

LD systems LD DIO 22 4×4 Input Output Dante Interface User Manual

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YOU MADE THE RIGHT CHOICE

This device was developed and manufactured under high quality requirements to ensure many years of trouble-free operation. This is what LD Systems stands for with its name and many years of experience as a manufacturer of high-quality audio products. Please read these operating instructions carefully so that you can quickly and optimally use your new LD Systems product. You can find more information about LD Systems on our website www.ld-systems.com

INFORMATION ON THIS SHORT MANUAL

These instructions do not replace the detailed operating instructions (www.ld-systems.com/LDDIO22downloads or www.ld-systems.com/LDDIO44-downloads). Please always read the detailed operating instructions first before operating the unit and observe the additional safety instructions contained therein!

INTENDED USE

The product is a device for professional audio installations! The product has been developed for professional use in the field of audio installation and is not suitable for use in households! Furthermore, this product is only intended for qualified users with expertise in handling audio installations! Use of the product outside the specified technical data and operating conditions is considered improper use! Liability for damage and third-party damage to persons and property due to inappropriate use is excluded! The product is not suitable for:

- People (including children) with reduced physical, sensory or mental abilities or lack of experience and knowledge.
- Children (Children must be instructed not to play with the device).

EXPLANATIONS OF TERMS AND SYMBOLS

- 1. **DANGER**: The word DANGER, possibly in combination with a symbol, indicates immediately dangerous situations or conditions for life and limb.
- 2. **WARNING**: The word WARNING, possibly in combination with a symbol, indicates potentially dangerous situations or conditions for life and limb
- 3. **CAUTION:** The word CAUTION, possibly in combination with a symbol, is used to indicate situations or conditions that may lead to injury.
- 4. **ATTENTION:** The word ATTENTION, possibly in combination with a symbol, refers to situations or states that can lead to damage to property and/or the environment.



This symbol indicates hazards that can cause an electric shock.



This symbol indicates danger spots or dangerous situations



This symbol indicates danger from hot surfaces.



This symbol indicates danger from high volumes



This symbol indicates supplementary information on the operation of the product



This symbol denotes a device that does not contain any user-serviceable parts



This symbol indicates a device that may only be used in dry rooms.

SAFETY INSTRUCTIONS



DANGER

- 1. Do not open or modify the device.
- 2. If your device is no longer working properly, liquids or objects have gotten inside the device, or the device has been damaged in any other way, switch it off immediately and disconnect it from the power supply. This device may only be repaired by authorized specialist personnel.
- 3. For devices of protection class 1, the protective conductor must be connected correctly. Never interrupt the protective conductor. Protection class 2 devices do not have a protective conductor.
- 4. Ensure that live cables are not kinked or otherwise mechanically damaged.
- 5. Never bypass the device fuse.



- 1. The device must not be put into operation if it shows obvious signs of damage.
- 2. The device may only be installed in a voltage-free state.
- 3. If the power cord of the device is damaged, the device must not be put into operation.
- 4. Permanently connected power cords may only be replaced by a qualified person.



DANGER

- Do not operate the device if it has been exposed to severe temperature fluctuations (e.g. after transport).
 Humidity and condensation could damage the device. Do not switch on the device until it has reached the ambient temperature.
- 2. Make sure that the voltage and frequency of the mains supply correspond to the values indicated on the device. If the device has a voltage selector switch, do not connect the device until this is set correctly. Only use suitable power cords.
- 3. To disconnect the device from the mains at all poles, it is not enough to press the on/off switch on the device.
- 4. Ensure that the fuse used corresponds to the type printed on the device.
- 5. Make sure that appropriate measures against overvoltage (e.g. lightning) have been taken.
- 6. Note the specified maximum output current on devices with a power out connection. Make sure that the total power consumption of all connected devices does not exceed the specified value.
- 7. Only replace pluggable power cords with original cables.



DANGER

- 1. Danger of suffocation! Plastic bags and small parts must be kept out of the reach of people (including children) with reduced physical, sensory or mental abilities.
- Danger from falling! Make sure the device is installed securely and cannot fall. Only use suitable tripods or attachments (especially for fixed installations). Make sure accessories are properly installed and secured.
 Make sure that the applicable safety regulations are observed.



