded from Dante's site **www.audinate.com** for a nominal fee. This driver allows you to send and receive Dante audio using nothing but your Ethernet connection on your PC or Mac. The driver shows up as multiple sound devices that you can use in software such as Sound Forge (shown below), Pro Tools, or the like.
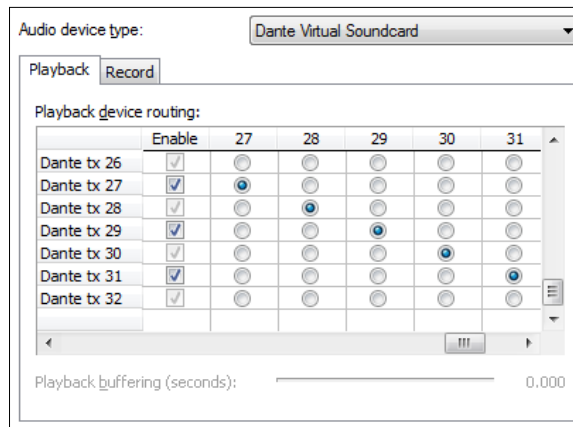
Sony Sound Forge Software – Audio Devices

APPLICATION TIPS

Want to Avoid Pops and Clicks in Your Audio?

Please read the following carefully as there are many correct ways and incorrect ways to setup the clocks on your SoundGrid and Dante works. Below are four correct scenarios for the SoundGrid and Dante clocks when using the WSG Bridge. Choose one of the following four scenarios that best suits your needs. As a general rule, the equipment with the analog inputs (such as a mixing console or A/D converter) will be setup as the clock master.

1. **Dante Device (such as a mixing console or A/D converter) as the Clock Master:**

In the Dante controller software, under the "Clock Status" tab, the device you wish to have be the master clock source (such as the mixing console or A/D converter) should be selected as "preferred master" and the WSG Bridge should NOT have the "Enable Sync to External" checked. When you double-click on each device and look at the Device Config window, all Dante devices should have the same sampling rate selected.

Next, move the physical switch (not in the Dante software) on the front panel of the WSG Bridge should be selected to input A. For the Waves SoundGrid setup, the WSG Bridge should be selected as the master clock and the clock source for the WSG Bridge and the source should be set to "digital" so that the clock that comes across from the Dante network propagates through to the SoundGrid network.
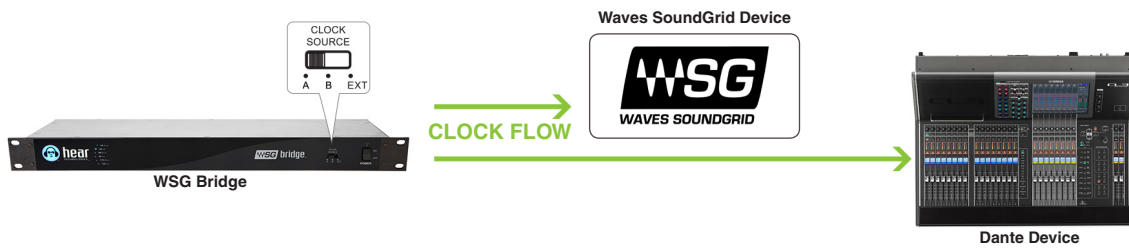
2. **WSG Bridge as the Clock Master, with the clock coming from the internal clock of the Waves SoundGrid card:**
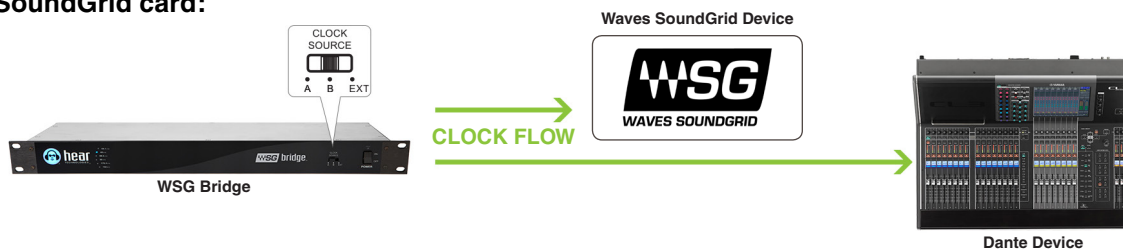
In the Dante controller software, under the "Clock Status" tab, the WSG Bridge should be selected as "preferred master" and the WSG Bridge SHOULD have the "Enable Sync to External" checked. When you double-click on each device and look at the Device Config window, all Dante devices should have the same sampling rate selected.

