



# **LM-DANTE-EXP2 USER GUIDE**

## **DANTE OPTION CARD FOR MIX-16/MIX-32**

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## **SAFETY INSTRUCTIONS**

**TO REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT REMOVE COVER. NO USER SERVICEABLE PARTS INSIDE. CONTACT DIGITAL AUDIO LABS FOR SERVICING.**

The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of un-insulated and/or potentially dangerous voltage within the products enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.



The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.



### **POWER CORD NOTICE FOR INTERNATIONAL OPERATION**

Please call Digital Audio Labs Support at 952-401-7700.

## **IMPORTANT SAFETY INSTRUCTIONS**

1. Read and understand this entire manual.
2. Keep this manual available for reference.
3. Heed all warnings and precautions in this manual and notices marked on the product.
4. Do not use this product near water or damp environments.
5. Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.
6. Provide for proper airflow around product. Do not install near products that produce high levels of heat. Do not expose the unit to direct sun light or heating units as the internal components' temperature may rise and shorten the life of the components.
7. 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 a third grounding prong.
8. Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they connect to the product. Do not use the unit if the electrical power cord is frayed or broken.
9. Only use attachments/accessories specified by the manufacturer.
10. Unplug this product during lightning storms or when unused for long periods of time.
11. Refer all servicing to qualified service personnel. There are no user serviceable components inside the product.
12. The product shall not be exposed to moisture. Do not touch the unit with wet hands. Do not handle the unit or power cord when your hands are wet or damp.
13. The product should be connected to a power supply only of the type described in the operating instructions or as marked on the product.

## **CARE**

- From time to time you should wipe off the front and side panels and the cabinet with a dry soft cloth. Do not use rough material, thinners, alcohol or other chemical solvents or cloths since this may damage the finish or remove the panel lettering.
- The Livemix system is capable of delivering high levels of volume. Please use caution with volume levels, listen with the lowest possible volume for proper operation and avoid exposure to prolonged high volume levels.
- The manufacturer cannot be held responsible for damages caused to persons, personal possessions, or data due to an improper or missing ground connection.

## DIGITAL AUDIO LABS LIMITED WARRANTY

Digital Audio Labs warrants their products against defects in material and workmanship for a period of two years from date of purchase. During this period, Digital Audio Labs will, at its option, repair the defective unit or replace it with a new or rebuilt one.

The warranty does NOT cover:

- Damage due to abuse, misuse, or accident.
- Damage due to operation contrary to the instructions in the product instruction manual.
- Units on which the product serial number has been removed or altered.
- Units that have been serviced by unauthorized personnel.

All implied warranties, including warranties on merchantability and fitness, are limited in time to the length of this warranty. Some states do not allow time limitations on implied warranties, so this limitation may not apply to you. Digital Audio Labs' liability is limited to the repair or replacement of its product. Digital Audio Labs shall in no way be held liable for incidental or consequential damages resulting from the use of their product or its software, including, without limitation, damages from loss of business profits, business interruption, loss of business information or other pecuniary loss. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you.

## REPAIR POLICY

Please do not return the product without obtaining an RMA number first. Contact Digital Audio Labs at [support@digitalaudio.com](mailto:support@digitalaudio.com) to acquire an RMA number. Do not return the product to the place of purchase. Please write the RMA number on the outside of the shipping carton. Any product sent to us without a valid RMA number will be refused. Include the following with the product: a brief description of the problem, your name, return shipping address, phone number and the RMA number. Do not include any accessories. DAL is not responsible for any damage to or loss of the product during transit. We recommend that customers obtain a receipt and tracking number for all packages shipped to us. Turnaround time on repairs is generally ten business days. If you live outside of the United States, please contact your local distributor for warranty service.

Please return product to:  
Digital Audio Labs  
Attn: RMA Number  
1266 Park Road  
Chanhassen, MN 55317  
USA

## WARRANTY SERVICE

You will be required to pay the shipping charges when you ship your product to DAL. DAL will pay for return shipping via UPS ground. We reserve the right to inspect any product that may be the subject of any warranty claim before repair is carried out. For warranty service, we may require proof of the original date of purchase if you have not registered your product with DAL. Final determination of warranty coverage lies solely with Digital Audio Labs.

