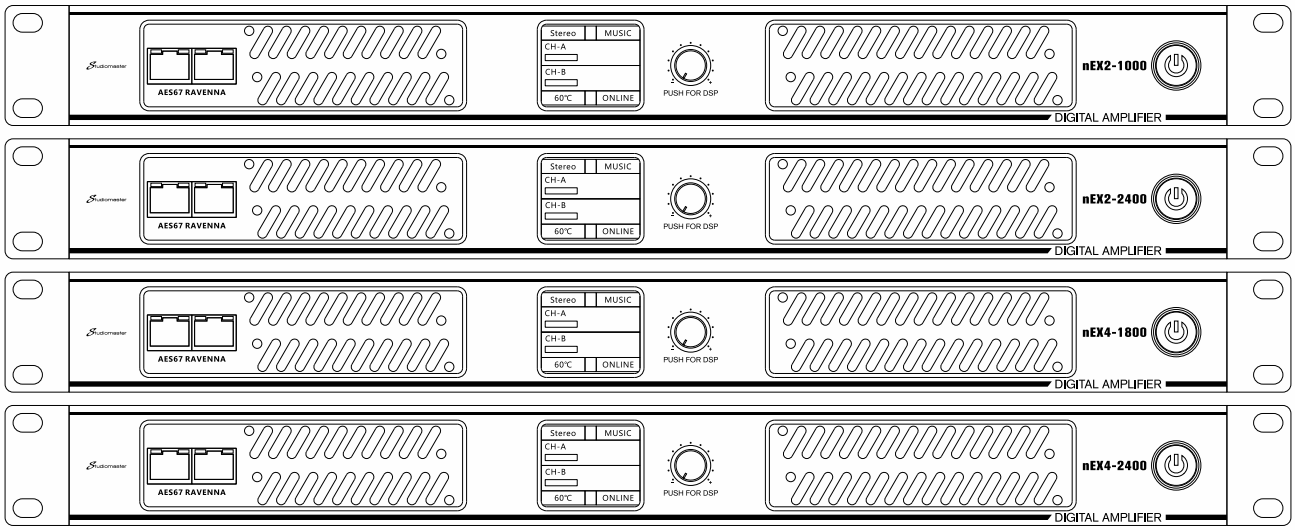
Studiomaster

Owner's Manual

Professional Class-D Amplifier



nEX SERIES

Professional Amplifier with AES67 network audio

This manual does not cover all details regarding the design, production, or modifications of the equipment, nor does it address every possible scenario during installation, operation, or maintenance. The contents are subject to updates without prior notice.

Contents

Important Safety Instructions

1.Connect the equipment only to the type of power outlet specified in this manual. Failure to do so may cause fire or electric shock.
2.Do not place containers of liquid or small metal objects on the equipment. Spilled liquid or falling metal can enter the unit and cause fire or electric shock.
3.Do not place heavy objects (including the equipment itself) on the power cord. A damaged power cord may lead to fire or electric shock.
4.Keep the power cord away from heaters. Melting of the cord can cause a fire.
5.Do not scratch, bend, twist, stretch, or heat the power cord. Damage to the cord may cause fire or electric shock.
6.When unplugging the power cord, always grasp the insulated plug body, not the cable. Pulling the cable may damage the cord and the socket, leading to fire or electric shock.
7.Do not handle the power plug with wet hands – risk of electric shock.
8.Keep the equipment away from liquids and moisture. Fire or electric shock hazard.
9.Do not use the equipment in the following locations:
– Unstable surfaces (e.g., shaking table or incline)
– Highhumidity or dusty areas
– Overheated environments (e.g., inside a parked car or in direct sunlight)
– Areas exposed to liquid splash (e.g., near steam, stoves, boilers, humidifiers)
10.The equipment has ventilation openings on the front and rear. Do not block them.
11.Maintain adequate clearance around the unit: at least 5 cm on the sides and 10 cm at the rear.
12.Before moving the equipment, unplug the power cord and disconnect all cables. Otherwise, cable damage may cause fire or electric shock.
13.Keep packing materials (e.g., cushions, desiccant, manual bag) out of children's reach.
14.Do not open the equipment cover – risk of electric shock. If repair or maintenance is needed, contact authorized personnel.
15.Do not modify the equipment. Unauthorized changes may cause malfunction, fire, or electric shock.
16.During a lightning storm, turn off the power and unplug the power cord as soon as possible.
17.The output signal may carry high voltage – risk of electric shock. Use only the dedicated connector.
18.Connect speakers to the amplifier output using only professional speaker cables. Use of unsuitable cables may cause fire.
19.When connecting equipment, turn off all audio devices and speakers.
20.Before turning on the amplifier, set the volume knob to minimum. Sudden loud sound may damage hearing.
21.If the equipment is not used for a long period, unplug the power cord from the AC outlet – fire hazard.
22.If the power cord is damaged (e.g., cut or exposed wires), replace it through authorized personnel. Continued use may cause fire or electric shock.
23.If the housing is damaged or the unit has fallen from a height, immediately turn off the power, unplug the cord, and contact authorized personnel – risk of fire or electric shock.
24.If any abnormality occurs (e.g., smoke, unusual odor), immediately turn off the power, unplug the cord, and contact authorized personnel – fire or electric shock hazard.
25.The power on/off switch is a lowvoltage control, isolated from the main circuitry. When the switch is in the "off" position, the equipment is not completely disconnected from the mains. The only way to fully isolate the equipment from the power grid is to unplug the power cord. This equipment is Class I, and the ground wire must be reliably connected to a socket with protective grounding.

