YAMAHA

DANTE ACCELERATOR

AUDIO INTERFACE CARD
AIC128-D

Operation Manual

Benutzerhandbuch

Fonctions Détaillées

Manual de Operaciones

Manuale Operativo

Руководство пользователя

使用说明书

オペレーションマニュアル

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Information

- The illustrations and LCD screens as shown in this manual are for instructional purposes only, and may appear somewhat different from those on your device.
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Connecting to a Network

In order to use your Dante Accelerator, you will need to set up an Ethernet network connecting:

• The computer on which the Dante Accelerator is installed

• The computer running Dante Controller (if it's not the same computer), and

• Any other Dante-enabled audio device you may have.

Before You Set Up Your Network - Important Notes

Gigabit Ethernet Support

Your Dante Accelerator has been designed to perform with Gigabit Ethernet networks. Connecting your Dante Accelerator to older 100Mbit/s Ethernet devices is not supported.

When connecting your Dante Accelerator to a network switch, make sure it supports Gigabit Ethernet and you are connected to a Gigabit Ethernet port.

Choosing a Gigabit Ethernet Network Switch

You get the best performance out of your Dante network even if you use standard Gigabit Ethernet network switches.

Dante uses standard Ethernet and IP Quality of Service (QoS) to ensure its high-quality synchronization is not affected, even on loaded networks. Make sure that you choose network switches which have the following features.

• DSCP-based QoS with four queues and strict priority queuing

• ACL filtering

• Fiber-optic cable support including SFP pluggable modules (if you need to run long cables)

• Managed network switches which allow you to manage the network switches and monitor your network

If you have chosen a network switch that has been used before, you may need to check its settings again.

For more information about choosing network switches, please visit the Support section of the Audinate website (www.audinate.com).

Choosing Ethernet Cabling

Dante uses completely standard Ethernet and IP, so it also uses standard Ethernet cabling (STP), including Cat5e or higher and fiber-optic.

Make sure your Ethernet cables and ports are in good condition.

Remember that Ethernet cables which are Cat5e or higher have a limit of 100 meters* at speeds of 1Gbps. If you require longer distances, you can use fiber-optic cables.

* The cable length limits depend on the cable types.

Network Configuration

The Dante Accelerator is a dedicated Dante audio interface, and cannot be used by the Dante Controller as a port for network control (configuring Dante devices, and routing audio).

Network control must be performed via the standard network adapter on the computer on which Dante Controller is installed.

If this is the same computer in which the Dante Accelerator is installed, the computer must be connected to the Dante network via two Ethernet cables and a network switch:

Dante-enabled devices

Network switch

Dante
Accelerator

Ethernet network adapter
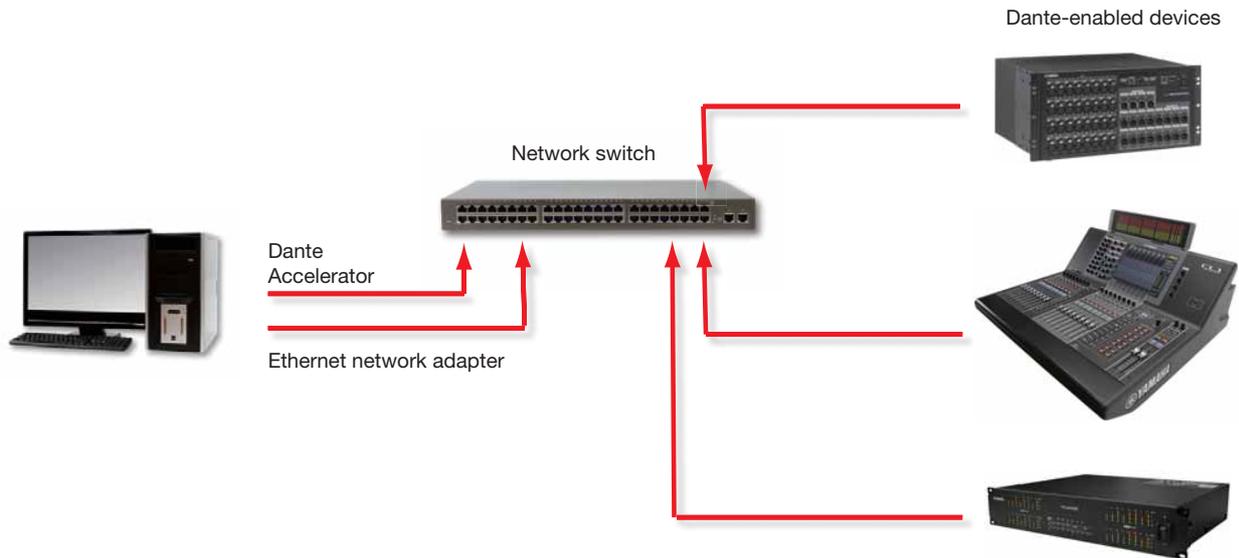
Basic network configuration