Next, move the physical switch (not in the Dante software) on the front panel of the WSG Bridge to the input B. For the Waves SoundGrid setup, the WSG Bridge should be selected as the master clock and the source should be set to "internal" for its clock source so that the clock generated in the Bridge goes to both the Dante network and also the Waves SoundGrid network.
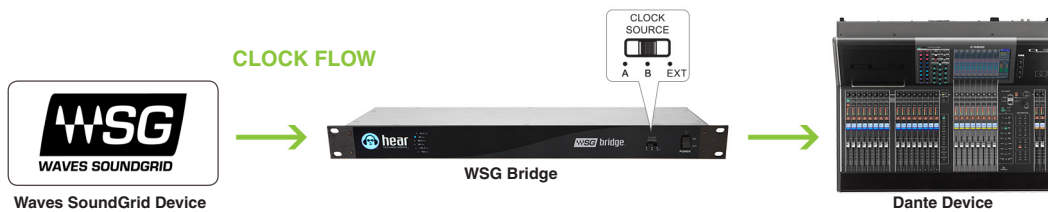
3. WSG Bridge as the Clock Master, with the clock coming from the internal clock of the Dante card:

In the Dante controller software, under the "Clock Status" tab, the WSG Bridge should be selected as "preferred master" and the WSG Bridge should NOT have the "Enable Sync to External" checked. When you double-click on each device and look at the Device Config, window, all Dante devices should have the same sampling rate selected.

Next, move the physical switch (not in the Dante software) on the front panel of the WSG Bridge to input A. For the Waves SoundGrid setup, the WSG Bridge should be selected as the master clock and the source should be set to "digital" so that the clock generated in the Bridge goes to both the Dante network and also the Waves SoundGrid network.

4. Waves SoundGrid Device (such as a mixing console or A/D converter) as the Clock Master:

In the Dante controller software, under the "Clock Status" tab, the WSG Bridge should be selected as "preferred master" and the Bridge SHOULD have the "Enable Sync to External" checked. When you double-click on each device and look at the Device Config window, all Dante devices should have the same sampling rate selected.

Next, move the physical switch (not in the Dante software) on the front panel of the WSG Bridge to input B. For the Waves SoundGrid setup, the WSG Bridge should NOT be selected as the master clock and its source0 should be set to "SoE" so that the clock that comes across from the SoundGrid network propagates through to the Dante network.

TECHNICAL SPECIFICATIONS

System I/O

Latency:	Typical Dante to WSG or WSG to Dante Latency:*
	0.787ms @ 44.1kHz
	0.778ms @ 48.0kHz
	0.580ms @ 88.2kHz
	0.520ms @ 96.0kHz
	For round-trip time, latency is exactly double. Does not include any A/D or D/A conversion time or plugin processing time
Clock Source:	A: Input "A" as clock master (Dante)
	B: Input "B" as clock master (WSG)
	EXT: Future external clock input (optional future external word-clock I/O card)
Sampling Rate:	44.1kHz, 48kHz, 88.2kHz, 96kHz, 176.4kHz, 192kHz
USB Port:	USB 2.0 (for firmware updates and future connectivity)
Card Slots (4x):	Each slot can accept an analog or digital input card, output card, or 8-port Mixer network card
HBUS Input	8-pin RJ45 jack (for future expansion)
HBUS Output:	8-pin RJ45 jack (for future expansion)

Waves SoundGrid Card

Audio Inputs:	64 (8-pin RJ45 jack 1000BaseT Ethernet for WSG audio network)
Audio Outputs:	64 (8-pin RJ45 jack 1000BaseT Ethernet for WSG audio network)
Sampling Rates (Supported):	44.1kHz, 48kHz, 88.2kHz, 96kHz

Dante Card

Audio Inputs:	64 @ 44.1kHz or 48kHz; 32 @ 88.2kHz or 96kHz
	(8-pin RJ45 jack 100BaseT or 1000BaseT Ethernet for Dante audio network)
Audio Outputs:	64 @ 44.1kHz or 48kHz; 32 @ 88.2kHz or 96kHz
	(8-pin RJ45 jack 100BaseT or 1000BaseT Ethernet for Dante audio network)
Sampling Rates (Supported):	44.1kHz, 48kHz, 88.2kHz, 96kHz

Physical

Size:	1.75" (44.5 mm) H x 19" (483 mm) W x 8.5" (216 mm) D
Unit Weight:	6.3 lb. (2.8 kg)
Mounting:	Standard rack mount, 1 RU

Power

Power Requirements:	48 VDC, 400mA Main (primary power supply)
	48 VDC, 400mA Secondary (redundant power supply)
External Power Supply Requirements:	Input Voltage: 100VAC to 240VAC 50/60Hz

Specifications and features subject to change without notice.