1. Welcome

Thank you for purchasing our Class D power amplifier. Our company specialises in Class D technology. A highly skilled R&D team, experienced production staff, and a quality technical support team ensure reliable and stable operation in a variety of applications, providing you with an effortless experience.
To maximise efficiency and user experience, please read this manual carefully.

1.1 Overview

Developed for the fixedinstallation market, this series is a highquality Class D power amplifier with builtin DSP and can be connected to AES67 network audio.
This series continues the circuit architecture of our highend performance range, using proprietary multiloop control technology with excellent technical specifications. It features high quality, high reliability, and strong adaptability. The design is optimised for fixed installation, offering more intuitive operation and better suitability for rack space.

1.2 Key Features

- Compact size, lightweight, 1U rack space
- Wide voltage range: 100–240 VAC (±10%)
- Supports AES67 network audio
- Full DSP control
- 1.8inch TFT LCD screen
- Modular design for easy maintenance

1.3 DSP Functions

- **Input channels (each):**
  Signal generator, noise gate, feedback suppression, delay, parametric EQ, highpass / low pass filter, expander, mute.
- **Output channels (each):**
  Delay, parametric EQ, highpass / lowpass filter, compressor, limiter, mute, gain, phase invert.
- **Mixing:**
  Mixing matrix, gain sharing, gain adjustment.
- **Group:**
  Gain control, mute.
- **Program management:**
  Save, import, and export user programs.

1.4 How to Use This Manual

This manual provides basic information for proper installation and use. It does not cover every possible realworld scenario. For more details, visit our website or contact technical support, system integrators, or distributors.
Please keep your receipt or invoice – it is required for warranty service.

1.5 Warning Symbols

Symbol	Meaning
	Important operating or maintenance instructions in the manual.
	Dangerous uninsulated voltage inside the product – risk of electric shock.

2. Installation

2.1 Unpacking

Open the package and inspect the equipment for shipping damage. If damaged, notify the shipping company immediately – only you can claim compensation. Keep the packing case as evidence. We will provide necessary assistance.

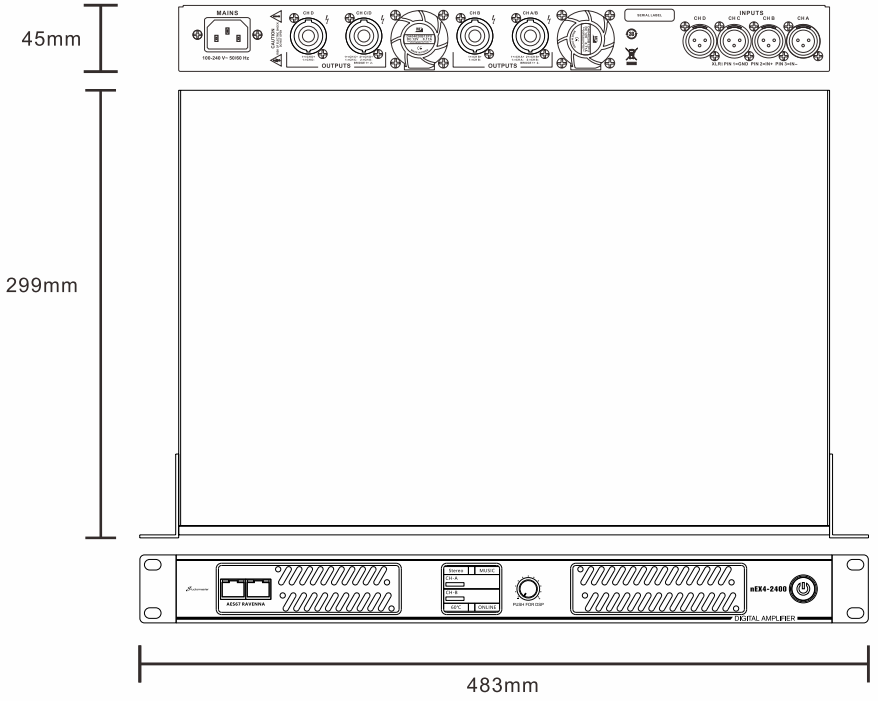
Save all packaging materials for future transport. Never ship the unit without proper external packaging.

