# DiGiGrid MGB / MGO

User Guide

# Contents

# Introduction

DiGiGrid MGB and MGO are MADI-to-SoundGrid interfaces used for connecting any MADI-enabled device to a Waves SoundGrid network for plugin processing and/or playback and recording. The MGB unit is equipped with MADI BNC connections and the MGO is equipped with MADI optical connections. With support for 56-channel and 64-channel modes, each unit can provide up to 112/128 channels I/O at 48 kHz and up to 56/64 channels at 96 kHz.

A SoundGrid I/O device is part of a SoundGrid 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 I/Os link to the SoundGrid network 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



**1** **MADI 1 & MADI 2** – Either BNC (MGB) or optical (MGO). Connect to any MADI device.

**2** **Waves SoundGrid Port** – Connect to SoundGrid Network.

**3** **Word Clock Input** – Connect to external word clock source.

**4** **5V Power Input** – Use only DiGiGrid-supplied or approved external power supply.



**MADI Status LEDs** –
Colors and respective status as follows:
- Green: MADI link
- Off: no MADI link



**Net Status LED –** Colors and respective status as follows:
- Flashing red = network cable not connected
- Blue = network connected
- All colors sequence = IDENTIFY mode
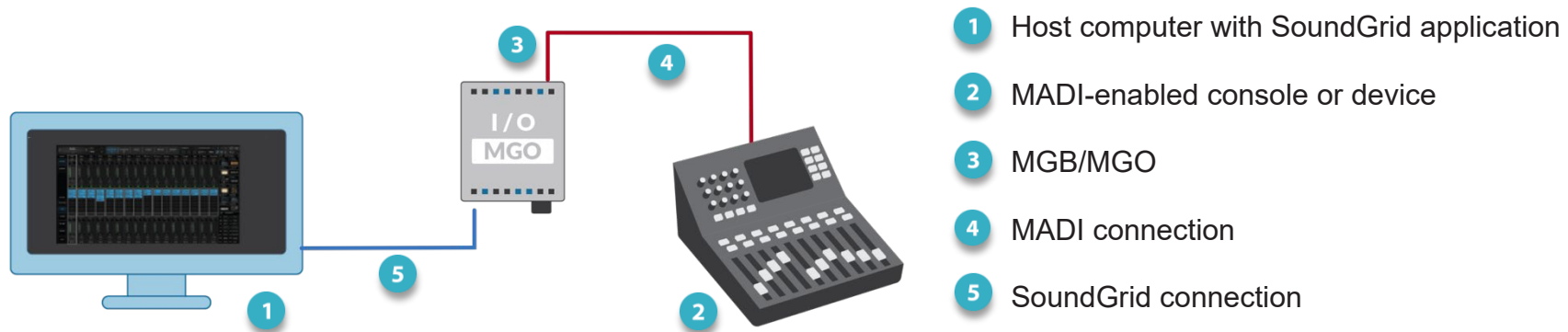- Yellow = firmware is updating or card is stuck while booting

# Getting Started

(A) Connect the hardware

(B) Install the software

(C) Configure your system

## (A) Connect the Hardware

### One I/O

In this illustration, the single MGB/MGO Ethernet port is used to connect a MADI-enabled console to 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 computer using a Cat 5e Ethernet cable or better.