## NON-WARRANTY SERVICE

If it is determined that the product does not meet the terms of our warranty, you will be billed for labor, materials, return freight and insurance. There is a \$80 USD minimum charge for materials and labor. Appropriate shipping charges will be applied. We require payment in advance of repair by credit card; we accept Visa and Master Card. In the event the charges are over the minimum charge, DAL will contact you and inform you of the cost of the repair before any work is completed.

# CONTENTS

SAFETY INSTRUCTIONS .....	ii
IMPORTANT SAFETY INSTRUCTIONS.....	ii
CARE.....	ii
DIGITAL AUDIO LABS LIMITED WARRANTY.....	1
REPAIR POLICY .....	1
WARRANTY SERVICE.....	1
INTRODUCTION .....	3
ANATOMY OF THE DANTE OPTION CARD.....	3
SETUP DIAGRAMS.....	4
DIRECT CONNECTION TO A DANTE DEVICE .....	4
CONNECTION TO A DANTE NETWORK.....	4
CONNECTION TO A DANTE NETWORK - REDUNDANT .....	4
SETUP AND OPERATION.....	5
INSTALLATION.....	5
PHYSICAL SETUP .....	5
DIRECT CONNECTION TO DANTE DEVICE.....	5
CONNECTING TO DANTE NETWORK WITH A SWITCH.....	6
CONNECTING TO A REDUNDANT DANTE NETWORK WITH A SWITCH.....	6
INPUT SELECT .....	7
DIGITAL CONFIGURATION .....	8
DANTE NETWORK CHANNEL SETUP.....	8
AUTO ASSIGN DANTE CHANNELS 1-24 .....	8
DEVICE/CHANNEL VIEW TOGGLE .....	9
IMPORT DANTE NAMES.....	10
SAVING DANTE CHANNEL DATA.....	10
DANTE CARD UPDATE .....	11
DANTE CARD FIRMWARE UPDATE TROUBLESHOOTING.....	11
LIVEMIX SYSTEM EXAMPLES .....	12
TROUBLESHOOTING .....	13
LIVEMIX SUPPORT .....	14
TECHNICAL SPECIFICATIONS.....	14

## INTRODUCTION

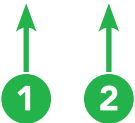
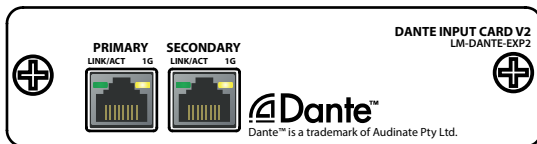
The Livemix LM-DANTE-EXP2 is an add-on option card for the MIX-16/MIX-32 that allows the Livemix personal monitor system to connect to a Dante network. The system can receive up to 24 channels from the Dante network. Any published channel can be assigned to any of the 24 available channels in the Livemix personal monitor system.

Audinate's Dante network protocol delivers a no hassle, self configuring, true plug-and-play digital audio network that uses standard Internet Protocols over 100Mb and/or Gigabit Ethernet. Patent-pending Dante technology distributes digital audio plus integrated control data with sub millisecond latency, sample-accurate playback synchronization, extreme reliability and high channel counts.

### NOTE:

It is important to understand how your Dante devices publish audio streams to the network. Many digital consoles have multiple output options and many of them can be published to the Dante network. Consult the manual for your particular Dante device to ensure you have published channels to the network.

## ANATOMY OF THE DANTE OPTION CARD



### 1 PRIMARY PORT

Connect a CAT5e or CAT6 network cable to the Primary port on another Dante equipped device to link the devices directly. Connect a CAT5e or CAT6 network cable to a Gigabit switch to connect multiple Dante enabled devices. Use the Primary port for the main Dante network or when using a single non-redundant network.

