Haozhiseng Audio

HAX12 PRO

FOUR CHANNEL PROFESSIONAL
SWITCHING POWER AMPLIFIER

Owner's Manual

CAUTION!

The amplifier runs on 100-240V AC voltage. Removing the cover will expose you to a potentially dangerous voltage! Do not use the unit if the electrical power cord is frayed or broken.
Power is supplied from 100-240V AC single-phase grounded 50/60 Hz source!

CAUTION!

To reduce the risk of fire or electric shock, do not expose the amplifier to rain or moisture!

CAUTION!

The amplifier can yield ***dangerous*** output voltage! Do not touch the non-insulated cable parts, connected to the unit in operation!

CAUTION!

The high sound pressure caused by the high output signal, applied to speaker systems, may endanger your hearing. Please, take care to observe the required safety precautions.

WARNING SIGNS:

Important information! Intended to warn the user about any important information contained in this Owner's Manual.

Hazardous voltage inside! Intended to warn the user about electric shock hazard due to high voltage inside the product.

This sign next to the output terminals warns about dangerous voltage while in operation.

GENERAL

The four-channel professional power amplifier LA12X is designed for sound signal high-fidelity amplification within professional sound reproduction systems.

The amplifier is equipped with built-in **DSP** engine (**DFM audio**, Germany), which provides the precision processing of the audio signal. To control the parameters of the amplifier (or group of amplifiers) the program **NetControl** is used, the amplifiers are connected via the **ETHERNET** interface.

To ensure faultless operation of amplifiers, please, take time to read this Manual before use.

WARNING!

Make sure to take all precautions where required.

Please, follow all instructions and guidelines.

To avoid any risk of electrical shock and/or fire hazard, please, do not expose this unit to rain or moisture. Do not use this unit near open water.

Use dry cloth to clean the unit.

Do not block fan vents.

Do not place the unit near heating radiators, furnaces or other heat-emitting devices.

Do not connect this unit to an ungrounded power supply line.

Protect the power cord against damage.

Disconnect the unit from power supply in case of thunder or during downtime.

In case of malfunctioning, caused by water or any other foreign matter inside or when the unit has been dropped, or the power cord has been damaged, or the unit has been found faulty, please, consult qualified personnel.

WARNING!

The amplifier yields high output power. The manufacturer shall not be held responsible for any damage to the speakers caused by excessive power from the unit.

UNPACKING

The manufacturer's quality control system provides for careful examination of each product before it leaves the factory to ensure its flawless appearance. After unpacking, please, check the unit for any physical damage. In case of damage, please, contact your local dealer. Keep the shipping carton and all packing material, as you may require them for reshipment of the unit.

DESIGN FEATURES

Physical Design

The amplifier is enclosed in a metal (steel) case of 2U height. The amplifier is designed to be installed into a standard 19" rack.

The amplifier must be fixed at four points, when installed in the RACK 19 "(two points in front and two at the rear).

Cooling System

Forced, cooling rate smooth adjustable system.

Five powerful fans. Backward air flow direction.

Dust Filter

One removable filter is located on the front panel under protective cover.

Covers can be removed and installed without the use of any tools.

Power Amplifier Units

amplifier is based on a modern, high performance **D** class topology.

This topology provides high efficiency, low heat generation and large output power At the same time, the high switching frequency of the output stage (450 kHz) provides sound quality comparable with the best analog amplifiers.

Analog inputs

The amplifier is equipped with four balanced analog inputs (**XLR** female).

The use of balanced inputs provides for an essential reduction of the environment-induced hum and noise interference with long input connecting cables.

*For **DSP** processing, the analog signal is converted to digital using four 24-bit A/D converters, operating at 96 kHz. The dynamic range of A/D and D/A converters is 120 dB.*

ETHERNET connectors

Two equivalent ports for connection to the **ETHERNET** network.

Provide the ability to configure and remotely control the amplifier over a network, using the ***NetControl*** software. The built-in router allows you to connect multiple amplifiers in *chain.*

Line Outputs

Four **XLR** connectors (male).

