



WSG HY128

Interface Card for Rivage PM Consoles

User Guide



Compliance Information	3
<i>PRECAUTIONS</i>	4
<i>COMPANY INFORMATION</i>	5
Welcome	6
About the Waves HY128 Card	7
<i>HY128 Features</i>	7
<i>About SoundGrid</i>	7
SoundGrid System Components.....	8
SoundGrid Applications.....	10
Native Uses.....	11
Installing the HY128	12
<i>HY128 Front Panel</i>	12
<i>Software Setup</i>	13
<i>Clock Considerations</i>	15
<i>Recording and Playback with the HY128</i>	19
HY128 Control Panel	20
<i>Clock Page</i>	20
<i>System Info Page and About Page</i>	22
Connection Examples.....	23



Compliance Information

FCC INFORMATION (U.S.A.)

IMPORTANT NOTICE: DO NOT MODIFY THIS UNIT!

This product, when installed as indicated in the instructions contained in this manual, meets FCC requirements. Modifications not expressly approved by Yamaha may void your authority, granted by the FCC, to use the product.

IMPORTANT



When connecting this product to accessories and/or another product, use only high-quality shielded cables. Cable/s supplied with this product **MUST** be used.

Follow all installation instructions. Failure to follow instructions could void your FCC authorization to use this product in the USA.

NOTE

This product has been tested and found to comply with the requirements listed in FCC Regulations, Part 15 for Class “B” digital devices. Compliance with these requirements provides a reasonable level of assurance that your use of this product in a residential environment will not result in harmful interference with other electronic devices. This equipment generates/uses radio frequencies and, if not installed and used according to the instructions found in this user manual, may cause interference harmful to the operation of other electronic devices. Compliance with FCC regulations does not guarantee that interference will not occur in all installations. This device complies with Part 15 of the FCC Rules.

Operation is subject to the following two conditions:

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



PRECAUTIONS

PLEASE READ CAREFULLY BEFORE PROCEEDING.

Please keep this manual for future reference.

WARNING

Always follow the basic precautions listed below to avoid the possibility of serious injury or even death from electrical shock, short-circuiting, damages, fire or other hazards. These precautions include, but are not limited to, the following:

- Before installing the card in an audio device, please check to make sure that the device is compatible with the card and check possible restrictions regarding the maximum number of Yamaha and third-party expansion cards that can be simultaneously installed. Refer to the owner's manual supplied with the audio device and/or the Yamaha Pro Audio website at www.yamahaproaudio.com.
- Do not install the card in any Yamaha products not specified by Yamaha for use with the card, to avoid possible electrical shock, fire, or equipment damage.
- Do not attempt to disassemble or modify the card. Do not apply excessive force to card connectors or other card components.
- Mishandling of the card may lead to shock, fire hazard, or equipment failure.
- Be sure to disconnect the power cable of the host device before installing the card and connecting/disconnecting the cables (in order to eliminate shock hazard, undesired noise, and avoid equipment damage).
- Turn off all peripheral devices connected to the host device before installation; unplug all related cables.
- Be sure to properly ground the host device to prevent electrical shock and/or malfunction.
- Do not touch the metallic leads (pins) of the circuit board when handling the card.
- Wear heavy gloves during installation to avoid scratching or cutting your hands on sharp edges.
- Avoid touching exposed connectors and metal parts to minimize the possibility of bad connections.
- Drain all static electricity from your clothing and body before handling the card. Touch an exposed metal part of the host device or other grounded object beforehand. Static electricity can damage the card.
- Do not drop the card or subject it to physical shock as this can result in breakage and/or malfunction.



- Do not drop screws or other small parts inside the card. If power is applied while screws or similar metal objects are loose inside the unit, the card may malfunction or be damaged. If you cannot retrieve dropped objects yourself, refer the problem to qualified Yamaha service personnel.
- The illustrations as shown in this Owner's Manual are for instructional purposes only and may be different from the ones on your equipment.
- The company names and product names in this user guide are the trademarks or registered trademarks of their respective companies.

