



# MIX-16/32 USER GUIDE

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Chanhassen, MN 55317  
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[www.digitalaudio.com](http://www.digitalaudio.com)

## **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 manufacture cannot be held responsible for damages caused to persons, personal possessions, or data due to an improper or missing ground connection.

# CONTENTS

SAFETY INSTRUCTIONS .....	ii
IMPORTANT SAFETY INSTRUCTIONS.....	ii
CARE .....	ii
DIGITAL AUDIO LABS LIMITED WARRANTY.....	1
REPAIR POLICY.....	1
WARRANTY SERVICE .....	1
NON-WARRANTY SERVICE .....	1
CONTENTS OF BOX.....	2
INTRODUCTION .....	2
ANATOMY OF THE MIX-16/32 .....	2
SETUP DIAGRAMS .....	4
ANALOG INPUT TO MIX-16/32 .....	4
DIGITAL INPUT TO MIX-16/32.....	4
MIX-16 TO CS-DUO CONTROL SURFACES .....	5
SETUP AND OPERATION .....	6
USING THE USB OUTPUT .....	6
MIX-16/32 FIRMWARE UPDATE INSTRUCTIONS.....	7
LIVEMIX SYSTEM EXAMPLES.....	8
TROUBLESHOOTING .....	9
LIVEMIX SUPPORT .....	10
TECHNICAL SPECIFICATIONS .....	10
OPEN SOURCE STATEMENT .....	11

## 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 \$50 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 OF BOX

- MIX-16/32
- External Power Supply

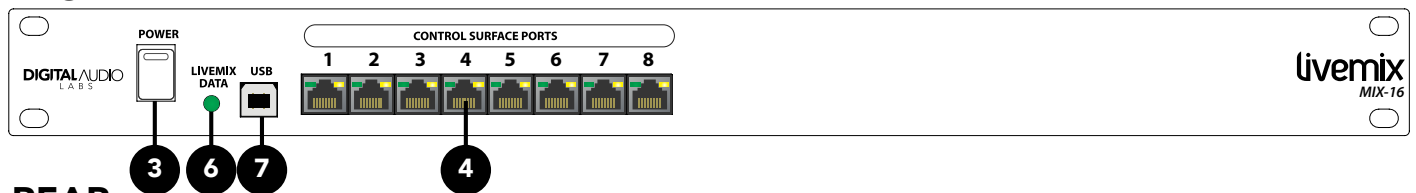
# INTRODUCTION

The MIX-16/32 is the central mixer and of the Livemix system. Although the mixing is controlled by the personal mixers, much of the actual mixing occurs in the MIX-16/32. The MIX-16/32 provides:

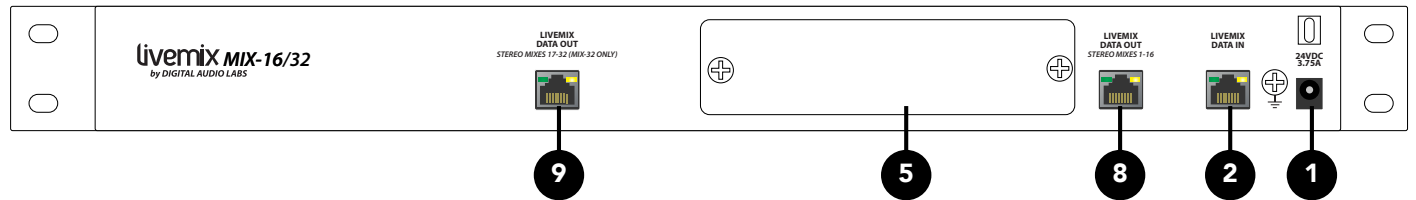
- 24-channel digital input
- 24-bit digital mixing and processing
- Power and audio distribution to attached personal mixers over a single network cable
- 16 discrete monitor mixes with the MIX-16
- 32 discrete monitor mixes with the MIX-32
- USB Connection to Windows PC or Apple computer

