

**Network I/O - PCIe-R  
Dante Audio Interface  
User Guide**  
Revision: 1.1



# Solid State Logic

O X F O R D • E N G L A N D

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**PLEASE READ ALL INSTRUCTIONS, PAY SPECIAL HEED TO SAFETY WARNINGS.**

E&OE

October 2018

## Document Revision History

THIRD VERSION	Revision 1.2	17th October 2018
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## Introduction

Thank you for purchasing the Network I/O PCIe-R by Solid State Logic, the ultimate Dante audio interface for your computer. The Network I/O PCIe-R provides high performance, high channel count, low latency connectivity to your Dante audio network.

This user manual will give detailed explanation of the hardware and software integration of the PCIe-R with your system. We recommend that both new and experienced users of Dante take the time to read through this user manual to make use of the full potential of the Network I/O PCIe-R.

### Key Features:

- Roundtrip ASIO latency of less than 3ms.
- 128 x 128 redundant channels (at 44.1kHz, 48kHz, 88.2kHz, and 96kHz).
- 64 x 64 redundant channels (at 176.4kHz or 192kHz).
- Compatible with standard network switches.
- PCI Express card standard.
- Seamless operation with other Dante compliant devices.
- Compatible with external Thunderbolt chassis.
- Supported for macOS and Windows.

### Front Panel



## What is Dante?

Dante is a professional audio networking technology used under licence from its developer Audinate. Dante uses standard Ethernet to connect Dante devices to computers and other Dante devices.



In a studio with a single control-room where direct connectivity to a DAW computer is required, Dante is a simple 'single Ethernet cable' alternative to Thunderbolt or USB, with round-trip latency of less than 3ms to your DAW computer.

In a larger multi-space facility, Dante is a state of the art Audio-Over-IP (AoIP) audio networking technology that facilitates low latency audio sharing between multiple computers or devices.

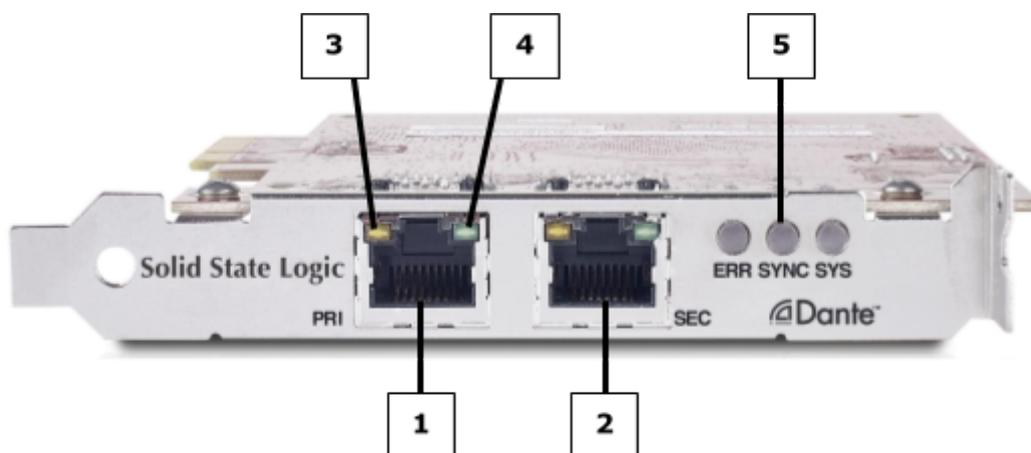
Dante enables users to combine audio devices from a wide range of audio manufacturers on a network and share audio between them. The great thing about a Dante network is that it's scalable; adding additional mic pre's or extra analogue outputs is as simple as plugging another Dante device onto the network, where it is automatically detected and ready to use.

For users who wish to learn more about Dante, we recommend visiting the training and tutorials section on the Audinate website:

<https://www.audinate.com/resources/training-and-tutorials>

## Hardware Features

This section will detail the hardware features found on the Network I/O PCIe-R.



- 1 Dante Primary port - this Ethernet port is connected to your Primary Dante network for transmission and reception of audio traffic.
- 2 Dante Secondary port - this Ethernet port is connected to your Secondary Dante network for redundancy. Only one network port is required to be connected for audio routing of all I/O channels.
- 3 Gigabit status LED - when this LED is orange it indicates a Gigabit Ethernet connection has been established.
- 4 Link status / Activity status LED - when this LED is green it indicates an Ethernet connection or 'Link' has been established. This LED will flash when there is activity on the network port.
- 5 Status LEDs:
  - SYS (System status LED) - on startup this LED will be orange, and will turn green when the system is operating correctly. If the orange LED persists, the system has failed to boot correctly.
  - SYNC (Clock synchronization LED) - a solid green LED indicates that the PCIe-R is successfully synced to the Dante PTP clock master (see more on page x). A flashing green LED indicates that the PCIe-R is the Dante PTP clock master. An orange light indicates a network synchronization error. Obtaining network sync may take up to 45 seconds.
  - ERR (Error LED) - if the SYS, SYNC, and ERR LEDs are solid red, the PCIe-R has encountered errors on boot and entered failsafe mode. To restore the device from failsafe mode, use the Firmware Update Manager (available from the SSL website [www.solidstatellogic.com](http://www.solidstatellogic.com)).

## System Requirements

This section will detail the minimum system requirements for the Network I/O PCIe-R.

### Apple MacOS:

- Computer: iMac, Mac Mini, Macbook, Macbook Pro, Macbook Air, Mac Pro  
*A PCIe expansion chassis may be required*
- Processor: 2.66GHz dual-core CPU (standard mode) / 2.66GHz quad-core CPU (minimum latency mode)
- Memory: 2GB RAM minimum, 4GB recommended
- OS: MacOS 10.10, 10.11, 10.12, or 10.13
- Storage: High transfer rates are required for transmission of high bandwidth audio; Disk speeds of 7200rpm and above are recommended for more than 16 channels of record / playback; solid state drives are preferable.
- Recommended apps: Logic Pro, Pro Tools, Ableton Live, Steinberg Cubase/Nuendo Apple Garageband, MainStage, Final Cut Pro, Digital Performer, Studio One.

