



## iLive and Waves SoundGrid

SoundGrid is an Audio-over-Ethernet networking and processing technology developed by Waves. Ideal for real-time professional audio applications, it provides an extremely low latency environment for high precision Waves audio processing using standard Gigabit Ethernet networks. Real-time audio processing is performed on Intel-based servers. Together with a separate control computer and an M-Waves card, audio can be sent from an iLive MixRack to the Server and back to the iLive after being processed by a multitude of Waves reverbs, equalizers, compressors and more.

M-Waves is one of a range of audio networking cards which can be fitted to iLive to enable integration with other systems. Besides the advantage of Waves plug-in processing, it is suitable for multitrack playback, recording and even linking modular iLive systems together with digital Front of House / Monitor split, provided that a separate audio clock is distributed.

M-Waves gives access to 64 input and 64 output channels and can be fitted to the expansion slot in iLive fixed format MixRacks (iDR-16, iDR-32, iDR-48 & iDR-64) or expander (xDR-16).

It can also be fitted to iLive modular MixRacks (iDR-0, iDR-10) if they are fitted with the new RAB-2 standard.



Several signals can be routed to the card for processing and recording, including any bus or Mix Channel (pre or post fade), Input Direct Out, Wedge and IEM monitors, MixRack Inputs, and Input or Mix Insert Sends. Inputs from the card can be routed to Input Channels, Mix External Inputs, Insert Returns, Output sockets and more.

An integrated Ethernet switch with two EtherCon and one RJ45 SoundGrid ports is provided on the M-Waves module to allow connection of multiple devices such as the SoundGrid Server and a computer for control of the network and plug-ins.

### APPLICATION EXAMPLE

Single system, Waves processing plus multitrack recording and playback.

An M-Waves option module is fitted in an iDR-48 MixRack. Up to 64 channels are processed by the SoundGrid Server. A separate computer running MultiRack is used for configuration, routing, plug-in control and recording / playback of up to 64 channels.









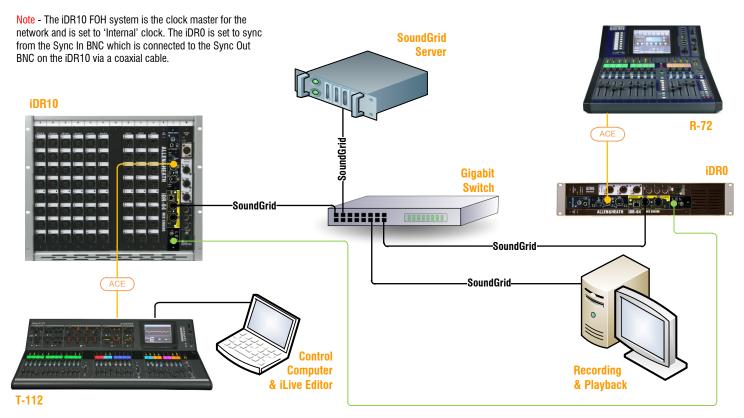






Distributed audio, Waves processing and multitrack recording / playback.

Here, the iDR0 is the Monitor system receiving most of its inputs digitally via SoundGrid. A laptop is connected to the surface and is being used to control the plug-ins, setup the SoundGrid network and run iLive Editor. SoundGrid data from the laptop is tunnelled over the ACE connection and bridged to the Waves card with a short Cat5 cable. A separate computer is running SG Driver for playback and recording.



Separate computers form the basis of a SoundGrid system:

#### SoundGrid Server

The SoundGrid Server is the 'number cruncher' which performs the audio processing. Audio is streamed from the card to the server, gets processed and is streamed back to the card.

Taking advantage of today's CPU power and memory capability of native processing, SoundGrid runs on standard CPUs dedicated exclusively to audio processing and under optimized Linux OS, resulting in predictability, stability, and low latency that was previously exclusive to dedicated DSP systems.

# SoundGrid Host

A standard Windows or Mac computer that runs the MultiRack SoundGrid control application and GUI functions. MultiRack displays rows of virtual plug-ins chains, named Racks, each of which chains up to eight Waves plug-ins. A Rack processes audio coming from a user-selected input and sends the processed output to a user-selected output.



Naming and grouping can be set for each Rack, Plug-in and Rack settings can be stored in Snapshots using the Top bar. Setup design and signal flow can be stored in Sessions. Up to 8 'Hot', important plug-ins can be set for fast access and control.













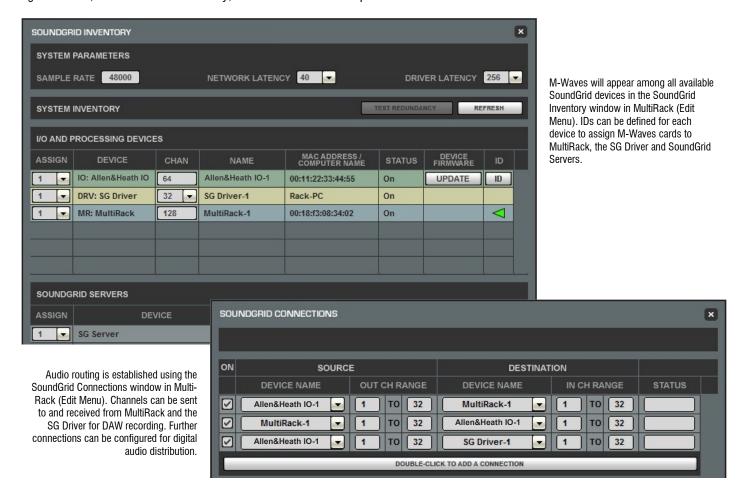
## Install, authorize and setup

Waves MultiRack and Waves plug-ins are installed by the Waves V8 standard installer available on www.waves.com. Once launched, select the MultiRack SoundGrid application and all desired plug-ins to be installed on your computer. The installation is straight forward - the relevant installers will guide you through the process.

