DirectOut I/O SG

User Guide
INTRODUCTION ................................................................................................................................................................. 3
Warnings, Conformity, and Certifications ......................................................................................................................... 3
HARDWARE AND CONNECTIONS ................................................................................................................................... 4
Install the DirectOut SG.IO .............................................................................................................................................. 4
GETTING STARTED ........................................................................................................................................................... 4
Connect the Hardware ..................................................................................................................................................... 5
One I/O......................................................................................................................................................................... 5
Add I/Os ....................................................................................................................................................................... 6
Download and Install Software ........................................................................................................................................ 7
Configure the System ...................................................................................................................................................... 8
Manual Device Configuration ....................................................................................................................................... 9
Automatic Device Configuration ................................................................................................................................... 9
Device Firmware ........................................................................................................................................................ 10
DIRECTOUT SG.IO CONTROL PANEL ........................................................................................................................... 11
Clock Page .................................................................................................................................................................... 12
System Info Page and About Page ................................................................................................................................ 14
USING AN I/O DEVICE WITH A DAW .............................................................................................................................. 15
Introduction

DirectOut SG.IO is an insert module that links a DirectOut Prodigy processor to a SoundGrid network. Audio and clock data are carried over an Ethernet cable using Sync-over-Ethernet to synchronize multiple devices and perform digital splits. This enables up to 128 channels of bidirectional audio at 48kHz and 64 channels at 96kHz. DirectOut Prodigy users working on practically any DAW can take advantage of Waves reverbs, equalizers, compressors, limiters, delays, and more. Plus, additional SoundGrid I/O devices can be assigned to the network.

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 configures the network—assigning servers and I/O devices to mix, process, or record, depending on the host. SoundGrid devices link to the SoundGrid network with standard Ethernet cable.

SoundGrid is scalable. 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.

Warnings, Conformity, and Certifications

Before installing and using the DirectOut SoundGrid.IO module, please refer to the DirectOut Prodigy user guide for important safety and compliance information.
Hardware and Connections

*Install the DirectOut SG.IO*

Refer to the DirectOut Prodigy user guide for installation instructions concerning Audio Network Module installation.

**Audio Network Module**

Each module is equipped with 1 x SFP and 2 x RJ45-sockets (Gigabit-Ethernet) for transmission of audio signals.

<table>
<thead>
<tr>
<th>PORT 1</th>
<th>RJ45 socket (1 Gbit/s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PORT 2</td>
<td>Network interface - connect here for network transmission.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PORT 3</th>
<th>SFP cage</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Insert SFP transceiver here and connect to the network.*</td>
</tr>
</tbody>
</table>

LEDs on Ethernet ports 1 and 2 indicate status.

**LED orange** - indicates the link state of the network connection.

(ON) = device link active

(OFF) = device link not active

**LED green** - indicates the activity state of the network connection.

(ON) = data sent or received

(OFF) = no data transmission
Getting Started

All SoundGrid systems, regardless of size, are set up in the same manner:

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

A Connect the Hardware

One I/O

Here, one DirectOut SG.IO is used to connect a DirectOut Prodigy processor to a the SoundGrid host application’s SoundGrid ASIO/Core Audio driver 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 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 there are more than two network connections, 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. You can also add more computers to enable audio streaming between 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 ST mixers. Visit the waves.com hardware pages to learn more about SoundGrid servers. Consult your host application’s user guide to learn how to configure additional I/Os and servers.
Download and Install Software

Installing a New SoundGrid Host System
Installing the Waves SoundGrid host application will also install all applicable device drivers and ASIO/Core Audio 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 its 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 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.
DirectOut SG.IO 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.

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 page is used to set the clock source and monitor clock status. The About and System Info pages provide information about the unit, such as MAC address, SOE master MAC Address, firmware version, and more.
**Clock Page**

Use the Clock page to set the clock source and sample rate for the device and to assess clock status. Clock controls are on the left side of the page, status indicators are on the right.

**1. SOURCE** sets the clock source

<table>
<thead>
<tr>
<th>Source</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internal</td>
<td>The device is the SOE clock master. Other devices in the SoundGrid network will lock to it.</td>
</tr>
<tr>
<td>Digital</td>
<td>The device is locked to an external clock source; it is a clock slave to the external device. SG.IO will likely be the master of the SoundGrid network in this setup.</td>
</tr>
<tr>
<td>SOE</td>
<td>The DirectOut SG.IO module sets its clock to the sample rate of the SoundGrid network. The device can be the SOE master or a slave.</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.

CLOCK STATUS INDICATORS

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

<table>
<thead>
<tr>
<th>Status</th>
<th>Reports the presence or absence of sync between the DirectOut SG.IO and the SoundGrid network.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current Clock Source</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 that the device is assigned to the SoundGrid network and whether it’s the SOE master or a slave.</td>
</tr>
</tbody>
</table>
**System Info Page and About Page**

The **About** page contains a description of the device. The **System Info** page contains technical details, 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**

A bar at the top of the control panel lets you save and load presets. A preset describes the condition of the control panel status, including clock source and sample rate.

Click the ID button on the right to illuminate an LED on the device. This helps to quickly identify the hardware device associated with the control panel.
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.