



CL series Live Recording with Nuendo Live

Using Steinberg Nuendo Live



2nd Edition: April 2013



Summary:

This guide will show how quick and easy it is to achieve a high quality, live multi-track recording using a Yamaha CL series digital mixer, the bundled software of Nuendo Live and Dante Virtual Soundcard (or an optional Dante Accelerator card), and a PC.

Such a system is ideal for use as a virtual sound-check tool, and to create a concert archive for later mix-down using Steinberg or other professional Digital Audio Workstation software.

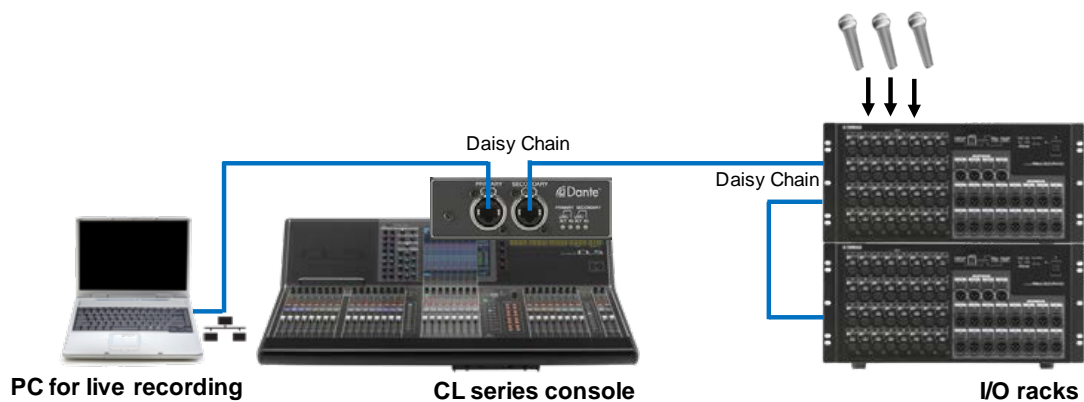
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Introduction

The live recording solution outlined in this document utilises Dante media networking technology, which is adopted as a backbone network for the Yamaha CL series mixing system. Using a Yamaha CL console and Dante utility software, it is simple to set up the recording system, and switch between recording and playback modes without the need for re-starting the console, re-patching cables, or changing the word-clock settings.

This guide assumes the reader already has a basic knowledge of Dante networking and at least a brief experience with “Dante Controller” software. For more information about Dante, and to download the latest software, user guides and support FAQs, please visit the website of Audinate, the company that created Dante: www.audinate.com.



Typical system for CL series live recording.

Equipment List

1. Yamaha CL series digital mixing console (CL5, CL3, or CL1).
2. Dante-equipped I/O rack units such as Rio3224-D, Rio1608-D and Ri8-D.
3. One computer. Either:
 - a. PC running Windows 7 (32-bit or 64-bit version), Intel or AMD Processor (Dual Core or better), at least 2GB RAM, USB port, 1GB Ethernet port.
 - b. Mac running OSX version 10.7 or later, Intel Dual Core CPU (or better), at least 2GB RAM, USB port, 1GB Ethernet port.
4. Steinberg Nuendo Live software (a license is bundled with CL series) and USB eLicenser.
5. Dante Virtual Soundcard software (a license is bundled with CL series, Rio3224-D and Rio1608-D) or Dante Accelerator card (optional PCIe audio interface card)
6. Dante Controller software (available on Audinate website)
7. CL Extension software (available on Yamaha website)
8. CAT5e or CAT6 Ethernet cable to connect the PC to the Dante network.

Computer Requirements

It is strongly recommended to use a computer with at least 2GHz processing speed, and at least 4GB RAM. Also a Hard Disk Drive with a speed of 7200rpm or faster is recommended for recording and playback of more than 16 channels at 48kHz 24-bit. If possible, use a separate hard drive for recording/playing the audio files.

With regard to disk storage, allow 500MB per hour for each mono track at an audio quality of 48kHz 24-bit. So for example, 120GB will be able to record 60 tracks for 4 hours. Or for a 2 hour show consisting of 48 tracks, allow 50GB of storage.

Tips:

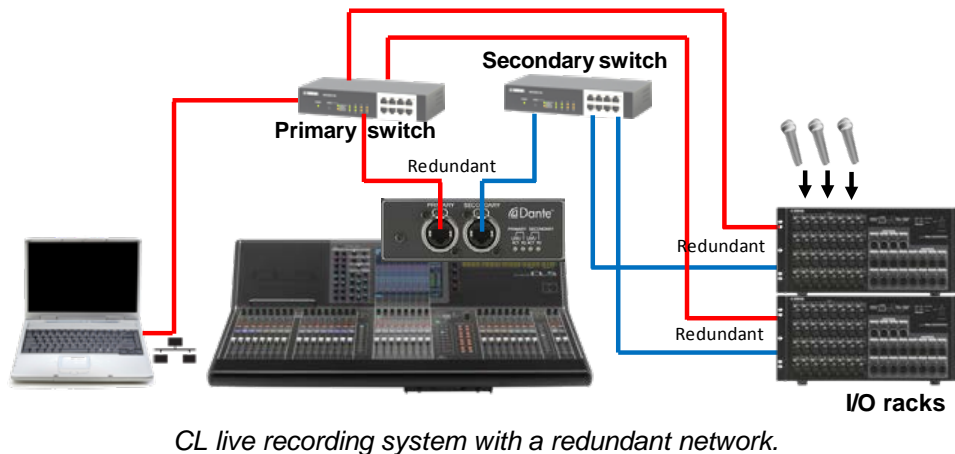
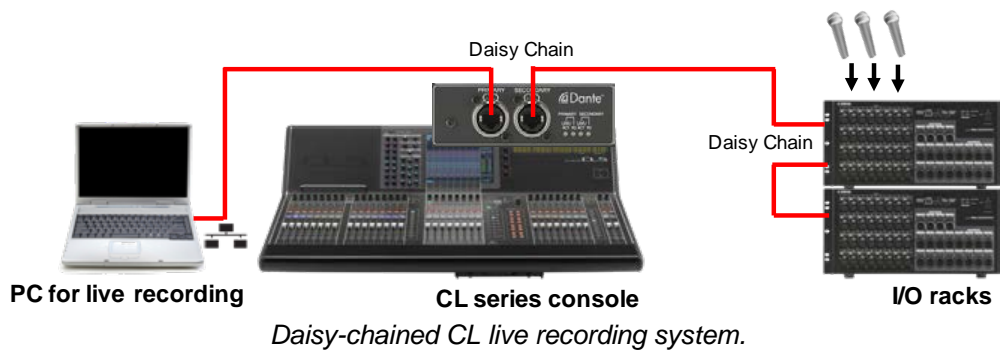
Disable all network interfaces except for the one being used with Dante. That includes disabling any wireless network interface the computer may have. This will improve the computers' performance with Dante.

Disable the computers' automatic indexing service on the disk drive used for recording and playback to further improve performance. In Windows 7, edit the "Indexing Options" in the Control Panel. In Mac OSX it is called "Spotlight", where external drives can be added to the "Privacy" list in the System Preferences.

Unfortunately, a specific type of Network Interface Card found in a few PCs is known to cause audio drop-outs. Please check the information in the Software Downloads area of www.audinate.com.

Hardware Setup

This guide assumes the CL mixing system is already configured. You can just connect your PC to the Dante network using a CAT5e network cable. Just as a simple example for 64 channel recording and playback, the PC, a CL series console and two units of Rio3224-D can be configured in a daisy-chain connection (as seen in the figure below). If the system is configured as a redundant system using network switches, be sure to connect your PC to the port of a Primary network switch. For further details on the system setup, refer to the CL series manuals.



Since CL firmware v1.5, where there are systems with multiple consoles and computers, each CL console in a system can integrate with a different computer running Nuendo Live. The limitation is that each computer can be controlled from only one CL, and each CL can control only one computer. However, audio can be freely routed from one computer to multiple consoles, or from one Rio to multiple computers for example.

Computer Preparation

Four items of software are needed on the computer:

1. Dante Virtual Soundcard (or DVS) allows the computers' network port to be used as an audio interface. (Not required for use with Dante Accelerator card.)
2. Dante Controller is used to configure the Dante network.
3. Nuendo Live is the multi-track live recording software.
4. CL Extension provides integration between Nuendo Live and the CL series consoles.

Software Installation

During the creation of this document, the current version of Dante Virtual Soundcard was V3.2.0, Dante Controller was V3.2.9, Nuendo Live was v1.0.0, and CL Extension was v1.1.0. Please use these or more recent versions if available.

Refer to www.audinate.com for the latest Dante software, user guides and support FAQs.

Refer to <http://www.steinberg.net> for the latest information and support about Nuendo Live.

Note that a license is required to run Dante Virtual Soundcard. One license can be obtained with the purchase of each CL console, Rio3224-D and Rio1608-D unit (not included with Ri8-D and Ro8-D). A yellow leaflet is supplied with the product, which describes a DVS token serial number (this is not a license ID!). The DVS token can be redeemed for a license ID on Audinate's website. Alternatively a license can be purchased directly from Audinate (see their website for details).