# ANATOMY OF THE MIX-16/32\*

## FRONT



## REAR



\* MIX-16 pictured

- 1. EXTERNAL POWER SUPPLY CONNECTOR:** Connect the included power supply to this jack. Only use the power supply that is supplied with your MIX-16 or MIX-32. The MIX-16 is supplied with a 24V / 3.75A power supply. The MIX-32 is supplied with a 24V / 5A power supply. Contact support for a replacement power supply if necessary.
- 2. LIVEMIX DATA IN:** If using an analog input source and the AD-24, connect a shielded CAT5 or CAT6 cable from the Livemix Data Out port on the AD-24 to the Livemix Data In on the MIX-16/32. This will be unused if using the Dante Option Card.
- 3. POWER SWITCH:** This switch turns power on/off to the MIX-16/32 unit. The MIX-16/32 supplies power to connected Livemix personal mixers. Turning the power on/off will also power on/off all connected personal mixers.

**4. CONTROL SURFACE PORTS:** Each port supplies both power and audio to connected Livemix personal mixers through a standard network cable.

Two indicator lights on each port report device status information.

- The green light will illuminate when a CS-DUO has a valid connection with the MIX-16/32.
- The yellow light is a fault indicator. It may illuminate briefly when each personal mixer is powered on. If it remains lit, this indicates a problem with the port, the network cable or the CS-DUO.

**NOTE:**

If power is interrupted to the MIX-16/32, the CS-DUO will automatically return to the last loaded mix when it powers back on. Additionally, the MIX-16/32 will automatically return to the last loaded Global Template.

**5. OPTION CARD SLOT:** This slot is used to provide access to additional input formats. When using an option card, such as the LM-DANTE-EXP Dante card, the system may need to be configured for digital input. The system will default to the option card slot if one is installed but this can be done manually on the CS-DUO (see CS-DUO guide for more information).

**6. LIVEMIX DATA LIGHT:** This light will change color to indicate the audio and power status of the MIX-16/32. If the light is off, there is no power to the MIX-16/32. Any illuminated light color means that power is on to the MIX-16/32.

*If using the AD-24 with analog inputs:*

- The light will illuminate green when the MIX-16/32 is receiving audio data.
- The light will illuminate red when there is no audio data present.

*If using an option card (digital input):*

- A green light means there is no “problem” with the audio; this could also mean no connections have been made (See LM-DANTE-EXP manual for more information).
- A yellow light means at least one digital channel is not connected properly (See LM-DANTE-EXP manual for more information).
- A red light means that at least one channel is reporting an error (See LM-DANTE-EXP manual for more information).

**7. USB PORT:** The USB port connects to a Windows PC or Apple computer, and allows the computer to record a 2-channel stereo mix of one of the mixes generated by a CS-DUO. Common uses for this type of recording include:

- Recording a worship service for a later podcast
- Documenting a band performance

**NOTE:**

When using the MIX-16/32 USB port with a computer, please keep in mind that the audio provided has the following characteristics:

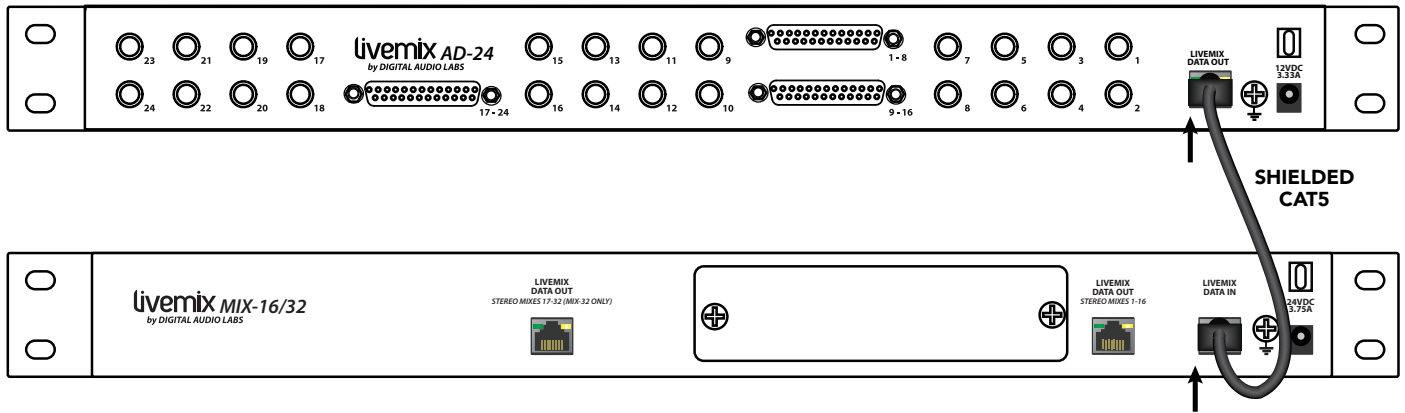
- 48 Khz sample rate
- 16-bit bit rate
- Stereo signal

