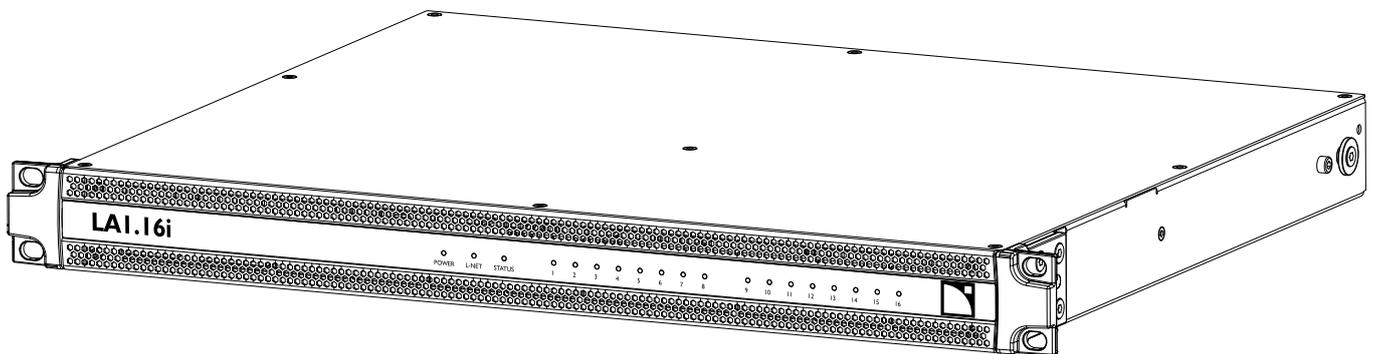


# LA1.16i



owner's manual (EN)



Document reference: LA1.16i owner's manual (EN) version 1.0

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# Safety

## Important safety instructions

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-  **Inspect the product before operation.**  
If any sign of defect or damage is detected, immediately withdraw the product from use for maintenance.
-  **Perform preventive maintenance at least once a year.**  
Refer to the preventive maintenance section for a list of actions and their periodicity.  
Insufficient upkeep of the product can void the warranty.
-  **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 V (Japan): 20 A  
120 V (North America): 15 A  
220-240 V (EU): 10 A  
WARNING: The product is of Class I construction and shall be connected to a mains socket outlet with a Protective Earth connection.
-  **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.
-  **Always interconnect a circuit breaker between the product and the mains supply.**  
Use these references, or equipment with equivalent characteristics:  
100 V (Japan): 20 A Terasaki S125-NF 1P  
120 V (North America): 15 A Square D QO  
220-240 V (EU): 10 A Type C
-  **Electrical generator**  
You must power on the generator before powering on the product.
-  **Terminals marked with the lightning flash symbol are HAZARDOUS LIVE.**  
The external wiring connected to these **terminals** requires installation by an **instructed person** or the use of ready-made leads or cords.  
Never attempt to touch any exposed speaker wiring while the product is operating: first disconnect the connector from the product.  
Mute all output channels before connecting a speaker to an amplified controller.  
Do not connect a speaker output in parallel or series with any output of another amplified controller.  
Do not connect the speaker outputs to any other voltage source, such as a battery, power mains, or power supply, regardless of whether the amplified controller is turned on or off.
- 
-  **Never incorporate equipment or accessories not approved by L-Acoustics.**
-  **Read all the related PRODUCT INFORMATION documents shipped with the products before exploiting the system.**
-  **Intended use**  
This system is intended for use by trained personnel for professional applications.

-  **As part of a continuous evolution of techniques and standards, L-Acoustics reserves the right to change the specifications of its products and the content of its documents without prior notice.**  
Check [www.l-acoustics.com](http://www.l-acoustics.com) on a regular basis to download the latest document and software updates.
-  **Beware of sound levels.**  
Do not stay within close proximity of loudspeakers in operation.  
Loudspeaker systems are capable of producing very high sound pressure levels (SPL) which can instantaneously lead to permanent hearing damage to performers, production crew, and audience members. Hearing damage can also occur at moderate level with prolonged exposure to sound.  
Check the applicable laws and regulations relating to maximum sound levels and exposure times.
-  **Beware of over power risks.**  
Only use compatible loudspeakers with appropriate presets to avoid damage to the loudspeakers.
-  **Do not use the product outside its operating temperature range.**  
The product operates at a room temperature between -5 °C / 23 °F and 50 °C / 122 °F.  
Do not expose the product to direct sun.
-  **Do not expose the product to extreme conditions.**  
Do not expose the product to moisture (rain, mist, sea spray, steam, humidity, condensation...) or excessive heat (direct sun, radiator...) for a long period of time.  
For more information, refer to the **Products weather protection** document, available on the website.
-  **Use the product in a conformed electro-magnetic environment.**  
The product can be used in the following environment: residential (class B).
- Avoid radio interference.**  
This product has been tested and complies with the regulations of the EMC directive (Electro Magnetic Compatibility). These regulations are designed to provide reasonable protection against harmful interference from electrical equipment, but it cannot be guaranteed that interference will never occur.
-  **Product disconnection**  
To completely disconnect this product from the mains, disconnect the power supply cord plug from the mains socket outlet.
-  **Power supply cord and socket accessibility**  
The main plug of the power supply cord shall remain easily accessible.  
The mains socket outlet shall be easily accessible.
-  **Read the maintenance section of this document before servicing the product.**
-  **Contact L-Acoustics for advanced maintenance.**  
Any unauthorized maintenance operation will void the product warranty.  
Before sending a product to L-Acoustics for maintenance, save all user presets to files using LA Network Manager.
-  **Shipping**  
Use the original packaging for shipping the product, unless it is mounted in a rack with the front and rear panels fixed to the rack, as described in this manual.

## Symbols on the product



### Explanation of graphical symbols



The lightning flash with arrowhead symbol within an equilateral triangle is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.



The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance instructions in the literature accompanying the product.



Do not open unless authorized. This symbol indicates the presence of electrical shock hazards. It also indicates that no maintenance performed by the end user requires access to internal components.

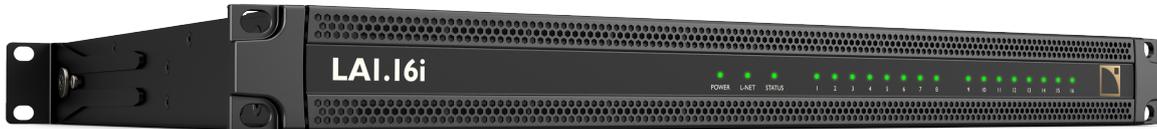


This marking indicates that this product should not be disposed of with other household waste throughout the EU. To prevent possible harm to the environment or human health from uncontrolled waste disposal, recycle it responsibly to promote the sustainable reuse of material resources. To return your used device, please use the return and collection systems or contact the retailer where the product was purchased. They can take this product for environmentally safe recycling.

# Introduction

## LA1.16i amplified controller

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LA1.16i is an ultra-compact 16 x 16 architecture amplified controller designed for permanent installations, providing a unique solution for applications that can benefit from high discretization amplification and processing. Primarily developed to power L-Acoustics small format loudspeakers in large quantities, LA1.16i is ideal for near-field applications that require lower sound pressure levels (SPL). With its channel density and flexible output bridging, LA1.16i offers unrivaled versatility. In single-ended (SE mode), each of the 16 output channels delivers 80 W at 8 ohms or 160 W at 4 ohms. Additionally, odd/even pairs of outputs can be bridged (BTL mode), increasing the available power to 300 W at 8 ohms. This functionality enables the 16 outputs to be operated in any combination of SE or BTL modes, providing unmatched value and adaptability for installers and integrators.

The feature set offered by LA1.16i benefits many types of integration projects. The high channel density is an asset for applications such as fills and delays in theaters and performing arts centers and distributed background music systems in restaurants, cruise ships, or museums. Setups requiring individual channel processing such as L-ISA spatial audio or Ambiance active acoustics designs, can fully utilize the 16 discrete inputs and outputs. Residential and marine spaces can take advantage of the flexible bridging capabilities and compact form factor, enabling a single LA1.16i to power a combination of full-range and subwoofer enclosures used in home theaters or poolside entertainment systems simply and efficiently.

First introduced with the groundbreaking LA7.16i amplified controller, L-SMART is a suite of advanced power management technologies, developed by L-Acoustics, that uses predictive modeling algorithms to manage the PSU and the individual amplification channels. Hardware sensors feedback data that is analyzed by the DSP to match the real-time needs of the loudspeaker system being driven. LA1.16i incorporates this patented technology to manage its dual internal PSUs, with a combined output of 1200 W, and this energy is delivered dynamically and intelligently to the advanced Class-D output stages, assuring optimum system performance.

Packaged in an ultra-compact 1U chassis for efficient use of rack space and lower cost of integration, LA1.16i reduces the associated carbon footprint of any L-Acoustics sound system, supporting our constant effort for greater sustainability. It incorporates features tailored for installation applications, such as loudspeaker monitoring, protection, and management, GPIO's, terminal block connectors, and a backup 24 V DC input enabling the DSP card to continue functioning if mains power is lost, smart mains current limiting is also included. The Milan-certified LA1.16i supports Milan-AVB and AES67 seamless network redundancy and is remotely controlled and monitored using LA Network Manager.

## How to use this manual

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The LA1.16i owner's manual is intended for all actors involved in the system design, implementation, preventive and corrective maintenance of the LA1.16i product. It must be used as follows:

1. Read the technical description for an overview of all product elements, their features, and their compatibilities.
  - [Technical description](#) (p.12)
2. Before installing the product, perform mandatory inspections and functional checks.
  - [Inspection and preventive maintenance](#) (p.17)
3. To deploy the product, follow the step-by-step installation instructions and refer to the cabling schemes.
  - [Installation](#) (p.19)
  - [Audio and network cabling](#) (p.24)
4. To configure the settings and parameters of the product, follow the step-by-step operation instructions.
  - [Operation](#) (p.32)

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Check [www.l-acoustics.com](http://www.l-acoustics.com) on a regular basis to download the latest document and software updates.

### Contact information

For information on advanced corrective maintenance:

- contact your Certified Provider or your L-Acoustics representative
- for Certified Providers, contact the L-Acoustics customer service: [customer.service@l-acoustics.com](mailto:customer.service@l-acoustics.com) (EMEA/APAC), [laus.service@l-acoustics.com](mailto:laus.service@l-acoustics.com) (Americas).

## Symbols

The following symbols are used in this document:

-  This symbol indicates a potential risk of harm to an individual or damage to the product. It can also notify the user about instructions that must be strictly followed to ensure safe installation or operation of the product.
-  This symbol indicates a potential risk of electrical injury. It can also notify the user about instructions that must be strictly followed to ensure safe installation or operation of the product.
-  This symbol notifies the user about instructions that must be strictly followed to ensure proper installation or operation of the product.
-  This symbol notifies the user about complementary information or optional instructions.

## Revision history

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version number	publication date	modification
1.0	Jun. 2025	Initial version.

## System components

### Powering and driving system

LA1.16i                      Install-specific amplified controller 16 × 160 W / 4 ohms

### Cables

DOE cables                      Dual AVB Network cable CAT6A, etherCON (black = primary network, red = secondary network)  
 Come in different sizes: DOE2 (2 m / 6.6 ft), DOE45 (45 m / 147.6 ft), and DOE100 (100 m / 328.1 ft)

### Software applications

Soundvision                      3D acoustical and mechanical modeling software  
 LA Network Manager              Software for remote control and monitoring of amplified controllers  
 LA1.16i embedded              User interface, accessed by typing the device IP address into a Web browser.  
 Web interface  
 L-Acoustics Device              Discovery and IP configuration utility for L-Acoustics devices (except L-ISA processors) on an  
 Scanner                              Ethernet network



Refer to the Soundvision help.  
 Refer to the LA Network Manager help.  
 Refer to the L-Acoustics Device Scanner user guide.