COMPANY INFORMATION

- Company: Waves Inc.
- Address: 2800 Merchants Drive, Knoxville TN 37912
- Telephone: 1-865-909-9200
- Type of equipment: Waves interface card
- Model Name: HY128



Welcome

Thank you for choosing Waves. To get the most from your Waves HY128 card, please take the time to read through this manual. We also suggest that you visit our Yamaha page at <http://www.waves.com/live-sound/yamaha#overview> for the latest tech specs, software updates, detailed installation guides, and current authorization and registration information.

By signing up at <https://www.waves.com/create-account>, you will receive reminders when updates are available, a direct line to Waves technical support, personalized information about registered products, and information concerning your authorization status.

The HY128 interface card is compatible with all Yamaha Rivage PM series consoles.

PACKAGE CONTENTS

- Waves HY128 interface card
- Warranty
- Registration card



About the Waves HY128 Card

HY128 is an HY card that enables Waves plugins to run on Yamaha Rivage PM series consoles, using Waves SoundGrid technology. Together with a SoundGrid DSP server, a Mac or PC, and authorized Waves plugins, the HY128 lets you process up to 128 channels of audio using award-winning Waves reverbs, equalizers, compressors, limiters, delays, and more. You can also assign additional SoundGrid I/O devices to your network.

The HY128 interface card uses Waves SoundGrid protocol to connect all I/O devices to the DSP server and the host computer. Audio and clock data are carried over an Ethernet cable, using Sync-over-Ethernet to synchronize multiple consoles and perform digital splits.

HY128 Features

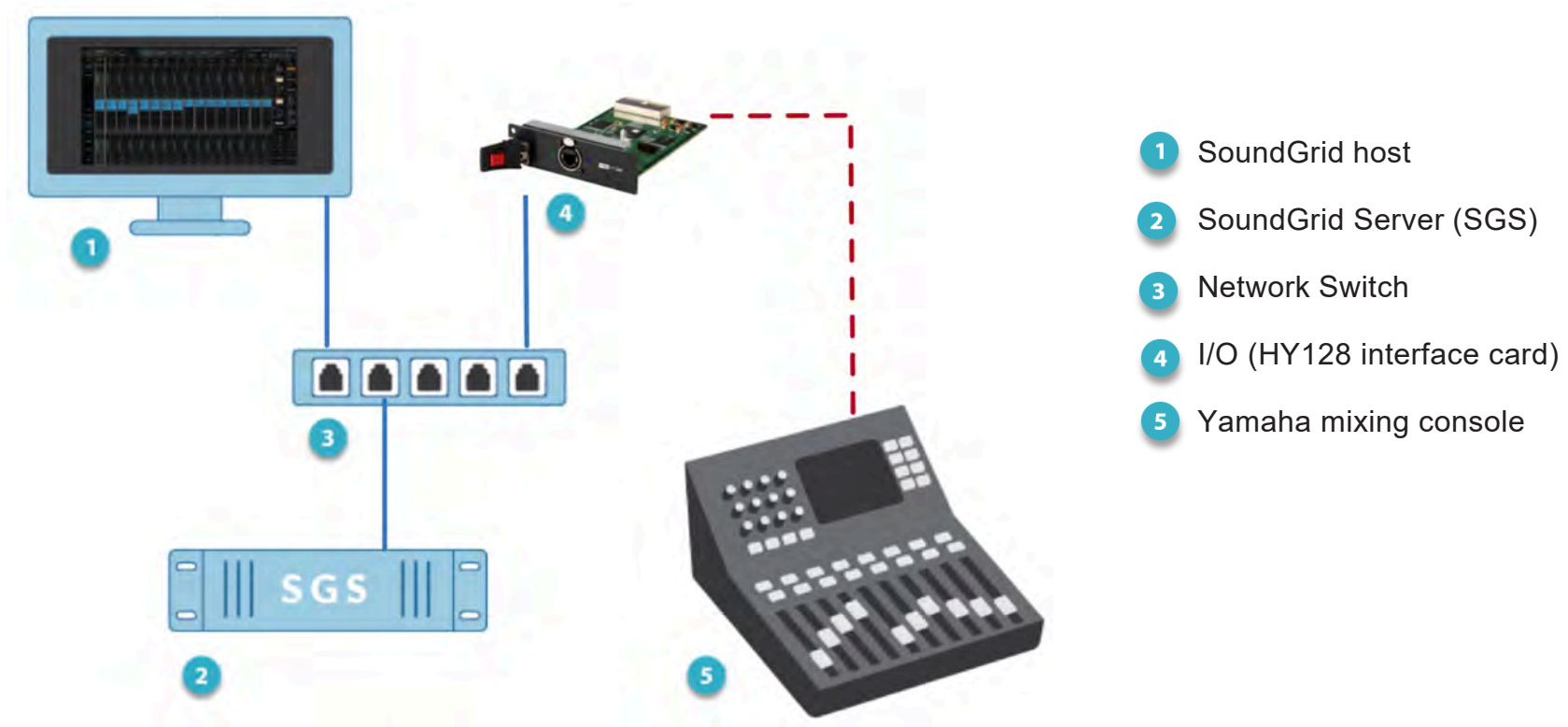
- Supports these sampling frequencies: 44.1 kHz, 48 kHz, 88.2 kHz, and 96 kHz
- Sample resolution: 24 bits
- 128 channels of audio at 44.1/48/88.2/96 kHz.
- Sync-over-Ethernet (SoE) clocking.
- Can accept firmware changes and upgrades