### Microsoft Windows:

- Computer: Desktop, laptop or tablet device.
- Processor: 2.66GHz dual-core CPU (standard mode) / 2.66GHz quad-core CPU (minimum latency mode)
- Memory: 2GB RAM minimum, 4GB recommended
- OS: Windows 7 (32 bit or 64 bit) and above.
- Storage: High transfer rates are required for transmission of high bandwidth audio; Disk speeds of 7200rpm and above are recommended for more than 16 channels of record / playback; solid state drives are preferable.
- Recommended apps: Pro Tools, Ableton Live, Steinberg Cubase/Nuendo, Studio One

### PCIe Expansion slot:

- PCI Express Version 1.0 or above
- Must have an available PCI Express x4 expansion slot
- When using Mac Pro with native PCIe slots, the slot closest to the motherboard will often provide the best (lowest) latency. This is normally slot 2 (directly above the graphics card).
- Thunderbolt PCIe expansion chassis supported.

### Network Switches

Dante networks are scalable; adding inputs or outputs to your setup is a simple matter of connecting additional devices to your network. It is highly recommended that if using more than one Dante device with the Network I/O PCIe-R, all devices be connected via a network switch.

Dante works with standard network switches, provided that they meet the following criteria:

- Rated for Gigabit Ethernet (switches rated lower than this are unsupported with the Network I/O PCIe-R).
- A non-blocking switch (allows full bandwidth of all ports at the same time).
- EEE switched **off** (Energy Efficient Ethernet is a system that will reduce power consumption of network ports when they have low activity - with this enabled, the performance of all Dante devices is negatively affected).

Depending on the size of your network, it is recommended your switch:

- Has Quality of Service (QoS).
- Has Diffserv QoS with 'strict' priority (this allows you to prioritise audio traffic on the network over other network packets).

### Other Network Audio Devices

Some non-Dante devices use Ethernet for audio transmission, such as those that use the Ravenna protocol. The Network I/O PCIe-R is able to transmit and receive audio from these devices provided that they are compatible with the AES67 Standard specification.

For more information on Audio-Over-IP interoperability, we recommend visiting the training and tutorials section on the Audinate website:

<https://www.audinate.com/resources/training-and-tutorials>

## Hardware Installation

Insert the card into a PCIe slot on your computer before installing the Audinate Dante PCIe Driver.



To install or remove the Network I/O PCIe-R, please refer to the section on PCIe card installation in your computer's technical manual. Be mindful of ESD protection when installing the PCIe-R into your computer.

If you remove the card, store the card in its anti-static bag and packaging while not in use.

## Software Installation

This section will detail how to download and install the Network I/O PCIe-R software.

1. To download the Dante Controller and Audinate PCIe-R Driver software, follow the following links to the Audinate website:

**Audinate Dante Controller:**

<https://www.audinate.com/products/software/dante-controller>

**Audinate PCIe-R Driver:**

<https://www.audinate.com/content/audinate-dante-pcie-r-v4072>

2. Run the installers and follow the instructions inside the installers. You should now have the **Audinate Dante PCIe driver V1.8.0.3 (Mac) / V1.8.0.1 (Windows)** and **Dante Controller V3.10.2.4** installed on your computer.

*Please Note: The Windows 8.x PCIe driver requires Microsoft .NET to support the ASIO control panel. The driver installer will install it automatically if it is not already present, but the installation will require internet connectivity.*

## Network Setup

This section details how to connect and setup your Network I/O PCIe-R with other Dante devices on a network.

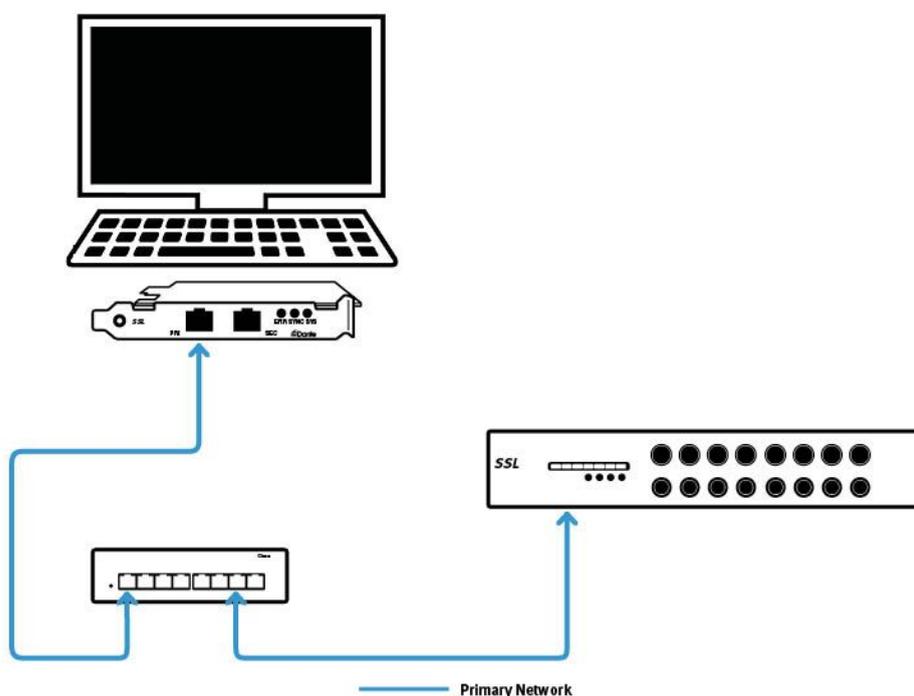
The Network I/O PCIe-R is a Dante audio device, the same as an I/O device you would find on your Dante network. As such, it cannot be used to configure devices on the network, or make audio routes using Dante Controller. This must be done from the standard network adaptor on the computer running the Dante Controller application (this does not have to be the computer that has the Network I/O PCIe-R installed).

