REDNET PCIeNX
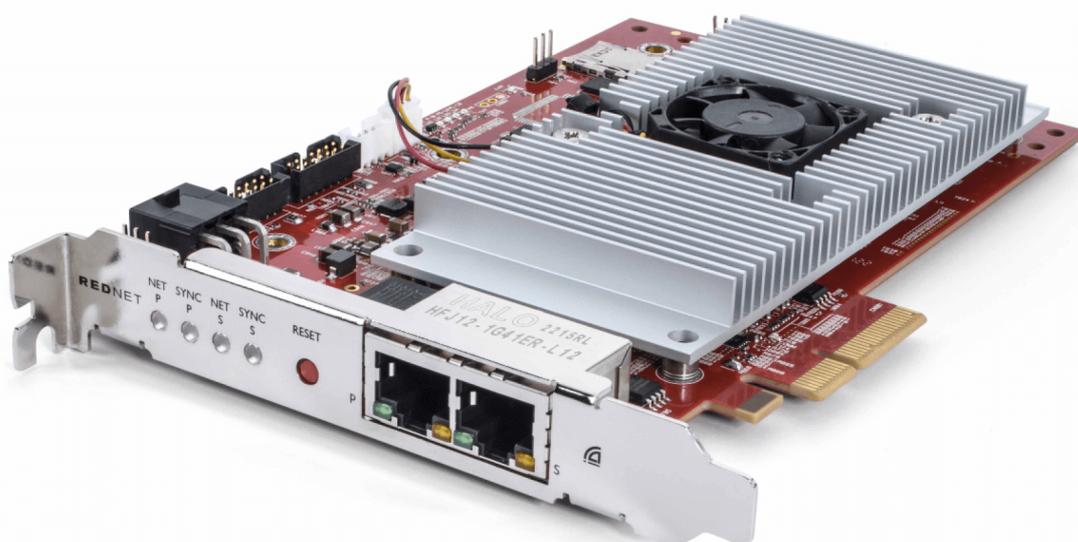
Dante Audio Interface

Installation Guide

Version 1.0

Focusrite®

focusrite.com

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About this User Guide

This user guide applies to the RedNet PCIeNX Dante interface card.

If this user guide doesn't include the information you need, you can find a collection of common technical support queries at:

focusritepro.zendesk.com

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Introduction

Thank you for investing in the Focusrite RedNet system.

RedNet is a powerful, low-latency, digital audio networking system designed specifically for music, recording studio, live, and broadcast applications. RedNet is based on Audinate's Dante, a well-established audio networking technology known for its extreme robustness. Dante – and the RedNet system – is capable of transporting up to 512 channels of bidirectional audio (at 48 kHz sample rate) over a single gigabit Ethernet link.

The RedNet PCIeNX card provides the hardware interface between the host computer and the Ethernet network, interconnecting the various I/O units in a RedNet system.

Key Features

- Standard PCI Express installation
- Compatible with standard network switches
- 128 × 128 redundant channels at up to 192KHz
- Seamless operation with other RedNet and Dante devices
- Support for macOS and Windows
- Supports AES67, Dante Domain Manager, and is SMPTE ST 2110 compliant, which makes it perfect for broadcast deployment

When installed in a 4-lane (minimum) PCIe card slot in either a PC, Mac or Thunderbolt chassis, the RedNet PCIeNX card allows up to 128 channels to be sent to/from the DAW through its on-board Ethernet ports.

> **Note**
> To achieve the best performance, we recommend using a 16-lane PCIe card slot.

Box Contents

- RedNet PCIeNX card
- 2m Cat 6A Ethernet cable
- Safety information cut sheet
- Focusrite Important Information Guide
- Product Registration Card – instructions on the card provide links to:
    - RedNet Control
    - RedNet PCIe drivers *(included with RedNet Control download)*

System Requirements

OS Version

The easiest way to check if your computer's operating system (OS) is compatible with the RedNet PCIeNXis to use our Help Centre's compatibility articles:

focusritepro.zendesk.com/hc/categories/360000105489-Compatibility

As new OS versions become available over time, you can continue to check for further compatibility information by searching our Help Centre at:

focusritepro.zendesk.com

PCIe Expansion Slot

A full-height, half-length, 4x to 16x lane PCIe slot, supporting PCIe 2.1.

Network

The Audinate Dante protocol, on which RedNet is based, uses standard Ethernet technology for the network. Whilst Dante traffic can be mixed with other network data, we recommend that for maximum performance, the RedNet audio network should be self-contained and should not also be used for other IT purposes.