**8. LIVEMIX DATA OUT 1:** This port is intended to connect to future Livemix products, it is currently inactive.

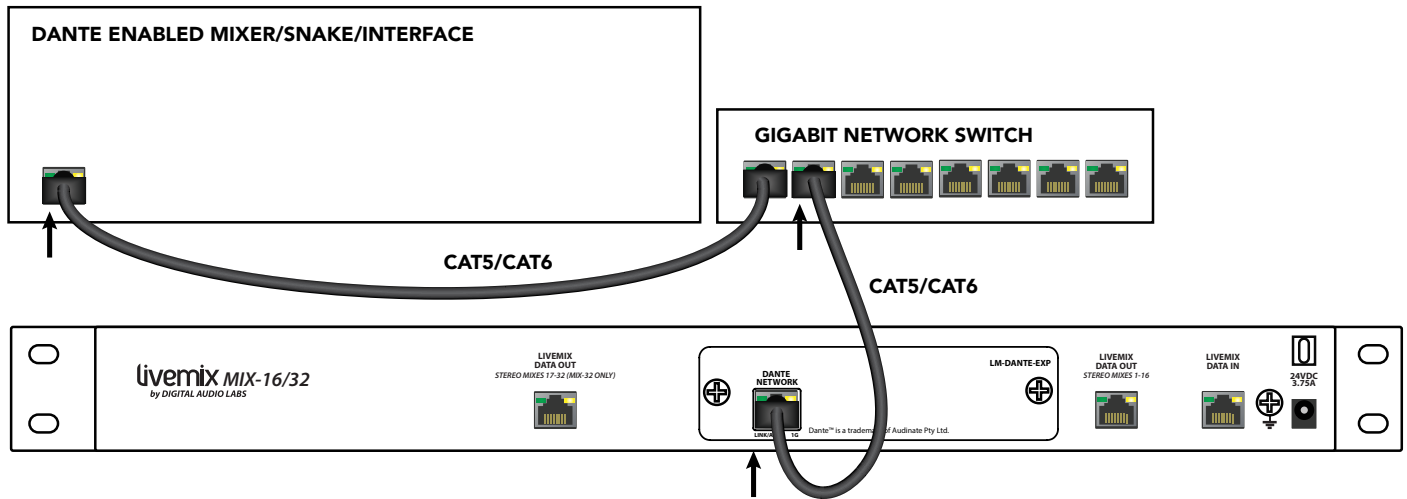
**9. LIVEMIX DATA OUT 2 (MIX-32 ONLY):** This port is intended to connect to future Livemix products, it is currently inactive.