If the Network I/O PCIe-R is installed in the same computer running the Dante Controller application, the computer must be connected to the Dante network via two connections; one from the computer's built-in network adaptor for control, and one (or two for redundancy) from the PCIe-R for audio transmission.

### Non-Redundant Setup

This is the simplest setup for the Network I/O PCIe-R. It requires only one Gigabit network switch.

A non-redundant network makes use of the PCIe-R Dante primary port only; there is no redundant (backup) network that will be activated should the primary network fail.



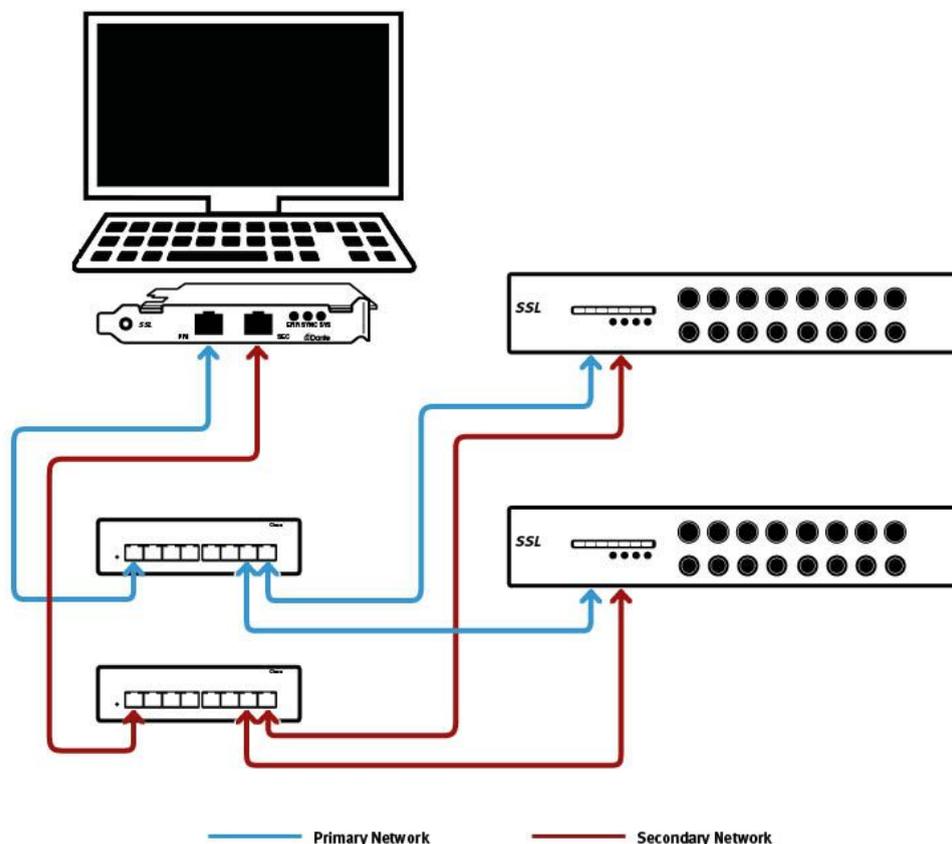
To setup a non-redundant network:

1. Connect the Dante Primary port of the Network I/O PCIe-R to your network switch. This connection is for Dante audio I/O to and from your computer.
2. Connect your computer's onboard network adapter to your network switch. This connection is for audio routing configuration and Dante device setup via the Dante Controller application.
3. Connect your other Dante device(s) to the network switch using the Dante Primary port on each device.

## Redundant Setup

A redundant network will require a minimum of two network switches.

A redundant network makes use of the PCIe-R Dante Primary port and Dante Secondary port; should the primary network fail for any reason, audio transmission will seamlessly switch over to the Secondary network. This is a common feature of Dante networks found in live and broadcast.



To setup a redundant network:

1. Connect the Dante Primary port of the Network I/O PCIe-R to the primary network switch. This connection for Dante audio I/O to and from your computer.
2. Connect the Dante Secondary port of the Network I/O PCIe-R to the secondary network switch. This connection for redundant Dante audio I/O to and from your computer.

*Please note: Do not connect the Dante primary network switch to the Dante secondary network switch.*

3. Connect your computer's onboard network adapter to the primary network switch. This connection is for audio routing configuration and Dante device setup via the Dante Controller application.
4. Connect your other Dante device(s) to the primary and secondary network switch using the Dante primary and secondary ports on each device respectively.

## Computer Network Settings

This section details how to configure the network settings on the computer running Dante Controller. This section assumes a simple Dante network setup without fixed IP addressing.

1. Connect the computer's network adapter to either the Dante Primary or Secondary network switch. This can be same computer with the PCIe-R installed; in this instance both the Dante Primary and Secondary ports of the PCIe-R card, and the computer's onboard network adapter are connected to the Dante network.
2. **On Mac**, go to System Preferences, and click on Network.



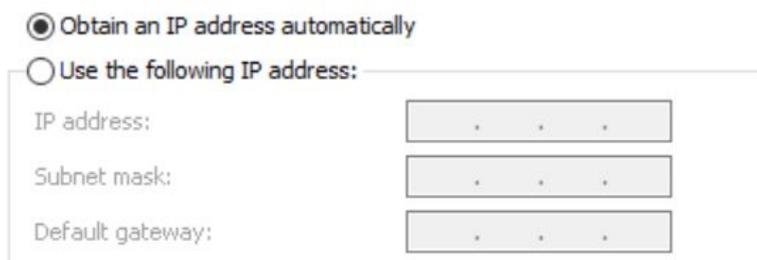
Select the Ethernet port / Thunderbolt Ethernet you have connected to the switch, and set the Configure IPv4 to: Using DHCP.



**On PC**, go to Settings and click on Network & Internet.



Click on Change adapter options, then Ethernet, Properties, and then Internet Protocol Version 4 (TCP/IPv4). You should make sure that Obtain an IP address automatically is enabled.



