

INSTALLATION AND STARTUP GUIDE

SPNDNT Network Processor



IMPORTANT NOTICE:

Several settings are mandatory to ensure the processor will connect and operate properly with a network and other processors.

See page 11 for details.



Fill in for your records:

Serial Number:

Purchase Date:



Important Safety Instructions



This symbol, wherever it appears, alerts you to the presence of uninsulated dangerous voltage inside the enclosure -- voltage that may be sufficient to constitute a risk of shock.



This symbol, wherever it appears, alerts you to important operating and maintenance instructions in the accompanying literature. Please read the manual.

When using your telephone equipment, basic safety precautions should always be followed to reduce the risk of fire, electric shock and injury to persons, including the following:

- 1) Read these instructions.
- 2) Keep these instructions.
- 3) Heed all warnings.
- 4) Follow all instructions.
- 5) Do not use this apparatus near water.
- 6) Clean only with a dry cloth.
- 7) Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.
- 8) Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
- 9) Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and third grounding prong. The wider blade or the third prong are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
- 10) Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.
- 11) Only use attachments/accessories specified by the manufacturer.
- 12) Use only with the cart, stand, tripod, bracket, or table specified by the manufacturer, or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over.
- 13) Unplug this apparatus during lightning storms or when unused for long periods of time.



- 14) Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.
- 15) **WARNING** -- TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS APPARATUS TO RAIN OR MOISTURE.
- 16) The AC mains plug, or appliance coupler shall be readily available to the operator as a means of power disconnection, if applicable.
- 17) Unit shall be connected to a MAINS socket outlet with a protective earthing connection.
- 18) Do not use this product near water for example, near a bathtub, washbowl, kitchen sink or laundry tub, in a wet basement or near a swimming pool.
- 19) Avoid using a telephone (other than a cordless type) during an electrical storm. There may be a remote risk of electric shock from lightning.
- 20) Do not use the telephone to report a gas leak in the vicinity of the leak.
- 21) Use only the power cord and batteries indicated in this manual. Do not dispose of batteries in a fire. They may explode. Check with local codes for possible special disposal instructions.
- 22) "CAUTION: To reduce the risk of fire, use only No. 26 AWG or larger (e.g., 24 AWG) UL Listed or CSA Certified Telecommunication Line Cord"

SAVE THESE INSTRUCTIONS

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Overview

What is Dante?

Audinate's patent pending Dante™ technology is a flexible Internet Protocol (IP) and Ethernet based digital AV network technology that eliminates the many bulky cables needed to provide point-to-point wiring for analog AV installations.

With Dante, existing infrastructure can be used for high performance audio as well as for ordinary control, monitoring or business data traffic. Digital networks utilize standard IP over Ethernet offering high bandwidth capable of transporting hundreds of high quality channels over Gigabit Ethernet.

Set-up and configuring the system is made easy as well, saving enormous installation costs and long term cost of ownership on a digital network. The physical connecting point is irrelevant: audio signals can be made available anywhere and everywhere. Patching and routing now become logical functions configured in software, not via physical wired links

The Role of the SPNDNT Processor

The SPNDNT acts as a node on the Dante digital audio network, with 32 inputs and 32 outputs. SPNDNT outputs are mapped to Dante transmit channels. Dante receive channels are mapped to SPNDNT inputs, which can be routed to mix busses in the ASPEN mix matrix. All of the normal automatic mixing features are available in the SPNDNT mix matrix. Gain control and muting are available for the SPNDNT inputs (Dante receive channels) and outputs (Dante transmit channels).



Switched and Redundant Modes

The rear panel Dante ports allow operation in a **switched** mode through a single network using either jack, or in a **redundant** mode through two separate networks using both jacks simultaneously. Redundancy is required in some applications where it is imperative that no audio is lost due to network problems, such as in courtroom recording. The secondary network duplicates real-time audio traffic. If the primary network fails for any reason, the secondary network's audio continues without losing even a single sample.

See page 15 and also refer to the help files and documentation provided by Audinate for more information regarding the setup for switched and redundant modes.

Front Panel

Headphone Monitor

Standard 1/4 inch jack and level control. Drives both channels of stereo headphones.

MCU Recovery (recessed pushbutton)

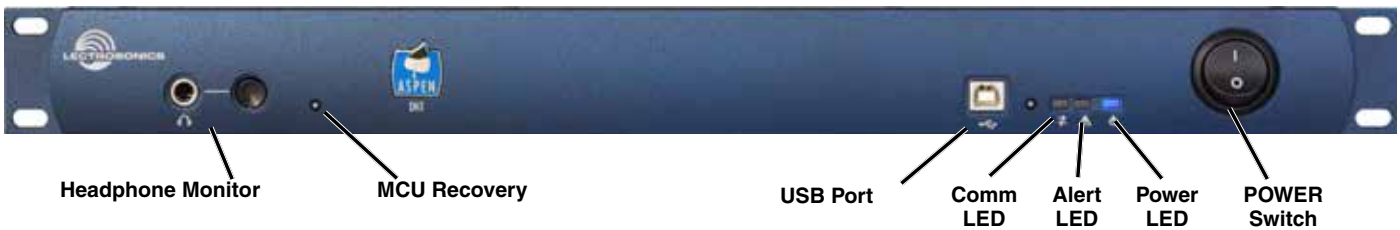
Used in the procedure to recover from an interrupted firmware update procedure. See section on **Firmware Update Procedure** for details on usage.

USB Port

Standard USB connector for the setup and control from a computer using Windows XP, Vista or Windows 7 operating system. The USB port is also used for firmware updates.

Status LEDs

- Comm LED - indicates USB, RS-232 and network communication
- Alert LED - blinks to indicate fault or error
- Alert LED - glows steady in firmware update mode
- Power LED - glows to indicate power ON



Rear Panel

Programmable Input and Output Ports

Programmable inputs and outputs used to control levels, settings, indicate the current state of a programmable input and control a variety of other parameters.

Serial Port

Used for control; typically with third party products such as touch panel displays.

Ethernet Port

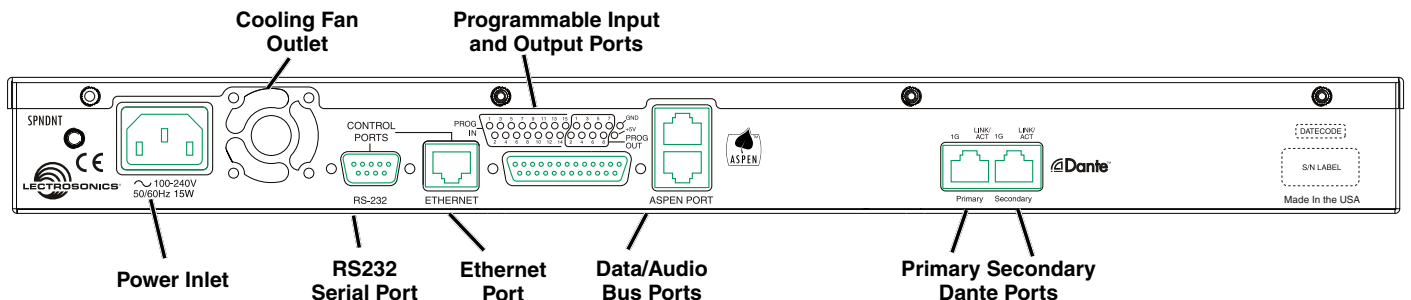
Used for control only. Does not pass audio.

ASPEN Bus Data/Audio Ports

This gigabit bus transports audio and data from one board to the next through CAT-6 cabling (maximum 2 meters or 6.5 ft length) and RJ-45 connectors. Processors are normally installed with the Master unit on top and Slave units below it. The cabling is then connected from the uppermost jack on one board to the lowermost jack on the unit just above it.

Dante Ports

The network audio ports. Either port can be used with a single network connection. When a second network is configured for redundancy, all processors connected to the network must have consistent connections, i.e. all Primary ports connected to one network and all Secondary ports connected to the other network.



USB Driver Installation

The example shown here illustrates the installation procedure using a Windows operating system. The screens that appear at each step using another operating system will vary, but the general steps are very similar. The driver installation only needs to be done once on each PC that will be connected to an ASPEN unit.

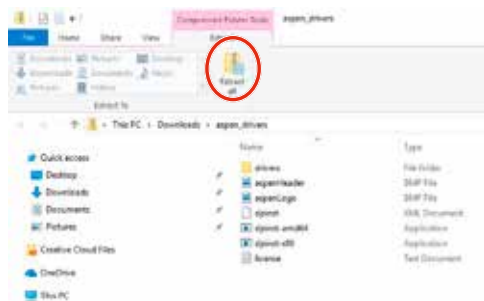
Visit <http://www.lectrosonics.com>, hover your mouse over **Support** and click on **Aspen Support**, then **USB Drivers**.

Download the USB Driver Installer.



A zipped file will appear.

NOTE: You must first click on “Extract All” in order to install the appropriate drivers.



Two versions of the installer are included, one for 32-bit Windows PCs and another for 64-bit Windows PCs:

- “dpinst-x86.exe” for 32-bit Windows
- “dpinst-amd64.exe” for 64-bit Windows

To start the installer:

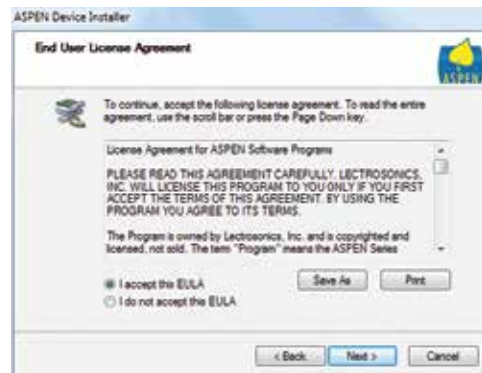
Double-click on the appropriate .exe file.

The ASPEN Device Installer opens.



Click Next to proceed.

The End User License Agreement is presented.



Accept, then click Next to proceed.



When installation is complete, the Driver Name and Status are displayed. Click Finish to close the Device Installer.



ASPEN Software

ASPEN Control Panel

ASPEN processors are set up and monitored using the ASPEN Control Panel program. The software will run on Windows 7, Windows Vista® and Windows XP® operating systems.

Download the installer from the web site at:
<http://www.lectrosonics.com/aspensupport>

ASPEN Software Installation

NOTE: Uninstall previous version before installing the software.