WARNING

- 1. Only use the device in the manner intended.
- 2. Only operate the device with the accessories recommended and intended by the manufacturer.
- 3. During installation, observe the safety regulations applicable in your country.
- 4. After connecting the unit, check all cable routes to avoid damage or accidents, e.g. due to tripping hazards.
- 5. Be sure to observe the specified minimum distance to normally flammable materials! Unless this is explicitly stated, the minimum distance is 0.3 m.



- 1. In the case of moving components such as mounting brackets or other moving components, there is a possibility of jamming.
- 2. In the case of units with motor-driven components, there is a risk of injury from the movement of the unit. Sudden movements of the equipment can lead to startle reactions.



DANGER

- 1. Do not install or operate the device near radiators, heat registers, stoves or other heat sources. Make sure that the device is always installed in such a way that it is sufficiently cooled and cannot overheat.
- 2. Do not place any sources of ignition such as burning candles near the device.
- 3. Ventilation openings must not be covered and fans must not be blocked.
- 4. Use the original packaging or packaging provided by the manufacturer for transport.
- 5. Avoid shock or shock to the device.
- 6. Observe the IP protection class and the environmental conditions such as temperature and humidity according to the specification.
- 7. Devices can be continuously developed. In the event of deviating information on operating conditions, performance or other device properties between the operating instructions and the device labeling, the information on the device always has priority.
- 8. The device is not suitable for tropical climate zones and for operation above 2000 m above sea level.



ATTENTION

Connecting signal cables can result in significant noise interference. Make sure that devices connected to the output are muted during plugging. Otherwise, noise levels can cause damage.



ATTENTION HIGH VOLUMES WITH AUDIO PRODUCTS!

This device is intended for professional use. The commercial operation of this device is subject to the applicable national regulations and guidelines for accident prevention. Hearing damage due to high volumes and continuous exposure: The use of this product can generate high sound pressure levels (SPL) which can cause hearing damage. Avoid exposure to high volumes.



NOTES FOR INDOOR INSTALLATION UNITS

- 1. Units for installation applications are designed for continuous operation.
- 2. Equipment for indoor installation is not weather-resistant.
- 3. Surfaces and plastic parts of installation equipment can also age, e.g. due to UV radiation and temperature fluctuations. As a rule, this does not lead to functional restrictions.

- 4. With permanently installed devices, the accumulation of impurities, e.g. dust, is to be expected. Always observe the care instructions.
- 5. Unless expressly stated on the unit, the units are intended for installation heights of less than 5 m.

PACKAGING CONTENT

Remove the product from the packaging and remove all packaging material. Please check the completeness and integrity of the delivery and notify your distribution partner immediately after purchase if the delivery is not complete or if it is damaged.

The package of LDDIO22 includes:

- 1 x DIO 22 Dante Break Out Box
- 1 set of terminal blocks
- 1 x mounting set for on-table or under-table installation
- 1 set of rubber feet (pre-assembled)
- User manual

The package of LDDIO44 includes:

- 1 x DIO 44 Dante Break Out Box
- 1 set of terminal blocks
- 1 x mounting set for on-table or under-table installation
- 1 set of rubber feet (pre-assembled)
- User manual

INTRODUCTION

DIO22

Part of the TICA ®series, the DIO 22 is a two input and output Dante interface that delivers the capabilities that audio and AV professionals really need. Equipped with two balanced mic/line inputs and line outputs with four-step gain settings and 24V phantom power on each input. Signal presence lights on each channel speed installation and fault-finding.

The DIO 22 is easy to configure from the front panel and can then be locked to prevent tampering.

Power from any PoE+ network switch or use the optional, external power supply. Since it comes with two Dante networked ports, you can daisy chain devices together. It also works as a PoE+ injector: if you use the external power supply, you can power one further networked device in the chain.

Its tiny form factor ($106 \times 44 \times 222 \text{ mm}$) and included mounting plates allow it to be installed discreetly behind screens or under tables. Alternatively, it fits into 1/3 19 inch rack. Use the optional rack tray to slot up to three TICA® Series products alongside each other and build a system to your exact requirements, using minimal rack space.

Terminal block connections on the analogue inputs and outputs make wiring easy.

The perfect solution for professional installers wanting to interface into Dante equipment.

Dante Domain Manager and AES 67 compliant.

