Inspection and preventive maintenance

How to do preventive maintenance

Inspect the product periodically as indicated, and after any corrective maintenance operation.

Structure and cleanness

Before and after each deployment (touring applications), or at least once a month (fixed installations):

- External structure (p.16)
- Cleanness (p.17)

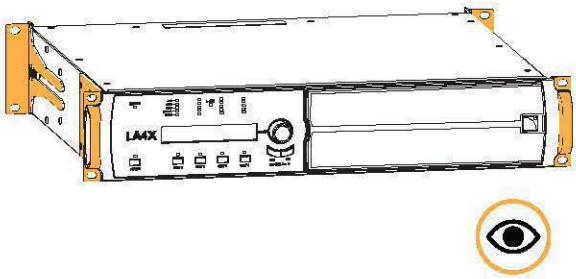
Functionalities

At least once a year:

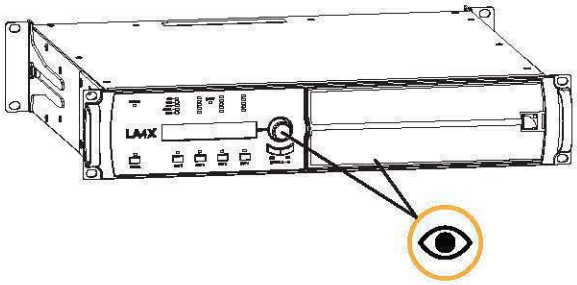
- Normal start-up sequence (p.17)
- Network functionalities and firmware (p.17)

External structure

The  indicates a visual inspection.

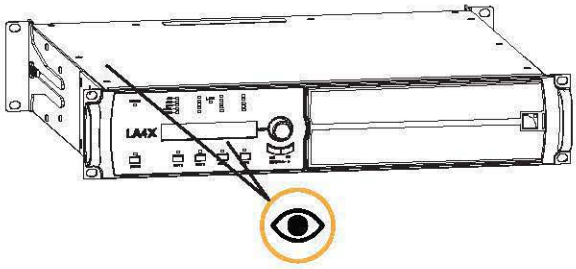


side brackets, front handles, and rear brackets are present and not damaged

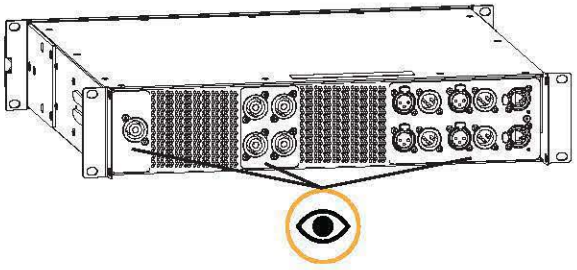


encoder wheel, and grill and foam filter are present and not damaged

see also Cleanness (p.17)



chassis, Lexan plate, LCD screen, and LEDs are not damaged



connectors are not damaged

Cleanness

Equipment

- air blower

Procedure

1. Disassemble the grill to clean the foam filter.
   Refer to the Grill and foam filter (p.72) procedure.

   Do not touch any part inside the amplified controller.
2. Clean the amplified controller through the front grill with an air blower.
3. Reassemble the foam filter and the grill.

Normal start-up sequence

Procedure

1. Plug the amplified controller to mains.
2. Power on the amplified controller.
3. Check that the LCD screen and all the LEDs lit during the start-up sequence.

Network functionalities and firmware

Equipment

- computer with LA Network Manager
- CAT5e U/FTP cable

Procedure

1. Connect the Ethernet port 1 of the amplified controller to an Ethernet port of a computer running LA Network Manager.
   Use the CAT5e U/FTP cable.
2. Run LA Network Manager.
3. Check that the amplified controllers are detected as online Units.
   Refer to the **LA Network Manager Help**.
4. Check that all LA4X in the system run the same version of the firmware, and that it matches with the version of LA Network Manager in use.
   Refer to the **LA NWM and Firmware Compatibility Issues** technical bulletin.
5. If convenient, update LA Network Manager and the firmware to the latest versions.

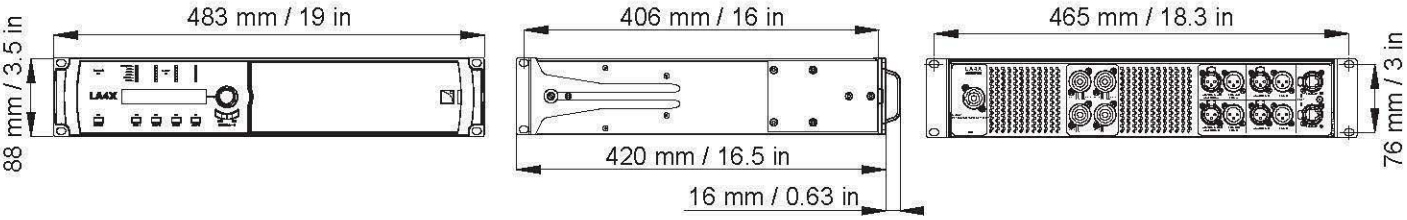
   If using a third-party control system such as Crestron or Extron, check that updating firmware does not break compatibility.

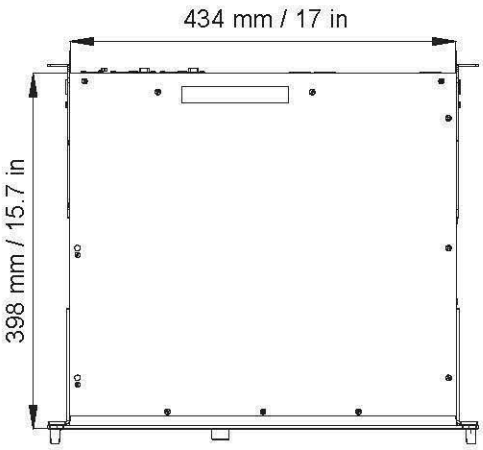
Installation

Mounting

The LA4X is two rack units high (2U) and can be mounted in an EIA-standard 19" rack using the four points on the front panel. Use the fixing material provided by the rack manufacturer to mount the controller to the rack front rails.

LA4X dimensions





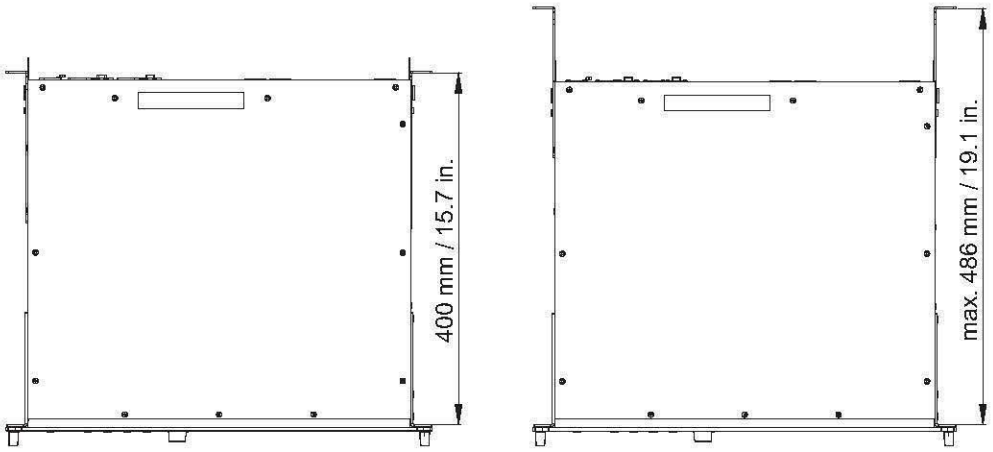
Risk of damaging the amplified controller during transport

During transport or while on tour the amplified controller should be rear supported in addition to the front panel mounting.

Use the rear brackets provided with the amplified controller.

Any mechanical damage to the amplified controller used in portable applications without rear support is not covered by warranty.

LA4X with rear rack support brackets



Ventilation

To maintain moderate operating temperatures, the LA4X is equipped with two fans and grills providing front to rear airflow.

Ventilation instructions

Install the controller in an open area so that the front and rear panels are located at a minimum distance of 30 cm / 12 inches from any external object or structure.

Ensure the front foam filter is clean and dirt free.

Do not block the front and rear ventilation grills.

Ventilation when rack-mounted

Do not block the ventilation grills with front or back panels or doors. If not possible, use a forced-ventilation system.

When stacking more than one controller in a rack, mount them directly on top of each other or close any open space in the rack with blank panels.

Connecting to AC mains

Electrical specifications

AC mains specifications

Verify the electrical conformity and compatibility of the mains supply.

Only connect the product to an AC power outlet rated 100-240 V, 50-60 Hz, with the following current values:

100-120 V: 20 A

200-240 V: 10 A

WARNING: The product is of Class 1 construction and shall be connected to a mains socket outlet with a protective connection to earth.

Three-phase circuit

When the product is used in a three-phase circuit, verify the electrical conformity and compatibility of the three-phase circuit.

Verify that the three phases work, and balance the loads between the three phases.

Verify that the neutral and earth work.

Never try to emulate a 230 V circuit connecting an apparatus to two live wires of a 120 V three-phase circuit.

Never try to emulate a 200 V circuit connecting an apparatus to two live wires of a 100 V three-phase circuit.

Circuit breaker

Always interconnect a Class C circuit breaker between the product and the mains supply.

The circuit breaker current rating depends on the mains voltage rating, as follows:

100-120 V: 20 A

200-240 V: 10 A

Planning the power of the electrical generator

Electrical generator

You must power on the generator before powering on the product.

LA4X draws 10 A max from 230 V.

A typical generator has a power factor of 0.8 and should operate at 70% load for good efficiency.

The kVA provision for one LA4X should therefore be:

(10 A × 230 V) / (0.8 × 70%) = 4.1 kVA

This calculation is an example using typical values. It can be adapted using the table in section Power consumption (p.21).

Power cord

The removable power cord is fitted at one end with a 20 A powerCON connector.

The other end and the wires color code depends on the cord type, as follows:

type	plug	live	neutral	ground
CE CN	CEE 7/7, 16 A / 250 V, grounded GB1002 GB2099, 16 A	brown	blue	green/yellow
US	NEMA 5-15, 15 A / 125 V grounded	black	white	green
INT	bare ends (local power plug to be fitted)	black	white	green/yellow

Strictly apply the specific safety regulations of the country of use.

Do not defeat the ground connection of the supplied power cord using an adaptor or any other methods.

A suitable plug must be wired to the INT power cord.