If your network switch has a mix of Gigabit and 100Mbps ports, make you connect all Dante Accelerator, and if possible all devices, to the Gigabit ports.

1. **Make sure all computers are set to automatically configure their IP address.**

2. **Power on the network switch.**

3. **Connect your Ethernet cables from each device to the Gigabit ports of the network switch.**

You may need to reboot the computers if they have active previous IP network configurations.

All devices will automatically be assigned IP network configurations.

Connection via a Redundant Network

Dante redundancy works by using two completely independent and separate networks, the Primary Network and the Secondary Network.

To set up and use Dante Redundancy, connect your redundant Dante-enabled device using duplicate network switches and Ethernet cables as shown below.

Connect the following to the Primary Network only:

• Any computers running Dante Controller

• Any non-redundant Dante-enabled devices

All Dante-enabled devices that support redundancy should be connected to both the Primary and Secondary networks.

The primary and secondary networks MUST NOT be interconnected at any point.
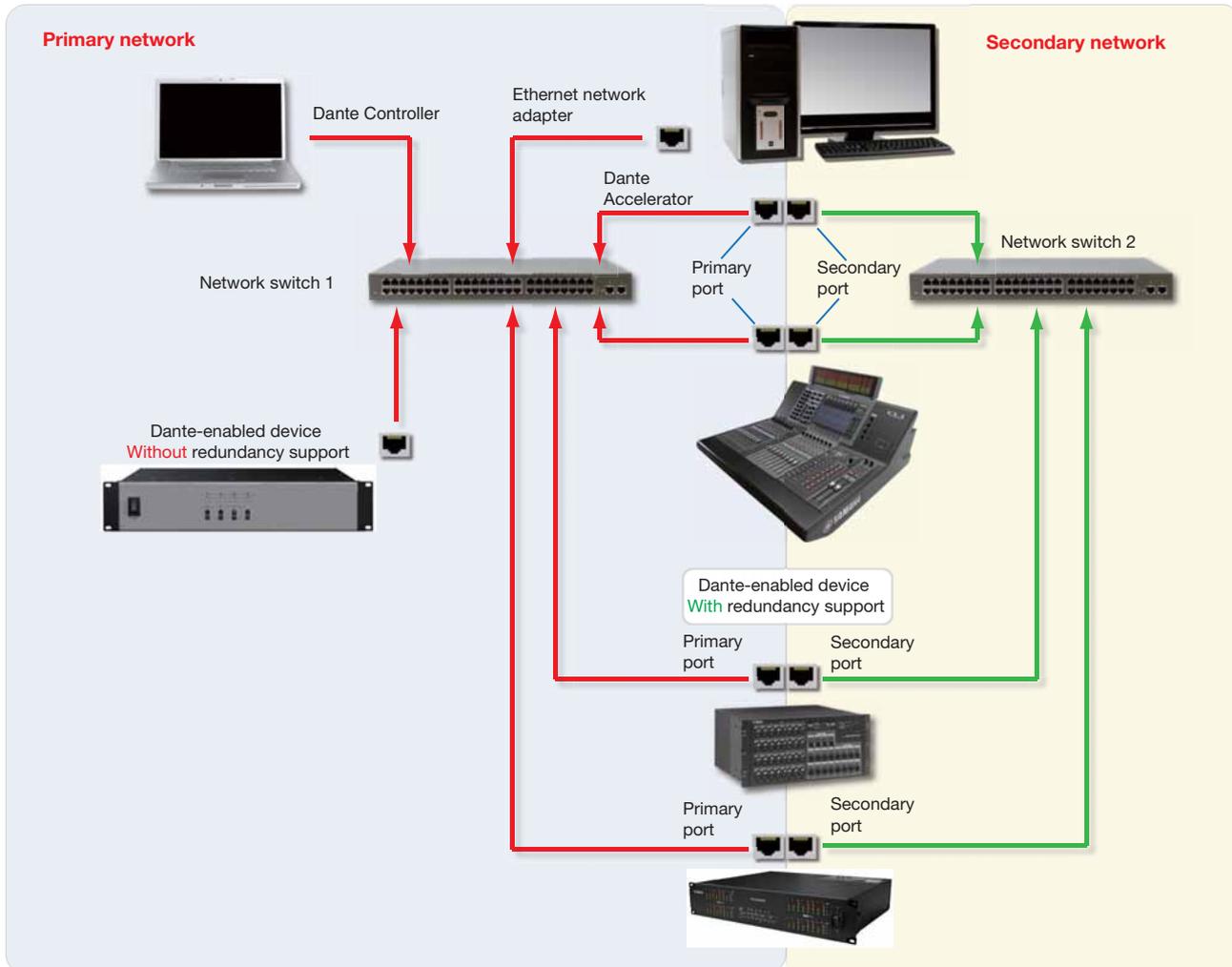
1. **Make sure all computers are set to automatically configure their IP address.**