Packing list:

- Amplifier ×1
- User's manual ×1
- Power cord ×1
- Rubber feet ×4

2.2 Rack Mounting

The amplifier fits into a standard 19inch rack, occupying 1U. Use four screws (not supplied) to secure it.

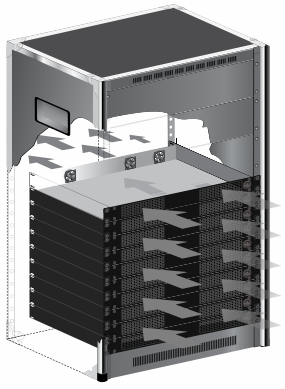


2.3 Installation Preparation

⚠	Before installation, ensure you have read and understood the safety warnings. Make sure the power cord is disconnected, the power switch is off, and the volume knob is fully down.
⚠	The amplifier is a highpower device and generates a strong magnetic field. Keep sensitive signal equipment at least 20 cm away to avoid noise.

Required for operation:

- Input cables
- Output speaker cables
- Ethernet cable (for AES67 network audio)
- Rack or mounting shelf



2.4 Cooling Instructions

Cooling airflow: cold air enters through the front panel vents, hot air exits from the rear. Operate the unit in an ambient temperature of 0°C to 40°C, with unobstructed airflow at both front and rear.
If the internal temperature exceeds 70°C, the output voltage will begin to decrease. At 85°C, the amplifier will automatically shut down as a protective measure. It will restart when the temperature returns to a safe level. Periodically power down the unit and clean the dust filter to maintain efficient cooling.

2.5 Power Cord

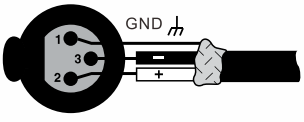
	Caution: The grounding terminal of the power cord must be properly connected to earth. Failure to do so may cause electric shock.

The power cord must have sufficient current capacity. AC supply voltage and frequency must be within ±10% of the rated values.

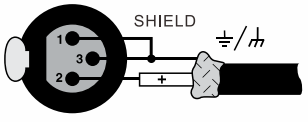
2.6 Input / Output Cables

General advice:

- Use shielded cables – the higher the shield density, the better.
- Prefer balanced connections for inputs to reduce noise.
- For unbalanced connections, keep cable length short (≤3 m).
- Avoid running lowlevel signal cables parallel to power cords or speaker cables – this may induce noise.
- Before changing any connections, turn off all equipment – otherwise hearing and speakers may be damaged.



Balanced analog input –
use XLR or TRS as shown.



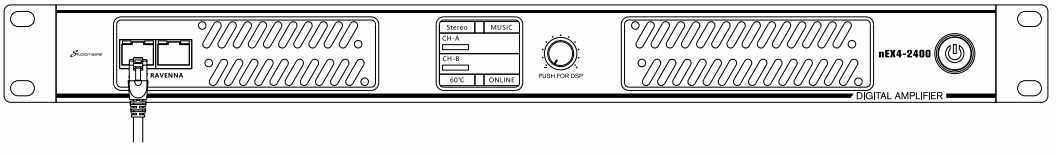
Unbalanced analog input –
use TS or RCA as shown.

3. Connecting to an AES67 Network

The nEX series amplifiers support **AES67** – a standard for highperformance, lowlatency audio over IP. To take full advantage of network audio routing, monitoring, and DSP control, use the **SM AES67 CONTROL** software.

