Safety Instructions for STG-1608

**WARNING: ELECTRICAL HAZARD**

To ensure your safety, please read this manual thoroughly before using the unit. Please observe all of these safety rules.

1. Keep this user guide for future reference.
2. Take notice of and comply with all warnings included in the user guide or indicated on the device itself.
3. Do not expose this unit to rain or moisture. Do not spill water or other liquids on this unit.
4. When cleaning the cabinet or other parts of this appliance, use only a dry or slightly damp soft cloth.
5. Do not block any ventilation openings or interfere with the proper ventilation of this unit. Install in accordance with the instructions.
6. Do not defeat the internal ventilation fans.
7. Do not use or store near any heat sources such as radiators, heat registers, stoves, or other heat-producing appliances.
8. Protect the power cord from being walked on or otherwise damaged by items placed on or against it. Particular attention should be given to the plugs, receptacles, and the point where the cord exits the appliance.
9. To avoid the risk of electrical shock, do not touch any exposed wiring while the unit is in operation.
10. Only use attachments/accessories specified by the manufacturer.
11. Unplug this unit and all connected electrical equipment during lightning storms or when left unused for a long period of time.
12. Refer all servicing to qualified service personnel. Servicing is required when the appliance has been damaged in any way or fails to operate normally.

For questions about safe installation, please contact us at [https://soundstudio.com/contact-us](https://soundstudio.com/contact-us).
Introduction

SoundStudio STG-1608 is a rugged stage box with 16 analog mic/line inputs and 8 line outputs. It's designed for both stage and studio applications. There are connectors for AES, MIDI, word clock, and a SoundGrid-compliant Ethernet port. All connections on this 3U rack-mountable device are on the front panel, except the mains connection and power switch, which are on the rear panel.

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, as well as providing very low system latency.
Hardware and Connections

The SoundStudio STG-1608 has one Ethernet port and can be connected directly to a SoundGrid host computer with Cat 5e Ethernet cable or better. Additional devices require a SoundGrid Ethernet switch.

Front Panel
Rear Panel

INPUT:
AC 100–240V
50–60Hz 0.3A
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 STG -1608 is connected directly to the SoundGrid host computer using a Cat 5e Ethernet cable or better. The SoundGrid ASIO/Core Audio driver is used for plugin processing and/or DAW playback/recording.

The 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 determines overall latency.
Add I/Os

Adding 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.

![Diagram of network setup]

1. Host computer
2. I/O devices
3. 1GB Ethernet switch

See [this support article](#) for a list of supported switches.

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 audio streaming among hosts.

**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 eMotion 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:

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 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 the Device Menu, then 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 all 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>Status</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 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.
**STG-1608 Control Panel**

There are two ways to open the device control panel:

**FROM THE DEVICE RACK**

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

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

**FROM THE DRIVER CONTROL PANEL**

Open the driver control panel and then click the Hardware Control Panel button. The driver control panel is located here in the host computer:

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

**CONTROL PANEL PAGES**

The **Clock**, **Input**, and **Output** pages are used to set up and manage the unit. The **About** and **System Info** pages provide information about the unit, such as MAC address, SOE master, firmware version, and more.
**Input Page**

The Input tab is used to configure the mic/line inputs. The STG-1608 has 16 analog inputs and 2 digital inputs.

- **48v ON/OFF**
  - Click this button and a light will blink on the STG-1608 device

- **MIC/LINE SELECT**
  - Select input: mic preamp or line input (XLR and TRS)

- **PREAMP GAIN and INPUT METER**
  - Adjust the clip indicator level of the entire I/O.

- **AES INPUT METER**
  - Shows the level of the monitor headphone jack on the front panel
Output Page

The Output tab is used to set the output headroom, pre-channel. There are 8 analog outputs and 2 digital outputs.

HEADROOM SELECT
Choose between +18 dB and +24 dB mixer headroom
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Clock Tab

Use the **Clock** tab to manage the clock relationship between the STG-1608 and the SoundGrid network. The following image shows the STG-1608 locked to the network via Sync Over Ethernet (SOE). This is the most common configuration. You can also lock the device to another clock source via AES or word clock.

SAMPLE RATE

When the device is the SOE master and is set to Internal clock, the drop-down menu is used to set the sample rate. When the STG-1608 is not the clock master, the window displays the SOE network sample rate.