2. **Power on the network switch.**

3. **Connect your Primary Ethernet cables from each device to the Gigabit ports of the Primary network network switch.**

4. **Connect your Secondary Ethernet cables from each device that supports redundancy to the Gigabit ports of the Secondary network network switch.**

You may need to reboot the computers if they have active previous IP network configurations.

All devices will automatically be assigned IP network configurations.

NOTE

Some firmware versions of the Dante Accelerator do not support redundant networks. Check whether your Dante Accelerator firmware version supports redundant network from the following website:
http://www.yamahaproaudio.com/

Unsupported Dante Network Configurations

Straight-through connection to another Dante-enabled device

Because the Dante Accelerator is a dedicated audio interface, Dante Controller must connect to the network via the standard network adapter on the computer.

Because of this, do not make a 'straight-through' connection from the Dante Accelerator to another Dante-enabled device.

Connecting Primary and Secondary redundant networks to the same network switch

When using Dante redundancy with any Dante-enabled device, two separate networks must be used.

You CANNOT connect any secondary network connections to a network switch used for the primary network, or any primary network connections to a network switch used for the secondary network.

Please refer to the section "Connection via a Redundant Network" on page 6 for information about the correct configuration to use.

Unsupported redundant network configuration
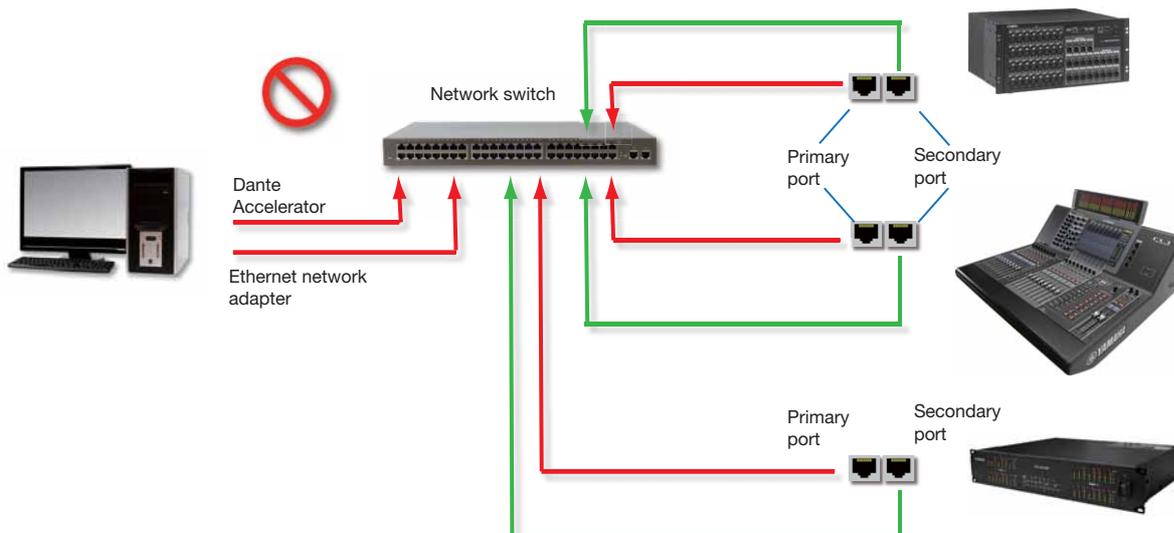
Dante Audio Data over Wireless Networks

Wireless Ethernet networks should not be used to carry Dante audio data, and Dante Controller installed on a PC or Mac will not allow selection of Wireless Ethernet interface or any other non-standard wired Ethernet interface.

You should NOT install any wireless components in your Dante network.

Dante
Accelerator

Ethernet network adapter