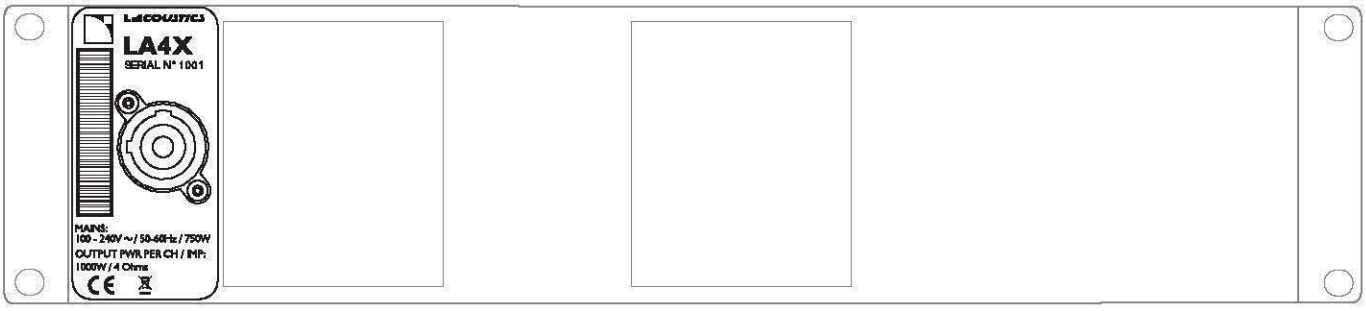
Verify that the plug conforms to the specific voltage and current rating given in section Electrical specifications (p.19).

Plugging the amplified controller

How to plug the amplified controller to the AC mains.

Procedure

— First, connect the powerCON to the amplified controller mains panel.



— Then, connect the power plug to the mains socket.
Following this order improves the powerCON longevity.

Power consumption

The LA4X power requirements depend on the load impedance and the signal level.

Mains input power and current draw (all channels driven)

Maximum output power	4 x 1000 W at 4 or 8 Ω
1/3 output power (-5 dB)	7 A / 1600 W
1/8 output power (-9 dB)	3 A / 750 W

Current values above are given for mains rated at 230 V. Multiply by:

- 2.3 for 100 V
- 1.9 for 120 V
- 1.15 for 200 V

Mains input power and current draw in Idle and Standby modes

Idle	0.9 A / 60 W
Standby	0.7 A / 11 W

Due to line filter operation, power factor is < 0.3 in Idle mode, and < 0.1 in Standby mode. Current values above are given for mains rated at 230 V and decrease with lower mains.

Output power references

A third (1/3) of the maximum output power corresponds to the worst case scenario of a program source using highly compressed music or pink noise with amplified controller driven to clip level.

An eighth (1/8) of the maximum output power corresponds to a loud music program with a small dynamic range and 9 dB of headroom (IEC standard power rating).

Heat power calculation

If a 4 Ω load is connected to each output channel of the LA4X, each channel delivers up to 1000 W.

With a standard use at 1/8 of full power (9 dB headroom), the power delivered per channel is:

1000 / 8 = 125 W, so a total power of 4 x 125 = 500 W.

According to the table in section Power consumption (p.21), the LA4X power consumption is 750 W. The heat power produced is then (difference between power consumption and output power):

750 - 500 = 250 W

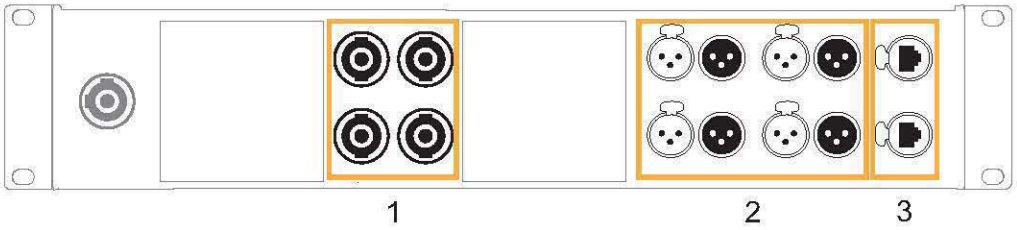
Audio and network cabling

Connection panels

The amplified controller's rear side features connectors for audio and network cabling:

1. For connection to the loudspeakers.
2. For connection of the analog and digital (AES/EBU or S/PDIF) audio sources, and for linking the signals to another amplified controller.
3. For connection to an AVB network, and to be remotely controlled by LA Network Manager.

LA4X audio and network connection panels

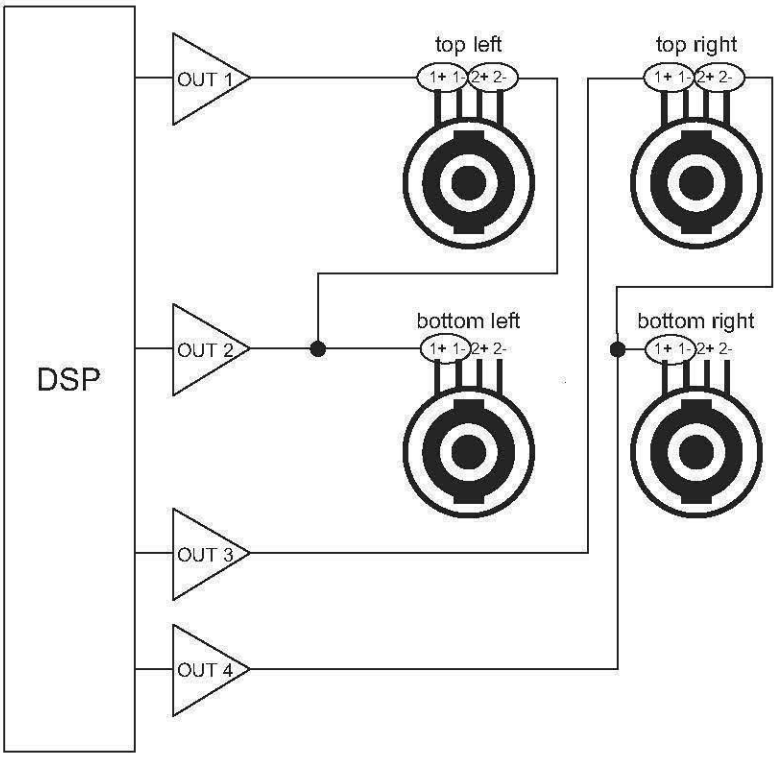


Speaker panel

The four 4-point speakON connectors on the rear panel are for loudspeaker connection. They are wired as follows:

left speakON connector		right speakON connector	
Pin 1+	Out 1+	Pin 1+	Out 3+
Pin 1 -	Out 1 -	Pin 1 -	Out 3 -
Pin 2+	Out 2+	Pin 2+	Out 4+
Pin 2 -	Out 2 -	Pin 2 -	Out 4 -

output audio paths



Signal panels

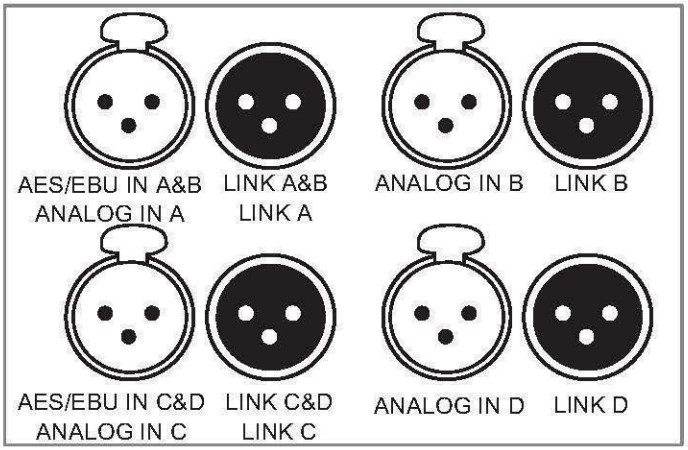
The eight XLR connectors on the rear panel are for analog or digital signal cabling.

The XLR connectors can transport analog or digital signals depending on the input mode selected by the user for channel pairs AB and CD (the two selections can be different). Connections to the IN connectors are referenced in the table. Refer also to section XLR INPUT MODE (p.45).

input mode AB	IN A / IN A&B	IN B
Analog	analog audio source (1 channel)	analog audio source (1 channel)
AES/EBU	digital audio source (2 channels)	not used

input mode CD	IN C / IN C&D	IN D
Analog	analog audio source (1 channel)	analog audio source (1 channel)
AES/EBU	digital audio source (2 channels)	not used

Each LINK connector is wired to the corresponding IN connector, and thus transports the same type of signal.



Analog input mode

The XLR connectors are wired according to IEC 60268-12:

- pin 1: shield
- pin 2: + signal
- pin 3: - signal

The female XLR input connectors ANALOG IN A to ANALOG IN D can receive up to four analog signals (when setting the analog input mode for channel pairs AB and CD). The headroom of the input circuits is high enough to accept the maximum output level from virtually any line level signal source (up to 22 dBu).

Each LINK connector is passively wired in parallel to the corresponding IN channel. The input impedance is high enough (22 kΩ, balanced) to allow multiple parallel input connections.

AES/EBU input mode

Digital audio source specifications
Standard: AES/EBU (AES3) or electrical S/PDIF (IEC 60958 Type II)
Sampling frequency: 44.1, 48, 64, 88.2, 96, 128, 176.4 or 192 kHz
Word length: 16, 18, 20 or 24 bits

The AES/EBU inputs are transformer balanced and their XLR connectors are wired according to IEC 60268-12.

The female XLR input connectors AES/EBU IN A&B and AES/EBU IN C&D can receive up to four digital signals (when setting the AES/EBU input mode for channel pairs AB and CD). The input format is AES/EBU (AES3) or electrical S/PDIF (IEC 60958 Type II).

Each LINK connector is electronically buffered to allow daisy-chaining any number of amplified controllers. It also features a failsafe relay to ensure wiring continuity in case of amplified controller shutdown.

L-NET panel

Use the two etherCON connectors for the remote control of LA4X over the L-NET network using LA Network Manager. The etherCON connectors are AVB-capable.

Each of the two etherCON connectors can be equally used as an IN or a LINK connector.

Analog audio

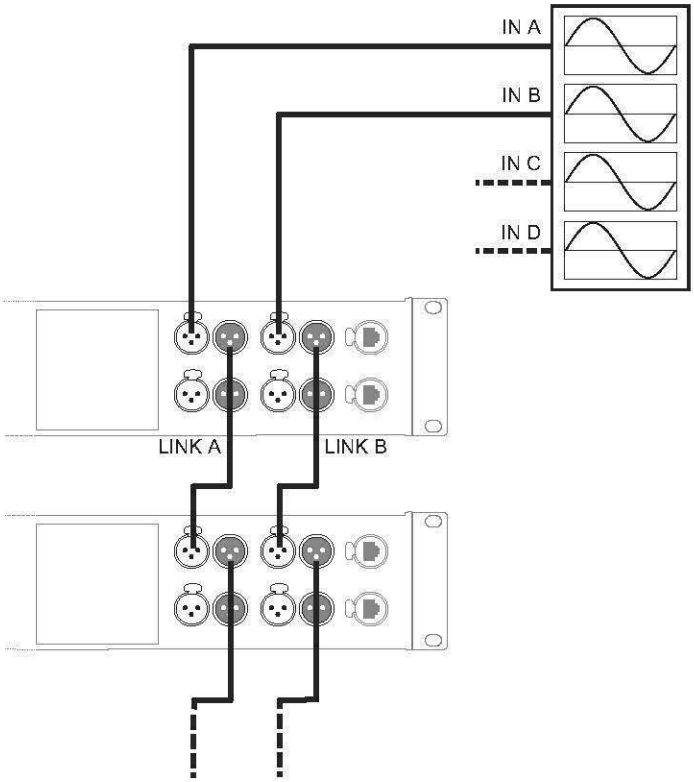
Balanced cables

Symmetrical (balanced) shielded cables are highly recommended as balanced signals are less sensitive to AC hum and radio interference.