RedNet is compatible with Cat 5e and above cabling; Cat 6 STP is preferred. Standard RJ45 connectors with metal screens should be used, with the cable screen bonded to the connector screen.

> **(!) Important**
>
> This product Satisfies FCC regulations when high-quality shielded cables are used to connect with other equipment. Failure to use high-quality shielded cables or to follow the installation instructions within this manual, may cause magnetic interference with appliances such as radios and televisions and void your FCC authorisation to use this product in the USA.

Network Switches

- Gigabit (1000 Mbps) capable – switches below this rating are not supported
- Quality of Service (QoS) with 4 queues
- Diffserv (DSCP) QoS, with strict priority
- Should be of the 'managed' type to provide detailed information about the operation of each network link: port speed, error counters, bandwidth used, etc.
- 'Non-blocking' to allow full bandwidth of all ports simultaneously
- An internal mains power supply is recommended – the external "plug-top" PSUs supplied with some units can be prone to interference which could generate audible artefacts

Hardware Features
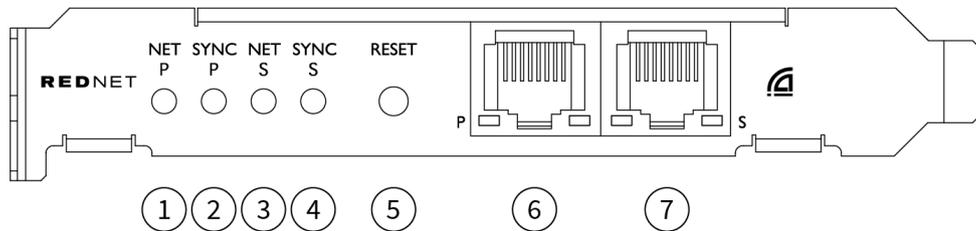
1. **Net P Status LED**
   Multicolour LED. Illuminates in Switched mode or Redundant mode:
   - **Green** (Solid) – Primary Link active (DHCP)
   - **Blue** (Solid) – Primary Link active (Static IP)
   - **Off** – No network connection

2. **Sync P Status LED**
   Multicolour LED. Illuminates in Switched mode or Redundant mode:
   - **Blue** (Solid) – Confirms card is a Dante **PTP leader**; the card is set (via Dante Controller) to generate the Dante clock which will be used by other units
   - **Green** (Solid) – Confirms card is a Dante **PTP follower**; the card will sync to the clock embedded in the incoming Dante bitstream
   - **Red** (solid) – No PTP sync

3. **Net S Status LED**
   Multicolour LED:
   - **Green** (Solid) – Secondary Link active (DHCP)
   - **Blue** (Solid) – Secondary Link active (Static IP)
   - **Off** – No network connection
   - **Purple** (Solid) – Indicates card is in Switched mode

4. **Sync S Status LED**
   Multicolour LED. Illuminates in Redundant mode only:
   - **Blue** (Solid) – Confirms card is a Dante **PTP leader**; the card is set (via Dante Controller) to generate the Dante clock which will be used by other units
   - **Green** (Solid) – Confirms card is a Dante **PTP follower**; the card will sync to the clock embedded in the incoming Dante bitstream
   - **Off** – No network connection
   - **Purple** (Solid) – Indicates card is in Switched mode

5. **Reset Switch**
   Clears current configuration (Name, IP config, etc.). Press and hold for seven seconds to return the card to its default state with the DHCP setting.
   When pressed, the front panel LEDs will illuminate in sequence at one-second intervals. All LEDs will then flash for a further three seconds, after which the card will reset.

6. **Primary Network Port**
   RJ45 connector for the Dante network. Use shielded Cat 5e or better network cables to connect the card to the Ethernet network switch.
   Adjacent to both network sockets are LEDs which illuminate to indicate a valid network connection and network activity.

7. **Secondary Network Port**
   Secondary Dante network connection where two independent Ethernet links are being used (Redundant mode), or an additional port on an integral network switch on the primary network (Switched mode). The operating mode is set via Dante Controller.
   The Dante network can be viewed or controlled via either port.

RedNet PCIeNX Installation

Hardware Installation

You must switch off and disconnect the mains supply for your computer before beginning the installation of the RedNet PCIeNX card. Hot-plugging is NOT supported.

Allow the computer to cool down before you begin installing.