The example shown here illustrates the installation procedure using a Windows operating system. The screens that appear at each step using another operating system will vary, but the general steps are very similar.

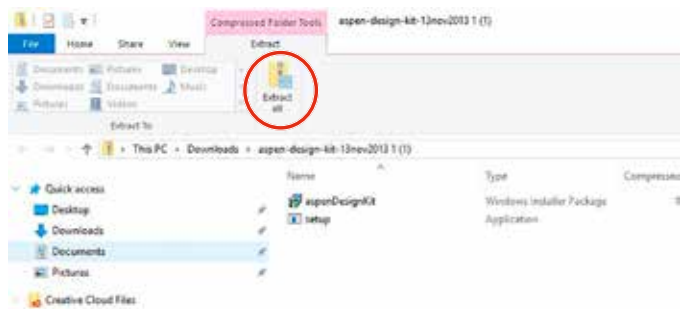
Visit <http://www.lectrosonics.com>, hover your mouse over **Support** and click on **Aspen Support**, then **Aspen Design Kit**.

Download the Design Kit Installer.



A zipped file will appear.

NOTE: You must first click on “Extract All” in order to install the appropriate drivers.



Next click on Set Up.

When the Welcome screen appears, click on *Next*.



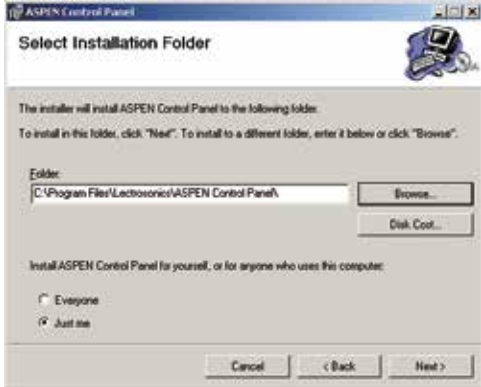
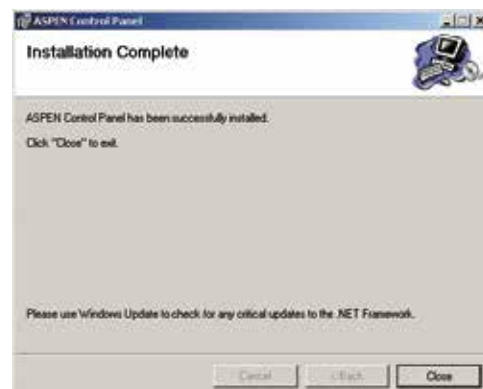
Click on *Next* to confirm the installation and continue.



The End User License Agreement screen appears. Click on *I Agree*, then on *Next* to continue.



When the installation is complete the final screen will appear. Click on *Close* to finish the installation.



It is usually best to accept the default folder for the installation. Click on *Next* to continue.



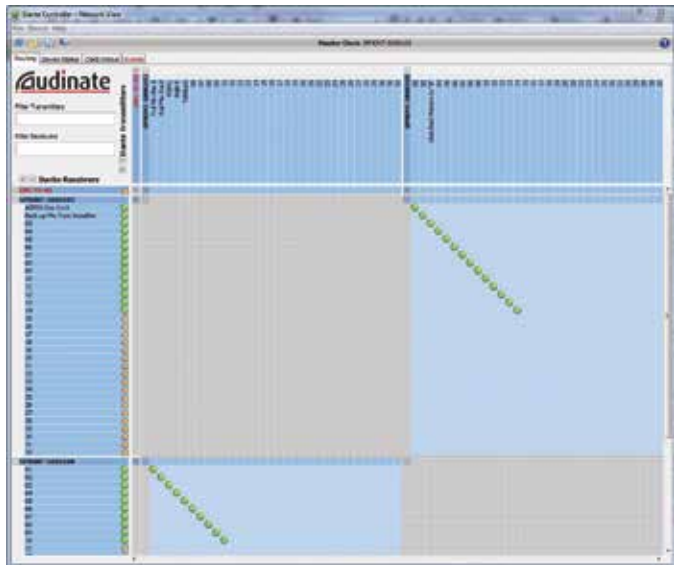
Dante Software

Dante Controller

This is a second software package needed to route network audio signals between the SPNDNT and other nodes on a Dante network. The software is downloaded from the Audinate web site and will run on Windows and Mac platforms.



Dante Controller is used to assign the transmit and receive signals between multiple Dante devices. When a device is set to receive a signal from another device that is transmitting, it is said to **subscribe** to the transmitted signal. These **subscriptions** appear in the Dante Controller window as green check marks.



Browser based Help Files are provided to explain various icons and setup tabs.

Download the software from: <http://www.audinate.com>

The installation is quick and simple.

Dante™ Software Installation

Bonjour Print Services (for Windows only)

Download the Bonjour Print Services for Windows installer into a temporary folder or desktop on your PC.

<http://support.apple.com/kb/DL999>

Double click on the file to open the installer. If the Security Warning dialog box opens, click on **Run** to launch the installer and follow the on screen prompts.



Set Up Audinate Account and Download the Dante Controller Installer

Set up an account with Audinate to gain access to the free Dante Controller software. Click on **Login** at the top of the screen and the forms page will open.

<http://www.audinate.com>

After your account is set up, return to the home page and click on Support->Software Downloads->Dante Controller. Log In on the next page and follow the on screen prompts to download the installer and store the file on your local drive.

Install Dante Controller

NOTE: Install *Bonjour Print Services for Windows* before installing *Dante Controller*.

Double click on the downloaded file to open the installer. If the Security Warning dialog box opens, click on **Run** to launch the installer and follow the on screen prompts.



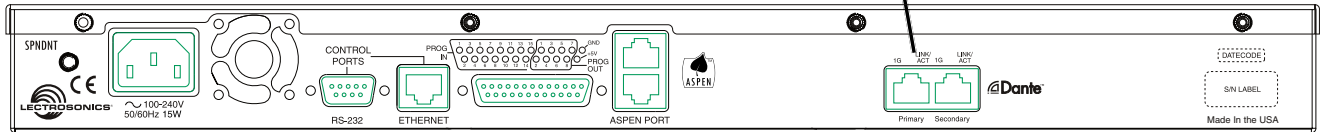
Mandatory Settings

Set up the system in the **Switched Mode** in the Network Config screen in Dante Controller. Once everything is set up and audio is flowing to and from the network, a second network and gigabit switch can be added and the mode can be changed to **Redundant**.

Connect an SPNDNT Dante port to the computer either directly or through a gigabit switch.

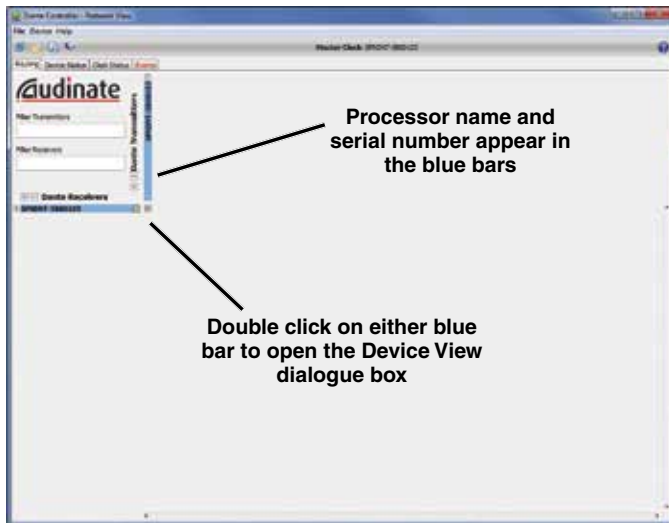


Dante Primary Port



Connect the PC to the **Primary Port** in case the mode had previously been set to Redundant. Confirm that the 1G and LINK/ACT LEDs next to the Dante port are flickering.

Launch the Dante Controller software. A brief splash screen appears, followed by the Network View/Routing screen. The serial number of the connected processor will appear in the bars labeled **Receivers** and **Transmitters**.

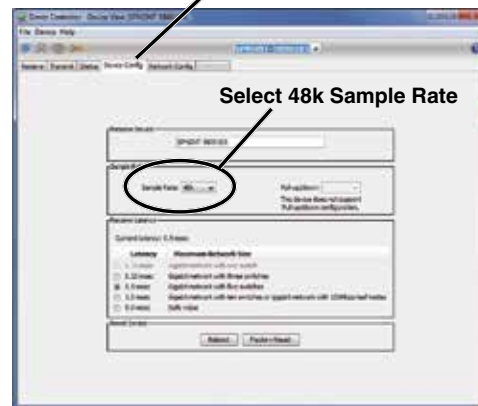


Processor name and serial number appear in the blue bars

Double click on either blue bar to open the Device View dialog box

Select the **Device Config** tab, then set the sample rate to 48k. The sample rate **MUST** be 48k so the DSP (filters, etc.) will operate as they should.

Device Config Tab



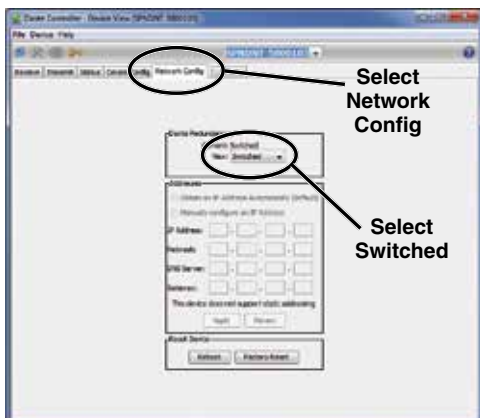
Select 48k Sample Rate

Latency under the same tab can be adjusted depending upon the number of switches in the network.

The other tabs in the Device View dialog box are used to rename channels and check the status of several parameters.

Consult the **Help** menu for details and explanations of Dante Controller software.

Double click on the processor name/serial number to open the Device View dialog box. Under the **Network Config** tab, select **Switched**.



Select Network Config

Select Switched

Hardware Connections

Installing the chassis into a rack

Install the chassis so that the cooling fan vent is not blocked. Mount with 4 rack screws using the appropriate mounting holes. Use nylon washers to prevent damage to the front panel's finish when tightening the mounting screws.

All ASPEN processors have internal switching power supplies that can tolerate voltages ranging from 100 to 240 VAC. Use an approved power cord with an IEC 60320 C13 connector.

Connecting the Master for the First Time

NOTE: Install ASPEN software before connecting the Master unit to a computer.

