Hear Back PRO
SoundGrid Card
User Guide
Introduction

The Hear Back PRO Waves SoundGrid card enables a Hear Back PRO Hub to communicate with any pro audio equipment on a Waves SoundGrid network, including directly out of a PC or Mac using only its Ethernet port. Each card connects 16 channels of simultaneous audio input and output. Two cards can be used per Hub to allow A/B input switching between two banks of 16 channels over standard Ethernet network connections. The card supports sampling rates of 44.1 kHz, 48 kHz, 88.2 kHz, and 96 kHz.

SoundGrid is the Waves high-speed networking protocol for moving audio, clock, and other information between a host system and I/O devices—and between I/O devices themselves. A SoundGrid host manages the network and assigns servers and I/O devices to mix, process, and record, depending on the host. All SoundGrid devices connect to the host with standard Ethernet cable.

SoundGrid is scalable. Connect one I/O device to a DAW and you have a high-quality sound card. Add more I/Os and your system becomes more flexible and powerful. Depending on the host application, a SoundGrid host can assign up to sixteen I/O devices. Complete SoundGrid systems can be networked together to share devices.

Add a server to a SoundGrid system to offload plugin processing from the host CPU to a SoundGrid DSP server. This dramatically increases processing power and enables greater plugin counts—it also provides very low system latency.
The 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 STATUS LED to the right indicates card status:
- SoundGrid network found = blue
- SoundGrid network not found = flashing red
- Firmware update in progress = yellow
- Hardware error = white
- Device ID mode = revolving colors

Recovery/reset button
Getting Started

Configure SoundGrid and assign your devices as follows, however large or small your system.

A. Connect the hardware.
B. Install the software.
C. Configure your system.

A Connect the Hardware

One I/O

In this example, one Hear Back PRO SoundGrid interface card is used to connect a Hear Back PRO hub to the SoundGrid host. The SoundGrid ASIO/Core Audio driver can be used for plugin processing and/or DAW playback/recording. The interface is connected directly to the host using a Cat 5e Ethernet cable or better.

The host computer’s LAN port that’s connected to the SoundGrid network should be used for SoundGrid only. Do not share this port with the internet or other networks.

In this configuration, all plugin processing is carried out on the host computer. The speed and power of the host defines overall latency.
Add I/Os

Adding SoundGrid I/O devices not only increases the number of I/O channels, but lets you have separate devices for stage and FOH, or live room and control room. When you have more than one device in the SoundGrid network, use a "star" network configuration with a 1GB Ethernet switch. Only use switches tested and approved by Waves.

You can connect and assign up to 16 SoundGrid I/O devices to the network, depending on the SoundGrid Host Application. All SoundGrid I/O devices, hosts, and servers are connected through the Ethernet switch. You can also add more computers to enable streaming between hosts. Two Hear Back PRO cards can be populated per Hub to allow A/B input switching between two banks of 16 channels and up to four cards can be populated to allow A/B input switching, as well as a second set of dedicated SoundGrid outputs.

ADD A SERVER

To add a server to your SoundGrid system, just connect it to the Ethernet switch and configure it in your host application. This moves all DSP processing from the host computer to the server, which provides a higher plugin count and enables the eMotion LV1 and ST mixers. Visit the waves.com hardware pages to learn more about SoundGrid servers. Consult your SoundGrid host application’s user guide to learn about using servers.
**Download and Install Software**

**INSTALLING A NEW SOUNDGRID HOST SYSTEM**
Installing the Waves SoundGrid host application will also install the SoundGrid ASIO/Core Audio driver and applicable device drivers. Your devices will appear in the Inventory of your host system. If a device is not visible in the Inventory, you may need to install a specific driver from **Waves Central**—please see below. First, however, check the device’s connections and power.

