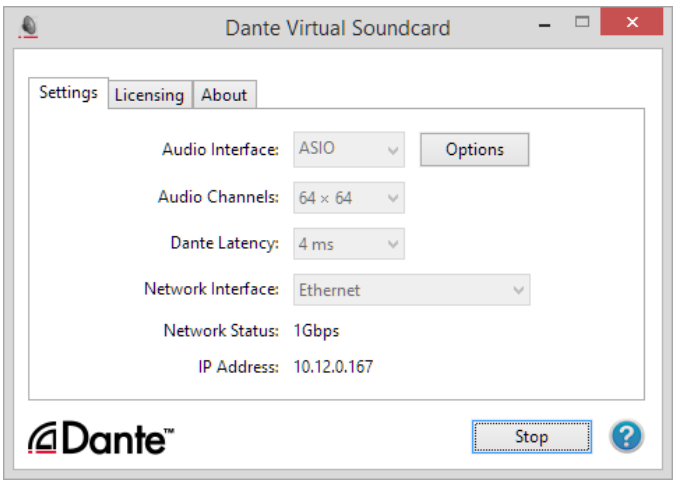
Dante Virtual Soundcard

User Guide

For Dante Virtual Soundcard software version 3.7.x.

For Windows, Windows Server and OS X



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Contacts

Audinate Pty Ltd

Level 1, 458 Wattle Street
Ultimo NSW 2007
AUSTRALIA
Tel. +61 2 8090 1000

Postal address

Audinate Pty Ltd
PO Box 855
Broadway NSW 2007
AUSTRALIA

Audinate Inc

1732 NW Quimby Street
Suite 215
Portland, OR 97209
USA
Tel: +1 503 224 2998
info@audinate.com
www.audinate.com

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About Audinate

Audinate revolutionizes AV systems to enable its customers to thrive in a networked world. Audinate's patented Dante media networking technology has been adopted by the leading manufacturers in the professional audio/visual industry.

Dante is used extensively for live performance events, commercial installation, broadcast, recording and production, and communications systems.

Audinate offices are located in US, UK and Australia. Visit www.audinate.com for the latest news and information on the company.

Dante is Digital Media Networking Perfected.

About Dante

Audinate's Dante technology provides high performance digital media networking that meets the quality and performance requirements of professional live sound, AV installations and broadcast and recording systems.

Designed to fully exploit the capabilities of today and tomorrow's networking equipment, Dante provides media transport mechanisms that eliminate many traditional audio network design restrictions. Dante makes it easy to set up robust, flexible digital audio networks with virtually unrestricted performance. A Dante network can be designed with mixed Gigabit and 100Mbps network speeds, simultaneously support audio with different sample rates and bit depths, and even allow the design of network zones with different latencies.

Dante is built on Internet Protocols – not just Ethernet. Because it uses standard IP over Ethernet, Dante is capable of running on inexpensive off-the-shelf computer networking hardware, and with the use of standard QoS can share installed networks with other data and computing traffic.

Dante provides sample-accurate synchronization and can deliver the very low latency required by professional audio. Dante's network-centric, audio-independent approach to synchronization allows perfectly synchronized playout across different audio channels, devices and networks, even over multiple switch hops.

Dante makes networking a true plug-and-play process, allowing automatic device discovery and system configuration. Dante-enabled devices will automatically setup their network configuration and advertise themselves and their channels on the network, reducing complicated, error-prone set-up procedures. Instead of 'magic numbers', networked devices and their input and output signals can be named to make sense to the user.

Dante is not restricted to allowing configuration and transmission of audio channels. Dante also provides mechanisms to send or receive control and monitoring information across the Dante IP network, including equipment-specific messages and control specified and developed by a particular manufacturer.

With its strong foundations and links to current and evolving network standards, Dante is able to deliver a level of future proofing otherwise unavailable in other types of digital audio transportation. Continued evolution of its networking technology is an integral part of the Dante roadmap.

Dante technology is available in ready-to-implement hardware and software products, reference designs and development APIs.

For more information, please visit the Audinate website at www.audinate.com.

About Dante Virtual Soundcard

Dante Virtual Soundcard is a software application that turns your PC or Mac into a Dante-enabled device, allowing Dante audio traffic to be transmitted and received using the standard Ethernet port. No additional hardware is required.

The latest version of Dante Virtual Soundcard supports the Core Audio (Mac OS X), Steinberg ASIO (Windows), and WDM (Windows) audio interfaces, and can be used with any supporting audio application.

Once you install Dante Virtual Soundcard on a computer and connect it to the Dante network, you can:

- View and change the current audio sample rate (via Dante Controller)
- Customize the Dante latency (the latency a receiving device should use before playout)
- Select your preferred Ethernet network interface
- Start and stop Dante Virtual Soundcard
- Select the number of audio channels available in Dante Virtual Soundcard

On Windows, you can also:

- Select ASIO or WDM mode
- View and set ASIO-specific options

Figure 1 - Running Dante Virtual Soundcard with an active 1Gbit network link (Windows)

What's New in version 3.7.x

v3.7.0

- User Interface redesign
  - Sample rate and audio format (bit depth) must now be set via Dante Controller
  - Channel count can now be set directly from the Settings screen
- Support for 16-bit and 32-bit audio
- Support for sample rate pull-up / down in ASIO and Core Audio
- Support for 176.4 kHz and 192 kHz sample rates in ASIO
- Support for 88.2 kHz and 96 kHz sample rates in WDM
- WDM channel support increased to 16
- Latency stats, late packet stats and signal presence (channel metering) are now exposed to Dante Controller
- Support for Windows 8.1
- Support for Windows Server 2008 R2 and 2012 R2
- Support for OS X 10.9.5 and 10.10

Previous versions

Windows v3.2

Released February 2013

- 44.1 kHz sample rate is now supported
- WDM audio is now supported
- Windows 8 is now supported (32-bit and 64-bit)

OS X v3.2

Released September 2011

The new feature for Dante Virtual Soundcard version 3.2 (Mac OS X only) is the addition of support for Mac OS X 10.7 (Lion), both 32- and 64-bit.

Before you Install: Important Notes

Dante Controller

You must have Dante Controller installed on a PC or Mac on your Dante network to control and route audio. It can be installed on the same computer as Dante Virtual Soundcard.

Dante Controller software can be downloaded from the Audinate website: www.audinate.com

Please refer to the Dante Controller User Guide for installation and operation instructions.

Minimum System Requirements

The tables below list the minimum system specifications your computer should meet to be able to use the Dante Virtual Soundcard in conjunction with a typical audio application such as Steinberg's Cubase. A more powerful computer may be required if the Dante Virtual Soundcard is being used with or alongside other applications requiring significant computing resources or disk I/O transfers.

Disclaimer: It is possible that your computer may meet the requirements below but suffer from some other individual performance limitation related to its particular hardware. Please seek the advice of your computer support team.

Note: The Dante Virtual Soundcard does not support virtual machines - it must be installed on a computer with a standard Windows or Mac OS X operating system.

General

Component	Minimum Requirement
Processor	Dual core CPU
Memory	1 Gigabyte of RAM
Network	Standard wired Ethernet network interface (100Mbps or Gigabit). On OS X, official Apple USB to Gigabit and Thunderbolt to Gigabit network adaptor cables are supported. A Gigabit (1000Mbps) interface is required for channel counts above 32x32 @48kHz. Wireless LAN (Wi-Fi) Ethernet interfaces are not supported.
Storage / Disk	As is the case with any application of this type, higher transfer rates are required for recording and playing back large numbers of audio tracks to and from disk. Disk speeds of 7200rpm and above are recommended for more than 16 channels of record / playback from disk.

Windows

Component	Minimum Requirement
Operating System	Windows 7 (SP1), 8 or 8.1, Server 2008 R2 or Server 2012 R2 **NOTE**: Both UTF-8 and Unicode are supported EXCEPT for host or device names; the DNS standard does not support Unicode for these.
Windows Drivers	System drivers must be of the performance standard expected by the Windows Logo Program
Audio Application	Must support the ASIO audio device interface for multi-channel recording / playback, or support WDM (Windows Driver Model) audio.