Example wireless configuration (unsupported)

Use of 100Mbps Network interface

The use of 100 Mbps Ethernet device with the Dante Accelerator is NOT SUPPORTED. You must connect the Dante Accelerator to Gigabit interfaces:

• Gigabit Ethernet network switch

• Gigabit network interface on a PC or Mac

Dante Accelerator Basic Operation

Once you have installed a Dante Accelerator in your computer and connected it to a network, you are in a position to start using Dante networking in earnest to set up audio routing between other Dante-enabled devices you may have on the network.

Pre-operation Checklist

To start configuring and using your Dante Accelerator and Dante Controller you should have completed the following:

• Installed your Dante Accelerator in your computer

• Installed the Dante Accelerator drivers

• Downloaded and installed your Dante Controller

• Set up a network between your computer and your Dante-enabled devices

• Referred to the Dante Controller User Guide

Download the Dante Controller User Guide from the following website:

http://www.yamahaproaudio.com/downloads/

Using Dante Controller

When you open the Dante Controller it displays the Network View, which shows all the Dante-enabled devices on the network. Initially it will display devices, but not channels within devices. Devices with transmitter (Tx) channels will be displayed along the top row and devices with receiver (Rx) channels will be displayed in the left hand column Channels can be viewed by clicking on the + symbol next to Dante Transmitters or Dante Receivers, or the + symbol next to a particular Dante device.

The Dante Controller User Guide contains detailed information about all aspects of using the Dante Controller. This section is only a brief overview – you will need to refer to the Dante Controller User Guide to be able to use all features of the Dante Controller.
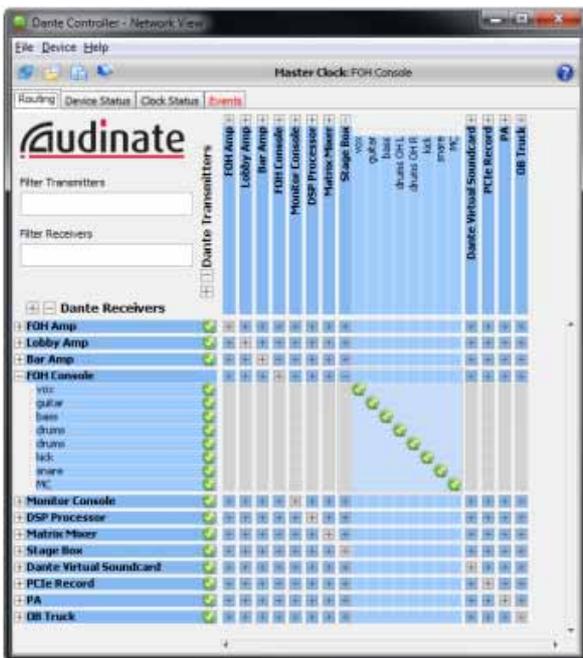
Dante Controller Network View

Setting Up Audio Routing

The Dante Controller can be used to configure audio routing between Dante devices.