3.1 Overview of AES67

AES67 enables lossless, ultralowlatency audio transmission over standard Ethernet networks. With the nEX amplifier, a single Cat5e/Cat6 cable carries both audio streams (receive/transmit) and device control/monitoring. The amplifier acts as an AES67 endpoint that can send and receive up to the number of channels indicated in the specifications.



3.2 Software Installation – SM AES67 CONTROL

1.Download the SM AES67 CONTROL installer from the official website or your distributor.
2.Doubleclick the installation package. Choose your preferred language (Simplified Chinese or English) and click **OK**.
3.Select whether to create a shortcut, then click **Next**.
4.Click **Install** – installation takes about 5 seconds.
5.Click **Finish** to launch the software.

3.3 Discovering Devices on the Network

1.Ensure your computer and the nEX amplifier are connected to the same local area network (LAN) via Ethernet.
2.Open the SM AES67 CONTROL.
3.If your computer has multiple network cards, select the correct one (the one connected to the amplifier) from the dropdown menu.
4.The software will automatically discover all AES67compatible devices on the network within about 5 seconds.
5.You can also manually refresh the device list via **Menu** → **Refresh**.

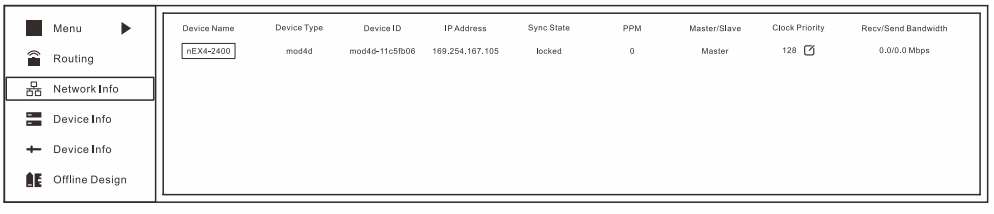
If the amplifier does not appear, check:

- Network cable connections and link LEDs.
- Firewall settings – allow SM AES67.exe, SM AES67 Upgrade.exe, and gohttpserver.exe.
- IP address settings (see Section 3.5).

3.4 Viewing Device Information and Parameters

On the left side of the software:

- **Device Information** column:
  - Device name (editable)
  - Device type (fixed)
  - Device ID (unique, fixed)
  - Synchronisation status: “Locked” means clock is synchronised with the PTP master; “Unlock” means initialising.
  - Clock priority (0–255, lower = higher priority)
  - Master/Slave status
  - Firmware version
- **Device Parameters** column:
  - Sampling rate (must match across all devices)
  - Packet time (e.g., 0.25 ms, 1 ms)
  - Network latency (1–10 ms, default 5 ms)
  - Running time
  - Temperature (keep below 70°C, do not exceed 80°C)



3.5 Setting the IP Address

The amplifier can obtain an IP address automatically (DHCP) or use a static IP.

1.Doubleclick the device name or row to open **Device Details**.
2.Go to the **Device Configuration** page.
3.Under **DHCP settings**, choose:
  - **Automatic** (DHCP) – the router assigns an IP.

◦ **Manual** – enter IP address, subnet mask, gateway, and DNS.

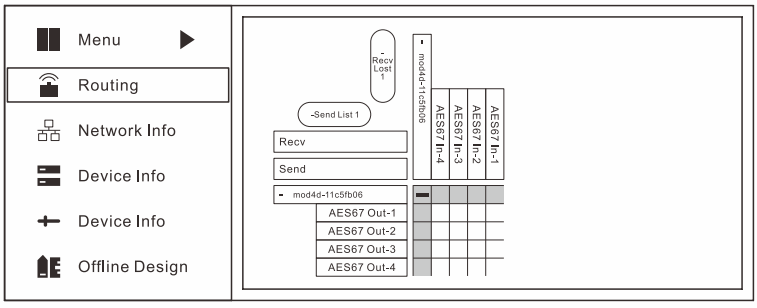
4.Click **Submit**. The device will reboot.

Important: The computer and amplifier must be on the same subnet for discovery and control.

3.6 Clock Priority and PTP Settings

AES67 uses PTP (Precision Time Protocol) for clock synchronisation. One device on the network acts as the master clock.

- To adjust a device's priority: go to **Device Information** → Clock **priority** column. Enter a value between 0 and 255 (default 128). Lower values increase the chance of becoming the master.
- To set PTP DSCP priority (Quality of Service): open **Device Details** → **Others** page. Change the **Ptp DSCP priority** (0–63, default 46). Higher values give audio streams higher priority on QoSenabled switches. Click **Restart** to apply.