About SoundGrid

SoundGrid is the Waves Audio-over-Ethernet networking and processing technology that provides high channel-count plugin processing and low system latency. Numerous remote I/O devices can be assigned to a SoundGrid network for easy installation, flexible use of resources, and enhanced processing power. SoundGrid uses standard, off-the-shelf network switches, servers, and computers, so it provides an extremely cost-effective platform for live sound.



SoundGrid System Components



SOUNDGRID HOST COMPUTER

SoundGrid applications, plugins, plugin presets, and—optionally—a DAW are located on the host computer. The CPU of that computer performs audio processing for native applications such as MultiRack and SuperRack. SoundGrid applications, such as MultiRack SoundGrid, SuperRack SoundGrid, and SoundGrid Studio, move processing to the SoundGrid server. To learn about system requirements, visit <https://www.waves.com/support>.



SOUNDGRID SERVER (SGS)

The SoundGrid Server is the “number cruncher” that performs the audio processing. Audio is streamed from the card to the server, is processed at low latency, and is streamed back to the card according to the audio connections set by the MultiRack SoundGrid, SuperRack SoundGrid, or SoundGrid Studio host application.

Visit <http://www.waves.com/hardware/soundgrid-servers> for a list of supported servers.

NETWORK SWITCH

A gigabit Ethernet switch connects all SoundGrid components. Refer to <http://www.waves.com/support/network-switches-for-soundgrid-systems> for a list of supported switches.

I/O DEVICE

At least one I/O device must be present. The HY128 card serves as one I/O device, but other SoundGrid I/O devices—hardware or software—can be assigned to the network.

MIXING CONSOLE

In this configuration, the mixing console hosts the HY128 interface card.

CABLES

SoundGrid uses Gigabit Ethernet and requires high-quality CAT 5e or CAT 6 STP cables.



SoundGrid Applications

MULTIRACK SOUNDGRID

MultiRack SoundGrid is a platform for controlling Waves plugins in virtual effect racks, each hosting up to eight plugins. Plugin processing is offloaded from the console's computer to a SoundGrid server, providing significantly greater processing and a much higher plugin count.

MultiRack SoundGrid is designed specifically for live applications. You can program up to 1000 snapshots per session, letting you change setups seamlessly between, or even within, songs. MultiRack supports Waves plugins up to V10. For more information, visit the MultiRack SoundGrid product page:

[https://www.waves.com/mixers-racks/multirack - introduction-to-multirack.](https://www.waves.com/mixers-racks/multirack - introduction-to-multirack)

SOUNDGRID STUDIO

SoundGrid Studio, the studio-oriented SoundGrid application, manages a SoundGrid network, assigns I/O devices and servers, and enables the transfer of DSP processing to a SoundGrid server. SoundGrid Studio includes a 64-channel studio monitor that can also enable low-latency monitoring while recording.