DIO44

Part of the TICA®series, the DIO 44 is a four input and output Dante interface that delivers the capabilities that audio and AV professionals really need. Equipped with four balanced mic/line inputs and line outputs with four-step gain settings and 24V phantom power on each input. Signal presence lights on each channel speed installation and fault-finding

The DIO 44 is easy to configure from the front panel and can then be locked to prevent tampering.

Power from any PoE+ network switch or use the optional, external power supply. Since it comes with two Dante networked ports, you can daisy chain devices together. It also works as a PoE+ injector: if you use the external power supply, you can power one further networked device in the chain.

ts tiny form factor (106 x 44 x 222,mm) and included mounting plates allow it to be installed discreetly behind screens or under tables. Alternatively, it fits into 1/3 19 inch rack. Use the optional rack tray to slot up to three TICA® DIO series products alongside each other and build a system to your exact requirements, using minimal rack space.

Terminal block connections on the analogue inputs and outputs make wiring easy.

The perfect solution for professional installers wanting to interface into Dante equipment.

Dante Domain Manager and AES 67 compliant.

FEATURES

DIO22

Two input and output Dante interface

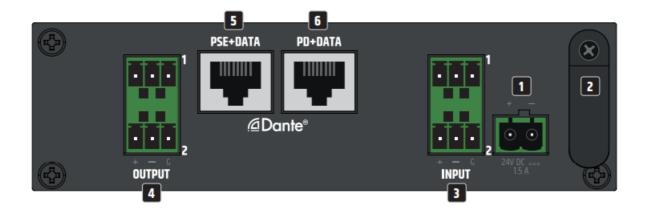
- · Connect microphones or line level inputs
- Four-step gain control and 24V phantom power per channel
- Terminal blocks for all analogue connections
- · Signal indicators on each channel
- Use PoE or an external power supply
- Use as a PoE injector to power another networked device
- · Daisy-chain Dante devices together
- Easy front panel configuration and user lock

- · Four input and output Dante interface
- Connect microphones or line level inputs
- Four-step gain control and 24V phantom power per channel

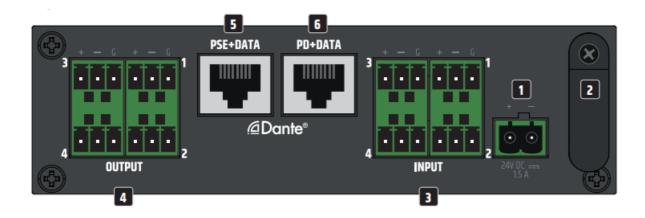
- Terminal blocks for all analogue connections
- · Signal indicators on each channel
- Use PoE or an external power supply
- Use as a PoE injector to power another networked device
- · Daisy-chain Dante devices together
- · Easy front panel configuration and user lock

CONNECTIONS, OPERATING AND DISPLAY ELEMENTS

DIO 22



DIO 44



TERMINAL BLOCK CONNECTION FOR POWER SUPPLY

Terminal block connection for the device's power supply. To avoid damage to the unit, please use only the original mains adapter (mains adapter optionally available).

Alternative power supply:

Ethernet switch or PoE injector with PoE+ (Power over Ethernet plus) or better.

STRAIN RELIEF

Use the strain relief for the flexible cable of the power supply unit to protect the device's power terminal block connector and the power supply terminal block from damage and to prevent the terminal block from being pulled out unintentionally.

INPUT

Analogue audio inputs with balanced terminal block connectors suitable for both line and microphone levels. A 24 volt phantom power supply can be switched on. The poles +, – and G are intended for the balanced input signal (suitable for unbalanced cabling). Terminal blocks are included in the packaging content.

OUTPUT

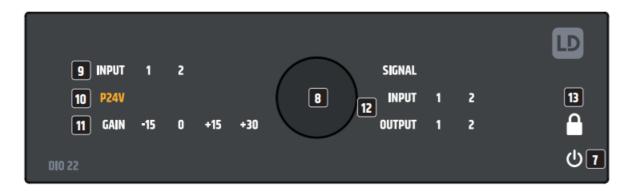
Analogue audio outputs with balanced terminal block connections. The poles +, – and G are intended for the balanced output signal (suitable for unbalanced cabling). Terminal blocks are included in the packaging content. If there is no audio signal at the line outputs OUTPUT, they are automatically muted after some time. If an audio signal is detected, the mute function is automatically deactivated.