Refer to your computer's technical manual for instructions on how to install the PCIe card.

Electrostatic Discharge Precautions

Electrostatic discharge (ESD) can irreversibly damage the product. You must observe the following ESD precautions when installing the card:

- Wear an ESD wrist strap connected to an unpainted surface of the computer's chassis. The strap should fit snugly against the skin to ensure a reliable connection.
- Keep the PCIeNX card in its ESD bag until you need it.
- Only grip the card by its edges or front panel; avoid touching any of the component parts.
- Do not touch the PCIe edge connector contacts.
- If you don't have an ESD wrist strap, always touch an unpainted surface of your computer's chassis before handling the card.
- Avoid walking across carpeted areas during installation
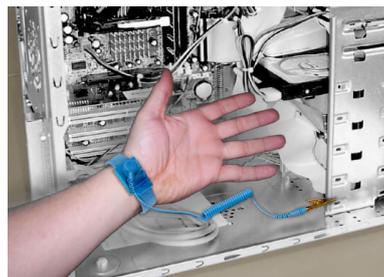
Software Installation

You can download all the software you need for a RedNet system from the Focusrite website after you register your RedNet PCIeNX at: focusrite.com/register.

You can control RedNet functions from RedNet Control, and define routing in Dante Controller.

Audinate Dante Controller

To download Dante Controller go to: audinate.com. After registering, you can download and install the application.

RedNet Control 2

The Product Registration Card provided with your RedNet device contains a validation code, which you need to enter in the Registration area.

Follow the instructions on the card to register your product and download RedNet Control 2 and associated software.

After it's downloaded, you can install the RedNet Control 2 application. Follow all on-screen instructions from this point.

RedNet Control is always available for anyone to download from downloads.focusrite.com/focusrite-pro

System Power Up

We recommend you power on the components in a RedNet system as follows:

1. Power up the Gigabit switch(es)
2. Power up all RedNet units on the network
3. Boot the host computer

Once your computer has finished booting, open RedNet Control 2.

Connecting your RedNet Audio Network

We recommend all Ethernet connections in your Dante system are made using CAT 6 STP cables.

> **Note**
> The RedNet PCIeNX includes a 'virtual' Ethernet port to enable control data to be passed through to remote RedNet I/O devices. There is therefore no need to connect any other network ports on your computer to your Dante network.

Standard Network

This setup requires only one gigabit network switch:

- Connect the Primary RedNet PCIeNX card port to the gigabit switch
- Connect the Ethernet ports on each RedNet I/O interface in your system to ports on the gigabit switch.

Daisy-chain to additional RedNet device. 'Switched' mode
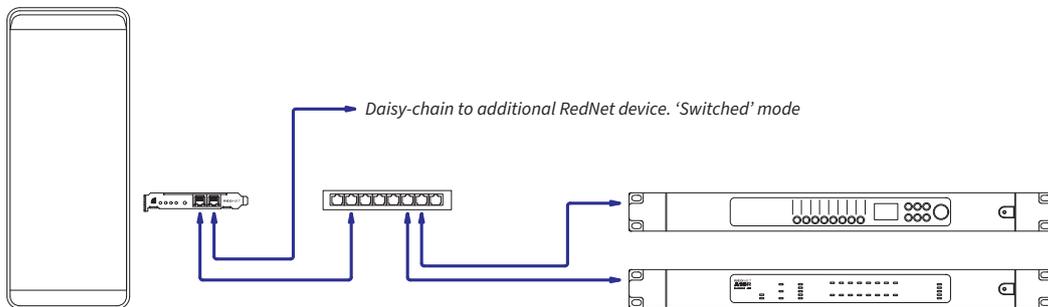
Redundant Network

You can use a redundant network for RedNet devices with both Primary and Secondary network ports. If the primary network fails, audio transmission seamlessly switches to use the secondary network. This redundant setup is often found in Live and Broadcast applications.