A USB eLicenser is required for using Nuendo Live. One of these is provided with each CL console purchase. Or they can be purchased independently from Steinberg's website

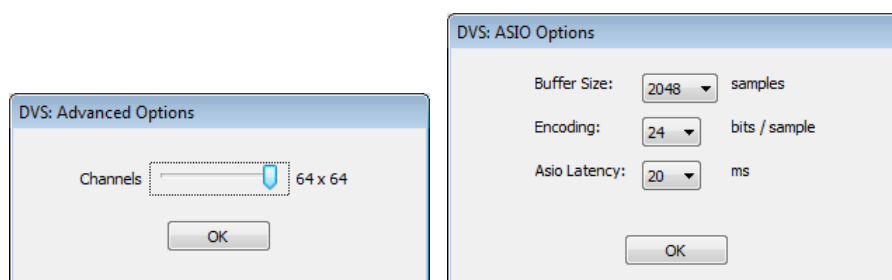
Dante Virtual Soundcard setup

Connect the computer's Network port to the Dante network. Ensure that the computer's IP address settings are set to automatic (default settings). Disable all other network interfaces on the computer, particularly any wireless interface. This will improve the computers' performance with Dante.

Start Dante Virtual Soundcard, but before enabling it, first select the ASIO Audio Interface (for Windows systems), the required audio format (48kHz, 24-bit for example), and the Dante Latency (keep it at a high setting for increased reliability with high channel counts). In the Advanced settings, select the number of channels to be recorded / played back. See the Dante Virtual Soundcard's User Guide for information about ASIO settings (for Windows operating systems), but it is sensible to use the highest buffer size and latency for reliable live recording.



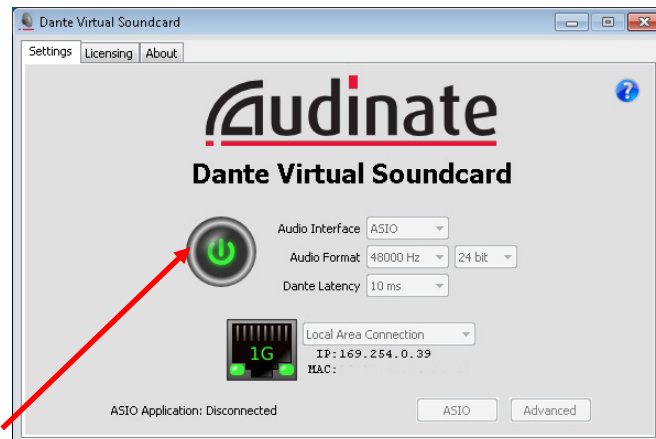
Dante Virtual Soundcard



Dante Virtual Soundcard: Advanced and ASIO options

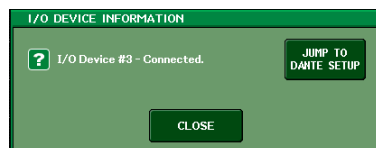
Tip:

Set the Buffer Size to 2048 samples, and ASIO Latency to 20ms for optimum reliability with high channel counts.

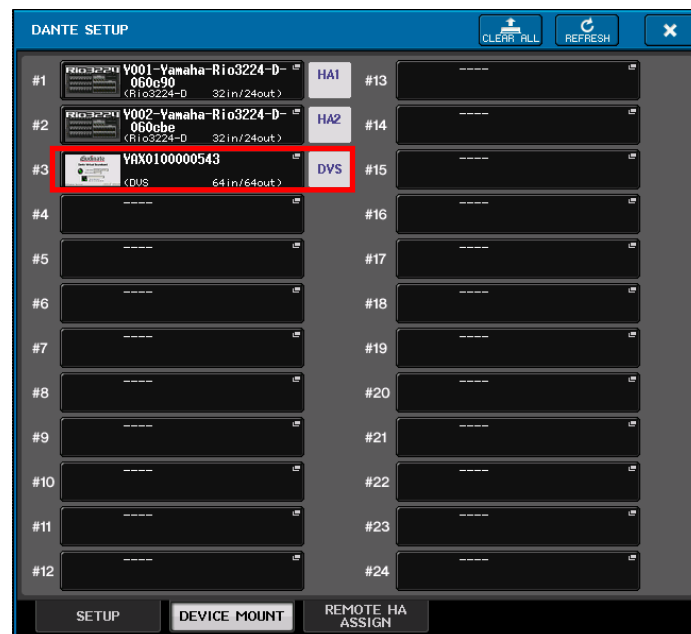


Enable Dante Virtual Soundcard by clicking on the big button!

The initial Dante Setup for the console has DVS selected as device #3. After Dante Virtual Soundcard (DVS) has been enabled, the CL console should automatically recognise that the PC has been connected to the network (assuming only a single PC with DVS running is connected). A message “I/O Device #3 – Connected” will appear on the touch-screen, and the computer name will appear at #3 in the Dante Setup screen -> Device Mount page and the I/O Device screen. It is important to wait for this to happen: if the PC connection is not recognised by the console, the integration with Nuendo Live will not function.



DVS connected message.



Dante Setup -> Device Mount page

Tip:

If after 2 minutes or more the CL mixer still hasn't detected the PC, then the firewall settings and/or anti-virus settings may need to be adjusted. Switch them off completely for a quick test, and then adjust the settings later for optimum performance or protection as required.

