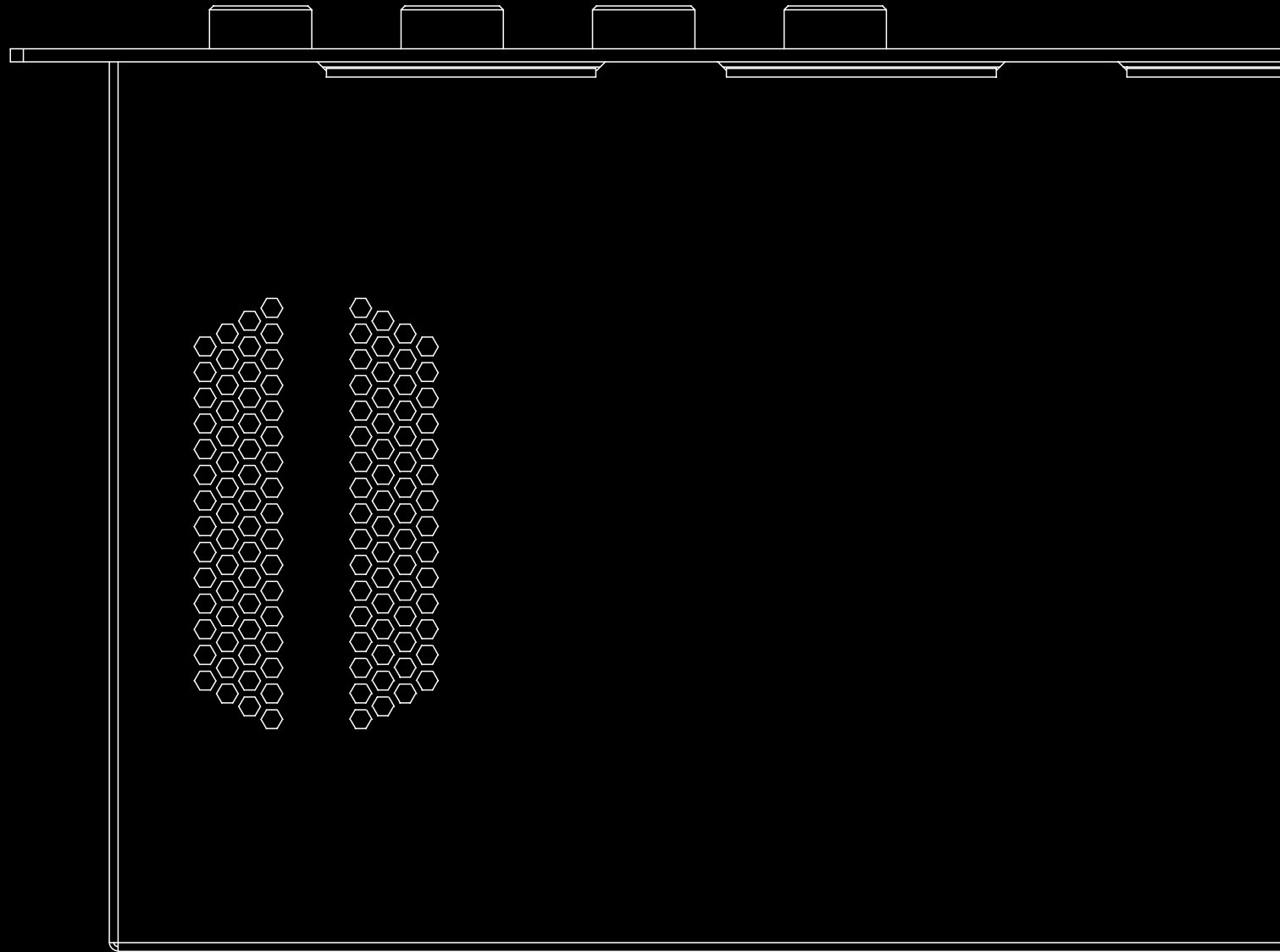


INTEGRAL-A

User manual



SOUND WITH SOUL

www.dasaudio.com

DAS Audio is a unique brand. We create sound solutions for businesses, always adapted to the different needs of our clients.