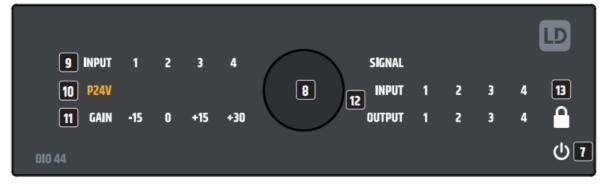
PSE+DATA (Power Sourcing Equipment)

Dante® interface with RJ45 socket for connecting further Dante® devices to the Dante® network. If the DIO 22 or DIO 44 is supplied with power via an external power supply unit, another DIO 22 or DIO 44 can be supplied with power via PoE (see connection example 2).

PD+DATA (Powered Device)

Dante® interface with RJ45 socket for connecting the DIO 22 or DIO 44 to a Dante® network. The DIO 22 or DIO 44 can be supplied with voltage via PoE+ (Power over Ethernet plus) or better.





POWER SYMBOL

As soon as the DIO 22 or DIO 44 is supplied with voltage, the starting process begins. During the start-up process, the white power symbol flashes and the line outputs OUTPUT are muted. When the start-up process is completed after a few seconds, the symbol lights up permanently and the unit is ready for operation.

ROTARY-PUSH ENCODER

The status query and editing of the settings of the input channels is done with the help of the rotary-push encoder.

Status request: Press the encoder briefly and then rotate it to sequentially retrieve the status information of each input channel. The number of the selected channel lights up. The status of the phantom power (symbol lights up orange = on / symbol does not light up = off) and the value of the input gain (-15, 0, +15, +30, selected value lights up white) are displayed.

EXAMPLE DIO





The illumination of the characters is automatically deactivated if no input is made within approximately 40 seconds

EXAMPLE DIO

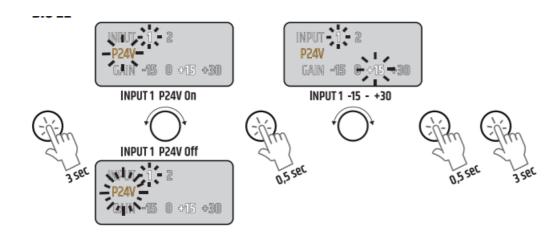




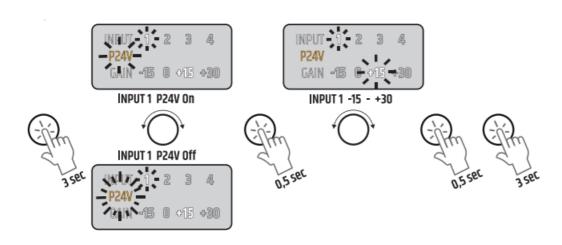


The illumination of the characters is automatically deactivated if no input is made within approximately 40 seconds

Edit mode: Press the encoder briefly and then select the desired channel by turning the encoder. Now press the encoder for about 3 seconds to switch to editing mode. The channel number and the abbreviation for phantom power P24V start flashing. Now switch the phantom power of this channel on or off by turning the encoder (P24V flashes in sync with the channel number = phantom power on, P24V flashes quickly = phantom power off). Confirm the selection by briefly pressing the encoder. At the same time, the currently set value for GAIN now starts flashing and you can change the value as desired by turning the encoder. Confirm the selection by briefly pressing the encoder. The digit of the next channel then flashes and you can set the status and value as desired or exit the editing mode by pressing the encoder again for about 3 seconds.



DIO



INPUT

Illuminated digits for the input channels. In each case, one of the digits lights up when the corresponding channel is selected during the status query and flashes in editing mode.

P24V

The orange abbreviation for the 24 V phantom power P24V lights up during the status query when phantom power is switched on and flashes in editing mode (P24V flashes in sync with the channel digit = phantom power on, P24V flashes quickly = phantom power off).

GAIN -15 / 0 / +15 / +30

White illuminated digits for status enquiry and for editing the channel preamplification. One of the values -15 to +30 lights up during the status query and flashes in editing mode. The values -15 and 0 are intended for line level and signals are passed on unprocessed. The values +15 and +30 are for microphone levels and signals are processed with a high-pass filter at 100 Hz.

SIGNAL INPUT / OUTPUT

Two-colour illuminated digits for signal detection and clip display.