The computer operating system will automatically detect and configure a USB port for the Master unit when it is connected and turned on the first time. Wait for the screen message that advises that the new device has been configured and is ready for use.

Rear Panel

Review the rear panel connectors on page 6. Connectors are used for the following purposes.

Port	Purpose
RS-232	Third party control devices such as LCD touch panels
ETHERNET	ASPEN control panel software interface for setup, monitoring and control
ASPEN PORTS	Interconnect multiple ASPEN processors
DANTE	Network audio I/O ports and setup with Dante Controller software

RS-232 is a common interface with LCD touch panel control systems such as Crestron® and AMX®. The wiring diagram for DB-9 connectors is shown on the opposite page.

The ETHERNET port is used with ASPEN control panel software for setup, monitoring, control and diagnostics. It does not transport audio. IP addresses can be set up statically, or one can be assigned by a network server if DHCP is enabled in the software control panel.

ASPEN Ports connect multiple processors for data and signal flow. 2RU units have two internal circuit boards that must be connected with cables in the same manner as two separate processors.

The DANTE ports connect to network switches. Multiple SPNDNT processors can also be connected directly to each other through these ports.

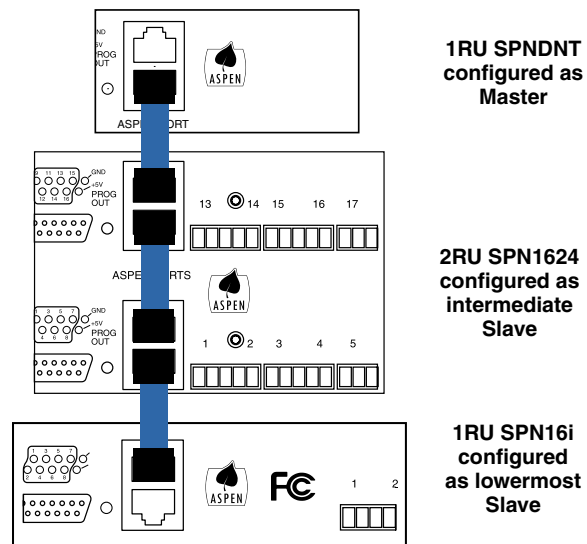
Cabling Of Stacked Units

NOTE: The SPNDNT must *always* be the Master at the top of the stack to synchronize the ASPEN system and network clocks.

The ASPEN bus is bidirectional, allowing data and audio to be propagated forward and backward through a single cable connection. Each Slave unit in a stack gathers data and audio signals from the unit below it, adds its own signals and passes the total on to the unit above it. At the top of the stack, the Master unit gathers all signals from below, adds its own and then sends the total back down the bus to all Slave units.

This architecture allows all Slave units to have access to the mixing data and audio in all 48 final mixes.

Each circuit board has an upper and a lower ASPEN bus connector. Since there are two circuit boards in a 2RU unit such as the SPN1624, the circuit boards are connected in the same manner as if they were each in a separate chassis.



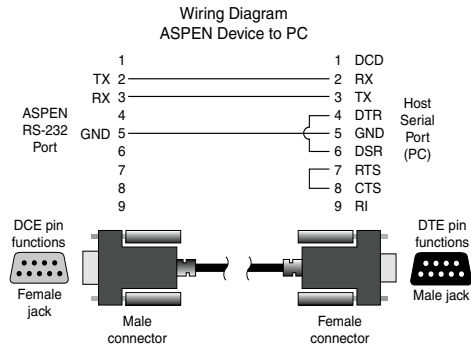
The processors automatically configure themselves for Master and Slave status as determined by the cabling.

Front Panel USB Port

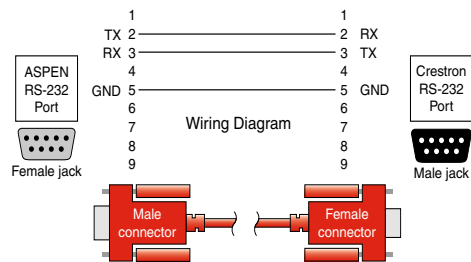
This is the easiest connection point to run ASPEN control panel software until the network is configured and IP addresses have been established. Connect the computer to the Master unit in the ASPEN stack and launch the control panel software. The Master unit will appear on the screen, and the Slave units below it will then be accessible as well.



ASPEN RS-232 Port

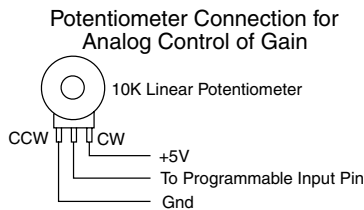


Crestron® RS-232 Port Wiring

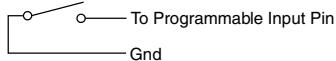


Programmable Inputs

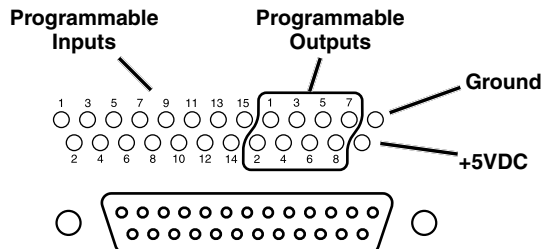
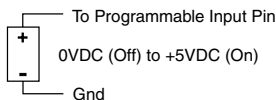
Programmable inputs are provided to enable external control over a variety of parameters. Each input can respond to a contact closure, a DC voltage source, or the variable voltage output from a potentiometer. The following illustrates common connections to the programmable input pins.



Contact Closure as Programmable Input



DC Voltage Source as Programmable Input



Programmable Outputs

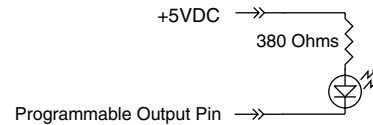
Programmable outputs are used for several purposes:

- indicate the current state of a programmable input
- monitor activity on audio input channels
- monitor active preset changes

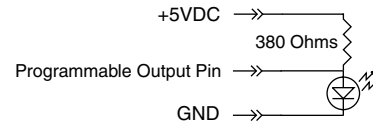
Each programmable output is the electrical equivalent of a contact closure to ground. When a programmable output is “active” it conducts current to ground. When the programmable output is “inactive,” no current flows to ground. The maximum usable voltage for the programmable outputs is 40 V and they will safely conduct up to 100 mA DC continuous.

Both LEDs and 5V relay coils can be powered by the +5 V DC pins on the programmable input connector, as long as the maximum combined current for all LEDs and relay coils does not exceed 100 mA.

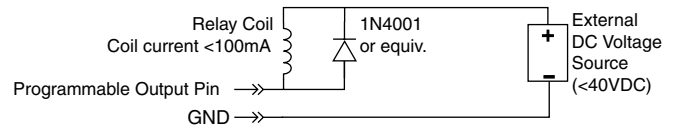
LED is ON when the programmable output is active



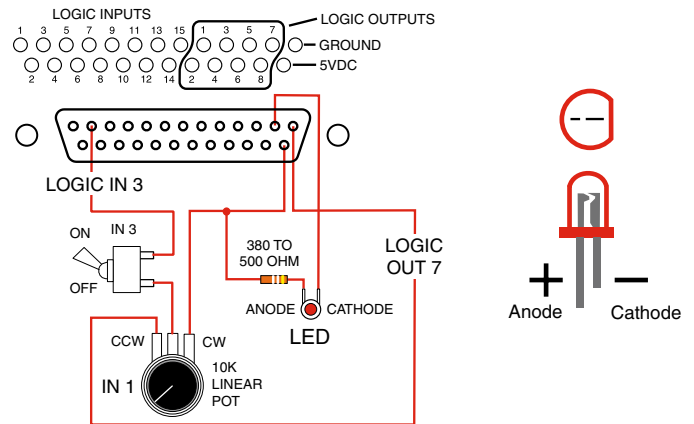
LED is OFF when the programmable output is active



Relay is on when the programmable output is active

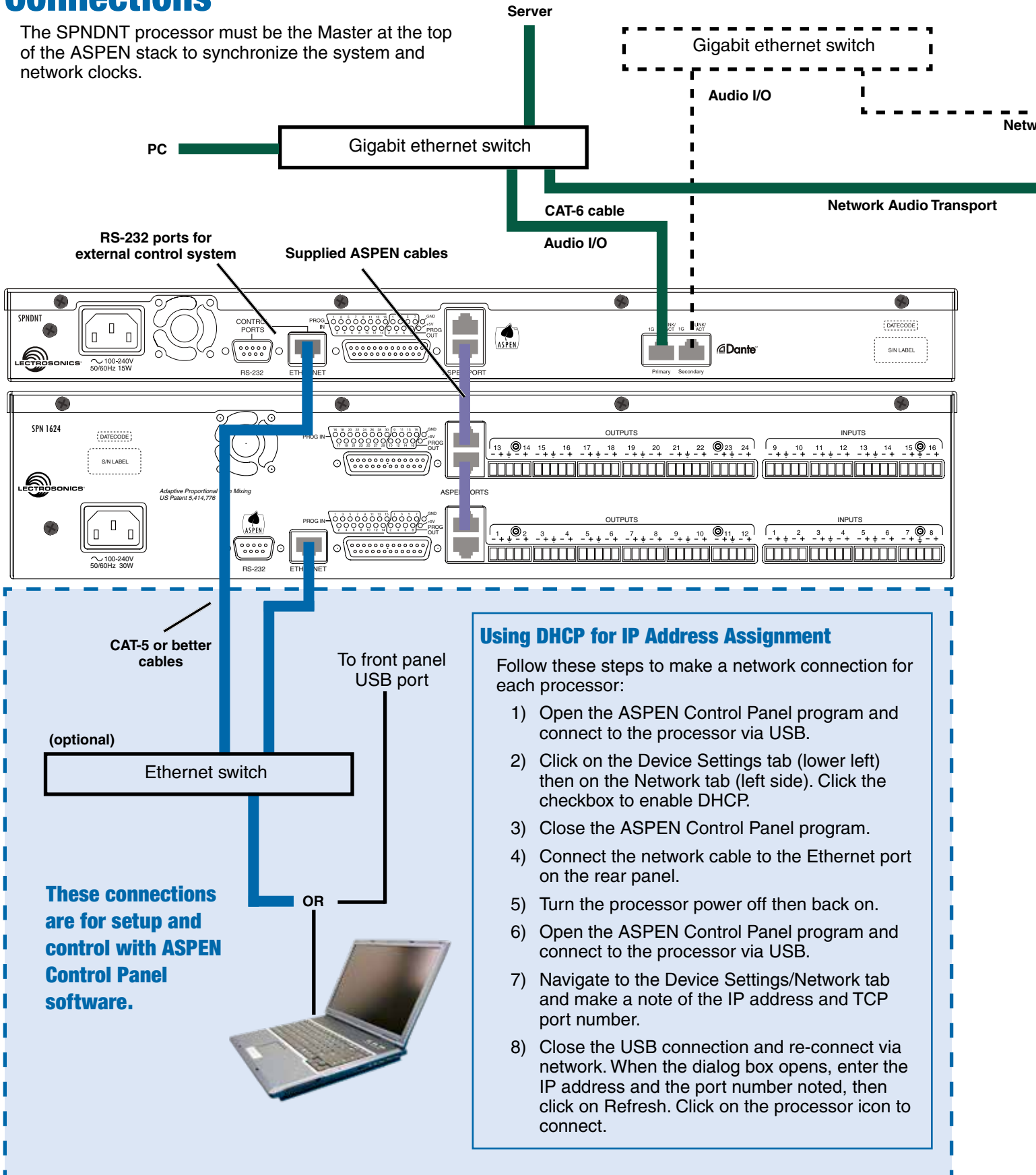


Note: The diagram above shows an external DC source powering the relay coil. This is necessary whenever coil voltages exceed 5 volts.