3.7 Network Audio Routing (Unicast / Multicast)

Routing determines which network audio stream from a source device is sent to which input of the amplifier (or from the amplifier's outputs to other AES67 devices).

1.In the main GUI, go to **Routing** (left panel).

2.The left list shows **SendList** and their network output channels.

3.The right list shows **RecvList** and their network input channels.

4.Click the checkboxes to route a sending channel to a receiving channel.

For **multicast streams**:

- Open **Device Details** → **Stream** page.
- Enter a stream name, choose destination address (or autoallocate), select which sending channels to include, then click **Create**.
- To delete a multicast stream, select it and click **Delete**.

For **unicast streams**, the routing is established automatically when you create a pointtopoint route in the routing matrix.

3.8 Device Details and Transport Streams

Doubleclick a device to open detailed pages:

- **Stream** → **Unicast stream** – displays active unicast receive/send streams, routing records, and source/destination IP addresses.
- **Stream** → **Multicast stream** – create or delete multicast streams.
- **Diagram** – graphical view of DSP input/output channels with level meters, mute, phase, gain, and realtime CPU usage (keep below 85%).
- **Channel Volume** – manage channel names, gain, mute, and group assignments.
- **Program Management** – save/load/delete up to 20 user programs, export/import to PC.

3.9 Firmware Upgrade

1.In the main menu, click **Menu** → **Firmware Upgrade**.

2.Select the correct network card (same as the amplifier's LAN).

3.Click **Select Firmware** and choose the appropriate upgrade package (do not unzip).

4.Click **Refresh Device** to list all devices on the network.

5.Select the nEX amplifier and click **Upgrade**.
6.Wait for completion – do not power off during the process.

Note: For devices with version 2.x.x, first upgrade to 3.0.7 using a specific package, then upgrade to the latest version.

3.10 Troubleshooting Network Issues

Symptom	Likely cause	Solution
Software cannot detect device	Wrong network card, firewall blocking, cable fault	Select correct NIC; allow apps in firewall; check link LEDs; ping device
Device detected but cannot control	IP addresses in different subnets	Set computer and amplifier to same subnet (both DHCP or both static with matching prefix)
Firmware upgrade fails	Wrong upgrade package, network interruption	Use correct package; ensure stable connection; disable firewall temporarily
Audio dropouts or red bars in statistics	High network latency, packet loss, or overload	Use QoS; reduce network load; check switch settings; increase network latency to 10 ms

4. Operating Instructions

4.1 Speaker Protection

Clipping not only distorts sound but can also damage tweeters. Reduce the input signal to avoid clipping.

Strong infrasonic signals can burn out speakers. A typical source is a microphone drop producing high level lowfrequency energy. To prevent infrasonic issues:

- Install a highpass filter between mixer and amplifier, or
- Activate the highpass filter on the mixer. Set the filter frequency as high as practical without affecting the programme material (e.g., 35 Hz for music, 75 Hz for microphones).

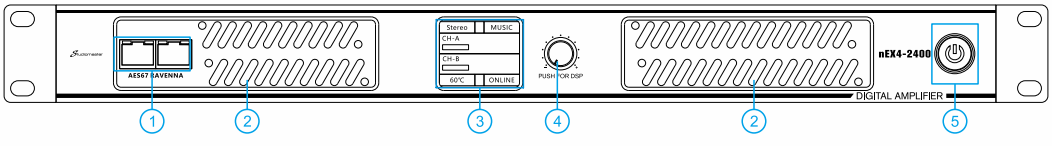
4.2 Important Notes

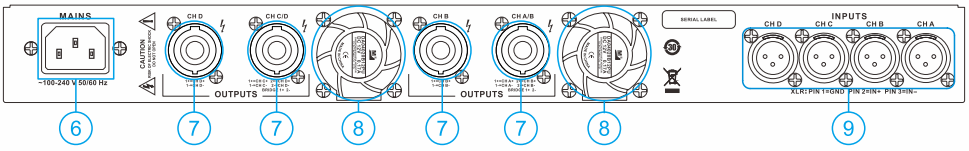
For best performance and maximum safety:

1.Configure the amplifier before use, including input/output wiring. See Section 2.
2.Be careful when connecting input signals and controlling output levels.
3.Do not connect input and output ground wires together – this creates a ground loop and may cause oscillation.
4.Never connect output cables to a power supply – electric shock hazard.
5.Unauthorised circuit modification is dangerous and voids service.
6.Do not operate the amplifier with the SIG LED flashing yellow continuously.
7.Avoid overdriving the mixer – it sends clipped signals to the amplifier, which reproduces them accurately and may damage speakers.
8.Do not operate the amplifier below its rated load impedance. Too low a load may trigger output protection, cause premature clipping, and damage speakers.
9.When the amplifier is on, the output terminals carry potentially lethal voltage.