1. Host computer with SoundGrid application
2. MADI-enabled console or device
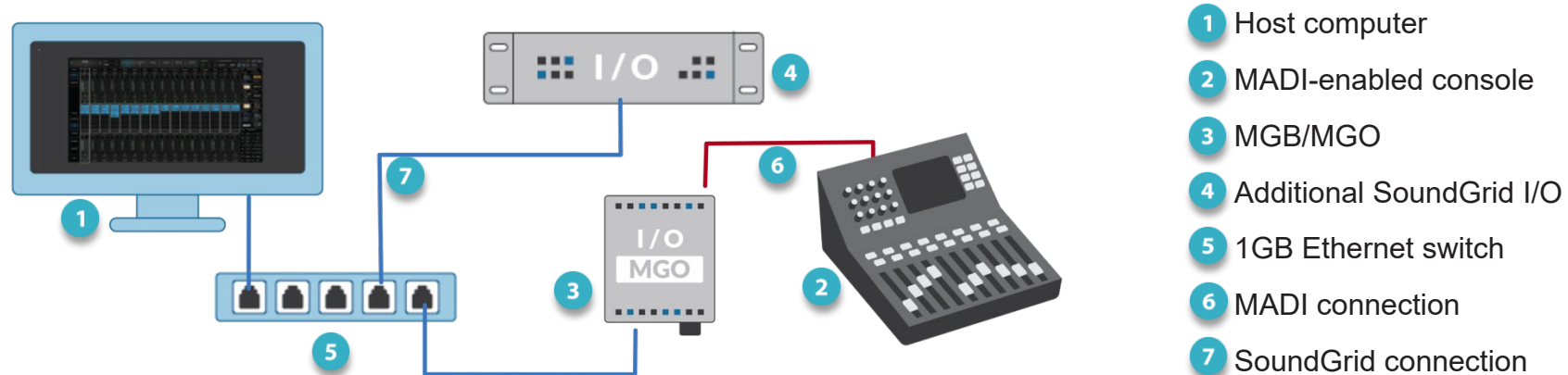3. MGB/MGO
4. MADI connection
5. SoundGrid connection

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 also lets you have separate devices for stage and FOH, or live room and control room. When there is more than one network connection, use a "star" network configuration with a 1GB Ethernet switch. Only use switches tested and approved by Waves.



1. Host computer
2. MADI-enabled console
3. MGB/MGO
4. Additional SoundGrid I/O
5. 1GB Ethernet switch
6. MADI connection
7. SoundGrid connection

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. 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 SoundGrid host application's user guide to learn about using servers.

## (B) *Download and Install Software*

### INSTALLING A NEW SOUNDGRID HOST SYSTEM

Installing the Waves SoundGrid host application will also install 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 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:
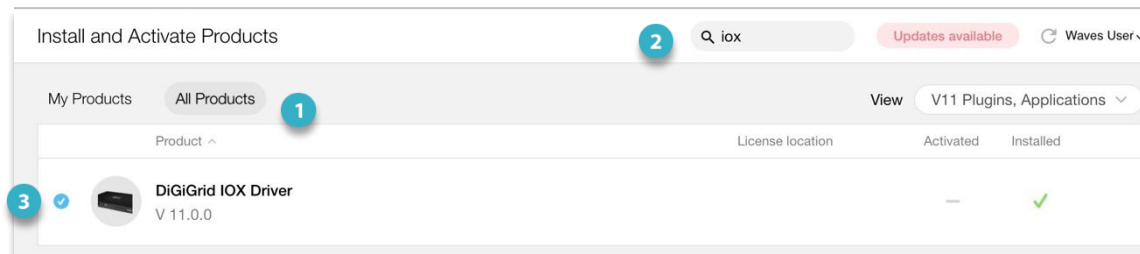


1. Choose **All Products**
2. Search for the driver by name
3. Choose the driver and click **Install**

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.

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[1] The SoundGrid QRec host is installed with any I/O.

## C 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.
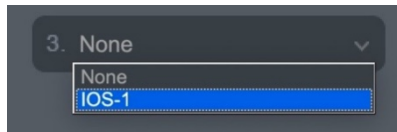


SoundGrid QRec



SoundGrid Studio Setup Window

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.

SoundGrid QRec

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.

SoundGrid Studio

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

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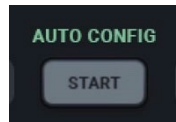
Certain SoundGrid hosts—including SoundGrid Studio, eMotion LV1 or SuperRack SoundGrid—offer an **Auto-Config** tool. Once your devices are connected and powered up, click **Auto Config** to start the configuration.