### 2 SECONDARY PORT

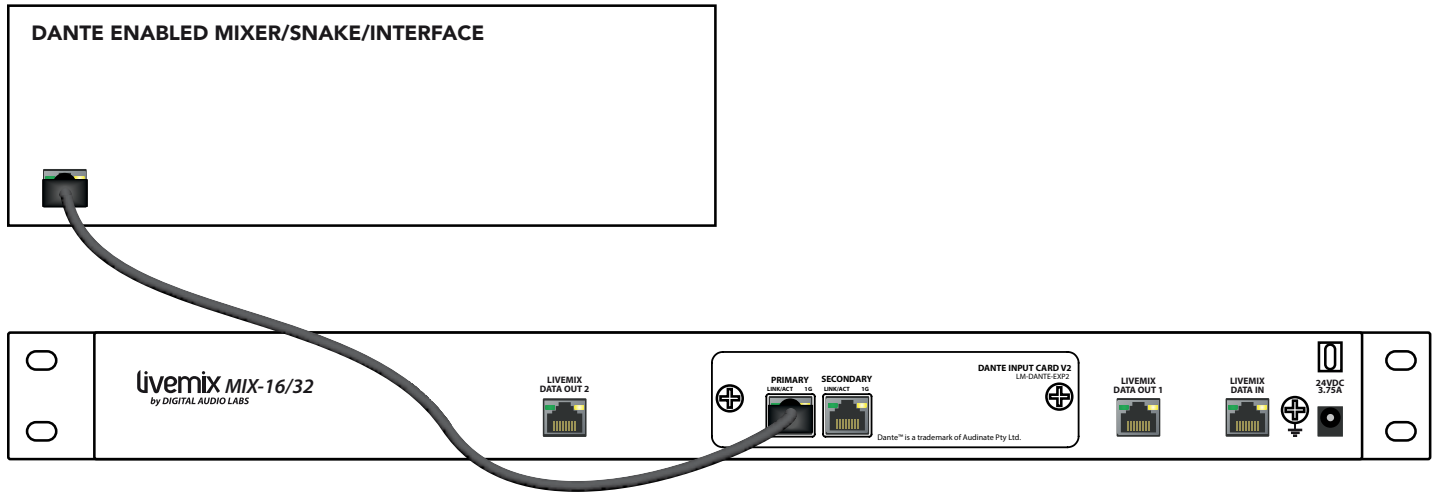
When configuring a redundant network, use the secondary port for the second "back-up" network when using Redundant Mode. The Primary and Secondary ports become a two port switch for connecting up to 2 devices when the card is in **Switched Mode**.

Two indicator lights on each port report device status information.

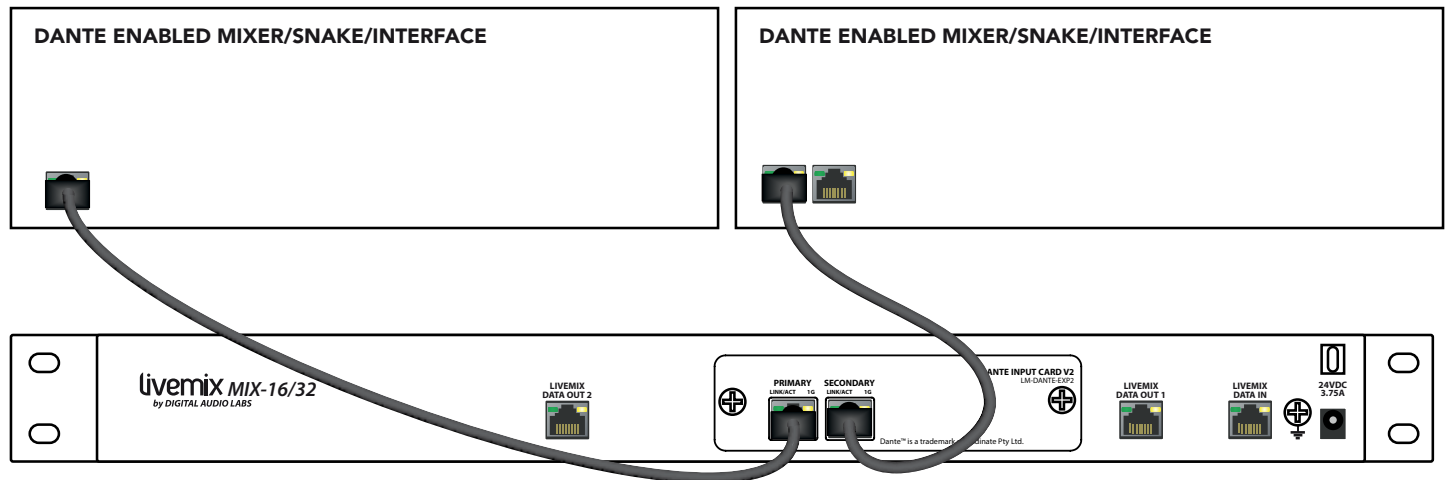
- The **green** light indicates data is being transferred.
- The **yellow** light will illuminate to indicate a 1 Gbps Ethernet connection. It will be off to indicate a 100 Mbps or lower connection.