# SETUP DIAGRAMS

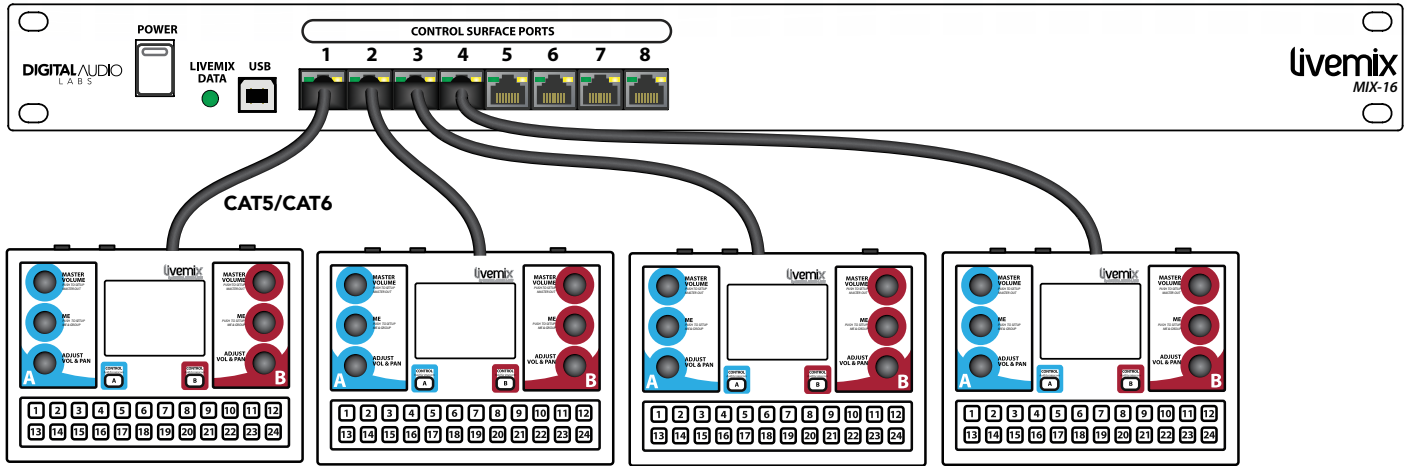
## ANALOG INPUT TO MIX-16/32



## DIGITAL INPUT TO MIX-16/32



# MIX-16/32 TO CS-DUO CONTROL SURFACES\*



\* MIX-16 pictured



## SETUP AND OPERATION

Although the MIX-16/32 is the central mixer of the Livemix system, there are no direct controls. Setting up the MIX-16/32 is simple and all configuration is done through an attached CS-DUO personal mixer (covered in the CS-DUO manual).

1. If using the analog input, connect the Livemix Data Out port on the AD-24 to the Livemix Data In port on the MIX-16/32. Please use shielded CAT5 or CAT6 cable to make this connection. If using an option card, you will not use the Livemix Data In port.
2. Connect each personal mixer to a Control Surface Port on the front of the MIX-16/32. These do not have to be in any particular order or sequential. Planning which CS-DUO goes into which Control Surface Port may help identify each personal mixer when using the MirrorMix® remote mixing feature.
3. Connect the power supply on the back of the MIX-16/32 to an appropriate power source.
4. Turn on the MIX-16/32.

## USING THE USB OUTPUT

The MIX-16/32 is equipped with a USB port for connection to a computer. When connected, the MIX-16/32 will show up on the computer as a USB audio class device. When used with recording software, the stereo output of any single CS-DUO can be recorded.

All configuration for this feature is performed on an attached CS-DUO personal mixer.

- Select a CS-DUO mix to assign to the USB Port and select the *Mix Tools* menu on that mix
- Press *Global Setup*
- Press the *MIX-16/32 USB Mix Assign* button
- You will see a message that says "Send your mix to the MIX-16/32 USB record port?" Press "Yes" to assign or "No" to cancel