The Integral Series is the heart and brain of our installation solutions. It comprises of a series of devices that in addition to feeding and processing the signal of our speakers, allow an absolute control to our users, guaranteeing the protection and quality of the equipment.

You are about to discover what it means to work with our brand, and this is just the beginning. You will have access to quality training materials on our website, where you will discover specific business solutions and learn how to use them: dasaudio.com/en/training/

This user manual is designed to guide you, swiftly and smoothly, during the installation of our equipment, but in case you have any questions or doubts, do not hesitate to contact our technical support team by writing directly to support@dasaudio.com or, if you prefer, through our website, contacting your nearest office at dasaudio.com/contact

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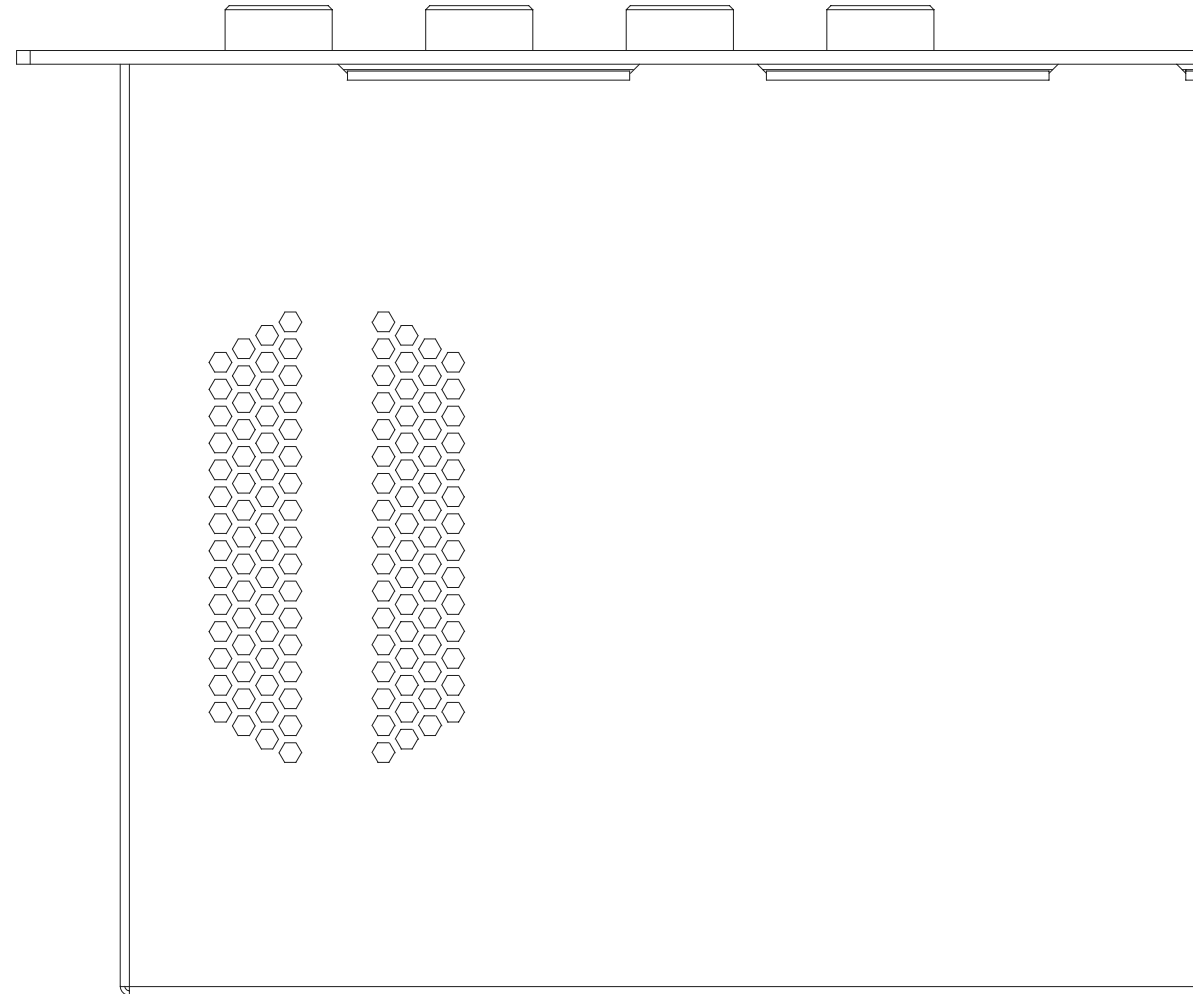
Description and features