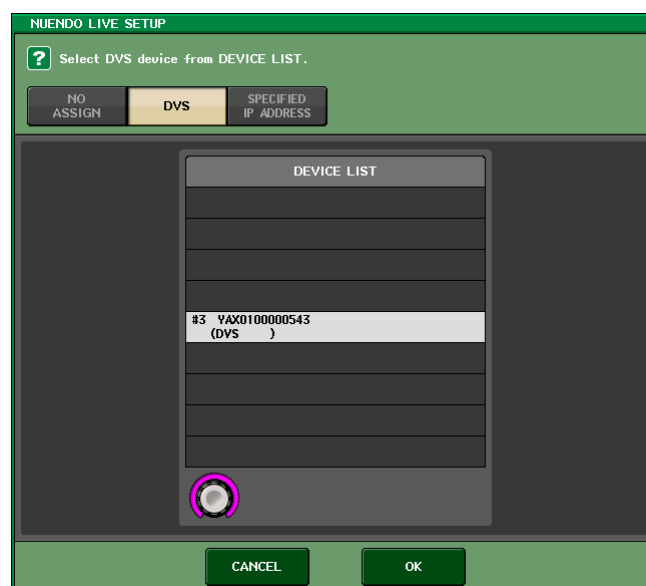
When multiple computers with DVS running are connected, or if DVS has not connected to the console automatically, it will be necessary to manually select and mount DVS on the DEVICE MOUNT page of the DANTE SETUP screen. Touch the desired device number in which to mount DVS, and the Device Select popup appears. Search in the Online Device List for the PC's name, select it and touch [OK].



Mounting online DVS.

Several computers can be mounted, so that audio patching can be edited from the console screen. (Remember that multiple computers can be used for recording redundancy).

Next, the PC to be controlled by the CL console can be chosen by opening the RECORDER menu, selecting the NUENDO LIVE page, and pressing the NUENDO LIVE SETUP button. Open the DVS list, and select a single PC for control.

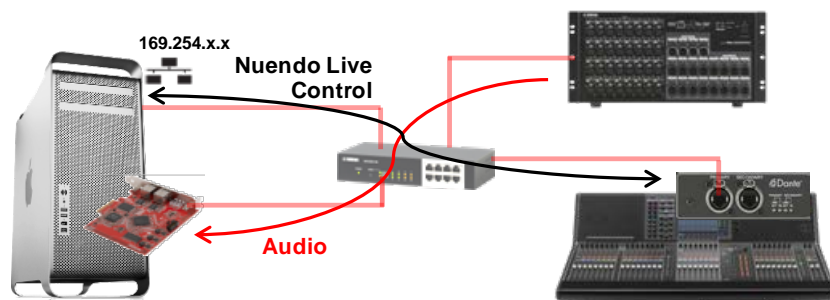


Choosing PC (DVS) for remote control

Dante Accelerator setup

Firstly, while the Dante Accelerator card is attached to the PCIe slot of your PC, you need to install the Dante Accelerator Driver. For details on the driver installation and the control panel settings, refer to the installation guide which is supplied with the driver. For a stable live recording, it is recommended to apply the maximum buffer size and latency.

Next, connect the Dante port of Dante Accelerator card to the Dante network, and connect the PC's network port to the same network as well.



The PC works fine with an automatic IP address (default setting), but it is convenient to fix the IP address to prevent it from changing after every PC restart. The IP address of the PC needs to be programmed into the CL console, so it is good if it doesn't keep changing. Set the IP address in the range of 169.254.x.x (eg. 169.254.0.1) and subnet mask to 255.255.0.0.

Tip:

If the computer's IP address is fixed, it is rare but possible that the same IP address is automatically assigned to another Dante device. However, the probability is only 0.0015% which will mostly not be an issue in real life. If the communication between devices does not work properly, restart the Dante devices (so their IP addresses change again).

To assign the PC to be controlled from the CL console, open the RECORDER menu, select the NUENDO LIVE page, and press the NUENDO LIVE SETUP button. Then press the SPECIFIED IP ADDRESS button, and enter the IP address of the PC's network port (not of the Dante Accelerator card.)



Specifying the IP address of the PC for remote control

Tip:



Keep in mind that up to 128 channels of audio (equivalent of two CL consoles) can be recorded on a single PC, but only one of the CL consoles can control the PC.