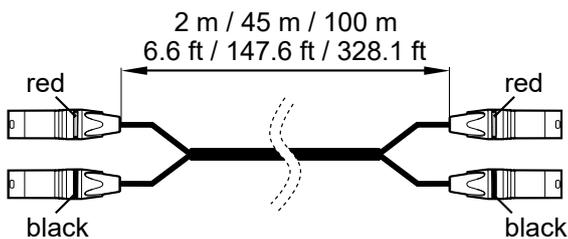
### Loudspeaker enclosures



Refer to the user documentation of the loudspeaker systems for detailed instructions about the enclosures and their connection to the amplified controllers.

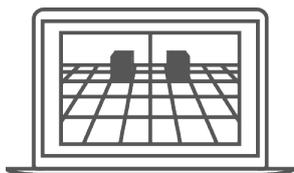
## System component illustrations

### Cables

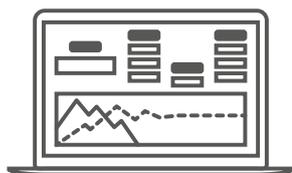


DOE cables

## Software applications



Soundvision



LA Network Manager

## WebUI

LA1.16i  
embedded  
Web interface



L-Acoustics  
Device Scanner

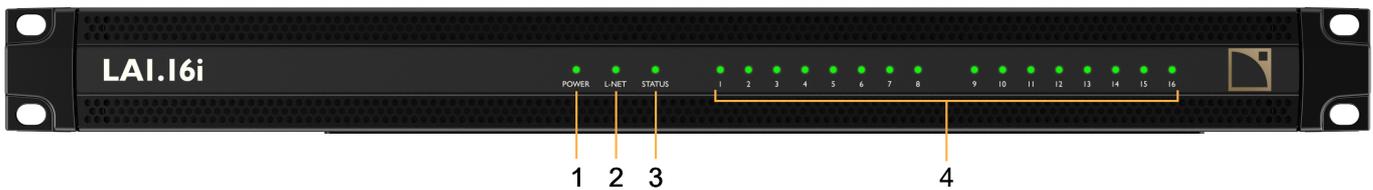
# Technical description

## Main features

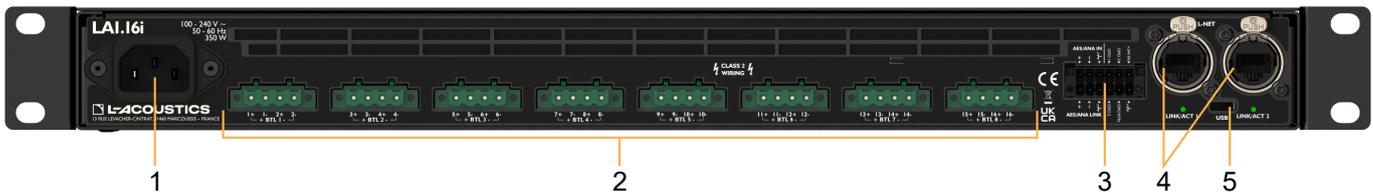
### Internal components

The core of the LA1.16i is a Gen. 5 dual DSP engine driving 16 channels of amplification from 16 AVB streams of up to eight channels, and one AES/EBU input (two channels) or one analog input (one channel). Alternatively, LA1.16i can operate in AES67 mode driving 16 channels of amplification from 16 AES67 streams of up to eight channels. LA1.16i features a flash memory for preset storage and management, high performance A/D-D/A converters for audio signals, two universal Switched Mode Power Supplies (SMPS) with PFC (Power Factor Correction), one for output channels 1-8, one for output channels 9-16, and a dual-port Ethernet Gigabit interface.

### Front and rear panels



1. power LED
2. L-NET LED
3. status LED
4. signal LEDs



1. V-Lock compatible IEC connector
2. 8 output female 4-point terminal blocks
3. 1 × 12-point terminal block that contains:
  - 1 × 24 V DC male to connect a backup power supply for the DSP
  - 1 ground pin
  - 3 General Purpose I/O (GPIO)
  - 1 ground GPIO pin
  - 1 AES/EBU input connector including:
    - 1 + signal pin
    - 1 - signal pin
    - 1 shield pin
  - 1 AES/EBU link connector including:
    - 1 + signal pin
    - 1 - signal pin
    - 1 shield pin
4. 2 × 1 Gb/s Ethernet etherCON® I/O connectors (right connector for primary network, left connector for secondary network)
5. 1 USB-C port for configuring IP settings (refer to the **LA Network Manager Help**)

## Signal processing and amplification

---

### Signal inputs

LA1.16i features two 1 Gb/s Ethernet ports capable of receiving up to 128 channels from 16 AVB streams at 48 kHz or 96 kHz. Alternatively, LA1.16i can operate in AES67 mode receiving up to 128 channels from 16 AES67 streams at 48 kHz.

In addition, an AUX (auxiliary) input in either AES/EBU or Analog mode is available through the 12-point terminal block. The AUX input source can be used as main input source, secondary input source, or fallback input source.

Refer to the **LA Network Manager** Help for more information.

### Milan-AVB

LA1.16i can operate in normal network mode or in redundant network mode.

In both modes, 16 AVB streams of up to eight channels may be connected to LA1.16i.

Each Ethernet port uses a high speed data transfer protocol up to 1 Gb/s and supports the IEC 61883-6 AM824 and AAF PCM32 stream formats with stream frequencies of 48 kHz or 96 kHz.

The amplified controller synchronizes its media clock according to the selection done by the user:

- internal clock generator
- one of the 16 AVB input streams
- the Media Clock stream in CRF format connected to its Media Clock input stream

The default selection is AVB input stream 1. When a CRF master media clock is available in the network, it is recommended to use it as clock source. LA1.16i features a CRF output stream that may be used as media clock master for the network.

In normal network mode, the Ethernet ports operate as part of an AVB bridge and may therefore be used to create an AVB network.

In redundant network mode, each port is dedicated to a separate network: first port for primary network, second port for secondary network.

Input channels can be freely assigned to the 16 amplification channels through flexible summing matrix.

### AES67

LA1.16i can operate in normal network mode or in redundant network mode.

In both modes, 16 AES67 streams of up to eight channels may be connected to LA1.16i.

Each Ethernet port uses a high speed data transfer protocol up to 1 Gb/s and supports the L16 and L24 stream formats with stream frequencies of 48 kHz.

The amplified controller synchronizes its media clock to the PTPv2 network clock. The BMCA (Best Master Clock Algorithm) automatically elects the PTPv2 network clock from the device with the lowest PTPv2 priorities. Use the LA1.16i embedded Web interface to adjust the priority values. It is recommended to set high values so that LA1.16i is clock follower.

In normal network mode, the Ethernet ports operate as part of a bridge and may therefore be used to create a daisy-chain network. In this case, LA1.16i operates as a boundary PTP clock.

In redundant network mode, each port is dedicated to separate networks: first port for primary network, second port for secondary network. In this case, LA1.16i operates as an ordinary clock.

Input channels can be freely assigned to the 16 amplification channels through flexible summing matrix using the LA1.16i embedded Web interface.

## AES/EBU

LA1.16i can be fed with one AES/EBU digital audio signal (containing two channels) using the 12-point terminal block (AES/ANA IN).

The audio signals can come from a digital mixing desk or from any audio device compliant with the AES/EBU (AES3) digital audio standards.

The input signals can be transmitted to daisy-chained amplified controllers using the 12-point terminal block (AES/ANA LINK).

The AES/EBU input port is equipped with an SRC (Sample Rate Converter) that has been selected to support a wide range of input formats (16 - 24 bits / 44.1 - 192 kHz). The SRC converts the formats to the 24 bits / 96 kHz internal format used by the amplified controller. The SRC is a high-quality implementation that provides constant propagation delay regardless of the input sampling frequency.

There is no AES/EBU external synchronization mode. The amplified controller's clock always runs at 96 kHz, referenced to the user-selected media clock: internal clock, AVB audio input stream, or CRF input stream. This ensures low jitter and high audio quality in live conditions (large cable lengths, large number of amplified controllers) while preventing phase shift, as required for line source systems.

In AES67 mode, the amplified controller's clock always runs at 96 kHz, referenced to the PTPv2 network clock. The AES67 streams at 48 kHz are automatically upsampled to 96 kHz.

### Digital domain benefits

Keeping the signal in the digital domain provides the following benefits (with any digital mixing desk or any audio device) compared to the analog signal distribution:

- Better audio quality by removing one D/A - A/D cycle.
- Optimized level chain by removing the risk of level misalignment between console and amplified controllers.
- Digital signal refreshed at each amplified controller in a daisy-chain.
- Improved maximum cable length. LA1.16i has been tested with up to 300 m / 984 ft of two models of AES/EBU rated cables (single cuts, digital source signal running at  $F_s = 48$  kHz):
  - 1696A from BELDEN INC.
  - OT234H from KLOTZ communications GmbH.

### Analog

LA1.16i can be fed with one balanced analog audio signal using the 12-point terminal block (AES/ANA IN, AES/ANA LINK).

The input signal can be transmitted to daisy-chained amplified controllers using the 12-point terminal block (AES/ANA LINK).

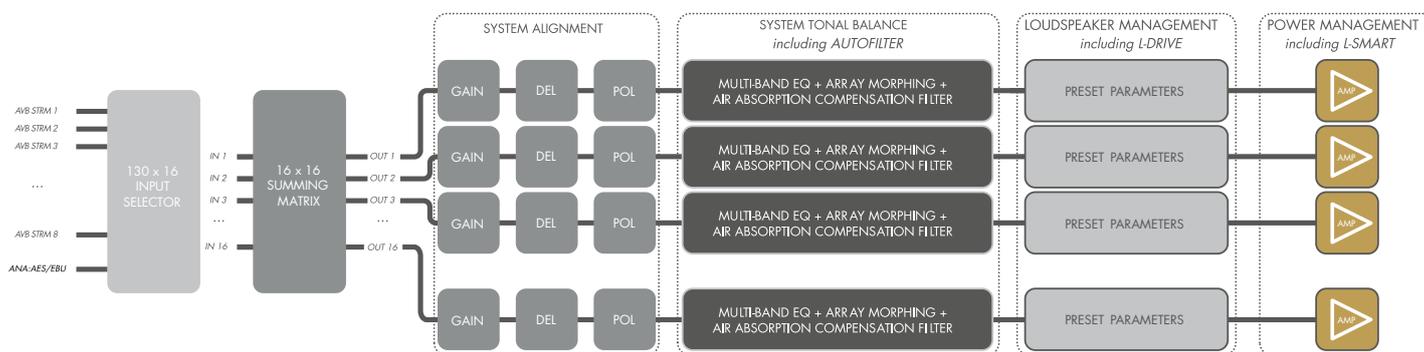
To be processed by the DSP, the analog signal must be converted into a digital signal. For this purpose, the LA1.16i amplified controller is fitted with one 32-bit A/D converter with a sampling rate of 96 kHz, allowing an encoding dynamic range of 99 dB (A-weighted, 20 kHz bandwidth).

## DSP architecture

The proprietary algorithms allow optimum performance and protection of each individual transducer of the L-Acoustics systems for an even more natural, transparent, and realistic sound experience.

- The DSP engine is a 32-bit floating point DSP at 96 kHz sampling rate providing an enhanced dynamic range since it does not generate calculation clips like a fixed point DSP.
- A dedicated engineering approach combining IIR and FIR filters generates perfectly linearized phase curves and significantly improved impulse responses.
- The 16 × 16 matrix architecture offers flexibility for various system configurations.
- A delay of up to 1000 ms can be set for each output channel.
- The L-DRIVE transducer protection system offers advanced protection by simultaneously monitoring the excursion and the temperature of the transducer.
- With a complete factory preset library and the possibility to create additional user presets, the flash memory provides a quick access to all the usual L-Acoustics speaker system configurations (refer to the **Preset Guide**).