Thank you for purchasing Integral-A Series amplifiers. They have been designed with the latest and most advanced Class D technology. As a result, a family of high-performance multichannel amplifiers with universal mains has been created for small to medium sized applications.

- 2 or 4 channel models
- Switched Mode Power Supply 90- 240 Vac
- Class D amplification
- Selectable Low or High Impedance operation
- Built-in limiter
- Built-in high-pass filter at 80Hz (selectable)
- Independent volume controls per channel
- “ON” LED indicator for unit status
- Dual LED “Signal/Clip” indicators per channel
- Overtemperature and overcurrent protection
- DC protection
- Short circuit protection
- “Stereo” (low impedance) and “Bridge” (high impedance) modes
- Ultra-light weight
- “Terminal block” input and outputs connectors

If there is unusual DC voltage at the output of the unit, the amplifier will be blocked until power is cycled off & on.

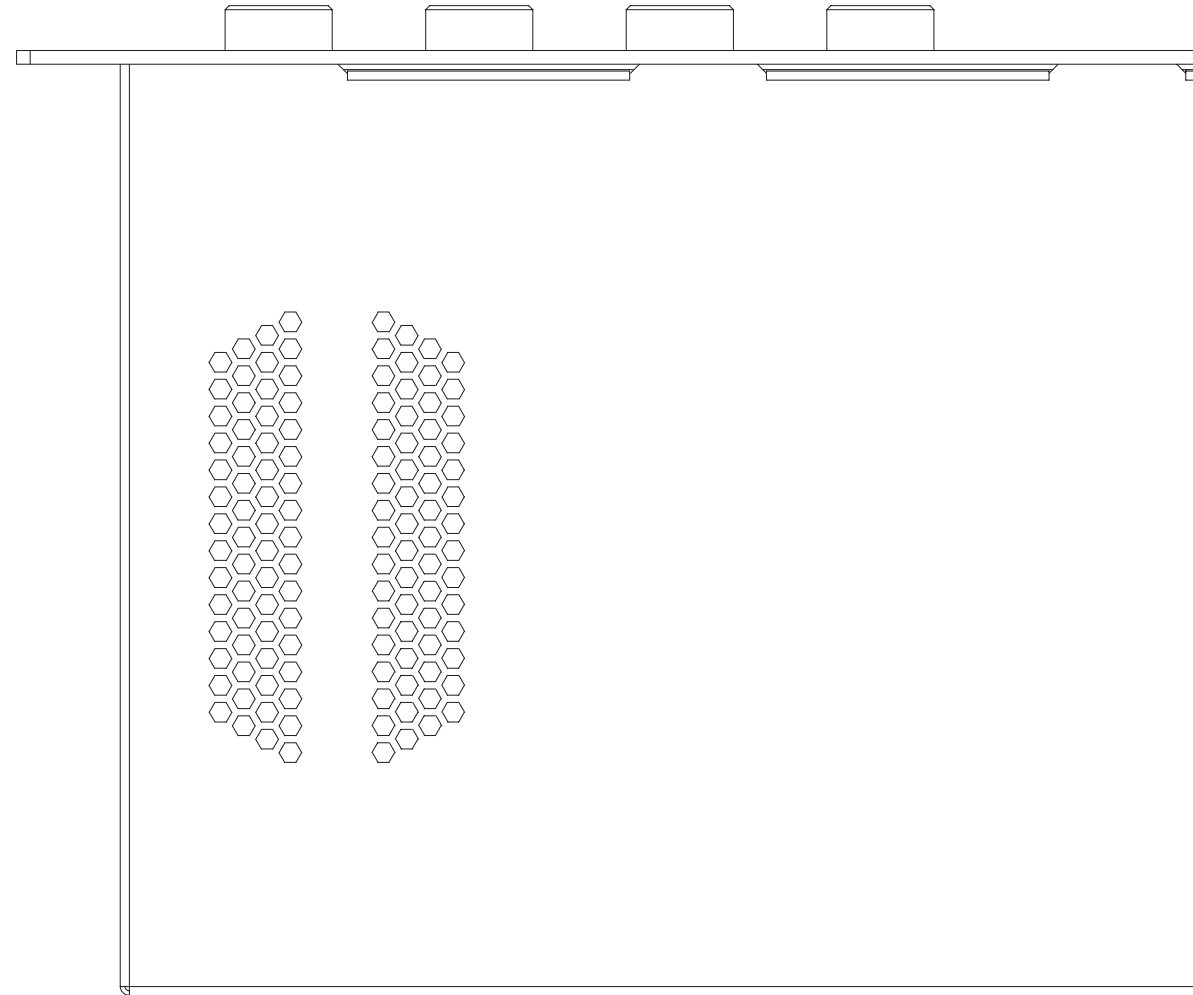
When DC voltage is due to excessively high voltage at the amplifier’s input, the unit will attempt to reactivate 3 times before shutting down.