For more about SoundGrid Studio, see [https://www.waves.com/mixers-racks/soundgrid-studio-emotion-st-8-ch#introducing-the-new-waves-soundgrid-studio.](https://www.waves.com/mixers-racks/soundgrid-studio-emotion-st-8-ch#introducing-the-new-waves-soundgrid-studio)

SUPERRACK SOUNDGRID

SuperRack is the next generation of Waves plugin chainers for live consoles. It combines the functionality of MultiRack with the advanced technology and improved workflow of the eMotion LV1 mixer. SuperRack can also act as a Native chainer, in which all DSP processing is carried out in the host computer.

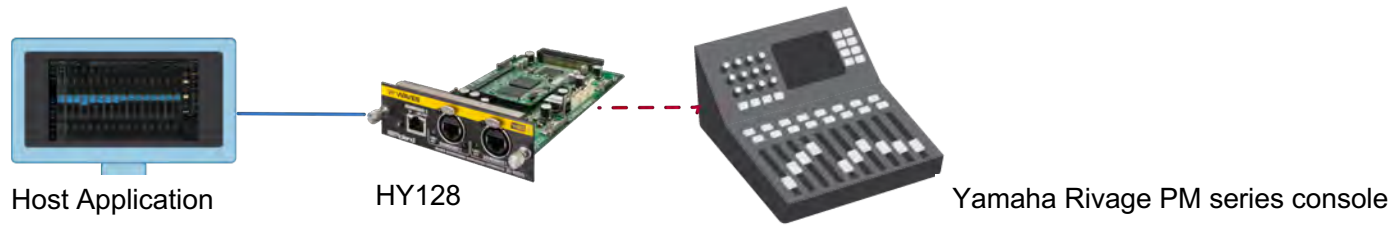
Visit the SuperRack product page at:

[https://www.waves.com/mixers-racks/superrack#introducing-superrack-advanced-plugin-rack.](https://www.waves.com/mixers-racks/superrack#introducing-superrack-advanced-plugin-rack)



Native Uses

The HY128 Interface Card can be used in a Native configuration, without a SoundGrid server. In such configurations, plugin processing will be carried out on the computer's CPU.



NATIVE VS. SOUNDGRID

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	HY128	HY128
Plugin Host Software	MultiRack Native, SoundGrid Studio, or SuperRack Native	MultiRack SoundGrid, SuperRack SoundGrid or SoundGrid Studio
Plugin Licenses	Native	SoundGrid



Installing the HY128

Before installing the HY128 in a host device, please see the Yamaha Pro Audio website at www.yamahaproaudio.com for the latest information on compatible devices.

The HY128 card is installed into one of the HY slots on the rear panel of the console.

1. Turn your console off. For additional safety, disconnect the power cable from the AC socket.
2. In the back of your console, unscrew the protective cover from the HY slot that you are installing to.
3. Align the card carefully with the slot guide, and then slide the HY128 card into the HY slot, following the directional grooves.
4. Ensure that the card is seated firmly, then screw it in place for added protection.

Refer to the console's operation guide for further installation instructions.

HY128 Front Panel



Ethernet Port

Use this port to connect the network switch to the SoundGrid System.



Software Setup

INITIAL CONFIGURATION

SoundGrid device configuration is very similar with all SoundGrid applications: MultiRack SoundGrid, SoundGrid Studio, and eMotion LV1. In this example, SuperRack SoundGrid is used for demonstration. Consult your host application's user guide for configuration details.

Automatic Device Configuration

To configure your I/O devices and servers automatically:

1. Turn on the console.
2. Launch SuperRack SoundGrid and go to the Setup/Inventory window.
3. Click Auto-Configure.

Auto-Configure locates the correct LAN port, scans the SoundGrid network and assigns available I/O devices and servers to slots in the inventory. You will see your HY128 interface card in a device slot, along with your other I/O devices on the SoundGrid network. Auto-configure also automatically patches device channels. In most cases, that's all you will need to do.

To access the device's control panel, click on the **Gear** symbol in the device icon. If you later change your inventory, you can reconfigure the devices by clicking the Auto-Configuration button. Prompts will appear to guide you through the reconfiguration process.



When the configuration is finished, there will be a brief audio dropout, the length of which depends on the size of the SuperRack SoundGrid, eMotion LV1, or SoundGrid Studio session. Don't reconfigure when you can't tolerate a drop. Wait for a short pause in the program.