Mac OS X

Component	Minimum Requirement
Operating System	Mac OS X 10.7.5, 10.8.5, 10.9.5 or 10.10 NOTE: Intel architecture only; PPC not supported
Audio Application	Any audio application using the standard Core Audio interface to a sound card (e.g. iTunes, Cubase, Nuendo, Logic)

Operating System Updates

Ensure your computer has the latest Windows or Apple Updates installed.

Supporting Services

Dante Virtual Soundcard relies on supporting services for automatic Dante device discovery and for Dante device control and monitoring. These services must be installed and running for Dante software and devices to function properly.

On OS X, Dante Virtual Soundcard relies on the Apple Bonjour service for device discovery. Bonjour is installed as part of OS X, and runs automatically as a background service.

On Windows, Dante Virtual Soundcard uses the Audinate 'Dante Discovery' service for device discovery. Dante Discovery is installed and started automatically when you install Dante Virtual Soundcard.

On OS X and Windows, Dante devices and software use the Audinate 'ConMon' service for control and monitoring. ConMon is installed and started automatically when you install Dante Virtual Soundcard.

Firewall Configuration

Firewall configuration for Windows Firewall and Mac OS X built-in firewall is automatically handled during installation, and on system boot (every time the Dante Virtual Soundcard services start).

The Dante Virtual Soundcard communicates over UDP using the following ports:

- Dante Clock Synchronization: 319, 320
- Dante Audio Routing: 4440, 4444, 4445, 4455

- Dante Control and Monitoring: 8700-8708, 8800
- Dante Multicast and Unicast Audio: 4321, 14336 – 14600

If you are using a third-party firewall product, use the port information provided above to configure it accordingly.

Installing Dante Virtual Soundcard

This section overviews the installation and operation of Dante Virtual Soundcard.

Downloading Dante Virtual Soundcard

Dante Virtual Soundcard is available for download from Audinate's website.

To download a copy of Dante Virtual Soundcard:

1. Go to Audinate's website: www.audinate.com.
2. Navigate to **Products** > **Dante Virtual Soundcard**.
3. Under 'Download', choose your operating system.
4. Click the red download button.

This will take you to the appropriate DVS release page for your operating system.

Click the link under 'File downloads' to download the DVS installer.

Installing Dante Virtual Soundcard on Windows

Once you have downloaded the Dante Virtual Soundcard installer file, navigate to the directory where you have downloaded it.

To install:

1. Ensure you are logged on to your PC as an administrator.
2. Double-click the icon for the Dante Virtual Soundcard installer.
3. Read the license text, and if you accept the terms of the agreement, click the 'I Agree...' checkbox.

   If you do not accept the terms, click **Close** to terminate the installation.
4. The Network Throttling Management screen is displayed. Audinate advises that you let Dante Virtual Soundcard manage network throttling (the default option).
5. Click **Install**.
6. Acknowledge / accept any Windows security warnings that are displayed.

Note: If you are upgrading to a new version of Dante Virtual Soundcard, you do not need to uninstall the previous version first. If you do uninstall the previous version before upgrading, you will need to re-enter your license key to activate the software.

Note: If you have Dante Virtual Soundcard selected as the default audio interface in Windows, upgrading to a new version of Dante Virtual Soundcard will reset the selection to an alternative interface, and you will need to reselect Dante Virtual Soundcard following the upgrade.

If you already have the latest version of Dante Virtual Soundcard installed, running the installer again will allow you to repair or uninstall the application.

Installing Dante Virtual Soundcard on Mac OS X

To install Dante Virtual Soundcard on Mac OS X:

1. Double-click the Dante Virtual Soundcard .dmg file.
2. A drive icon will appear on your Desktop Finder window. Double click it to open.
3. Double-click the Dante Virtual Soundcard.pkg. This will run the installer.
4. Read the license text, and if you accept the terms of the agreement, click **Agree**.

   If you do not accept these terms, click **Disagree** to terminate the installation.

Uninstalling Previous Versions

You do not usually need to uninstall a previous version of Dante Virtual Soundcard before installing a new version.

However, if you should need to uninstall Dante Virtual Soundcard:

Windows

- To uninstall via the Windows Control Panel: **Start** > **Control Panel** > **Add or Remove Programs**
- To uninstall via the Audinate uninstaller: **Program files / apps** > **Audinate** > **Dante Virtual Soundcard** > **Uninstall**

Mac OS X

To uninstall previous versions of the Dante Virtual Soundcard, please use the Uninstall tool available in the new .dmg file.

Starting the Dante Virtual Soundcard Control Panel

The Dante Virtual Soundcard Control Panel enables user interaction with Dante Virtual Soundcard.

Windows

By default the Dante Virtual Soundcard will be installed in:

`C:\Program Files\Audinate\Dante Virtual Soundcard\`

In 64-bit Windows, it will appear under `C:\Program Files (x86)`

The Dante Virtual Soundcard Control Panel can be started in one of two ways:

- Using the Start menu: **Start** > **Programs** > **Audinate** > **Dante Virtual Soundcard** > **Dante Virtual Soundcard**; or
- Windows 8: **Windows** key > **Dante Virtual Soundcard**
- Navigate to the directory where it is installed, and double-click the Dante Virtual Soundcard icon: 

Mac OS X

The Dante Virtual Soundcard application will be installed in the Applications folder.

To start the Dante Virtual Soundcard Control Panel:

- Navigate to the Applications folder, and click the Dante Virtual Soundcard icon: 

Obtaining a Dante Virtual Soundcard License

Dante Virtual Soundcard will not operate until a valid License ID has been entered and activated.

The first time you start the Dante Virtual Soundcard Control Panel, you will be presented with the Licensing screen.

Obtaining a License ID

You are required to register with Audinate at www.audinate.com and provide an email address to obtain a valid License ID for Dante Virtual Soundcard.

Note: If you have purchased a Dante product that entitles you to a free or discounted copy of Dante Virtual Soundcard, details of how to obtain this will be provided in the documentation accompanying your product.

If the machine on which you are installing Dante Virtual Soundcard is connected to the Internet, click the **Get a License** button to be taken directly to the Audinate website.

Entering a License ID

Once you have obtained a License ID, it can be entered in the Licensing tab. The **Activate** button is not enabled until a correctly formatted License ID has been entered into the dialog box.

You can paste the entire license ID directly into the first text field on the licensing screen, or enter the license manually using the keyboard.

Click **Activate** to register the installation with the Audinate servers.

Note: Ensure that your computer has access to the Internet during this step.