INTEGRAL

Description and features

- Current limiting: The amplifier has a built-in current limiter to protect it under overload conditions. The current limiter will allow a typical current of 30A_{peak} during audio peaks without disabling the amplifier. If an external clip limiter has not been implemented, or if an external clip limiter is not capable of limiting the output current properly (e.g., if a permanent short is loading the amplifier), the amplifier will be disabled to prevent any damage. The current limiting depends on the amplifier's temperature. The higher the temperature, the lower the current limit for optimal amplifier protection.
- The amplifier monitors the internal rail voltages to prevent overloading of internal components and to ensure proper operation of the integrated amplifiers.



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Front panel

A LED “ON” / “Standby” / “Protect”

The “ON” LED indicator lights up green when the amplifier is on. When the amplifier is in standby mode, the LED indicator illuminates red. An orange LED indicates that the amplifier is in protection mode.

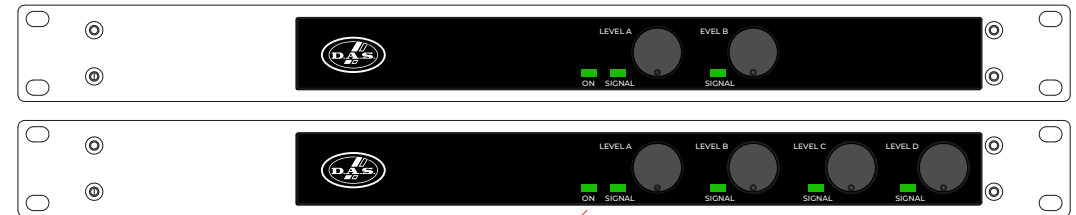
The protection mode can be triggered by:

Overheating: Thermal protection will be enabled when the internal power supply, transformer or one of the two amplifier channels overheat due to inadequate cooling. When the amplifier has cooled down, the channel’s output will be activated, and operation will resume.