In the expanded view, wherever there is a blue cell at the intersection of a transmitting channel column and an receiving channel row, it is possible to establish an audio routing between them.

Using the Network View, click on the cell at the intersection of a transmit and receive channel to configure an audio routing from the transmitting channel to the receiving channel. A green icon will appear when the routing is established. Click again to remove the routing.

NOTE

Ctrl+click on the cell at the intersection of the devices to configure the entire routing.

Configuring the Card

To configure features of your Dante Accelerator, including its name, sample rate, and latency:

1. **Start the Dante Controller.**

2. **Select the device – either:**

• Double-click on the device name in the Dante Controller Network View (either in the transmitter row, or the Receiver column) - or:

• From the Network View menu, select Device -> Device View (or press Ctrl+D).

This opens a Device View window for the selected device.

If there are multiple computers with Dante Accelerator cards in your network, to identify a particular card:

• Look for the device name ending in the last six characters of its MAC address – or:

• After selecting a device at random, use the Identify feature in the Dante Controller (see below) to check which card it is.

Device View Window

The Device View has five tabs: Receive, Transmit, Status, Device Config and Network Config. The Receive tab for a configured Dante Accelerator is shown below.
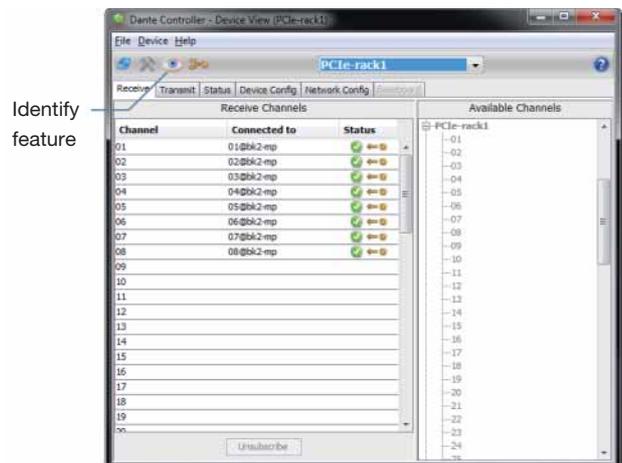
Device View window

Identifying Individual DANTE ACCELERATOR

When there are multiple computers with Dante Accelerator cards in your network, you can use the Identify feature to know which card is which.

Once you have selected a particular card within Device View in the Dante Controller, you can click on the Identify icon 👁 in the Device View toolbar. This will cause all of the LEDs on the Dante Accelerator to flash green for about ten seconds.

Changing the Device Name

By default the device name for the Dante Accelerator is ****-nnnnnn, where **** is the name of the card and nnnnnn is a unique alphanumeric identifier consisting of the last six digits of the MAC address. This is the name the card will have when you first use it.

It is possible to replace the Dante Accelerator default device name with a custom, user-defined name. To do this open Device View in the Dante Controller, select the card you wish to modify in the Device View, and change the Device Name in the Device Config tab.

If you rename a device, you must re-establish any existing audio routing to and from the re-named device using its new name.

Please refer to the Dante Controller User Guide for more information on renaming devices.

Changing Channel Labels

To change channel labels in Dante Controller:

1. **Open the Device View for the relevant device.**

2. **Click the Receive or Transmit tab (depending on which channel labels you want to edit).**

3. **Double-click the channel label.**

4. **Enter a new value.**

Tx (transmit) labels must be specific to that device.

Changing the Sample Rate

Audio routing can only be set up between devices that are operating at the same sample rate.