Unbalanced lines may add noise especially over long cable runs.

In a daisy-chain layout, the male XLR link connectors LINK A to LINK D feed the input signals to the next amplified controller in the signal chain.

daisy-chaining analog audio



Analog daisy-chain and LA4/LA8 with power off or in standby

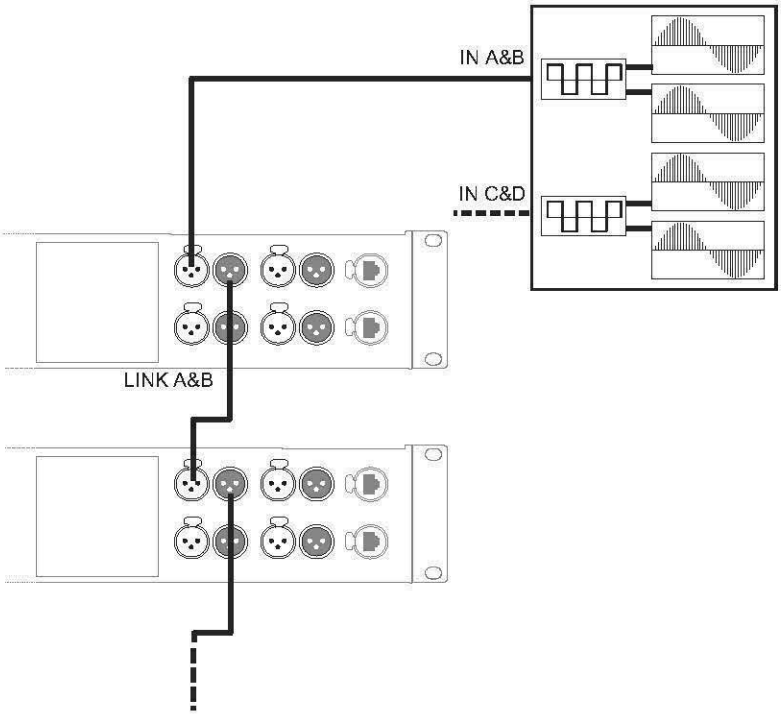
In an analog daisy-chain, LA4 and LA8 with power off or in standby cause sound distortion at high input levels to the other amplified controllers they are connected to.

Make sure all LA4 and LA8 are powered on and in operating (not in standby) mode, or disconnect them from the daisy-chain.

Digital audio

In a daisy-chain layout, the male XLR link connectors LINK A&B and LINK C&D feed the input signals to the next amplified controller in the signal chain.

daisy-chaining digital audio



Cables for AES/EBU digital audio

AES3 specifies that the nominal characteristic impedance of cables used for AES/EBU digital audio transmission shall be 110 Ω ± 20%, and closer tolerances allow for increased transmission reliability over long lengths or higher sampling rates.

Therefore, it is highly recommended to use high-quality AES/EBU rated cables only, although certain cables designed for balanced analog audio prove to be acceptable at 48 kHz sampling rate over very short distances.

It is recommended to use single lengths of cable between AES/EBU outputs and inputs. Using several shorter cables joined together reduces performance. If it is not possible to use single lengths, it is required to use the same model of cable between two AES/EBU interfaces.

In case an amplified controller shuts down, the failsafe relay makes a passive connection between the AES/EBU IN ports and the LINK ports to maintain continuity. However the signals are no longer refreshed for the next amplified controller, so that the input cable and the link cable must be considered as a unique input cable with regard to the maximum supported length.

In case of transmission losses, try to reduce the sampling frequency of the digital audio source. Moreover, as a general rule, avoid using sources rated beyond 96 kHz, as the maximum possible cable length is reduced, while the additional information is cancelled by SRC to 96 kHz.

L-NET/AVB

Do not create loops in the network setup.

Always place LA2Xi, LA4X, and LA12X amplified controllers *before* LA4/LA8 amplified controllers in daisy-chain networks.

LA4 and LA8 amplified controllers are equipped with former generation 100 Mb/s Ethernet ports that cannot communicate with Ethernet ports of different capabilities, creating detection issues in LA Network Manager.

- LA4X amplified controllers with HARDWARE INFO **ID1**, **ID2** or **ID3** (in MONITORING & INFO menu) do not support AVB nor redundancy. These Units can be upgraded to support AVB by purchasing and installing KR LA4XDSP2.
- LA4X amplified controllers with HARDWARE INFO **ID4** or higher (in MONITORING & INFO menu) support AVB but do not support redundancy.

Use the two etherCON connectors on the rear panel to connect LA4X both to L-NET and to an AVB network. Real-time audio traffic and control traffic are automatically managed by AVB on the same network.

Refer to the **LA Network Manager** Help for more information on how to connect LA4X to the AVB network in daisy-chain, star or hybrid topologies.

Speaker

Use the speakON connectors to connect an enclosure to the amplified controller.

For cabling schemes, refer to the **Amplification reference** technical bulletin.

For the enclosure drive capacity per amplified controller, refer to the **Amplification reference** technical bulletin or the **Preset guide**.

Operation

Powering on

Press the POWER key (2) for one second.

The amplified controller goes through a 6 seconds start-up sequence displaying **Initializing Controller**. The POWER LED turns off, then is lit in orange (1).

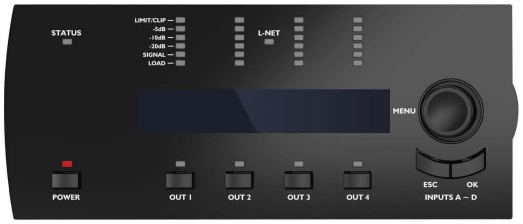
The amplified controller is ready for use when the main screen is displayed and the power LED is lit in green. Refer to section Main screen description (p.31).

Powering off

Press the POWER key for one second.

The LCD screen and LEDs turn off. The POWER LED is lit in red to indicate that the controller is not disconnected from mains.

The amplified controller is no longer detected over the network.



Powering off the amplified controller does not disconnect it from mains.

Power loss

If power is lost, the amplified controller shuts down, but all parameters are restored when the amplified controller switches on again.

Setting to standby mode

To reduce the electrical consumption, the amplified controller can be put in standby mode.

Use LA Network Manager to set the amplified controller to standby or back to operating mode. Refer to the **LA Network Manager** Help.

An amplified controller in standby mode displays **Standby mode** and its POWER LED is lit in orange.

Standby mode can also be cancelled from the amplified controller front panel by pushing and holding the encoder wheel for one second.

Interpreting the front panel LEDs

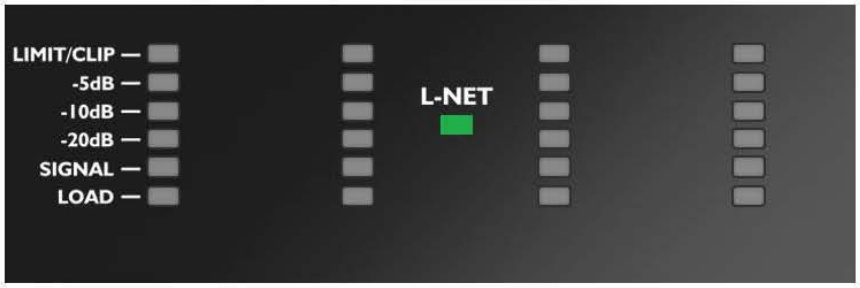
STATUS

The STATUS LED on the front panel displays the state of the amplified controller.

- green: when the LA4X operates normally
- red: during firmware update or when a fault is detected in the LA4X circuitry, indicating a protection system is active. Refer to Error messages (p.67)

L-NET

The L-NET LED on the front panel displays the L-NET status.

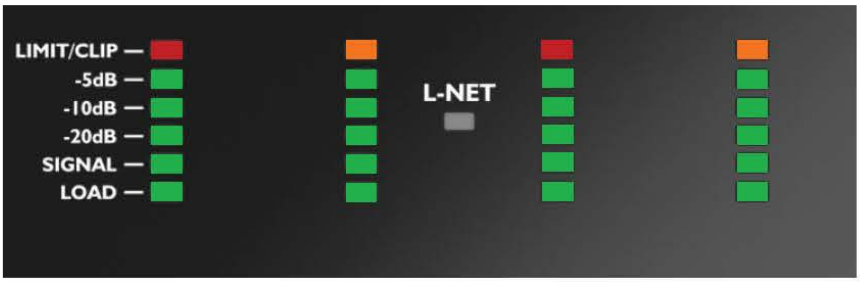


- green: when LA4X is remotely controlled by software such as LA Network Manager (refer to the **LA Network Manager** Help).
- off: when no software remotely controls the amplified controller.

The front panel commands remain accessible when the L-NET LED is lit.

Meters

The four LED meters (six LEDs each) display the state of the corresponding output channel.



LIMIT/CLIP	orange: the L-DRIVE limiter is activated with gain reduction of at least 3 dB red: the output voltage reaches the maximum level (signal clip)
-5dB	
-10dB	green: the output voltage reaches 5, 10 or 20 dB below the maximum level
-20dB	
SIGNAL	green: a signal is detected and the output voltage reaches 0.1 V
LOAD	green: a load is connected and the output module delivers a minimum of 0.8 A

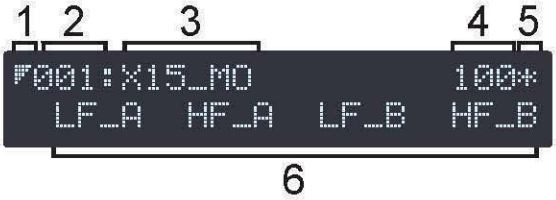
OUT

The four OUT LEDs on the front panel display the mute status.

- white: when the corresponding output channel is muted
- off: when the corresponding output channel is unmuted

Main screen description

The amplified controller displays the main screen at the end of the startup sequence.



