UNDERSTANDING M-DANTE

Dante is an Ethernet compliant, AVB-ready audio networking solution created and developed by Audinate. It provides high performance digital media networking that meets the quality requirements of professional live sound, AV installations and broadcast and recording systems. Dante is built on standard Internet Protocols over Ethernet. It distributes multiple streams of digital audio plus integrated control data and clock, with sub millisecond latency, sample-accurate playback synchronization, extreme reliability and high channel count.

Dante can be used for iLive or GLD expansion and integration with third party devices. Playback and recording without any third party audio interface are possible thanks to the Dante Virtual Soundcard.

It is also suitable for linking iLive and GLD systems together: typically for front of house / monitor systems where digital splits of the mic pre-amps in one system are sent over Cat5 cable to the second system. This provides independent trim, EQ, processing, FX, and mix-bus structure for each system.

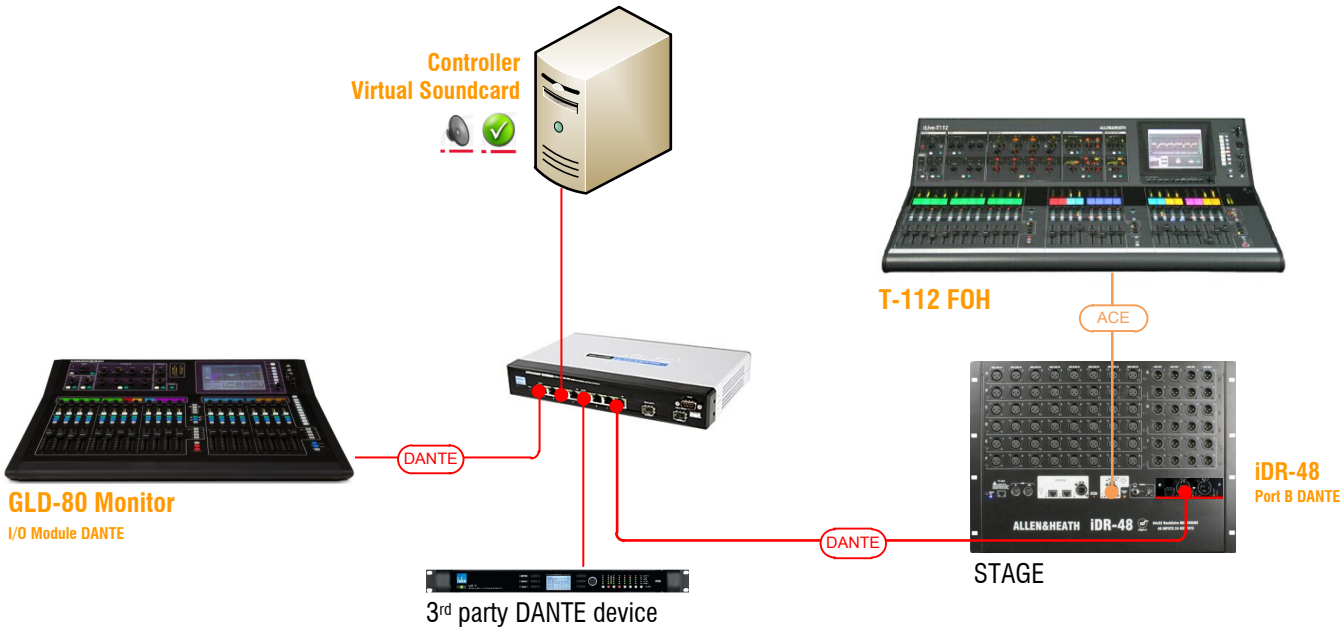
The M-DANTE option module is one of a range of option cards. It gives access to 64 input and 64 output channels and can be fitted to the Port B expansion slot in iLive fixed format MixRacks (iDR-16, iDR-32, iDR-48 & iDR-64) or expander (xDR-16), iLive modular MixRacks (iDR-0, iDR-10), and Port A of iLive surfaces 80/112/144/176 if they are fitted with the new RAB-2 standard with appropriate firmware version installed (1.71 or higher). It can also be fitted to the I/O Module expansion slot in GLD-80.

Cables up to 100m in length can be used. Cat5e or Cat6 cables are required for Gigabit networks and premium touring-grade flexible cables are preferable for live PA work. Allen & Heath can supply an 80m Neutrik 'Etherflex' cable on a drum (AH7000).

The M-DANTE option module can be fitted easily. It is installed (front-mounted) with the power off, and has two screws to secure it in place. The module has 3 Gigabit ports. The 'Control Network' port allows connection of a laptop for control of the Dante network using Audinate Dante Controller software. The 'Primary' and 'Secondary' links are designed to work as two separate Dante networks to provide redundancy. Do not connect these networks together.