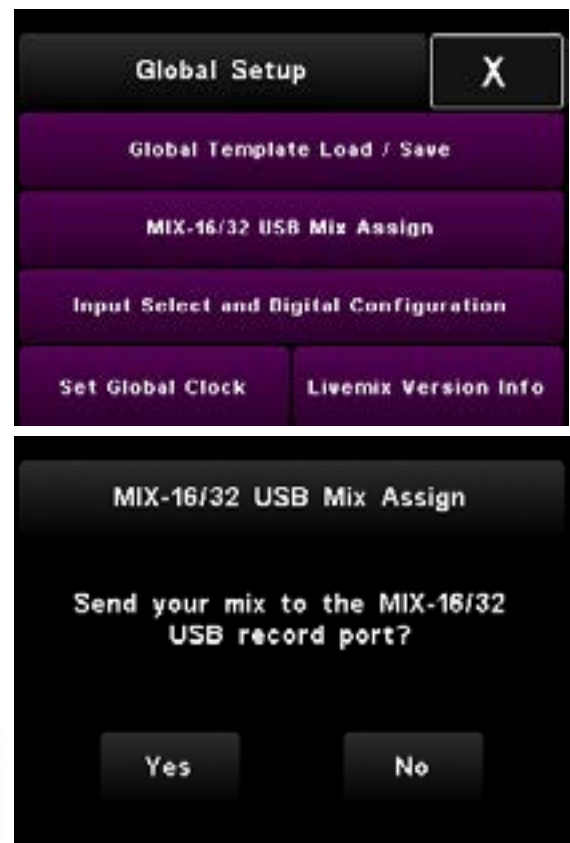
The selected stereo mix will be sent to the USB port of the MIX-16/32. Connect to a Windows PC or Apple computer and record the stereo signal with recording software.

### NOTE:

The audio data sent over the Livemix system is a proprietary data format. It will not work with a switch or a standard Ethernet network. When using an Option Card designed for networked audio use, such as the LM-DANTE-EXP, consult the Option Card manual for information on how to connect to the network.

### NOTE:

There are a variety of options when it comes to network cables. For the purposes of Livemix, either CAT5e or CAT6 cabling is appropriate.



## MIX-16/32 FIRMWARE UPDATE INSTRUCTIONS

The MIX-16/32 can be updated with an application that runs on a Windows PC. Updating from the PC application is the preferred method of updating.

MIX-16's with serial numbers greater than 12-02-01030 can be updated from the CS-DUO if the MIX-16 firmware version is greater than 1.01 and the CS-DUO firmware is 1.31 and above.

TO UPDATE THE FIRMWARE OF THE MIX-16/32 WITH THE PC APPLICATION:

1. Update all CS-DUO's to the latest version per the instructions above.
2. Download the MIX-16/32 Update Application from <http://www.digitalaudio.com/support>.
3. Connect the USB port on the MIX-16/32 to a Windows computer.
4. Wait for the MIX-16/32 drivers to fully install.
5. Run the MIX-16/32 Update Application. A second set of drivers will be installed at the start of this process and may take a few minutes. Once the updater has started, a progress bar will show the progress. Do not turn off the power until the update has finished or you may damage the MIX-16/32.
6. Press the Finish button.
7. Disconnect the MIX-16/32 from the PC and verify that the update was successful by checking the firmware version with the CS-DUO.

TO UPDATE THE FIRMWARE OF A MIX-16/32 WITH A CS-DUO:  
(CS-DUO version 1.31 and MIX-16/32 version 1.01 and above only)

1. Download the latest firmware from <http://www.digitalaudio.com/support>.
2. Unzip the firmware zip file and copy the LMUPDATE folder to the root directory of a USB flash drive. Please make sure the LMUPDATE folder is not in another folder.
3. Go to the Livemix Version Info screen by pressing Mix Tools, then Global Setup, then Livemix Version Info.
4. Press the "Update MIX-16/32 Firmware" button.
5. On the confirmation screen, Press YES to begin the update. If you do not want to update, press NO.
6. Insert the flash drive that contains the update when prompted. Press CONTINUE to start the update or EXIT to cancel. Once the firmware update has started, make sure you do not turn off the power to the MIX-16/32 or you may damage the unit.



### NOTE:

Some updates take a while to complete. If updating the MIX-16/32 from the CS-DUO, it works best to have only the CS-DUO you are using to update connected to the system.