### audio path parameters



## Power supply and amplifier section

The Class D amplification circuits ensure that the LA1.16i is energy-efficient for minimal heat dissipation. LA1.16i delivers (CEA-2006 / 490A 20 ms, sine burst < 1% THD, 1 kHz):

- 16 × 120 W at 4 Ω, all channels driven
- 16 × 80 W at 8 Ω, all channels driven

LA1.16i is a green amplified controller that relies on two universal Switched Mode Power Supplies (SMPS) suitable for mains 100 V AC - 240 V AC (± 10%, 50 Hz - 60 Hz). Both SMPS feature PFC (Power Factor Correction) which maximizes the amplifier efficiency and takes advantage of nearly 100% of the electrical power available with a very high tolerance to unstable mains. This represents a reduction of the electrical power requirements (cable gauge, power conditioning, etc.) for substantial savings.

The first SMPS delivers power to the loudspeaker output channels 1 to 8, while the second SMPS delivers power to the loudspeaker output channels 9 to 16. Each SMPS has its own power budget.

## Speaker outputs

LA1.16i features eight female 4-point terminal blocks for loudspeaker outputs.

The terminal blocks can be used in a single-ended (SE) configuration or a bridge-tied load (BTL) configuration. Using the bridge operating mode improves maximum SPL on large loudspeakers, but reduces the maximum number of loudspeaker enclosure per output and per amplified controller. For the enclosure drive capacity and the enclosure maximum SPL per amplified controller, refer to the **Amplification reference** technical bulletin or the **Preset guide**.

## Speaker protection

The L-DRIVE transducer protection system provides a dual analysis of both signal intensity and voltage in real-time and RMS. Under extreme conditions, when component membranes reach the over-excursion zone or if the coil temperature reaches a critical point, L-DRIVE is activated and acts as a power regulator.

As a result, the amount of power delivered at any channel is adjusted to the dynamic and thermal capacity of each individual transducer.

## Monitoring and control

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### User interface

The LED display provides real-time monitoring functionalities:

- power
- L-NET network
- status
- mute, level, limit, clip, and error for each output



Refer to section [Operation](#) (p.32) for detailed operating instructions.

### L-NET remote control network

Remote control of processors and amplified controllers requires setting up a private local area Ethernet network to interconnect up to 253 units (and additional devices such as Ethernet switches / AVB bridges) with a single control computer. This Ethernet network, called L-NET, uses L-COM PROTOCOL, a proprietary communication protocol based on TCP/IPv4.

The integration of the L-NET Ethernet-based network, with its high speed data transfer protocol up to 1 Gb/s, allows up to 253 amplified controllers to be controlled and monitored in real-time from LA Network Manager.

Multiple network topologies such as daisy-chain, star, and hybrid are configurable. The computer running LA Network Manager and the amplified controllers are connected to each other using industry standard CAT5e U/FTP cables (or higher category) fitted with RJ45 connectors.

The LA1.16i connects to the network via the two Ethernet etherCON<sup>®</sup> I/O sockets located on its rear panel.



Refer to the **LA Network Manager** Help for detailed operating instructions.

### Third party management solutions

L-Acoustics is a certified member of the Crestron<sup>®</sup> partner program, and provides software modules allowing control integration into their automation systems.

L-Acoustics provides a plug-in for control and monitoring of LA2Xi, LA4X, LA7.16(i), and LA12X on the QSC Q-SYS platform.

For other control platforms, an HTTP API is available on request after signing a memorandum of understanding. Contact [avcontrol@l-acoustics.com](mailto:avcontrol@l-acoustics.com) for more information.

# 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):

- [CHK - External structure](#) (p.17)
- [CHK - Cleanness](#) (p.18)

### Functionalities

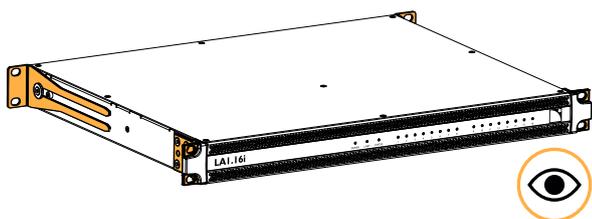
At least once a year:

- [CHK - Normal start-up sequence](#) (p.18)
- [CHK - Network functionalities and firmware](#) (p.18)

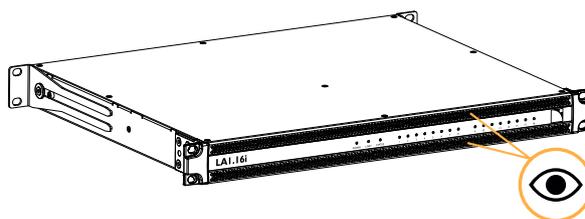
## CHK - External structure

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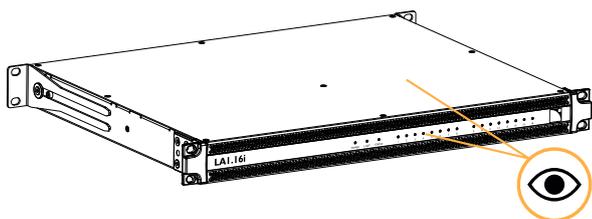
The  indicates a visual inspection.



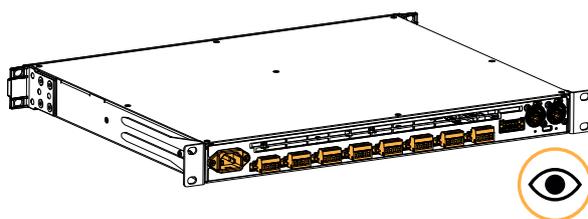
side brackets and rear brackets are present and not damaged



front grills are clean and not damaged  
see also [CHK - Cleanness](#) (p.18)



chassis and LEDs are not damaged



connectors and paired connectors are not damaged

## CHK - Cleanness

---

### Equipment

- air blower

### Procedure

Clean the amplified controller through the front grill with an air blower.

## CHK - Normal start-up sequence

---

### Procedure

1. Plug the amplified controller to mains.
2. Check that all the LEDs light up in orange during the start-up sequence.
3. Check that fan noise can be heard for a few seconds during the start-up sequence.

## CHK - Network functionalities and firmware

---

### Equipment

- computer with LA Network Manager version 2025.2 minimum
- appropriate network 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 appropriate network 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 LA1.16i 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.



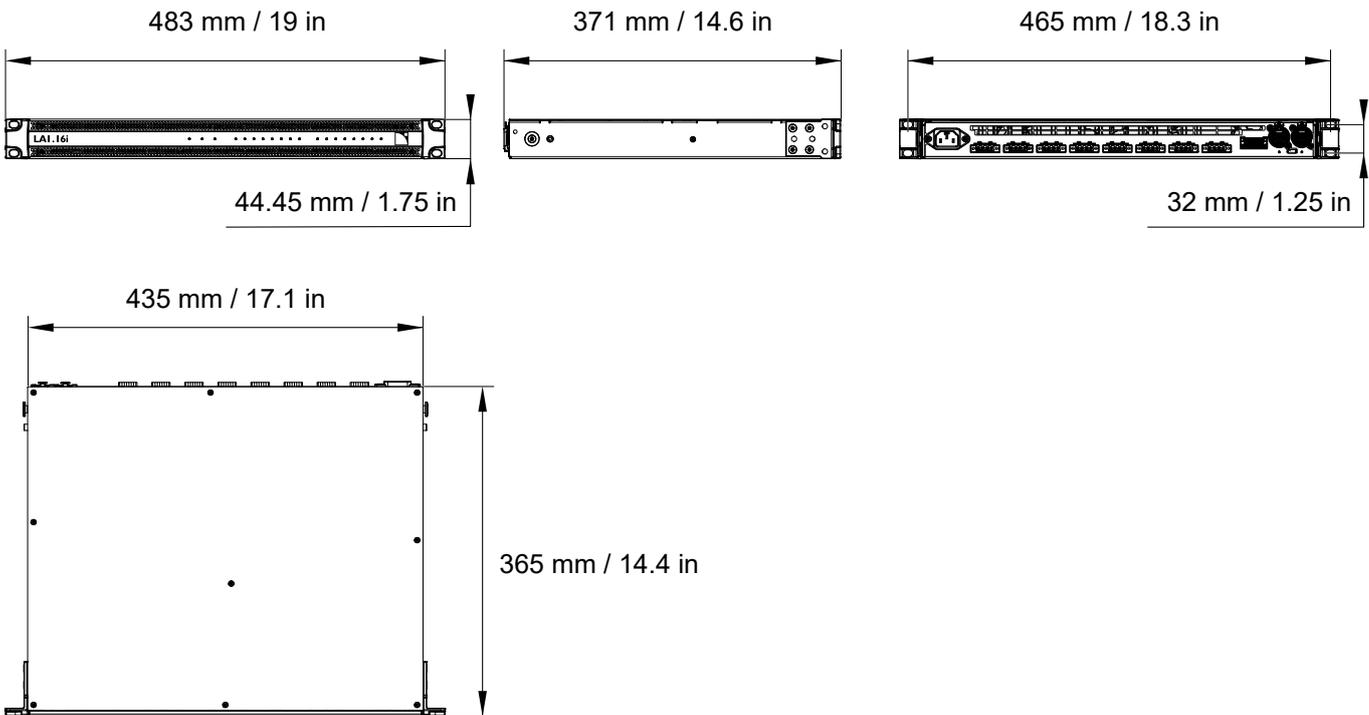
If using a third-party control system such as Crestron or QSC Q-SYS, check that updating the firmware does not break compatibility.

# Installation

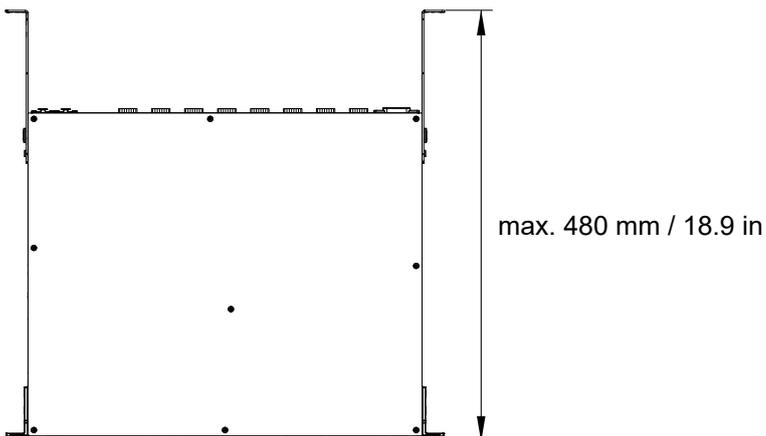
## Mounting

The LA1.16i is one rack unit high (1U) 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 amplified controller to the rack front rails.

### LA1.16i dimensions



### LA1.16i with rear rack support brackets



#### Risk of damaging the amplified controller

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 without rear support is not covered by warranty.



**LA1.16i is not compatible with L-Case / L-CASE II.**

## Ventilation

To maintain moderate operating temperatures, the LA1.16i is equipped with DSP-controlled 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 in from any external object or structure.

Ensure the front grill is clean and dirt free.

Do not block the front and rear ventilation grills.