Provide the possibility of parallel connection of several amplifiers, using standard signal cables.

When analog input signal is used, the line outputs are connected in parallel to the corresponding line inputs.

DSP engine

The amplifier is equipped with a flexible and powerful high-end **DSP** from **DFM audio**, Germany.

*The close integration of processing and amplification allows the **DSP** to monitor and better respond to amplifier behavior, making dynamics processing far more accurate and effective than that typically achieved with separate components. The onboard **DSP** offers four channels of crossover filters, parametric **EQ**, **FIR** filter and alignment delay – everything needed to optimize a loudspeaker system.*

*Flexibly configurable **RMS** and **PEAK** limiters in each channel ensure reliable loudspeakers overload protection.*

***DSP** settings control is performed via **ETHERNET**, using personal computer with the installed **NetControl** software.*

For use in large installations, the processor has the tools for group control of many amplifiers simultaneously. The amplifier can be supplied with pre-formed library of passive speakers.

Software is designed for group control of a large number of amplifiers simultaneously. The program provides the ability to create virtual systems, which can be automatically merging with real amplifiers.

It is based on the work with Speaker and Preset libraries. The amplifier can be supplied with pre-installed Speaker libraries. Also, the user can update the Speaker library or create his own library. When creating a sound system, the user simply selects the desired type of loudspeaker from the library.

The NetControl software and user manual can be downloaded from https://www.china-sanway.com/download.html

User Interface

LCD display, LED indicators and controls (encoder and 4 buttons with illumination).

*LED indicators on the front panel shows a signal presence, limiters activation and the overload of each amplifier channel. Encoder, LCD and buttons provide local access to navigation and **DSP** control.*

Removable Power Cord

NEUTRIK **powerCON 32A.**

This feature is provided for convenience of transportation and rack mounting.

FUNCTIONAL FEATURES

Output Overload and Short-Circuit Protection

Individual per each channel. Protects the output stage of the amplifier units against short-circuiting, as well as limits the output current, when a maximum-level sine signal is applied continuously to 2-Ohms loudspeaker.

In case short-time overload (e.g. overload, caused by a sudden drop of complex load impedance), the fast output stage protection system limits the output current to 60A.

In case of long-term overload (>0.5sec), the slow protection system limits the output current to 40A.

In case of a short circuit, the protection system momentarily blocks the output of the amplifier. The processor periodically tries to turn on the amplifier. If the short-circuit persists for a long time, test attempts are made less often.

The protective system does not switch the amplifier off, so it resumes its unattended operation after the short-circuiting conditions are gone.

Built-in to each channel microprocessor ensures safe operation.

DC Output Protection

Independent for each channel. Prevents DC damage to loudspeakers.

The amplifier's schematics precludes transit of any clicks or noise during the power-on/off transition process.

Protection of loudspeakers against DC damage is ensured for each pair of channel by individual power supply units which are disabled in the event of output DC voltage or any powerful LF fluctuations. In case the protection system becomes active on all channels and both power supply units become disabled, all indicators go off.

Thermal Protection

Individual for each channel. Protects the amplifier's output stage against overheating.

In case the temperature of the output stage transistors rises to 80°*C,* the CLIP LED of the corresponding channel lights up. At the same time, the thermal protection system will gradually reduce the signal level as the temperature increases. When the output stage reaches 85°C, the thermal protection system will block the input and output stage of the corresponding amplifier channel. After the temperature drops to 70°*C,* the amplifier automatically resumes operation.

Soft Start

Reduces the power-on inrush current.

The soft start system is provided to reduce inrush current to the amplifier and to minimize the noise contributed by the amplifier to the power mains during the poweron process.

Soft Signal Start

Ensures smooth power-on sound signal rise.

During the power-on process, this feature ensures smooth gain from zero to the maximum level to provide for a smooth rise of the sound level emitted from the loudspeakers.

Overvoltage Protection System

Relay system. Used to protect the amplifier against overvoltage in the mains.