*If updating with the CS-DUO does not work, please use the PC Application.*

## LIVEMIX SYSTEM EXAMPLES

A Livemix system requires either an analog (AD-24) or digital input (option card), the MIX-16/32 central mixer, and at least one CS-DUO 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-EXP 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 is required. CAT6 is not required, CAT5 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-EXP). This is an option card that is installed in the MIX-16/32 and allows the Livemix system to receive audio from a digital device or network.

### CONTROL SURFACE

Livemix needs at least one connected personal mixer to make a mix. Each Livemix CS-DUO personal mixer connects via CAT5/CAT6 cable to one of the ports of the MIX-16/32. Using various controls on the unit, two users can each create their own custom mix, which is then output to headphones, in-ear monitors or stage monitors, right from the CS-DUO unit.

# TROUBLESHOOTING

## **MY MIX-16/32 IS NOT POWERING ON CORRECTLY.**

- Verify that you have connected the external power supply to a working power outlet
- Verify that the front panel power switch is set to ON.

## **I AM NOT SEEING THE “LIVEMIX DATA” LIGHT ILLUMINATE.**

If the Livemix Data light is not illuminating, there is a problem with the power to the MIX-16/32. Check to make sure that the power supply is connected to the MIX-16/32 and that all the cables are secure. Also check to ensure that the power supply is plugged into an appropriate power source and that the power cable from the source to the power supply transformer is securely attached.

## **I HAVE CONNECTED THE USB PORT TO MY COMPUTER BUT AM NOT RECEIVING ANY AUDIO INTO MY RECORDING SOFTWARE.**

- Verify that you have properly assigned a specific CS-DUO monitor mix to the USB port (see CS-DUO user’s manual for more details)
- Verify that you have configured your Windows PC or Apple OS X computer properly to use the MIX-16/32 as the desired audio input to your software

## **I WAS PLANNING ON FEEDING THE MIX-16/32 FROM MY DIGITAL MIXER, BUT DO NOT SEE THE RIGHT CONNECTOR TO USE ON THE MIX-16/32.**

- The MIX-16/32 interfaces with digital consoles through the use of an option card that inserts into a slot and offers the necessary connectors.
- Verify that you have the correct digital option card installed.

## **THERE IS A CLICKING OR POPPING SOUND IN MY MIX.**

Audible clicking and popping is usually an issue with the digital clock. 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 the Dante controller on a Windows PC or Apple computer.

# LIVEMIX SUPPORT

Phone Support: 952-401-7700  
Toll Free: 844-DAL-INFO  
Email Support: [support@digitalaudio.com](mailto:support@digitalaudio.com)  
Website: [www.digitalaudio.com/support](http://www.digitalaudio.com/support)

DIGITAL AUDIO LABS  
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## TECHNICAL SPECIFICATIONS

### MIX-16/32 SPECIFICATIONS

Max Cable Length from CS-DUO	100 ft CAT5 Cable
Max Cable Length from AD-24	300ft Shielded CAT5 Cable
Bit Rate	24-Bit Digital Mixing and Processing
Sample Rate	48 Khz
USB Output	16-bit / 48 Khz Stereo
Digital Format	Proprietary in System
Expansion	Option Card Bay

### LIVEMIX SYSTEM SPECIFICATIONS

	.03% (100mW, 22Ω Load)
	.014% (100mW, into 32Ω Load )
THD+N (18 dBu 1KHz input)	.005% (100mW into 64Ω ohms)
	.003% (100mW into 300Ω)
S/N Ratio	103dB
Frequency Response	20Hz-22KHz ± 3dB
Crosstalk (Left to Right)	-103 dB
Latency	1.5 mS

## OPEN SOURCE STATEMENT

The Livemix MIX-16/32 firmware includes the open source software module FreeRTOS, which is licensed under the terms of the GNU General Public License (version 2) AND MODIFIED BY the FreeRTOS exception, as outlined in the FreeRTOS license. In accordance with those licensing terms, we must provide you the source code for the version of FreeRTOS used in the MIX-16/32. You may download the FreeRTOS source code at <http://www.digitalaudio.com/open-source-center>.



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