Network and PC Connections

The SPNDNT processor must be the Master at the top of the ASPEN stack to synchronize the system and network clocks.

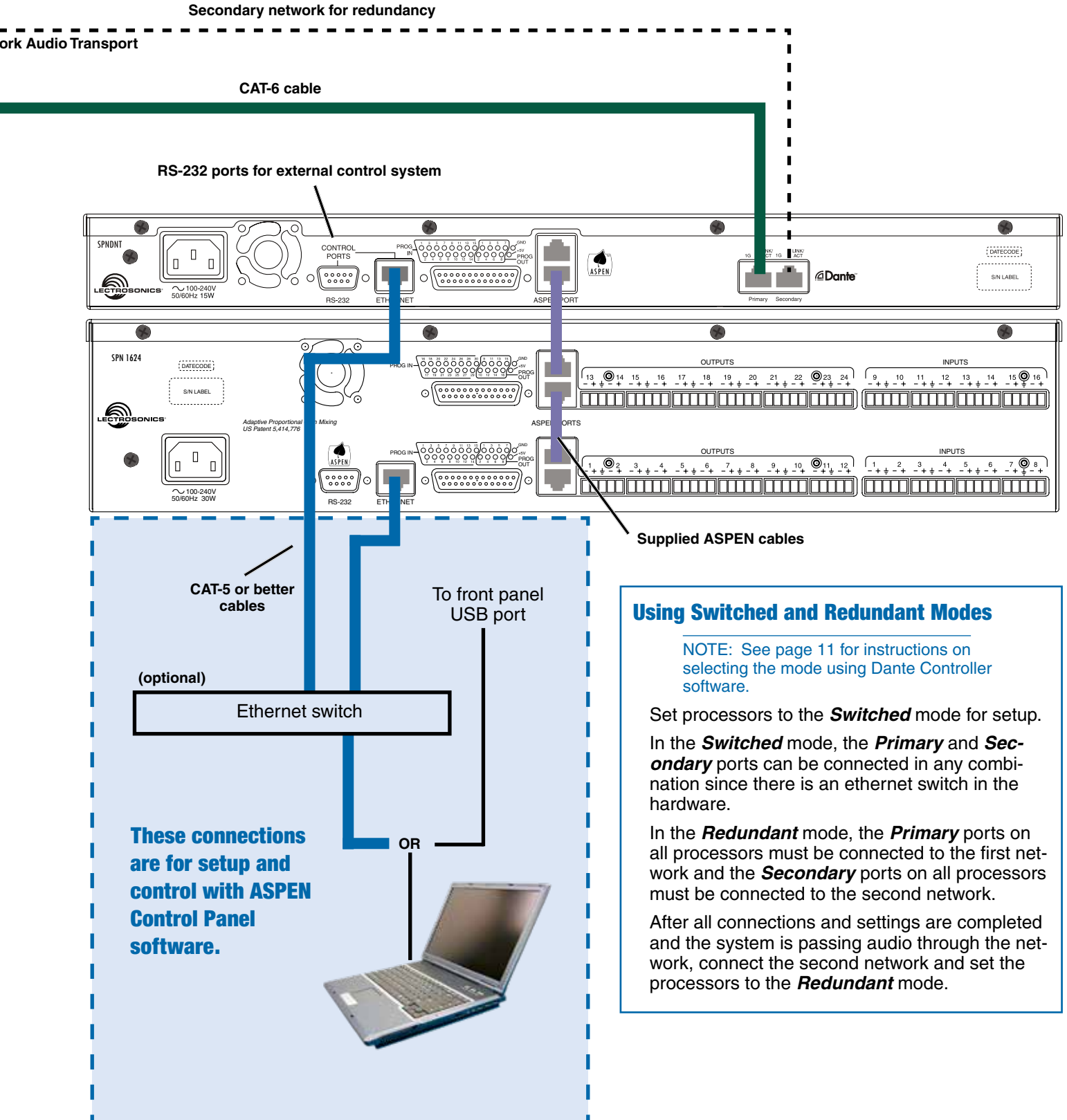


Using DHCP for IP Address Assignment

Follow these steps to make a network connection for each processor:

- 1) Open the ASPEN Control Panel program and connect to the processor via USB.
- 2) Click on the Device Settings tab (lower left) then on the Network tab (left side). Click the checkbox to enable DHCP.
- 3) Close the ASPEN Control Panel program.
- 4) Connect the network cable to the Ethernet port on the rear panel.
- 5) Turn the processor power off then back on.
- 6) Open the ASPEN Control Panel program and connect to the processor via USB.
- 7) Navigate to the Device Settings/Network tab and make a note of the IP address and TCP port number.
- 8) Close the USB connection and re-connect via network. When the dialog box opens, enter the IP address and the port number noted, then click on Refresh. Click on the processor icon to connect.

These connections are for setup and control with ASPEN Control Panel software.



Using Switched and Redundant Modes

NOTE: See page 11 for instructions on selecting the mode using Dante Controller software.

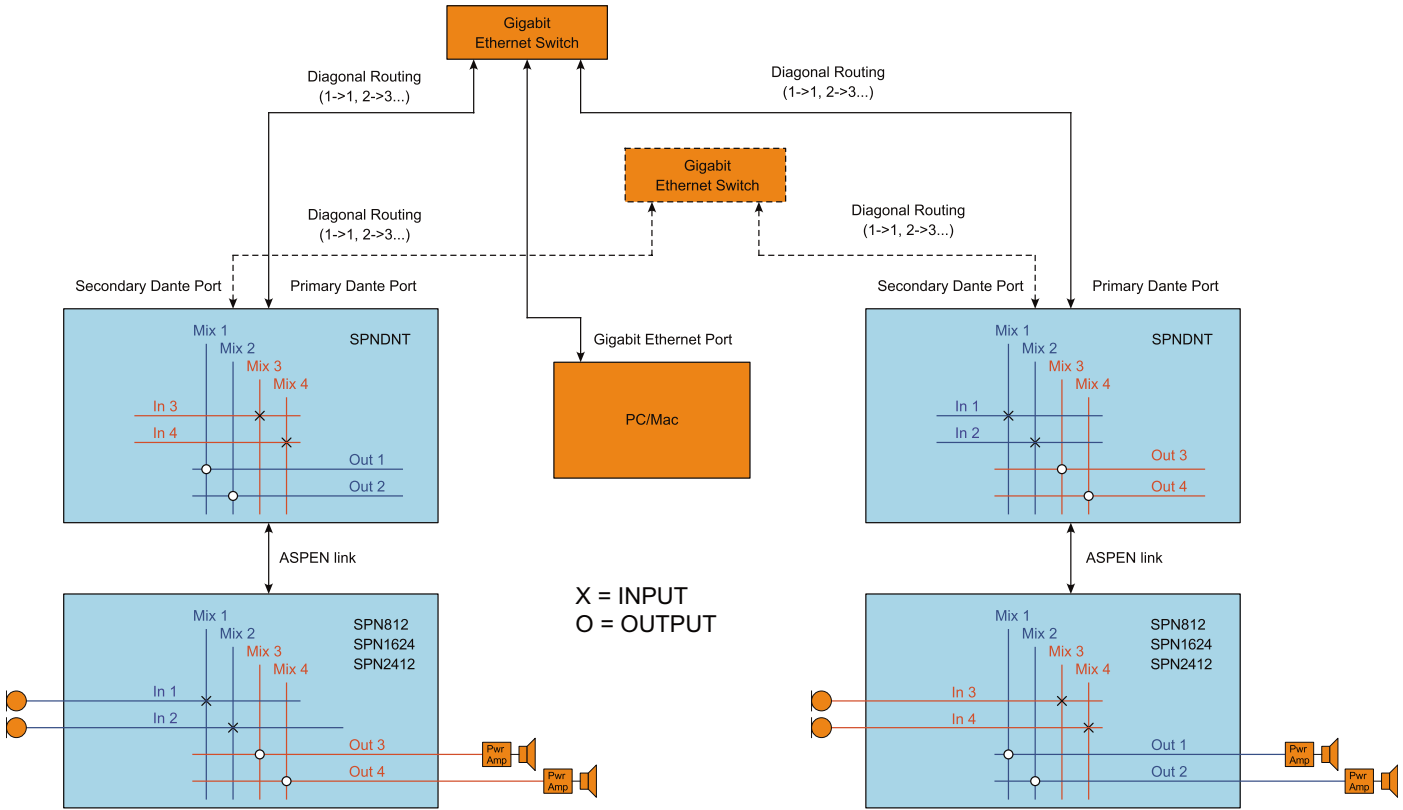
Set processors to the **Switched** mode for setup. In the **Switched** mode, the **Primary** and **Secondary** ports can be connected in any combination since there is an ethernet switch in the hardware.

In the **Redundant** mode, the **Primary** ports on all processors must be connected to the first network and the **Secondary** ports on all processors must be connected to the second network.