NOTES

TROUBLESHOOTING AND OPERATING TIPS

Note: Some problems require you to refer to the A-B-C-D error code LEDs below the HBus ports on back of WSG Bridge.

No Audio Output	• Verify the WSG Bridge is powered on. • Check input connections. • Make sure Clock Source switch is in the proper position for your audio source – input A (slots 1 & 2), input B (slots 3 & 4), or EXT (External Clock). • Verify the status-indicating logo is BLUE. • Check your routing in SoundGrid Studio and Dante Controller.

Logo is solid RED	**Refer to the A-B-C-D error code LEDs below the HBus ports on back of WSG Bridge:**
	• If no error code LED is lit:
	  ○ No clock is present.
	  ○ Verify the digital source is functioning correctly – powered on and sending clock.
	  ○ Verify the Clock Source switch is in the correct position.
	  ○ Verify the Digital Input card is present in either slot 1 (for input A) or slot 3 (for input B).
	  ○ If the problem still persists, please call customer service.
	• If error code LED **A**, **B**, or **A & B** are lit:
	  ○ An internal problem is present. Please call customer service.
	• If error code LED **C** is lit:
	  ○ No firmware file can be found on the internal SD card. Connect the WSG Bridge to a computer via USB. The WSG Bridge will appear on the computer as a mass storage device named WSGBRIDGE. Download the latest firmware file from our website, and simply drag and drop the file onto the WSGBRIDGE, then reboot.
	• If error code LED **D** is lit – alone or in combination with any other error LEDs:
	  ○ An internal power problem has occurred. Please call customer service.

Logo is blinking RED	**Refer to the A-B-C-D error code LEDs below the HBus ports on back of WSG Bridge:** • This is typically an overheating problem – if so, error code LEDs **A**, **B**, & **C** will be lit. ○ Allow adequate ventilation for WSG Bridge as specified in owner's manual. • If any other combination of error code LEDs are lit, please contact customer service.

Logo OFF	• Verify power switch is on.
	• Verify the WSG Bridge is receiving power by checking for a yellow LED beneath the power port on the back of the WSG Bridge. This LED should be lit when the power supply is connected, even with the WSG Bridge powered off.
	• If the yellow LED is not lit:
	  ○ Verify the external power supply is the unit provided by Hear Technologies.
	  ○ Replace external supply with known good unit.

If you need further assistance, feel free to contact **Hear Technologies** technical support by phone at +1-256-922-1200 or visit our web site at **http://www.HearTechnologies.com**.

LIMITED WARRANTY

Hear Technologies warrants the equipment against defects in materials and labor for a period of one year from the original date of purchase. The duration of this warranty is limited to claims made to Hear Technologies within the periods stated with respect to parts and labor from the date of purchase. During the warranty period, defective equipment will be replaced or repaired to the general condition as received, at the discretion of Hear Technologies.

All transportation is the responsibility of the purchaser or owner. Equipment should be shipped in the original shipping box.

This warranty applies only to defects in materials and workmanship and does not cover failure or damage due to shipping loss or damage, abuse, misuse, misapplication, incorrect or varying power line voltages, lack of proper maintenance, natural disasters, acts of God, or unauthorized modifications, repairs, or any alterations done without the expressed

written consent by Hear Technologies. Hear Technologies shall not be liable for any loss of use of the equipment, or consequential damages, including damages to other parts of the installation in which the equipment is a part.

Hear Technologies does not make any warranty, express or implied, other than the warranty contained herein. No agent, representative, or employee has the authority to increase or alter the liability, obligations, and terms of this warranty or sale of the equipment. NOTE: It is strongly recommended that any equipment returned to Hear Technologies be properly packaged and insured for its full value in case of loss, handling or shipping damage.

Hear Technologies shall not be responsible for damage or loss of equipment during shipment.

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NOTES

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