1. **low latency symbol:** indicates loaded preset is a low latency preset (refer to the **LA Network Manager** help)
2. **preset memory number (001 to 255):** memory space containing the current preset. The preset can be a user preset or come from the on-board preset library — refer to section LOAD PRESET (p.36)
3. **preset name:** as in the on-board preset library or as entered by the user (if stored in a user preset)
4. **last number of the IP address (1 to 254):** identifies the controller within the L-NET network — refer to section ADDRESS (p.58)
5. **star sign:** indicates unsaved changes in the preset parameters — refer to section STORE PRESET (p.38)
6. **output name and input selection:** placed above the corresponding output key, written in the **xx_y** form, where:
   - **xx** indicates the type of transducer section or enclosure to be connected to the output channel:

     LF: low frequency transducer section, part of a 2 or 3-way loudspeaker enclosure
     MF: mid frequency transducer section, part of a 3-way loudspeaker enclosure
     HF: high frequency transducer section, part of a 2 or 3-way loudspeaker enclosure
     PA: passive loudspeaker enclosure
     SB: subwoofer enclosure with the front face towards the audience
     SR: subwoofer enclosure with the front face in the opposite direction from the audience (in a cardioid configuration)
   - **y** indicates the input selection of the output channel (input channel or input channels combination selected to drive the output channel) — refer to section PRESET PARAMETERS (p.39):

     A: IN A
     B: IN B
     A+: sum of IN A and IN B (A+B)
     A-: difference between IN A and IN B (A-B)
     C: IN C
     D: IN D
     C+: sum of IN C and IN D (C+D)
     C-: difference between IN C and IN D (C-D)
     X: sum of IN A, IN B, IN C and IN D (A+B+C+D)

Using quick access functions

Quick access functions are available directly from the main screen.

Locking/Unlocking the front panel

The front panel can be locked to prevent unintentional operations.

- To lock: press and hold simultaneously the ESC and OK keys until **Display Locked** is displayed.
- To unlock: press and hold simultaneously the ESC and OK keys until **Display Unlocked** is displayed

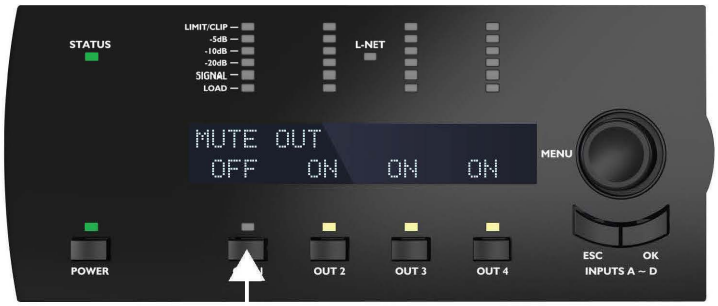
Muting/Unmuting an output channel

By default, all output channels are muted in all factory presets (the OUT LEDs are lit).

- To unmute an output channel: press the corresponding OUT key for less than 0.3 seconds.
- To mute an output channel: press the corresponding OUT key for less than 0.3 seconds.

The screen displays **MUTE OUT** and the mute status of each output channel for 2 seconds.

example: unmuting OUT1



Gain can be set before unmuting.

Modifying gain

About this task

Gain can be modified for sets of output channels having input channels in common in their input selections.

Examples of output channels having input channels in common:

- The OUT1 key displays gain for OUT1, OUT3 and OUT4 (containing IN A)
- The OUT2 key displays gain for OUT2, OUT3 and OUT4 (containing IN B)
- The OUT3 and OUT4 keys display all channels (containing IN A and/or IN B)

For individual gain settings, refer to section PRESET PARAMETERS (p.39).

Procedure

1. Press and hold the OUT key of the corresponding output channel.
   The screen displays the gain values of all the output channels having an input channel in common.

   example with OUT3 displaying OUT3 and OUT4 (IN B)

2. Turn the encoder wheel to modify the gain values.

   Turn the encoder wheel to modify gain by steps of 0.1 dB, or
   Press and turn simultaneously the encoder wheel to modify gain by steps of 1 dB.

3. Release the OUT key to return to the main screen.

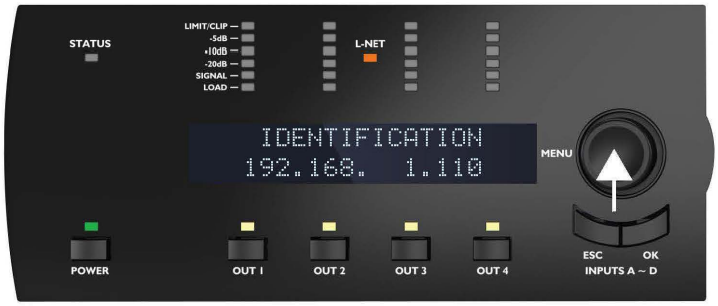
Identifying an amplified controller

If the amplified controller is connected to the L-NET network, it can be identified among other amplified controllers on the Workspace of LA Network Manager (refer to the **LA Network Manager** Help).

To identify an amplified controller, press and hold the encoder wheel.

On the Workspace of LA Network Manager, the amplified controller blinks in yellow.

On the amplified controller, the L-NET and OUT LEDs flashes and the screen displays **IDENTIFICATION** and the complete IP.



Displaying input level, input selection, input mode and group information

Press and hold the ESC or the OK key to display information about the input level, the input selection, the input mode and the group(s) the amplified controller is assigned to.

- The LED meters and the first line of the screen display information about input channels IN A, IN B, IN C and IN D respectively from left to right:
  - The SIGNAL to LIMIT/CLIP LEDs (1) indicate the level of the signal of the corresponding input channel.

    Input voltage values

    The SIGNAL LED is lit when the input voltage reaches -38 dBu (analog audio source) or -60 dBFS (digital audio source).

    The LIMIT/CLIP LED is lit when the input voltage reaches +22 dBu (analog audio source) or -0.1 dBFS (digital audio source).

    Reminder: -38 dBu = 10 mV, 22 dBu = 9.8 V.
  - The LOAD LED (2) is lit if the corresponding input channel is part of the input selection of at least one output channel.
  - The first line of the LCD screen (3) indicates the input mode and status of input channel pairs AB and CD. Brackets indicate Channel Sets — refer to PRESET PARAMETERS (p.39).
- The second line of the screen indicates the group names (if any) of output channels OUT1, OUT2, OUT3 and OUT4 respectively from left to right — refer to section CLEAR GROUP PARAMS (p.41). In case of multiple group assignations, the screen displays **mult_grp**.

For example, in the illustration:

- The signal of channel IN A has a level of -10 dB, the signal of channel IN B has a level of -20 dB and channels IN C and IN D receive no signal (1).
- Channels IN A and IN B are selected and channels IN C and IN D are not selected (2).
- The IN A/IN B pair receives an AES/EBU signal of 44.1 kHz and pair IN C / IN D is configured to receive ANALOG signals. Input mode cannot be different between IN A and IN B or between IN C and IN D (3).
- Channels OUT1 and OUT2 are assigned to the same set of groups, OUT3 is not assigned to any group, and OUT4 is assigned to group **All** (4).

Using the main menu

The main menu gives access to functions and submenus.

The vertical arrows on the left indicate the current position in the menu:

- ↓ The page is the first in the menu.
  Turn the encoder wheel clockwise to display the other pages.
- ↕ The page is between the first and last in the menu.
  Turn the encoder wheel clockwise or counterclockwise to display the other pages.
- ↑ The page is the last in the menu.
  Turn the encoder wheel counterclockwise to display the other pages.

The horizontal arrows on the right indicate submenus availability:

- ↔ Indicates a submenu is available.
  Press the OK key or the encoder wheel to access it.
- No submenu is available.

Procedure

1. From the main screen, press and release the encoder wheel.
2. Turn the encoder wheel to select the page.
   A page is selected when it is displayed on the top line of the screen.
3. Press the OK key or the encoder wheel to enter the page.
   To return to the main screen, press the ESC key.

Main menu pages

LOAD PRESET (p.36)	load a user preset (from memories 1 to 10)
	load a factory preset (from memories 11 to 199)
STORE PRESET (p.38)	save the current preset (including current settings) as a user preset (in a memory from 1 to 10)
DELETE PRESET (p.39)	delete a user preset (in memory from 1 to 10)
PRESET PARAMETERS (p.39)	set parameters for gain, delay, polarity and input selection
CLEAR GROUP PARAMS (p.41)	remove the group parameters defined in LA Network Manager (name, gain, delay, and Contour EQ)
INPUT SETTINGS (p.42)	set the input mode, fallback mode and AES/EBU & AVB gain
MONITORING & INFO (p.50)	display real-time measured values: RMS output voltage and output temperature (in percentage of the maximum values) display firmware and preset library versions and amplified controller's MAC address launch ENCLOSURE CHECK
OPTIONS (p.53)	set the amplified controller's delay unit and screen contrast reset audio parameters, or all parameters to factory settings
IP SETTINGS (p.57)	set the amplified controller's IP settings (IP address, subnet mask and gateway)

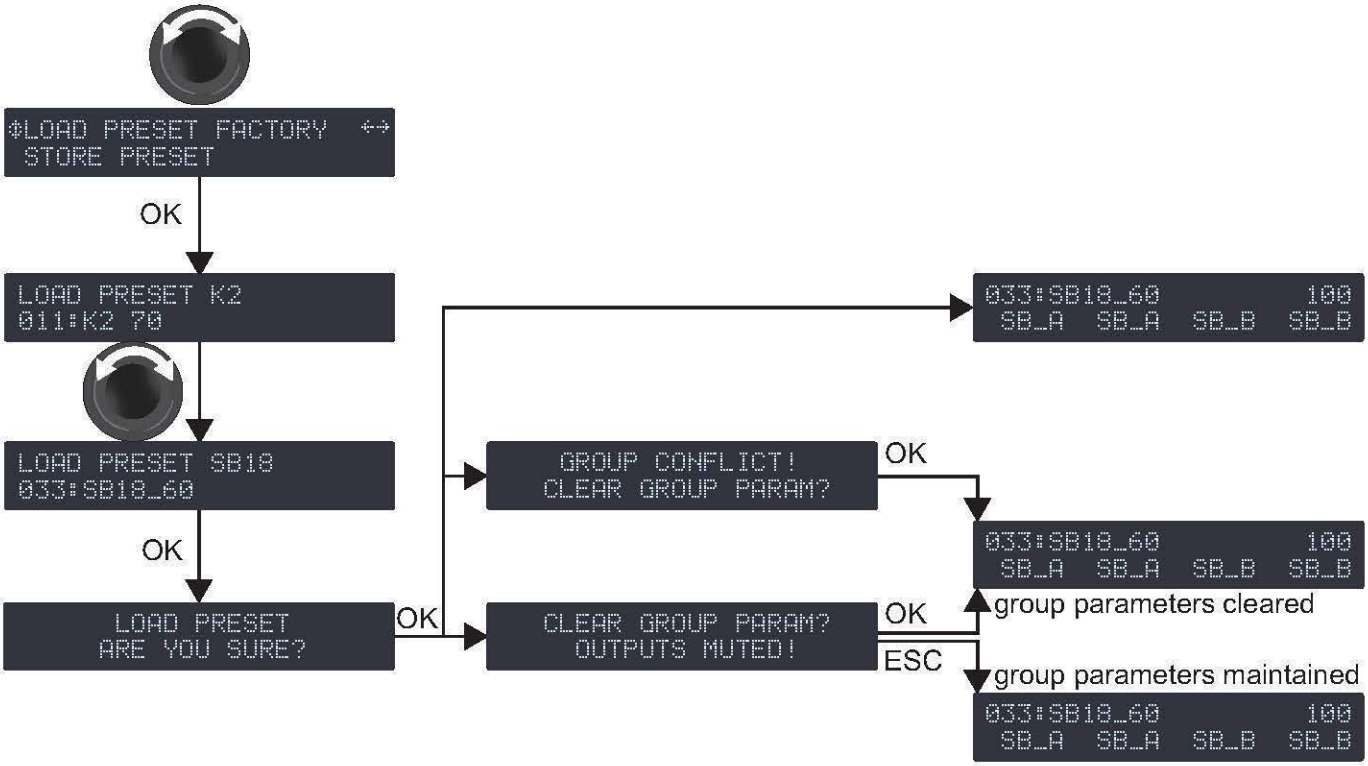
All parameters can also be selected from LA Network Manager. Refer to the **LA Network Manager** Help.