Once this step has been completed, a “Licensed to …” message will appear, and the software is ready for use. The Control Panel will appear as shown below:

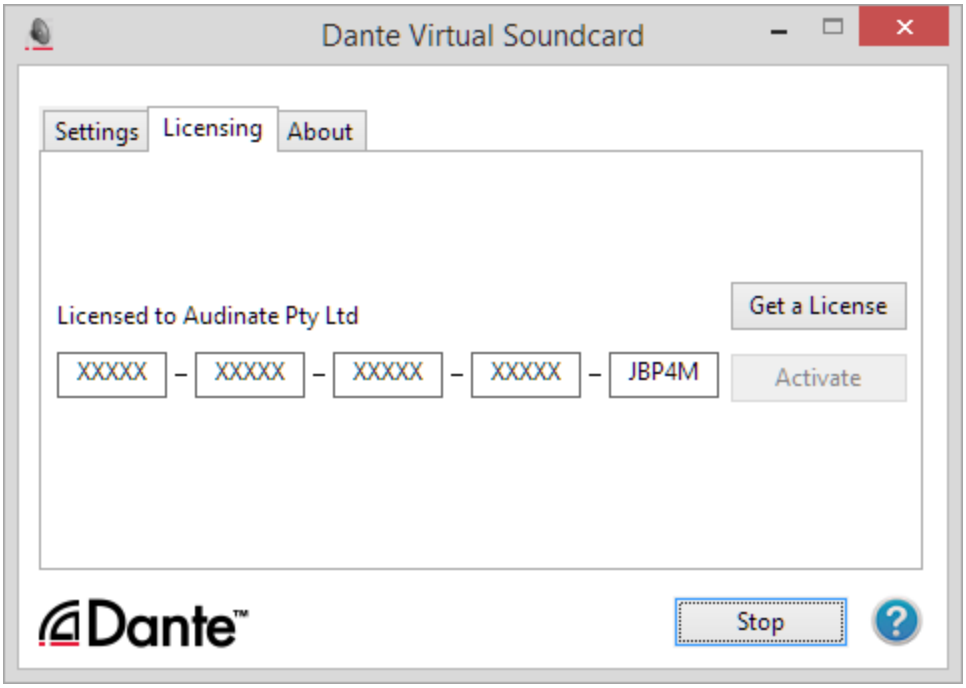


Figure 2 - Dante Virtual Soundcard Licensing Screen - Licensed (Windows)

If you are using a trial license the Control Panel will appear as shown below:

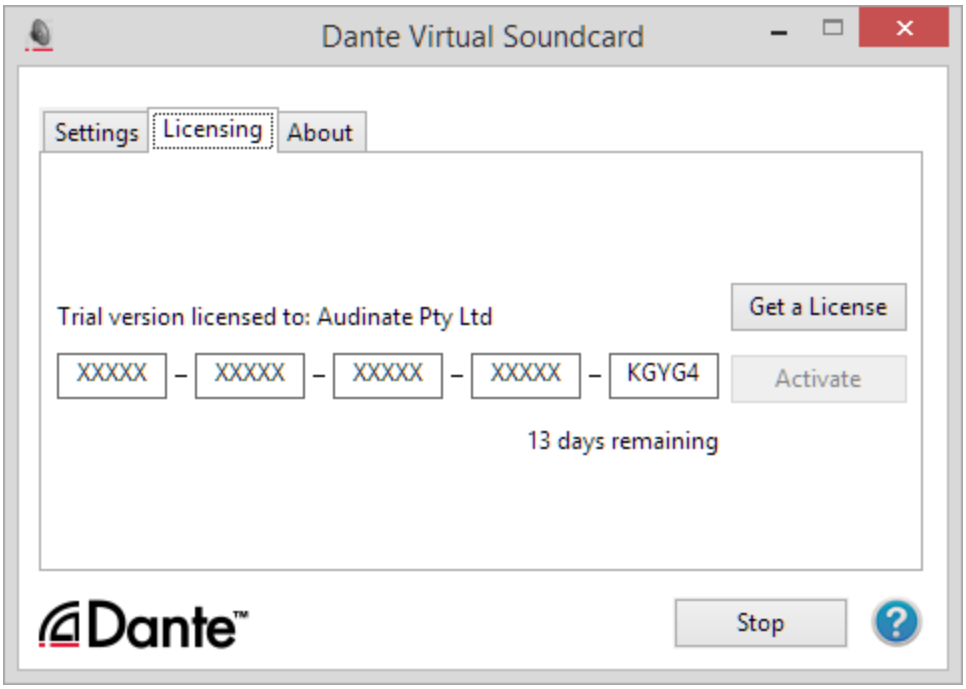


Figure 3 - Dante Virtual Soundcard Licensing Screen - Trial License (Windows)

In order to continue to use the Dante Virtual Soundcard after the trial period has expired, you will need to purchase a full license.

Configuring Dante Virtual Soundcard

It is important to understand that the Control Panel that is displayed when you click on the Dante Virtual Soundcard icon  is a means of configuring and controlling Dante Virtual Soundcard, it is NOT the Dante Virtual Soundcard itself. The actual Dante Virtual Soundcard runs as a background process.

When you open the Dante Virtual Soundcard Control Panel, you are presented with a window with three tabs: Settings, Licensing and About. The **Settings** tab is selected by default when the application is opened.

Settings Available in Dante Controller

Some Dante Virtual Soundcard settings are only configurable via Dante Controller:

- Device Name
- Sample Rate (and sample rate pull-up/down in Windows)
- Encoding (audio bit depth)

To change these settings, use the Device Config tab of the Device View in Dante Controller.

To open the Device View > Device Config tab:

1. Completely quit out of any audio applications (such as DAWs) that are using Dante Virtual Soundcard. Connected applications may prevent new settings from taking effect.
2. Ensure Dante Virtual Soundcard is running.
3. In Dante Controller, open the device view for Dante Virtual Soundcard - either:
    - Double-click the Dante Virtual Soundcard device in the routing view, or:
    - Use Ctrl + D (command + D for OS X) to open the device view, and select the Dante Virtual Soundcard device from the drop-down menu.
4. Click the Device Config tab.

See the Dante Controller user guide for more information about configuring Dante devices.

Changing the Device Name

By default, Dante Virtual Soundcard will appear in Dante Controller with the same name as the computer on which it is installed.

To change the Dante Virtual Soundcard device name:

1. In Dante Controller, open the Device Config tab for Dante Virtual Soundcard.
2. In the Rename Device field, enter the new device name and click **Apply**.

Changing the Sample Rate

To change the sample rate and sample rate pull-up/down (Windows only) for Dante Virtual Soundcard:

1. In Dante Controller, open the Device Config tab for Dante Virtual Soundcard.
2. Use the Sample Rate drop-down menus to set the required sample rate and pull-up/down.

Note: Changing the sample rate will interrupt audio.

Note: Increasing the sample rate in Dante Controller may reduce the channel count ('Audio Channels') setting on Dante Virtual Soundcard, if the channel count setting is not supported at the new sample rate. Subsequently decreasing the sample rate, however, will not restore the channel count setting to its previous value.

About sample rate pull-up/down

Sample rate pull-up down allows you to adjust the sample rate to account for frame rate conversion in video.

Note: Supported on ASIO and OS X only.

Note: Applying pull-up/down places the device in a dedicated clock domain, so it will only be able to sync with other devices with the same sample rate and pull-up/down.

Changing the Encoding

The encoding value is the audio bit depth.

To change the encoding setting:

1. In Dante Controller, open the Device Config tab for Dante Virtual Soundcard.
2. Use the Encoding drop-down menu to set the required bit depth.

Note: Changing the encoding setting will interrupt audio.