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.
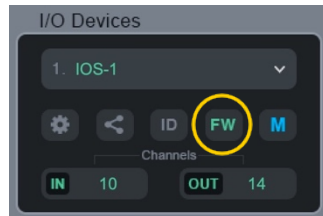
## Device Firmware

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.
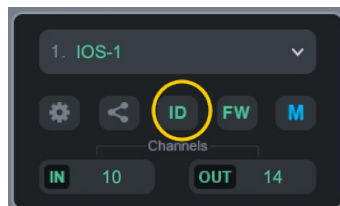
| | |
|---|---|
| Grey | Compatible firmware |
| Blue | Compatible firmware, but a newer version exists |
| Red | Firmware not compatible and must be updated in order to use |

SoundGrid Studio          SoundGrid QRec

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 front panel of the corresponding hardware device. You can also activate the front panel from the top bar of the device's control panel.

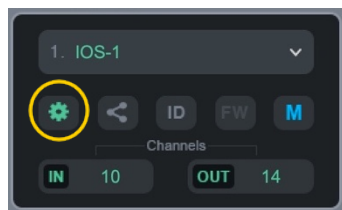SoundGrid Studio          SoundGrid QRec

# MGB / MGO Control Panel

There are two ways to open the device control panel:

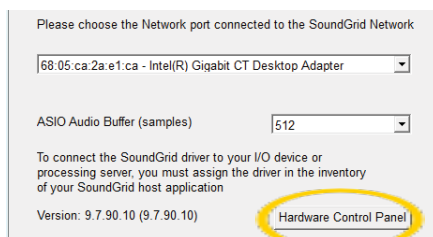FROM THE DEVICE RACK



SoundGrid Studio

SoundGrid QRec

Click on 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 **About** and **System Info** pages provide information about the unit, such as MAC address, SOE master MAC Address, firmware version, and more. The **Clock** and **MADI Options** pages are used to set up and manage the MGB/MGO.

## MADI Options page

The **MADI Options** page lets you select the appropriate channels mode for each MADI port.
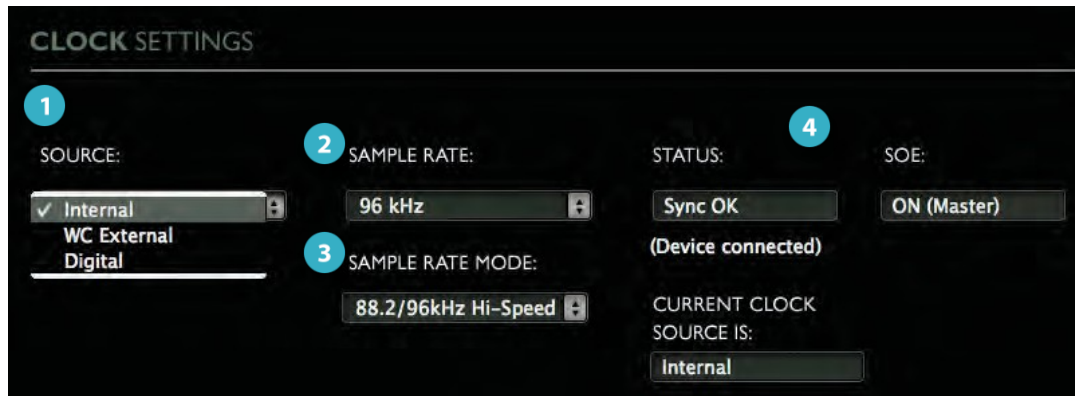


One MADI port connection supports 56 or 64 in/out channels at 44.1kHz/48 kHz, and 28 or 32 in/out channels at 88.2 kHz/96 kHz.

In **MADI Port Settings**, set the number of available channels according to your MADI device settings.
Range: 64/32 channels, 56/28 channels

## Clock Page

From the **Clock** page, you can control clock source, sample rate, and clock type, and assess clock status.