In order to activate the Waves plug-ins an iLok key must be connected to the control computer. If you are not familiar with the process of downloading licenses to your iLok, please visit www.wavessupport.net.

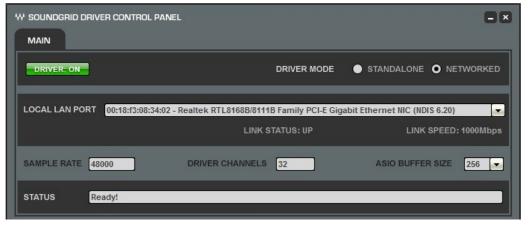


System configuration data is part of the SoundGrid protocol, allowing the user to connect and route audio between system components, configure servers, set buffer size and latency, monitor and control component status.



## SG Driver

The SG Driver Control Panel allows configuring DAW recording and playback. It is installed as a user-selectable option in the Waves V8 standard installer. The driver can also be installed on a separate computer for recording and playback applications only.



The correct Gigabit network adapter must be selected under 'Local LAN port'. The sample rate is set automatically to be slave to the iLive system 48kHz clock.

When combined with MultiRack and SoundGrid Servers. Driver Mode must be set to 'Networked'. As such, the driver expects MultiRack to configure it and route audio to and from it.

In Standalone mode the driver works as a standard ASIO or CoreAudio driver, and the System Inventory tab will list available I/O devices.



















## **ASIO STREAMER FAQ**

#### Q: Which cables and cable lengths can be used in a SoundGrid system?

A: Cat5e or Cat6 cables are required, with cable length strictly dependent on cable type. Cat6 allows for up to 70m between the iLive MixRack and the switch and 10m between the switch and any SoundGrid Server. Cat5e is limited to much shorter cable lengths. Please refer to http://www.waveslive.com/pdf/soundgrid-cables.pdf for more information.

### Q: Can I control plug-ins and routing from the iLive Surface?

A: No. A computer running SoundGrid MultiRack software is required.

#### Q: Is Waves SoundGrid Server One the only recommended computer for processing?

A: No. A list of third-party, tested and recommended workstations is available on www.waveslive.com, where the latest SoundGrid Server software can be purchased separately if needed. Waves servers come pre-installed with the software on an internal flash disk.

### Q: Do I need an Ethernet switch for my SoundGrid setup?

A: Most applications such as plug-in processing plus playback & recording do not strictly require an external switch, as the card comes with an integrated three-ports switch. When more devices are connected together in a network, a Gigabit Ethernet switch which supports jumbo frames is required. Please refer to www.waveslive.com for a list of tested and recommended switches.

#### Q: Can I use SoundGrid to record and playback using my existing DAW software?

A: SoundGrid works with standard ASIO drivers for Windows or the CoreAudio interface for OSX. These are supported by nearly all currently available professional level audio workstations such as Nuendo. Cubase. Reaper. Sonar. Pro Tools 9 and many others.

#### Q: Is the recording and playback pre or post Waves processing?

A: Channels can be set to record either pre or post MultiRack processing. Playback channels can be set to play pre or post processing. A selection of both pre and post channels can be configured too.

# Q: Does my computer need a static IP address?

A: No. SoundGrid uses IPv6 and RAW Ethernet. IPv4 settings do not affect communication between SoundGrid devices.

# Q: Can I use SoundGrid as my Surface to MixRack link?

A: No. M-Waves is not supported as a Port A primary audio link.

## Q: Can I use SoundGrid as my digital split between FOH and Monitor?

A: Only with modular iLive MixRacks equipped with RAB2 and separate clock distribution. M-Waves is fit in Port B and digital splits of the mic preamps in one system are sent over Cat6 cable to the second system. This provides independent trim, EQ, processing, FX, and mix-bus structure for each system. A coaxial cable runs from the Sync Out BNC on the master MixRack to the Sync In BNC on the slave MixRack.

## Q: Can I bridge my iLive control network into the Waves card?

A: Yes, this is desirable when a single computer is used for iLive Editor and MultiRack SoundGrid. Your computer must be set to a static IP address compatible with the iLive system.

# Q: If I bridge my iLive control network into the Waves card, can I connect the control computer at the Surface?

A: Yes, though recording and playback with SG Driver should be avoided in this scenario due to bandwidth limitations.

# Q: Which latency should I expect from SoundGrid processing and how many plug-ins can I run?

A: System performance depends on the SoundGrid Server. Server One can run up to 184 C4 or 232 SSL Channel plug-ins and has a throughput latency of 40 samples (less than 1ms). Please note that certain Waves plug-ins need to buffer audio in order to process, resulting in additional latency. A table indicating how much latency is produced by each plug-in is available on www.waveslive.com. The Group Properties window in MultiRack allows automatic or manual latency alignment of grouped Racks.

#### Q: Does SoundGrid support my existing Waves plug-ins?

A: Most Waves plug-ins are compatible with SoundGrid. Owners of Waves native plug-ins need to get a TDM license upgrade.

A compatibility chart is available here: http://www.waveslive.com/pdf/soundgrid-products.pdf.

Dedicated Pro. Essentials and Prelude bundles, hand-picked especially for FOH and Monitor engineers, are available for SoundGrid.

### Q: What is Waves TLC?

A: TLC is a Theft and Loss Coverage for the iLok-based license. For further information please visit www.waveslive.com.