# SETUP DIAGRAMS

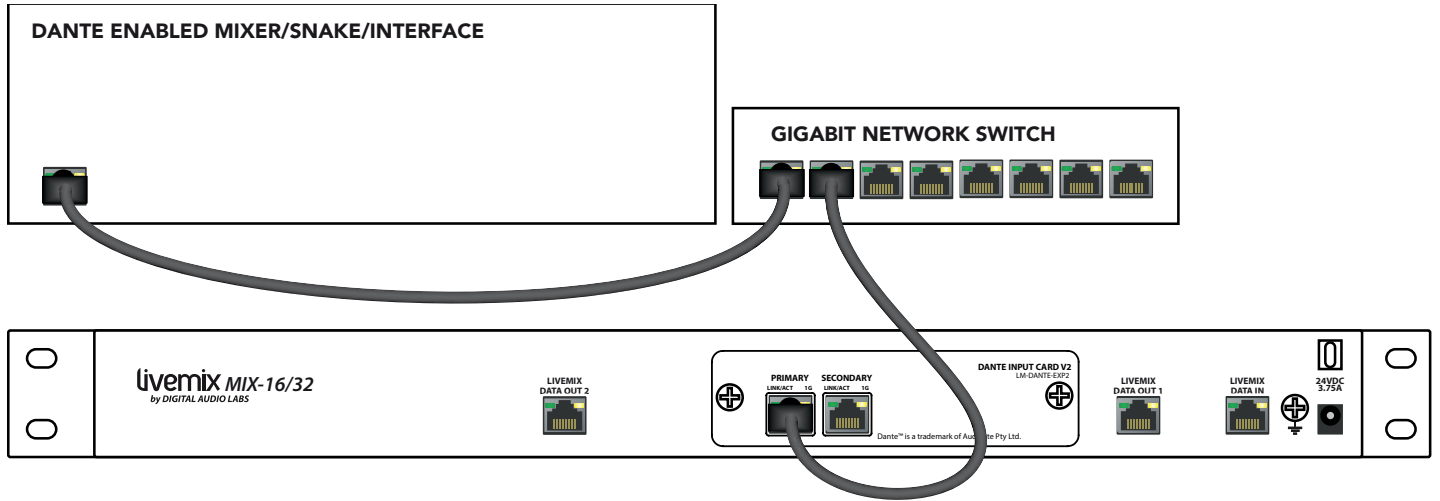
## DIRECT CONNECTION TO A DANTE DEVICE



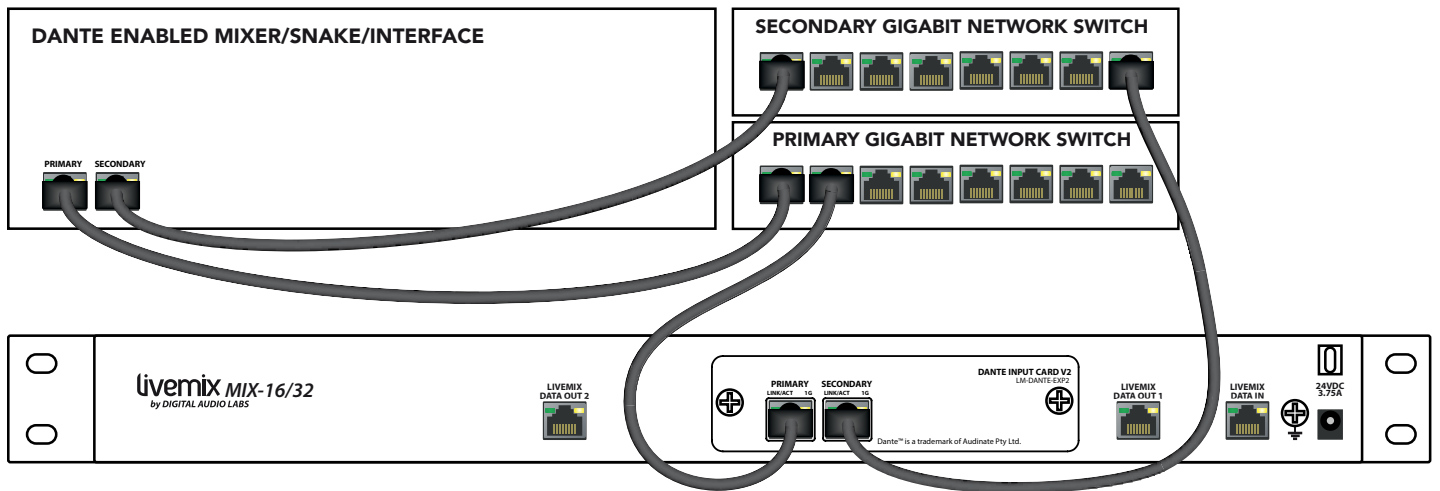
## CONNECTION TO DANTE DEVICES - SWITCHED MODE