In case of accidental connection of the amplifier to incorrect-wired mains, the inter-phase voltage of 400V may be applied to the amplifier. In this case the protection system will block the mains connection to the power supply. Only the protection system stand-by power supply unit remains in operation. The system activates, whenever the mains voltage exceeds ~270V. The amplifier automatically resumes operation after the mains voltage goes down to ~270V.

Microcontrol Monitoring

All amplifier protection systems are controlled by the microcontrollers, built into each channel of the amplifier. Microcontrollers constantly monitor protection and control systems, which increases the overall reliability and fault tolerance of the amplifier.

CABLE REQUIREMENTS

Input Cables

Make sure to use only shielded cables whether balanced or unbalanced. Shielding when properly grounded, protects a signal against external electrical interference. As a rule, unbalanced lines of over 3 meters long are not acceptable. Greater distances require a balanced cable.

Avoid placing input cables close to power cords or power transformers.

Output Cables

The amplifier is capable of delivering high level output current; therefore, the wire gauge used for speaker cables is particularly important. Inadequate wire gauge adds significant resistance to the speaker's own impedance, reducing the power which is actually delivered to the speaker. It will also result in a decreased damping factor and possible fire hazard.

Since the power applied to the loudspeaker is of primary concern in system design, we have included the table below to allow you determine the appropriate wire gauge for your application.

Wire Gauge	Cable Resistance	Cable Power Loss		
		2Ohm Load	4Ohm Load	8Ohm Load
1.50mm^2	0.24Ohm	10.7 %	5.7 %	2.9 %
2.00mm^2	0.18Ohm	8.3 %	4.3 %	2.2 %
2.50mm^2	0.15Ohm	7 %	3.6 %	1.8 %
4.00mm^2	0.09Ohm	4,3 %	2.3 %	1.1 %
6.00mm^2	0.06Ohm	2.9 %	1.5 %	0.7 %

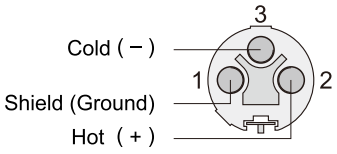
The table shows the percentage of the power loss in a 10-meter copper multiple-core cable. This table reflects the power loss as a percentage of the output power of the amplifier applied to the load. Use this table to determine the power loss to the load at other cable lengths. For example, if you plan to deliver 1000 Watts to 2-Ohm load through 20 m of 2.5-mm 2 cable, the power loss in the cable would be 7 % x 2=14 % of 1000 W or 140 W lost in the cable.

INPUT AND OUTPUT CONNECTORS

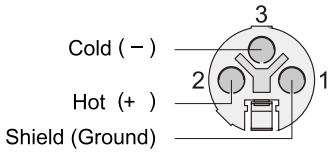
Input Connectors

Use **XLR** (male) connectors to connect to the amplifier inputs and **XLR** (female) connectors to line outputs.

XLR Wiring (male)



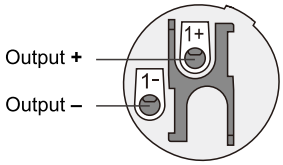
XLR Wiring (female)



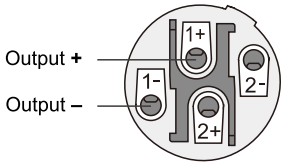
Output Connectors

Use SpeakON **NL2FC** or **NL4FC** connectors to connect speaker systems to the amplifier individual channel outputs. For connection of both channels via a single cable, use SpeakON **NL4FC**.