After all connections and settings are completed and the system is passing audio through the network, connect the second network and set the processors to the **Redundant** mode.

System Setup Examples

Basic Configuration



This example illustrates the basic signal routing between two ASPEN subsystems connected via a Dante network. This setup creates a “full-duplex” connection where each ASPEN subsystem transmits and receives signals simultaneously as might be used to conduct conferencing between two meeting rooms. In this example, no local sound reinforcement is in use.

The success of this setup could be limited by loudspeaker/microphone acoustical coupling in the sound systems in each room. If the level of the sound from the loudspeakers arriving at each microphone is not far below the loudness of the talker, an echo will be heard at the far end (opposite ASPEN system). With careful placement of loudspeakers and microphones, and the use of mix-minus zoning, this type of system can be used.

NOTE: See the next example regarding the use of the AEC (acoustic echo canceller) on network connections.

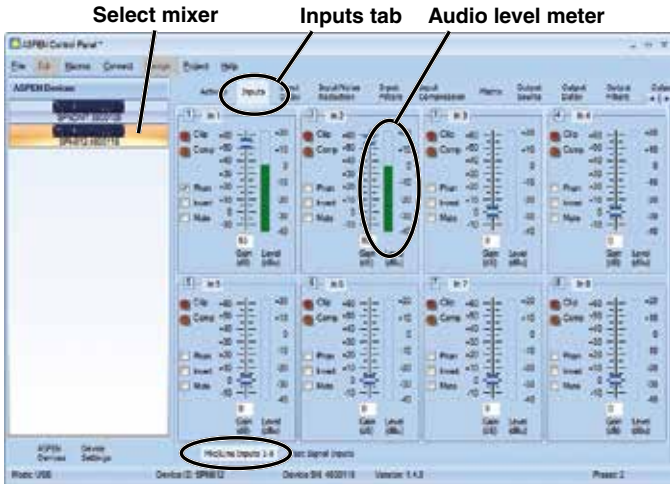
In the ASPEN subsystem on the left, the blue lines indicate inputs with the signal path starting at the microphones. The audio is routed to Mix 1 and Mix 2 in the ASPEN matrix, which are then assigned to Dante transmit channels 1 and 2 (labeled Out 1 and Out 2) in the SPNDNT processor.

In the ASPEN subsystem on the right, Dante receive channels 1 and 2 are assigned to Mix 1 and Mix 2 in the ASPEN matrix by the SPNDNT processor. These two mixes are then selected as the signal sources for outputs 1 and 2 of the mixer.

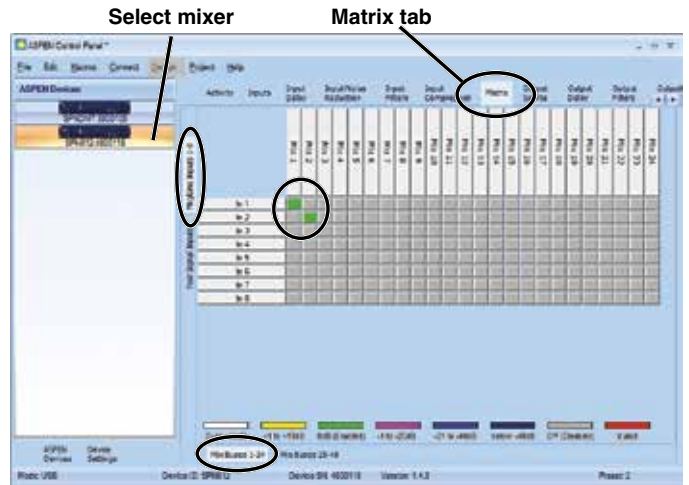
The reverse of this signal flow (in red) from the ASPEN system on the right to the system on the left takes place through ASPEN Mixes 3 and 4, and Dante transmit channels 3 and 4.

Each ASPEN system is an independent sub-system, so the Mix numbers used in one system have no bearing on those used in any other ASPEN sub-system. The Mix numbers used here were chosen only for clarity in visualizing the signal paths.

Set up the inputs for the microphones with the gain value set to achieve 0 dBu on the meter during speech.



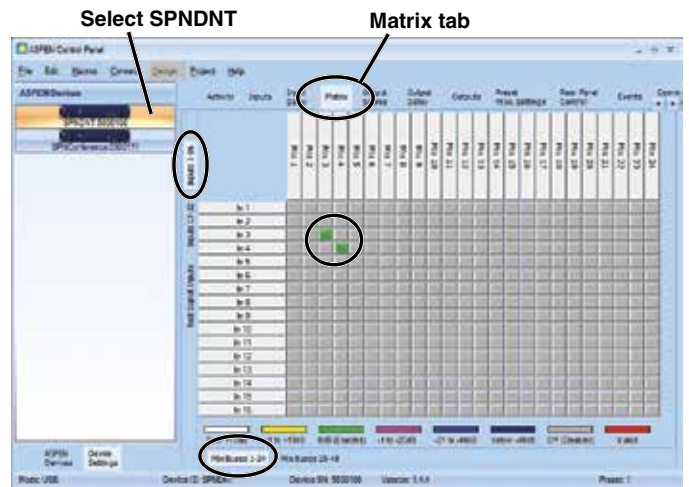
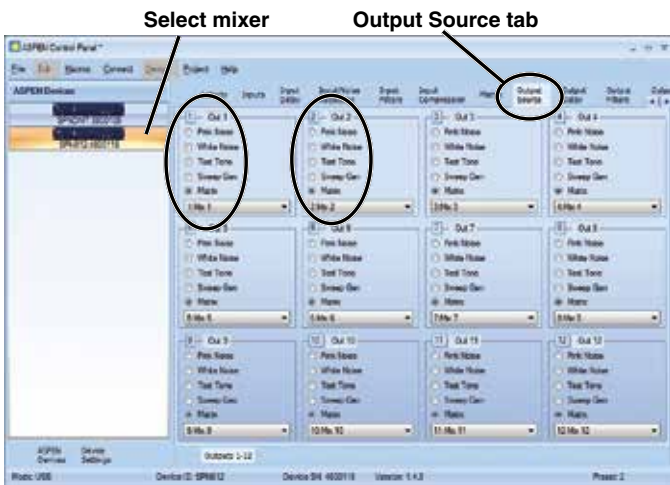
Route the microphone inputs to Mix 1 and Mix 2 on subsystem A and Mix 3 and Mix 4 on subsystem B under the matrix tab (subsystem A shown).



Select the source signal to be delivered to the outputs.

- For subsystem A: Mix 3 to Out 3; Mix 4 to Out 4
- For subsystem B: Mix 1 to Out 1; Mix 2 to Out 2

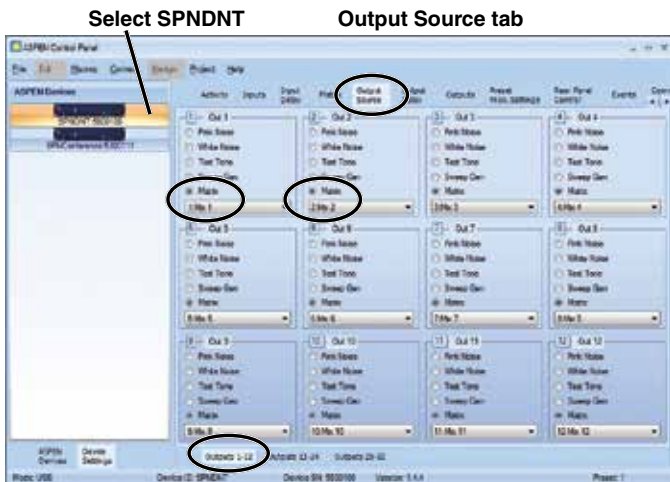
Assign Dante receive channels 3 and 4 to Mixes 3 and 4 respectively in the SPNDNT processor in subsystem A and Dante channels 1 and 2 to Mixes 1 and 2 respectively in subsystem B (subsystem A shown)



Select the signal sources to deliver audio to the network from The SPNDNT in each subsystem.

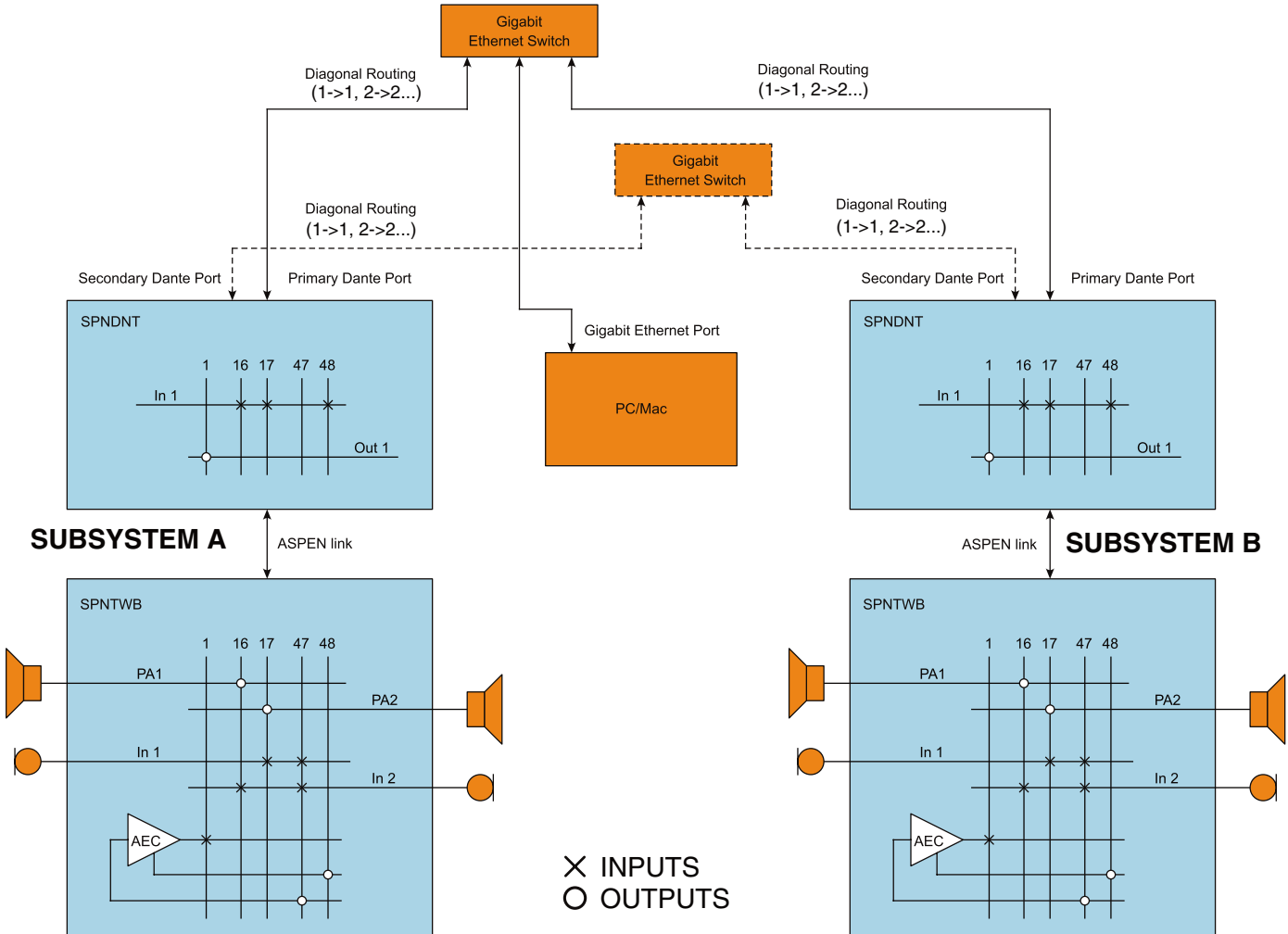
- For subsystem A: Mix 1 for Out 1
- For subsystem B: Mix 2 for Out 2