APPLICATION EXAMPLE

Digital FOH / Monitor split with Record / Playback and speaker management.



The iDR-48 FOH system is the clock master for the network. The GLD-80 is the Monitor mixer receiving most of its inputs digitally via Dante. Outputs from iLive and/or GLD are also sent to a Dante-enabled loudspeaker processor or amplifier. A desktop computer is being used to control the DANTE network and record all audio signals sent from the iDR-48.

Note—The iDR-48 is set as the preferred clock master or Grand Master in the Dante Controller software. 'Slave to External Word Clock' is also selected, so that the M-DANTE module uses the internal system clock of the iLive as a reference. The iDR-48 is set to 'Internal' clock in iLive software and GLD is set to sync from the I/O Module.

DANTE VIRTUAL SOUNDCARD

Audinate's Dante Virtual Soundcard (DVS) is a software application that turns your computer into a Dante-enabled device, allowing Dante audio to be transmitted and received using its standard Ethernet port, either directly or through an Ethernet switch, ideal for multitrack recording and playback.

M-DANTE is shipped with a free DVS licence token to activate one computer. You can purchase more licences from Audinate if you need to run DVS on more than one computer.

Detailed information on downloading and activating the Dante Virtual Soundcard are included in the Getting Started Guide AP8340 shipped with the M-DANTE module. Please also read Audinate's Dante Virtual Soundcard User Guide for information describing how to install, configure and operate the software.

MULTITRACK RECORDING

Top-spec desktop workstations are often the way to go for professional, reliable audio recording and playback. Nevertheless, the following best practices should help to improve your overall I/O capability and get better audio performance.

The Dante Virtual Soundcard is a kernel-based driver. It can be set for latency values of 4, 6 or 10ms. Lower settings require greater resources from the host computer, and so should be used only with machines that exceed the minimum requirements. Some device drivers, including wireless adapters and FireWire interfaces, can hold the CPU for a long time, with spikes of several milliseconds, causing dropouts on playback and recording. Tools are available on-line to check and monitor your Deferred Procedure Call (DPC) latency. Make sure that you have installed the latest version of each driver. Disable the advanced visual effects in Windows. To prevent installed protocols and services interfering with the streaming, disable all non-essential options for your Network Interface from device properties in Windows Device Manager. Disable any unused Network Interface and any installed antivirus or firewall software. Some of these applications need complete removal from the system in order for the Dante Virtual Soundcard to work at its best. Audinate can provide more information on system requirements.

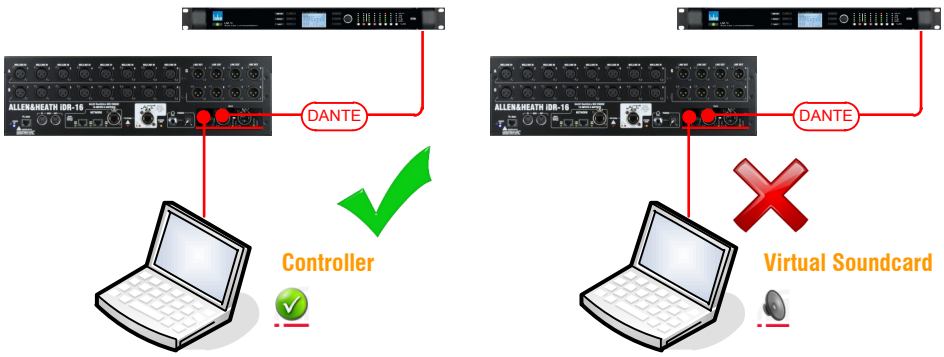
Direct recording data to a non-system, separate, fast hard drive, either internal or external. Multiple drives are recommended for recording more than 32 channels. Quit any unnecessary applications or services you may have running. It is always advisable either to run as few simultaneous applications as possible, or to have a completely separate dedicated machine for recording.

M-DANTE and the Dante Virtual Soundcard FAQ

Q: **Do I need an audio interface to record with Dante?**
A: No. One of the main benefits of Dante Virtual Soundcard is that it replaces expensive multichannel soundcard hardware. It works with any audio application that supports ASIO drivers (Windows) or the Core Audio interface (Mac). These include nearly all currently available professional level audio workstations such as Nuendo, Cubase, Reaper, Sonar, Logic, Pro Tools 9 and many others.

Q: **Can I install a single licensed copy of Dante Virtual Soundcard on all my computers?**
A: No. Dante Virtual Soundcard is licensed to one machine per license. Additional full licenses or temporary low-cost ones are available from the Audinate Store.

Q: **Can I use the Control Network port for recording?**
A: No. The Control Network port isn't intended for playback and recording purposes. It should only be used for connecting a computer running Dante Controller.