It is possible to set the sample rate to any one of the following values: 44.1, 48, 88.2, 96, 176.4, and 192 kHz. To do this, open Device View in the Dante Controller, select the card you wish to modify in the Device View, and change the sample rate in the Device Config tab. Pull-up/pull-down (+4.1667, +0.1, -0.1, and -4.0 %) is also supported.

Please refer to the Dante Controller User Guide for more information on changing sample rates.

Setting the Latency

To adjust the latency setting, open a Device View for the selected device in Dante Controller, and select the Device Config tab. This allows several device settings to be viewed and modified. It shows the current receive latency setting and allows the user to change the operating receive latency for the selected device.

The allowed values are:

• 0.15ms (150 microseconds) - a suitable setting for a network containing a single network switch

• 0.25ms - a suitable setting for a network containing 3 network switches

• 0.5ms - a suitable setting for a network containing where the signal path may encompass up to five network switches

• 1.0ms - a suitable setting for a network containing where the signal path may encompass up to ten network switches

• 5.0ms – a safe value for a network of almost any conceivable size

NOTE

Even if you set values suited for your network, various factors may cause some noises.

If a value other than the current setting is selected a message will be displayed warning the user that the effect of changing the latency is that any existing audio routing to the device will be temporarily suspended, resulting in some loss of audio data.

If you wish to make the change select Yes button; otherwise select No.

Using the Card with an Audio Application

Choosing an Audio Application

The Dante Accelerator acts like a standard Core Audio device in an Apple Mac computer, and like an ASIO sound device in a PC running Windows.

ASIO for Windows

There are a number of different audio interfaces commonly used by Windows. The Dante Accelerator provides an ASIO audio interface, and is compatible with audio applications that support this standard. This is the interface preferred by most pro audio applications such as Nuendo and Cubase.

The Dante Accelerator does not support Windows audio interfaces (such as WDM/MME and DirectX) and cannot be used with common media players available for Windows, including Windows Media Player and iTunes.

Core Audio for Mac OS X

The Core Audio interface is used by almost all audio applications available for Mac OS X. This allows you to use the Dante Accelerator with applications ranging from DAW software such as Nuendo and Cubase to media players such as iTunes.

Choosing Dante 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 the Dante Accelerator as its audio interface, make sure you have configured the card with your required settings (sample rate and latency) and rebooted your computer if necessary.

Windows

Select and configure a Dante Accelerator as your audio interface from within the audio application. It should appear as "Yamaha AIC128-D" in the list of available sound cards. Note that if "Yamaha AIC128-D" does not appear in the list of available sound cards, the Dante Accelerator is either not installed properly or not operating correctly.

Mac OS X

You will need to set the Dante Accelerator as the system's default sound card in order to use applications like iTunes. DAW software such as Nuendo and Cubase allows you to select the card from within the application itself.

For applications which allow a sound card to be selected, choose "Yamaha AIC128-D" from the list of available sound cards for both input and output. Note that if "Yamaha AIC128-D" does not appear in the list of available sound cards, the Dante Accelerator is either not installed properly or not operating correctly.

For applications which do not have a mechanism to select a sound card 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:

Configuring Sound on Mac OS X – System Preferences
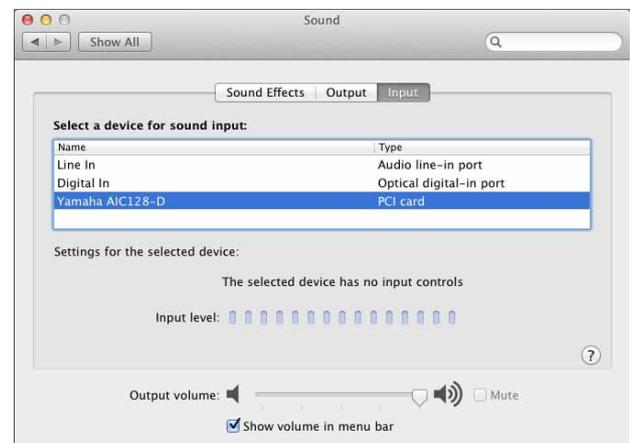
Configuring Sound on Mac OS X – Input