**1** **SOURCE** sets the clock source

| Internal | The interface itself provides the clock |
|---|---|
| External WC | The interface has a Word Clock Input connector to connect an external clocking source to sync all devices in your network to the external clock |
| Digital | Syncs via the BNC or optical MADI connection on MADI Port 1 or Port 2 (selectable). The MGB/MGO interfaces sync to the incoming MADI from the console or MADI enabled device. |
| Sync over Internet | Send or receive clock and sample rate over an Ethernet cable between SoundGrid network devices |

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

**3** **SAMPLE RATE MODE** sets the MADI mode for 88.2 kHz / 96 kHz operation. Check your MADI enabled console or device manual for the proper selection.
Range: High-Speed, SMUX

## 4 CLOCK STATUS INDICATORS
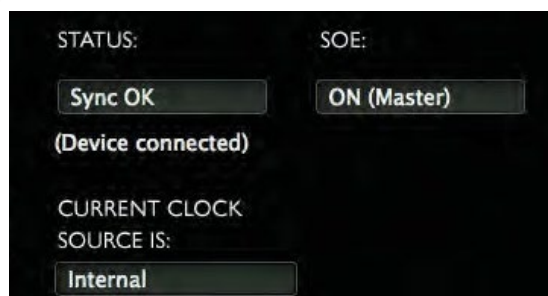


Three windows on the right side of the Clock control panel help you to quickly assess the network status of the MGO/MGB.

| Status | Reports the presence or absence of sync between the D and the SoundGrid network. |
|---|---|
| Current Clock Source | Displays the current sync method. |
| SOE | Indicates that the device is assigned to the SoundGrid network and whether it's the SOE master or a slave. |

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.

**CLOCK SOURCE AUTO-SWITCHING**

If the MGB/MGO is clocked to an external source and that source fails, the MGB/MGO will seek an alternate source of clock, in this order of priority: word clock, Digital 1, Digital 2, and finally SOE. If this fails, the device will switch to Internal.
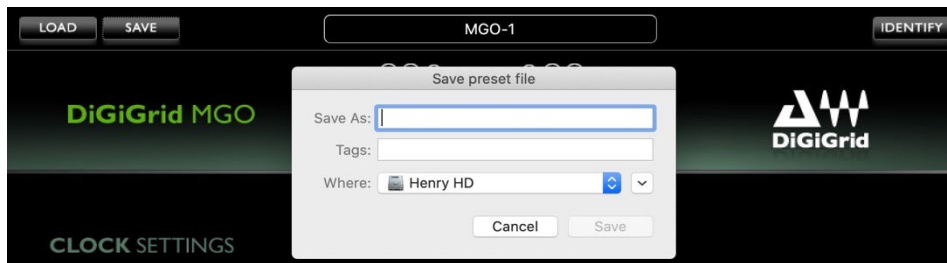
## System Info Page and About Page

The **About** page contains a description of the device. The **System Info** page contains technical details about the device, including MAC address and Firmware version. This information can be useful for troubleshooting.



## Presets

The top bar is used to load and save device presets and to identify device hardware.



A saved preset includes all Clock and MADI Options panels parameters. Save MGB/MGO presets to use on future sessions or copy them to another computer to duplicate a configuration.

Click the **Identify** button to indicate which MGB/MGO hardware device belongs to this Control Panel. Clicking the button causes the Network LED on the front panel of the MGB/MGO to flash in a rather psychedelic manner.

# 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.

# Specifications

**MGB**: MADI Coaxial I/O (BNC)

**MGO**: MADI Optical I/O (SFP Optics cartridges)

**SoundGrid Ethernet port (RJ45)**

**Supported sample rates:** 44.1kHz, 48 kHz, 88.2 kHz, 96 kHz

    112/128 channel I/O @ 48 kHz

    56/64 channel I/O @ 96 kHz

**Support for 64chn and 56chn modes**

**Support for double wire (48k frame) and single wire (96k frame) @96kHz**

**Clock Synchronization via (in fallback order):**

    Word Clock input, MADI (port A), SoundGrid (SOE), Internal

**Dimensions**

    Width: 10.6 cm / 4.17 inches
    Height: 14.82 cm / 5.83 inches
    Depth: 2.9 cm / 1.14 inches
    Device Weight: 0.4 kg / 0.88 lbs


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.