

nEXO

AES67

User Manual



IP AUDIO INTERFACE AES67

SAFETY INSTRUCTIONS

Please read these safety instructions carefully.

- 1 Save this user manual for future reference.
- 2 Power connectors must be accessible for disconnection and where people cannot step on or trip. Disconnect the equipment from the AC/DC (AC) outlet before cleaning it.
- 3 The appliance must not be exposed to falling water or splashes and no liquid-filled objects should be placed on the appliance. Do not use liquid or spray detergent for cleaning. Do not expose this equipment to wet areas.
- 4 Bare flame sources, such as burning candles, should not be placed on the appliance.
- 5 Install this equipment on a secure surface. If you do not place the equipment on a safe surface, it may fall and be damaged.
- 6 The roof grilles are used for convection of air. DO NOT COVER THE GRIDS. Leave 5 cm of gap in front and on the sides for proper ventilation.
- 7 Never open the device. For safety reasons, the team should only open it with qualified personnel.
- 8 The equipment must be connected to a protective ground outlet.
- 9 Pay attention to the connection polarity when operating the equipment with a DC (DC) power supply. The reverse polarity connection may cause damage to the equipment, or to the power supply.
- 10 If any of these situations arise, let the technical staff check the equipment:
 - a) The power cord or plug is damaged.
 - b) Liquid has infiltrated the inside of the team.
 - c) The equipment has been exposed to moisture.
 - d) The equipment has not worked well or does not work properly following the instruction manual.
 - e) Equipment has fallen off and is damaged.
 - f) If the equipment has obvious signs of damage.
- 11 Wiring should be done only by trained personnel. Disconnect the audio inputs and outputs while making connections or disconnect the equipment from power. Make sure you use the right cables to make connections.

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1 INTRODUCTION

The NEXO device is a network audio converter designed for integration into voice communication and evacuation systems, compliant with EN54 standard. This equipment is optimized for integration into advanced IP networks and public address systems, providing high-quality audio transmission and reception.

NEXO is a versatile solution that allows you to extend and manage complex communication systems using advanced protocols such as AES67 and ACSINet, designed to transmit and receive 2x2 channels of high-quality audio (48kHz, 1ms) over IP networks. Its compact design makes it easy to install in both racks and desktops, adapting to the specific needs of each environment.

1.1 System Features

- **High-quality IP audio:** Compatible with the AES67 standard, it allows you to transmit and receive audio with a minimum latency of 1 ms and quality of 48 kHz.
- **EN54 certification:** Fully integrated with LDA PA/VA systems, such as NEO+, ensuring compatibility with the EN54-16 standard.
- **Advanced connectivity:** Two PoE-capable RJ-45 Ethernet ports, VLAN support, and Flexnet functionality for efficient networking.
- **Device expansion:**
 - Connect up to 32 additional devices per unit using the ACSI v2 protocol.
 - Ability to integrate up to 4096 devices into a NEO+ system, including microphones and emergency panels, via the ACSINet protocol.
- **Integrated DSP:** Digital signal processing with a 2x2 audio matrix and encryption for added security.
- **Control and monitoring:** 8 GPIOs (programmable input and output ports for system events), RS-232 serial connection port for external system integration, and microSD reader for future expansion.
- **Compact and versatile design:** Ideal for rack, wall or desktop installations, adapting to different environments and requirements.

Future applications:

- **NEXO Hub:** Designed to centralize the management of PA/VA systems, facilitating communication and monitoring in multi-site systems and emergency scenarios.

2 DESCRIPTION

2.1 User interface. Frontal



Illustration 1:Indicators

	RESET		FAULT
	SAFE MODE		EMERGENCY
	POWER		USB
	SYSTEM		

Board 1:Indicators

2.1.1 Buttons

The unit has physical controls that allow the device to be operated manually, being especially useful in maintenance tasks or in specific situations that require direct intervention.

(a) "RESET"

It allows you to perform two different functions depending on the duration of the press:

- **Short press:** Restarts the device, resetting it to operation without modifying the configured settings.
- **Long Press (5 seconds):** Restores the device to factory defaults. This removes any custom settings and returns the device to its original state.

(b) "SAFE MODE"

Safe Mode disables the VLANs configured on the device, allowing direct connectivity between the device and a computer over the local network. This mode is useful for adjusting or troubleshooting connectivity issues.


The device will automatically exit Safe Mode after a predefined period, or when you press the button again to deactivate it.

2.1.2 Status indicators

Status indicators allow you to monitor the operating condition of the equipment or system.

- (c)  "POWER". Green

Power on: The device is properly powered from a valid power source.

- (d)  "SYSTEM". Amber

Power on: Indicates a critical system failure, such as an unexpected device reboot or critical hardware failure that should be considered system issues according to EN54.

- (e)  "FAULT". Amber

Power on: Indicates that the device or any other member of the system is in a fault state.

- (f)  "EMERGENCY". Red

Available when NEXO is linked to a remote PA/VA system via the ACSINet interface.

Power on: Indicates that the system is in a state of emergency VA

2.1.3 Input

- (g)  "USB"

The available USB port is reserved for future applications.

2.2 Back. Inputs and outputs

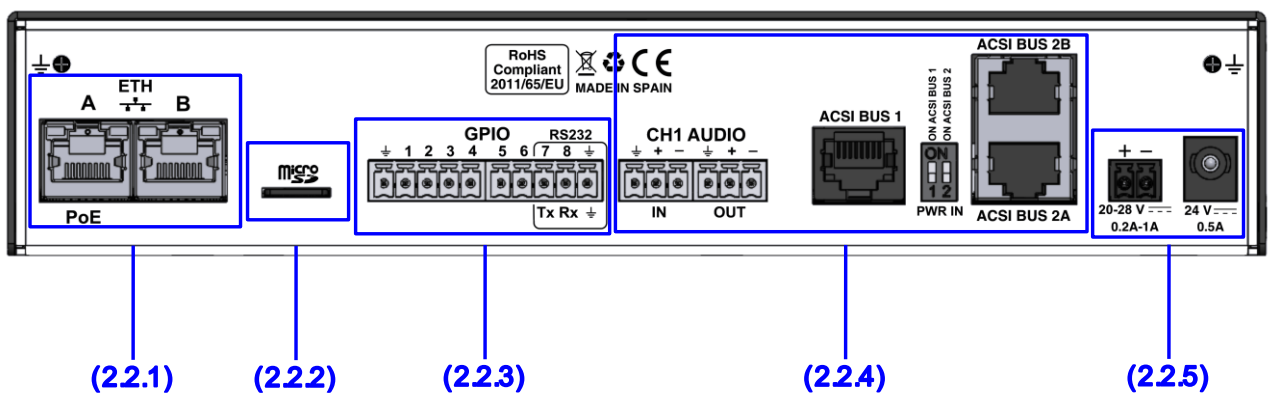


Illustration 2: Inputs and outputs

2.2.1 Ethernet Ports

NEXO has two RJ-45 Ethernet ports, designed for connection to advanced networks and allowing AES67 data and audio transmission, using Flexnet technology. In this way, the flow of information in complex communication systems is optimized.

The separation of audio and data traffic through VLANs configured in the network is a highly recommended practice to ensure that possible interference in configurations with a high volume of traffic is avoided.

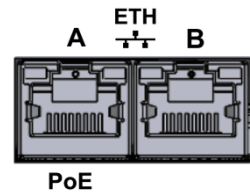


Illustration 3: Ethernet Ports

NOTE: Flexnet mode will have Control Data on VLAN 1 + Audio Data on VLAN 2 by default. For more information see configuration chapter 4.2.2 Network

NEXO's Ethernet A port supports Power over Ethernet (PoE), which supports the IEEE 802.3af Class 0 standard. The maximum power supported is 12W.

The distance between the device and the PoE switch, or injector should not exceed 100 meters.

The connection is made via CAT5 or higher Ethernet network cable, RJ-45 T568B standard (a connection cable is supplied with the equipment).

Brand	Description	Type	Signals	Activation
A/B	System Connection Ports	Port	Ethernet CAT 5	Proprietary /AES67 command protocol

Board 2: Ethernet Ports

2.2.2 microSD socket



Illustration 4: microSD socket

Future applications: Although the microSD socket is physically present, its functionality is not yet implemented in this version of the device. Once enabled, it will allow you to install a license to use NEXO Hub.

2.2.3 System Integration Ports

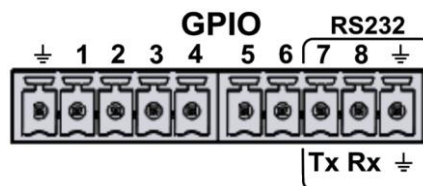


Illustration 5: Integration Ports

The connection is made through 2 Euroblock female type connectors with 5 contacts and 3.81 mm pitch (supplied with the equipment). The cable cross-section range for each pole of this connector is: 0.14 → 1.5 mm² (30 → 14 AWG).

(a) GENERAL PURPOSE INPUT OUTPUT (GPIO) PORTS

The device has 8 programmable input and output ports, configurable via the configuration application, for system events (see 4.5.1 GPIO Port). GPIO ports work with TTL level logic signals (0 – 5 VDC).



Illustration 6: GPIO

Brand	Description	Type	Signals	Activation
GPIO X	Configurable general purpose I/O port	Input Output	\perp x	0-5V DC Input Output 0-5V DC

Board 3: GPIO

(b) INTEGRATION PORT

The device has a two-wire RS232 serial port for the integration of third-party systems.

Default settings for events: 9600 bps, 8 data bits, no parity, 1 stop bit. These values can be changed via the Settings application (see 4.5.2 RS232 Serial Port).

Enabling the RS232 port involves the use of GPIOs 7 and 8.

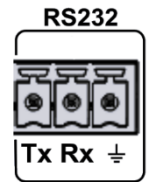


Illustration 7: RS232

Brand	Description	Type	Signals	Activation
RS232 Tx/Rx	Serial connection port for RS232 integration Tx and Rx terminal	Port	Tx Rx	RS232 Full-Duplex Standard
RS232 ⊥	Cable chassis or mesh	NA	NA	NA

Board 4: RS232

2.2.4 Audio source inputs and outputs

NEXO is equipped with two multi-purpose audio channels, named CH1 and CH2, designed to provide a flexible solution for audio management. Both ports can handle an input channel and an output channel, configuring a total of 4x4 audio channels.

The two channels have a sensitivity of 1 Vrms and operate with balanced audio, enabling high-quality transmission for professional applications and offering greater noise resistance on long wiring lines.

(c) CH1 AUDIO

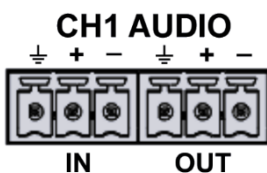


Illustration 8: CH1 Audio

The CH1 channel is designed for general audio applications (see 4.3 Audio Config).