Dante Controller setup

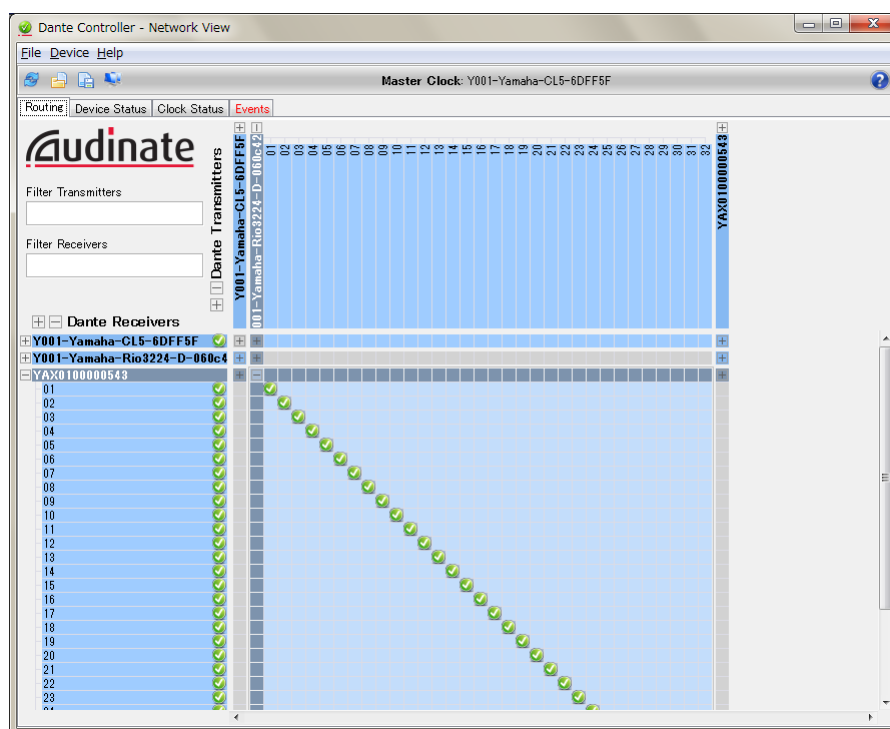
This guide assumes the Dante patching between CL console and Rio units are already configured from the CL screen. Extra audio routing from Rio units to the PC, and from the PC to CL console will be made using Dante Controller.

Network Routing

Using Dante Virtual Soundcard, any 64 channels (128 channels with Dante Accelerator card) on the Dante network can be recorded. The most efficient way to make a live recording is to capture the inputs directly from the Rio units, rather than taking Direct Outputs or Mix Bus outputs from the console. In that way, if the Gain Compensation system in the Rio is enabled, the recording level will not change even if the input gain is adjusted.

To route input signals of Rio units to the computer, first open the “Routing” tab of Dante Controller. Press the [+] buttons to expand the view. Check the grid so that the computer receives the correct channels from the Rio units. By clicking on the  while holding [Ctrl], all available channels are routed between the selected devices. All the device’s routing is removed by clicking on the  box while holding both [Ctrl] and [shift].

Be sure to route the inputs to the PC in the same order as on the CL console, because the channel names and colours on the CL console are automatically carried to the Nuendo Live tracks. It is really handy when you perform a virtual sound-check as well as a mix-down.

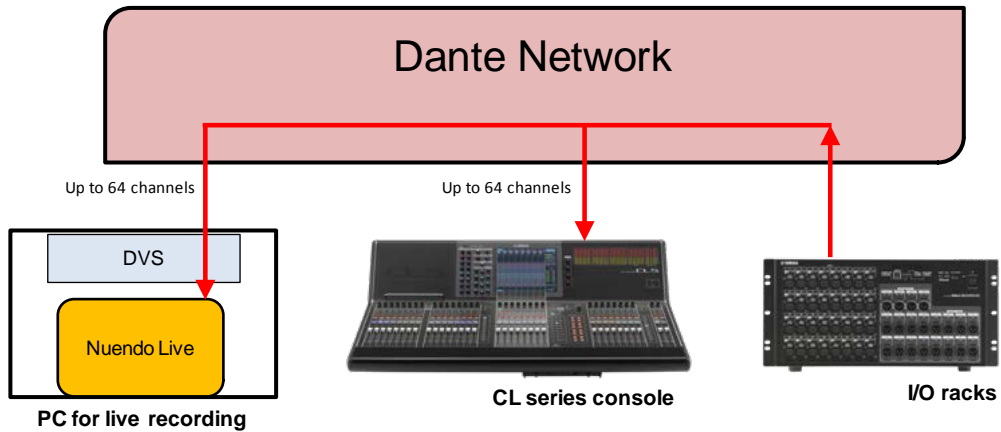


Dante Controller: Routing from Rio units to Computer.

Tip:

Though device names can be edited in Dante Controller, be careful with the CL and Rio device names: they are used by the CL console for auto patching and device recognition. Only edit the last part of the name, while keeping this part intact: “Y001-Yamaha-Rio3224-D-“

Now the audio signal flow of the Dante network is represented in the figure below.