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 traveling over the network:

Configuring Sound on Mac OS X – Internal Speakers

Troubleshooting

Introduction

Problems or issues related to Dante and setting up your Dante Accelerator tend to fall in one of three main areas:
• Network Configuration (Page 13)
• Computer configuration (Page 13)
• Dante configuration (Page 15)

Network Configuration

Gigabit Ethernet

All your Dante Accelerator require a Gigabit Ethernet interface.
This means that they should be connected to a Gigabit Ethernet network switch.

How can I check whether I AM using Gigabit Ethernet?

• The orange Gigabit LED on the Card Ethernet port will be lit:

Gigabit LED

• In Dante Controller, the Primary Link Speed of the card (shown in the Device Status tab) is shown as 1Gbps:

Link speed when connected to 1Gbps port/network switch

Computer Configuration

Dante hardware devices are set to obtain their IP address automatically from the network. They will either:
• Automatically assign themselves an address in the range 169.254.*.* (172.31.*.* for the secondary network if present), or
• Obtain an IP address from a DHCP server if it is present on the network

The PC or Mac must be connected to the Primary Dante network, and must have a correct IP address.

How do I check which interface Dante Controller is using?

The selected network interface can be viewed or changed via the Interface Selection button 🖥 in the Network View toolbar of the Dante Controller.

How do I check what IP address Dante Controller is using?

The IP address can be viewed in the Configure Dante Interfaces dialog box brought up by the Interface Selection button 🖥 .
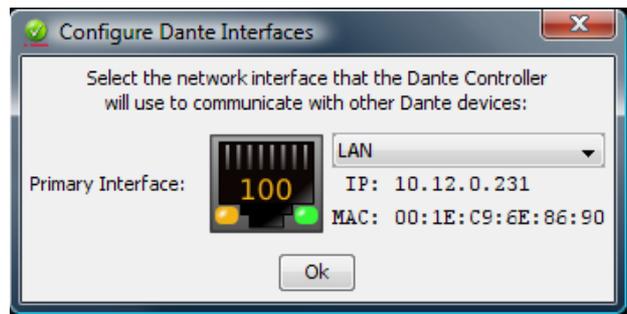
Configure Dante Interfaces dialog

• If the Dante network is standalone and does not have a DHCP server installed, this address should be 169.254.*.*
• If the Dante network is using a DHCP server, the IP address should conform to the addressing scheme it is using (as in the image above)

How do I check the IP address that my Dante Accelerator is using?

• IP addresses configured for all Dante devices on the network can be viewed via the Device Status tab in the Dante Controller
• This includes the Dante Accelerator

What are the symptoms of using the wrong interface on my PC or Mac?

• Dante Controller cannot see any devices

Checking your PC or Mac IP configuration

• Is the PC configured to "Obtain an IP address automatically"?

  This way it will automatically acquire a Link Local automatic IP address in the same network as other Dante devices.

• If a DHCP server is present, the PC and Dante devices will all acquire their IP addresses via DHCP.

• Does it have a third-party firewall installed?

  Standard Windows and Mac firewalls will be configured on installation.

  Third party firewalls will need to be manually configured.

  Please read the Dante Controller User Guide for detailed information about firewall requirements and configuration.

Network Switch Configuration and Cabling

Cables are the most vulnerable part of a network system, and "home-made" manually terminated cables can be error-prone.

If you suspect cabling issues, check for:

• Unplugged / badly connected Ethernet cables

• Misconfigured network switches

• Dante devices removed, or turned off

Symptoms of network switch or cabling issues

• You cannot see one or more devices in the Dante Controller Network View

• The Dante Controller shows orange "unsuccessful subscription" icons, which usually means a device that was present earlier, is now missing

• Faulty cables can lead to intermittent faults, which may be heard as dropped samples or "cracks" in the audio

• Dante devices may appear and disappear in Dante Controller

Network Switch and Cabling Checklist

• Are all the connected link / status lights on the network switch lit, or flashing, as expected?