Supported Audio Formats

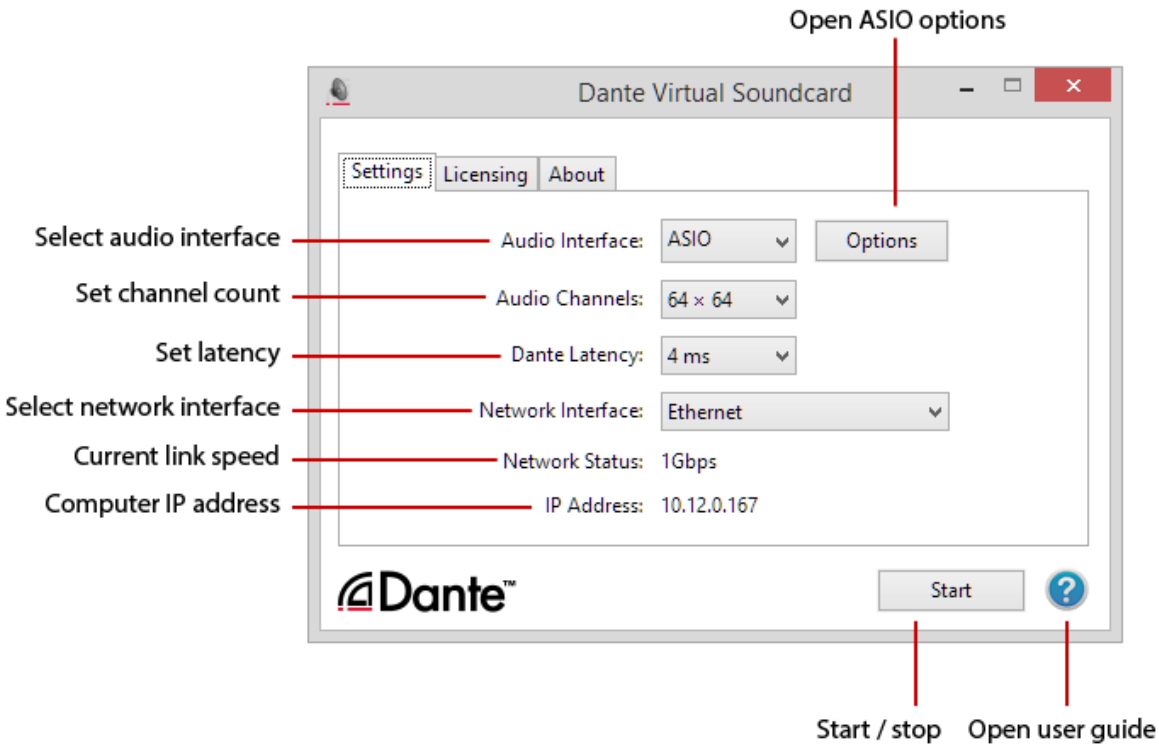
The supported audio formats are shown below.

Audio format	Supported values		
	ASIO (Windows)	WDM (Windows)	Core Audio (OS X)
Sample rate	■ 44.1 kHz ■ 48 kHz ■ 88.2 kHz ■ 96 kHz ■ 176.4 kHz ■ 192 kHz	■ 44.1 kHz ■ 48 kHz ■ 88.2 kHz ■ 96 kHz	■ 44.1 kHz ■ 48 kHz ■ 88.2 kHz ■ 96 kHz ■ 176.4 kHz ■ 192 kHz
Bit depth	■ 16 bit ■ 24 bit ■ 32 bit	■ 16 bit ■ 24 bit ■ 32 bit	■ 16 bit ■ 24 bit ■ 32 bit

Changing Settings in Windows

The Settings tab is the first screen you see when you open the Dante Virtual Soundcard Control Panel.

Note: Most settings cannot be changed while Dante Virtual Soundcard is running, or when an ASIO application is connected.



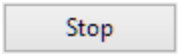
To change settings:

1. Completely quit out of any audio applications that are using the Dante Virtual Soundcard.
2. Stop Dante Virtual Soundcard.
3. Change your Dante Virtual Soundcard settings.
4. Restart Dante Virtual Soundcard.
5. Restart your audio application/s.

Note: The device name and audio format (sample rate and bit depth) must be set in Dante Controller, while Dante Virtual Soundcard is running. You should quit out of any connected applications before changing the device name or audio format.

Start / Stop

The Start / Stop button in the Settings Tab indicates whether Dante Virtual Soundcard is currently running, and can be used to toggle the running state.



Button shows 'Stop': Dante Virtual Soundcard is currently running

Button shows 'Start': Dante Virtual Soundcard is currently stopped

Click the button to toggle the running state of Dante Virtual Soundcard.

Important: If you are recording via Dante Virtual Soundcard, stop the recording *before* you stop Dante Virtual Soundcard. Stopping Dante Virtual Soundcard off during a recording can lead to driver instability issues.

Note: Dante Virtual Soundcard can be either on or off (running or stopped) when the Dante Virtual Soundcard Control Panel is started. It will always be in the state it was in when the Control Panel was last closed. If the computer is power cycled, Dante Virtual Soundcard will resume in the state it was in when the computer was powered off.

When Dante Virtual Soundcard is running, it will be visible in Dante Controller. By default, the device name shown in Dante Controller will be the same as the name of the computer on which it is running.

Most Dante Virtual Soundcard settings can only be changed while it is stopped.

Audio Interface

Use the Audio Interface drop-down menu to switch between ASIO and WDM audio engines. Dante Virtual Soundcard must be stopped before you can change the Audio Interface.

ASIO

In ASIO mode, Dante Virtual Soundcard supports audio applications that use ASIO audio, for example Steinberg Cubase or Nuendo, Avid Pro Tools and Ableton Live.

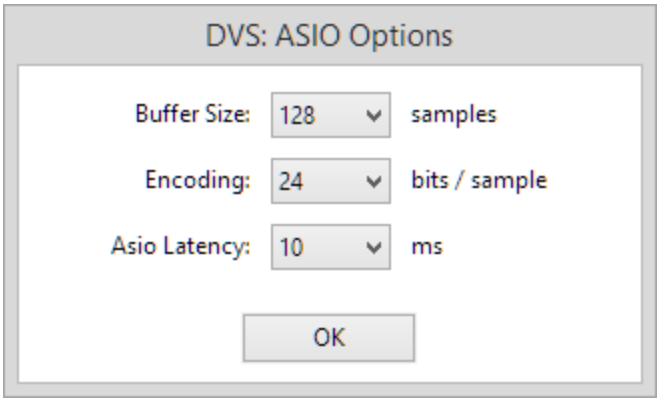
In ASIO mode, the Options button is enabled.

WDM

In WDM mode, Dante Virtual Soundcard supports audio applications that use WDM audio, for example iTunes for Windows, Windows Media Player and Skype.

Options

This button is only available in Dante Virtual Soundcard for Windows, in ASIO mode. The OS X version of Dante Virtual Soundcard uses Core Audio, and has no related user-configurable settings.



The ASIO options supported by Dante Virtual Soundcard are shown below.

Setting	Description	Allowed values
Buffer Size	Size (in audio samples) of the ASIO buffer used when transporting audio between Dante Virtual Soundcard and the audio application. Computers with poor scheduling performance will need to use a higher setting. By default, the Buffer size is set to 128 samples.	32, 64, 128, 256, 512, 1024, or 2048 samples
Encoding	Default: 24 bit. The bit depth required by the audio application being used with Dante Virtual Soundcard. Some audio applications may not support the Dante network's native 24-bit, and will need a different bit depth set at the ASIO interface. If the ASIO bit depth does not match the Dante Virtual Soundcard bit depth set in Dante Controller, all received audio is truncated or padded to the value the application supports, and vice versa.	16, 24 or 32 bits
ASIO Latency	Latency to insert before transmitting audio from the ASIO buffer on to the Dante network. This compensates for the variability in computer scheduling. By default, the ASIO latency is set to 10ms.	1, 2, 3, 5, 10 and 20ms

Audio Channels

Use the Audio Channels drop-down menu to set the number of transmit and receive Dante audio channels available and advertised on the network. This enables the number of channels shown in Dante Controller (and any connected audio application) to be limited, if required. The maximum number of channels supported depends on the interface type and the selected audio format.

Important: The number of Dante audio channels that can be reliably handled by Dante Virtual Soundcard is dependent on the network speed and sample rate. The maximum recommended number of channels is shown in the table below.

Network speed	Max Channels @ 48kHz / 24bit	Max Channels @ 96kHz / 24bit	Max Channels @ 192kHz / 24bit
100Mbps	32x32	16x16	8x8
1000Mbps (Gigabit)	64x64	32x32	8x8

Note: A Gigabit network is recommended for best performance.

Note: For recording and playing back more than 16 audio tracks to and from disk, disk speeds of 7200rpm and above are recommended.

Dante Latency

The Dante Latency drop-down menu allows you to set the device latency (time before playout).

A Dante device receiving audio from Dante Virtual Soundcard will use this value (unless the receiving device only supports higher latencies). The latency compensates primarily for computer scheduling jitter, as well as delay variations encountered in the network.