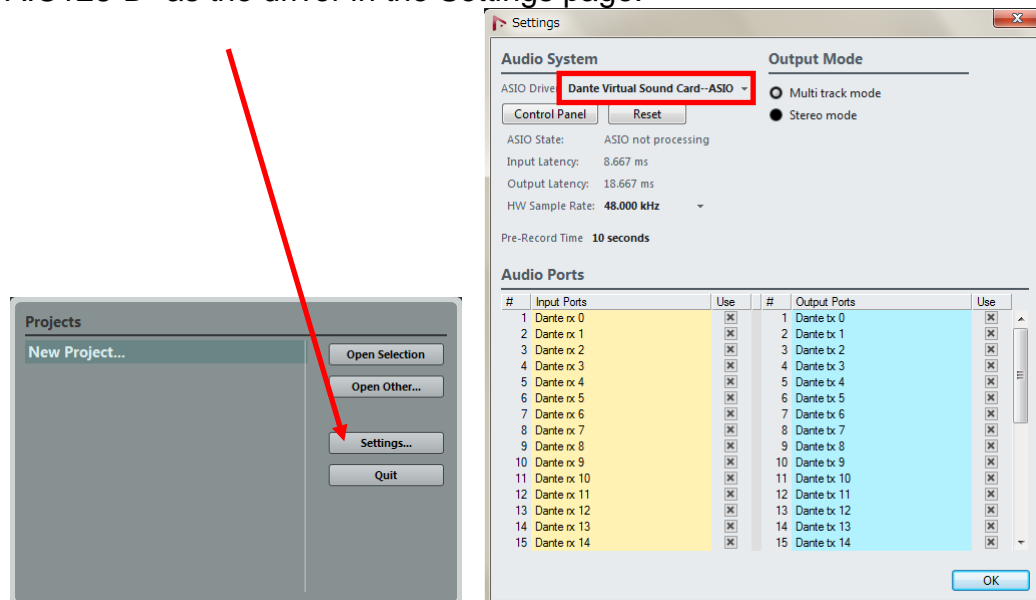


Dante signal flow for recording a live show.

Nuendo Live Setup

Start Nuendo Live with the USB eLicenser inserted in the PC.

Select “Dante Virtual Sound Card--ASIO” (“Dante” for Mac) or “Yamaha AIC128-D” as the driver in the Settings page.



Tip:

Use the “Pre-Record Time” setting to select up to 60 seconds of audio that will be captured on all tracks before Recording is enabled: just in case the button is hit a little bit late after the show starts!

Open a “New Project”.

Tracks will be automatically created according to the driver settings. The track names and colours are copied from the CL channel names and colours.

(This operation is only performed as a new project is created: names and colours do not update dynamically. Also, even with Dante Accelerator, only up to 64 track names and colours can be copied from the CL console).

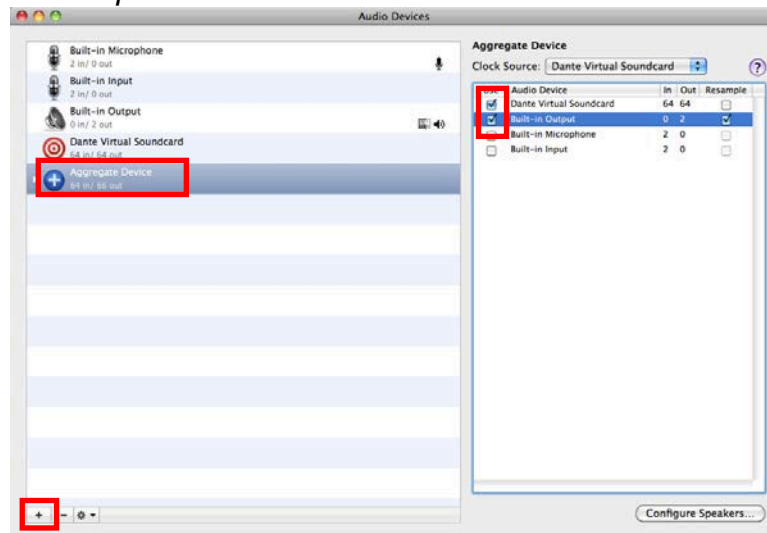
Briefly press the “Record Enable All Tracks” button (or use the keyboard shortcut [R]) to check that audio is reaching Nuendo Live: the meters will display the input levels.



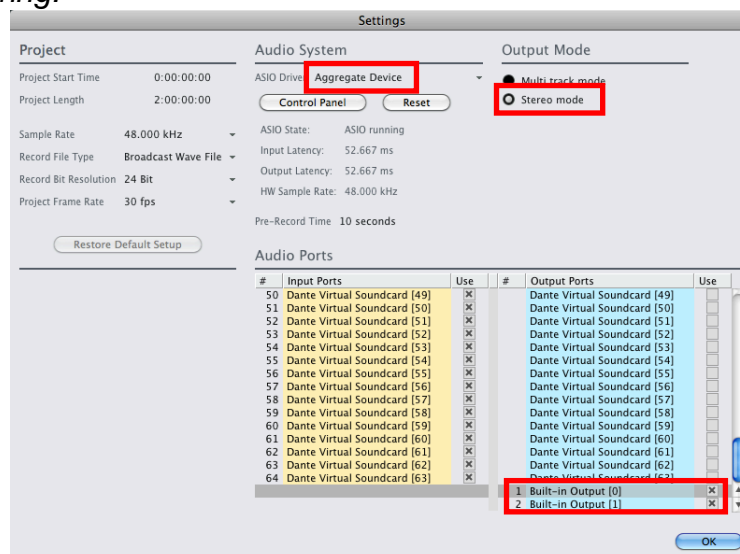
Tip:

Nuendo Live is not equipped with monitor buttons, but the record-enabled tracks always output their input signals for monitoring. If required, all tracks can be mixed to a stereo output for monitoring. These signals are normally monitored via the Dante network, but with a Mac, you can also monitor it via the built-in headphones or an external headphone amp as follows:

1. On your Mac, open "Audio MIDI Setup" in the "Utility" folder.
2. Click the "+" button at the lower-left corner of the window to add "Aggregate Device".
3. Place checkmarks at the right side of the window for each device to be used in the aggregate device. Select "Dante Virtual Soundcard" first, then "Built-in Output" (or the driver for an external headphone amp). The order you place marks in determines the order of the inputs and outputs as well as the clock source.



4. Open the "Settings" window in Nuendo Live.
5. Select the aggregate device as the driver and "Stereo mode" as Output Mode. Enable the correct two outputs for headphone monitoring.



Start Recording

Open the Nuendo Live page on the CL screen (RECORDER -> Nuendo Live)



Press “EASY REC”, which performs the following actions instantly:

- Enables recording on all tracks.
- Moves the locator to the end position of the last recording.
- Opens the record panel of Nuendo Live.
- Locks the record panel.
- Captures the pre-record buffer (10sec by default).
- Starts recording.

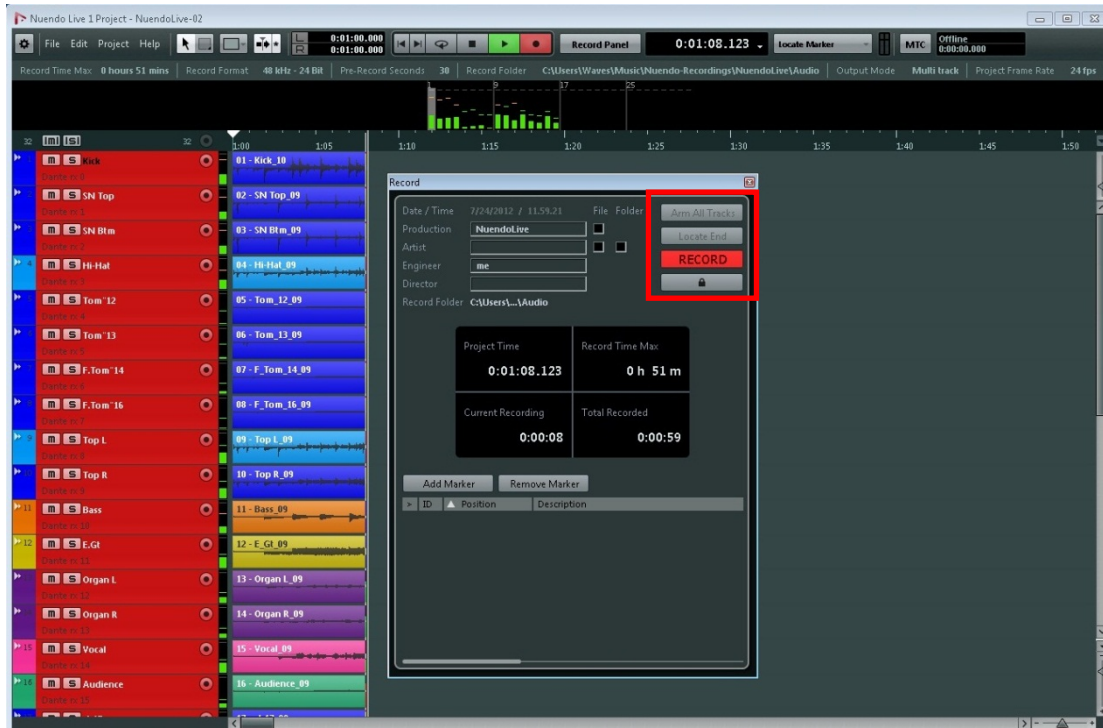
Tip:

If RECALL LINK is on, recalling a scene on the CL console creates a new marker in Nuendo Live.

The “EASY REC” function locks the transport controls on the CL console and on the PC, so recording will not stop by accident. First the “REC Unlock” button needs to be pressed before recording can be stopped.

Tip:

User Defined keys on the CL console can be used for transport control and for “EASY REC”.



Nuendo Live, during Recording.

If control of the PC is not needed from the CL console, open the Record panel on Nuendo Live (Ctrl+[R] keyboard shortcut). Then press “Arm All Tracks”, followed by “Locate End” and then “RECORD”. The keyboard can be locked if required.

Playback


Before playing back audio from the live recording, the Dante network patching must be prepared. This is a quick and simple task, thanks to Dante Controller software and the Dante Input Patch Library of the CL console.