Create Dante subscriptions in a diagonal pattern: 1:1, 2:2, 3:3, 4:4.

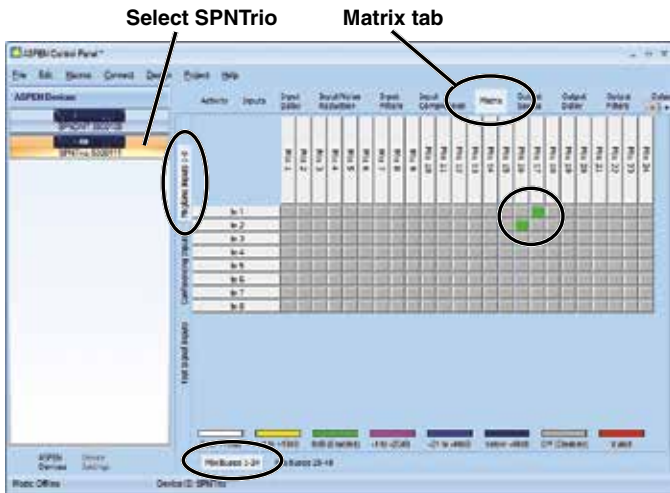


Using the AEC on Network Connections

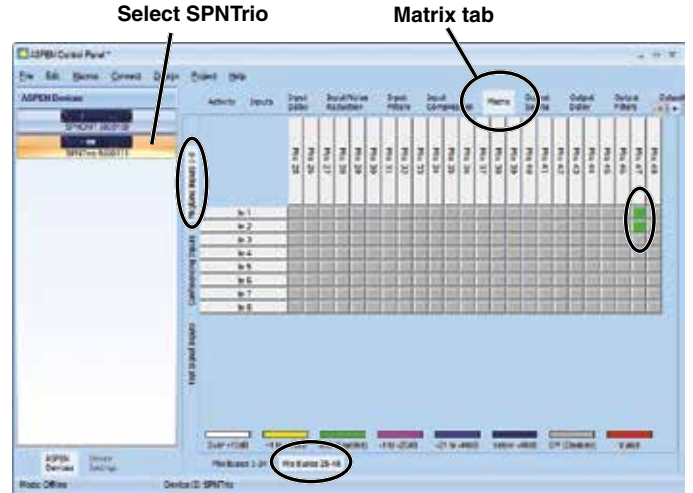
When the Trio or Conference processor is used in the ASPEN subsystem, the AEC (acoustic echo canceller) can be applied to the network connections to suppress echo caused by acoustical coupling between microphones and loudspeakers. In this example, a local sound reinforcement system is in place, which further increases the potential echo.



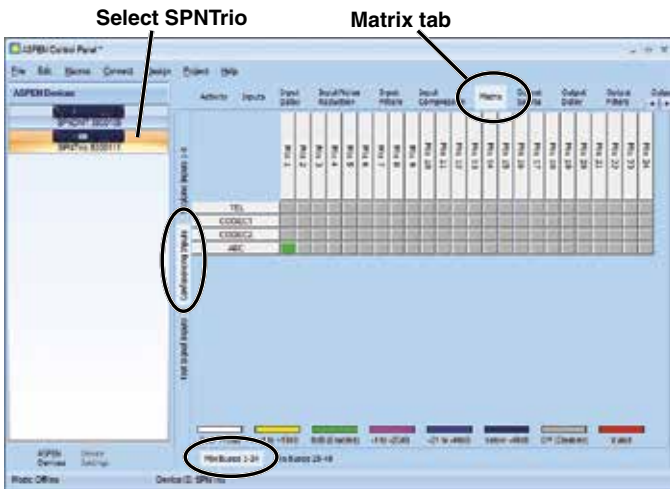
Assign the two microphone inputs to Mix Buses 16 and 17 to be used for local sound reinforcement. Make the assignments under the SPNTrío matrix tab.



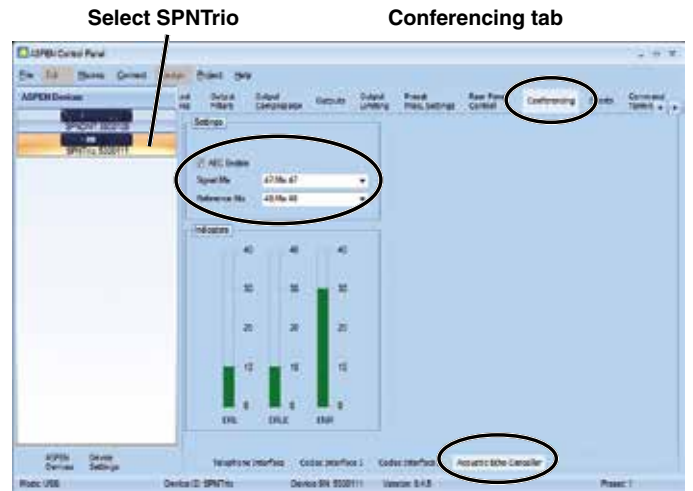
Assign the two microphone inputs to Mix Bus 47 to deliver audio to the other ASPEN system via the network. Make the assignments under the SPNTrío matrix tab.



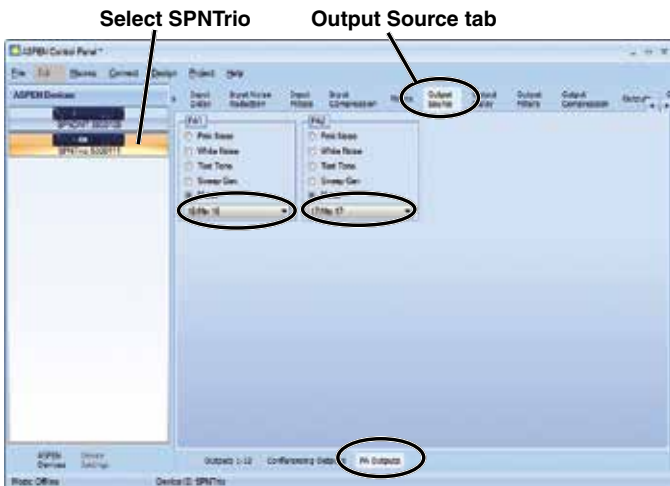
Assign the AEC output to Mix 1, which is the signal source for the audio sent to the other ASPEN system via the network.



Assign the Signal Mix and Reference Mix in the SPNTrío under the Conferencing tab. The Signal Mix contains the audio from the local microphones. The Reference Mix contains the audio from the other ASPEN system which the AEC cancels to remove an echo that might be heard due to coupling between the local microphones and loudspeakers.

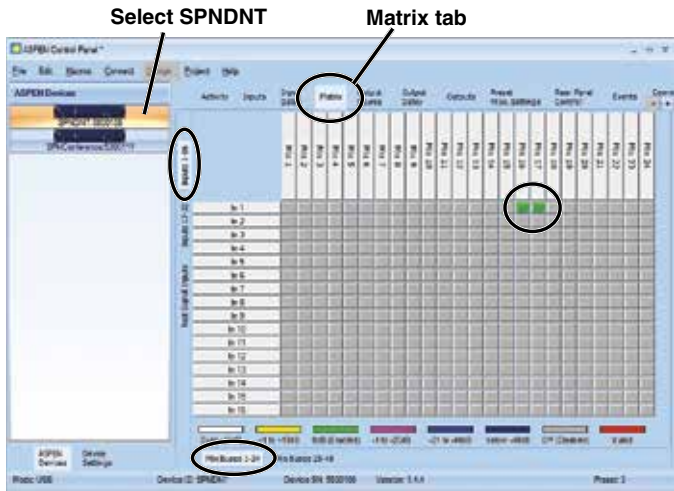


Select Mixes 16 and 17 as the signal source for the power amp outputs to feed the local loudspeakers.