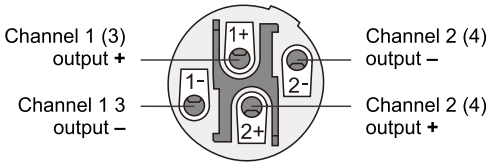
NL2FC for individual channel linking up



NL4FC for individual channel linking up

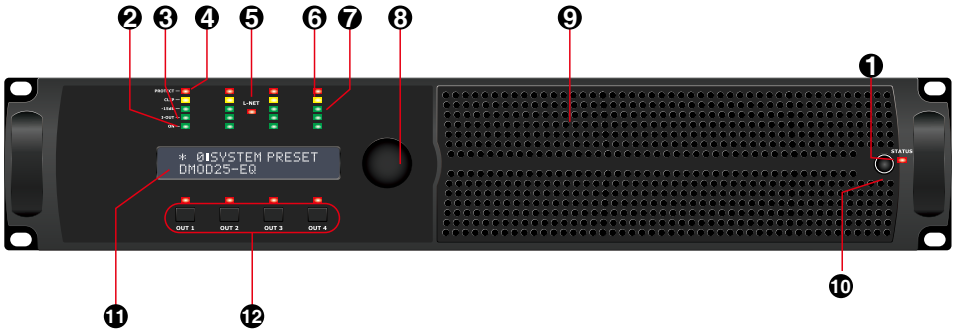


NL4FC for linking up two channels with a single connector



CAUTION! Never attempt to jumper or otherwise link up any pins of output connectors.

FRONT PANEL



❶ **POWER ON INDICATOR -** This LED light up when the mains switch is pressed .If it does not light up ,the unit is not connected to the mains or the mains fuse has blown .

❷ **-15dB -** This LED light up when the output reach -15dB .

❸ **Protect LED -** When this LED lights up during operation ,one of the protection circuits against over-temperature , overload ,shorted outputs ,radio frequency interference or DC faults has been triggered .The cause of the error e.g. shorted loudspeaker line must be remedied .In case of overheating ,wait a little until the amplifier switches back to operating mode itself .

❹ **limit indicator -** This indicator signals if the amplifier output is clipping or limiting. It has two different indication states:
a:If the clip limiter is engaged, it has a short time constant, and it illuminates briefly.
b:If the clip limiter is not engaged, it has an increased time constant, and it illuminates for a longer period.

❺ **Level control -** Calibrated detente potentiometers to alter the total gain of the power amplifier. In order to avoid distortions in mixing consoles upstream , these controls should normally be positioned between 0dB and-6dB . The calibrated markings show the additional attenuation directly.

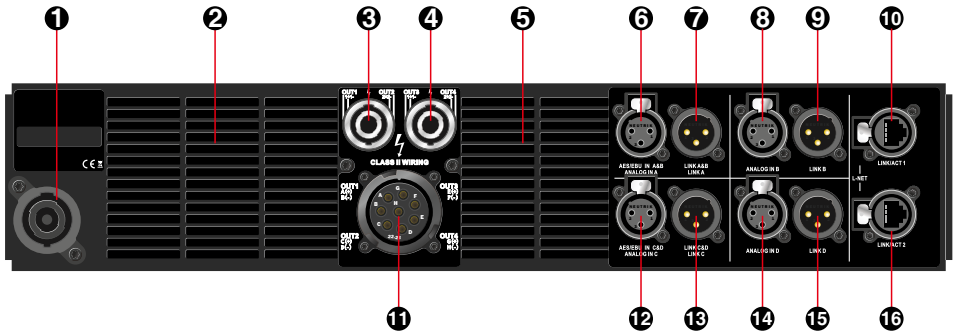
❻ **Fan outlet gills -** The amplifier uses forced air cooling. The cooling fan from the back of the intake air, and then exclude from the back. Never obstruct the intake and exhaust ports.

❼ **POWER Switch -** The unit is switched on via the power switch. The loudspeaker outputs are switched on via delayed relays so that no startup transients are audible .A current limiter prevents startup peaks on the mains line and prevents the mains fuse from blowing .

❽ 2 x 20 characters LCD display

❾ **Mute** - Channel selection for setting parameters/ mute corresponding channel.

REAR PANEL



❶ **Mains input -** mains cable connector.

❷ ❺ **Output air grill.**

❸ ❹ ⓫ **Speaker outputs -** output SpeakOn connectors for speakers connection. Connectors pin assignment are marked on the amplifier rear panel.

❻ ❽ ⓬ ⓮ **Analog inputs.**

❼ ❾ ⓭ ⓯ **Link outputs.**

❿ ⓰ **ETHERNET 1, ETHERNET 2 -** RJ45 connectors for ETHERNET network connection.