Manual Device Configuration

For greater control over clock, device sequence, or device assignments, you can set up the network manually. Your SoundGrid network assets are referred to as the “Inventory.” These devices are assigned in the Setup Window >Inventory page.

The screenshot displays the 'Setup' window for a SuperRack SoundGrid system. The interface is divided into several sections: 'INVENTORY' (left sidebar), 'I/O DEVICES / DRIVERS / HOSTS' (top left grid), 'SERVERS' (top right grid), and 'ROUTING VIEW' (right sidebar). A 'CONTROLLERS' section is at the bottom. A legend box on the right side of the image provides a key for the numbered callouts:

- 1 Setup Window tab
- 2 Inventory Page tab
- 3 Auto-Configuration button
- 4 Rack slots with assigned I/O devices
- 5 Empty rack slots
- 6 Server slots with Primary and Redundant servers
- 7 Host computer LAN port selector



Add I/O Devices



1. Use the PORT drop-down menu (#7 in the image above) to select the host computer's LAN port connected to the SoundGrid network. When the correct port is selected, the LINK and SPEED indicators will display valid data.
2. Assign devices to slots in the Inventory (#5 in the image above). To open the Device menu, click the "+" sign in an empty slot in the I/O section.
3. Assign a device from the Network Devices list. Repeat this for as many devices as you need—you can do this in any slot.

Clock Considerations

By default, the first I/O device assigned will be the clock master device of the SoundGrid network. The clock master icon is blue, and all slave icons are green.

To assign another device as the clock master, open the Device menu and select "Set Master." Confirm that all the devices show the correct sample rate and sync status.



1. Select "Set Master." This opens a drop-down menu of all I/O devices assigned to the SOE network.



2. Choose a device. Its icon changes to blue and “M” appears. Other assigned devices will become slaves.

The clock slave/master assignment of certain I/O devices cannot be changed directly from the SuperRack Inventory window. One example is when an I/O device is receiving clock from another device via word clock or AES. In this case, the I/O clock cannot be set from the Inventory page, but rather from its own control panel.

If a device will not sync to the clock master device, try the following:

- Remove and reassign the device.
- Power cycle the hardware device and check the cables.
- If possible, reassign the clock master to another device.



I/O DEVICE ICON INDICATORS



Once a device is assigned, the color of text on the icon provides device status information.

Clock Indicators

Font Color	Indication
Green	SOE slave device is working properly and is owned by this user.
Blue	The SOE master device is working properly and is owned by this user. A blue “M” indicates that this device is the clock master of the local SOE network.
Gray	Device is disconnected. Icon text: “N/A.”

Other Color Codes

Red	The device is not available (e.g., disconnected, in the process of firmware re-flashing, owned by someone else). This state overrides other settings if there is a conflict. Device icon text: “Not Available: (<i>owner’s name</i>).” Red also indicates an offline device.
Orange	This is a shared device that you can assign to your inventory and patch to its free I/O channels.



Servers

When you connect a server to the network, Auto-Config will recognize the device and ask if you want to assign it. Once assigned, the server will appear in the SoundGrid Studio Server rack.



To assign a server manually, click on the arrow to reveal the list of available servers, select a server from the list, or remove or assign the server.

If you assign two servers, the second is indicated as redundant and will be named RSGS. SoundGrid Studio does not allow for a redundant server.

A server cannot be shared by multiple SoundGrid host applications such as SoundGrid Studio or MultiRack. Within a SoundGrid network, only one computer can utilize a server's processing power for StudioRack and the eMotion ST mixer. Once assigned to a computer, a server remains unavailable to all other computers until released by the user.

Refer to the [SuperRack SoundGrid user guide](#) for details.



CONFIGURING HY128 WITH MULTIRACK SOUNDGRID

1. Check the Local LAN Port setting under **Preferences>General**. If the Local LAN Port is set to **None**, you'll see the message "SoundGrid network not found."
2. Choose the correct port from the menu. "SoundGrid network found" will confirm your setting.
3. Navigate to MultiRack Audio menu>SoundGrid Inventory and confirm that all of the system components are present.
4. Check the SoundGrid Connections under the Audio menu.