Supported values are:

- 4ms (low)
- 6ms (medium)*
- 10ms (high)*

** Not supported at sample rates of 176.4 kHz or 192 kHz when transmitting to hardware devices running Dante firmware v3.7.x or earlier. In order to enable these latency settings for the higher sample rates, upgrade your Dante device firmware to v3.8.x or above. Please contact your device manufacturer for information about Dante firmware upgrades.*

As a rule of thumb, 4ms can be used where Dante Virtual Soundcard is running on a high-spec computer with low scheduling jitter. Computers with poor scheduling performance may need to use the 10ms Dante Latency setting.

Note: If the Dante Latency setting is set too low to compensate for network delay variation and computer scheduling jitter, there is a risk of intermittent loss of audio.

Network Interface

The Network Interface drop-down menu allows you to select the computer's network interface that Dante Virtual Soundcard will use to transmit and receive Dante audio.

The available entries will be all the wired Ethernet network interfaces currently enabled on the machine. For machines with only one Ethernet network interface enabled, there will only be one option available.

The IP address of the currently selected interface is displayed below the Network Status field.

Note: Dante Virtual Soundcard does not support wireless, Bluetooth or bridged Ethernet interfaces. On OS X, official Apple USB to Gigabit and Thunderbolt to Gigabit network adaptor cables are supported. USB is not supported on Windows.

Note: All Dante applications on the same computer have a shared understanding of the primary Dante interface. For example, if you have installed Dante Controller on the same PC as Dante Virtual Soundcard, and a new primary interface is selected from within Dante Controller, Dante Virtual Soundcard will automatically switch to the newly selected interface, and begin operating on that interface.

Network Status

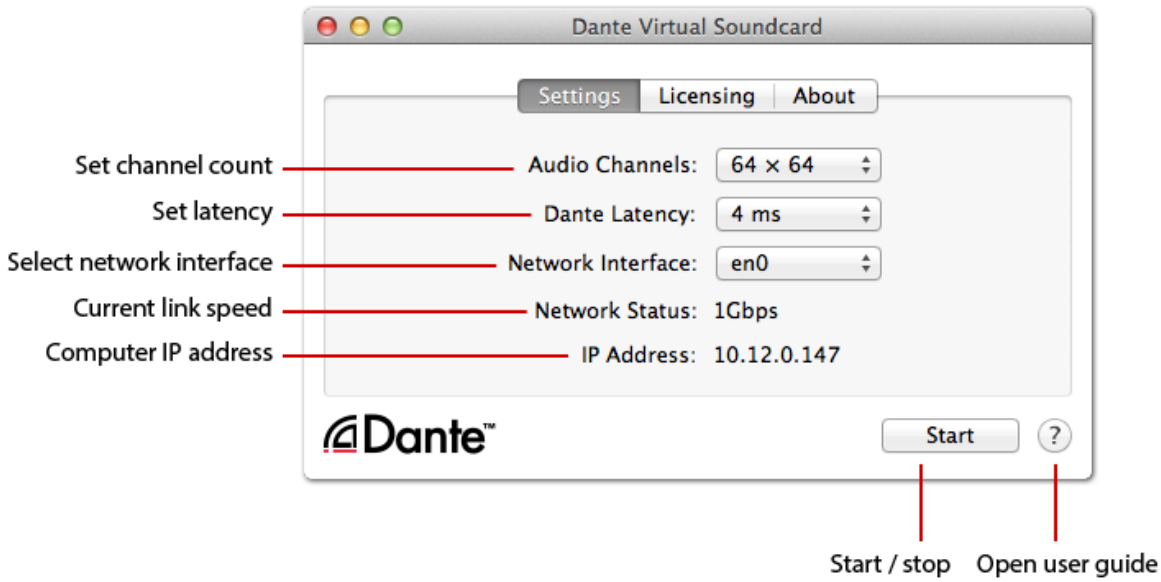
The Network Status value indicates the link speed of the computer's Ethernet network interface that is currently in use by Dante Virtual Soundcard. It can have the following values:

- 1Gbps (1 gigabit per second)
- 100Mbps (100 megabits per second)
- N/A (no Ethernet network detected)

Changing Settings in OS X

The Settings tab is the first screen you see when you open the Dante Virtual Soundcard Control Panel.

Note: Settings cannot be changed while Dante Virtual Soundcard is running.



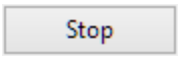
To change settings:

1. Completely quit out of any audio applications that are using the Dante Virtual Soundcard.
2. Stop Dante Virtual Soundcard.
3. Change your Dante Virtual Soundcard settings.
4. Restart Dante Virtual Soundcard.
5. Restart your audio application/s.

Note: The device name and audio format (sample rate and bit depth) must be set in Dante Controller, while Dante Virtual Soundcard is running. You should quit out of any connected applications before changing the device name or audio format.

Start / Stop

The Start / Stop button in the Settings Tab indicates whether Dante Virtual Soundcard is currently running, and can be used to toggle the running state.



Button shows 'Stop': Dante Virtual Soundcard is currently running

Button shows 'Start': Dante Virtual Soundcard is currently stopped

Click the button to toggle the running state of Dante Virtual Soundcard.

Important: If you are recording via Dante Virtual Soundcard, stop the recording *before* you stop Dante Virtual Soundcard. Stopping Dante Virtual Soundcard off during a recording can lead to driver instability issues.

Note: Dante Virtual Soundcard can be either on or off (running or stopped) when the Dante Virtual Soundcard Control Panel is started. It will always be in the state it was in when the Control Panel was last closed. If the computer is power cycled, Dante Virtual Soundcard will resume in the state it was in when the computer was powered off.

When Dante Virtual Soundcard is running, it will be visible in Dante Controller. By default, the device name shown in Dante Controller will be the same as the name of the computer on which it is running.

Most Dante Virtual Soundcard settings can only be changed while it is stopped.

Audio Channels

Use the Audio Channels drop-down menu to set the number of transmit and receive Dante audio channels available and advertised on the network. This enables the number of channels shown in Dante Controller (and any connected audio application) to be limited, if required. The maximum number of channels supported depends on the interface type and the selected audio format.

Important: The number of Dante audio channels that can be reliably handled by Dante Virtual Soundcard is dependent on the network speed and sample rate. The maximum recommended number of channels is shown in the table below.

Network speed	Max Channels @ 48kHz / 24bit	Max Channels @ 96kHz / 24bit	Max Channels @ 192kHz / 24bit
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1000Mbps (Gigabit)	64x64	32x32	8x8

Note: A Gigabit network is recommended for best performance.

Note: For recording and playing back more than 16 audio tracks to and from disk, disk speeds of 7200rpm and above are recommended.

Dante Latency

The Dante Latency drop-down menu allows you to set the device latency (time before playout).

A Dante device receiving audio from Dante Virtual Soundcard will use this value (unless the receiving device only supports higher latencies). The latency compensates primarily for computer scheduling jitter, as well as delay variations encountered in the network.

Supported values are:

- 4ms (low)
- 6ms (medium)*
- 10ms (high)*

** Not supported at sample rates of 176.4 kHz or 192 kHz when transmitting to hardware devices running Dante firmware v3.7.x or earlier. In order to enable these latency settings for the higher sample rates, upgrade your Dante device firmware to v3.8.x or above. Please contact your device manufacturer for information about Dante firmware upgrades.*

As a rule of thumb, 4ms can be used where Dante Virtual Soundcard is running on a high-spec computer with low scheduling jitter. Computers with poor scheduling performance may need to use the 10ms Dante Latency setting.

Note: If the Dante Latency setting is set too low to compensate for network delay variation and computer scheduling jitter, there is a risk of intermittent loss of audio.

Network Interface

The Network Interface drop-down menu allows you to select the computer's network interface that Dante Virtual Soundcard will use to transmit and receive Dante audio.

The available entries will be all the wired Ethernet network interfaces currently enabled on the machine. For machines with only one Ethernet network interface enabled, there will only be one option available.

The IP address of the currently selected interface is displayed below the Network Status field.