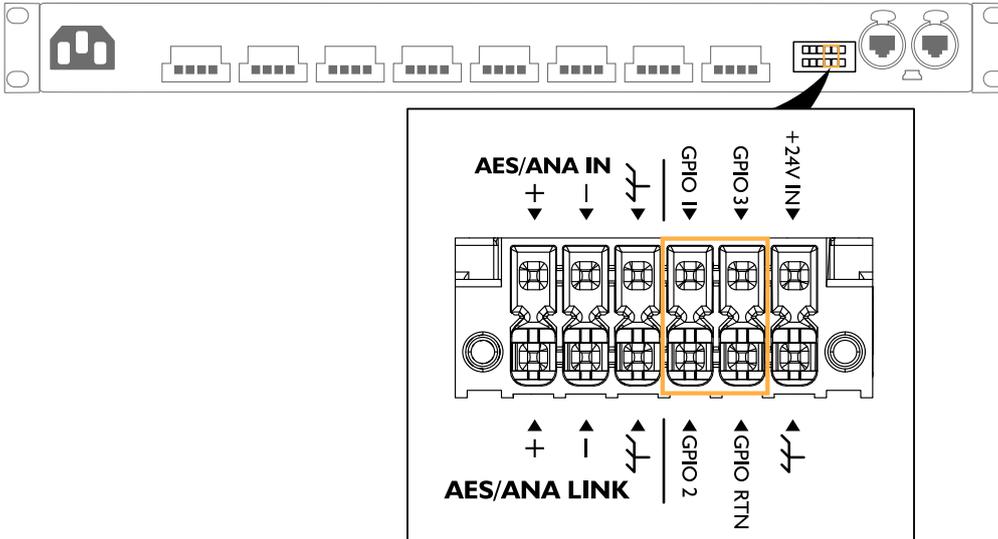
### Ventilation when rack-mounted

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.

## General Purpose I/O (GPIO)

The amplified controller's rear side features a 12-point terminal block General Purpose I/O (GPIO).



Pin	Description
GPIO 1	General Purpose I/O 1
GPIO 2	General Purpose I/O 2
GPIO 3	General Purpose I/O 3
GPIO RTN	GPIO return

GPIO can be configured using LA Network Manager. For more information, refer to the **GPIO on L-Acoustics products** technical bulletin.

## Connecting to AC mains

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### 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 V (Japan): 20 A

120 V (North America): 15 A

220-240 V (EU): 10 A

**WARNING:** The product is of Class I construction and shall be connected to a mains socket outlet with a Protective Earth connection.

#### 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 circuit breaker between the product and the mains supply.**

Use these references, or equipment with equivalent characteristics:

100 V (Japan): 20 A Terasaki S125-NF 1P

120 V (North America): 15 A Square D QO

220-240 V (EU): 10 A Type C

### Planning the power of the electrical generator



**Electrical generator**

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

LA1.16i draws up to 5 A 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 LA1.16i should therefore be:

$$(5 \text{ A} \times 230 \text{ V}) / (0.8 \times 70\%) = 2 \text{ kVA}$$

## Power cord

The removable power cord is fitted with a V-Lock compatible IEC connector at one end, and a country-specific plug at the other end.

type	plug	cable ratings	live	neutral	ground
CE	CEE7/VII, earthed	10 A / 250 V	brown	blue	green/yellow
CN	GB 2099, earthed				
UK	BS 1363, earthed				
INT	bare ends (local power plug to be fitted)				
US	NEMA 5-15, earthed	10 A / 125 V	black	white	green

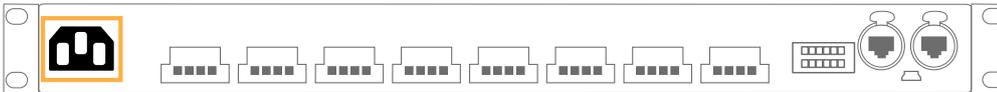
-  Strictly apply the specific safety regulations of the country of use.
- Do not defeat the ground connection of the supplied power cord using an adaptor or any other method. A suitable plug must be wired to the INT power cord.
- Verify that the plug conforms to the specific voltage and current rating given in section [Electrical specifications](#) (p.21).

## Plugging the amplified controller

How to plug the amplified controller to the AC mains.

### Procedure

- First, connect the IEC connector to the amplified controller mains panel.



- Then, connect the power plug to the mains socket.

## Power consumption

The LA1.16i power requirements depend on the load impedance and the signal level.

### Mains input power and current draw (all channels driven)

#### In SE mode

Maximum output power (CEA-2006 / 490A 20 ms, $\leq 1\%$ THD, 1 kHz, all channels driven, sine burst)	16 × 40 W RMS (at 16 $\Omega$ )	16 × 80 W RMS (at 8 $\Omega$ )	16 × 120 W RMS (at 4 $\Omega$ )
1/3 output power (-5 dB)	1.4 A / 300 W	2.4 A / 540 W	4.6 A / 1040 W
1/8 output power (-9 dB)	0.8 A / 160 W	1.1 A / 240 W	1.9 A / 430 W

#### In BTL mode

Maximum output power (CEA-2006 / 490A 20 ms, $\leq 1\%$ THD, 1 kHz, all channels driven, sine burst)	8 × 160 W (at 16 $\Omega$ )	8 × 230 W (at 8 $\Omega$ )
1/3 output power (-5 dB)	2.5 A / 550 W	4.3 A / 970 W
1/8 output power (-9 dB)	1.2 A / 250 W	1.8 A / 400 W

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

- 2.3 for 100 V

- 1.92 for 120 V
- 1.15 for 200 V

### **i** 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).

### Mains input power and current draw in Idle and Standby modes

Idle	0.4 A / 70 W
Standby	0.2 A / 12 W

Due to line filter operation, power factor is < 0.3 in Idle mode, and < 0.2 in Standby mode. Current values above are given for mains rated at 230 V and decrease with lower mains.

### Heat power calculation

If a 4 Ω load is connected to each output channel of the LA1.16i in SE mode, each channel delivers up to 160 W.

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

$$160 \text{ W} / 8 = 20 \text{ W}$$

Therefore, a total power of:

$$16 \times 20 \text{ W} = 320 \text{ W}$$

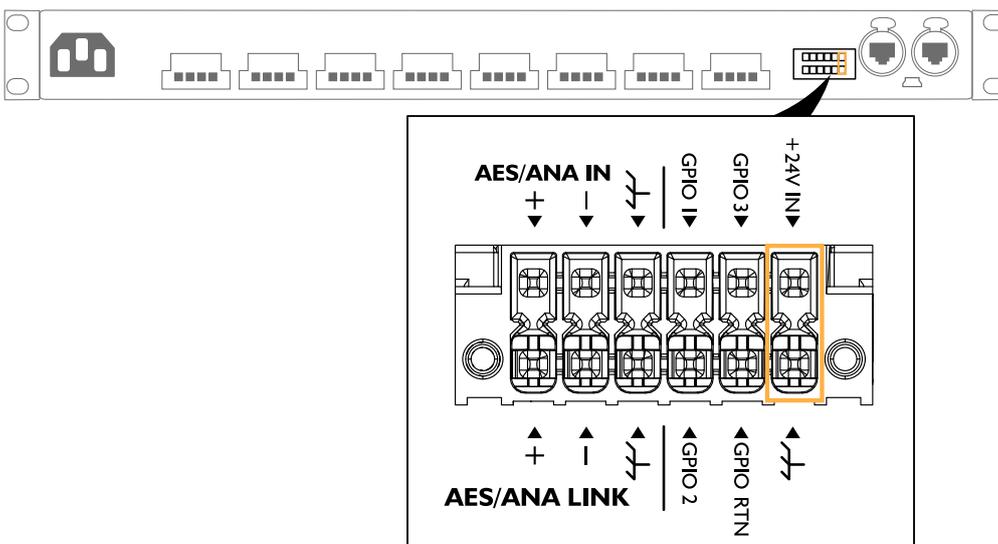
According to the table in section [Power consumption](#) (p.22), the LA1.16i power consumption is 430 W. The heat power produced is then (difference between power consumption and output power):

$$430 \text{ W} - 320 \text{ W} = 110 \text{ W}$$

### 24 V DC Input

The amplified controller's rear side features a 12-point terminal block for external powering of the DSP in case of mains failure.

In case of power failure, 24 V DC input (if used) allows for a faster recovery of the amplified controller and continued reporting and monitoring of the network and DSP.



The external power supply should be rated 24 V DC (± 10%) 17 W minimum (-5 °C / 23 °F to 50 °C / 122 °F ambient).

## ! LS10 24 V DC output is not powerful enough to supply LA1.16i DSP.

The amplified controller must be connected to the mains for firmware updates. Firmware updates cannot be performed when the amplified controller is solely powered by the 24 V DC input.

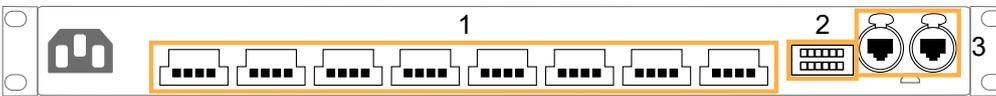
## Audio and network cabling

### 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 or digital (AES/EBU) audio sources and for linking the signals to another amplified controller.
3. For connection to an AVB or AES67 network, and to be remotely controlled by LA Network Manager or the embedded Web interface.

### LA2Xi audio and network connection panels



### Speaker connectors

Use the eight female 4-point terminal blocks for loudspeaker connection. The connectors are wired from left to right as follows:

CH 1 - 2		CH 3 - 4		CH 5 - 6		CH 7 - 8	
SE*	BTL*	SE*	BTL*	SE*	BTL*	SE*	BTL*
Out 1+	Out 1+	Out 3+	Out 3+	Out 5+	Out 5+	Out 7+	Out 7+
Out 1-	N/A	Out 3-	N/A	Out 5-	N/A	Out 7-	N/A
Out 2+	N/A	Out 4+	N/A	Out 6+	N/A	Out 8+	N/A
Out 2-	Out 2-	Out 4-	Out 4-	Out 6-	Out 6-	Out 8-	Out 8-

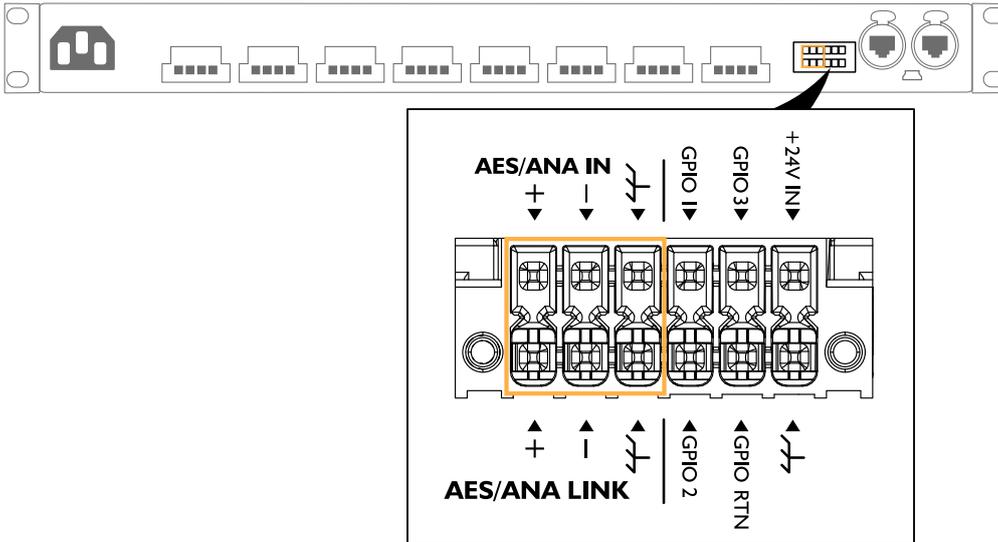
  

CH 9 - 10		CH 11 - 12		CH 13 - 14		CH 15 - 16	
SE*	BTL*	SE*	BTL*	SE*	BTL*	SE*	BTL*
Out 9+	Out 9+	Out 11+	Out 11+	Out 13+	Out 13+	Out 15+	Out 15+
Out 9-	N/A	Out 11-	N/A	Out 13-	N/A	Out 15-	N/A
Out 10+	N/A	Out 12+	N/A	Out 14+	N/A	Out 16+	N/A
Out 10-	Out 10-	Out 12-	Out 12-	Out 14-	Out 14-	Out 16-	Out 16-

\*SE: single-ended. BTL: bridge-tied load. Refer to [Speaker](#) (p.29).