## CONNECTION TO A DANTE NETWORK



## CONNECTION TO A DANTE NETWORK - REDUNDANT MODE



# SETUP AND OPERATION

## INSTALLATION

To install the LM-DANTE-EXP2:

1. Turn off the MIX-16/MIX-32 and disconnect the power cable.
2. Remove the blank panel on the back of the MIX-16/ MIX-32 by removing the two screws holding it in place.
3. The back of the LM-DANTE-EXP2 has a slotted connector (see image to the right). This connector needs to seat into a connector in the MIX-16/MIX-32.
4. Insert the LM-DANTE-EXP2 into the option card slot. Hold the card by the black panel and gently seat the connector into the MIX-16/MIX-32. Do not force it, but feel for gentle resistance as the connectors mate.
5. Reattach the screws removed in step 1 to secure the option card.



## PHYSICAL SETUP

Using the Livemix personal monitor system with a Dante network requires at least one device that is transmitting/publishing audio to the network. To connect Livemix to the Dante network, you will need either a Gigabit switch, or a direct connection to the transmitting device.

At this time, Livemix is a receiving device only. This means that it can receive and subscribe to channels on the network, but does not place any audio onto the network.

## DIRECT CONNECTION TO DANTE DEVICE

If you have only one additional Dante device like a digital console, the Dante option card can connect directly to another Dante enabled device.

1. Connect a CAT5e or CAT6 network cable to the PRIMARY Ethernet connector on the Dante option card.
2. Connect the opposite end to the PRIMARY Dante connector on the transmitting device.

## TERMINOLOGY

Dante terminology is based on networking terms. When a channel is PUBLISHED, it is made available for any device on the network to SUBSCRIBE to it. You might also see TRANSMIT and RECEIVE. It is similar to input and output in audio terminology. A device must TRANSMIT its channels by PUBLISHING them to the network. The Livemix system will RECEIVE the channels by SUBSCRIBING to them.



## CONNECTING TO DANTE NETWORK WITH A SWITCH

If you have multiple Dante devices like a digital console and a digital snake, you will want to use a Gigabit switch to connect Livemix to the Dante network. Most standard off the shelf Gigabit switches will work with Dante, provided they meet the Quality of Service (QOS) requirements. For more information, please reference the Dante FAQ on the Audinate website ([www.audinate.com](http://www.audinate.com)).

1. Connect a CAT5e or CAT6 network cable to the PRIMARY Ethernet connector on the Dante option card.
2. Connect the opposite end to an open port on the Gigabit switch.
3. Connect other Dante enabled devices to the Gigabit switch in the same manner.
4. Optimize the switch for your Dante network. Consult the Audinate website or the website of the device you will use to transmit onto the Dante network for more information. In general, you will need to disable the Energy Efficient Ethernet (EEE) if your switch has that feature.