The connection is made through 2 female Euroblock connectors with 3 contacts and 3.81 mm pitch, supplied with the equipment. The cable cross-section range for each pole of this connector is: 0.14 → 1.5 mm² (30 → 14 AWG).

Brand	Description	Type	Signals	Activation
IN	Line-level balanced audio	Input	\perp + -	NA
OUT		Output		

Board 5: CH1 Audio

(d) BUS ACSI

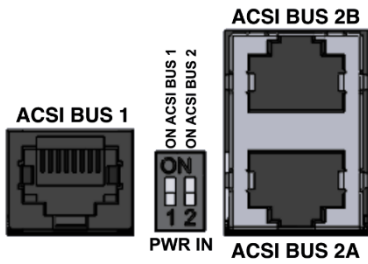


Illustration 9: ACSI Bus

The ACSI bus is dedicated to connecting to devices that use the ACSIv2 protocol, such as microphones or emergency panels, such as MPS8Z, MPS8Z+, VAP-1, and VAP-FES.

It consists of a line-level audio input, control signal and power, for connection of up to 32 ACSIv2 devices.

The connection is made via Ethernet network cable with RJ-45 T568B standard, compatible with cables of CAT5 category or higher. The bus supports a maximum connection distance of 1000 m.

The port named ACSI BUS 1 is factory enabled, providing a functional communication line.

Future applications: Although the ACSI BUS 2 port is physically present to allow for a star connection, its functionality is not yet implemented in this version of the device. Once enabled, it will allow the integration of two independent communication lines into the same system.

Brand	Description	Type	Signals	Activation
ACSI BUS 1				
ACSI BUS 2A	Line-level balanced audio	Input/Output	Protocol	NA
ACSI BUS 2B				

Board 6: ACSI Bus

NOTE: This connection is not compatible with standard Ethernet network electronics.

2.2.5 Power supply

(e) EMERGENCY POWER INPUT

The device has an emergency power supply input. The emergency voltage is continuous and has a nominal value of 24 VDC, which will be supplied externally to the equipment by a battery source and charger system according to EN 54-4.

The connection is made through a 2-pin female Euroblock connector with a pitch of 3.81 mm supplied with the equipment. The cable cross-section range for each pole of this connector is: 0.14 → 1.5 mm² (30 → 14 AWG).



20-28 V ---

Illustration 10: Emergency Power

Brand	Description	Type	Signals	Activation
20-28 V	Emergency power input	Input	+ -	20 – 28 VDC Min. current: 0.2 A Max. Current: 1A

Board 7: Emergency Power

(f) MAIN POWER INPUT

It is the recommended form of power supply for continuous and safe operation.

The connection is made via a standard round power connector (DC jack). The external power supply supplied with the equipment provides 24VDC / 0.5A output.




24 V 
0.5A

Illustration 11: Main power supply

Brand	Description	Type	Signals	Activation
24V	Main power input	Input	NA	24 VDC Current: 0.5 A

Board 8: Main power supply

3 INSTALLATION

3.1 Assembly

The equipment can be installed in a rack or directly on the wall, depending on the space and needs of the system.

The NEXO device is supplied with the parts required for rack mounting and installation:

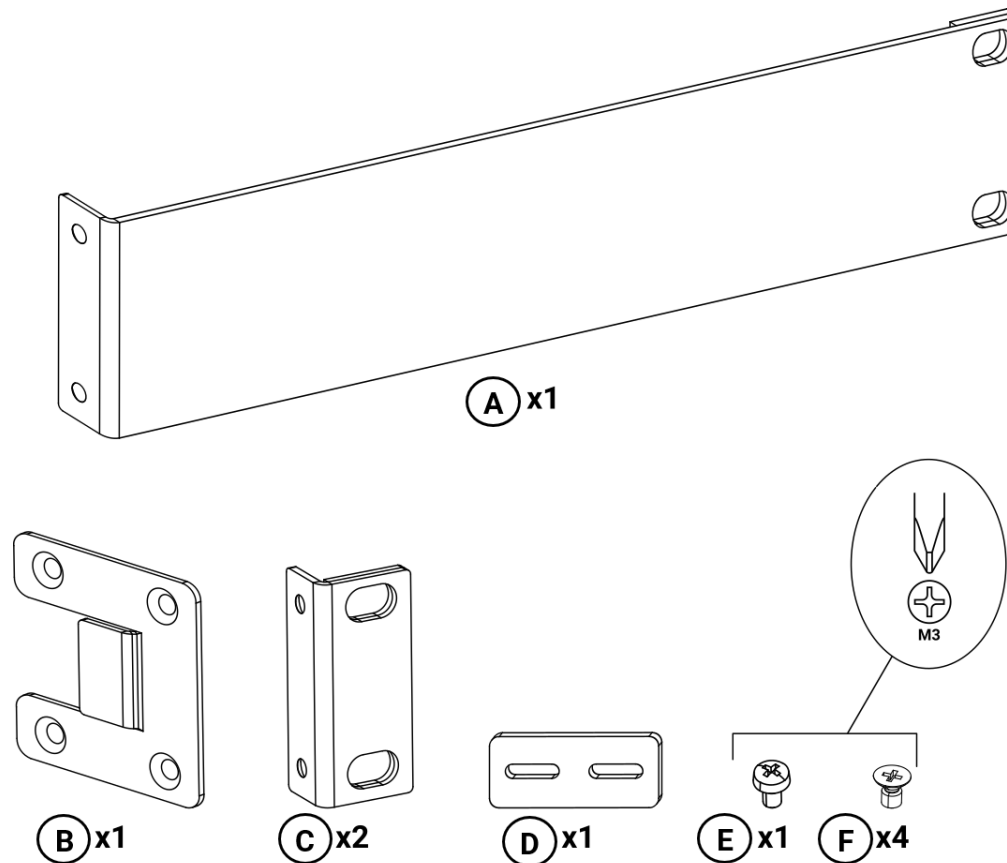


Illustration 12: Parts supplied for rack mounting

- A. 1 × Long fixing bracket.
- B. 1 × Side Binding Plate.
- C. 2 × Short fixing bracket.
- D. 1 × Rear Junction Plate.
- E. 1 × M3 pan head screw.
- F. 4 × M3 countersunk screws.

3.1.1 Rack mount an appliance

For rackmount of a single device, the following parts will be used:

- A. 1 × Long fixing bracket.
- C. 1 × Short fixing bracket.
- F. 4 × M3 countersunk screws.

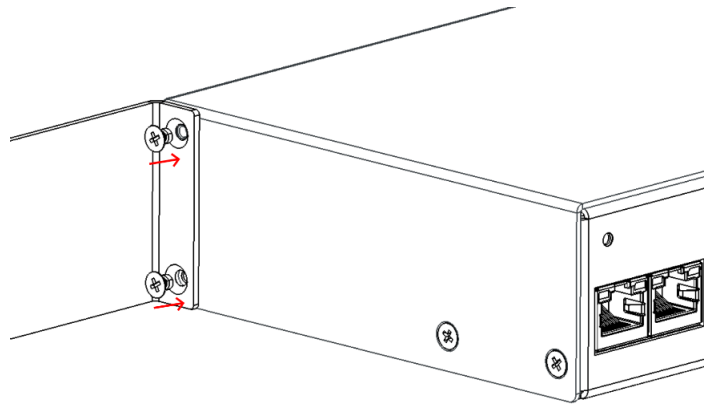


Illustration 13: Long fixing bracket assembly

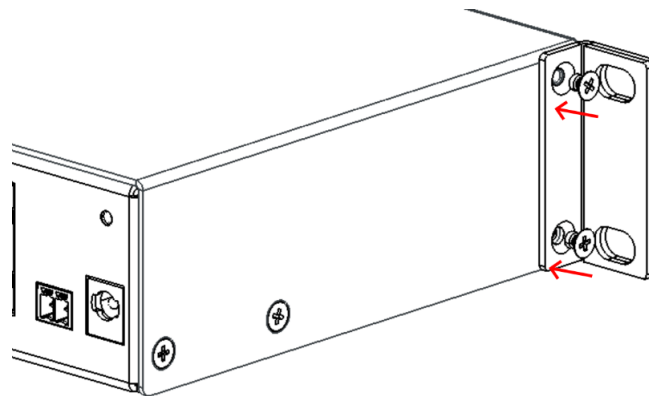


Illustration 14: Short fixing bracket assembly

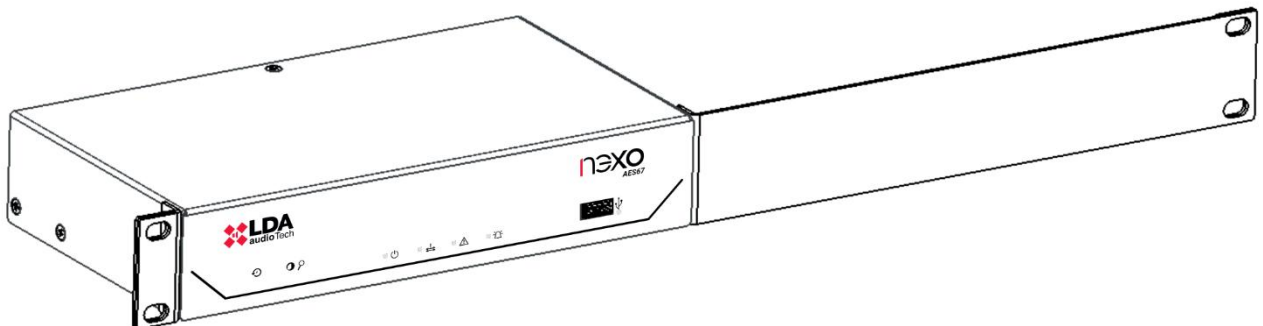


Illustration 15: Front view rackmount of a device

3.1.2 Two-device rackmount

The following parts shall be used for the joint rack mounting of two devices:

- B. 2 × Side Binding Plate.
- C. 2 × Short fixing bracket.
- D. 1 × Rear Junction Plate.
- E. 2 × M3 pan head screw.
- F. 8 × M3 countersunk screws.