Important: The manufacturer is not responsible for damage caused by misuse or overdriving.

4.3 Front / Rear Panel Description





1.Ethernet interface – dual RJ45 ports with builtin switch, supports AES67.
2.Cooling vent – forced airflow front to back, with dust filter.
3.LCD control screen – 1.8inch TFT display.
4.Control knob – rotate to navigate DSP menu, press to confirm.
5.Power switch – push to turn on/off.
6.Power inlet – IEC socket; use supplied power cord.
7.Output interface – speaker connectors (Neutrik speakON compatible).
  - Stereo mode: connect as per pinout diagram.
  - Bridge mode: connect as per diagram.
8.Fan – forced fronttorear cooling.
9.Analog audio input – balanced XLR/TRS combo jacks.

5. Menu Structure of the Display Screen

Opening Screen
Power on → logo displayed → after a few seconds, main appears.
Main Screen
Displays output level, clipping, compression per channel, operating temperature, and network connection status. Press the control knob to enter the operation menu.
Menu Items

- **1. Preset**
  - 00: System Default
  - 01: MUSIC
  - 02: LIVE
  - 03: SPEECH
  - 04–19: User presets (20 total storable)
- 2. **DSP Control**
  - Volume & Mute: perinput channel volume, peroutput channel mute
  - Matrix: audio routing and mixing
  - Mode: Bridge or Stereo
- 3. **Factory Reset** – erase all data and restore factory settings.
- 4. **Monitor**
  - V: output voltage per channel
  - I: output current per channel
  - State: protection status (over temperature, overload, DC)
  - TEMP: operating temperature
- 5. **Info**
  - Model
  - Communication type (Network)
  - MD: timestamp
  - FW: firmware version
  - IP Address

6. DSP Function Parameters

6.1 Input Channels

Function	Options
Signal Generator	On/Off; Sine wave (20Hz–20kHz, step 1Hz, -60.0~0dBFS), White noise (-60.0~0dBFS), Pink noise (-60.0~0dBFS)
Noise Gate	On/Off; Threshold (-90.0~-42.0dBFS), Attack (0–1000ms), Release (0–1000ms)
Feedback Exterminator	On/Off; Level 1, 2, 3
Delay	On/Off; 0–500ms, step 1/48ms; supports sample points, ms, m, ft
Parametric Equalizer	On/Off; 7 bands; types: Peaking, Highshelf, Lowshelf, Allpass; Gain ±24dB (0.1dB step), Freq 20Hz–20kHz (0.1Hz step), Bandwidth 0.019–4.750 (0.001 step)
HighPass Filter	On/Off; Freq 20Hz–19900Hz (0.1Hz step); Types: Butterworth 6/12/24/36/48, Bessel 12/24/36/48, LinkwitzRiley 12/24/36/48
LowPass Filter	On/Off; Freq 20.1Hz–20000Hz (0.1Hz step); same types as HPF
Expander	On/Off; Threshold -40.0~0dBFS; Ratio 1.2:1 to 128:1; Attack 1–100ms; Release 100–6000ms
Mute	Mute/Unmute
Gain	-60.0 to +12.0dB, step 0.1dB
Phase Invert	0° / 180°

6.2 Output Channels

Function	Options
Delay	Same as input delay
Parametric Equalizer	Same as input PEQ
HighPass Filter	Same as input HPF
LowPass Filter	Same as input LPF
Compressor	On/Off; Threshold -40.0~0dBFS; Ratio 1.2:1 to 128:1; Attack 1–100ms; Release 100–6000ms
Limiter	On/Off; Threshold -40.0~0dBFS
Mute	Mute/Unmute
Gain	-60.0 to +12.0dB, step 0.1dB
Phase Invert	0° / 180°