## CONNECTING TO A REDUNDANT DANTE NETWORK WITH A GIGABIT SWITCH

To configure a Redundant Dante network, you will want to use a second Gigabit switch to connect Livemix to the Redundant Dante network. Most standard off the shelf Gigabit switches will work with Dante, provided they meet the Quality of Service (QOS) requirements. For more information, please reference the Dante FAQ on the Audinate website ([www.audinate.com](http://www.audinate.com)).

1. Connect a CAT5e or CAT6 network cable to the SECONDARY Ethernet connector on the Dante option card.
2. Connect the opposite end to an open port on the second Gigabit switch.
3. Connect other Dante enabled devices to the Gigabit switch in the same manner.
4. Optimize the switch for your Dante network. Consult the Audinate website or the website of the device you will use to transmit onto the Dante network for more information. In general, you will need to disable the Energy Efficient Ethernet (EEE) if your switch has that feature.
5. The LM-DANTE-EXP2 card comes preconfigured in Switched mode. To change this mode to Redundant, use your PRIMARY Dante Network and Dante Controller (on a computer), select the MIX-16/32 Dante card, click Device View, go to the Network Config tab and choose Redundant.

### **MORE INFORMATION ON SETTING UP A DANTE NETWORK:**

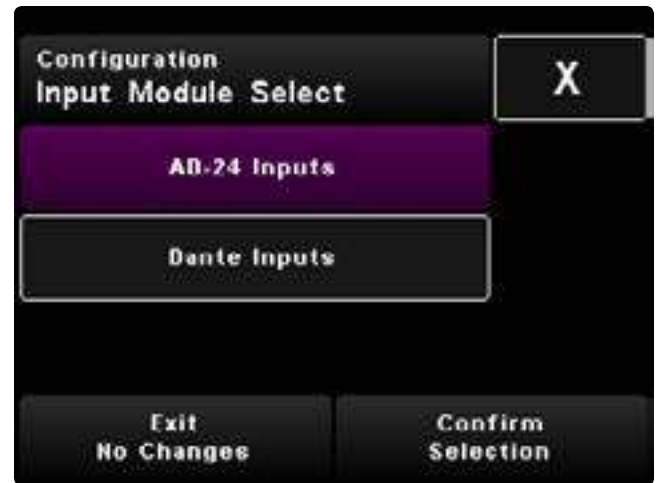
For more detailed information on switches and setting them up, please visit Audinate's Dante Setup pages here:

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

## INPUT SELECT

If the LM-DANTE-EXP2 option card is installed in the MIX-16 or MIX-32, Input Select will be visible. This function will prepare the system to accept audio from the AD-24 or the Dante Network.

1. From Global Configuration, SELECT Input Select.
2. You will be prompted with a warning. PRESS Continue.
3. SELECT AD-24 for analog inputs or Dante Inputs to receive audio from the Dante Network.
4. PRESS Confirm Selection.



## DIGITAL CONFIGURATION

If the LM-DANTE-EXP option card is installed in the MIX-16 or MIX-32, Digital Configuration will be visible. This function configures Livemix to accept audio from a Dante network.

## DANTE NETWORK CHANNEL SETUP

Configuring Livemix for use with a Dante network can be performed on any Livemix personal mixer. You can also use Dante Controller software provided by Audinate on a Windows or Mac OS X computer. Consult the user guides of your Dante enabled devices for information on how each device will transmit/publish channels to the Dante network.

## AUTO ASSIGN DANTE CHANNELS 1-24

With Dante Channel Setup, easily assign the first 24 networked channels of any Dante device.

1. From the Global Configuration page, SELECT Digital Configuration.
2. You will be prompted with a warning. PRESS Continue.
3. SELECT Dante Channel Setup.
4. PRESS Import Dante 1-24. The button will flash to indicate the import feature is active.
5. Turn the ADJUST knob to select a device on the Dante network.
6. PRESS the ADJUST knob to confirm the device selection.

Your Livemix system will now be subscribed to the first 24 channels of the chosen Dante device.



**NOTE:** Each channel in the Dante Channel Setup screen will report the status.

### STATUS OPTIONS

**OK:** This Livemix channel is assigned to a Dante channel properly.

**OFF:** This Livemix channel is not assigned, there is no device/channel present, or it is assigned to a device that is no longer on the Dante network.

**WAIT:** Device is in the process of setting up a subscription.

**ERROR:** There is a problem with this Dante channel or there is not enough bandwidth on the network to accommodate a subscription.