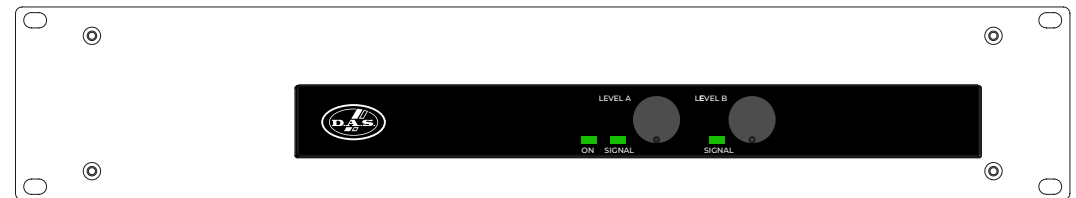
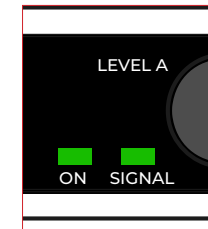
DC protection: DC protection protects the loudspeaker from damage in the event the amplifier attempts to deliver direct current (DC) to the loudspeaker. This could happen either because the voltage on the input of the amplifier is too high or if the unit has an internal fault.

Overvoltage: In case internal rail voltage is too high, the unit will disable or mute the channels and temporarily will shut itself down to prevent damage to internal components.

Undervoltage: In case internal rail voltage is too low, the unit will disable or mute the channels to ensure correct amplifier operation. Once the internal rail voltage rises to a normal level again, the amplifier channels will be re-enabled.



INTEGRAL-A402/404



INTEGRAL-A1002/A1004/A1602/A1604

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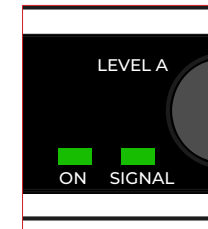
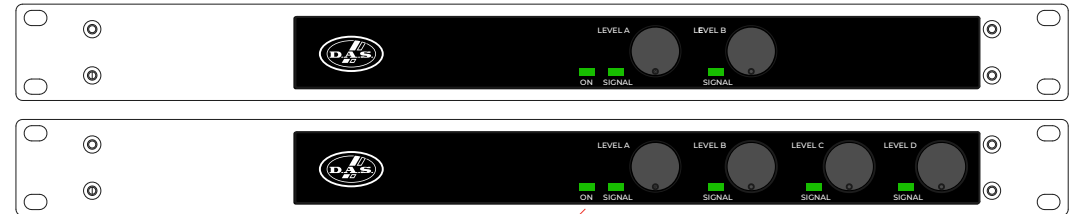
Front panel

B Output channel volume controls

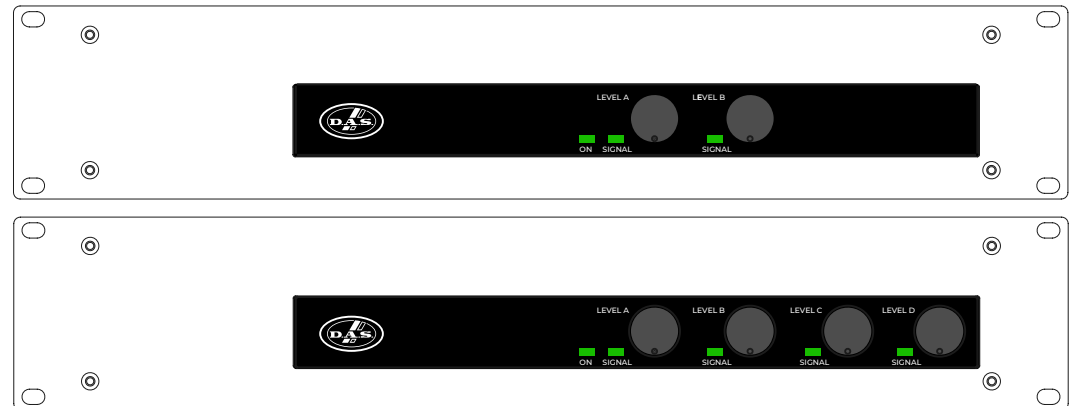
The volume levels per channel can be adjusted using the front panel rotary switch encoders. Gain is at maximum when the encoder is turned fully clockwise.

C “Signal / Clip” LED indicators

The LED indicators illuminate when signal is present at the amplifier inputs and they depend upon the position of the level control. If the input signal level exceeds the input sensitivity of the amplifier, Clip LED indicators will light up orange (soft clip) or red (severe clip).