LOAD PRESET

A preset can be loaded from two pages:

page	memory range	contents
LOAD PRESET USER	1 to 10 (read and write)	User presets stored by user — refer to STORE PRESET (p.38)
LOAD PRESET FACTORY	11 to 199 (read only)	Factory preset library created by L-Acoustics and automatically installed during firmware update (refer to the **LA Network Manager** Help)

Example with a factory preset:



Procedure

1. From the main menu, select **LOAD PRESET USER** or **LOAD PRESET FACTORY**.

   When selecting **LOAD PRESET USER**, the amplified controller displays **NO PRESETS AVAILABLE!** when all user memories are empty.

   Press the ESC key to cancel.

2. Turn the encoder wheel and select the preset.

   The first line displays **LOAD PRESET** and the preset family name to help make a coarse selection.

   The second line displays the preset name to select within a family.

   If a user preset has a customized name, press and hold the encoder wheel to display the original name — refer to section STORE PRESET (p.38).

3. Press the OK key to load the selected preset.

   The amplified controller displays **ARE YOU SURE?**

4. Press the OK key or the encoder wheel to validate (or press the ESC key to cancel).
   - The amplified controller displays **CLEAR GROUP PARAM? OUTPUTS MUTED!** when it is assigned to groups and is no longer connected to the L-NET network.

     Either press the OK key to load the preset while clearing the group parameters
     Or press the ESC key to load the preset while maintaining the group parameters
   - The amplified controller displays **GROUP CONFLICT! CLEAR GROUP PARAM?** when it is assigned to groups and there is a group conflict. Loading the preset is only possible while clearing the group parameters.

     Either press the OK key to load the preset while clearing group parameters
     Or press the ESC key twice to cancel
   - The amplified controller displays **GROUP CONFLICT! CANNOT LOAD PRESET!** when it is assigned to groups and there is a group conflict, but it is not possible to clear the group parameters as the amplified controller is connected to the L-NET network.

     Press the ESC key twice to cancel.

Possible group conflicts:

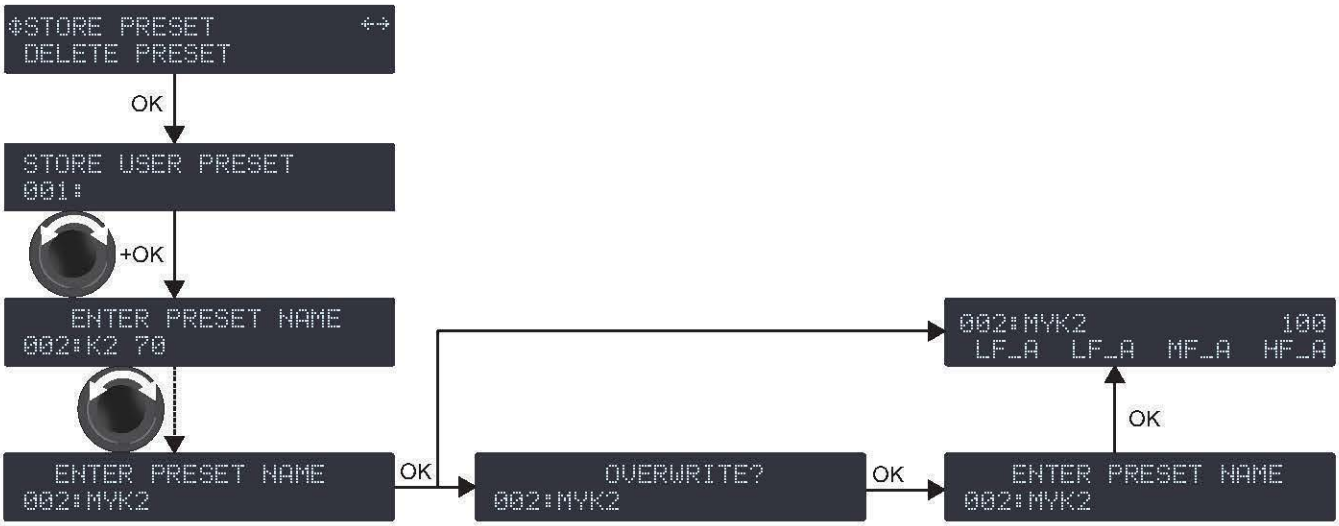
The output channels are assigned to groups and the assignation structure is not compatible with the channel sets of the preset to be loaded.

Group parameters include enabled FIR filters (Zoom Factor, FIR1, FIR2, FIR3, FIR4, or Air Absorption Compensation) and the preset to be loaded is a low latency preset.

STORE PRESET

The currently loaded preset, including all modified settings, can be stored to a user memory (in memory location 1 to 10).

Unsaved modifications to the preset parameters are indicated by a star sign at the end of the first line.
Unsaved modifications are lost if the preset is reloaded prior to storing.
However, the current state of a loaded preset is saved when the amplified controller is turned off.



Procedure

1. From the main menu, select **STORE PRESET**.
2. Turn the encoder wheel and select the user memory space.
3. Press the OK key or the encoder wheel to validate.
4. If necessary, enter a user preset name (16 characters max):
   a) Turn the encoder wheel to select the first character.
   b) Press the encoder wheel to set the cursor on the second character.
   c) Repeat until all characters are entered.

   Pressing the encoder wheel after the 16th character sets the cursor back to the first character.
5. Press the OK key to validate the name.

The controller displays **OVERWRITE?**, when the selected memory space is not empty.
Press the OK key to overwrite (or the ESC key to cancel).

DELETE PRESET

A user preset stored in a user memory (in memory range 1 to 10) can be deleted.

Procedure

1. From the main menu, select **DELETE PRESET**.

   The amplified controller displays **NO PRESETS AVAILABLE!** when all user memories are empty. Press the ESC key to cancel.
2. Turn the encoder wheel to select the user memory space.
3. Press the OK key or the encoder wheel to validate.

   The amplified controller displays **CANNOT DELETE THE CURRENT PRESET**, when the selected preset is the currently loaded preset. It is not possible to delete the currently loaded preset.

   Press the ESC key to cancel.

   The amplified controller displays **ARE YOU SURE?**.
4. Press the OK key or the encoder wheel to validate (or press the ESC key to cancel).

PRESET PARAMETERS

The preset parameters include gain, delay, polarity and input selection.

Gain and delay value ranges

Gain is adjustable from -60 dB to +15 dB.

Delay is adjustable from 0 to 1000 ms — see also section DELAY UNIT (p.53).

Total delay

The total delay includes all group delays (set in LA Network Manager) and the output channel delay. Total delay cannot exceed 1000 ms.

The parameters of the currently loaded preset can be set individually for each output channel or channel set.

Channel set

In certain presets, some channels are interdependent and form a channel set.

Within a channel set the preset parameters are common to all channels.

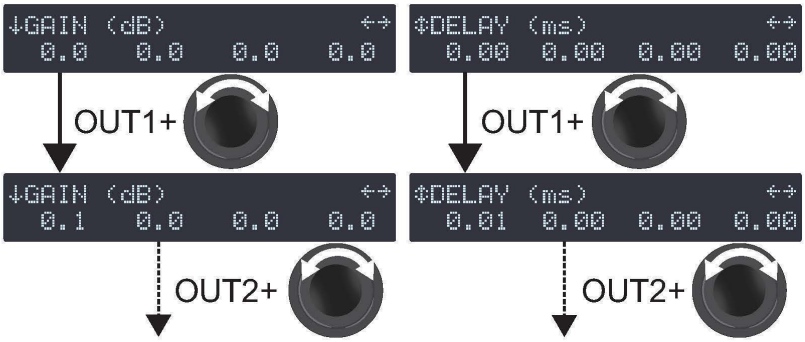
On the amplified controller's screen, channel sets are indicated by brackets above the corresponding output channel keys.

Two 2-channel sets (LF/HF - LF/HF)

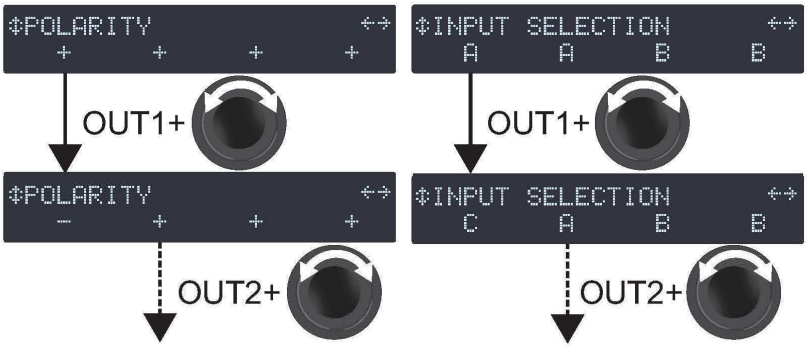
One 4-channel sets (LF/LF/MF/HF)

Setting the preset parameters

for gain and delay



for polarity and input



Procedure

1. From the main menu, select **PRESET PARAMETERS**.
2. Turn the encoder wheel to select a preset parameter (**GAIN (dB)**, **DELAY (ms)**, **POLARITY** or **INPUT SELECTION**).
3. Press and hold the output key of an output channel or one of the output keys of a channel set to select it.
4. Turn the encoder wheel to select the value.

   Gain and delay value setting

   Turn the encoder wheel for fine resolution (last digit).

   Press and turn the encoder wheel for coarse resolution (second to last digit).
5. Release the output key.
6. Repeat steps 3 to 5 for each output channel or channel set.
7. Repeat steps 2 to 5 for each preset parameters.