Note: Dante Virtual Soundcard does not support wireless, Bluetooth or bridged Ethernet interfaces. On OS X, official Apple USB to Gigabit and Thunderbolt to Gigabit network adaptor cables are supported. USB is not supported on Windows.

Note: All Dante applications on the same computer have a shared understanding of the primary Dante interface. For example, if you have installed Dante Controller on the same PC as Dante Virtual Soundcard, and a new primary interface is selected from within Dante Controller, Dante Virtual Soundcard will automatically switch to the newly selected interface, and begin operating on that interface.

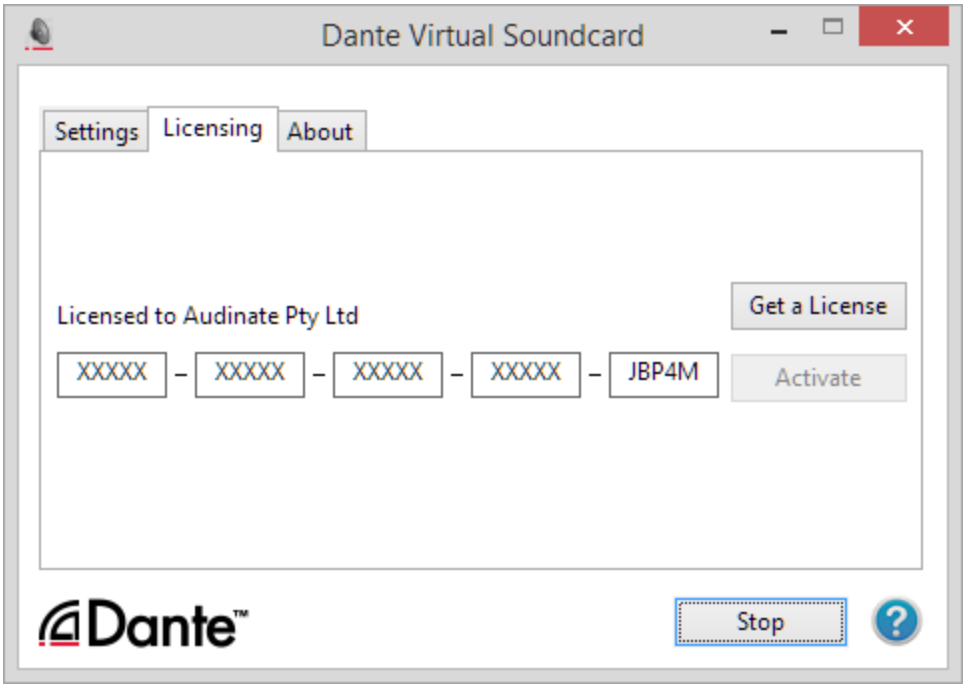
Network Status

The Network Status value indicates the link speed of the computer's Ethernet network interface that is currently in use by Dante Virtual Soundcard. It can have the following values:

- 1Gbps (1 gigabit per second)
- 100Mbps (100 megabits per second)
- N/A (no Ethernet network detected)

Licensing Tab

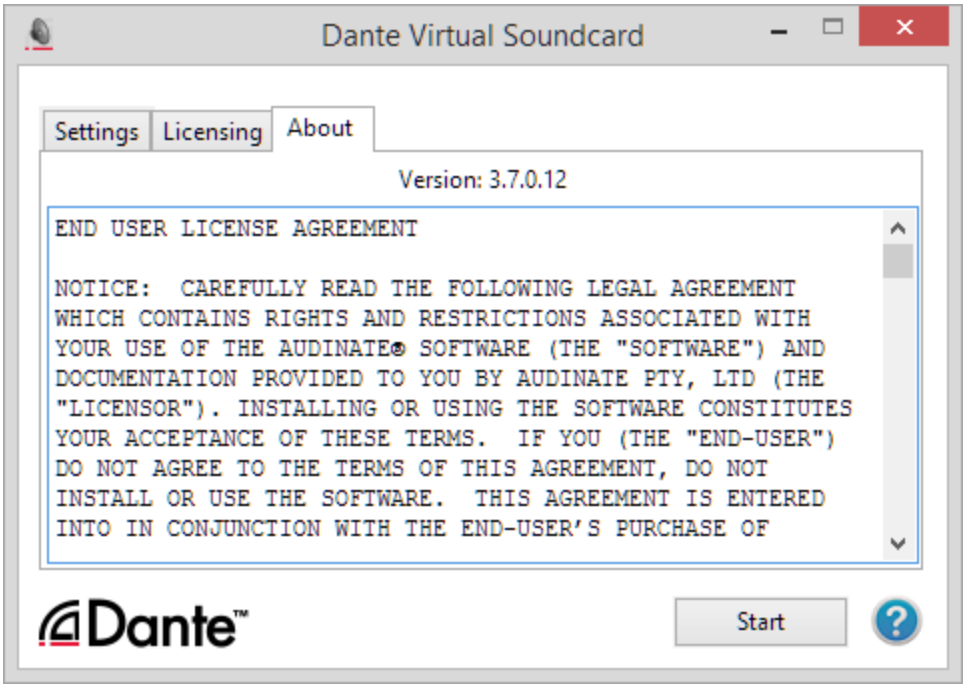
The Licensing Tab allows you to see the status of the license you have, and if necessary allows you to enter a new license key and re-activate the Dante Virtual Soundcard. If you have a trial license, it will display the number of days remaining before the trial license expires.



See Obtaining a Dante Virtual Soundcard License for more details on the use of this tab.

About Tab

The About Tab displays the version of Dante Virtual Soundcard that you have installed, and the End User License Agreement.



Using Dante Virtual Soundcard with an Audio Application

Important Notes

Dante Virtual Soundcard acts in a very similar way to a hardware soundcard.

Note: Make sure that you start Dante Virtual Soundcard with the settings you require *before* you start your audio application.

Note: Digital Audio Workstations (DAWs) treat Dante Virtual Soundcard like any other ASIO (Windows), WDM (Windows) or Core Audio (Mac OS X) device. For support information about using audio devices (including Dante Virtual Soundcard) with your DAW, please use the support services provided by the manufacturer of your DAW.

Choosing an Audio Application

Dante Virtual Soundcard acts like a standard Core Audio device in a Mac OS X machine, and like an ASIO or WDM sound device in a PC running Windows.

ASIO for Windows

In ASIO mode, Dante Virtual Soundcard is compatible with audio applications that support the ASIO standard. This is the interface preferred by most pro audio Windows applications, such as Cubase, Pro Tools and Ableton Live.

WDM for Windows

In WDM mode, Dante Virtual Soundcard supports common audio applications available for Windows, such as Windows Media Player, iTunes and Skype.

Core Audio Mac OS X

The Core Audio interface is used by almost all audio applications available for Mac OS X. This allows you to use Dante Virtual Soundcard with applications ranging from professional audio applications such as Logic, to media players such as iTunes.

Choosing Dante Virtual Soundcard as your Audio Interface

Audio applications generally provide a mechanism for selecting the sound card that they will use. Before configuring the application to use Dante Virtual Soundcard as its audio interface, make sure you have

started Dante Virtual Soundcard with the required settings (and in Windows, with the correct interface mode selected - ASIO or WDM).