INTEGRAL-A402/404



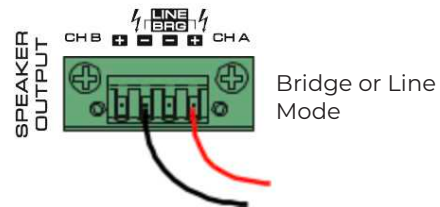
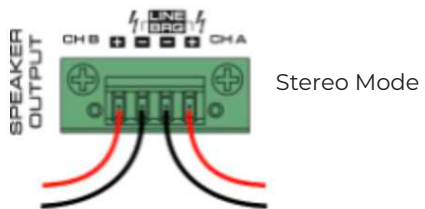
INTEGRAL-A1002/A1004/A1602/A1604

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Rear panel

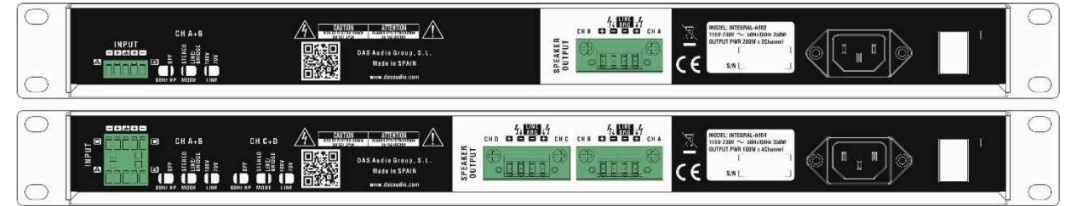
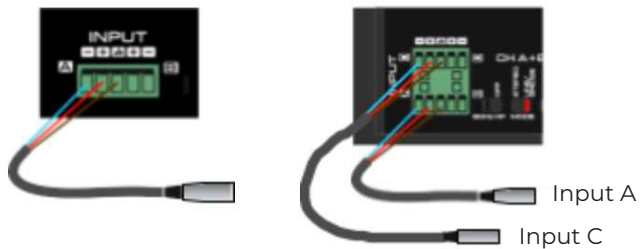
A Speaker output

The units are equipped with 4-pin “Terminal Block” connectors (5.08mm-pitch). Stereo and Bridge or Line 100/70V configurations will be connected as follows:

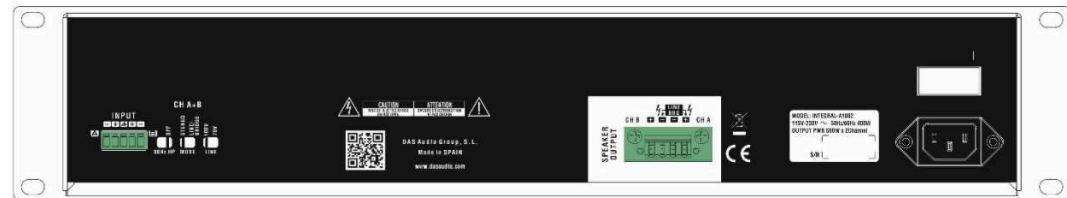


B Entradas

The units are equipped with 5-pin “Terminal Block” connectors (3.5mm-pitch).



INTEGRAL-A402/404



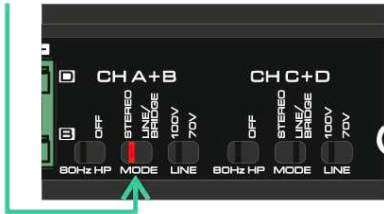
INTEGRAL-A1002/A1004/A1602/A1604

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Rear panel

C Mode Switch

It allows to configure the mode for the unit: stereo or bridge/line 100/70V.

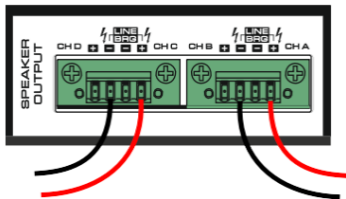


Typically, amplifiers are used in stereo mode, where input A feeds channel A and input B feeds channel B.