**ADDING AN I/O DEVICE TO AN EXISTING SOUNDGRID HOST SYSTEM**
If you are already using a Waves SoundGrid host application and your device does not appear in the Network Devices list, use Waves Central to update the host application, which also updates the device drivers—or install just the missing device driver from Waves Central.¹

**Waves Central**
All Waves software is downloaded and installed via the Waves Central application. To install a specific device driver, launch Waves Central and follow these steps:

![Waves Central Installation Steps]

1. Choose **All Products**
2. Search for the driver by name
3. Choose the driver and click **Install**

If you are new to Waves products, begin by downloading the Waves Central installer from the Waves Download Page. See the Waves Central User Guide for instructions on how to install drivers, plugins, and applications.

**LICENSES**
You do not need a license to use this device. However, many hosts or specific host configurations do require a license. Refer to your host’s [product page](#) for details.

¹ The SoundGrid QRec host is installed with any I/O.
**Configure the System**

A SoundGrid network is configured and devices are assigned in a host’s **Setup** window. At the heart of this window are racks where devices are assigned. Any compatible device that’s part of the host’s SoundGrid network will be available for assignment. This collection of devices is called the **Inventory**. Setup is similar with all hosts: identify the host’s LAN port, select a device slot, and use the drop-down menu to choose an available device. Please consult the user guide of your host application for specific instructions.

All SoundGrid devices are configured in a very similar manner. Throughout this section, we show DiGiGrid IOS as an example.
Manual Device Configuration

You can assign, remove, and manage a device manually. Click on the plus or arrow symbol in a device slot to open its the Device Menu. Select a device.

Any device not already used will be available for assignment. If no other devices are assigned, the current device will become your clock master. Drivers and servers are assigned in the same manner.

See the user guide of your host system for specific instructions on device assignment and I/O channel patching.

Automatic Device Configuration

Certain SoundGrid hosts—including SoundGrid Studio, eMotion LV1 or SuperRack SoundGrid—offer an Auto-Config tool. Once your devices are connected and powered up, click Auto Config to start the configuration.

Auto-Config chooses the correct LAN port on the host computer and scans the SoundGrid network for devices. It then patches the devices to the host. We recommend that you let Auto-Config take care of things, at least when you are getting started. If later you add, remove, or swap a device, Auto-Config will reconfigure your inventory and re-patch.

Note that SoundGrid Studio assigns the SoundGrid driver automatically. SuperRack SoundGrid and eMotion LV1 require that the SoundGrid ASIO/Core Audio driver is assigned manually.
Device Firmware

An I/O that is using outdated or incompatible firmware will not work properly in a SoundGrid network until its firmware is updated. The color of the **FW** button in a device slot indicates the current firmware status.

<table>
<thead>
<tr>
<th>Color</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grey</td>
<td>Compatible firmware</td>
</tr>
<tr>
<td>Blue</td>
<td>Compatible firmware, but a newer version exists</td>
</tr>
<tr>
<td>Red</td>
<td>Firmware not compatible and must be updated in order to use</td>
</tr>
</tbody>
</table>

If a device requires updated firmware, click on the FW button to start a hardware scan. Do not disconnect the device or turn off the computer before **Done** appears. Once the update is ready, turn the device off and on to reset.

Identify a Device on the SoundGrid Network

Click on the **ID** button to activate a hard-to-miss LED on the panel of the corresponding hardware device. You can also activate the LED from the top bar of the device’s control panel.
Hear Back PRO SoundGrid Card Control Panel

There are two ways to open the device control panel:

**FROM THE DEVICE RACK**

Click the **Gear** button on a device in the rack slot.

![SoundGrid Studio](image1.png) ![SoundGrid QRec](image2.png)

**FROM THE DRIVER CONTROL PANEL**

You can also access the control panels of all assigned I/O devices from Driver Control Panel application, which is located here:

- PC: C:\Program Files (x86)\Waves\SoundGrid\Driver Control Panel
- Mac: System HD/Applications/Waves/SoundGrid

**CONTROL PANEL PAGES**

The **About** and **System Info** pages provide information about the unit, such as MAC address, SOE master MAC Address, firmware version, and more. The **Clock** page is used to set up and manage the Hear Back PRO SoundGrid card.
Clock Page

Use the Clock page to set the clock source and sample rate for the device and to assess clock status.