INPUT: As soon as an audio signal with sufficient level is present at an input channel, the corresponding digit lights up white. As soon as one of the digits lights up red, the corresponding input stage is operated at the distortion limit. In this case, reduce the channel pre-amplification

GAIN or reduce the level on the playback device so that the digit no longer lights up red.

OUTPUT: As soon as an audio signal with sufficient level is present at an output channel, the corresponding digit

lights up white. As soon as one of the digits lights up red, the corresponding output stage is operated at the distortion limit. In this case, reduce the level on the source player so that the digit no longer lights up red.

LOCK SYMBOL

The editing mode can be locked against unauthorised editing. Press the encoder for about 10 seconds to activate the lock. Ignore the fact that the editing mode is activated after about 3 seconds. Now the lock symbol flashes for a few seconds and then lights up permanently and only the status query of the input channels can be carried out. To deactivate the lock, press the encoder again for about 10 seconds.

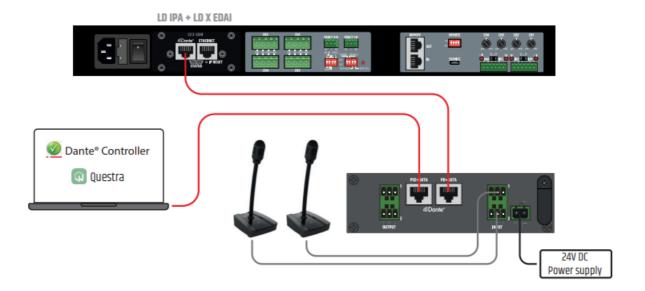
AIR VENTS

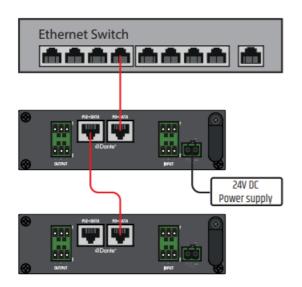
To prevent damage to the device, do not cover the ventilation openings on the left and right sides and on the top and bottom of the device and ensure that air can circulate freely. Covering the ventilation openings on the top or bottom of the enclosure when mounting it underneath or on top of a table is not critical, as the cooling provided by the ventilation openings on the remaining sides is sufficient.

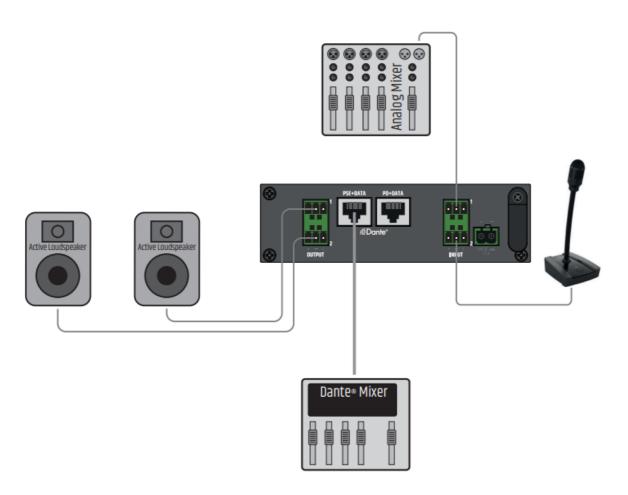


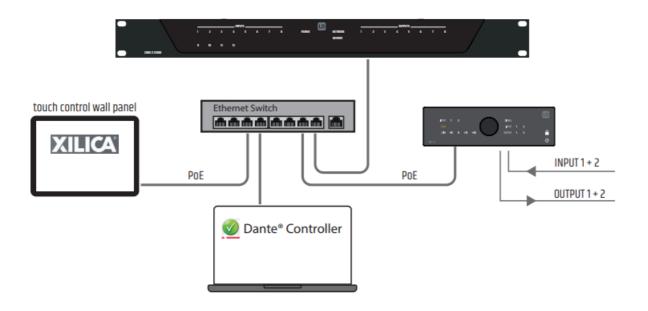
Tip: Preferably use balanced audio cables for wiring analogue line inputs and outputs.