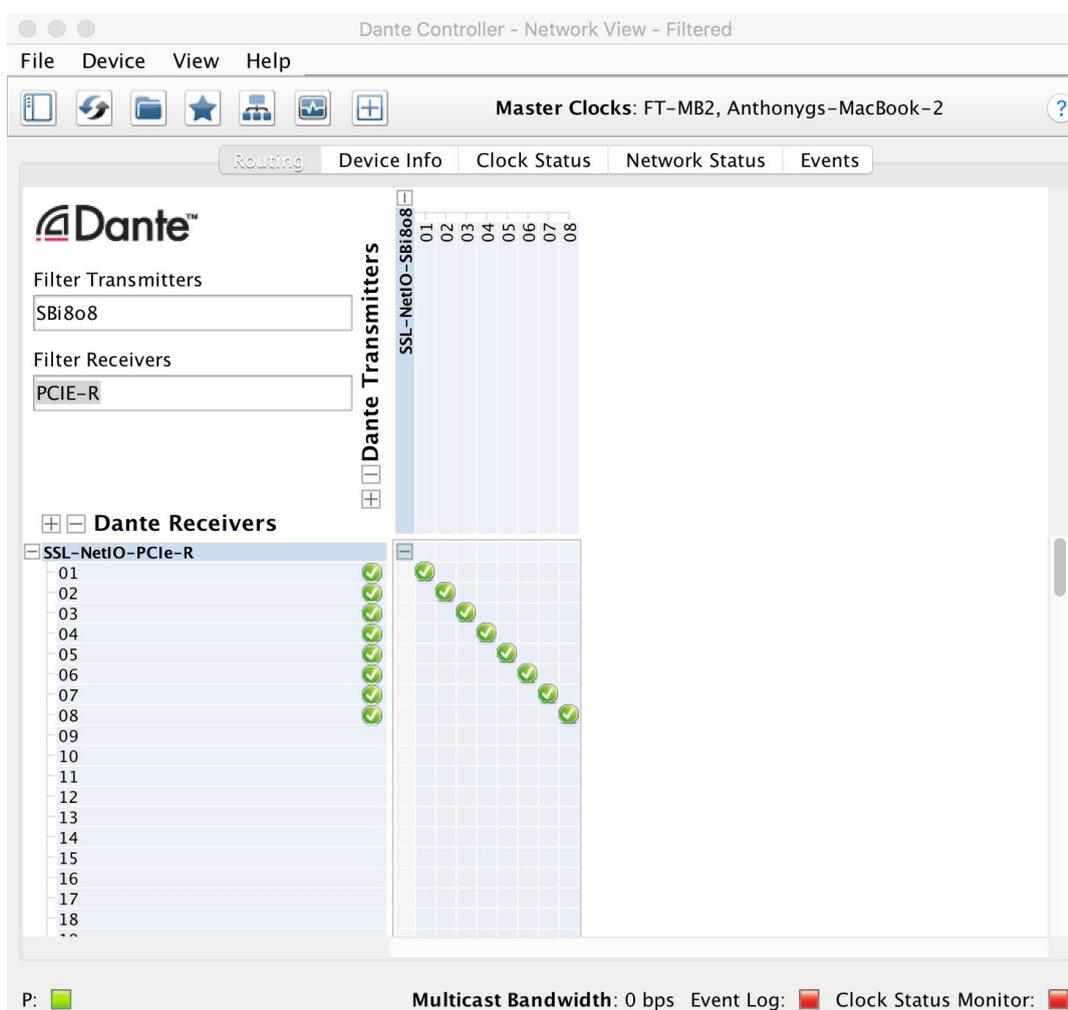
## Audio Routing, Device Settings, and DAW Setup

This section details how to setup audio routes between your Network I/O PCIe-R with other Dante devices on the network, alter the settings on your Network I/O PCIe-R, and setup your DAW's playback device.

For complete details on Dante Controller software, refer to Audinate's user guide: [www.audinate.com/resources/technical-documentation](http://www.audinate.com/resources/technical-documentation). The information below will give you the basics to get started.

### Audio routing

1. Open Dante Controller.
2. Expand the audio routing matrix by clicking the + buttons between Dante Transmitter and Dante Receiver devices. The Network I/O PCIe-R will appear as both Dante Transmitter and Dante Receiver as it has inputs and outputs. Some Dante devices may only have inputs or outputs.
3. To make an audio connection (a subscription), and click on the cross points between the Network I/O PCIe-R and your Dante device(s). When the connection is made (a successful subscription), a green tick icon will appear (as shown).



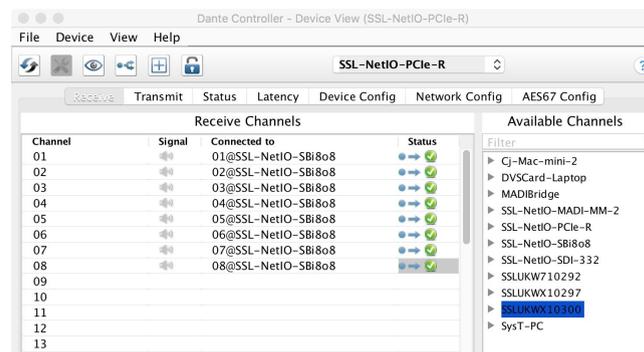
For quick 1:1 routing with a single Dante device, Ctrl-click on the first subscription cross-point for incremental 1:1 routing.

## Network I/O PCIe-R Settings

The settings for the Network I/O PCIe-R are configured from Dante Controller.

In the Dante Controller **Routing** tab, double-click on the Network I/O PCIe-r. This will open the **Device View**, where the Network I/O PCIe-R settings can be altered.

- From the **Receive** or **Transmit** tab, you can alter channel-specific naming, and view audio Receiver or Transmitter subscriptions to and from other Dante devices.