MultiRack should appear as a Source for the HY128, and the HY128 should appear as a Source for MultiRack, thus enabling bidirectional connections (see Figure 4). When you open the input or output rails in the rack, the correct connections appear.

For more on MultiRack setup and use, please refer to the [MultiRack SoundGrid](#) user guide.

Recording and Playback with the HY128

The SoundGrid Driver lets you record and play audio to and from your favorite DAW.

The driver streams audio via Ethernet through your local LAN port, allowing you to stream up to 128 channels of audio at 44.1 kHz to 96 kHz sample rates.

To stream audio between I/Os, Waves applications, DAWs or multiple computers, one host computer must control the devices and drivers of all other computers on the network using the Waves SoundGrid Studio, eMotion LV1, SuperRack SoundGrid, or MultiRack SoundGrid applications.

In MultiRack SoundGrid, you can use up to two drivers at the same time, allowing simultaneous recording to a second computer.

Using the SoundGrid Studio, eMotion LV1 or SuperRack SoundGrid application, you can connect up to eight drivers at the same time, enabling simultaneous streaming, recording and mixing from multiple computers.



HY128 Control Panel

The HY128 Control Panel sets the device's clock and displays device and firmware information.

Clock Page



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

1 SOURCE sets the clock source for the HY128

Internal	The interface itself provides the clock.
Digital Clock	Clock is provided by the Yamaha console in which the card is mounted.
Sync over Ethernet	Word clock is transmitted between SoundGrid devices using Ethernet.

2 SAMPLE RATE sets the sample rate when Clock Source is set to Internal in the host. Range: 44.1 / 48 / 88.2 / 96 kHz. When Clock Source is set to Internal, you can use this Sample Rate menu to control the clock of the HY128 device. If the HY128 is the network (SoE) clock master, as determined in the Device Racks of the host, then this setting determines the sample rate of the SoundGrid network.



3 **CLOCK STATUS INDICATORS** help you to quickly assess the network status of the HY128.

Status	Reports the presence or absence of sync between the HY128 and the SoundGrid network.
Current Clock Source	Displays the current sync method. This may differ from the choice made in the Source menu.
Sync over Ethernet	Indicates whether this HY128 is the master or a slave in the SoundGrid network. This mirrors the status information in the SoundGrid Studio Device Rack

When the device is a slave in the SoundGrid network, you will likely sync it to the SoundGrid network clock (via SoE). Even when it 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 external device over word clock rather than via network SoE.

In the event that the selected clock source fails, HY128 has a series of clock fallback layers, in this order: Digital, SoE, Internal. If a device is clocked to Digital and this external source fails, it will first try to clock to SoE. If that not successful, it will fall back to Internal.

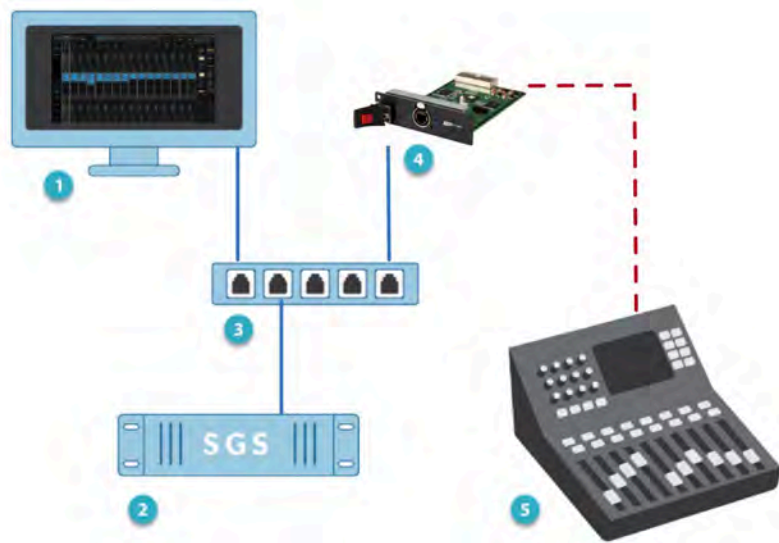


System Info Page and About Page

These pages provide general information about the HY128 card, as well as details about firmware and network status.