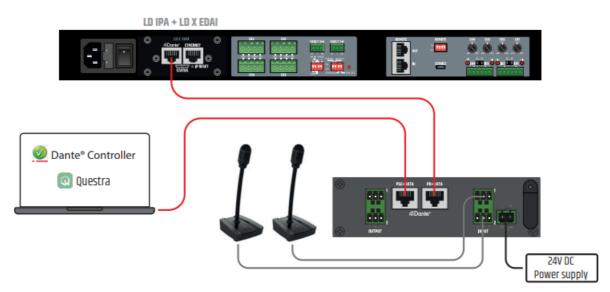
CONNECTION EXAMPLES

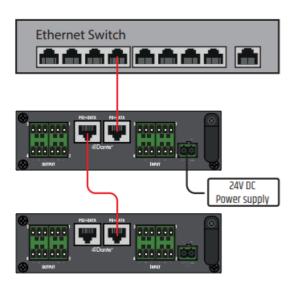


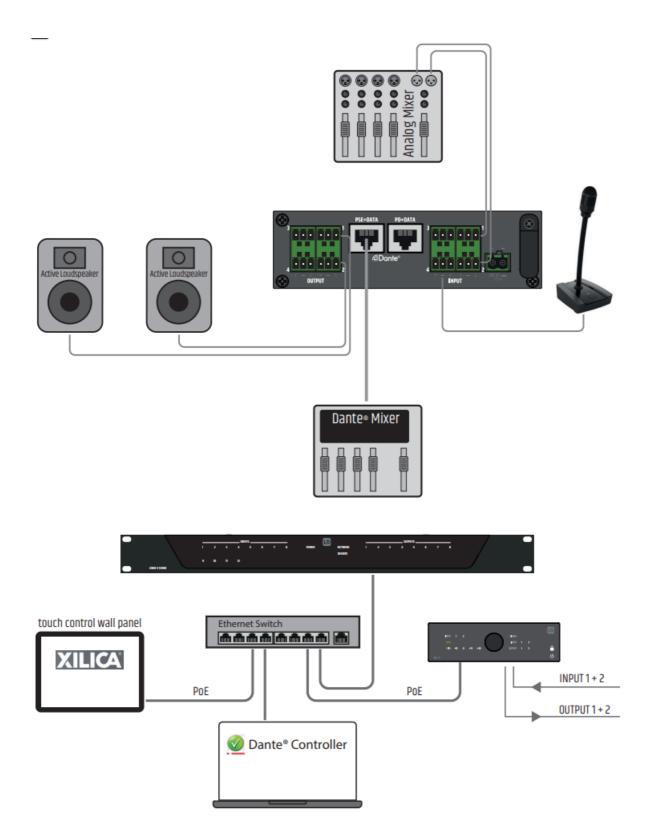




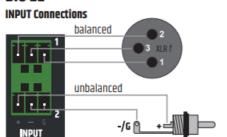


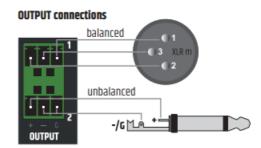




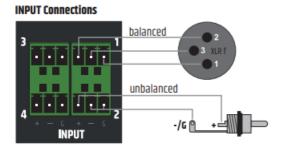


TERMINAL BLOCK CONNECTIONS

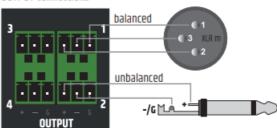




DIO 44



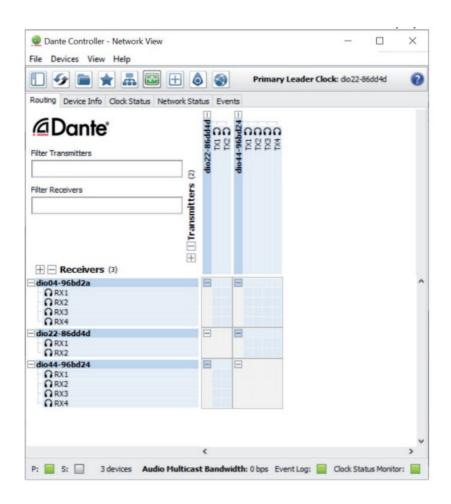




When wiring terminal blocks, please observe the correct assignment of the poles/ terminals. The manufacturer accepts no liability for damage caused by faulty wiring!