## MANUALLY ASSIGN DANTE CHANNELS

You may want to manually subscribe to channels on a Dante network. The manual assign feature allows you to connect to multiple devices or to change the order of connected devices. An example of this would be: connecting Dante transmitter channel 24 from a console to channel 4 on the Livemix personal monitor system.

1. From the Global Configuration screen, PRESS Digital Configuration.
2. You will be prompted with a warning. PRESS Continue.
3. PRESS Dante Channel Setup to enter Dante setup configuration.
4. SELECT a Channel to assign to a Dante channel. A pop-up will appear on the bottom.
5. Select a Device by rotating the ADJUST knob. PRESS the ADJUST knob to accept a selected device. If you have previously assigned a device to this channel, the selector may be on Channel Select. If so, PRESS the ADJUST knob to change to the Device Selector.
6. Select a Channel on the selected device by rotating the ADJUST knob. After a few seconds, the channel will be automatically selected.
7. Repeat steps 5-7 as necessary. Press Slots 13-24 to access additional channels.
8. PRESS Accept Assignments to accept the assigned channels.



## DEVICE/CHANNEL VIEW TOGGLE

The Show Device/Show Channels button toggles what information is visible for each channel. By default, the names of the assigned channels are visible. PRESS Show Devices to see which devices are assigned to each Livemix channel. PRESS Show Channels to toggle to the Show Devices view.

## IMPORT DANTE NAMES

If you are using Livemix with an existing system that has published “Channel Labels” to the network, you can use those same labels as the Livemix channel names that appear in the Channel Overview and Single Channel View.

To import Channel Labels from the Dante network:

1. PRESS Global Configuration in Mix Tools.
2. SELECT Digital Configuration.
3. You will be prompted with a warning.  
PRESS Continue.
4. PRESS Import Dante Names.
5. PRESS Yes to copy the Dante Channel names to the Livemix channel names.

## SAVING DANTE CHANNEL DATA

To ensure that Dante channel setup and names are saved, save the Global Template after changes are made. See the *instructions for Saving a Global Template* section.



### NOTE:

Not all Dante network devices use channel labels. Some only publish the number of the channel.

## DANTE CARD UPDATE

It may be necessary to update the Dante option card to keep current with networking standards and to stay compatible with third party products. To determine if you need to update your Dante card, go to the Livemix Version Info screen by pressing Mix Tools, then Global Setup, then Livemix Version Info. If the Dante Version is lower than the version available at <http://www.digitalaudio.com/support>, follow the instructions below to update the firmware.

TO UPDATE THE FIRMWARE OF THE DANTE OPTION CARD (LM-DANTE-EXP2):

1. Visit <http://www.digitalaudio.com/support> to download the the latest Dante Firmware Update Manager.
2. Download the MIX-16/MIX-32 update file from <http://www.digitalaudio.com/support>.
3. Connect your computer to the MIX-16/MIX-32 with an Ethernet cable or connect to the same switch that the MIX-16/MIX-32 is connected to.
4. Install the Dante Firmware Update Manager.
5. Run the Dante Firmware Update Manager. Press "Browse" to locate the update file previously downloaded. DO NOT check the "Override Device Matching" box.
6. The Firmware Update Manager will search for Dante devices on the network. When the list appears, select the checkbox for your MIX-16/MIX-32 and click the "Start" button. The update will take a few minutes.
7. When the update is finished, turn off the power to your MIX-16/MIX-32 and restart it.

## DANTE CARD FIRMWARE UPDATE TROUBLESHOOTING

If no devices are found in step 6:

- Make sure the MIX-16/MIX-32 is plugged in and turned on
- Make sure your computer is connected to the same network as the MIX-16/MIX-32
- Make sure there are no firewall settings blocking a connection to the MIX-16/MIX-32

## LIVEMIX SYSTEM EXAMPLES

A Livemix system requires either an analog (AD-24) or digital input (option card), the MIX-16/MIX-32 central mixer, and at least one Livemix personal mixer. Below are some examples of what a basic system may look like.