• Is the network switch powered on?

• Is the cable correctly plugged in at the network switch and the computer / device?

• Is the network switch correctly configured?

• Has QoS been set up correctly?

• Are you using a network switch from another application with an unchecked or untested configuration?

• Did you read the network switch manual and check the configuration?

System Checklist

Before installing, a PC or Mac needs to have:

• The user logged in with administrator privileges

A PC or Mac for use on the Dante network should have:

• Latest version of Dante Controller installed

• An audio application supporting the ASIO or Core Audio interface installed

A correct PC or Mac Dante network configuration should have:

• The correct network interface selected

• The correct IP addresses used

• An audio application correctly configured to use the Dante Accelerator as its audio interface

Checking Driver Version

Windows

In Windows, an installed Dante Accelerator will appear in the Device Manager.

To open the Device Manager in Windows 7, go to Control Panel > Hardware and Sound > Device Manager.

The card will appear under the "Sound, video and game controllers" group.
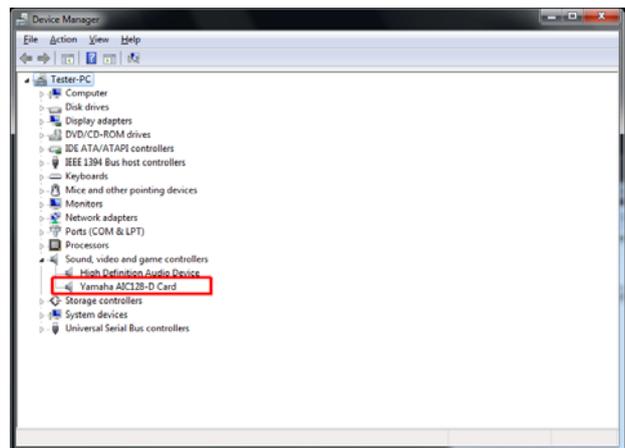
Windows Device Manager

To check the driver version, right-click the device, select Properties, and select the Driver tab.

Mac OS X

In Mac OS X, an installed Dante Accelerator will appear in the System Profiler.

The System Profiler is in the Utilities folder within your Applications folder.

The card will appear in the Hardware section under PCI Cards, but to see the driver version, navigate to Software > Extensions.
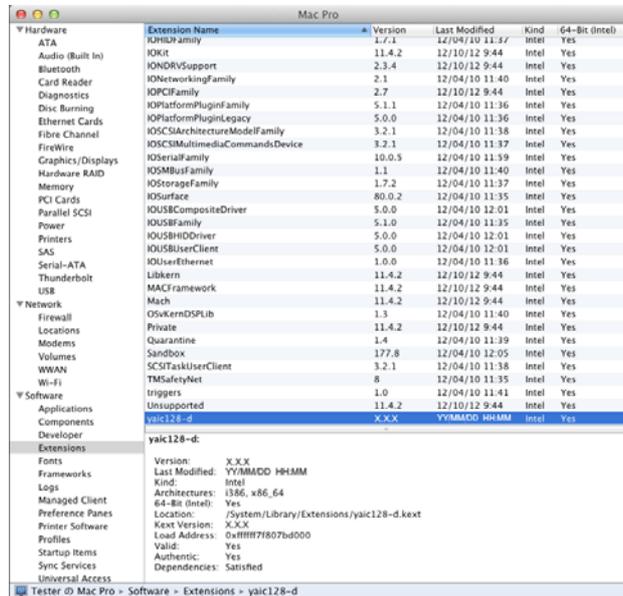
Mac OS X System Profiler

To check the driver version, select the device. The driver version is shown in the top line of the device details. X.X.X represents the driver version.

Dante Configuration

Sample Rate

Sample rate configuration
• Have the Dante Accelerator and/or other devices communicating audio data been configured with different sample rates?

Use the Dante Controller to check Dante device sample rates.

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