The device name in the main menu, the currently loaded preset and network information.
To switch to the other menu push the Encoder main menu. The encoder is not modified for several seconds when the system automatically jumps to the main menu.

1.Main Menu

Amplifier Status:
O: The system is running normally
S: Amplifier is starting up
E: Wrong amplifier

Connection Status:
C: PC connection
-: No connection

Input Status:
A: Analog input
L: AES-input lock
U: AES-input is unlocked

2.The volume

The input level of the motion encoder conversion module. With a short press can be 0.1 dB and 1 dB change between the degree of change. After 2 seconds, the module will jump back to the main menu.

3.Load the presets

Move the encoder to change the preset number. The preset number can be changed between 1 and 24 by the long push encoder that loads the preset and jumps back to the main menu.

4.IP settings

Press the encoder to select the number. Move the encoder to modify the value. Long press the encoder to take over IP settings.

If the encoder does not move until the 8 second module jumps back to the main menu.

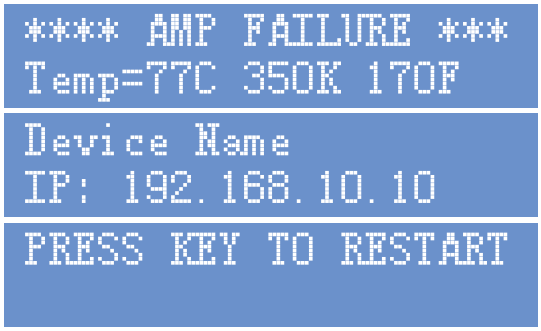
Note: When connecting to the computer, IP must be set to the same segment address as the computer IP.

5. Choose Enter

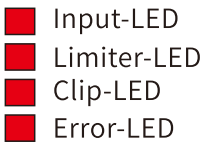
Move the encoder or toggle the analog and digital inputs of a short-pressed encoder. Long press the encoder to take over the input settings.

6. Function

If there is a problem with the amplifier, a failure message is displayed.



7.LED indicators



Input-LED:
AES mode: When the LED is lit, the module has no input signal
Analog mode: LED lights up when the input signal is above -0.5 DBFS
Limiter-LED
The LED is lit when the software limit is active
Clip-LED
LED lights up when the hardware pressure limit
Error-LED
The LED is lit when an error occurs in the hardware. The output is muted.

MAINTENANCE

Cleaning of Dust Protective Air Filter

No special tools are required for removing the filter.

Filters are located under the cover grills on the front panel. To removethe cover, use your finger to turn the screws used for fixing (shown in the figure) and pull it toward. The locking latch must be unlocked. After that, carefully remove the cover and the filter. A heavily dusted filter can be washed in any synthetic detergent, thoroughly rinsed and dried. In case the filter is worn out, replace the filter with a spare one supplied.

ATTENTION! *Never install a wet filter.*

Do not dry the filter with hot air or expose it to direct sun rays.

Professional Power Amplifier Specifications

	HAX12 PRO
Output Power 1KHz,<0.05%THD:	
8Ω Stereo Power:	4x1500W
4Ω Stereo Power:	4x2800W
2Ω Stereo Power:	4x3000W
THD (20Hz-20kHz for 1W):	<0.1%
THD (1kHz and 1 dB below clipping):	<0.05%
DSP Processor:	DFM
Signal Noise Ration:	>120dB
Frequency Response(+/-0.1dB):	10Hz-34kHz
Damping coefficient:	>500
Impedance(balanced/unbalanced):	20KΩ/10KΩ
Gain (optional):	35dB
Output socket:	Speakon Connectors(NEUTRIK)
Input socket:	Combo XLR type,3pin(NEUTRIK)
Link socket:	XLR type,3pin male(NEUTRIK)
Protection:	Short circuit, open circuit, thermal, overload, DC, super audio protection
Power Requirement:	100-240V~50Hz
Size(W x H x D):	483x459x88mm
Weight(net):	18Kg