## Analog/Digital connectors

Use the male 12-point terminal block for digital (AES/EBU) and analog signal cabling.



### Analog inputs

When the input mode is set to analog, AES/ANA IN can receive one analog signal. The headroom of the input circuits is high enough to accept the maximum output level from almost any line-level signal source (up to 22 dBu).

The input signals can be transmitted to daisy-chained amplified controllers using AES/ANA LINK.

### AES/EBU inputs

#### Supported digital input format

Standards	AES/EBU (AES3)
Sampling frequency (Fs)	44.1, 48, 88.2, 96, 176.4, or 192 kHz
Word length	16, 18, 20, or 24 bits
Synchronization	signal resampled to internal clock at 96 kHz

When the input mode is set to AES/EBU, AES/ANA IN can receive up to two (one stereo pair) digital signals.

The AES/ANA 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.

### Ethernet connectors

Use the two etherCON connectors for the remote control of LA1.16i over the L-NET network using LA Network Manager.

In normal network mode and AVB mode, the two etherCON connectors are part of an internal AVB switch, and allow for daisy-chaining of additional devices. In AES67 mode, the internal switch operates as boundary clock.

In redundancy mode, the two etherCON connectors are independent: the LINK/ACT 1 connector is used for the primary network, and the LINK/ACT 2 connector is used for the secondary network.

## Analog audio

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

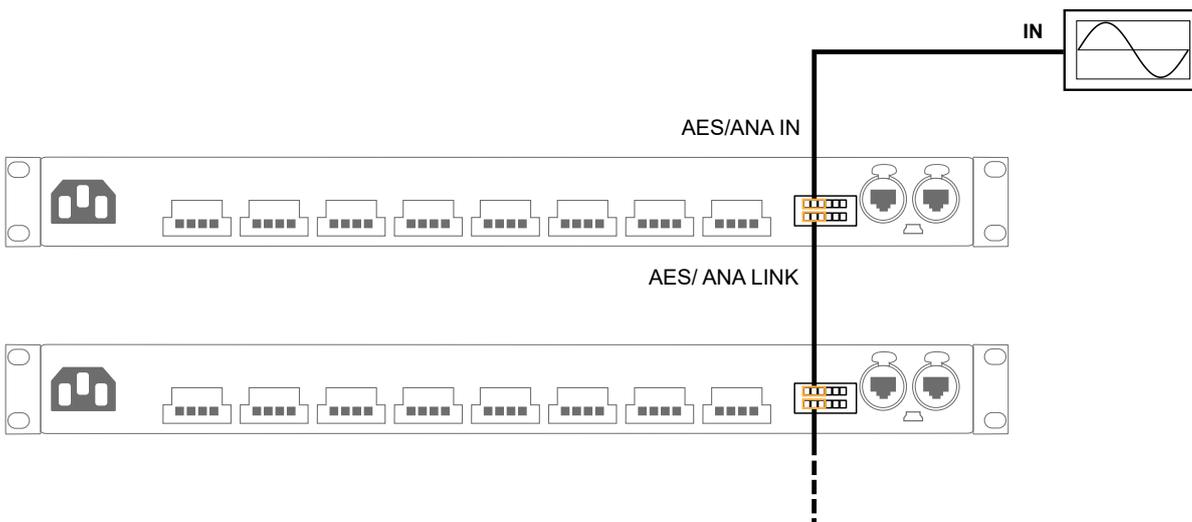
Unbalanced lines may add noise especially over long cable runs.

In a daisy-chain layout, the AES/ANA LINK feeds the input signal to the next amplified controller in the signal chain.

**!** **Risk of sound issues**  
All amplified controllers in the daisy-chain must be set to the same input mode (AES/EBU or ANALOG), even if turned off.

The input mode can be changed in LA Network Manager (refer to the **LA Network Manager Help**).

### *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.

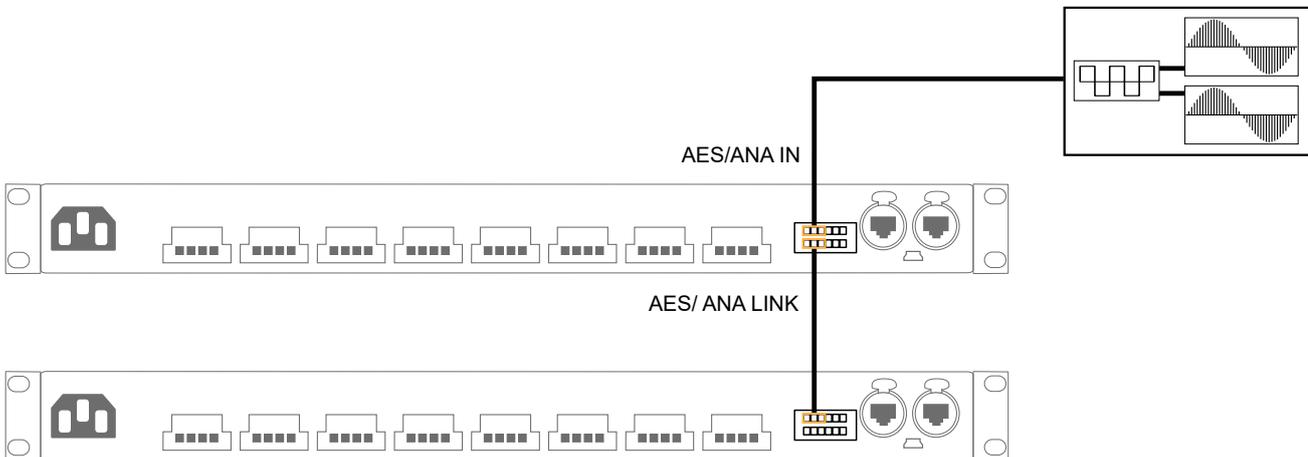
## Digital audio

In a daisy-chain layout, the AES/ANA LINK feeds the input signal to the next amplified controller in the signal chain.

- ! Risk of sound issues**  
All amplified controllers in the daisy-chain must be set to the same input mode (AES/EBU or ANALOG), even if turned off.

The input mode can be changed in LA Network Manager (refer to the **LA Network Manager Help**).

### *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  $110 \Omega \pm 20\%$ , 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 port and the LINK port 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 discarded by the SRC to 96 kHz.

## L-NET/AVB or AES67



**Do not create loops in the network setup.**



**In daisy-chain networks, always place LA4X with hardware version\* ID1, ID2 or ID3, LA4, and LA8 after any other type of amplified controller.**

These 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.

\*The LA4X hardware version is visible in the MONITORING & INFO menu (HARDWARE INFO section).

Use the two etherCON connectors on the rear panel to connect LA1.16i both to L-NET and to a Milan-AVB or AES67 network. Real-time audio traffic and control traffic are automatically managed by Milan-AVB on the same network.

LA1.16i supports Milan-AVB or AES67 in normal mode and in redundant mode. In Redundant mode, LA1.16i must be connected in star topology, port 1 being used for the primary network, port 2 being used for the secondary network. In normal mode, daisy-chain, star, or hybrid topologies are supported.

Refer to the **LA Network Manager** Help for network setup.

Remote control of processors and amplified controllers requires setting up a private local area Ethernet network to interconnect up to 253 units (and additional devices such as Ethernet switches / AVB bridges) with a single control computer. This Ethernet network, called L-NET, uses L-COM PROTOCOL, a proprietary communication protocol based on TCP/IPv4.

An IP address is a unique identifier for a network device on a given IP network. In IPv4 networking, it is made of 4 bytes (32 bits). An IP address is composed of a subnet address and a host address. The host address serves as a unique device identifier on the subnet. The subnet mask determines how many bits define the subnet address, and how many define the host address.

By convention, the first possible number of the host address is reserved to designate the subnet, and the last number is reserved to communicate with all devices of the subnet (IP broadcast address).

The factory default IP settings of all L-Acoustics devices are:

- IP address: 192.168.1.100
- Subnet address: 192.168.1.0/24
- IP broadcast address: 192.168.1.255
- Subnet mask: 255.255.255.0

With these settings, the first three bytes of the IP address (192.168.1) define the subnet address, and the last byte is the host address (100).

In general, it is recommended to:

- Use the default subnet address and subnet mask.
- Edit the device host address to provide a unique identifier to each unit: use consecutive IP addresses starting from 192.168.1.1 up to 192.168.1.253.
- Set the control computer to 192.168.1.254.

However, it is possible to configure other IP settings when required by network administration. Subnet mask may be defined from 255.0.0.0 to 255.255.255.0, and the IP and gateway addresses must both belong to one of the following IP ranges (standards for Private Local Area Networks):

- 10.0.0.1 to 10.255.255.254
- 100.64.0.1 to 100.127.255.254
- 172.16.0.1 to 172.31.255.254
- 169.254.0.1 to 169.254.255.254 (not recommended)
- 192.168.0.1 to 192.168.255.254



**LA Network Manager and its host computer must be using the same subnet and Subnet mask as the units.**

In **AVB or AES67 redundant mode**, the host address is always made identical for both the Primary and the Secondary network. The subnet address of the Secondary network is that of the Primary +1. For example, with default settings:

- Primary port: 192.168.1.100
- Secondary port: 192.168.2.100

The subnet mask setting always applies to both networks. When using smaller subnet masks, the host address is also made identical. For example:

- Primary port: 172.16.1.100
- Secondary port: 172.17.1.100

The Gateway address is only available for the Primary network.

For subnet settings, refer to the **LA Network Manager** Help.

## Speaker

 When a short-circuit is detected, output channels are automatically muted. After resolving the short-circuit issue, output channels must be manually unmuted.

Use the eight female 4-point terminal blocks to connect an enclosure to the amplified controller in a single-ended (SE) or bridge-tied load (BTL) configuration.

Using the bridge operating mode improves maximum SPL on large loudspeakers, but reduces the maximum number of loudspeaker enclosure per output and per amplified controller. For the enclosure drive capacity and the enclosure maximum SPL per amplified controller, refer to the **Amplification reference** technical bulletin or the **Preset guide**.

 **Using multicore loudspeaker cables**  
Never connect more than one amplified controller on a single multicore loudspeaker cable.  
Connecting several amplified controllers may cause audible interferences on the loudspeaker enclosures when the amplified controllers are in idle mode, even when muted.

### Speaker layout recommendations

 These recommendations only apply to output channels operating in single-ended (SE) mode.

For best performance when using LA1.16i output channels in SE mode, it is recommended to balance the loads between odd and even output channels within a block of eight channels (1-8 or 9-16), especially when using 4 ohms loads. In practice, this means that identical speaker types should be evenly distributed between odd and even output channels.

#### *Loudspeaker layout example (not recommended)*

Output channel	1	2	3	4	5	6	7	8
Loudspeaker	SB6i	X4i	SB6i	X4i	SB6i	X4i	SB6i	X4i

This loudspeaker layout is not optimal because all SB6i (4 ohms subwoofers) are exclusively connected to odd output channels. Such a layout can trigger the power budget limiter before the L-DRIVE limiters, which reduces the total output of the system. These limiters can be monitored using LA Network Manager.

#### *Recommended loudspeaker layout example*

Output channel	1	2	3	4	5	6	7	8
Loudspeaker	SB6i	SB6i	SB6i	SB6i	X4i	X4i	X4i	X4i

On the contrary, this loudspeaker layout is optimal because the SB6i are evenly distributed between odd and even output channels.