DANTE® CONTROLLER

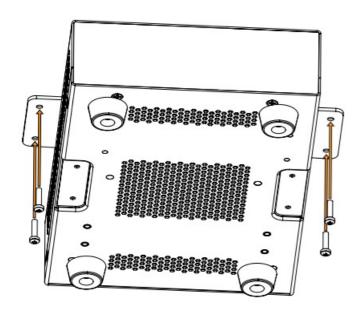
A Dante® network is set up using the freely available DANTE® CONTROLLER software. Download the software from the manufacturer's website www.audinate.com and install it on a computer. Connect the Ethernet interface of the computer to a network interface of the DIO 22 or DIO 44 using a network cable (Cat. 5e or better) and run the Dante® Controller software. The software has an automatic device detection function. Signal routing is done by mouse click and the unit and channel designations can be individually edited by the user. IP address, MAC address and other information about the devices in the Dante® network can be displayed in the software.



Once the configuration of the devices on the Dante® network is complete, the Dante® Controller software can be closed and the computer disconnected from the network. The settings in the units in the network are retained. When the DIO 22 or DIO 44 is disconnected from the Dante® network, the unit's audio outputs are muted and the power icon on the front panel starts flashing

UNDER / ON-TABLE MOUNTING

There are two recesses on the top and bottom of the enclosure, each with two M3 threaded holes, for mounting underneath or on top of the table. Screw the two enclosed mounting plates to the top or bottom using the enclosed M3 countersunk screws. Now the amplifier can be fixed in the desired position (see illustration, fixing screws not included). For tabletop mounting, the four rubber feet must be removed beforehand.



CARE, MAINTENANCE AND REPAIR

To ensure the proper functioning of the unit in the long term, it must be cared for regularly and serviced as required. The need for care and maintenance depends on the intensity of use and the environment. We generally recommend a visual inspection before each start-up. Furthermore, we recommend that you carry out all the maintenance measures listed below every 500 operating hours or, in the case of low intensity of use, after one year at the latest. Defects caused by inadequate care may result in limitations of the warranty claims.

CARE (CAN BE CARRIED OUT BY THE USER)

WARNING! Before carrying out any maintenance work, disconnect the power supply and, if possible, all appliance connections.



NOTE! Improper care can lead to impairment or even destruction of the unit.

- 1. Housing surfaces must be cleaned with a clean, damp cloth. Make sure that no moisture can penetrate the unit.
- 2. Air inlets and outlets must be regularly cleaned of dust and dirt. If compressed air is used, make sure that damage to the unit is prevented (e.g. fans must be blocked in this case).
- 3. Cables and plug contacts must be cleaned regularly and freed from dust and dirt.
- 4. In general, no cleaning agents, disinfectants or agents with an abrasive effect may be used for maintenance, otherwise the surface finish may be impaired. Especially solvents, such as alcohol, can impair the function of the housing seals.
- 5. Units should generally be stored in a dry place and protected from dust and dirt.

MAINTENANCE AND REPAIR (BY QUALIFIED PERSONNEL ONLY)

ANGER! There are live components in the unit. Even after disconnecting from the mains, residual voltage may still be present in the unit, e.g. due to charged capacitors



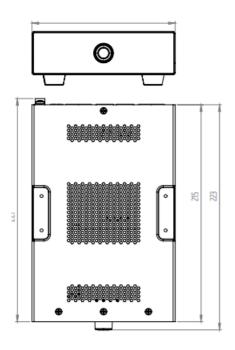
NOTE! There are no assemblies in the unit that require maintenance by the user

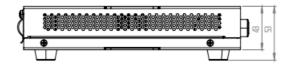
NOTE! Maintenance and repair work may only be carried out by specialist personnel authorised by the manufacturer. In case of doubt, contact the manufacturer.



NOTE! Improperly performed maintenance work can affect the warranty claim.

DIMENSIONS (mm)





TECHNICAL DATA

Item number	LDDIO22	LDDIO44
Product type	2×2 I/O Dante Interface	4×4 I/O Dante Interface
Inputs	2	4
Input type	Switchable balanced mi c or line level	