Utilize Bridge mode to combine power from the two channels into a single output. Use Bridge mode to connect cabinets with 100 / 70V transformers directly to the amplifier's output. In Bridge mode, inputs B and D are disabled, use inputs A and C.

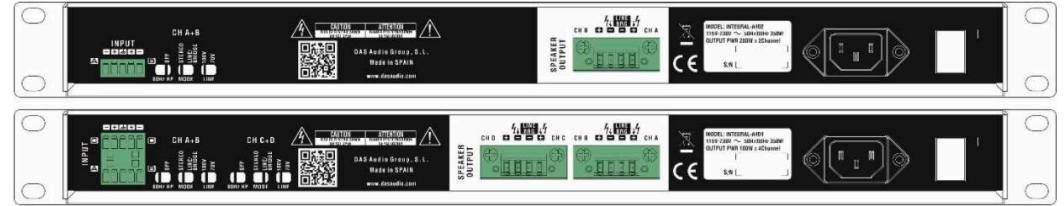
D Power Switch

Turns the amplifier on (position "I") and off (position "0"). When the amplifier is powered, the LED "ON" will illuminate.



Channels C+D

Channels A+B



INTEGRAL-A402/404



INTEGRAL-A1002/A1004/A1602/A1604

INTEGRAL

Installation

Rack Mounting

There are two 1U DIN models (A-402/404) and four 2U DIN models (A-1002/1004/1602/1604). All units have standard 19-inch rack mounting width and are equipped with four front panel mounting holes for use with M5 or M6 screws. Amplifier dimensions can be found in the “Line Drawings” section of this manual.

Cooling system

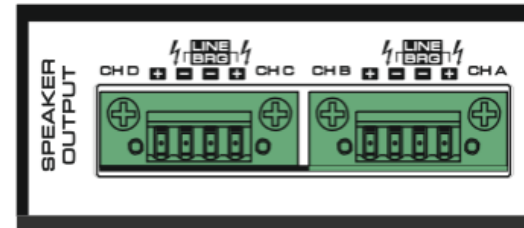
The amplifiers are equipped with a fan located in a side panel to keep the unit under stable conditions. The fans are managed by a microcontroller which varies their speed according to the needs. Air inlets are located on one side of the amplifier. Under no circumstances should they be blocked. The side walls of the rack should be a minimum of 2 inches (5 cm) from the amplifier sides. The back of the rack should be opened.

Input Cable Connections

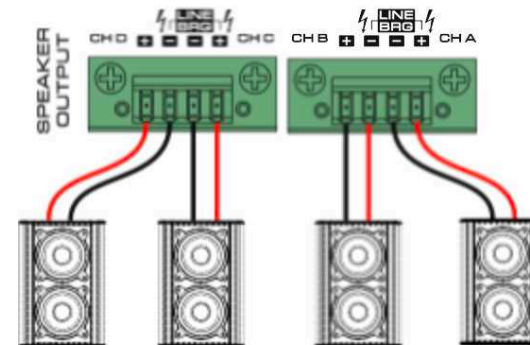
DAS Audio recommends using professional balanced cables (two conductors, shielded, 0.22 mm² or 22-24 AWG) to connect the amplifier balanced input using 3.5 mm pitch “terminal block” connectors. Wiring should only be performed by qualified personnel.

Speaker Cable Connections

To connect the loudspeakers, 4-pin “terminal block” (5.08 mm pitch) connectors are used:



If two channels are bridged, they can be used for a 100/70V (high impedance) line.

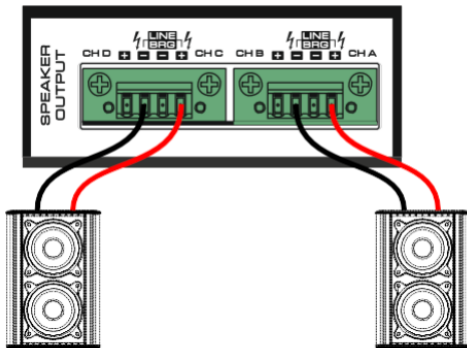


Select 4 / 8 ohm impedance to work in stereo mode with 4 channels.