Preset parameter modifications apply immediately.

Saving preset parameters

Preset parameter modifications are not automatically saved and are lost if the preset is reloaded.

Refer to STORE PRESET (p.38).

Resetting the preset parameters

All preset parameters (including preset name) can be reset to the default values.

Procedure

1. From the main menu, select **PRESET PARAMETERS**.
2. Turn the encoder wheel to select **RESET PRESET**.
3. Press the OK key or the encoder wheel to validate.
   The amplified controller displays **ARE YOU SURE? OUTPUTS MUTED!**.
4. Press the OK key or the encoder wheel to validate (or the ESC key to cancel).

Resetting the parameters of a user preset (stored in memory space 001 to 010) only affects the current parameters.

To reset the parameters of a stored preset, overwrite the memory space after resetting the preset. Refer to STORE PRESET (p.38).

CLEAR GROUP PARAMS

Group parameters (names, gains, delays, contour EQs) are defined in LA Network Manager and cannot be accessed from the amplified controller. They remain active when the amplified controller is disconnected from the computer running LA Network Manager (in standalone mode), and when the amplified controller is shut down or restarted. Group parameters are not preset-dependent and remain active when a different preset is loaded.

Therefore, L-Acoustics recommends to clear group parameters when an amplified controller is used in standalone mode after being used within a network.

To verify if output channels are assigned to a group, refer to Displaying input level, input selection, input mode and group information (p.34).

CLEAR GROUP PARAMS does not clear the preset parameters. Refer to PRESET PARAMETERS (p.39)

clearing the group parameters

Procedure

1. From the main menu, select **CLEAR GROUP PARAMS**.

   The amplified controller displays **L-NET ACTIVE. CANNOT CLEAR** when the amplified controller is connected to the L-NET network. Group parameters cannot be cleared when the amplified controller is remotely controlled by LA Network Manager.

   Press the ESC key to cancel.

   The amplified controller displays **NO GROUP DEFINED. CANNOT CLEAR** when the amplified controller is not assigned to any group.

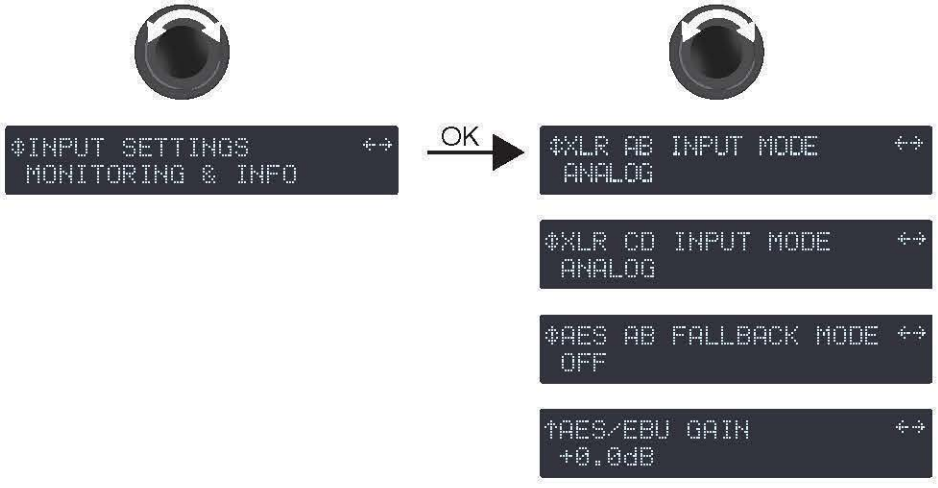
   Press the ESC key to cancel.
2. Press the OK key or the encoder wheel to validate.
   The amplified controller displays **ARE YOU SURE? OUTPUTS MUTED!**.
3. Press the OK key or the encoder wheel to validate (or press the ESC key to cancel).

INPUT SETTINGS

The INPUT SETTINGS menu gives access to settings of the input mode, the fallback modes and the AES/EBU & AVB gain.

- LA4X amplified controllers with HARDWARE INFO **ID4** or higher (in MONITORING & INFO menu) support AVB but do not support redundancy.

- LA4X amplified controllers with HARDWARE INFO **ID1**, **ID2** or **ID3** (in MONITORING & INFO menu) do not support AVB nor redundancy. These Units can be upgraded to support AVB by purchasing and installing KR LA4XDSP2.



ABCD INPUT SOURCE

Compatible LA4X amplified controllers can retrieve four channels from an AVB stream containing up to eight channels, at 48 kHz or 96 kHz, connected by one of the two 1 Gb/s Ethernet ports.

Use **ABCD INPUT SOURCE** to select between XLR or AVB input sources for all channels.

selecting the input source

Procedure

1. From the main menu, select **INPUT SETTINGS**.
2. Press the OK key or the encoder wheel to validate.
3. Turn the encoder wheel to select **ABCD INPUT SOURCE**.
4. Press the OK key or the encoder wheel to validate.
5. Turn the encoder wheel to select the input source (**XLR** or **AVB**).
6. Press the OK key or the encoder wheel to validate.

AVB status

Possible statuses when AVB is enabled:

IDLE	The unit is not connected to any talker. If unexpected, possible cause is that an AVB controller requested a disconnection. To resolve, connect an AVB controller and use it to connect the unit to a talker.
WAITING TLKR / WAIT TLKR / WTLK	The listener has been told by an AVB controller to connect to a talker and it is now waiting for the talker to be online. If displayed for more than a few seconds: • Check the network for a disconnected cable. • Check that the talker is in working order (fully booted).
CONNECTING / CING	Temporary status while the listener waits for the talker to send information about the stream.
CON TIMEOUT / CTMO	Timeout has been reached while the listener waits for the talker to send information about the stream. Check that there are no issue on the network such as firewall parameters or Wi-Fi access points.
CONNECTION ERROR / CON ERROR / CERR and error code	While the listener waited for the talker to send information about the stream, the talker reported an issue. Refer to the Appendix C - List of AVB connection (CON) errors (p.83).
WAITING RSV / WAIT RSV / WRSV	The listener is waiting for the conclusion of the bandwidth reservation from the talker.
RESERVATION ERROR / RSV ERROR / RERR and error code	The bandwidth reservation has failed. It can also be temporarily displayed when a network cable is disconnected then reconnected. Refer to the Appendix B - List of AVB reservation (RSV) errors (p.81).
WAITING START / WAIT START / WSRT	The bandwidth is reserved but the unit has received a "stop streaming" command by the AVB controller: Try disconnecting and reconnecting the stream.
WAITING DATA / WAIT DATA / WDAT	Waiting for the talker to transmit the stream. If displayed for more than a few seconds, possible causes are: • Talker is physically disconnected or off: check the talker. • A "stop streaming" command has been sent to the talker from a third-party AVB controller: Try disconnecting and reconnecting the stream.

DATA ERROR / DERR	The listener is receiving the stream from the talker but the format is not as announced by the AVB controller. Check that the controller is sending the correct information.
VALIDATING / VLDT	The listener is receiving the stream from the talker, the stream has the correct format and the listener is verifying the validity of the time synchronization information from the stream before processing it. If displayed for more than a few seconds, check the number of hops in the network cabling.
READY and the sampling frequency	Processing of audio is suspended. Possible causes are: The input source on the amplified controller is selected as XLR or FBACK XLR. Select AVB to set the media clock.
WAITING MCLK / WAIT MCLK / WMCK	The listener cannot process audio from this stream because the currently selected media clock source is not providing a valid clock. Possible cause is: Non-Avnu certified devices on the network are disrupting the media clock synchronization. Preferably use Avnu-certified devices.
LOCKED / LCK and the sampling frequency	Processing audio stream data.

Reverting from AVB fallback

When the READY status is recovered on the AVB input, reverting to the initial input mode is manual.

Procedure

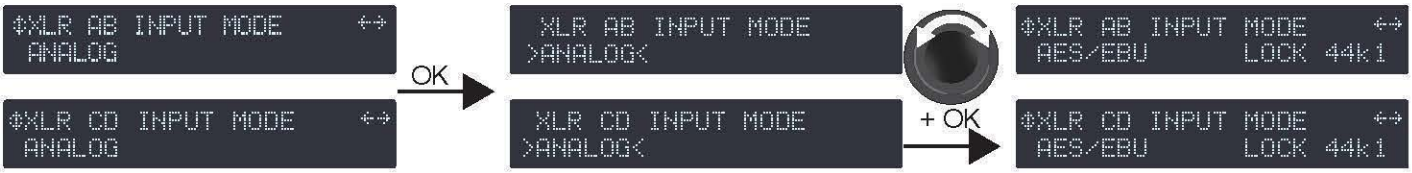
1. From the **ABCD INPUT SOURCE** menu, press the OK key.
2. Turn the encoder wheel to select the input mode.
3. Press the OK key or the encoder wheel to validate.

XLR INPUT MODE

The XLR connectors of the signal panel can receive analog or digital signals. Use **XLR INPUT MODE** to select the type of signal, depending on the type of connected audio sources, for channel pairs AB and CD.

The input mode selection can be different between channel pairs AB and channel pairs CD, but it cannot be different between input channel A and input channel B, or between input channel C and input channel D.

selecting the XLR input mode



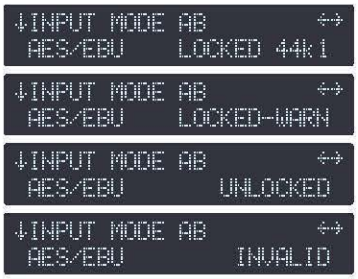
Procedure

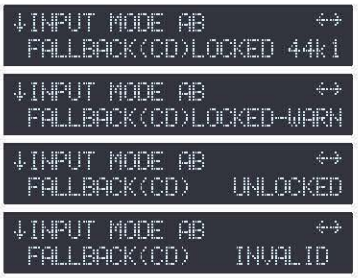
1. From the main menu, select **INPUT SETTINGS**.
2. Press the OK key or the encoder wheel to validate.
3. Turn the encoder wheel to select **XLR AB INPUT MODE** or **XLR CD INPUT MODE**.
4. Press the OK key or the encoder wheel to validate.
5. Turn the encoder wheel to select between the input modes (**ANALOG** for analog audio source, **AES/EBU** for digital audio source).
6. Press the OK key or the encoder wheel to validate.
7. Repeat steps 3 to 6 for the other channel pair.