A redundant network requires a minimum of two network switches:

- Connect the Primary port of the RedNet PCIeNX card to the primary network switch
- Connect the Secondary port of the RedNet PCIeNX card to the secondary network switch
- Connect your other Dante device(s) Primary and Secondary ports to the primary and secondary network switches respectively for each device

> **Note**
> Do not make any connections between the primary and secondary network switches.
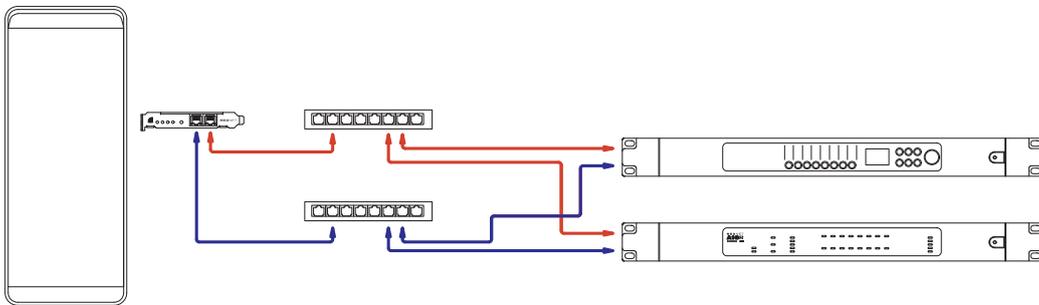
Operation

Audio Routing in your DAW with RedNet Control 2

Your DAW allows you to select which RedNet audio channel feeds each track. Please refer to your DAW's documentation or Help files if you are unsure about this.

The RedNet PCIeNX card will be detected by your DAW and added to the list of available audio sources. Select PCIeNX (macOS) or Focusrite Thunderbolt ASIO (Windows).

Using Dante Controller

Audinate Dante Controller is installed on your computer as part of the RedNet Control 2 installation. You can open Dante Controller either by going to its shortcut (in **Applications** on Macs or in **All Programs** in Windows), or by selecting '**Launch Dante Controller...**' from the right-click Utility menu in RedNet Control 2.
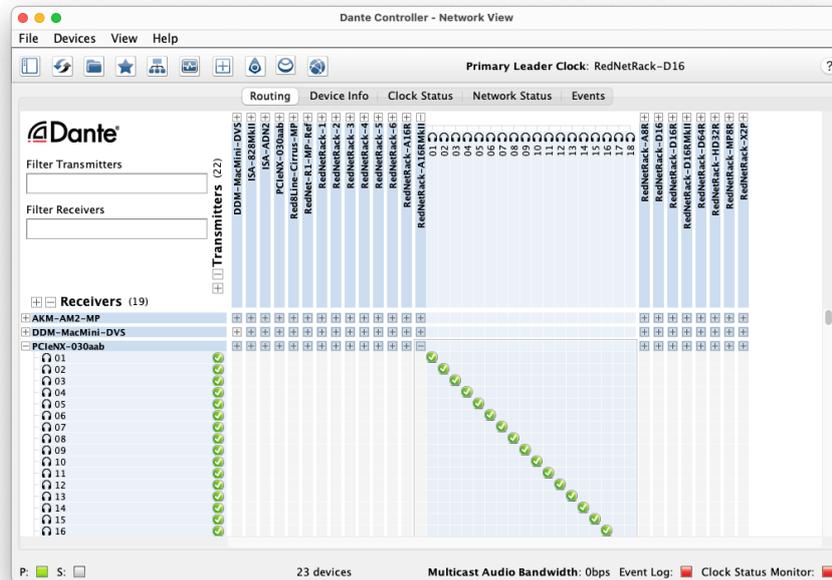
The **Routing** tab is arranged as a cross-point matrix. Audio inputs are listed horizontally (called Dante Transmitters) and audio outputs are listed vertically (called Dante Receivers).

You can expand the I/O matrix for each RedNet and Dante device – to reveal its full set of inputs or outputs – or collapse by clicking the appropriate '**+**' or '**-**' symbol against each device's name. Some devices may have only inputs or outputs.

The RedNet PCIeNX card appears as a device with Dante Transmitters and Dante Receivers, as it has both inputs and outputs.

- To create an audio connection (called a subscription), click on the appropriate crosspoint between the RedNet PCIeNX card and your other Dante I/O device. When the connection is made (a successful subscription), a green tick icon will appear.