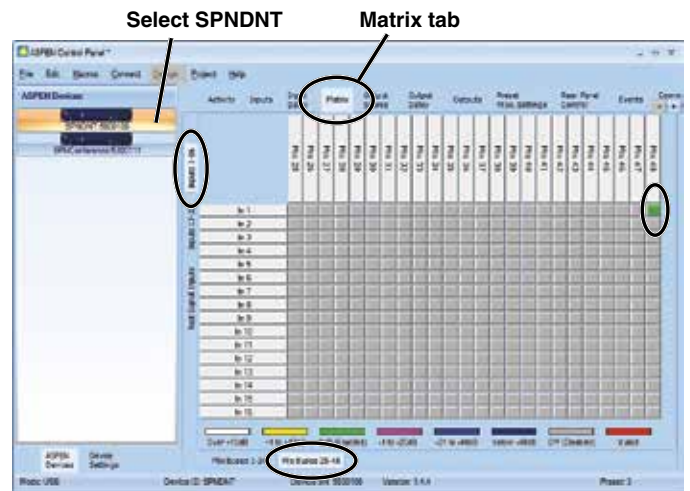


(See next page)

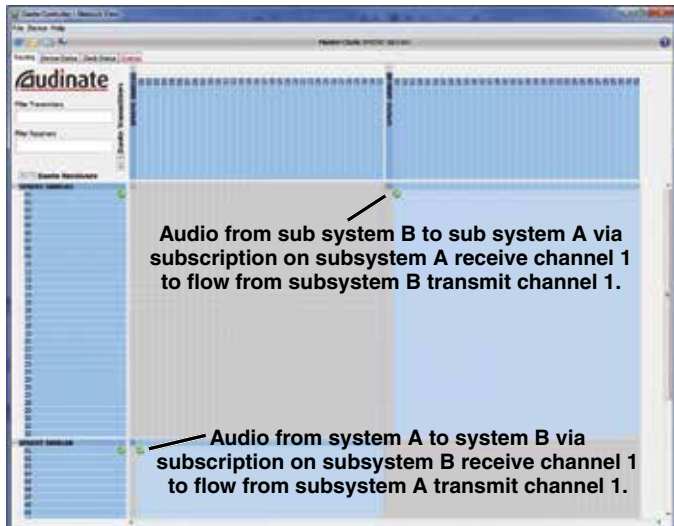
Assign the Dante receive channel 1 to Mixes 16 and 17 to deliver the audio from the network into the local sound system under the SPNDNT Matrix tab.



Assign Dante receive channel 1 to Mix 48 to deliver the audio from the network to the AEC to provide a reference signal for echo cancellation.

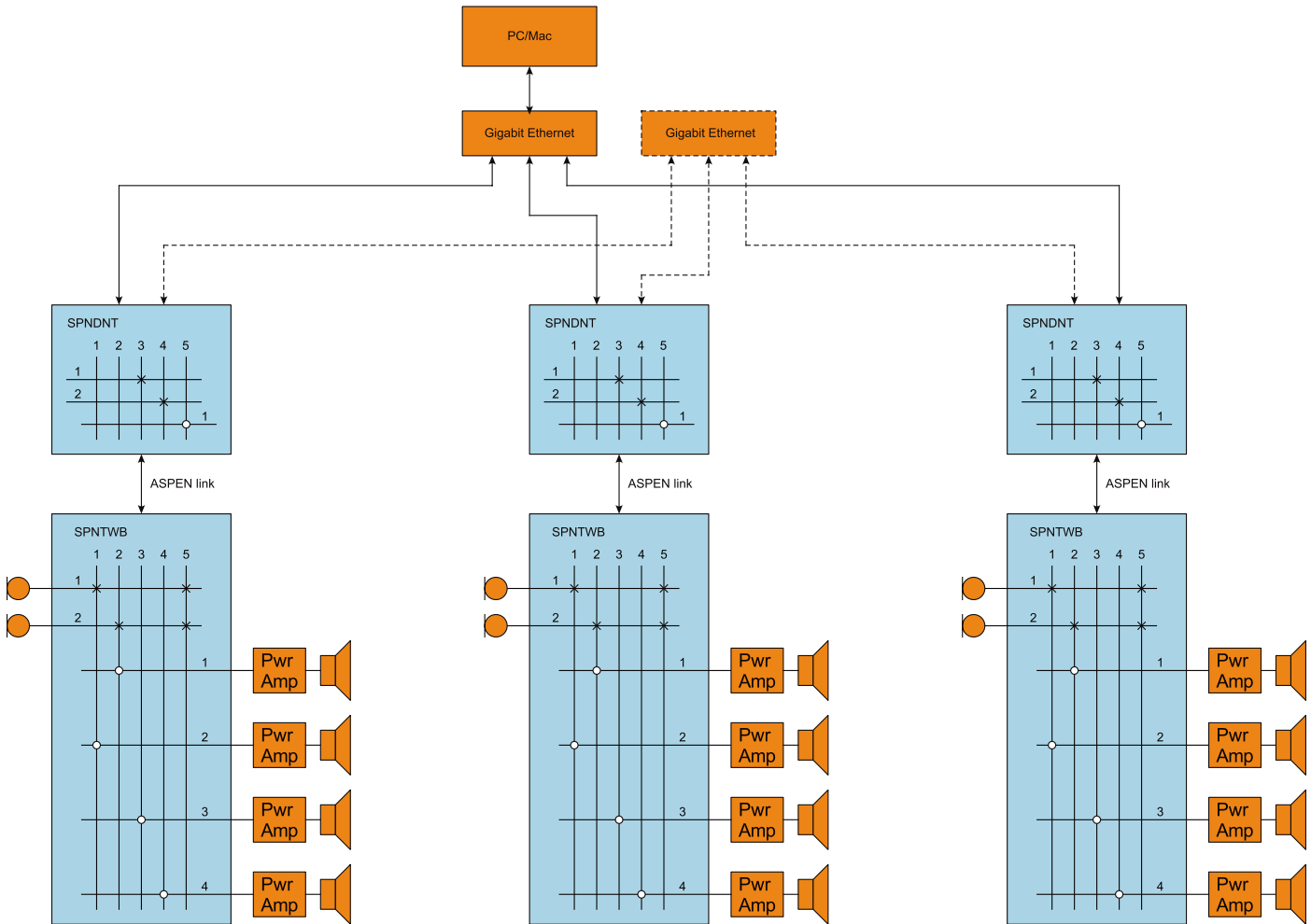


Subscribe to the transmit channels from the opposite ASPEN subsystems to flow audio back and forth between the ASPEN systems.



Multiple Site Conferencing

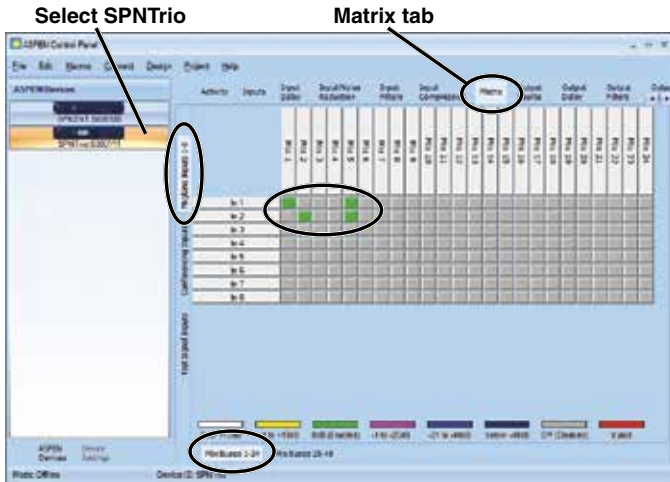
This example illustrates how multiple ASPEN subsystems can be set up identically and use Dante channels to transmit and receive audio.



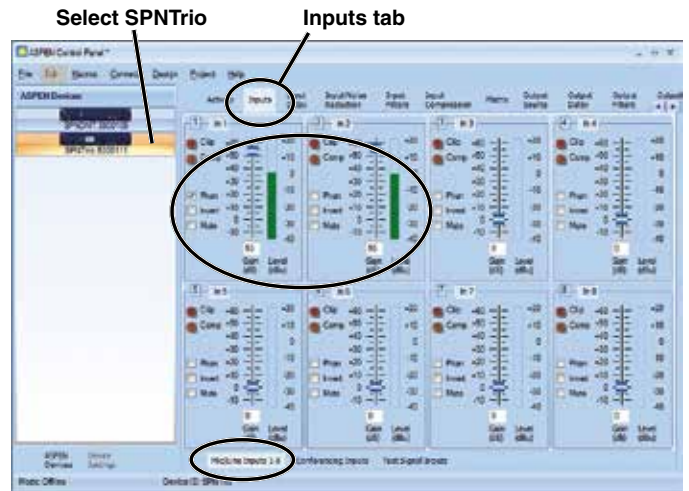
Route the inputs as follows:

- In 1 to Mix 1 and Mix 5
- In 2 to Mix 2 and Mix 5

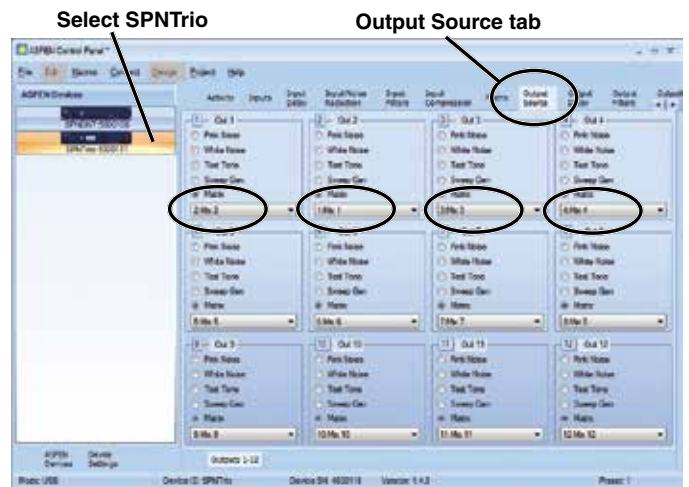
In this example, Mixes 1 and 2 are routed to the local sound system in a mix-minus pattern. Mix 5 delivers the audio from the local microphones into the Dante network.



Set up the inputs for the microphones connected to the SPNTrio. Adjust the gain so the level is close to 0dBu during normal speech.



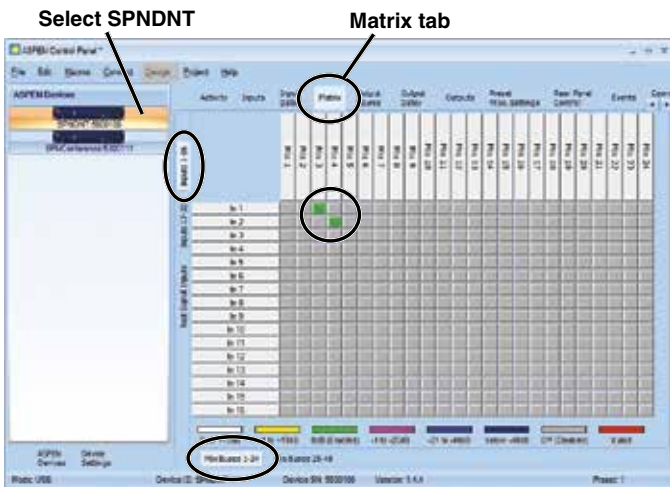
Select the signal sources for the output channels on the SPNTrio to feed the local sound system.