## Procedure

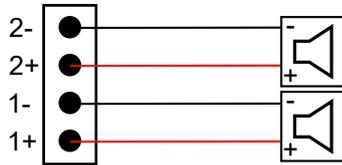
1. Refer to [Connection panels](#) (p.24) to locate the pins.
2. Connect the enclosure(s):



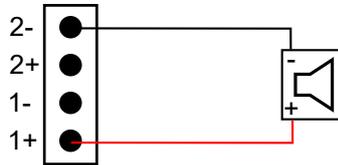
**Strictly follow the loudspeaker wiring diagrams.**

Risk of unwanted noise and errors (bridge modes not operational).

Risk of acoustic cancellations and lack of audio source localization (discrepancy in loudspeaker polarities).



SE|SE|SE|SE configuration



BTL|BTL configuration

Unused pins do not need to be connected.

For more enclosure-specific cabling schemes, refer to the owner's manual of the enclosure.

3. Turn on LA1.16i.
4. Connect LA1.16i to LA Network Manager.  
If using an existing session, solve any Unit Type conflicts in the Unit Matcher.

## Connector references

usage	number	type	reference	max. cable gauge
GPIO	1	female 12-point terminal block (pitch 3.5 mm / 0.137")	Phoenix DFMC 1,5/6-ST-3,5 – 1790522	1.5 mm <sup>2</sup>
24 V DC input				
AES/ANA input				
AES/ANA link				
loudspeaker output	8	female 4-point terminal block (pitch 5.08 mm / 0.200")	Phoenix IC 2,5/4-STF-5,08 – 1825336	2.5 mm <sup>2</sup>
			Amphenol Anytek – V80451520000G	

Use a 3.5 mm slotted screwdriver for terminal blocks to secure the loudspeaker output connectors to the amplified controller. Reference: Phoenix Contact SZS 0,6X3,5 – 1205053.

PHOENIX CONTACT is a trademark of PHOENIX CONTACT GmbH & Co. KG.

ANYTEK is a trademark of Anytek Electronic Technology (SZ) Co., Ltd.

## Operation

### Powering on/off

LA1.16i turns on immediately when plugged, and turns off immediately when unplugged (no on/off switch), refer to [Plugging the amplified controller](#) (p.22).

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

The POWER LED is lit in orange when the amplified controller is 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](#).

### Interpreting the front panel LEDs

#### L-NET

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



- green: when LA1.16i is remotely controlled by LA Network Manager (refer to the [LA Network Manager Help](#)).
- orange: when LA1.16i is remotely controlled by a third-party software.
- off: when no software remotely controls the amplified controller.

#### STATUS

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



- green: when the LA1.16i operates normally
- orange: during firmware update
- red: when a fault is detected in the LA1.16i circuitry, indicating a protection system is active

Refer to the [LA Network Manager Help](#) for more information on errors.

## Meters

The 16 LED meters display the state of the corresponding output channel.



red	continuous	the output voltage reaches the maximum level (signal clip)
	fade in/out	the output channel is muted
	1 s blink	there is an error on the output channel
orange	continuous	the L-DRIVE limiter is activated with gain reduction of at least 3 dB
	blink	during identification from LA Network Manager
	progress from 1 to 16	during firmware update
green	high	the output voltage reaches 20 dB below the maximum level
	low	the output voltage reaches 60 dB below the maximum level
off		the output voltage is more than 60 dB below the maximum level

## Other operations

The following operations can only be performed from software applications.

	LA Network Manager	USB Terminal <sup>1</sup>	L-Acoustics Device Scanner	embedded Web interface
Connection type	L-NET network	USB <sup>2</sup>	network	network
Edit IP address	yes	yes	yes	read-only
Edit subnet mask	–	yes	yes	read-only
Select redundancy mode	yes	yes	yes	read-only
Select spanning tree (RSTP) mode	yes	–	–	read-only
Configure GPIO	yes	–	–	–
Manage presets and edit their parameters	yes	–	–	–
Edit input settings	yes	–	–	yes (AES67 mode only)
Set in standby / wake up mode	yes	–	–	read-only
Reboot	yes	–	yes	–
Edit group parameters	yes	–	–	–
Monitor	temperature, mains voltage, firmware version, library version	firmware version, MAC address, serial number	firmware version, MAC address, serial number	firmware version, MAC address, serial number
Enable settings protection	yes <sup>3</sup>	–	–	–
Enable HTTP authentication	–	–	yes	–
Mute/Unmute	yes	–	–	–
Update firmware <sup>4</sup>	yes	–	–	–
Identify	yes	–	yes	–
Edit name	–	–	yes	yes
Retrieve logs	yes	–	yes	–
Reset to factory default settings	–	yes	–	–

Refer to the **LA Network Manager** help, the **L-Acoustics Device Scanner** user guide, and the **GPIO** technical bulletin for more information.

<sup>1</sup> The USB Terminal utility is available in LA Network Manager.

<sup>2</sup> Disconnect the amplified controller from the L-NET network or switch LA Network Manager to offline mode when making changes from the USB Terminal.

<sup>3</sup> Settings Protection does not prevent actions done from the **USB Terminal** utility. Take measures to restrict access to the USB port of the amplified controller.

<sup>4</sup> The amplified controller must be connected to the mains. Firmware updates cannot be performed when the amplified controller is solely powered by the 24 V DC input.

## LA1.16i embedded Web interface

Connect LA1.16i to a control computer using an Ethernet cable. Open a Web browser and enter the IP address of LA1.16i to open the embedded Web interface.

### HTTP authentication

HTTP authentication is disabled by default on LA1.16i.

To manage the authentication parameters, use L-Acoustics Device Scanner. Refer to the **L-Acoustics Device Scanner** user guide.

If HTTP authentication is enabled and the password is forgotten, use the USB Terminal tool to restore the device to factory default settings. Refer to the **LA Network Manager** Help.

The information displayed depends on the audio network protocol mode of LA1.16i (Milan-AVB or AES67). The mode can be changed in LA Network Manager (refer to the **LA Network Manager** Help).

When LA1.16i is in AES67 mode, the embedded Web interface can be used to configure AES67 stream parameters and input mapping.

When LA1.16i is in Milan-AVB mode, the embedded Web interface displays read-only information on AVB inputs and device settings.

For other operations, use LA Network Manager.

## Top bar

The LA1.16i embedded Web interface displays a top bar with configuration tools and general status.



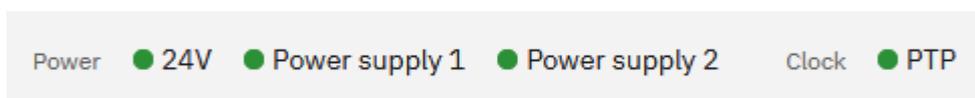
### Name

An LA1.16i can be given a name to identify it. Giving a name can help distinguish different devices in the same system, as the name appears in the tabs of the Web browser used to display the embedded Web interfaces, as well as in L-Acoustics Device Scanner and Milan Manager, Hive, or other AVDECC Controllers.

To edit, click the field and enter the name.



### Power status



The power status displays:

- the power presence on 24 V DC input (green: connected, blank: not connected). For more information, refer to [Powering on/off](#) (p.32).
- the operating state of the two power supplies:
  - green: in operation, ready to deliver power to outputs
  - orange: in standby
  - red cross: not in operation. This can be displayed in case of mains failure if LA1.16i is connected to a 24 V DC input.

### Clock status

The clock status displays the status (green: locked, red: unlocked) and the source of the clock reference.

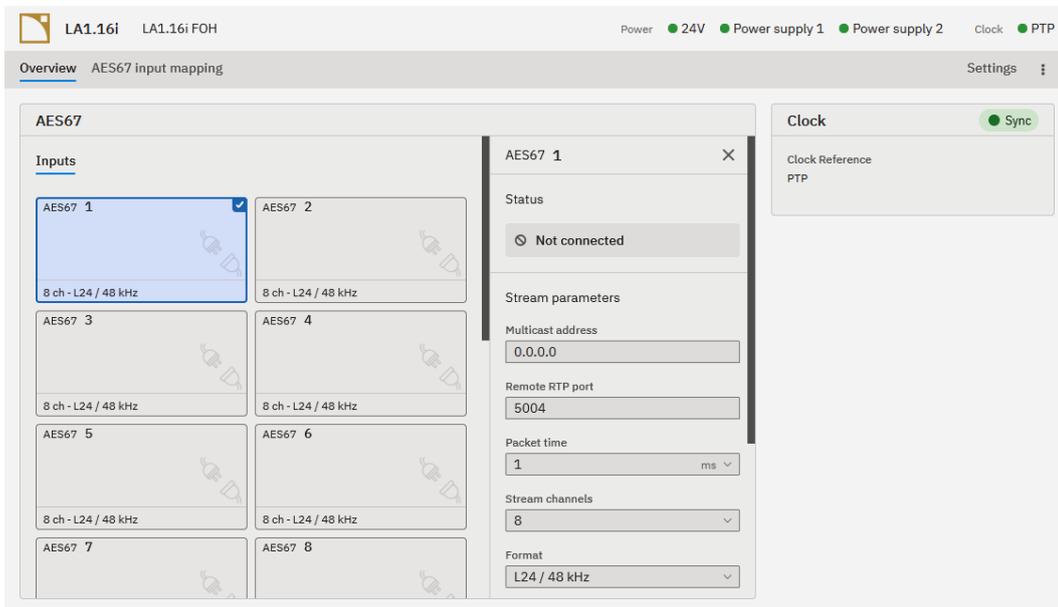
## In AES67 mode

### Overview

The **Overview** tab gives access to panels to configure the AES67 input streams and monitor the clock status.

### AES67 inputs

The **Inputs** panel displays the status of the AES67 input streams on 16 tiles. Select a tile to open a side panel with an extended view and edit stream parameters.



### Stream parameters

Set the stream parameters according to the AES67 sender.

**!** Always set the same AES67 latency parameters on all amplified controllers driving a same line source. More generally, it is highly recommended to use identical latency parameters within a sound system for simplicity.

**Stream parameters**

**Multicast address**

**Remote RTP port**

**Packet time**  
 ms

**Stream channels**

**Format**

**Media clock offset**

- **Multicast address:** enter the multicast address.
- **Remote RTP port:** enter the remote RTP port.
- **Packet time:** select the packet time between 0.333 ms or 1 ms.
- **Stream channels:** select the number of stream channels from 1 to 8.
- **Format:** select the format between L16 or L24.
- **Media clock offset:** enter a media clock offset. The media clock offset should be 0 unless the AES67 sender requires a specific setting.

When LA1.16i is in redundant network mode, **Multicast address** and **Remote RTP port** for both primary and secondary streams can be set.

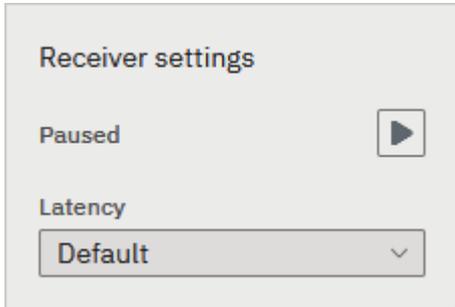
**!** When a non-redundant AES67 sender is connected to an LA1.16i in AES67 mode and redundant network mode, it is recommended to set the secondary multicast address to 0.0.0.0 to turn off the AES67 secondary receiver.

### Receiver settings

Set the **Latency** to **Default** and click the **PLAY** button to start receiving.

If there are packet losses, click the **PAUSE** button, set the **Latency** to **Extra 1 packet time**, and click the **PLAY** button again.

**!** Always set the same AES67 latency parameters on all amplified controllers driving a same line source. More generally, it is highly recommended to use identical latency parameters within a sound system for simplicity.



Refer to the **AES67 practical guide** for more information.