- For incremental 1:1 routing within a single RedNet device, Ctrl-click on the first subscription cross-point

> 📄 **Note**
> For further details on how to configure a RedNet/Dante audio network, including 'How to' animations, please see the Audinate website at: audinate.com

Appendix A. Connector Pinouts

Network

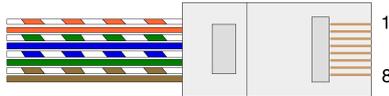Applies to:

- Primary, Secondary

Connector type:

- RJ-45 receptacle

Pin	Cat 5/6 Core
1	White + Orange
2	Orange
3	White + Green
4	Blue
5	White + Blue
6	Green
7	White +Brown
8	Brown

Appendix B. A note about Latency

No digital audio system is "instantaneous"; the term "latency" is used to express the time by which the audio is delayed in travelling through the system. In practice, latency only becomes a problem when mixing signals from systems having significantly different delays. The Dante protocol used by RedNet exhibits very low latency, and you should not experience any problems in normal recording practice when using it for multichannel audio transport between a DAW and sources or monitoring.

The precise latency of any given system will be determined by multiple factors, including the processing speed of the computer, the number of switches in the network, or make/model of switch used and the network topology.

If you are using Dante Virtual Soundcard instead of the RedNet PCIeNX card, the computer requires additional processing time.

Performance and Specifications

RedNet PCIeNX Card	
Compatibility	A full-height, half-length, 4x to 16x lane PCIe slot, supporting PCIe 2.1
Network connection	2 x RJ45, Primary and Secondary
Network interface	Gigabit (1,000Mbps) Ethernet
Size	Full height, half-width
Front panel	2 x Activity LED (Primary / Secondary)
	2 x Lock LED (Primary / Secondary)
	Factory Reset button

Digital Performance	
Supported sample rates	44.1 / 48 / 88.2 / 96 / 176.4 / 192 kHz
Pull-up / down	+4.1667, +0.1, -0.1, -4%
Bit depth	24 bit PCM

Notices

Focusrite Warranty and Service

All Focusrite products are built to the highest standards and should provide reliable performance for many years, subject to reasonable care, use, transportation and storage.

Many of the products returned under warranty are found not to exhibit any fault. To avoid unnecessary inconvenience to you in terms of returning the product please contact Focusrite support.

If a Manufacturing Defect becomes evident in a product within 36 months from the date of the original purchase, Focusrite will ensure that the product is repaired or replaced free of charge.

A Manufacturing Defect is defined as a defect in the performance of the product as described and published by Focusrite. A Manufacturing Defect does not include damage caused by post-purchase transportation, storage or careless handling, nor damage caused by misuse.

Whilst this warranty is provided by Focusrite the warranty obligations are fulfilled by the distributor responsible for the country in which you purchased the product.

In the event that you need to contact the distributor regarding a warranty issue, or an out-of-warranty chargeable repair, please visit: focusrite.com/distributors

The distributor will then advise you of the appropriate procedure for resolving the warranty issue. In every case, it will be necessary to provide a copy of the original invoice or store receipt to the distributor. If you cannot provide proof of purchase directly, then you should contact the reseller from whom you purchased the product and attempt to obtain proof of purchase from them.

Please do note that if you purchase a Focusrite product outside your country of residence or business you will not be entitled to ask your local Focusrite distributor to honour this limited warranty, although you may request an out-of-warranty chargeable repair.

This limited warranty is offered solely to products purchased from an Authorised Focusrite Reseller (defined as a reseller who has purchased the product directly from Focusrite Audio Engineering Limited in the UK, or one of its Authorised Distributors outside the UK). This Warranty is in addition to your statutory rights in the country of purchase.

Registering Your Product

To access optional bundled software, please register your product at: focusrite.com/register

Customer Support and Unit Servicing

You can contact our Customer Support team:

Email: focusriteprosupport@focusrite.com

Phone (UK): +44 (0)1494 836 384

Phone (USA): +1 (310) 450 8494

Troubleshooting

If you are experiencing problems with your RedNet PCIeNX, we recommend you visit our Support Help Centre at: focusritepro.zendesk.com

Credits

Focusrite would like to thank the following RedNet PCIeNX team members for their hard work in bringing you this product:

Adam Bassom, Adrien Fauconnet, Alex Davis, Alex Wood, Agata Schweizer, Ben Allim, Ben Bates, Cameron Stevenson, Daniel Johnson, Dan Stephens, Dave Curtis, Ed Fry, Ed Reason, Gagan Mudhar, Hannah Williams, Ian Dennis, Ioannis Moschopoulos, Jack Cole, James Hallowell, James Surgenor, Jamie Gomez, Jason Cheung, Jon Jannaway, Keith Burton, Laurence Clarke, Mark Rapson, Mary Browning, Nima Kalantar, Pete Carrs, Rebecca Clarke, Richard Finlayson, Richard Walters, Wade Dawson, Will Hoult.

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