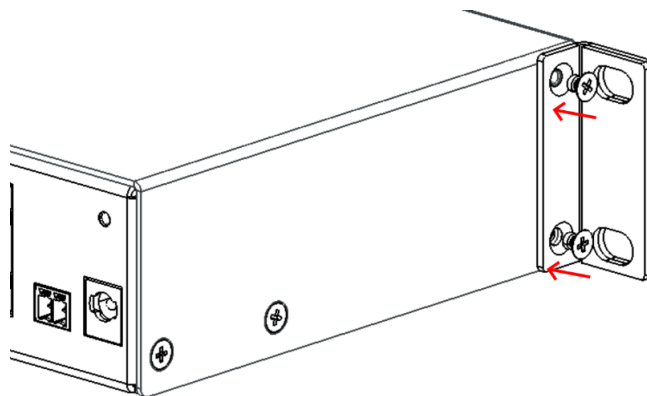


Illustration 16: Short fixing bracket assembly

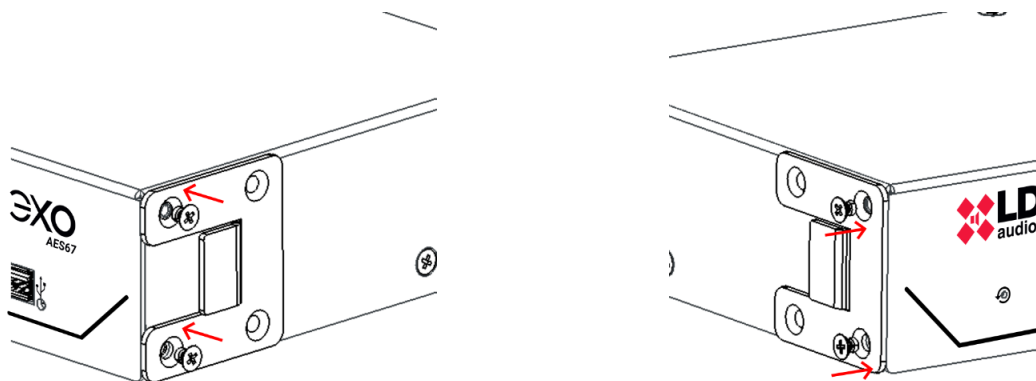


Illustration 17: Side Junction Plate Mounting

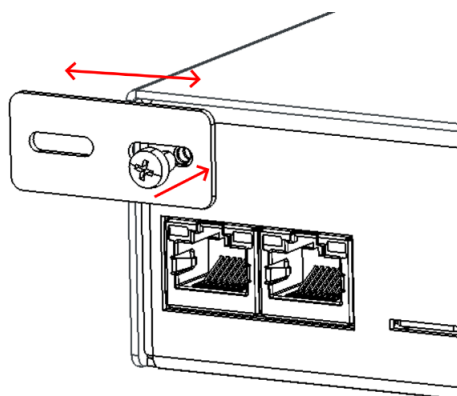


Illustration 18: Rear Attachment Plate Mounting

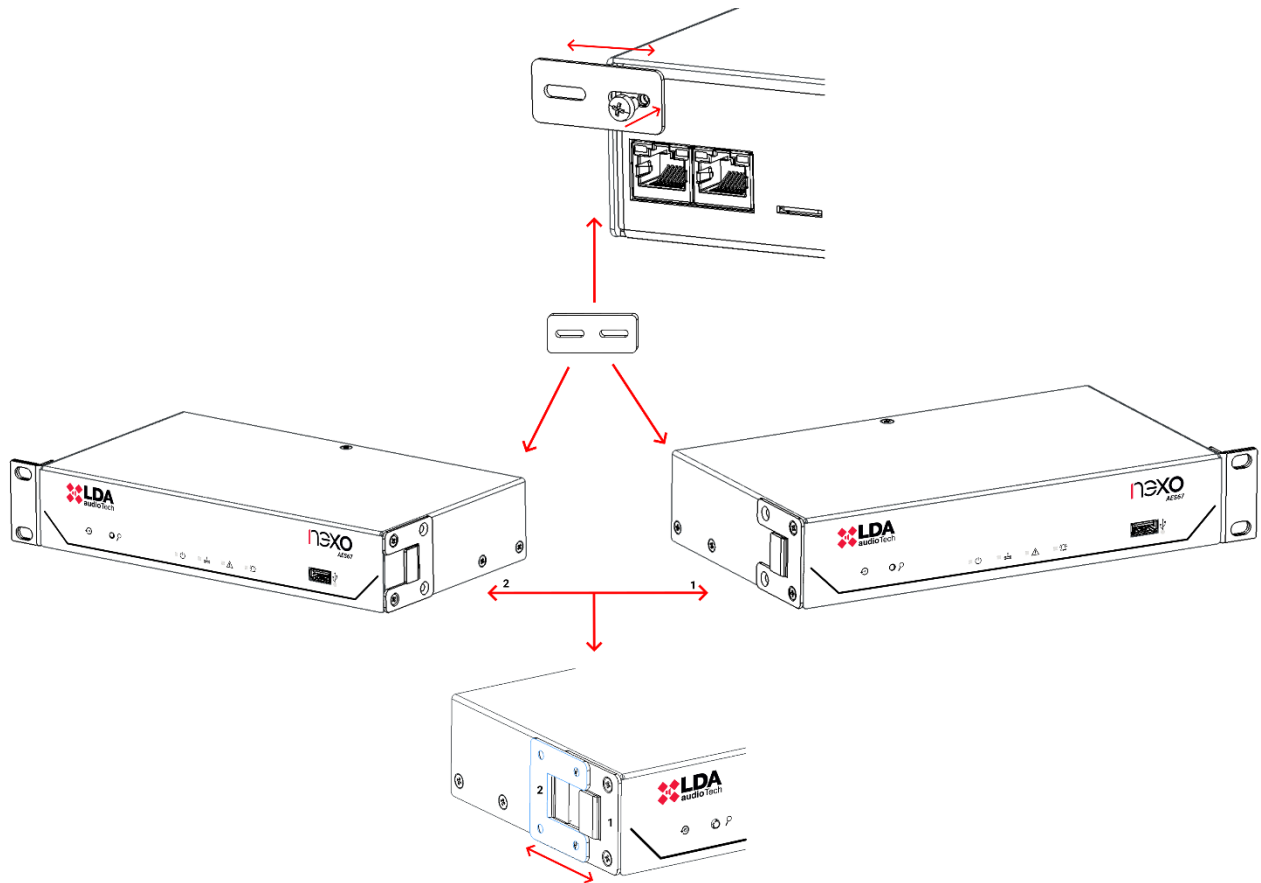


Illustration 19: Two-device rackmount scheme

3.1.3 Wall Mount

- C. 2 × Short fixing bracket.
- F. 4 × M3 countersunk screws.

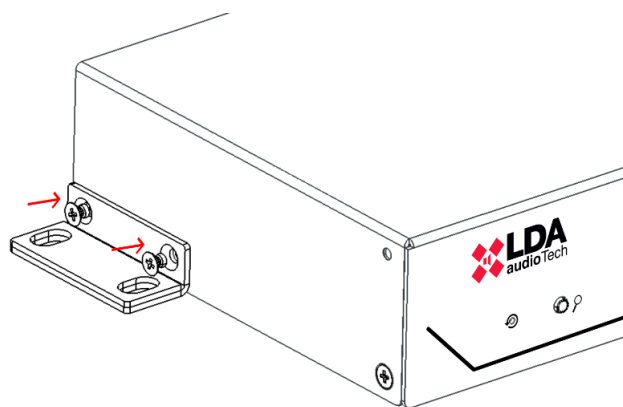


Illustration 20: Short fixing bracket assembly

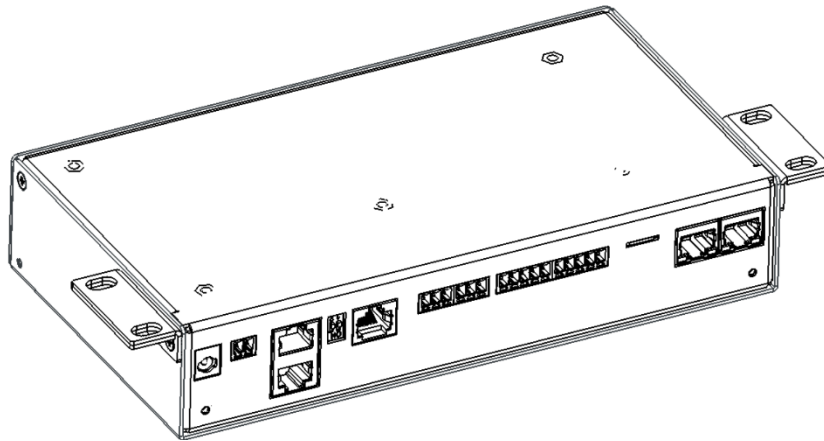



Illustration 21: Wall Mount View

3.2 Power management

To ensure safe and continuous operation of the equipment, it is important to follow these steps during the power connection of the NEXO device:

- **Main power:** Connect the external 24V DC / 0.5A adapter to the round connector (DC jack) of the equipment, ensuring the correct polarity.
- **Power over Ethernet (PoE):** If powering the equipment over PoE, connect a compatible Ethernet cable (CAT5e or higher) to port A RJ-45 and a PoE switch or injector that complies with the IEEE 802.3af Class 0 standard.
- **Emergency power:** Connect the EN54-4 certified battery system to the emergency port using the 2-pin Euroblock connector.

Before turning on the device, make sure that all connections are firm, properly polarized. Turn on the equipment and verify that the indicator  lights up green, indicating that the power has been done correctly.

3.3 Connections to the NEO System

The NEXO device can be integrated into the NEO system through different network configurations, adapting to the specific needs of each installation. There are two main connection modes: Flexnet Ring Integration and Multi-Service Network Connection.

3.3.1 Flexnet Ring Integration

To integrate NEXO within a Flexnet ring, it is necessary to enable Flexnet mode (VLANs) in the network configuration (see section 4.2.2 Network). according to NEO system parameters

The Flexnet option must be enabled in the device settings. Next, it is imperative to define the Flexnet Control VLAN and Flexnet Audio VLAN values, ensuring that they match those set in the system controller to ensure effective communication.

The physical connection must be made using both NEXO Ethernet ports to establish a redundant connection to the NEO+ system within the Flexnet ring. Connect the ports following the layout indicated in the following illustration.