Q: **Can I playback audio files into the Dante network and iLive/GLD system using iTunes or Windows Media Player?**
A: In a Mac OS, all major applications including iTunes and QuickTime support the Core Audio interface and will recognize properly the Dante Virtual Soundcard. However, Windows Media Player doesn't support ASIO drivers. A suitable media player for the Windows environment is Winamp with the ASIO plugin installed.

Q: **How many channels can I record / playback with the Dante Virtual Soundcard?**
A: Dante Virtual Soundcard allows routing up to 64x64 channels. The actual channel count depends on your PC or Mac specs. Please read the 'Multitrack Recording' section in this document and visit www.audinate.com for further information.

Q: **What sample rates does the Dante Virtual Soundcard support?**
A: Dante Virtual Soundcard allows you to select either 48kHz or 96kHz sample rates, although iLive and GLD operate at 48kHz only.

Q: **Is there a recommended operating system for the Dante Virtual Soundcard?**
A: Windows 7 and Mac OS X have been found far more reliable than Windows XP SP3 and Vista.

IP ADDRESSING

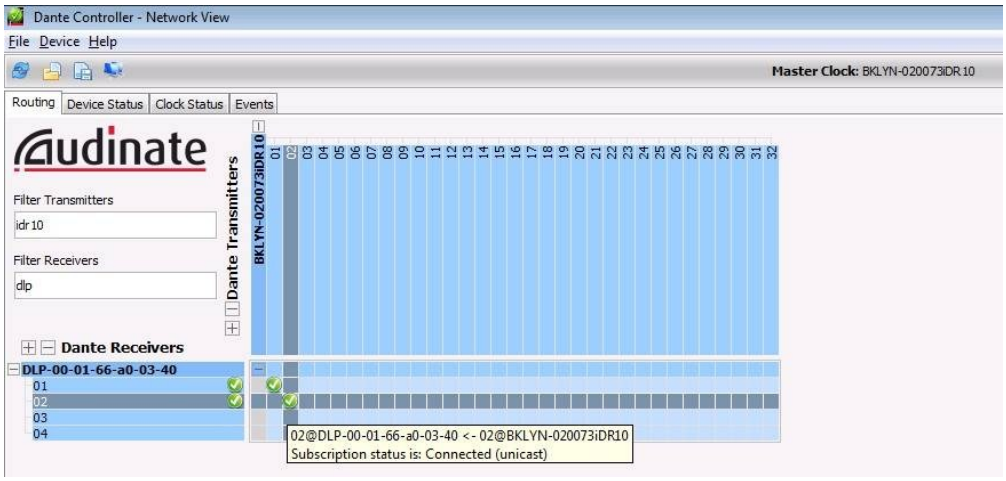
Dante uses 'Bonjour' Zero Config auto addressing protocol by Apple. If your network has a DHCP server, Dante devices will receive their IP configuration using the standard DHCP protocol. On a network without DHCP, a Dante-enabled device will automatically assign itself an address using 'Bonjour'.

DANTE CONTROLLER

You must have Audinate's Dante Controller software installed to configure and use your M-DANTE module.

Dante Controller is a software application that allows users to configure and route audio around Dante networks, view all Dante-enabled devices and their status, access clock settings, change the labels of transmitted audio channels etc. It is available as a free download to registered users on www.audinate.com, and can be installed on the same computer running the Dante Virtual Soundcard.

To install the Dante Controller on a PC you will need to download 'Bonjour' for Windows, so that your computer will get assigned a compatible IP address when connected to the network. A link is provided in the installer package. Please read the Dante Controller User Guide for information describing how to install, configure and use the software.



Clicking matrix crosspoints in the Routing page allows transmitting audio channels from the iLive system to any other device in the network, as well as receiving channels.

Don't forget to make the relevant patches in the iLive or GLD software OUTPUTS and PREAMP screens.

NETWORK recommendations and best practices

Make certain that your network is using good quality components and is running Gigabit throughout. This helps reducing latency and increases bandwidth flexibility. As a rule of thumb, a separate dedicated Dante network is recommended for critical, high channel-count applications.

If you need Dante, iLive control and third-party Ethernet traffic to be on the same network, your Ethernet switch must support Diffserv (DSCP) Quality of Service (QoS) with strict priority and 4 queues, as these features are used to prioritize clock sync and audio traffic over other network data. Please refer to the Audinate website for further recommendations. If a DHCP server is used and enabled in the iLive system, all devices on the network automatically get assigned a compatible IP address so both iLive and Dante devices can be viewed and controlled from the same computer. Because iLive devices do not support Zero Config auto addressing, on a network without DHCP you would need to manually assign each device (MixRack, Surface and TouchScreen) to a compatible, static address in the 169.254.xxx.xxx range.