Route the Dante network channels in the SPNDNT as follows:

- In 1 to Mix 3
- In 2 to Mix 4

This will provide the audio source from the network to the local sound system.



Output Channel	Signal Source
1	Mix 2
2	Mix 1
3	Mix 3
4	Mix 4

Outputs 1 and 2 are configured in a “criss cross” manner to imply that there is a mix-minus arrangement in the local sound system.

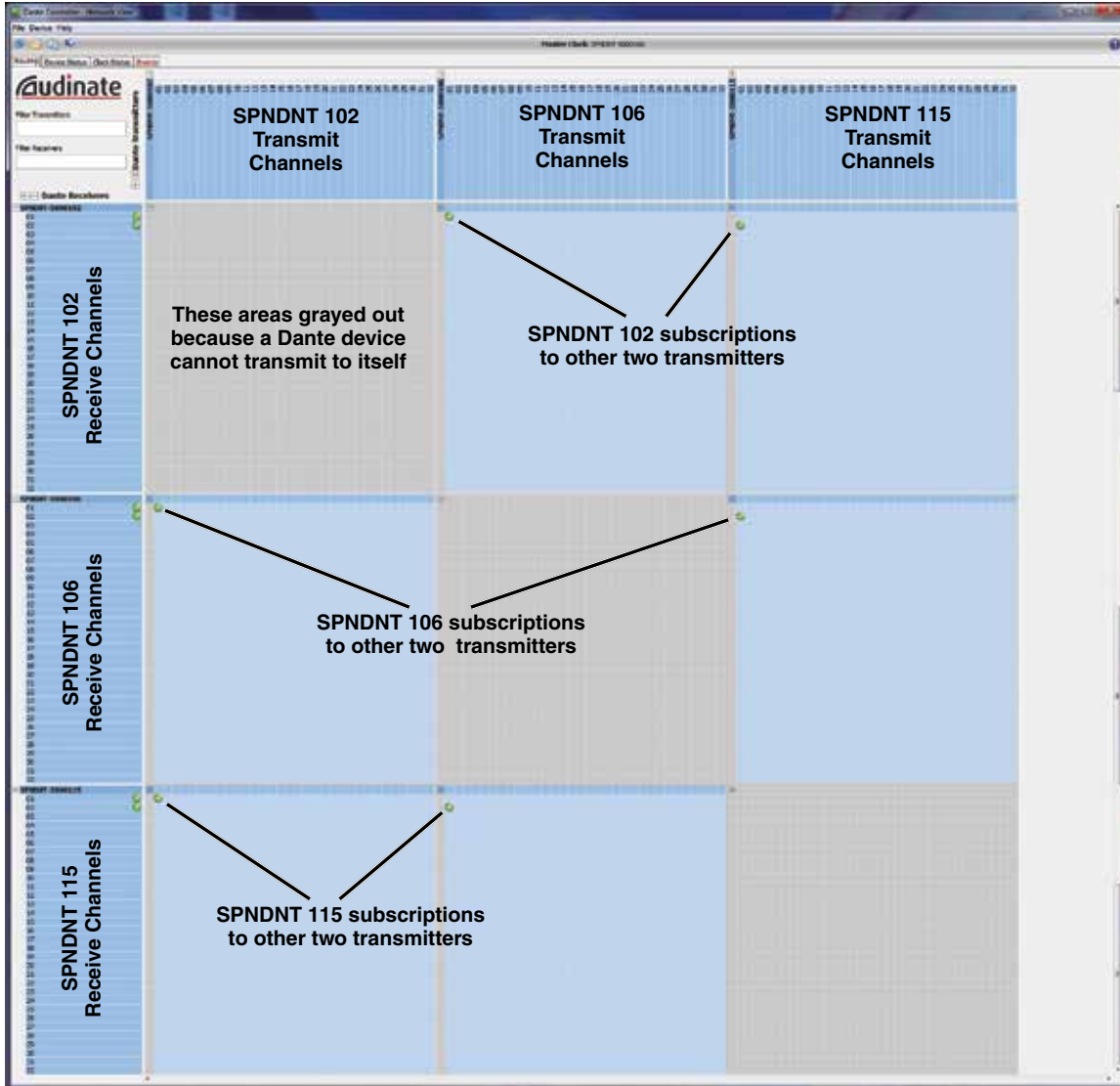
Outputs 3 and 4 deliver the audio from the other two ASPEN systems on the network into the local sound system.

(see next page)

In this example, the processors in the subsystems all subscribe to receive audio from the other two subsystems on Dante transmit channels 1 and 2.

A system configuration like this would be an ideal solution for multi-site Telepresence video conferencing by allowing a full-duplex, system wide audio signal flow.

This setup is also an effective solution for signal routing in room combining systems.



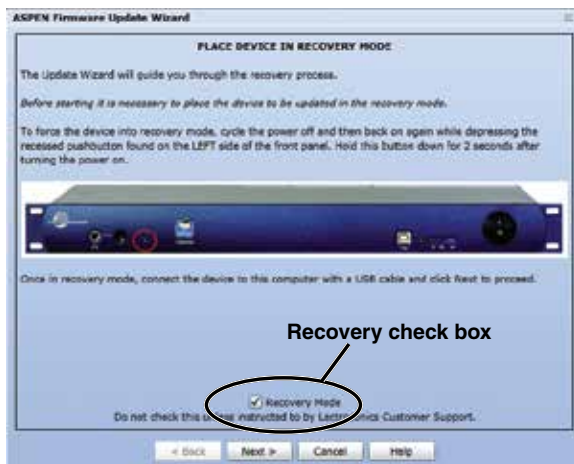
Firmware Update Procedure

MCU Recovery from Interrupted Firmware Update Procedure

If instructed to do so by Lectrosionics Customer Support, the firmware in a non-functioning unit can be restored.

Launch the Control Panel program. After the panel opens, click on **Connect->Update Firmware...**

In the lower part of the screen is a check box that is used only for the recovery process. When the box is checked, the instructions will change to describe the recovery procedure.



Follow the on-screen prompts to return the unit to normal operation.

FCC Part 15 Compliance

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

CAUTION: Changes or modifications not expressly approved by Lectrosonics, Inc. could void the user's authority to operate the equipment.

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at this own expense.

Service and Repair

If your system malfunctions, you should attempt to correct or isolate the trouble before concluding that the equipment needs repair. Make sure you have followed the setup procedure and operating instructions. Check the inter-connecting cables and then go through the **Troubleshooting** section in this manual.

We strongly recommend that you **do not** try to repair the equipment yourself and **do not** have the local repair shop attempt anything other than the simplest repair. If the repair is more complicated than a broken wire or loose connection, send the unit to the factory for repair and service. Don't attempt to adjust any controls inside the units. Once set at the factory, the various controls and trimmers do not drift with age or vibration and never require readjustment. **There are no adjustments inside that will make a malfunctioning unit start working.**

LECTROSONICS' Service Department is equipped and staffed to quickly repair your equipment. In warranty repairs are made at no charge in accordance with the terms of the warranty. Out-of-warranty repairs are charged at a modest flat rate plus parts and shipping. Since it takes almost as much time and effort to determine what is wrong as it does to make the repair, there is a charge for an exact quotation. We will be happy to quote approximate charges by phone for out-of-warranty repairs.

Returning Units for Repair

For timely service, please follow the steps below:

- A. DO NOT return equipment to the factory for repair without first contacting us by e-mail or by phone. We need to know the nature of the problem, the model number and the serial number of the equipment. We also need a phone number where you can be reached 8 A.M. to 4 P.M. (U.S. Mountain Standard Time).
- B. After receiving your request, we will issue you a return authorization number (R.A.). This number will help speed your repair through our receiving and repair departments. The return authorization number must be clearly shown on the **outside** of the shipping container.
- C. Pack the equipment carefully and ship to us, shipping costs prepaid. If necessary, we can provide you with the proper packing materials. UPS or FEDEX is usually the best way to ship the units. Heavy units should be "double-boxed" for safe transport.
- D. We also strongly recommend that you insure the equipment, since we cannot be responsible for loss of or damage to equipment that you ship. Of course, we insure the equipment when we ship it back to you.

Lectrosonics USA:

Mailing address:
Lectrosonics, Inc.
PO Box 15900
Rio Rancho, NM 87174
USA

Shipping address:
Lectrosonics, Inc.
581 Laser Rd.
Rio Rancho, NM 87124
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Telephone:
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(800) 821-1121 Toll-free
(505) 892-6243 Fax

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720 Spadina Avenue,
Suite 600
Toronto, Ontario M5S 2T9

Telephone:
(416) 596-2202
(877) 753-2876 Toll-free
(877-7LECTRO)
(416) 596-6648 Fax

E-mail:
Sales: colinb@lectrosonics.com
Service: joeb@lectrosonics.com

LIMITED THREE YEAR WARRANTY

The equipment is warranted for three years from date of purchase against defects in materials or workmanship provided it was purchased from an authorized dealer. This warranty does not cover equipment which has been abused or damaged by careless handling or shipping. This warranty does not apply to used or demonstrator equipment.

Should any defect develop, Lectrosonics, Inc. will, at our option, repair or replace any defective parts without charge for either parts or labor. If Lectrosonics, Inc. cannot correct the defect in your equipment, it will be replaced at no charge with a similar new item. Lectrosonics, Inc. will pay for the cost of returning your equipment to you.

This warranty applies only to items returned to Lectrosonics, Inc. or an authorized dealer, shipping costs prepaid, within three years from the date of purchase.

This Limited Warranty is governed by the laws of the State of New Mexico. It states the entire liability of Lectrosonics Inc. and the entire remedy of the purchaser for any breach of warranty as outlined above. NEITHER LECTROSONICS, INC. NOR ANYONE INVOLVED IN THE PRODUCTION OR DELIVERY OF THE EQUIPMENT SHALL BE LIABLE FOR ANY INDIRECT, SPECIAL, PUNITIVE, CONSEQUENTIAL, OR INCIDENTAL DAMAGES ARISING OUT OF THE USE OR INABILITY TO USE THIS EQUIPMENT EVEN IF LECTROSONICS, INC. HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. IN NO EVENT SHALL THE LIABILITY OF LECTROSONICS, INC. EXCEED THE PURCHASE PRICE OF ANY DEFECTIVE EQUIPMENT.

This warranty gives you specific legal rights. You may have additional legal rights which vary from state to state.