### ANALOG INPUT SYSTEM

1 x AD-24 Analog Input Rack Unit  
1 x MIX-16 Central Mixer  
4 x CS-DUO Dual Mix Personal Mixers  
4 x MT-1 Dual Position Mounts  
1 x CBL-CAT6-100 Shielded CAT6 Cable 100' \*\*  
4 x CBL-CAT6-50 Shielded CAT6 Cable 50'

### DIGITAL INPUT SYSTEM

1 x MIX-16 Central Mixer  
1 x LM-DANTE-EXP2 Dante option card  
4 x CS-DUO Dual Mix Personal Mixers  
4 x MT-1 Dual Position Mounts  
1 x CBL-CAT6-100 Shielded CAT6 Cable 100' \*\*  
4 x CBL-CAT6-50 Shielded CAT6 Cable 50'

\*\*Shielded cable between AD-24 and MIX-16/MIX-32 is required. CAT6 is not required, CAT5e is acceptable.

### ANALOG OR DIGITAL?

Users receiving their audio from an analog source will use the AD-24. Using the TRS or DB-25 inputs, audio from the source is made available to the Livemix system.

Users receiving their audio from a digital source will use the Option Card (LM-DANTE-EXP2). This is an option card that is installed in the MIX-16/MIX-32 and allows the Livemix system to receive audio from a digital device or network.

### PERSONAL MIXER / CONTROL SURFACE

Livemix needs at least one connected personal mixer to make a mix. Each Livemix personal mixer connects via CAT5e/CAT6 cable to one of the ports of the MIX-16/MIX-32. Using various controls on the unit, users can each create their own custom mix, which is then output to headphones, in-ear monitors or stage monitors, directly from the personal mixer or Livemix DA-816 analog output unit.



# TROUBLESHOOTING

<p>I have connected the LM-DANTE-EXP2 to a Dante device but I can't see the device in the setup screen.</p>	<p>Cycle the power to the Dante device to make sure the Livemix system is properly seeing it.</p>
	<p>Verify that the Dante devices are available on the network. The Dante Controller software from Audinate can be a helpful tool. It is a free download at <a href="http://www.audinate.com">www.audinate.com</a>.</p>
<p>I have assigned all the channels and they show up but there is no audio.</p>	<p>In many devices like a console, you need to tell the Dante network which signals get assigned to the channels. A digital console may allow you to put directs, inserts, aux sends, etc. on the Dante network. Consult the user guide for your particular device to determine how to assign the desired outputs to the Dante network.</p>
<p>I hear audio, but every once in a while I hear a click or pop.</p>	<p>Audible clicking/popping is usually an issue with the digital clock. The Dante network has a built in clocking system that automatically selects the most stable source for clocking. If you are using Livemix with a Dante network, make sure that your console or Dante device is set to be the Master and Livemix is set to Slave. This can be done through Dante Controller software on a Windows PC or Apple computer.</p> <p>NOTE: If you desire to have your console's internal clock be the clock source, select this configuration setting on your console. Then in Dante Controller, set your console's Dante option card to be the Master Dante device on the Dante network and select "Sync to External" for this. This means you want the clock source to be external or outside of the Dante network.</p>
	<p>Verify that the Sample Rates are the same for all Dante devices.</p>



# LIVEMIX SUPPORT

Phone Support: 952-401-7700  
Toll Free: 844-DAL-INFO  
Email Support: support@digitalaudio.com  
Website: www.digitalaudio.com/support

DIGITAL AUDIO LABS  
1266 Park Rd  
Chanhassen, MN 55317

## TECHNICAL SPECIFICATIONS

### LM-DANTE-EXP2

Input Channels	24
Bit Rate	24 bits
Sample Rates Supported	48 kHz 96 kHz
Dimensions	5" (127mm) W 3.25" (83mm) D 1.25" (25mm) H
Weight	.3 lb (.14kg)

### WHOLE SYSTEM

	.03% (100mW, 22 $\Omega$ )
THD+N (18 dBu 1kHz input)	.014% (100mW, into 32 $\Omega$ ) .005% (100mW, into 64 $\Omega$ ) .003% (100mW, into 300 $\Omega$ )
S/N Ratio	103dB
Frequency Response	20Hz-22 kHz $\pm$ 3dB
Crosstalk (Left to Right)	-103 dB
Latency	1.5 ms



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Patents pending.