Connection Examples

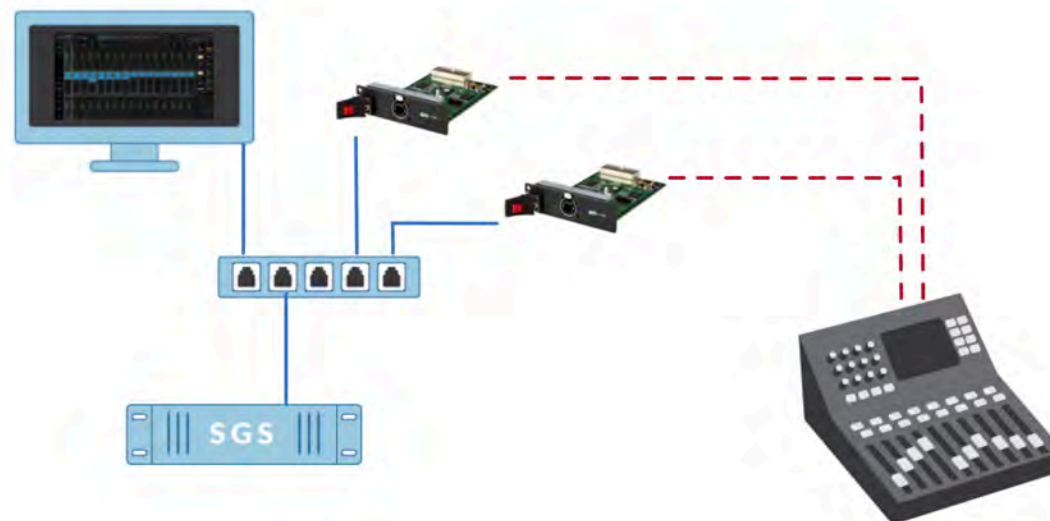


BASIC SOUNDGRID SYSTEM WITH ONE HY128 INTERFACE CARD

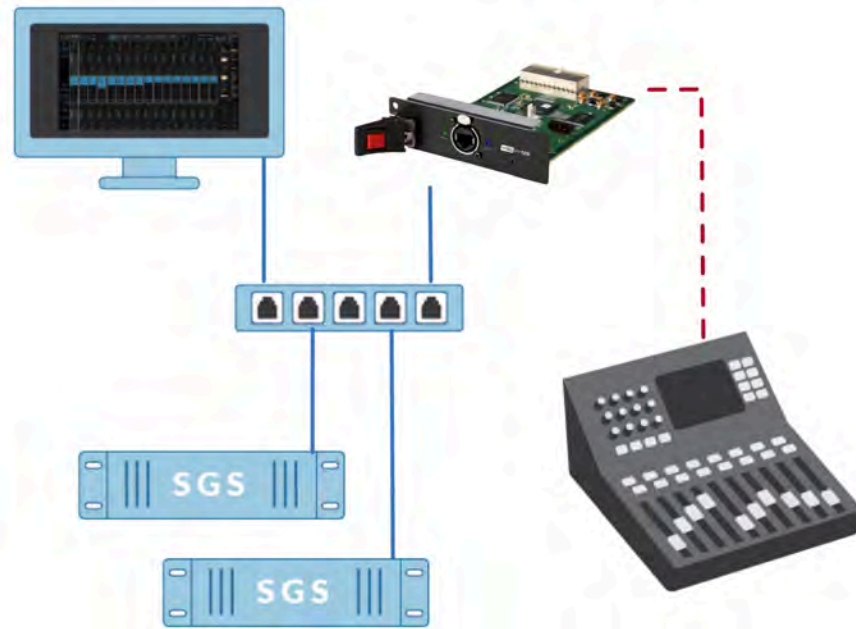
- 1 SoundGrid host computer
- 2 SoundGrid Server (SGS)
- 3 Network Switch
- 4 I/O (HY128 interface card)
- 5 Yamaha mixing console

All SoundGrid devices connect via Ethernet.