6.3 Mixing

- Mixing – full mixing matrix between inputs and outputs
- Gain Sharing – automatic gain sharing when multiple inputs are mixed to one output
- Gain Adjustment – perinput to peroutput gain, -48 to +12dB (0.5dB step)

6.4 Group

- Gain – -60.0 to 0dB (0.1dB step)
- Mute – Mute/Unmute

6.5 Program Management

- Supports saving up to 20 user programs
- Import, export, delete, and recall programs

7. Specifications

Model		nEX2-2400	nEX4-2400	nEX2-1000	nEX2-600	nEX2-400	nEX4-1800	nEX4-1200	nEX4-600	nEX4-400
Rated Output Power(THD+N=1 %, 1kHz continue sine wave, all channel driving)	8Ω/Stereo	2X1200W	4X600W	2X500W	2X300W	2X200W	4X450W	4X300W	4X150W	4X100W
	4Ω/Stereo	2X1800W	4X900W	2X750W	2X450W	2X300W	4X675W	4X450W	4X225W	4X150W
	8Ω/Bridge	1X3600W	2X1800W	1X1500W	1X900W	1X600W	2X1350W	2X900W	2X450W	2X300W
Output RMS Voltage		98.0V	69.3V	63.2V	49.0V	40.0V	60.0V	49.0V	34.6V	28.2V
Default Gain		33.8dB	30.8dB	30.0dB	27.8dB	26.0dB	29.5dB	27.8dB	24.8dB	23.0dB
Max Input Level		+21dBu								
THD+N		Typical:0.05%(10%Rated Power,8Ω)								
Cross-talk		>75dB(20Hz-1kHz,below Rated Power)								
Frequency Response		<±0.5dB(10%Rated Power,20Hz-20kHz,8Ω)								
Input Impedance		20kΩ（Balance）, 10kΩ（Unbalance）								
Damp Factor		>500(20Hz-200Hz,8Ω)								
SNR		>100dB (A weighted,20Hz-20kHz,8Ω)								
Main Power		100-240 VAC(±10%),50/60Hz								
Protection		Over Temperature Voltage Limit, Overload Protection, Output DC Protection								
Dimension		483x45x299mm(WxHxD)								
Net Weight		5.4kg	5.8kg	4.8kg			5.2kg		4.8kg	

8. Maintenance

The internal circuitry is complex and should only be serviced by trained technicians. If a fault occurs, contact technical support.
Do not include any accessories (power cord, manual, etc.) when returning the unit – they are not needed for repair, and we are not responsible for them.
Use the original packaging or equivalent protection for transport.

9. Packing Directions for Service Return

If you use your own packaging, it must meet these minimum requirements:

a. Doublelayer carton passing 275 PSI burst test, with 8 cm of solid foam polystyrene on all six sides.
b. Sufficient sealing tape to close the carton.
c. Do not use thin cartons. Damage from poor packaging is not covered under warranty.

10. OutofWarranty Service

We will diagnose the unit, inform you of the repair cost, and proceed only with your approval. If you decline repair, contact customer service to reclaim the unit promptly.

11. Warranty

We provide a three (3) year warranty from the date of purchase covering any failure (subject to exclusions).

12. Warranty Exclusions

This warranty does not cover:

- Damage due to improper use or accident.
- Losses covered by an insurance contract.
- Serial number defaced, modified, or erased.
- Damage caused by improper transport packaging.
- Unauthorised maintenance or modification.

13. Warranty Remedy

For any defect covered by warranty, we will repair, replace, or refund. Refund requires returning the defective product to us free of charge, with no liens. The refund amount equals the actual purchase price (excluding interest, insurance, handling, etc.). Warranty service is performed only at an authorised service centre or factory.

14. How to Obtain Warranty Service

Notify us of your warranty claim within the warranty period. Our authorised service centre will take appropriate action within a reasonable time after receiving the defective product. If you are unsatisfied with the repair, please inform us immediately.

15. Disclaimer of Indirect or Incidental Damages

You are not entitled to compensation for any damages caused by defects in our new products, including damage to other products. The company is not responsible for any direct or indirect losses resulting from equipment damage.

16. Warranty Modification

No one has the right to extend or modify this warranty. This warranty is not prolonged by any period of nonuse.

17. Design Changes

We reserve the right to change product designs at any time without notice and are not obligated to make corresponding changes to previously manufactured products.

18. Buyer’s Legal Remedy

After the warranty expires, the company has the right to cease any quality assurance measures. This statement supersedes any other statements contained in this manual.

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