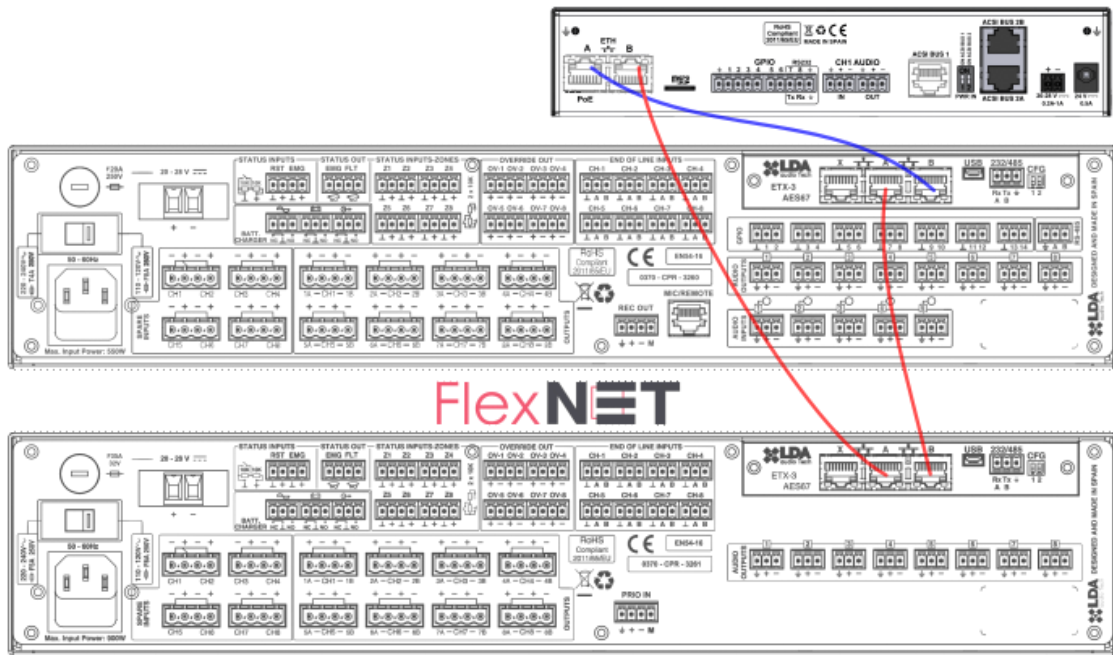


Illustration 22: Flexnet Ring Integration

For more information on the Flexnet protocol, please consult the NEO+ user manual available on the LDA Audio Tech Support website. You can access it through the following link: [Support - LDA Audio Tech](#)

Note: All audio and control traffic are managed exclusively within the FlexNet environment, avoiding interference with other systems on the network. To ensure proper operation, if intermediate network switches are used, they must support tagged VLANs (802.1Q) and their configuration must be consistent across all devices in the ring, thus ensuring efficient and uninterrupted communication.

3.3.2 Multi-service network connection

In installations where NEXO connects to a shared multi-service network, only one of the Ethernet ports available on the equipment must be used, making the connection to the NEO+ system as shown in the illustration.

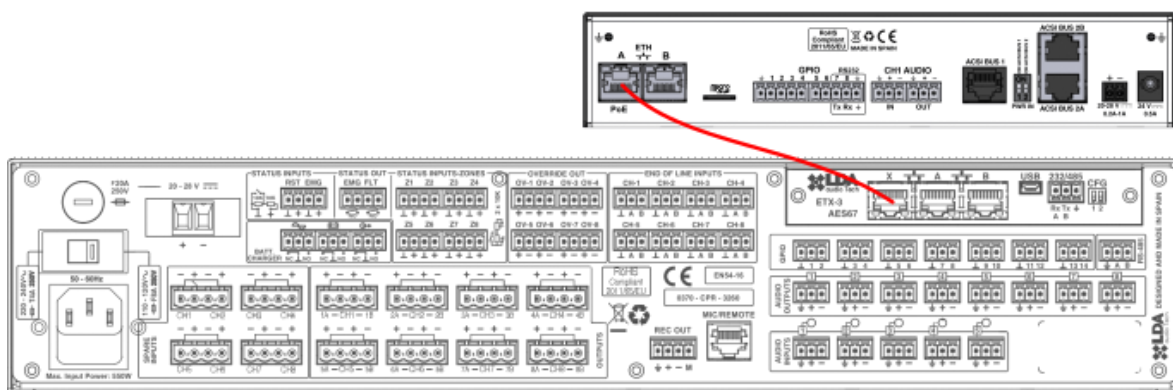


Illustration 23: Multi-service network connection

This mode allows NEXO to be integrated into a network infrastructure shared with other services. In this case, the configuration of VLANs is not mandatory, as the network can handle traffic in a conventional way. However, if the network requires segmentation, the appropriate VLANs must be defined according to the existing infrastructure (see section 4.2.2 Network).

NOTE: Network settings should be reviewed with your network administrator to avoid compatibility issues with other existing services on the network.

4 CONFIGURATION. NEXO CONFIG TOOL APP

It is recommended that the personnel in charge of the configuration should have a solid knowledge of Layer 3 IP audio networks, including protocols such as AES67 and Dante.

NEXO Config Tool is the official tool that allows users to manage and configure the NEXO device. The following are the steps to install and access the app:

NOTE: The images and directions in this manual are described using the **NEXO Config Tool software version v1.0.2** and the NEXO firmware version **v01.00.01.02**.

Prerequisites: It is compatible with Windows 10 and 11 operating systems. It requires having the .NET 8.0 framework installed, which can be downloaded from Microsoft's official website if it is not previously installed.

Download: The application is available on the official website of LDA Audio Tech Support. You can access its download through the following link: [Support - LDA Audio Tech](#)

Installation: The application is distributed in a ZIP file. Extract its contents and run the NEXOConfigTool.exe file. No additional installation is necessary.

Access: After running the application, an access password window will appear. Please contact LDA's technical support team to obtain this password via email support@lda-audiotech.com.

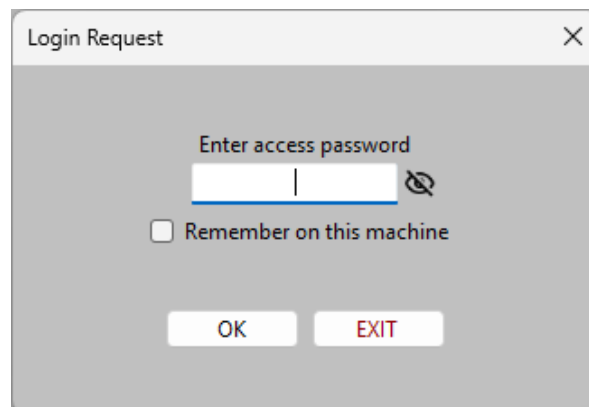


Illustration 24:Login

4.1 Interface

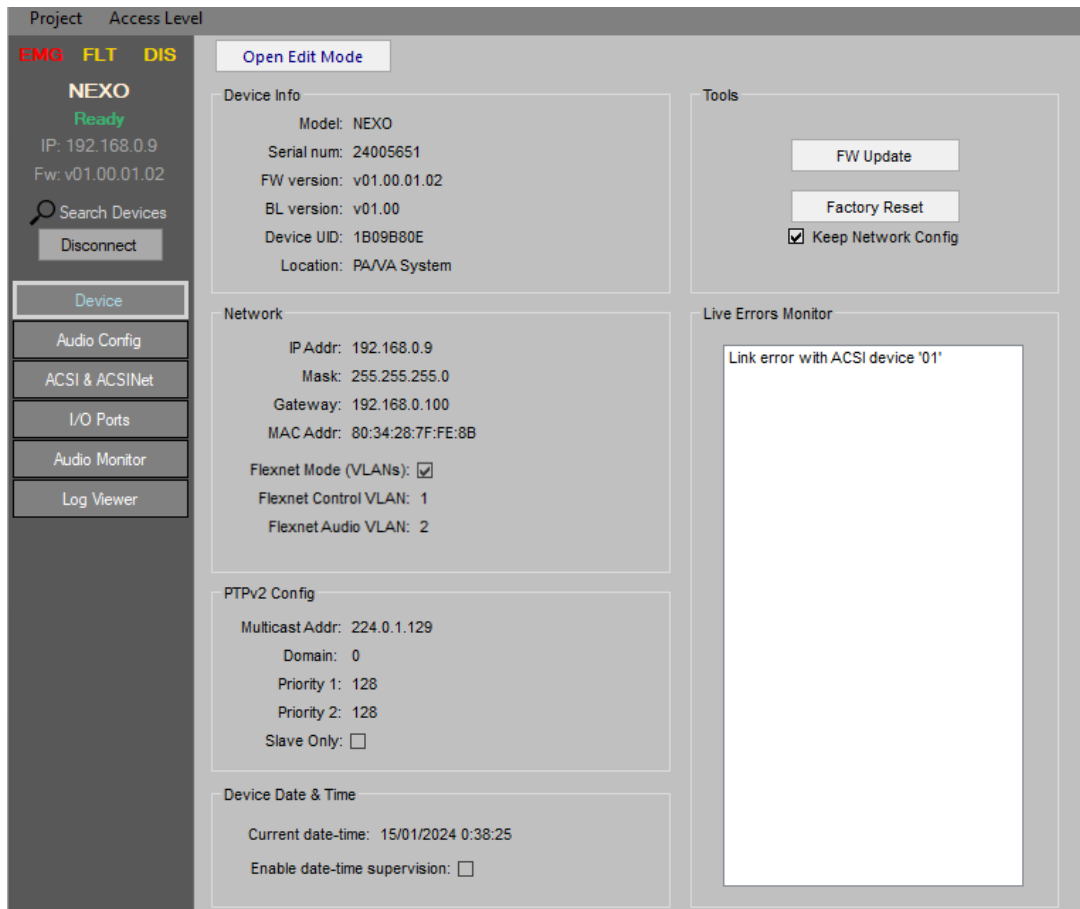


Illustration 25: NEXO Config Tool Interface

4.1.1 Menu Bar

Located at the top of the window, the menu bar provides access to advanced project management options and system access settings. It contains the following menus:

- **Project:** Includes options such as restarting the device, importing/exporting settings from files, and closing the app.
- **Access Level:** Allows you to change the access level and manage user authentication.

4.1.2 Left Panel

This dashboard provides an overview of the system status and direct access to the various configuration sections.

System Status Indicators:

- **EMG (Emergency):** Displays the emergency status of the system.
- **FLT (Failure):** Indicates errors or failures detected in the system.
- **DIS (Disarmed):** Reflects the deactivation status of system zones.

Device connection status:

- **Not Connected:** No connection has been established with any device.
- **No link:** A connection has been established, but the device is not reachable.
- **Ready:** Connection established, no activity in progress.
- **Working:** The device is processing changes or receiving data.

Network and connection data:

- **NEXO IP address .**
- **Firmware** version installed on the device.
- **Search Devices:** Opens the LDA Discover Tool to search for LDA devices on the network.
- **Connect/Disconnect:** Allows you to establish or terminate the connection with NEXO.

Configuration sections:

- **Device:** General information about the device.
- **Audio Config:** Configuration of audio input and output channels.
- **ACSI & ACSINet:** Management of the ACSINet domain and devices connected to the ACSI bus.
- **I/O Ports:** Configuration of GPIO ports and RS232 serial ports.
- **Audio Monitor:** Real-time monitoring of audio transmission and reception.
- **Log Viewer:** View and export event logs.

4.1.3 Center Panel

The central panel is the area where the various system parameters are displayed and configured. Its content varies according to the option selected in the left panel, allowing you to modify the configuration of the device in a structured way. To make changes to the settings, it is necessary to activate the edit mode through the "Open Edit Mode" button, located at the top of each section.