SOUNDGRID SYSTEM WITH TWO HY128 INTERFACE CARDS



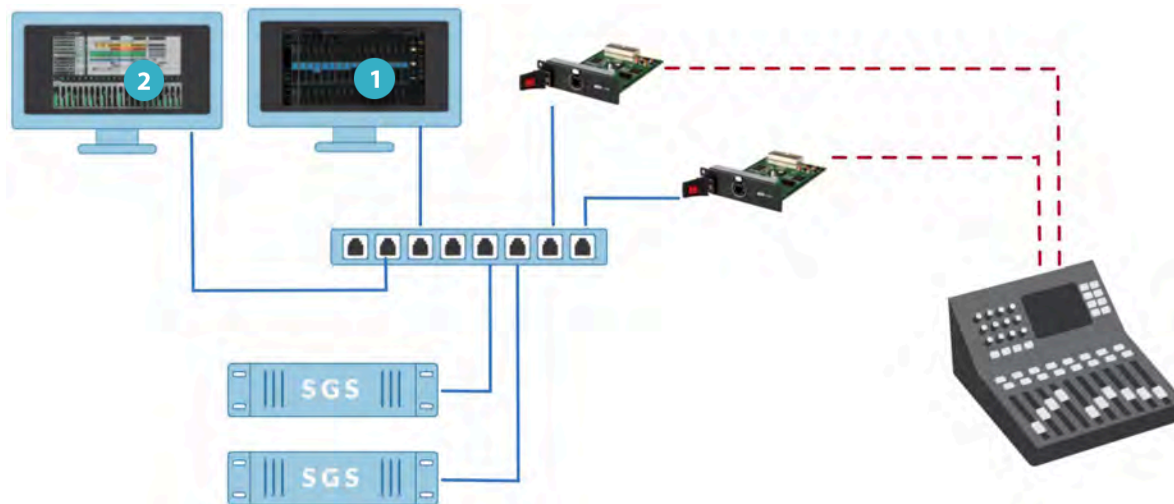
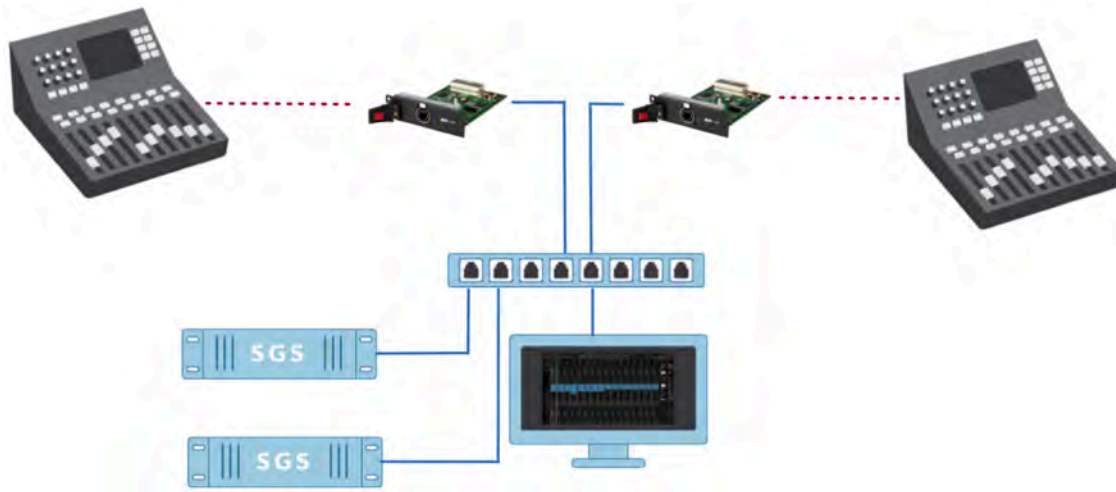
SYSTEM WITH TWO SERVERS (REDUNDANT SERVER SETUP)



Redundant Server



SYSTEM WITH TWO CONSOLES SYNCHRONIZED-OVER-ETHERNET PLUS TWO SERVERS



PROCESSING AND RECORDING ON SEPARATE COMPUTERS

1 SOUNDGRID HOST COMPUTER (SUPERRACK)

2 DAW

*The same computer can host the SuperRack SoundGrid and a DAW.