AES/EBU signal status

When AES/EBU is enabled, the status of the signals is displayed:

LOCKED and the sampling frequency	Indicates a digital audio source is connected to the AES/EBU input, the signal delivered by the source has a format supported by the controller's digital audio board, and no loss or fault is being detected during data transfer. For example, LOCKED 44k1 indicates the digital audio source provides signals of sampling frequency of 44.1 kHz.
LOCKED-WARN	Indicates the incoming digital signal has a sampling frequency that is out of the nominal range, but it does not lead to loss of audio.
UNLOCKED	Indicates the incoming digital signal is faulty and leads to loss of audio. If the fallback mode is active, UNLOCKED on channel pair AB automatically switches to channel pair CD. FALLBACK(CD) and the status of the signal on channel pair AB is displayed. Refer to section AES AB FALLBACK MODE (p.47). The LOCKED status is re-acquired after at least 500 ms of stability.
INVALID	Indicates non-audio data in the payload or errors in the AES/EBU transmission.





Reverting from AES AB fallback

When the LOCKED status is recovered on channel pair AB, reverting to the initial input mode is manual.

Procedure

1. From the **XLR AB INPUT MODE** menu, press the OK key.
2. Turn the encoder wheel to select the input mode.
3. Press the OK key or the encoder wheel to validate.

AVB FALLBACK MODE

Sound cuts in case of failure of the AVB input source can be avoided with the AVB fallback option on compatible LA4X.

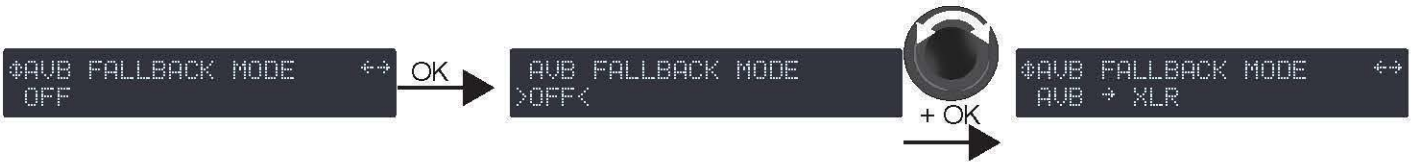
When the automatic fallback is on (**AVB > XLR**), the amplified controller automatically switches to the XLR input sources in case of loss of the LOCKED status on the AVB stream.

Possible causes for the loss of the "locked" status:

- Switch or talker failure (rebooted, turned off, unplugged...).
- Cable failures.
- Disconnection or "stop streaming" requested by the AVB Controller.
- Non-Avnu certified device in the network.

Reverting to the AVB input source when the signal returns to a normal state is manual — refer to INPUT MODE (p.44). It can also be done simultaneously for all amplified controllers in LA Network Manager.

When automatic fallback is disabled (OFF), sound is cut off in case of loss of the LOCKED status, but sound is automatically recovered when the signal returns to a normal state.



Procedure

Precautions to avoid sound cuts or level differences upon fallback

The XLR inputs must be connected to an audio source (analog or digital) playing the same program as the AVB audio source.

When an analog source is connected to the XLR inputs, the level of the AVB audio source must be aligned to the level of the analog audio source using AVB & AES/EBU GAIN — refer to section AES/EBU & AVB GAIN (p.47).

Fallback and time-alignment

The propagation time of the AVB signal distribution is likely to be longer than the propagation time of the AES/EBU or ANALOG redundant signal distribution. In this case, if some Units in the system switch to AVB fallback, but not other Units, parts of the system are no longer time-aligned.

It is highly recommended to adopt network topologies and a system deployment that minimize these risks, and to use the Trigger Fallback button in LA Network Manager on Units that did not switch over in order to re-align the system until the initial cause of the problem is found and resolved.

If the connected signal source comes from a P1, enable the time-alignment option in LA Network Manager to solve the issue.

1. From the main menu, select **INPUT SETTINGS**.
2. Press the OK key or the encoder wheel to validate.
3. Turn the encoder wheel to select **AVB FALLBACK MODE**.
4. Press the OK key or the encoder wheel to validate.

5. Turn the encoder wheel to select the setting (**ON** or **AVB > XLR**).
6. Press the OK key or the encoder wheel to validate.

AES AB FALLBACK MODE

Sound cuts in case of digital signal failure on input pair AB can be avoided with the fallback option.

When automatic fallback is enabled (ON), the amplified controller automatically switches to input pair CD in case of digital signal failure on input pair AB.

The switchover conditions are:

- No clock
- Loss of lock
- CRC error
- Bipolar encoding error
- Data slip

Validity bit (invalid audio) value does not trigger a fallback.
Instead the signal is muted.

Reverting to input pair AB when the digital signal returns to a normal state is manual — refer to INPUT MODE (p.46).
It can also be done simultaneously for all amplified controllers in LA Network Manager.

When automatic fallback is disabled (OFF), sound is cut off in case of digital signal failure on input pair AB, but sound is automatically recovered when the signal returns to a normal state.

Enabling the AES AB fallback mode

Procedure

Precautions to avoid sound cuts or level differences upon fallback
Input pair CD must be connected to an audio source (analog or digital) playing the same program as the digital audio source connected to input pair AB.
When an analog audio source is connected to input pair CD, the level of the digital audio source connected to input pair AB must be aligned to the level of the analog audio source using AES/EBU GAIN — refer to section AES/EBU & AVB GAIN (p.47).

1. From the main menu, select **INPUT SETTINGS**.
2. Press the OK key or the encoder wheel to validate.
3. Turn the encoder wheel to select **FALLBACK MODE**.
4. Press the OK key or the encoder wheel to validate.
5. Turn the encoder wheel to select the setting (**ON** or **OFF**).
6. Press the OK key or the encoder wheel to validate.

AES/EBU & AVB GAIN

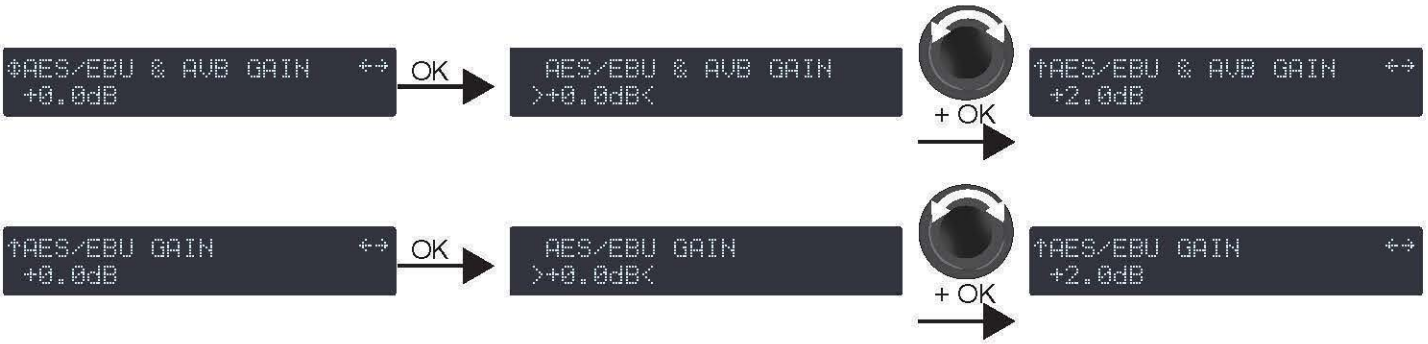
AES/EBU & AVB GAIN (on LA4X supporting AVB) / AES/EBU GAIN (on LA4X not supporting AVB) must be used when:

- the AES AB fallback mode is enabled
- and/or the AVB fallback mode is enabled (on LA4X supporting AVB)
- and the fallback input is an analog audio source

This gain allows aligning the digital and/or AVB audio source level to the analog level for a seamless fallback switch — refer to section AES AB FALLBACK MODE (p.47) and AVB FALLBACK MODE (p.46). It can be set from -12 dB to +12 dB by steps of 0.1 dB.

This gain must be set according to the analog audio source's calibration (based on manufacturer's specs or user measurements) and the amplified controller's analog inputs calibration (0 dBFS for an input signal of +22 dBu). These examples illustrate the most common cases:

analog audio source calibration	**AES/EBU & AVB gain**
+18 dBu for 0 dBFS	- 4 dB
+24 dBu for 0 dBFS	+ 2 dB
+22 dBu for 0 dBFS or, if fallback is disabled or, if the fallback input is a digital audio source	+ 0 dB



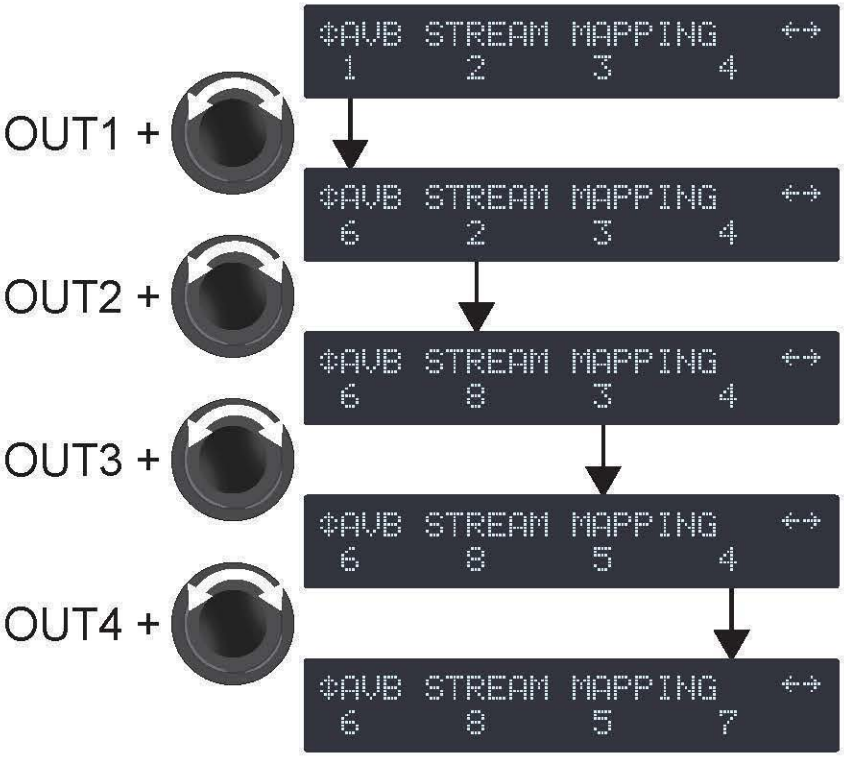
Procedure

1. From the main menu, select **INPUT SETTINGS**.
2. Press the OK key or the encoder wheel to validate.
3. Turn the encoder wheel to select **AES/EBU & AVB GAIN**.
4. Press and hold the ESC, OK or OUT1 key.
5. Turn the encoder wheel to select an input value.
   Setting applies in real-time.

   Turn the encoder wheel for steps of 0.1 dB.
   Press and turn the encoder wheel for steps of 1 dB.
6. Release the key.

AVB STREAM MAPPING

Compatible LA4X amplified controllers can retrieve four channels from an AVB stream containing up to eight channels. Use AVB STREAM MAPPING to select the channel numbers to be retrieved for each input channel.