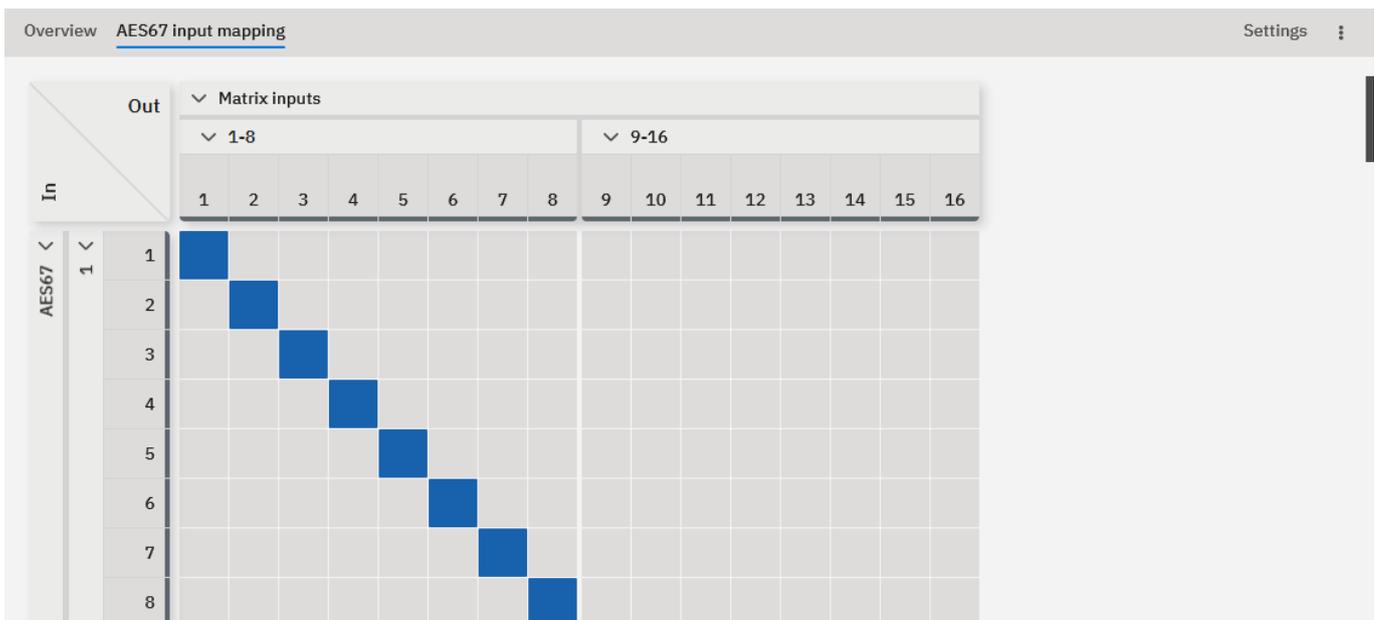
### Clock

Use the **Clock** panel to monitor the clock status.



### AES67 input mapping

Use the **AES67 input mapping** tab to configure the mapping of the 16 AES67 input streams (on the left) to the 16 matrix inputs (on the top).



Use the arrows to collapse or expand parts of the matrix table.

Click a cell in the matrix to map an AES67 input stream to a matrix input. The cell turns blue. Click the cell again to remove the mapping. Click and hold over multiple cells in a line or a diagonal to map multiple cells at once. The same AES67 input streams can be used several times in the mapping. The blue lines at the top of columns or the side of rows indicate the presence of an active mapping in that column/row.

## Settings

The **Settings** tab displays read-only panels to monitor the network settings and the device information. The only editable settings are the PTPv2 priority settings.

Overview AES67 input mapping Settings

### Network

Audio protocol

Milan-AVB  AES67

Mode

NORMAL  REDUNDANT

RSTP

IP settings

IP address  
192.168.1.110

Subnet mask  
255.255.255.0

Gateway  
0.0.0.0

PTPv2

Priority 1	Priority 2	Domain
254	254	0

Grandmaster

### Device info

Firmware

Version  
2.15.0.9

Date  
07/02/2025

Identity

MAC Address  
[Redacted]

Serial number  
[Redacted]

### PTPv2

Adjust the values of **Priority 1** and **Priority 2** to define the priority ranking of LA1.16i in the election of the PTPv2 grandmaster clock. A lower value corresponds to a higher priority.

**!** In most cases, it is recommended to define high values for **Priority 1** and **Priority 2** to make sure LA1.16i is **NOT** elected as grandmaster clock.

The **Domain** value must be the same for all devices in the AES67 network. The **Domain** value is set to 0 by default. Do not change it unless the network administration requires a specific value.

A **Me** label is displayed when the device is elected as grandmaster clock.

PTPv2

Priority 1	Priority 2	Domain
254	254	0

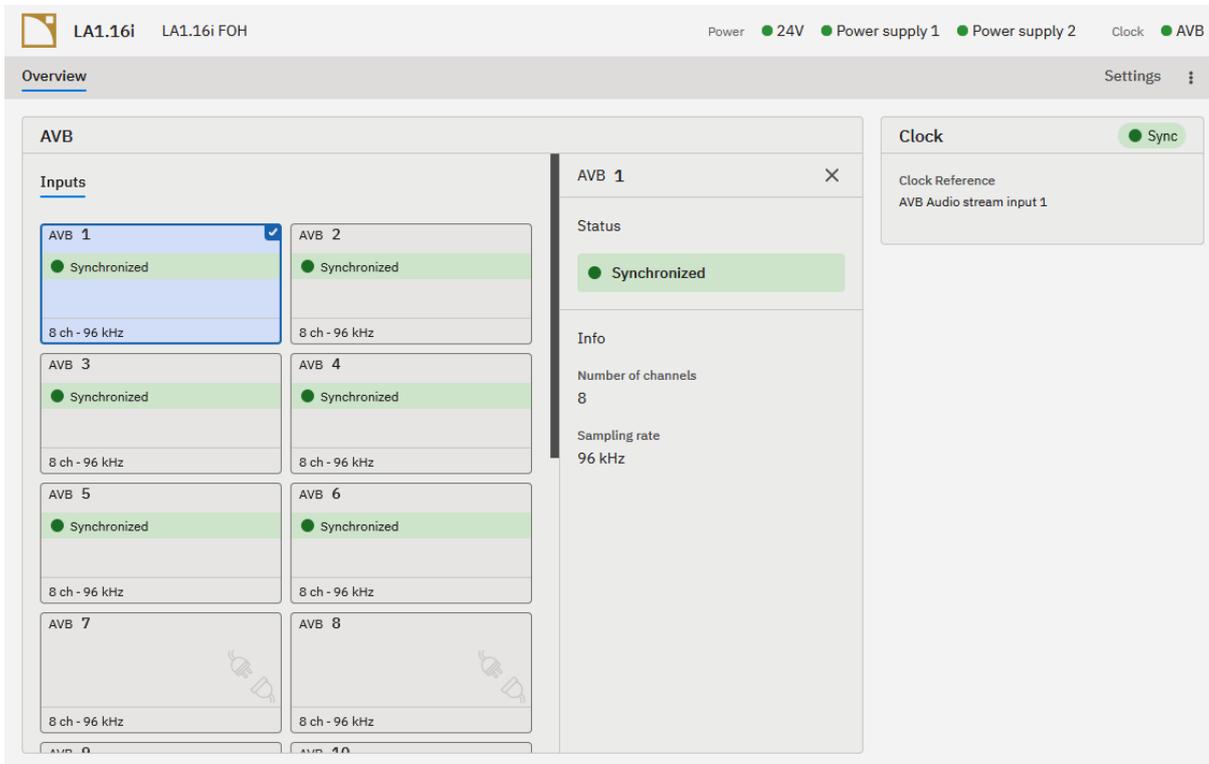
Grandmaster

## In AVB mode

When LA1.16i is in Milan-AVB mode, the embedded Web interface is read-only. To manage device settings, use LA Network Manager.

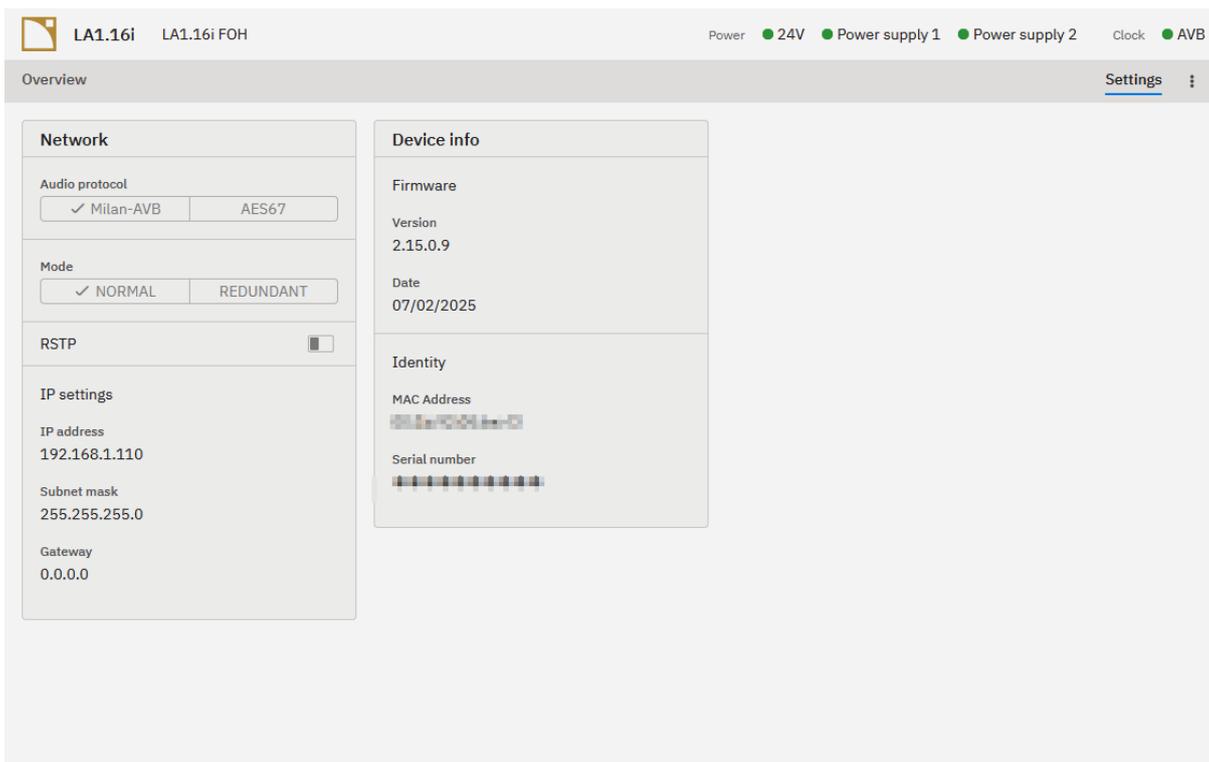
### Overview

The **Overview** tab displays read-only panels to monitor the 16 AVB input streams and the clock status. Select an AVB input stream tile to display a side panel with an expanded view.



### Settings

The **Settings** tab displays read-only panels to monitor the network settings and the device information.



## Additional actions

Click the three dots on the right to open a menu for additional actions.

### Theme

Select the color scheme of the embedded Web interface between **System** (color scheme is set based on the operating system theme), **Light**, or **Dark**.

# Specifications

## Specifications

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All values given in this section are typical values.