SOURCE SELECT

Request a clock source. If this source is not available, the device will poll all other potential clocks. If there are no available clock sources, the device will switch to internal clock.

LOAD/SAVE

Enables you import and export preamp settings for later use. Available in all tabs.

STATUS

Displays device network sync status

SOE

Indicates SOE status: on/off; SOE Master/Slave

CURRENT CLOCK SOURCE

Indicates the actual clock source.
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.
Presets

You can save and load presets of device settings. A saved preset includes all parameters in the Clock and Control panels. Save STG-1608 presets to use on future sessions or copy them to another computer to duplicate a configuration.

Click the ID button to indicate which STG-1608 hardware device belongs to this Control Panel. Clicking this button causes the Network LED on the front panel of the STG-1608 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.

Using the STG-1608 with MIDI

An external MIDI controller can be connected to an STG-1608. The STG-1608 software installer includes two MIDI drivers.

To activate MIDI ports, open the SoundGrid host application. Go to the I/O Rack and locate the STG-1608 that you want to assign. From the drop-down menu, choose “Assign to SoundGrid MIDI Driver.” In the DAW, select the port for MIDI in and out, “Waves SoundGrid Device I/O.” Refer to your SoundGrid host application user guide for more information.
Specifications

XLR Input

Input Gain
Adjustable from 0 dB to 60 dB, in steps of 1dB

Frequency Response:
+0/-0.2 dB 16 Hz to 21 kHz @ 48 kHz sample rate (+4 dBu input @ +20 dB gain)
+0/- 0.2 dB, 17 Hz to 40 kHz @ 96 kHz sample rate
Dynamic Range: (measured bandwidth limited 20 Hz to 20 kHz) 110 dB Gain = 0
EIN (Gain 60, 150 ohms) -128.7 dBu A weighted
THD+N (Measured at 1 kHz @ +4 dBu, Gain = +20) 0.0019%

Phase Response:
+/- 10 Deg 20 Hz to 20 kHz

Input impedance: 2 kiloohms
48V phantom power available

TRS Input

Input Gain:
Adjustable from 0 dB to 60 dB, in steps of 1dB

Frequency Response:
+0/-0.2 dB 16 Hz to 21 kHz @ 48 kHz sample rate (+4 dBu input @ +20 dB gain)
+0/-0.2 dB 17 Hz to 40 kHz @ 96 kHz sample rate
Dynamic Range: (measured bandwidth limited 20 Hz to 20 kHz) 110 dB Gain = 0
EIN (Gain 60, 150 ohms) -128.7 dBu A weighted
THD+N (Measured at 1 kHz @ +4 dBu, Gain = +20) 0.0019%

Phase Response:
+/- 10 Deg 20 Hz to 20 kHz

Input impedance: 2 kiloohms
XLR Balanced Outputs

Selectable maximum output level: +18 dBu or +24 dBu

Frequency Response:
+0/-0.2 dB 15 Hz to 22 kHz @ 48 kHz sample rate
+0/-0.2 dB 17 Hz to 40 kHz @ 96 kHz sample rate

Dynamic Range: (Measured bandwidth limited 20 Hz to 20 kHz) 110 dB Gain = 0
EIN (Gain 60, 150 ohms) -128.7 dBu A weighted
THD+N (measured at 1 kHz, Gain = 0) 0.0015%

Phase Response:
+/- 10 Deg 20 Hz to 20 kHz

Output impedance: -40 ohms

Headphones output
1 watt per channel into 32 Ohm headphones.

Digital I/O
AES-3, AES-EBU Stereo Output. Output sample rate 44.1 kHz to 96 kHz
Word clock input: Standard 5 Volt square wave. 50% duty cycle.
Word clock output: 1X sample rate Standard 5 Volt square wave. 50% duty cycle.
Word clock input: 1X sample rates of 44.1 kHz, 48 kHz, 88.2 kHz and 96 kHz.

Power
Universal input power supply 100V to 240 VAC, 50/60 Hz, 1.0 ampere

Specifications are subject to change without notice.
Resetting the Unit

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

1. Turn off the unit.
2. Press and hold the Reset button.
3. Restart the unit while holding the button.
4. 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. If your device does not have a reset button, please contact Waves technical support.