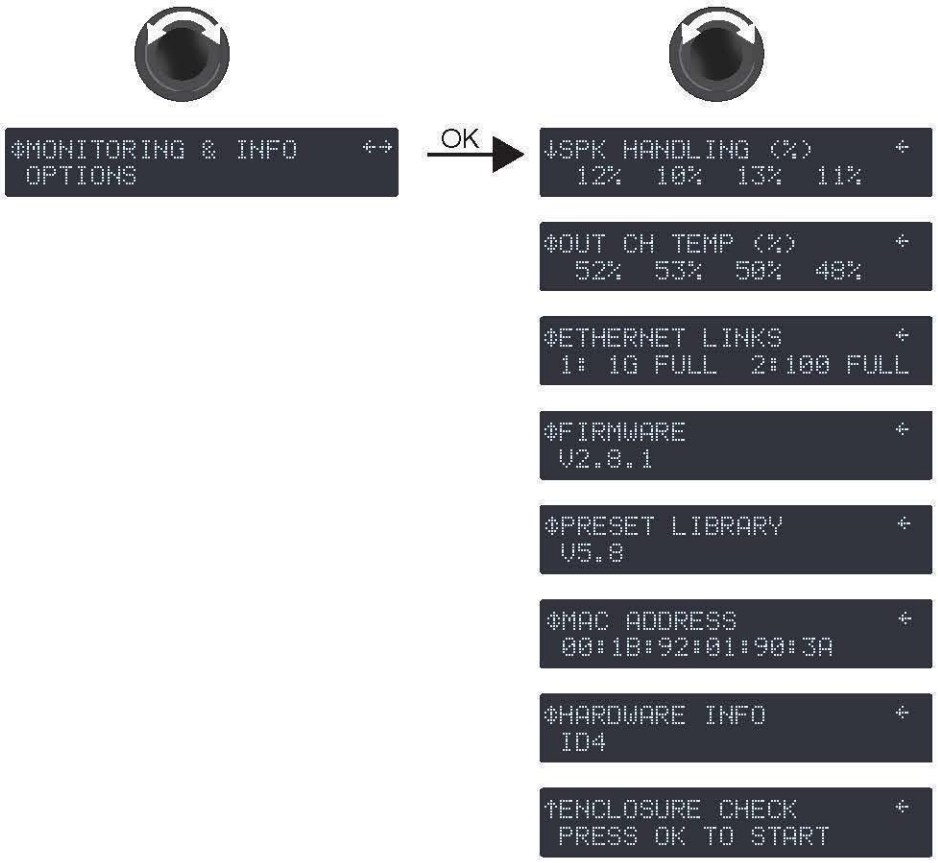
Procedure

1. From the main menu, select **INPUT SETTINGS**.
2. Press the OK key or the encoder wheel to validate.
3. Turn the encoder wheel to select **AVB STREAM MAPPING**.
4. Press and hold the OUT1 key.
5. Turn the encoder wheel to select the channel number.
6. Release the OUT1 key.
7. Repeat step 4 to 6 with the OUT2, OUT3 and OUT4 keys.

MONITORING & INFO

The MONITORING & INFO menu provides real-time measurements and information on the amplified controller:

- For each output channel:
  - real-time RMS output voltage (in percentage of the maximum value supported by the connected transducer section)
  - output temperature (in percentage of the operating range)
- Ethernet ports current status.
- Version numbers of the amplified controller onboard firmware and preset library.
- Amplified controller's MAC address and hardware version.
- The ENCLOSURE CHECK function.



SPK HANDLING (%)

SPK HANDLING (%) (speaker handling) displays the RMS voltage measured at each individual amplifier circuit output as a percentage of the maximum voltage supported by the connected speaker section.

For example in this illustration, the RMS voltage of channels OUT 1 to OUT 4 is respectively 12, 10, 13, and 11% of the maximum values.

OUT CH TEMP (%)

OUT CH TEMP (%) (output channel temperature) displays the temperature measured at each individual amplifier circuit output as a percentage of the maximum operating temperature supported by the amplified controller: 60° C / 140° F = 100%.

For example in this illustration, the temperature of channels OUT 1 to OUT 4 is respectively 52, 53, 50, and 48% of the maximum values.

Refer to Error messages (p.67) for information on the temperature-related messages.

ETHERNET LINKS

ETHERNET LINKS displays the current status of the link of each Ethernet port.

This function is only available on LA4X with 1 Gbit/s Ethernet ports. Refer to the **Networking and control of LA4X with 1 Gbit/s Ethernet ports** technical bulletin for more information.

The status includes, for each port:

- the Ethernet link speed: 10M (for 10 Mbits/s), 100 (for 100 Mbits/s) or 1G (for 1 Gbits/s)
- the communication mode: HALF (for half-duplex) or FULL (for full-duplex)

If no connection has been established, the displayed status is DOWN.

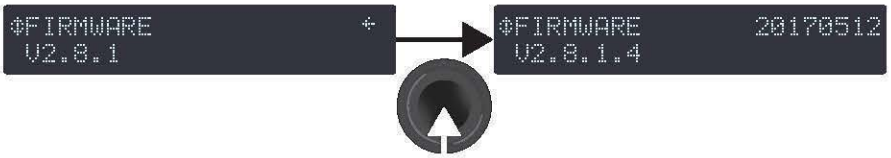
Possible causes: no cable connected to the port, faulty cable connected to the port, cable connected to the port but no device connected at the other end of the cable, port failure.

For example, in this illustration, port 1 has a speed of 1 Gbits/s, port 2 has a speed of 100 Mbits/s, and both are in full-duplex mode.

FIRMWARE

FIRMWARE displays the version number of the amplified controller onboard firmware.

Press the encoder wheel to display the fourth digit and the build date (in the YYYYMMDD format).

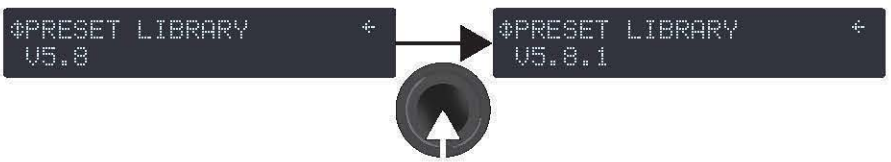


Network
Always ensure that all LA4X amplified controllers used in a given network run the same firmware version.

PRESET LIBRARY

PRESET LIBRARY displays the version number of the amplified controller onboard preset library.

Press the encoder wheel to display the third digit.



Refer to the **Preset Guide** for the full description of the factory preset library.

MAC ADDRESS

MAC ADDRESS displays the MAC (Media Access Control) address of the amplified controller. This address is unique to each amplified controller and is the equivalent of an international identification serial number. It is set by the manufacturer and cannot be modified.

For example, in this illustration, the MAC address is 00:1B:92:01:90:3A.

HARDWARE INFO

HARDWARE INFO displays the version of the hardware in use in the amplified controller.

For troubleshooting purposes, it can be useful to communicate this number to the L-Acoustics representative.

For example, in this illustration, the hardware has ID4.

ENCLOSURE CHECK

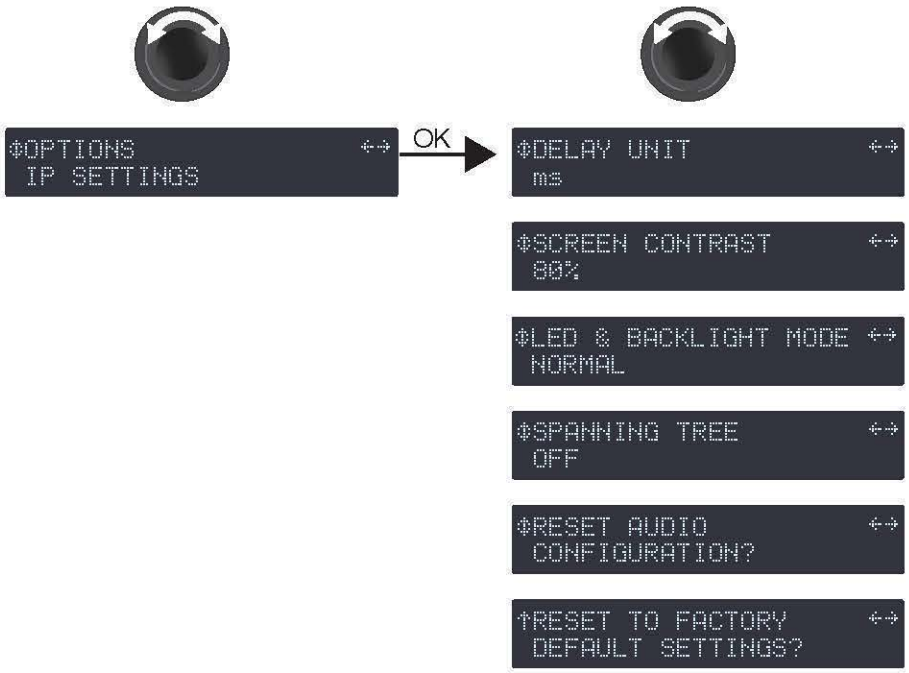
ENCLOSURE CHECK is a preliminary diagnosis tool for the loudspeaker enclosures connected to the amplified controller.

Refer to the **Enclosure Check** technical bulletin for the full procedure.

OPTIONS

The OPTIONS menu gives access to the amplified controller general settings:

- delay unit (ms, meters, feet or samples)
- LCD screen contrast
- LED and screen backlight mode
- spanning tree
- reset audio configuration
- reset to default factory settings



DELAY UNIT

Delay values can be displayed in ms (milliseconds), meters, feet or samples. The values in meters and feet are given for a temperature of 20° C / 68° F.

Procedure

1. From the main menu, select **OPTIONS**.
2. Press the OK key or the encoder wheel to validate.
3. Turn the encoder wheel to select **DELAY UNIT**.
4. Press the OK key or the encoder wheel to validate.
5. Turn the encoder wheel to select the value.

SCREEN CONTRAST

The LCD screen contrast can be modified to adapt to a very bright or very dark environment.

Procedure

1. From the main menu, select **OPTIONS**.
2. Press the OK key or the encoder wheel to validate.
3. Turn the encoder wheel to select **SCREEN CONTRAST**.
4. Press the OK key or the encoder wheel to validate.
5. Turn the encoder wheel to select the value.
6. Press the OK key or the encoder wheel to validate.

LED & BACKLIGHT MODE

The brightness of the LED and the LCD screen backlight can be modified to adapt to a very bright or very dark environment.

Procedure

1. From the main menu, select **OPTIONS**.
2. Press the OK key or the encoder wheel to validate.
3. Turn the encoder wheel to select **LED & BACKLIGHT MODE**.
4. Press the OK key or the encoder wheel to validate.
5. Turn the encoder wheel to select the value (**OFF**, **LOW**, **MEDIUM**, **NORMAL** or **SUNLIGHT**).
6. Press the OK key or the encoder wheel to validate.