4.2 Device

The "Device" window displays and allows you to configure basic parameters of the device. Some of these parameters are configurable. To access this setting press the "Open Edit Mode" button

4.2.1 Device info

Displays the general information of the device: model, serial number, firmware version, bootloader version, and unique identifier of the device within the system.

The "Location" field allows you to assign a custom label to identify the equipment physically in a location.

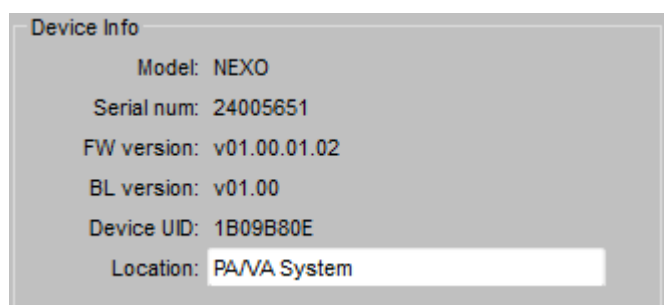


Illustration 26: Device Info

4.2.2 Network

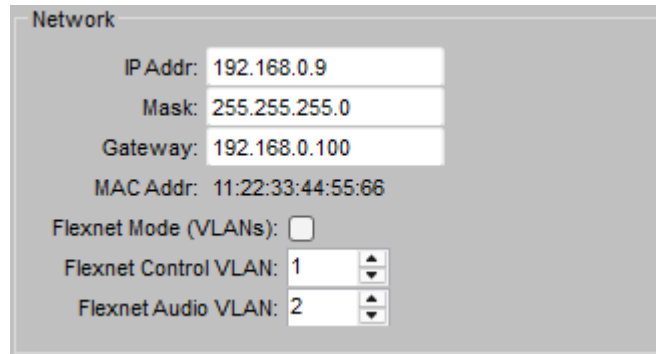


Illustration 27: Network

Allows you to configure the network parameters of the device: IP address, subnet mask, and gateway.

- **Flexnet mode (VLANs):** Enables audio and data transmission using dedicated VLANs. To integrate the equipment within the Flexnet ring, this option must be enabled and configured with the same VLAN values as the system controller.

By default, Flexnet mode is disabled, which means that network traffic is managed without VLAN segmentation.

- **Flexnet Control VLAN:** Identifier for the data VLAN of the Flexnet protocol. By default, it will have a value of 1. Supports values from 1 to 4095.
- **Flexnet Audio VLAN:** Identifier for the AES67 audio VLAN of the Flexnet protocol. By default, it will have value 2. Supports values from 1 to 4095.

NOTE: A VLAN value equal to 0 disables segmentation.

4.2.3 PTPv2 Config

The PTPv2 protocol synchronizes the devices that broadcast and/or receive audio streams. It is crucial that NEXO shares the PTP IP and domain values with all devices that receive or transmit AES67 audio on the same network.

It is recommended to use the system with the default parameters, although these are editable in case the system specifications require it.

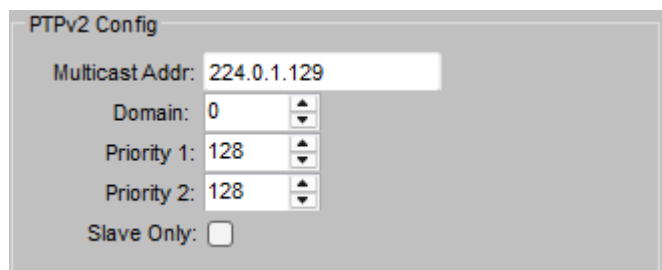


Illustration 28: PTPv2 Config

4.2.4 Device Date & Time

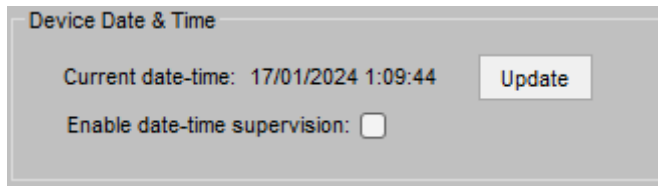


Illustration 29: Device Date & Time

Displays the current date and time of the device. With the "Update" button it is possible to synchronize the time of the device with the local time of the equipment through which we establish a connection with NEXO.

By default, monitoring is disabled.

4.2.5 Tools

The "FW update" button allows you to upload a firmware file to update the device. You can download the latest version available on the LDA Audio Tech Support website, through the following link [Support - LDA Audio Tech](#).

The "Factory Reset" function restores the device to factory defaults. To keep the network parameters configured in the Network section, select the "Keep Network Config" option.

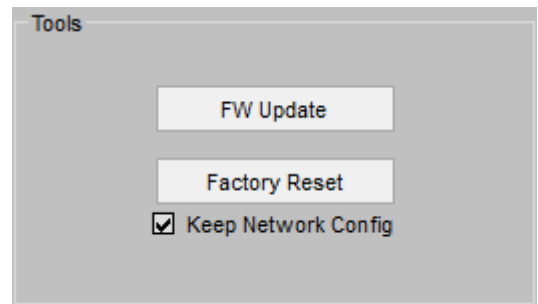


Illustration 30: Tools

4.2.6 Live Errors Monitor

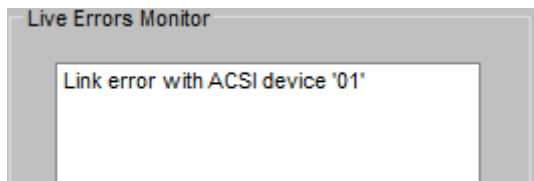


Illustration 31: Live Error Monitor

This section shows real-time errors related to the operation of the equipment.

To view the historical record of errors detected by the device see chapter 4.7 Log Viewer.

4.3 Audio Config

In the "Audio Config" tab, you manage the transmission and reception of NEXO audio. The configuration matrix allows for custom assignment of input and output channels either via the AES67 protocol, the ACSINet protocol, or via physical channels.



Illustration 32: Audio Config

4.3.1 Inputs

The "Inputs" section in the "Audio Config" tab allows you to configure different audio sources according to the selected input channel.

(a) Input 1: CH1 Analog Audio In

Receive analog audio through physical input.

- **Volume (dB):** Adjusts the value of the input volume, with values between -100 and 10 dB.
- **Mute:** Mute the audio input
- **Phantom power:** Activates the 24VDC phantom power supply to the input.

(b) Input 2: ACSI Bus Analog Audio In

Input for microphones compatible with the ACSI Bus as well as MPS8Z, MPS8Z+, VAP-1 and VAP-FES.

Up to 32 ACSI devices can be connected to the same NEXO, depending on the characteristics of each microphone, to be integrated into the same ACSINet domain (see 0 Output 4 can be controlled by the ACSINet protocol when the equipment is integrated within an ACSINet domain. For more information, see the chapters 4.4.1 ACSINet Domain Configuration and 4.3.3 ACSINet-controlled channels.

4.3.2 ACSINet-controlled channels

The message "**Controlled by ACSINet**" may appear on some inputs and outputs, when the specifications mentioned above in each section are met.

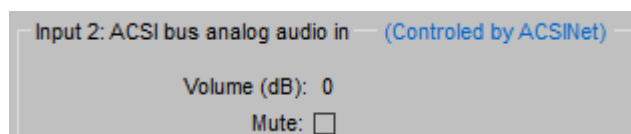


Illustration 34: Controlled by ACSINet

This indicator indicates that the channel is being managed directly by the ACSINet protocol, which means that any manual configuration made on these inputs or outputs will have no effect.

When a channel is controlled by ACSINet, the audio input or output settings are automatically defined based on the ACSINet domain to which NEXO is linked. Values such as volume level, mute, or stream assignment in AES67 are disabled for manual editing. In the case of audio outputs, the channel can only be used for the assigned function within the ACSINet system, such as zone monitoring using the zone monitor.

This behavior affects various configurations within Audio Config, including:

- Input 2: ACSI Bus Analog Audio In (when the device is integrated into an ACSINet domain)
- Input 3: AES67 Rx Slot 1 (when zone monitoring is enabled)
- Output 1: CH1 Analog Audio Out (when zone monitoring is enabled)
- Output 4: AES67 Tx Slot 2 (when the device is integrated into an ACSINet domain)

ACSI & ACSINet).

- **Volume (dB):** Adjusts the value of the input volume, with values between -100 and 10 dB.
- **Mute:** Mute the audio input

This entry can be controlled by the ACSINet protocol when the device is integrated within an ACSINet domain. For more information, see the chapters 4.4.1 ACSINet Domain Configuration and 4.3.4 ACSINet-controlled channels.

(c) Inputs 3 & 4: AES67 Rx Slots

These inputs receive audio streams using AES67 protocol

- **Rx Enabled:** Enables audio reception using the AES67 protocol on the input channel.
- **Stream ID (bundle):** Defines the audio receive stream. Set values between 1 and 255. Each Stream ID corresponds to a defined multicast IP address.
- **Channel:** Specifies the channel within the audio stream. Set values between 1 and 8.
- **IP Address:** Editable only in "Advanced" mode. Allows you to define the multicast IP address for audio reception. If you set an invalid IP address, the Stream ID will be disabled (value 0).
- **Port:** Editable only in "Advanced" mode. Indicates the port of reception. By default, AES67 uses port 5004.

Input 3 can be controlled by the ACSINet protocol when zone monitoring is activated. For more information, see the chapters 4.4.1 ACSINet Domain Configuration and 4.3.4 ACSINet-controlled channels.

4.3.3 Outputs

In the "Audio Config" tab, the "Outputs", allow you to assign the audio channels configured on the inputs to their respective destinations.

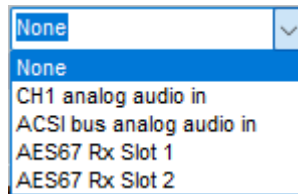


Illustration 33: Input Channels

(d) Output 1: CH1 Analog Audio Out

It allows analog audio to be transmitted to a connected physical device.

- **Select Input:** Assigns the input channel that will feed this output (CH1, ACSI, AES67).
- **Volume (dB):** Adjusts the audio level between -100 and 0 dB.
- **Mute: Mute** the audio output.

This output can be controlled by the ACSINet protocol when zone monitoring is activated. For more information, see the chapters 4.4.3 Zone Monitor Configuration and 4.3.4 ACSINet-controlled channels.

(e) Output 2: ACSI Bus Analog Audio Out

Future application: This functionality is not currently implemented, so it is not configurable or operational in this version of the system.

(f) Outputs 3 & 4: AES67 Tx Slots

These outputs transmit audio using the AES67 protocol to configure multicast addresses.