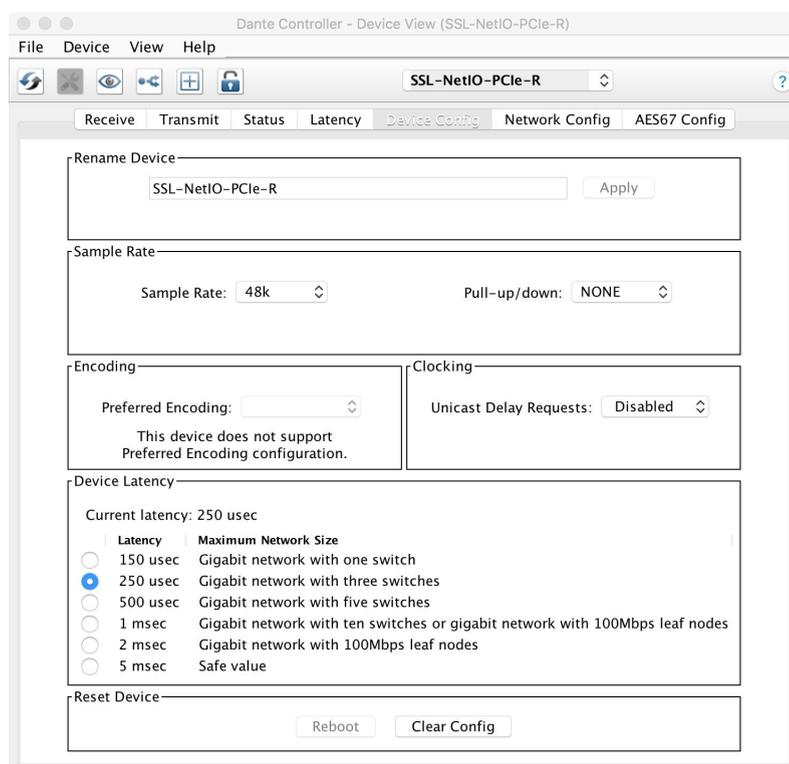


- When multiple PCIe-R cards are available on the network, it useful to identify which card is which. Clicking the **Identify** icon in the Device View will cause all LED's on the selected PCIe-R card front panel to flash green for ten seconds.



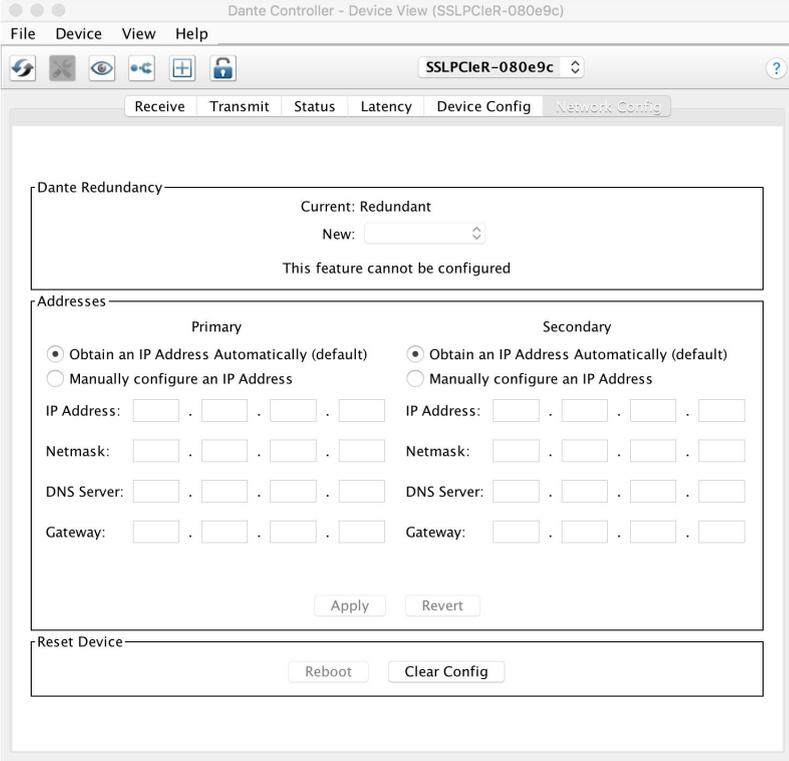
- From the **Device Config** tab, you can alter the **sample rate**, **device latency**, and also **rename the device**.

*Please Note: Changing the latency setting will cause audio routes to and from the Network I/O PCIe-R to be temporarily suspended.*



- From the **Network Config** tab you can alter the device network settings. As standard, the Network I/O PCIe-R is set to obtain an IP address automatically, and resolves to a link local address when not connected to a DHCP server. For smaller networks that do not require specific IP address configuration, we advise keeping this setup.

From the **Network Config** tab you can configure a fixed IP address if needed.



The screenshot displays the Dante Controller's Network Config interface for device SSLPCIeR-080e9c. The interface is divided into several sections:

- Dante Redundancy:** Shows 'Current: Redundant' and a 'New:' dropdown menu. A message below states 'This feature cannot be configured'.
- Addresses:** This section is split into 'Primary' and 'Secondary' columns. Each column has two radio button options: 'Obtain an IP Address Automatically (default)' (selected) and 'Manually configure an IP Address'. Below these are input fields for IP Address, Netmask, DNS Server, and Gateway, each with a dotted box for the IP address and a box for the netmask.
- Reset Device:** Contains two buttons: 'Reboot' and 'Clear Config'.

*Please Note: to configure either of the Network I/O PCIe-R Dante ports to a fixed IP address, the computer running Dante Controller will initially need to be connected to a DHCP server or resolve to a link local address, in order to access these settings from Dante Controller. After the IP address has been set on the Network I/O PCIe-R, the computer running Dante Controller can then be set to a fixed IP address in the same subnet.*