Choosing DVS as your Audio Interface - Windows

ASIO

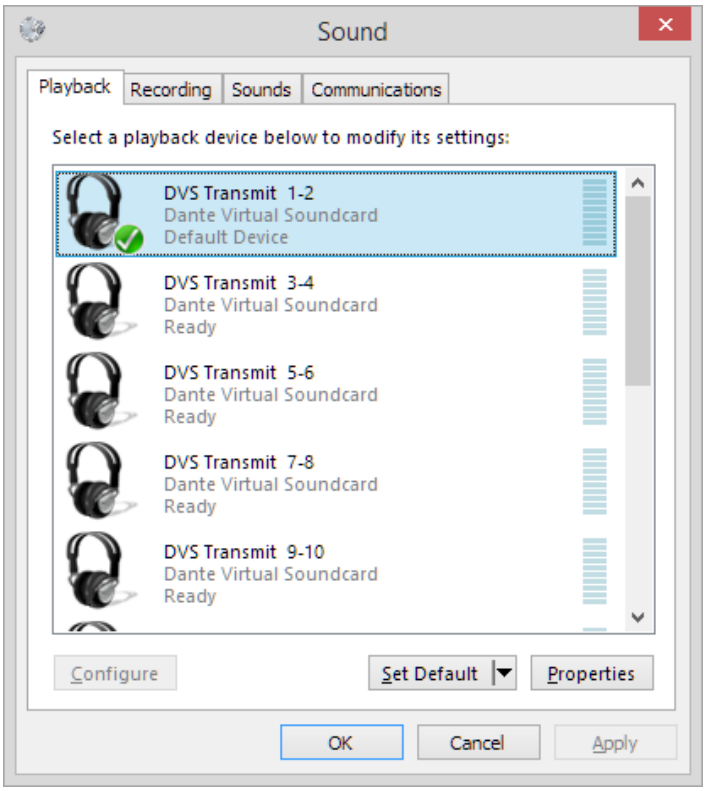
Select and configure Dante Virtual Soundcard as your audio interface from within the audio application. It should appear as 'Dante Virtual Soundcard' in the list of available soundcards. Note that if 'Dante Virtual Soundcard' does not appear in the list of available soundcards, it is either not running, or not operating correctly.

Use the Options button to configure options such as buffer size, latency and channel count.

WDM

Dante Virtual Soundcard supports 16 channels (8 stereo pairs) in WDM mode. Each stereo pair appears as an independent selectable audio device in any relevant Windows and supporting application dialogs.

Show me how Dante Virtual Soundcard appears in the Windows 8 Sound Playback options



Note: Dante Virtual Soundcard stereo pairs will appear as selectable audio interfaces in Windows regardless of the current mode - i.e. with Dante Virtual Soundcard in ASIO mode, it will still appear as a set of selectable audio interfaces in the Windows sound playback options dialog. Similarly, in WDM mode, it will appear as a selectable audio interface in an ASIO-supporting DAW. However, it will not function correctly unless the currently selected mode matches the requirements of the application.

Windows Audio Shared Mode

Windows allows applications to share audio interfaces.

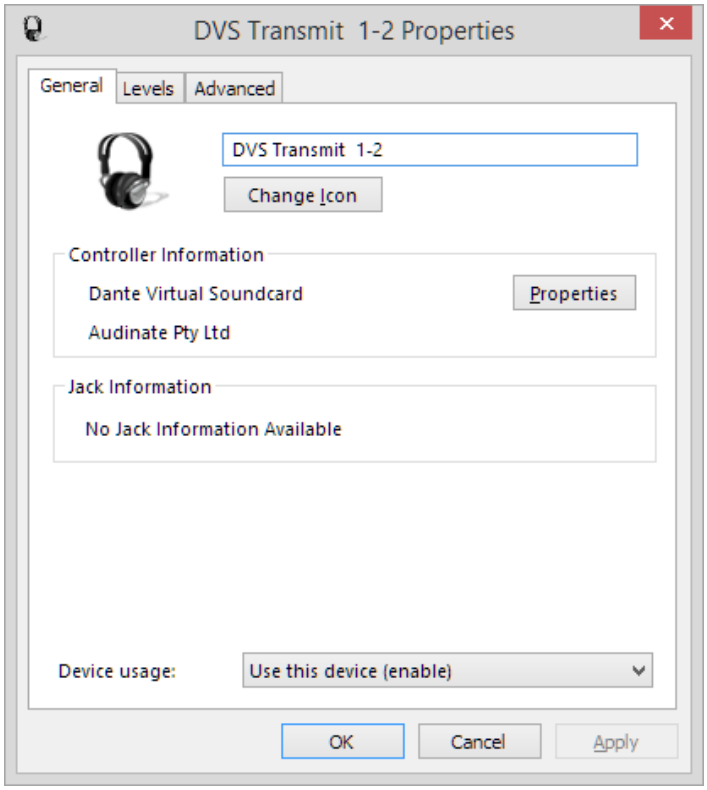
If applications with differing sample rates share an audio interface, their sample rates are automatically brought into line by Windows, so it can mix the audio streams. This will result in sample rate conversion on one of the audio streams, which can adversely affect audio quality.

To prevent Windows performing sample rate conversion on Dante Virtual Soundcard audio, the 'Shared Mode' default format for all Dante Virtual Soundcard channels must match the sample rate currently selected on the Dante Virtual Soundcard control panel.

In **Windows 7**, the default shared mode format for the device is automatically updated when the audio format Dante Virtual Soundcard is adjusted in Dante Controller, so you should not have to adjust it manually.

In **Windows 8.x**, you will need to manually specify the default shared mode format for the device.

1. Open the Windows Sound options dialog (**Start** > **Control Panel** > **Sound**).
2. With the Playback tab selected, double-click the 'DVS Transmit 1-2' entry in the interface list.
   The 'DVS Transmit 1-2 Properties' dialog is displayed.



3. Select the Advanced tab.
4. Set the Default Format to the required setting.
5. Click OK.
6. Repeat for all Dante Virtual Soundcard stereo pairs.
7. Repeat again for the Recording tab.
8. Click OK.

Choosing DVS as your Audio Interface - OS X

You will need to set Dante Virtual Soundcard as the system's default soundcard in order to use applications like iTunes. More sophisticated audio applications such as Logic allow you to select the soundcard from within the application itself.

For applications which allow a soundcard to be selected, choose 'Dante Virtual Soundcard' from the list of available soundcards for both input and output. Note that if 'Dante Virtual Soundcard' does not appear in the list of available soundcards, it is either not running, or not operating correctly.

For applications which do not have a mechanism to select a soundcard from within the application, the System Preferences panel must be used to configure the default sound output and input settings as shown in the following screens:

Figure 4 - Configuring Sound on Mac OS X - System Preferences

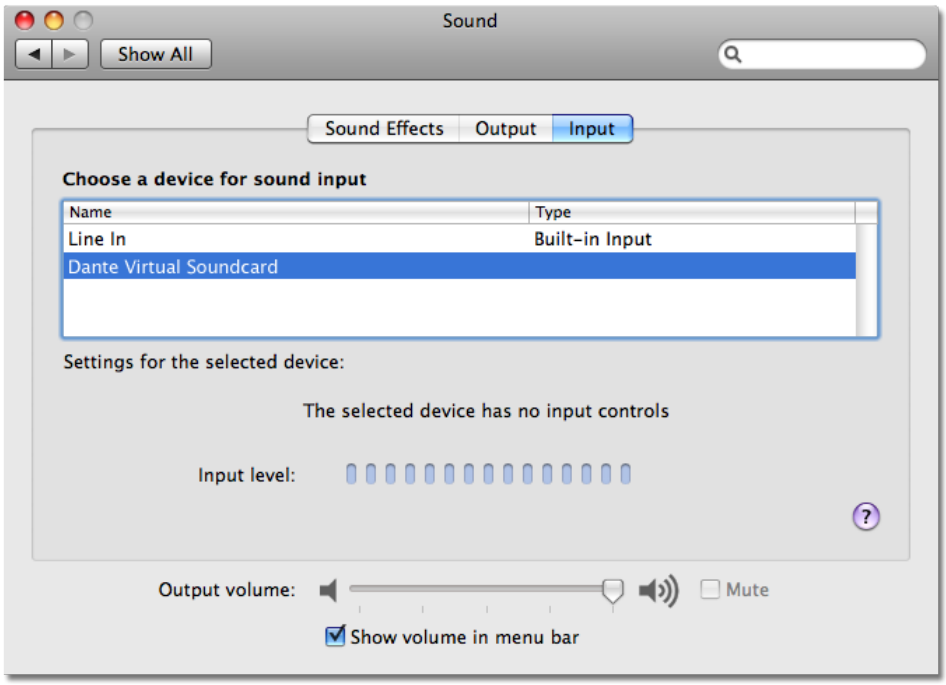


Figure 5 - Configuring Sound on Mac OS X - Input

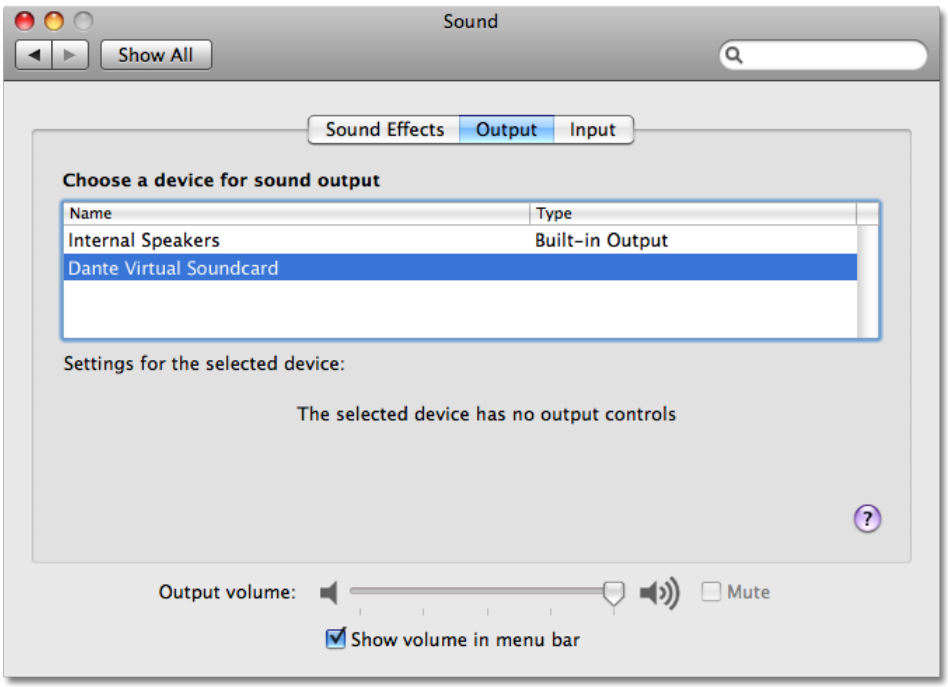


Figure 6 - Configuring Sound on Mac OS X - Output

The system sound effects should be sent to the built-in speakers rather than Dante, so that they don't interfere with the audio travelling over the network:

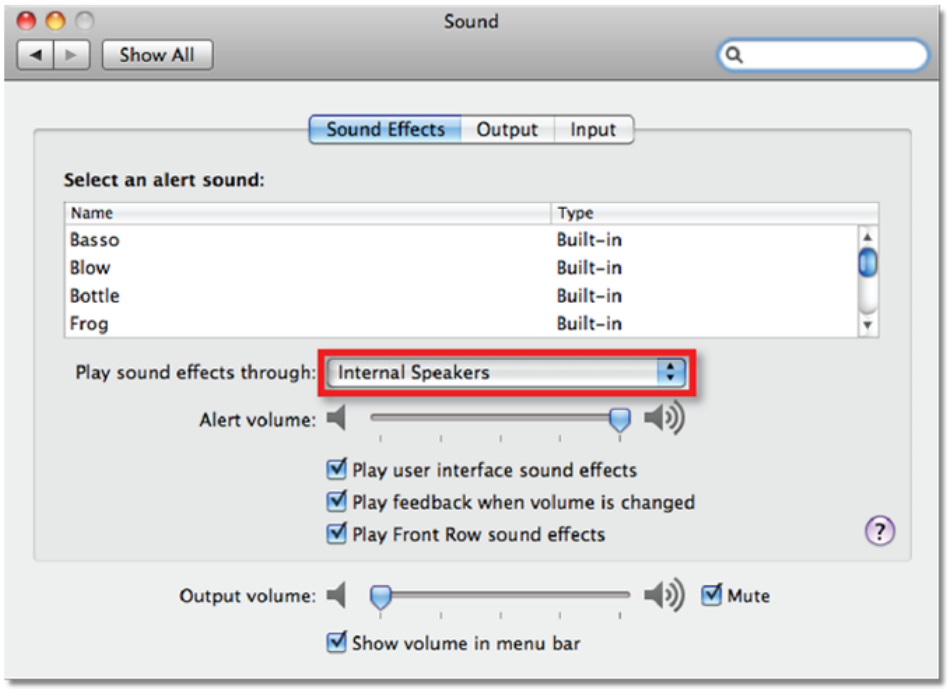


Figure 7 - Configuring Sound on Mac OS X - Internal Speakers

Troubleshooting

Possible Messages on Startup

Error Message	Meaning & Actions
System clock has gone backwards since DVS was last run	**Meaning**: The standard licensing mechanism used in Dante Virtual Soundcard checks whether the system clock has been set backwards to detect deliberate attempts at license fraud. **Action**: If you still have a valid Dante Virtual Soundcard License ID, you can uninstall Dante Virtual Soundcard, then reinstall and use your License ID to reactivate.
The DVS Manager service is not available, please try again in a few minutes	**Meaning**: On some computers, system services may take a long time to start when the computer is rebooted and you may be able to log in and open the Dante Virtual Soundcard Control Panel before all required services are available. **Action**: To resolve this, please wait a few minutes to allow the services to start and try again. The Dante Virtual Soundcard Control Panel should then start normally.

Possible Messages During Operation

Error Message	Meaning & Actions
The DVS Manager service is not available, please try again in a few minutes	**Meaning**: On some computers, system services including the DVS Manager service may not recover from a System Suspend or Hibernate. **Action**: To resolve this, please exit Dante Virtual Soundcard and restart.

Possible Messages During Licensing

Error Message	Meaning & Actions
The licensing server couldn't be found	**Meaning**: Dante Virtual Soundcard could not find the IP address of the Audinate Licensing Server. Likely to be caused by local network DNS failure or Proxy settings. **Action**: Wait and try again in case the issue is temporary. If the problem persists please talk to your local IT support staff.

Error Message	Meaning & Actions
Communication error while contacting server	**Meaning**: Dante Virtual Soundcard could not make a network connection to the Audinate Licensing Server. Likely to be due to either network or local proxy settings. **Action**: Wait and try again in case the issue is temporary. If the problem persists please talk to your local IT support staff.
DVS is not licensed for use via terminal server	**Meaning**: Dante Virtual Soundcard is not supported and will not activate on a Windows PC with Terminal Services (Remote Desktop) running. **Action**: Deactivate Terminal Services on the PC.
DVS is not licensed for use on virtual machines	**Meaning**: Dante Virtual Soundcard is not supported and will not activate if it is installed on a Virtual Machine. **Action**: You will need to install Dante Virtual Soundcard on a computer with a standard Windows or Mac OS X operating system install.
The license server has no knowledge of license ID xxxx...	**Meaning**: The License ID that has been entered is not a known Dante Virtual Soundcard License ID. **Action**: Check to make sure a valid Dante Virtual Soundcard License ID has been entered, and not a different product serial number.
The license has been activated too many times	**Meaning**: A Dante Virtual Soundcard License can only be activated a limited number of times, and this activation limit has been exceeded.

Further Dante Troubleshooting

The Dante Controller User Guide and the Dante FAQs contain further information regarding troubleshooting issues you may be experiencing with Dante software and network configuration and operation.

On Windows, if you are experiencing latency problems or dropped audio (especially at higher sample rates), you may need to adjust Flow Control and Interrupt Moderation for your network adaptor. See www.audinate.com/faq/how-can-i-tune-windows-pc-best-audio-performance for more information.

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