Patch Library

The Dante Input Patch Library is found in the I/O Device -> Dante Patch -> Dante Input Patch menu. It stores all the Dante network channels that input to the CL console.

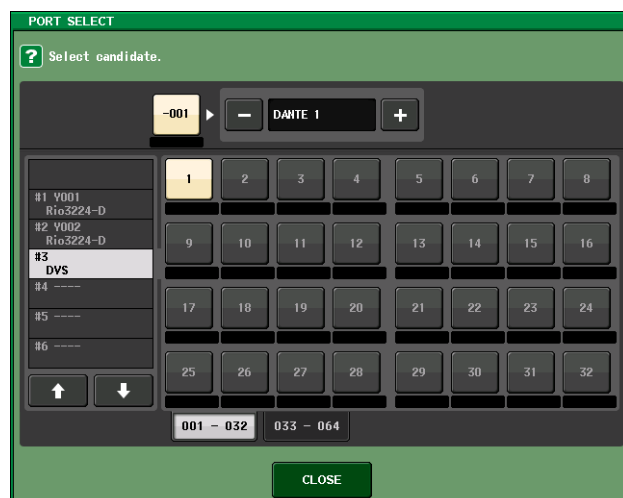
First store the current patch, which is used for the show or event (Rio inputs to console for example).



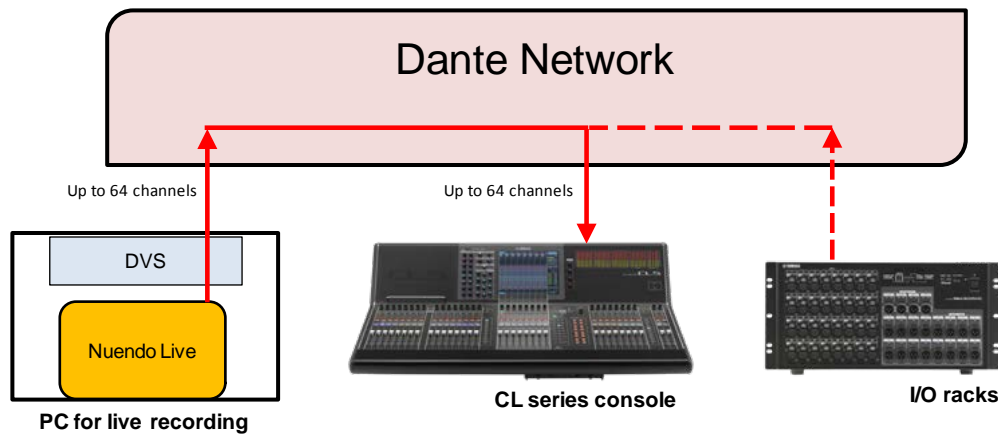
Now use Dante Controller to route the PC outputs to the CL inputs, using the Ctrl+ shortcut for speed and simplicity.

Alternatively, the patch can be made from the console:

- Open the I/O Device -> Dante Patch -> Dante Input Patch menu.
- For each input, select a DVS channel, which will be registered as #3 by default.
- Complete this for all required inputs.



Next open the Dante Input Patch Library again, and store these settings with a new library number for playback, or “Sound-Check”. The audio routing for playback is represented in the diagram below.



Dante signal flow for playback (sound-check).

Tip:

Playback from one computer can be routed to multiple consoles, for a complete system sound-check. And if some microphones are still needed live, adjust the Dante Input Patch so some Rio inputs are active while other inputs are from the PC.

Start playback

Before starting playback, open the Nuendo Live settings panel, and confirm the Output Mode is set to Multi track mode. This will ensure each audio track has its own Dante network channel.

Start playback either from the CL screen, a User Defined Key, or the PC's mouse or keyboard (Space bar).

If audio was recorded directly from the Rio units, then playback to the console will be at exactly the same level as the live sound from the mic inputs. Make adjustments to the mix, tweak the EQs, dynamics, Premium Racks and Effects as necessary, then store the Scene. This is a perfect way to perform a virtual sound-check.

After the virtual sound-check is complete, remember to recall the Dante Input Patch Library for the "show", so all the inputs from the Rio units once again are patched to the console.

Tip:

Nuendo Live regularly performs an "Auto Save" as it runs, without interrupting the audio, so you will never accidentally lose any important recordings!

More Nuendo Live Tips:

- *Nuendo Live can be used to trim, split, cut, copy and paste audio tracks.*
- *In “Stereo Output Mode”, a rough mix can be created on the PC by itself, using level and pan settings.*
- *The whole project can be directly loaded in to compatible versions of Nuendo 5.5 (or later) and Cubase 6.5 (or later).*
- *The audio can be exported as WAV or MP3 files.*
- *A whole recording session can be exported in WAV or AAF format for further production on other systems.*

Reference Websites:

www.yamahaproaudio.com

www.steinberg.net

www.audinate.com