- **Tx Enabled:** Enables audio streaming on the output channel.
- **Stream ID (bundle):** Configures the Audio Stream Stream.
- **Channel:** Specifies the channel of the stream to be broadcast.
- **IP Address:** Editable in "Advanced" mode, defines the multicast IP address for the stream.
- **Port:** Defines the transmit port (default, 5004).
- **Stream Name:** A descriptive label for the audio stream.
- **SAP Announcement:** Editable only in "Advanced" mode. Allows third-party devices to identify the stream.
- **Audio Encryption:** Editable only in "Advanced" mode. Blocks audio reception to non-LDA devices.

Output 4 can be controlled by the ACSINet protocol when the equipment is integrated within an ACSINet domain. For more information, see the chapters 4.4.1 ACSINet Domain Configuration and 4.3.3 ACSINet-controlled channels.

4.3.4 ACSINet-controlled channels

The message "**Controlled by ACSINet**" may appear on some inputs and outputs, when the specifications mentioned above in each section are met.

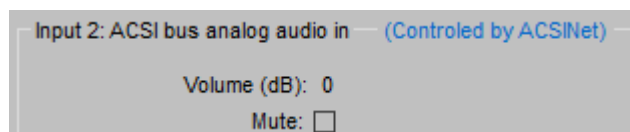


Illustration 34: Controlled by ACSINet

This indicator indicates that the channel is being managed directly by the ACSINet protocol, which means that any manual configuration made on these inputs or outputs will have no effect.

When a channel is controlled by ACSINet, the audio input or output settings are automatically defined based on the ACSINet domain to which NEXO is linked. Values such as volume level, mute, or stream assignment in AES67 are disabled for manual editing. In the case of audio outputs, the channel can only be used for the assigned function within the ACSINet system, such as zone monitoring using the zone monitor.

This behavior affects various configurations within Audio Config, including:

- Input 2: ACSI Bus Analog Audio In (when the device is integrated into an ACSINet domain)
- Input 3: AES67 Rx Slot 1 (when zone monitoring is enabled)
- Output 1: CH1 Analog Audio Out (when zone monitoring is enabled)
- Output 4: AES67 Tx Slot 2 (when the device is integrated into an ACSINet domain)

4.4 ACSI & ACSINet

The "ACSI & ACSINet" tab allows you to manage the configuration of the ACSINet Domain and the devices that compose it.

4.4.1 ACSINet Domain Configuration

The "ACSINet Domain Configuration" section allows you to configure the parameters required for the integration of NEXO into an ACSINet domain.

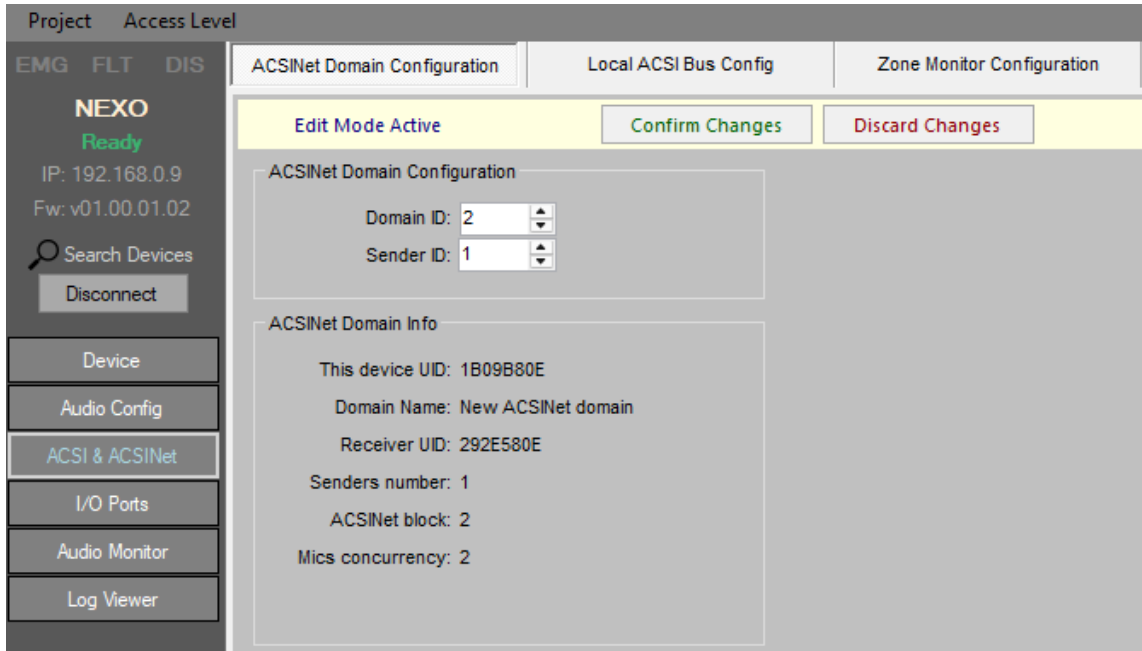


Illustration 35: ACSINet domain

(a) ACSINet Domain Configuration

This section allows you to modify the configuration of the domain where NEXO is integrated:

- **Domain ID:** Domain identifier, with a value between 1 and 128. It must match the value configured in the system controller where it is integrated.
- **Sender ID:** Identifies the device as the sender within the ACSINet domain. Each NEXO within the same domain must have a unique value between 1 and 128. For a domain to be active, at least one issuing device must exist, otherwise the domain will remain disabled.

(b) ACSINet Domain Info

At the bottom, the current status of the domain is displayed, providing information about the domain configuration:

- **This device UID:** Unique identifier of the device within the ACSINet Domain.
- **Domain Name:** Identification label of the ACSINet Domain. This name appears on all devices configured in the same domain.
- **Receiver UID:** Unique identifier of the NEO+ receiver, within the domain.
- **Sender number:** The total number of active sender devices within the domain.
- **ACSINet block:** Its value matches the Domain UID.
- **Mics concurrency:** Maximum number of emitters that can simultaneously stream audio in the domain, maximum 16.

NOTE: Do not confuse the **concurrency** of the **ACSINet Domain**, with the number of devices that can send audio over the **ACSI Bus**, which is limited to 1.

4.4.2 Local ACSI Bus Config

The “ACSI Local Bus” section allows you to manage the devices connected to the ACSI bus of the NEXO system, facilitating their detection, installation and monitoring within the system.

The settings for the following parameters can be accessed by pressing the "Open Edit Mode" button.

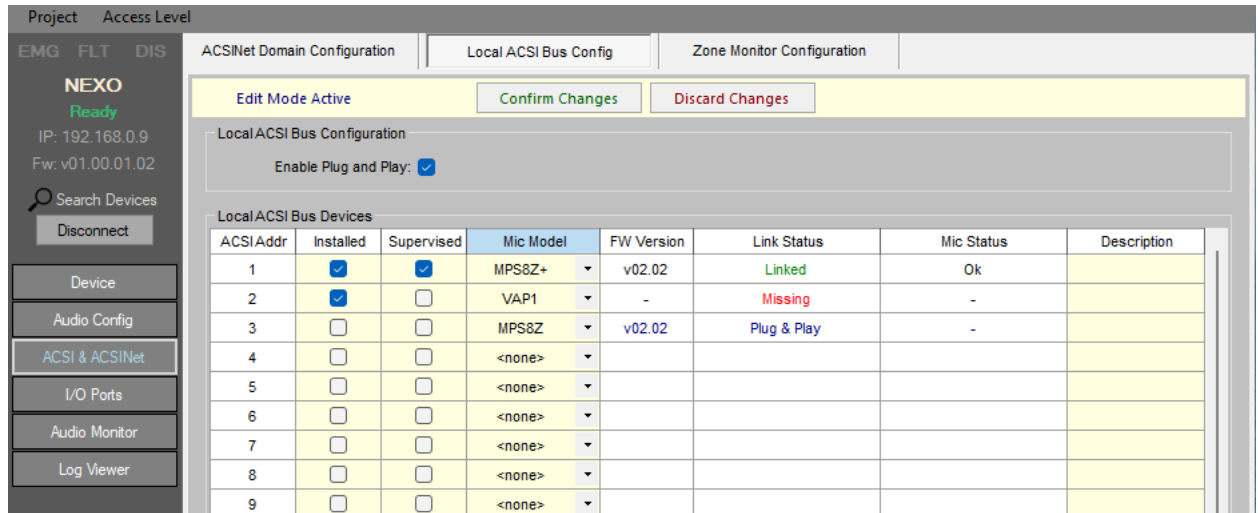


Illustration 36: Local ACSI Bus

The top of the window shows the local bus configuration mode:

- **Enable Plug and Play:** If enabled, the system will automatically detect ACSI devices connected to the bus. If disabled, devices will need to be manually installed by assigning them a specific address.

At the bottom of the window is the list of ACSI devices currently connected to NEXO. If we access the edit mode, the following parameters can be configured for each ACSI address:

- **ACSI Addr:** Addresses available within the ACSI bus. Determines the assigned address of the ACSI microphone on the bus and also its default priority for speech granting, which will be applied when more than one microphone requests to speak in the same areas, unless a custom priority is specified in the ACSINet* profiles.
- **Installed:** Assigns this address to an ACSI device within the bus.
- **Supervised:** Allows you to enable or disable device monitoring, as long as it is installed. If monitoring is enabled, the System Controller will report a fault if the physical device is not detected on the ACSI bus in the specified direction.
- **Mic Model:** Model of the connected device. The microphones available are:
 - **MPS8Z and MPS8Z+:** Microphones for General Public Address (PA)
 - **VAP1:** Emergency microphone (VA).
 - **VAP1FES:** Emergency microphone (VA) adapted to German regulations.
- **FW Version:** Firmware version of the connected ACSI device.
- **Link Status:** Displays the status of the ACSI device within the bus
 - **Plug & Play:** The device has been automatically detected.
 - **Linked:** The device has been manually installed and is correctly paired.
 - **Missing:** The device has been manually installed but has not been detected on the network.
- **Mic Status:** Current status of the microphone with active monitoring. In case of microphones detected via the "Plug & Play" function and not installed, their status will not be monitored and the field will appear empty. Possible status are:
 - **Ok:** The device is working properly.
 - **Talking:** The device has the floor granted and is emitting audio through the bus.
 - **Error:** The ACSI device is failing.
- **Description:** An editable field to add a custom description of the device.

***NOTE:** In case there are ACSINet profiles configured in the system driver, these will be applied to ACSI devices that share an address within the same ACSINet domain.

4.4.3 Zone Monitor Configuration

The "Zone Monitor Configuration" section allows you to enable system zone monitoring using a loudspeaker connected to NEXO's physical CH1, Output 1. This function allows you to verify in real time the audio that is being transmitted in different areas of the system without the need to be physically in them. This facilitates the supervision of the public address system.