### General

#### Output power

12 dB Crest Factor 2 ms, 1 kHz, all channels driven, sine burst	16 × 40 W peak (at 16 Ω)
	16 × 80 W peak (at 8 Ω)
	16 × 160 W peak (at 4 Ω)
	8 × 150 W peak (at 16 Ω) (BTL)
	8 × 300 W peak (at 8 Ω) (BTL)
CEA-2006 / 490A 20 ms, ≤ 1% THD, 1 kHz, all channels driven, sine burst	16 × 40 W RMS (at 16 Ω)
	16 × 80 W RMS (at 8 Ω)
	16 × 120 W RMS (at 4 Ω)
	8 × 160 W RMS (at 16 Ω) (BTL)
	8 × 230 W RMS (at 8 Ω) (BTL)
Maximum peak output voltage	36 V pk (SE)
	70 V pk (BTL)
Amplification class	High-efficiency Class D
Digital Signal Processor (DSP)	Gen. 5 dual SHARC 32-bit, floating point, 96 kHz sampling rate
Frequency response 20 Hz - 20 kHz	± 0.25 dB
Distortion THD+N	< 0.003% (at 1 kHz, 8 Ω, unweighted)
Output dynamic range	> 114 dB (SE, 20 Hz - 20 kHz, 8 Ω, A-weighted, digital input)
	> 116 dB (BTL, 20 Hz - 20 kHz, 8 Ω, A-weighted, digital input)
Amplification gain	26 dB (SE)
	32 dB (BTL)
Noise level	< -83 dBu (SE, 20 Hz - 20 kHz, 8 Ω, A-weighted, digital input)
	< -79 dBu (BTL, 20 Hz - 20 kHz, 8 Ω, A-weighted, digital input)
Channel separation	> 90 dB (at 1 kHz, 8 Ω)
Damping factor	> 900 (SE at 1 kHz, 8 Ω)
	> 800 (BTL at 1 kHz, 8 Ω)
Output delay	0 ms to 1000 ms

**Mains input power and current draw (all channels driven)****In SE mode**

Maximum output power (CEA-2006 / 490A 20 ms, $\leq 1\%$ THD, 1 kHz, all channels driven, sine burst)	16 × 40 W RMS (at 16 $\Omega$ )	16 × 80 W RMS (at 8 $\Omega$ )	16 × 120 W RMS (at 4 $\Omega$ )
1/3 output power (-5 dB)	1.4 A / 300 W	2.4 A / 540 W	4.6 A / 1040 W
1/8 output power (-9 dB)	0.8 A / 160 W	1.1 A / 240 W	1.9 A / 430 W

**In BTL mode**

Maximum output power (CEA-2006 / 490A 20 ms, $\leq 1\%$ THD, 1 kHz, all channels driven, sine burst)	8 × 160 W (at 16 $\Omega$ )	8 × 230 W (at 8 $\Omega$ )
1/3 output power (-5 dB)	2.5 A / 550 W	4.3 A / 970 W
1/8 output power (-9 dB)	1.2 A / 250 W	1.8 A / 400 W

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

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

**Mains input power and current draw in Idle and Standby modes**

Idle	0.4 A / 70 W
Standby	0.2 A / 12 W

Due to line filter operation, power factor is  $< 0.3$  in Idle mode, and  $< 0.2$  in Standby mode. Current values above are given for mains rated at 230 V and decrease with lower mains.

**Power supply**

Model	2 universal Switched Mode Power Supplies (SMPS) with power factor correction (PFC) SMPS 1: output channels 1-8 SMPS 2: output channels 9-16
Power factor	$> 0.9$ (at full load)
Mains rating	100 V AC - 240 V AC $\pm 10\%$ , 50 Hz - 60 Hz, 430 W
Nominal current requirements	20 A for 100 V AC 15 A for 120 V AC 10 A for 220 V AC - 240 V AC
Connector	IEC V-Lock compatible

**Operating conditions**

Temperature	-5 °C / 23 °F to 50 °C / 122 °F
Maximum altitude	3000 m

## Protection

Mains and power supply	over and under voltage over temperature L-SMART overcurrent (fuse protection, and inrush current protection) power budget limiter
Power outputs	overcurrent DC short circuit over temperature
Transducers protection	L-DRIVE excursion temperature over-voltage
Cooling system	fans with temperature-controlled speed
Fan noise (free field, 1 m)	in Idle mode: 26 dBA at 1/8 output power: 44 dBA at maximum speed: 52 dBA

## Interface and connections

Indicators	1 power LED, 1 status LED, and 1 L-NET LED 16 signal LEDs
Output connectors	8 female 4-point terminal block
L-NET connectors	2 × 1 Gb/s Ethernet etherCON® I/O
Service port	1 USB-C, 2.0 compliant - for configuring IP settings using the USB Terminal tool of LA Network Manager.

## Input signal distribution

Interface and connections	
Routing and summation matrix	16 × 16
Input	1 for analog or AES/EBU on the rear 12-point terminal block
Link	1 for Analog or AES/EBU on the rear 12-point terminal block

## Digital input

### Supported digital input format

Standards	AES/EBU (AES3)
Sampling frequency (Fs)	44.1, 48, 88.2, 96, 176.4, or 192 kHz
Word length	16, 18, 20, or 24 bits
Synchronization	signal resampled to internal clock at 96 kHz

### Sample Rate Converter (SRC)

Sampling frequency	96 kHz (SRC referenced to the amplified controller internal clock)
--------------------	--

Word length	24 bits
Dynamic range	140 dB
Distortion THD+N	< -120 dBFS (dB Full Scale)
Bandpass ripple	±0.05 dB 20 Hz - 40 kHz, 96 kHz

**Input gain**

Range	-12 dB to +12 dB
Steps	0.1 dB

**Latency****Analog and AES/EBU**

In standard operating mode	3.84 ms
In low latency operating mode	1.18 ms

**Milan-AVB**

Featured AVB entities	MILAN™-certified, Avnu™-certified Milan-AVB Bridge and Listener
Standards	Ethernet Milan-AVB: IEEE 802.1BA-2011 Transport: IEEE 1722-2016 (AVTP) Control: IEEE 1722.1-2013 (AVDECC)
Input audio stream	Number: 16 (in normal or redundancy mode) Class: A Maximum network latency: 2 ms Formats: AAF PCM32, up to 8 channels, at 48 kHz or 96 kHz IEC 61883-6 AM824, 8 channels, at 48 kHz or 96 kHz
Media clock	upon user selection: synchronized on clock of the connected AVB input stream (upsampling at 96 kHz in case of stream at 48 kHz) synchronized on clock of the connected CRF stream internal
Streams forwarded by AVB Bridge	up to 150

## AES67

Standards	AES67: AES67-2023 Transport: RTP over UDP/IP Network and media clocking: IEEE 1588-2008, PTPv2
Input audio stream	Number: 16 (in normal or redundancy mode) Formats: L16, up to 8 channels, at 48 kHz L24, up to 8 channels, at 48 kHz Packet times supported: 0.333 ms or 1 ms Default latency: 3 packet times Maximum latency: 4 packet times
Media clock	Derived from the network grandmaster clock elected according to PTPv2
Control	AES67 mode selection: LA Network Manager version 2025.2 minimum AES67 stream configuration and mapping: embedded Web interface, L-Acoustics Q-SYS plug-in

## Automatic fallback option

Mode	AVB or AES67 to AES or analog, with user-defined mapping
Switchover conditions	AVB or AES67: loss of lock
Constant delay	independent from input Fs
Constant level	upon manual user selection of gain, independent from input Fs
Revert to initial input	upon manual user selection

## Remote control and monitoring

Network connection	dual-port Ethernet Gigabit interface
Network redundancy	RSTP
General Purpose I/O (GPIO)	3 GPIO, isolated Optocoupler Inputs, isolated Relays Contacts, available on the 12-point terminal block
External DSP backup voltage input	1 × 24 V DC (± 10%) 17 W minimum (-5 °C / 23 °F to 50 °C / 122 °F ambient)
L-Acoustics remote control software	LA Network Manager version 2025.2 minimum
Third-party management solutions	Crestron®, QSC Q-SYS

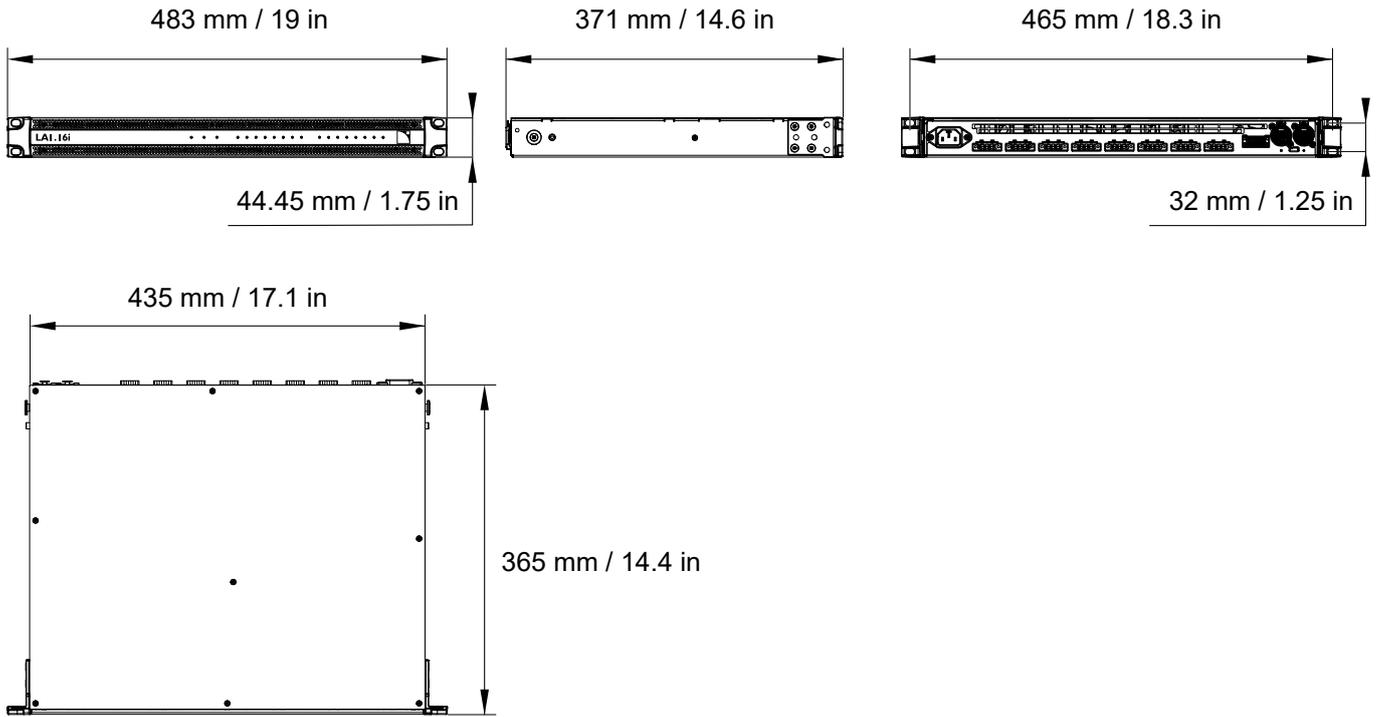
Crestron is a trademark or registered trademark of Crestron Electronics, Inc. in the United States, other countries or both.

QSC® and Q-SYS™ are trademarks or registered trademarks of QSC, LLC in the U.S. Patent and Trademark Office and other countries.

## Physical data

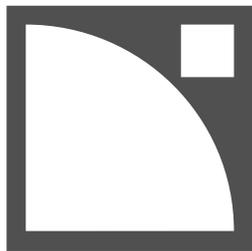
Height	1U
Weight	5.9 kg / 13 lb
Finish	black
Protection rating	IP2x

### LA1.16i dimensions



## Glossary

<b>CE</b>	Europe
<b>CHK</b>	check procedure
<b>CN</b>	China
<b>D/R</b>	disassembly/reassembly procedure
<b>INT</b>	international (bare lead version of the power cable)
<b>KR</b>	repair kit
<b>SMPS</b>	Switched Mode Power Supply (power supply inside of the amplified controller)
<b>UK</b>	United Kingdom
<b>US</b>	United States



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