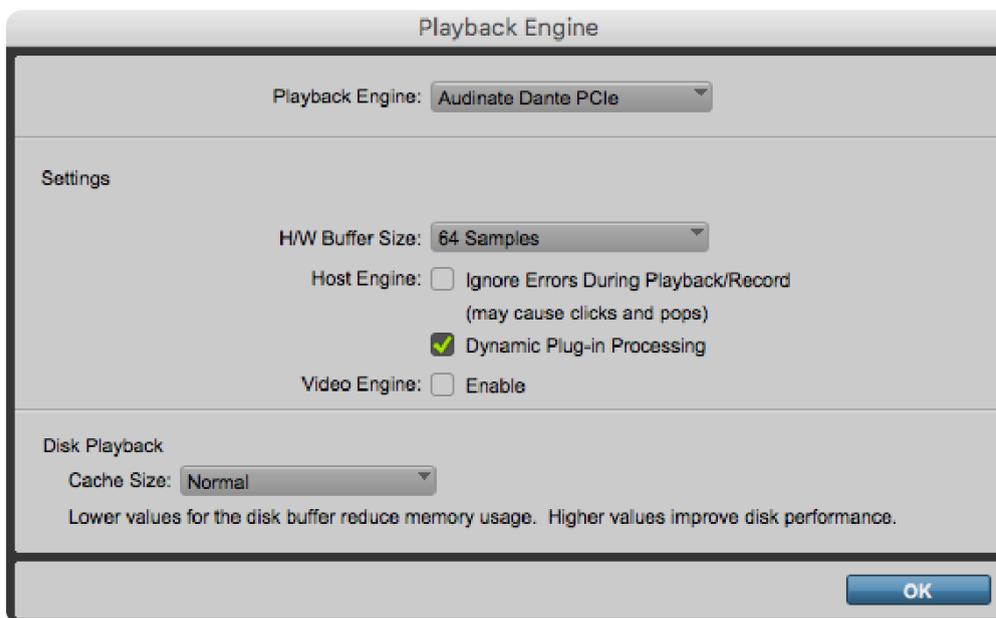
For more details on configuring an expanded Dante audio network with other Dante based products, please see the Audinate website at [www.audinate.com](http://www.audinate.com).

We also recommend viewing the useful Audinate videos about Dante Controller here: <https://www.audinate.com/resources/videos/gs0-getting-started-dante-audio-networking-training>

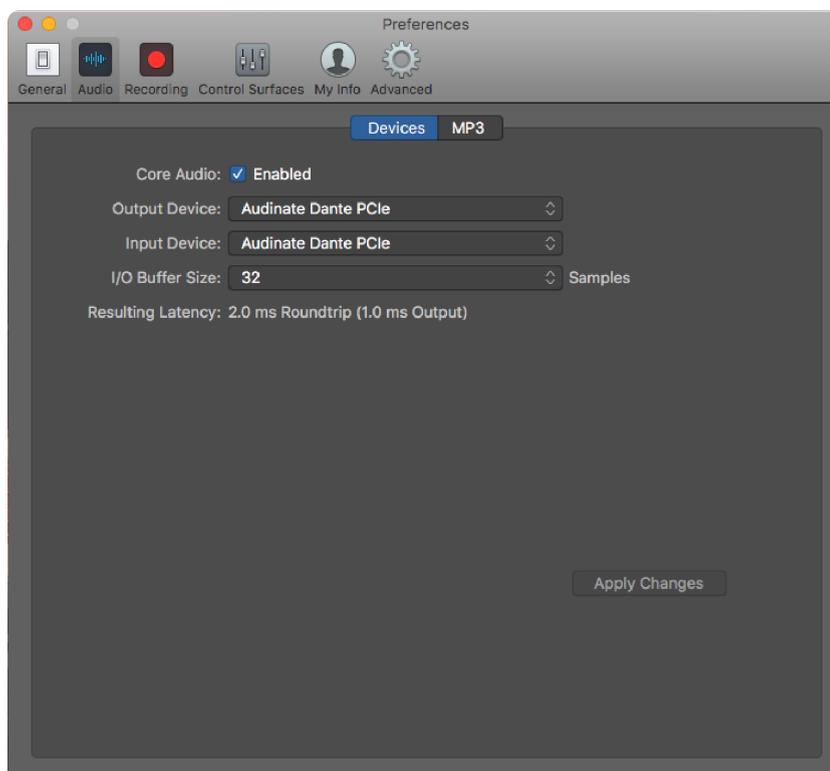
## DAW Settings

Once you have configured the Network I/O PCIe-R with the rest of your Dante network, open your DAW. Open the playback / ASIO device settings, and set the device to be the Audinate Dante PCIe.