This function is activated by an MPS8Z+ microphone, which will act as a control device.

NOTE: When activating the zone monitoring function, Output 1 will automatically become controlled via ACSINet and the "Audio Config" settings will be ignored

To activate this function, we must access the editing mode through the "Open Edit Mode" button and activate the "Enable Zone Monitor on CH1 Output" option. The settings menu will then appear on the screen:

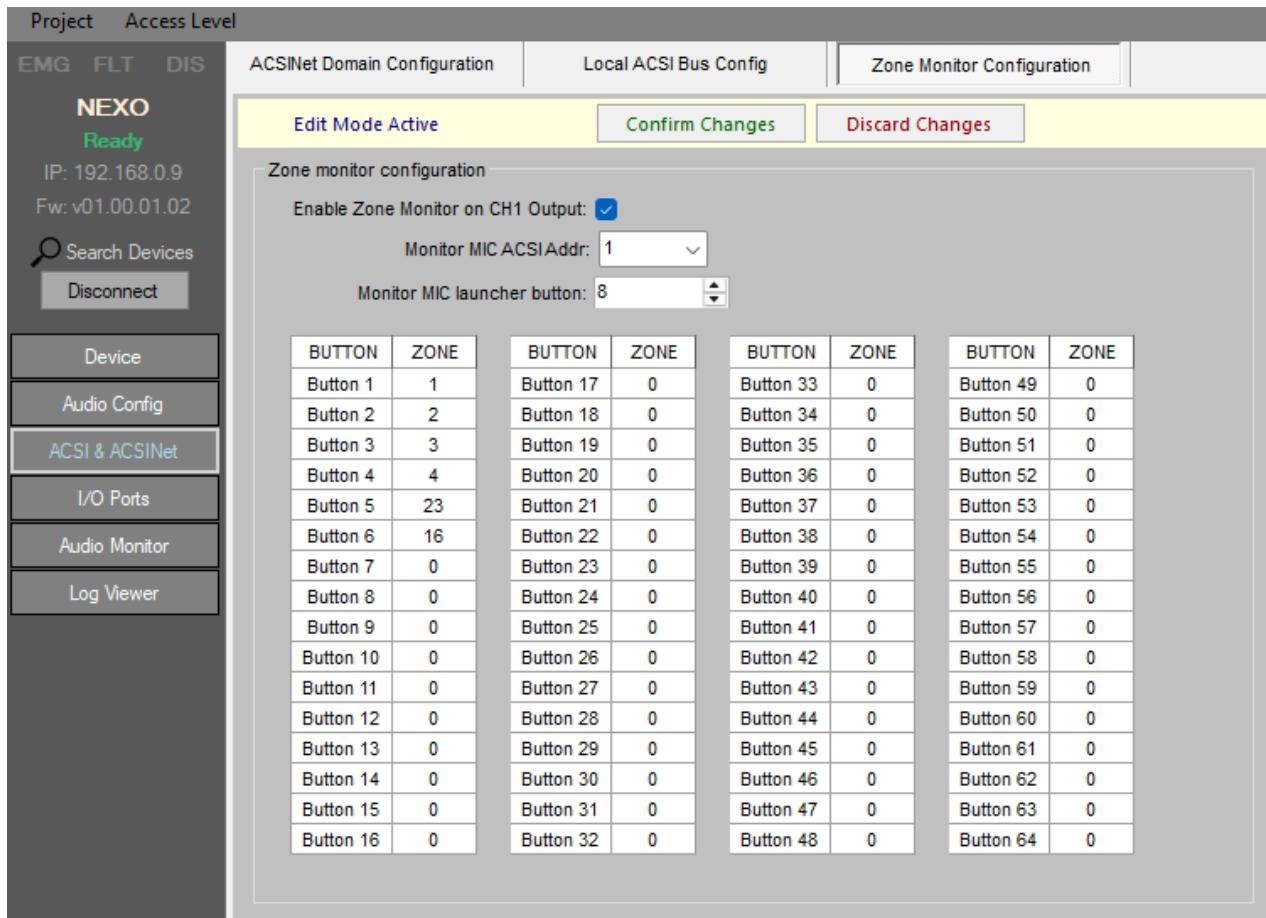


Illustration 37: Zone Monitor

- **MIC ACSI Addr Monitor:** Defines the ACSI address of the MPS8Z+ that will trigger the monitoring function. Only a microphone on the bus can activate this function.
- **Monitor MIC Launcher Button:** Sets the button on the MPS8Z+ that will activate the monitoring function. This button cannot be assigned to any other function within the system.

In the table, each button on the MPS8Z+ can be assigned for monitoring of a specific zone, up to a maximum of 64.

NOTE: An MPS8Z+ has a total of 8 zone buttons, so MPS8K+ expansion keyboards must be added, up to a maximum of 7. Each keyboard adds 8 extra zone buttons, making a total of 64 zones.

To run the monitor function, on the MPS8Z+ microphone, press the EVENT button, then press the button previously defined as "MIC Launcher" and the zone button you want to monitor. Press the "Talk" button to confirm the execution.

To stop monitoring, on the MPS8Z+ microphone, press the events button, then the button previously defined as "MIC Launcher". Press the "Talk" button to stop the function.

4.5 I/O Ports

The I/O Ports tab allows you to configure the input and output interfaces available on the NEXO, such as GPIO ports and RS232 communication.

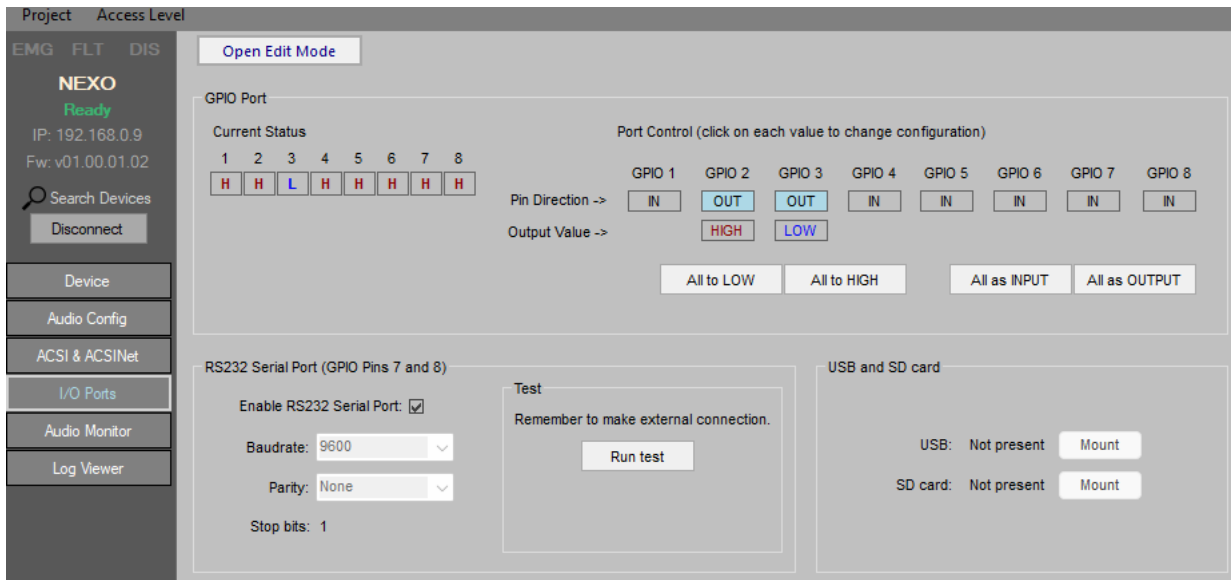


Illustration 38: I/O Ports

4.5.1 GPIO Port

GPIO (General Purpose Input/Output) ports allow interaction with external devices for system control and monitoring. Each of the 8 pins can be configured as input or output according to the needs of the system by accessing through the "Open Edit Mode" button.

- **Current Status:** Displays the current status of pins 1 through 8, indicating whether they are on High (H) or Low (L).
- **Pin Direction:** Each GPIO can be individually configured as an input (IN) or output (OUT) independently by clicking on the corresponding value or simultaneously with the "All as INPUT" and "All as OUTPUT" buttons.
- **Output Value:** Allows you to set the activation status of the pins configured as Output at high (HIGH) and low level (LOW) independently by clicking on the corresponding value or simultaneously with the "All to LOW" and "All to HIGH" buttons.

4.5.2 RS232 Serial Port

This section allows advanced configuration of the RS232 interface, used for connection with external devices that require serial communication for system control.

The RS232 interface shares pins 7 and 8 of the GPIO port. To use it, it is necessary to activate the "Enable RS232 Serial Port" option, which disables any previous configuration on these pins within the GPIO section.

- **Baudrate:** Defines the data transmission rate, with a default value of **9600 bps**.
- **Parity:** Allows you to select the type of parity (None, Even, Odd).
- **Stop bits:** Configures the number of stop bits in the communication.

The "Test" option allows you to verify the RS232 connection with an external device before use.

4.6 Audio Monitor

The "Audio Monitor" tab allows you to view in real time the audio status in the NEXO system, including the signal level at the inputs and outputs, the status of PTPv2 synchronization, and the monitoring of AES67 audio streams.

This section is an essential diagnostic tool for monitoring audio status, verifying system synchronization, and monitoring the quality of audio streams in real time.