**SOURCE** sets the requested clock source.

<table>
<thead>
<tr>
<th>SOURCE</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internal</td>
<td>The device itself provides the SEO clock.</td>
</tr>
<tr>
<td>External WC</td>
<td>Clock is provided by an external device via the Word Clock Input connector.</td>
</tr>
<tr>
<td>Sync over Ethernet</td>
<td>The device receives clock from the SoundGrid network.</td>
</tr>
</tbody>
</table>

**SAMPLE RATE** sets the sample rate when Clock Source is set to Internal. Range: 44.1 / 48 / 88.2 / 96 kHz.

If the device is the network (SOE) clock master, as determined in the Device Racks of the SoundGrid host, then this setting determines the sample rate of the SoundGrid network.

If Clock Source is set to an external clock source, you cannot change the sample rate from the host. The Sample Rate menu is grayed out and inoperative.
3 CLOCK STATUS INDICATORS

Three windows on the right side of the Clock control panel help you to quickly assess the network status of the device.

<table>
<thead>
<tr>
<th>Status</th>
<th>Reports the presence or absence of sync between the Hear Back PRO and the SoundGrid network.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current Clock Status</td>
<td>Displays the current sync method. This may differ from the choice made in the Source menu.</td>
</tr>
<tr>
<td>SOE</td>
<td>Indicates whether this Hear Back PRO card is the master or a slave in the SoundGrid network. This mirrors the status information in the SoundGrid Studio Device Rack</td>
</tr>
</tbody>
</table>

When the device is a slave in the SoundGrid network, you will likely sync it to the SoundGrid network clock (via SOE). Even when the device is an SOE slave, you can lock it to an external clock source. For example, if another SoundGrid I/O device is the SOE master and is locked to a word clock device, you may choose to receive clock from the same external device over word clock from the master device rather than via network SOE.

In the event that the selected clock source fails, Hear Back PRO card has a series of clock fallback layers, in this order: SOE, Internal. If an Hear Back Pro Card is clocked to SOE and this external source fails, it will fall back to Internal.
System Info Page and About Page

The About page contains a description of the device. The System Info page contains technical details about the device, including MAC address, Firmware version, and Module version. This information is useful for troubleshooting. Please have this information handy if you contact Waves technical support concerning the device.

Preset

You can save and load presets of device settings. A saved preset includes all Clock parameters. Save Hear Back PRO SG Card presets to use on future sessions or copy them to another computer to duplicate a configuration.

Click the ID button to indicate which Hear Back PRO SoundGrid Card hardware device belongs to this Control Panel. Clicking the button causes the Network LED on the panel of the card to flash.
Using an I/O Device with a DAW

Setting up SoundGrid devices with a DAW involves these steps:

_Patch the I/O device and the SoundGrid ASIO/Core Audio driver_
When using a DAW on a SoundGrid network, the SoundGrid ASIO/Core Audio driver serves as a bridge between the I/O device and the DAW. It enables the I/O to communicate with the DAW and it provides patches. Patching an I/O to the SoundGrid ASIO/Core Audio driver differs slightly among hosts. When you use a host’s Auto-Config tool, the host input channels are patched automatically in an order based on rack. The order of the devices in the Device Rack determines the default patching order. Please refer to your SoundGrid host’s user guide for details.

_Configure the DAW for SoundGrid_
1. Set the DAW playback engine to “Waves SoundGrid.” The SoundGrid driver channels will now appear in the DAW I/O preferences and in the Input/Output selector in each DAW channel.
2. Route the DAW inputs and outputs to SoundGrid.
Resetting the Unit

If an unsuccessful firmware update results in the device no longer being recognized by the SoundGrid host application, follow these steps:

1. Turn off the console.
2. Press and hold the Reset button located on the SoundGrid I/O panel in the back of the console.
3. Turn ON the console while holding the button.
4. Release the Reset button once the console has fully booted.

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