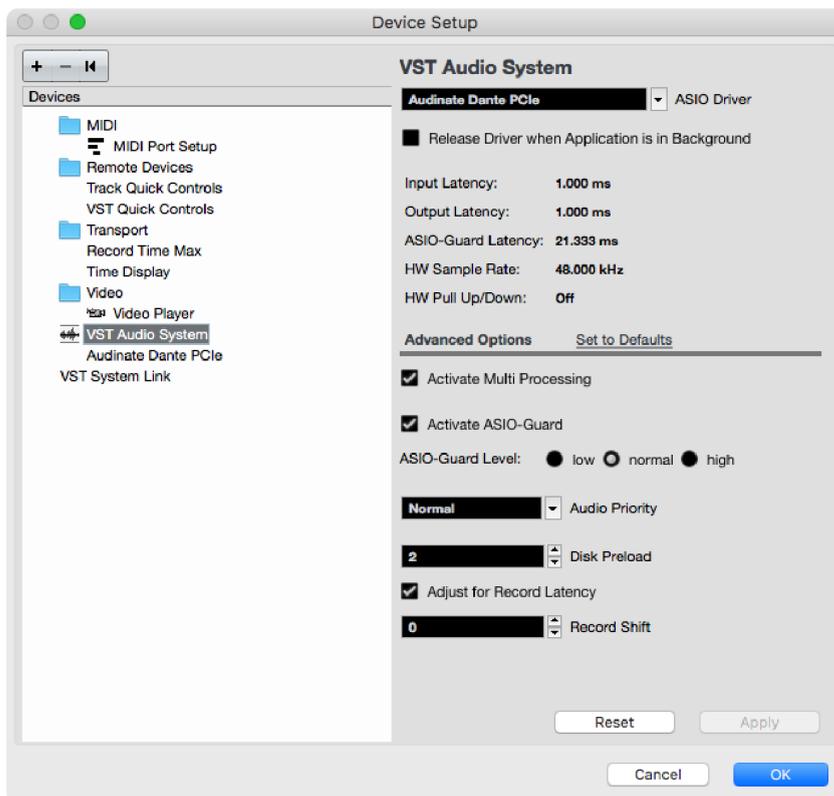
### Avid Pro Tools



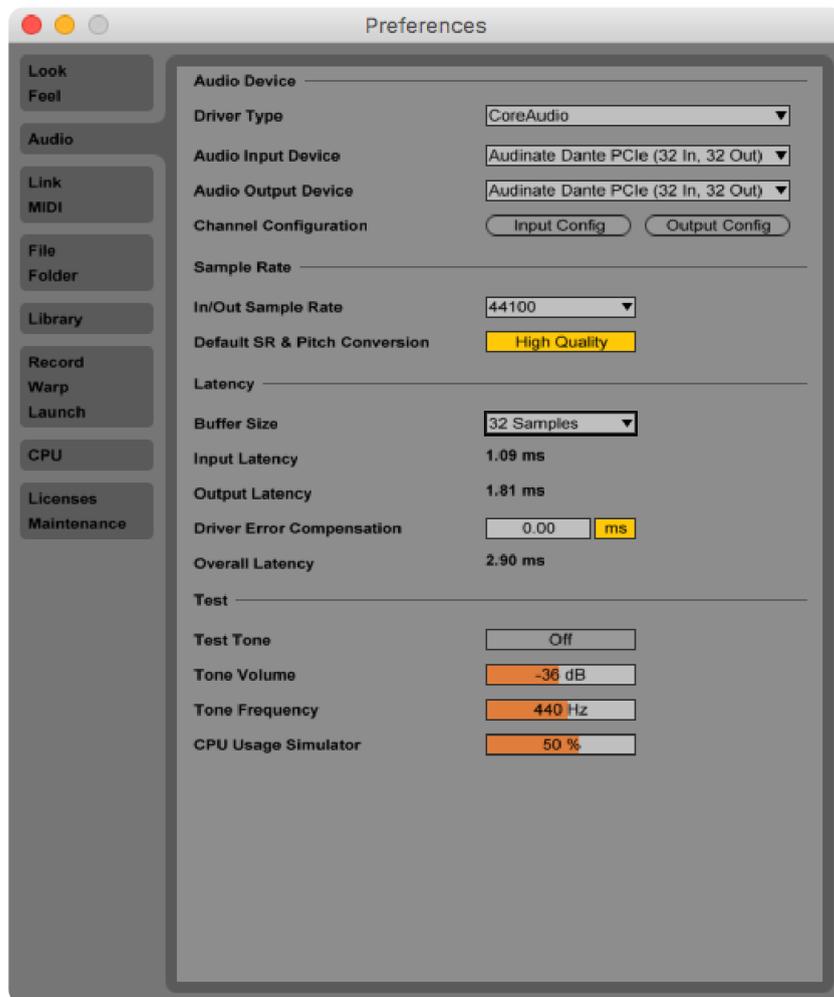
### Apple Logic Pro



Steinberg Cubase



Ableton Live



## Troubleshooting and FAQ's

Frequently Asked Questions can be found on the Solid State Logic Website at:

<http://www2.solidstatelogic.com/support/>

If you require technical support for your Network I/O PCIe-R or other SSL Products, click on the Ask a Question link on the support page to open a support ticket, and an SSL Product Support Engineer will be in contact.

Can't find what you need?

[Ask a Question](#)

## Warranty

Warranty claims will only be accepted if the purchased product has been used for its intended purpose. Any purchased product used for an unintended purpose will not be eligible for warranty protection. For all warranty inquiries or claims please address your claim to the dealer that you purchased the product from – or to Solid State Logic if the purchase was directly from Solid State Logic – within a period of two months from the date on which you detected its lack of conformity with the terms of the warranty. Please include your original proof of purchase when initiating the claim.

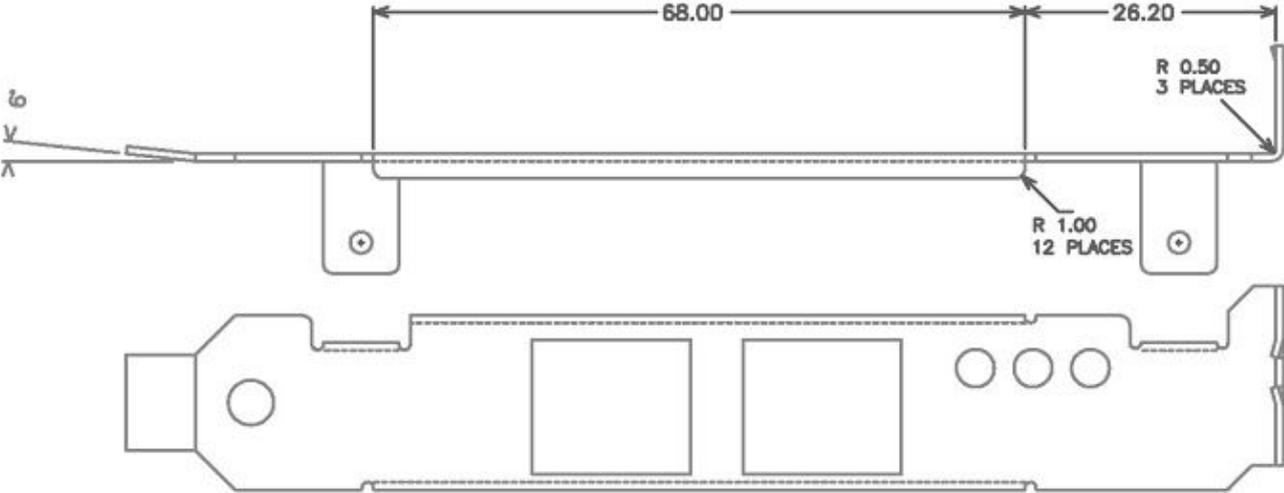
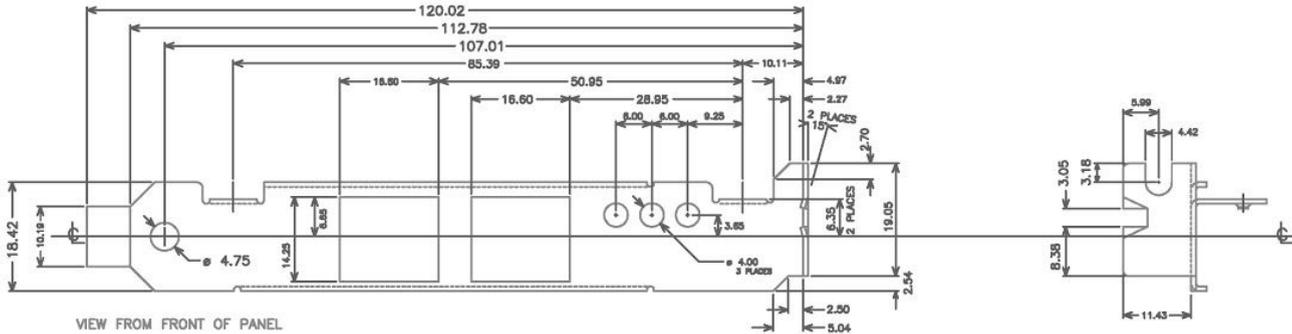
- **Within the EU:** Pursuant to the Solid State Logic Terms and Conditions under European consumer law the purchaser has full statutory warranty rights for two years from the date of purchase of the product. The warranty is valid only in those Member States of the European Union (EU) who have adopted the applicable EU law into their national legislation. The applicable national legislation governing the sale of consumer goods is not affected by this warranty.
- **Outside of the EU:** Outside of the European Union a 12 month warranty from date of purchase is applicable.