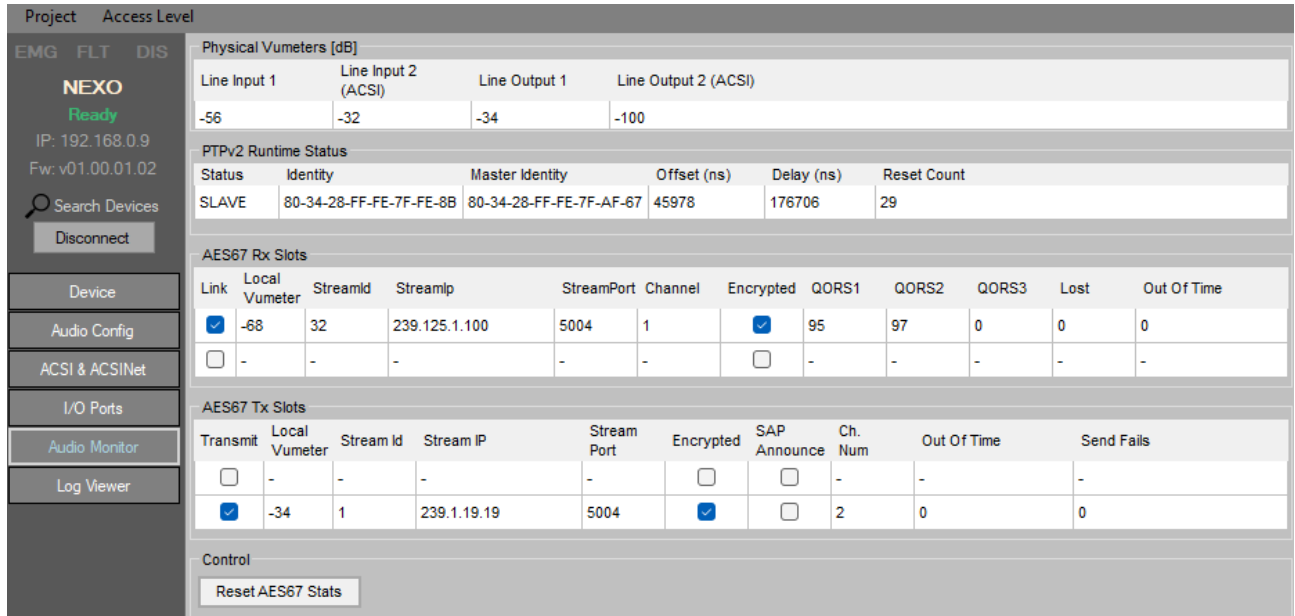


Illustration 39: Audio Monitor

4.6.1 Physical Vumeters [dB]

This section shows the signal levels in dB of the physical audio inputs and outputs of NEXO:

- **Line Input 1:** Signal level on the analogue input CH1.
- **Line Input 2 (ACSI):** The signal level at the input coming from the ACSI bus.
- **Line Output 1:** Signal level of the analogue output CH1.
- **Line Output 2 (ACSI):** The signal level of the ACSI bus audio output (not implemented).

4.6.2 PTPv2 Runtime Status

The PTPv2 (Precision Time Protocol) protocol is used for clock synchronization between devices on the network. This section shows the current status of NEXO synchronization:

- **Status:** Indicates whether NEXO acts as a SLAVE (sync receiver) or MASTER (sync source).
- **Identity:** MAC address of the NEXO device.
- **Master Identity:** MAC address of the device that acts as the synchronization master.
- **Offset (ns):** Time difference in nanoseconds between NEXO and the clock master.
- **Delay (ns):** Delay in synchronizing time between devices.

- **Reset Count:** Number of synchronization protocol restarts.

Stable PTPv2 synchronization is essential to ensure audio transmission without interruptions or lags.

4.6.3 AES67 Rx Slots

Displays the status of audio streams received using AES67. Each input stream is represented by the following parameters:

- **Link:** Indicates if there is an active connection with the received stream.
- **Local Vumeter:** Signal level of the received audio.
- **Stream ID / Stream IP:** Identify the configured multicast stream.
- **Stream Port:** Audio receive port.
- **Channel:** Audio channel within the stream.
- **Encrypted:** Indicates whether the received audio is encrypted.
- **QORS1, QORS2, QORS3:** Quality of service parameters of the received audio.
- **Lost:** Number of packets lost in transmission.
- **Out Of Time:** Number of audio packets received out of time.

4.6.4 AES67 Tx Slots

Displays the status of audio streams streamed by NEXO using AES67. Each output stream includes the following parameters:

- **Transmit:** Indicates whether the stream is enabled.
- **Local Vumeter:** Signal level of the transmitted audio.
- **Stream ID / Stream IP:** Identify the configured multicast stream.
- **Stream Port:** Audio transmission port.
- **Encrypted:** Indicates whether the transmitted audio is encrypted.
- **SAP Announce:** If enabled, allows external devices to discover the stream.
- **Ch. Num:** Number of channels in the streaming stream.
- **Out Of Time:** Number of packets transmitted out of time.
- **Send Fails:** Number of failures in audio transmission.

4.6.5 Control

The "Reset AES67 Stats" button allows you to reset the status counters of AES67 streams (lost packets, sync errors, etc.).

4.7 Log Viewer

The "Log Viewer" tab allows you to view and manage system logs in NEXO. These logs include events, detected errors, and device connection states, providing an essential tool for system diagnostics and maintenance.

- **Read Log:** Reloads logs stored on the system to show the most recent events.
- **Export Log To File:** Allows you to export the event log to an external file for analysis or storage.
- **Clear Log:** Clears all logs stored on the system.

5 MAINTENANCE INSTRUCTIONS

The equipment requires reduced periodic maintenance.

The frequency of maintenance must be adjusted according to the installation conditions of the equipment. At least it is advisable to establish a maximum period of one year.

Operations:

- Clean the air inlets and outlets of the equipment with a vacuum cleaner.
- Check the equipment connections and the ground connection.

Warnings:

- Use only soft, lint-free cloth.
- Disconnect your device from any external power source.
- Disconnect all external devices.
- Keep the product away from any liquid.
- Do not use aerosols, solvents or abrasive substances.
- Do not spray any cleaner directly onto the appliance

6 SPECIFICATIONS

MODEL	NEXUS
Reference	LDANEXOS02
Power Supply	100 - 240V ~ Adapter to 24Vdc/0.5A included
Input EN54-4	20-28 VDC / 0.2-1A for EN54-4 charger. Euroblock 2p
Power consumption	5W typical. Maximum 15W (ACSI devices)
Frequency Response	20Hz-20kHz +/-0.05dB
Signal-to-noise ratio	SNR > 93dB
Distortion	<0.05%
DSP	2 x 2 48kHz, 28bit – 50 MIPS matrix
Phantom Power supply	24Vdc CH1 input
Ethernet	2 x 100Mbps/s RJ-45 female Ethernet ports with loop function. Port A with PD PoE 12W IEE802.3at
MicroSD	1 x microSD Reader
General Control (GPIO)	8 x I/O Control, 0 – 5Vdc 100Ω / RS-232 "2 GPIO less". Euroblock 5p
Audio IP	AES67, 1ms, 48kHz, 24bits
Audio IN/OUT	1 x 1 input 10kΩ / output 100Ω - Balanced audio 1 Vrms. Euroblock 3p
LDA BUS ACSI	2 x ACSI ports, 1 with 10kΩ redundant capacity, RJ-45 female, total 1000m / 3280.84ft
Switch	2 x ACSI bus power input switch, one per ACSI port
USB	1 x Product Maintenance
Indicators	Status: Power on, breakdown, fault, emergency and USB detection
Bellboy	1 x reset, 1 x function
Dimensions (W x H x D)	220.9 x 42.7 x 121.2 mm / 86.96" x 16.81" x 47.71"
Operating conditions	-5 °C to +45 °C / 23 °F to 113 °F 5% to 95% Relative Humidity (non-condensing)
Finishing	Top: Material Fe - Grey colour RAL 7016 Base: Material Al - Natural color
Weight	0.75 kg

Anexo I. Network Configuration

FACTORY NETWORK SETTINGS

NEXO has the following factory default network settings:

- IP: 192.168.000.009
- Mask: 255,255,255,000
- Gateway: 192.168.000.100
- Flexnet Mode (VLANs) disabled by default.

MULTICAST IP ADDRESSING

Service	IP address	MAC Address
LDA Discovery Service	224.0.2.11	01:00:5E:00:02:0B
PTPv2	224.0.1.129	01:00:5E:00:01:81
FlexNet+ Control	232.0.1.21	01:00:5E:00:01:15
FlexNet+ Loop Supervision	232.1.1.21	01:00:5E:01:01:15
FlexNet+ Loop Supervision (backup)	232.1.1.84	01:00:5E:01:01:54
Multicast IGMP	224.0.0.1	01:00:5E:00:00:01
LDA AES Streams (NEO+ and NEXOs02)	[232.1.1.100-232.255.1.100]	-
NEXOs01 Default Streams (IPBOX)	[239.3.208.1-239.3.208.16]	-

Board 9: IP Addressing

Anexo II. Network Specifications

NEXO is designed to integrate into advanced IP networks, using standard technology and protocols that ensure high-quality audio and data transmission. These features make the device highly versatile and compatible with complex public address and communication systems.

NETWORK COMPATIBILITY AND OPERATION

NEXO employs a standard Ethernet infrastructure that supports full-duplex connections at speeds of as little as 100 Mbps. It supports networks based on the AES67 protocol for audio transmission, ensuring a synchronized and high-fidelity stream.

The device also uses LDA's FlexNet standard, allowing simultaneous transmission of data and audio over two different VLANs. It is recommended to divide networks into VLANs to separate critical audio traffic from standard data traffic, especially in high-density configurations, improving efficiency and minimizing potential interference.

NOTE: FlexNet mode activation and VLAN configuration must be done from the NEXO Config Tool configuration application (see chapter 4.2.2 Network).

IP ADDRESS MANAGEMENT

NEXO can operate with a static IP address or through dynamic assignment via DHCP:

- Static IP address: Ideal for configurations where precise control over the network is required.
- DHCP (Dynamic Host Configuration Protocol): Allows the device to automatically obtain network parameters (IP, subnet mask, and gateway) from a DHCP server.

The default IP address and other specific details are located in the Anexo I Network Configuration.

SUPPORTED PROTOCOLS

NEXO uses a number of standard protocols to ensure synchronization, audio streaming, and network management.

(a) Precise Time Protocol (PTP)

Used for clock synchronization between devices on the network, it is essential for IP audio transmission under the AES67 standard. PTP ensures that the devices work at identical sample rates, selecting a master that synchronizes the slave devices.

A single PTP domain must be configured in each network or section, or the network must be divided into sections called PTP Boundaries, each with an independent master.

(b) Session Announcement Protocol (SAP):

SAP makes it easy to publish and discover active AES67 audio streams on the network, allowing devices to automatically connect to available streams.

(c) Multicast Management (IGMP):

IGMP is used to manage multicast group subscriptions, optimizing audio and data transmission on medium or large networks.

This protocol ensures efficient use of bandwidth by avoiding sending unnecessary data to non-subscribed devices.

NOTE: On large networks, make sure the switches support IGMP Snooping. An IGMP querier must be activated on the network and unregistered multicast traffic must be filtered in order to have correct bandwidth management.

(d) QoS and DSCP.

Quality of Service (QoS) allows you to prioritize critical network traffic, ensuring that AES67 audio data has lower latency, lower packet loss, and more stable transmission on congested networks.

For optimal operation, it is recommended that the network switches used in the system support QoS and DSCP prioritization. Traffic classification in AES67 uses the following priorities:

- PTPv2 (Precision Time Protocol) → DSCP 56 (Expedited Forwarding - EF) traffic, prioritizing audio synchronization.
- Audio AES67 RTP (Real-Time Protocol) → DSCP 46 (Assured Forwarding - AF41), ensuring quality in audio transmission.
- Control traffic → DSCP 00, ensuring correct communication between devices without interfering with audio streams.

(e) ACSINet

Used for communication between devices and audio transmission within the NEO+ system, employing specific multicast addresses.

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