Line outputs	2	4		
Output type	Balanced line level with auto mute relay on loss of Dante/AES67 signal			
Cooling	Convection			
Analogue Input Section				
Number of input connectors	2	4		
Connection type	3-pin terminal block, Pit ch 3.81 mm			
Mic input sensitivity	55 mV (Gain +30 dB swi tch)			
Nominal input clipping	20 dBu (Sine 1 kHz, Gain 0 dB switch)			
Frequency response	10 Hz – 20 kHz (-0.5 dB)			
THD + Noise	< 0.003% (0 dB switch, 4 dBu, 20 kHz BW)			
DIM	< -90 dB (+ 4 dBu)			
Input Impedance	10 kohms (balanced)			
Crosstalk	< 105 dB (20 kHz BW)			
SNR	> 112 dB (0 dB switch, 20 dBu, 20 kHz BW, A-weighted)			
CMRR	> 50 dB			
High Pass Filter	100 Hz (-3 dB, when +15 or +30 dB is selected)			
Phantom power (per input)	+ 24 VDC @ 10 mA ma x			
Gain	-15 dB, 0 dB, +15 dB, + 30 dB			
Analogue Line Output				
Number of output connectors	2	4		

Connection type	3-pin terminal block, Pit ch 3.81 mm	
Max. Output Leve	18 dBu	
Interm. Distortion SMPTE	< 0.005% (-20 dBFS to 0 dBFS)	
THD + Noise	< 0.002% (10 dBu, 20 kHz BW)	
Idle Noise	> -92 dBu	
Dynamic Range	> 107 dB (0 dBFS, AES 17, CCIR-2k Weighting)	
Frequency response	15 Hz – 20 kHz (-0.5 dB)	

Item number	LDDIO22		LDDIO44	
Dante® Specifications				
Audio Channels	2 Inputs / 2 Outputs		4 Inputs / 4 Outputs	
Bit depth	24 bit			
Sample Rate		48 kHz		
Latency		Minimum 1 ms		
Dante Connector		100 BASE-T RJ45		
Power over Ethernet (PoE) Specifications				
Minimum PoE Requirements		PoE+ IEEE 802.3at		
PSE +Data		Capable of powering 1 extra PD unit		
Power Input Requirements				
Input Voltage		24 VDC		
Minimum Current		1.5 A		

Power Input Connector	Pitch 5.08 mm terminal block (2-pin)	
Max power consumption	10 W	
Idle power consumption	7.5 W (no signal input)	
Power Consumption with Secondary Port use	22 W	
Mains Inrush Current	1.7 A @ 230 VAC	
Operating Temperature	0°C – 40°C; < 85% humidity, non condensing	
General		
Material	Steel chassis, Plastic front panel	
Dimensions (W x H x D)	142 x 53 x 229 mm (height with rubber feet)	
Weight	1.050 kg	
Included Accessories	Mounting plates for surface mount applications, Termi nal blocks for Electrical Connections, rubber feet.	

DISPOSAL



- 1. Packaging can be fed into the recycling system via the usual disposal channels.
- 2. Please separate the packaging according to the disposal laws and recycling regulations in your country.



- 1. This appliance is subject to the European Directive on Waste Electrical and Electronic Equipment as amended. WEEE Directive Waste Electrical and Electronical Equipment. Old appliances and batteries do not belong in household waste. The old appliance or batteries must be disposed of via an approved waste disposal company or a municipal waste disposal facility. Please observe applicable regulations in your country!
- 2. Observe all disposal laws applicable in your country.
- 3. As a private customer, you can obtain information on environmentally friendly disposal options from the dealer from whom the product was purchased or from the relevant regional authorities.

DIO 22 / 44 USER MANUAL ONLINE

Scan this QR Code to get to the download section of DIO 22 / 44. Here you can get the complete User manual in the following languages:

EN, DE, FR, ES, PL, IT www.ld-systems.com/LDDIO22-downloads

www.ld-systems.com/LDDIO44-downloads





Documents / Resources



<u>LD systems LD DIO 22 4x4 Input Output Dante Interface</u> [pdf] User Manual LDDIO22, LDDIO44, DIO 22 4x4 Input Output Dante Interface, 4x4 Input Output Dante Interface, Input Output Dante Interface

References

- @ Eventtechnik Lösungen | Adam Hall Group
- D LD Systems® | Your Sound. Our Mission.
- @ Eventtechnik Lösungen | Adam Hall Group
- Audinate Maker of Dante, Pro AV's Leading Networking Technology
- D LD Systems® | Your Sound. Our Mission.
- D LD Systems DIO 22 | Dante Interfaces | LD Systems
- D LD Systems DIO 44 | Dante Interfaces | LD Systems

Manuals+,