### All returns

- No unit will be accepted for repair by Solid State Logic unless accompanied by a valid RMA (Return Material Authorisation) number, obtainable from Solid State Logic prior to shipping.
- All units should be shipped to Solid State Logic in suitable rigid packaging – Solid State Logic cannot be held responsible for any damage caused by shipping units in other packaging.

# Appendices

## Appendix A – Physical specifications



## Appendix B – Performance specifications

<b>PCI Express card</b>	Compatible with PCIe x4 slots v1.0 or above.
<b>Audio Interface</b>	Presents as standard ASIO audio interface (Windows) or Core Audio (Mac OSX) sound card.
<b>Audio Channels</b>	256 @ up to 96kHz (128 x 128) 128 @ 176.4 and 192kHz (64 x 64)
<b>Supported Sample Rates</b>	44.1, 48, 88.2, 96, 176.4, and 192kHz
<b>Pull-up/down</b>	+4.1667, +0.1, -0.1, -4%
<b>Sample bit-depth</b>	24 bit PCM
<b>Round Trip Latency</b>	Less than 2.99ms digital round trip to/from connected Dante audio equipment through DAW including sample buffers at fS.
<b>Clock</b>	Dante and IEEE 1588 PTPv1 and PTPv2 (AES67) clocking. Slave or Grand Master option.
<b>Dante Network interface</b>	Gigabit (1000Mbps; 1Gbps) Ethernet RJ45 connectors
<b>Glitch-free redundancy</b>	Secondary network interface for connection to a redundant network
<b>Full Dante implementation</b>	Compatible with all Dante-enabled audio equipment over standard IP/Ethernet network

## Appendix C – Safety Notices

### *General Safety*

- Read and keep and follow these instructions!
- Do not expose your PCI Express card to rain or moisture.
- Do not block any of the host computer ventilation openings.
- Do not install near any heat sources such as radiators, heat registers, stoves or other apparatus (including amplifiers) that produce heat.
- There are no user-adjustments, or user-serviceable items on this product.
- Alterations to this product may affect the performance such that safety and/or international compliance standards may no longer be met.
- To reduce risk of electric shock, do not perform any servicing other than that contained in these instructions unless you are qualified to do so.

### *Installation Notes*

- PCI Express cards can be severely damaged by static electricity. Ensure that you are properly grounded before you open your PC or touch your PCI Express card. If an anti-static strap is not available then discharge any built-up static electricity by touching a large grounded metal surface for a few seconds.
- Only handle the PCI Express card by its edges and do not touch the connector pins.
- When installing this card, place the host system into which it is to be installed on a secure level surface.
- Always remove the power cord from the host system prior to accessing this apparatus.
- Be careful of rough or sharp edges when accessing the inside of the host system.
- If in doubt about installing this card, please contact a qualified service person.

### *CE Certification*



This apparatus fully conforms with the current protection requirements of the European community council directives on EMC and LVD.

### *FCC Information (USA)*



1. Do not modify this product!

This product when installed correctly meets FCC requirements. Any modifications not approved by SSL may void your authority, granted by the FCC, to use this product.

2. Important:

Follow all installation instructions and only use high quality shielded cables when connecting this product. Failure to follow instructions could void your FCC authorization to use this product in the USA.

3. Note:

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful

interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Relocate either this product or the device that is being affected by the interference.
- Use power outlets on a different mains circuit or install AC line filters.
- If there is radio or TV interference, relocate or reorientate the antenna.
- Consult your dealer or an experienced radio/TV technician for help.

### *RoHS notice*

Solid State Logic complies with and this product conforms to European Union's Directive 2011/65/EU on Restrictions of Hazardous Substances (RoHS) as well as the following sections of California law which refer to RoHS, namely sections 25214.10, 25214.10.2, and 58012, Health and Safety Code; Section 42475.2, Public Resources Code.

### *Instructions for disposal of WEEE by users in the European Union*



The symbol shown here, which is on the product or on its packaging, indicates that this product must not be disposed of with other waste. Instead, it is the user's responsibility to dispose of their waste equipment by handing it over to a designated collection point for recycling of waste electrical and electronic equipment. The separate collection and recycling of your waste equipment at the time of disposal will help to conserve natural resources and ensure that it is recycled in a manner that protects human health and the environment. For more information about where you can drop off your waste equipment for recycling, please contact your local city office, your household waste disposal service or where you purchased the product.