When a Wi-Fi connection is necessary on the same network, e.g. to gain iPad MixPad control over your iLive system, Wi-Fi routers must support IGMP Snooping multicast protocol; MAC Id and ACL filtering are recommended to ensure that audio packets do not reach the wireless network, as these can easily saturate the wireless link.

Avoid using Dante Multicast streams* when Dante and iLive control are on the same network, as it can slow down metering / operation on iLive surfaces and Editor.

* Multicast is typically used when an audio channel is sent to multiple receivers at the same time, as it is a more efficient use of available bandwidth than using multiple Unicast connections. This is achieved by the switch sending copies of the original message to all interested parties.

M-DANTE Networking FAQ

Q: **What does AVB mean?**
A: AVB stands for Audio Video Bridging and is a common name for the set of standards in development by the IEEE 802.1 AVB Task Group. The charter of this organization is to provide the specifications that will allow time-synchronized low latency streaming services through Ethernet networks. AVB addresses multiple streams in the same network, phase coherency, latency and traffic management. It is fully compatible with TCP/IP data and non-AVB devices. A Stream Reservation Protocol is used to guarantee enough resources are allocated in each device. Please visit the AVnu Alliance website for more information: www.avnu.org

Q: **Can I connect Dante ports to an Ethernet network or a LAN?**
A: Yes. Dante uses the UDP/IP standard protocol to transmit audio, which is compatible with TCP/IP data. Unlike EtherSound and ACE, you can transmit audio along with regular IT network traffic. This allows third party Ethernet data such as DMX-over-Ethernet or amplifier/speaker control systems to be connected within the same Dante network. To prevent bandwidth-related issues please read the 'Network recommendations and best practices' section in this document.

Q: **Can Dante operate over a Wi-Fi network?**
A: No. The practical limitations of current wireless technology (802.11a/b/g/n) render reliable performance unachievable.

Q: **Can I sync my iLive or GLD system from an M-DANTE card?**
A: Yes. This is typically done when connecting two or more systems together (e.g. front of house / monitor systems).

Q: **Can I use redundant Dante connections with iLive or GLD?**
A: Redundant link capability is supported with upcoming firmware V3.5.x or higher.

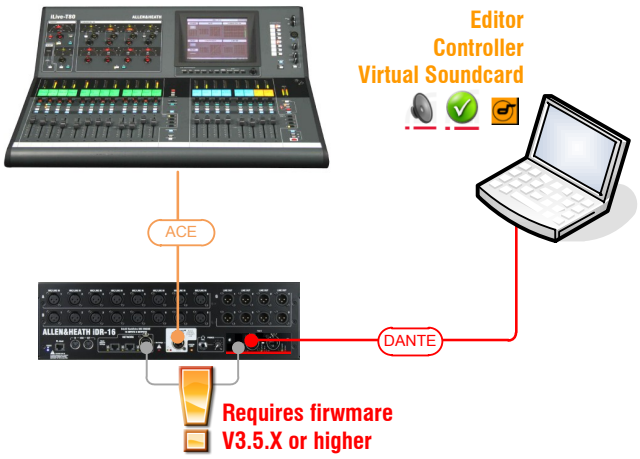
Q: **Can I use Dante as my iLive surface to MixRack link?**
A: Only with modular iLive surfaces and MixRacks equipped with RAB2. You can fit M-DANTE in Port A as your primary audio link, although the Dante network will need to be manually configured to support the required routing. Channels 1-32 will need to be transmitted between each device. Ch63-64 need to be routed from the MixRack to the surface for PAFL. Ch64 from the surface needs to be routed to Ch64 of the MixRack for talkback. The MixRack also needs to be set as the preferred master clock and 'Slave to External Word Clock' should be ticked.

Q: **Can I connect two devices directly together?**
A: Yes. This can be done for a Port A link between modular MixRacks and Surfaces, or between Port B of any two MixRacks in a split FOH / Monitor system. When using more devices a Gigabit switch is required to connect all devices on the network in a star configuration.

Q: **Should I bridge my iLive control network into the Dante module?**
A: This is desirable only in particular applications such as one-cable connection when a Port A link is established between modular MixRacks and Surfaces, or when a single computer is used for iLive Editor and Dante Controller. Please note bridging the iLive network over Dante is supported with firmware V3.5.x or higher.

When the iLive network is bridged into the Dante network, it is not advised to transmit Dante audio packets over the iLive network and Multicast Dante streams should be avoided.

Q: **Which version of iLive/GLD firmware do I need before using M-DANTE?**
A: iLive version 1.71 upwards, GLD version 1.00 upwards.
Check www.allen-heath.com for the latest version.



For more FAQs and information about Dante, Dante Controller and the Dante Virtual Soundcard, please visit www.audinate.com.