INTEGRAL

Installation

Select the transformer tap position (10/20/30W) to work in Bridge mode with two line channels 100/70V



DAS Audio recommends using professional, high quality, two-conductor cables for speaker connection. For optimum results, speaker wires should be twisted cable, if possible. To prevent the possibility of short circuits, the wires should be stripped back no more than 6 mm (1/4"). The maximum cable run for the line (100 / 70V) will be determined by the cable gauge (section) and the rated power of the line.

For best performance, cable loss should not exceed 10% (approx. 1dB).

The values below are a reference when selecting cable gauge / length (copper cables):

Cable loss in dB for 100V line

| L (m) | AWG | S (mm ²) | 200W | 400W | 500W | 1000W |
|-------|-----|----------------------|--------|--------|--------|-------|
| 10 | 16 | 13 | -0,05 | -0,1 | -0,12 | -0,24 |
| 10 | 14 | 2,1 | -0,03 | -0,06 | -0,075 | -0,15 |
| 10 | 12 | 3,3 | -0,018 | -0,037 | -0,047 | -0,1 |
| 25 | 16 | 1,3 | -0,12 | -0,24 | -0,3 | -0,6 |
| 25 | 14 | 2,1 | -0,075 | -0,14 | -0,18 | -0,36 |
| 25 | 12 | 3,3 | -0,05 | -0,1 | -0,12 | -0,23 |
| 50 | 16 | 1,3 | -0,24 | -0,47 | -0,6 | -1,12 |
| 50 | 14 | 2,1 | -0,18 | -0,3 | -0,36 | -0,7 |
| 50 | 12 | 3,3 | -0,1 | -0,18 | -0,23 | -0,46 |
| 75 | 16 | 1,3 | -0,35 | -0,7 | -0,85 | -1,7 |
| 75 | 14 | 2,1 | -0,22 | -0,43 | -0,54 | -1,05 |
| 75 | 12 | 3,3 | -0,14 | -0,28 | -0,34 | -0,68 |

Cable loss in dB for 70V line

| L(m) | AWG | S(mm ²) | 200W | 400W | 500W | 1000W |
|------|-----|---------------------|--------|--------|--------|-------|
| 10 | 16 | 13 | -0,1 | -0,2 | -0,24 | -0,48 |
| 10 | 14 | 2,1 | -0,06 | -0,12 | -0,15 | -0,3 |
| 10 | 12 | 3,3 | -0,036 | -0,074 | -0,094 | -0,2 |
| 25 | 16 | 1,3 | -0,24 | -0,48 | -0,6 | -1,2 |
| 25 | 14 | 2,1 | -0,15 | -0,28 | -0,36 | -0,72 |
| 25 | 12 | 3,3 | -0,1 | -0,2 | -0,24 | -0,46 |
| 50 | 16 | 1,3 | -0,48 | -0,94 | -1,2 | -2,24 |
| 50 | 14 | 2,1 | -0,36 | -0,6 | -0,72 | -1,4 |
| 50 | 12 | 3,3 | -0,2 | -0,36 | -0,46 | -0,92 |
| 75 | 16 | 1,3 | -0,7 | -1,4 | -1,7 | -3,4 |
| 75 | 14 | 2,1 | -0,44 | -0,86 | -1,08 | -2,1 |
| 75 | 12 | 3,3 | -0,28 | -0,56 | -0,68 | -1,36 |

INTEGRAL

Installation

Mains Power Connection

Connect your amplifier to the mains power outlet using a suitable power cord for your country. First, connect the IEC mains power cable connector to the amplifier, and then connect the other end of the cord to the mains power supply.

Warning: Do not attempt to disable the third prong (ground connection), as it is a safety feature of this connector, by using an adapter or other methods.

Power Consumption

Measured current consumption delivering 1/3 of rated output power to the loads, including pink noise, corresponds to the worst-case scenario and it can be used when designing audio installations.

Depending on the mains power supply, these are the values:

A-402/404

1.5A a 230Vac, y 3A a 115Vac

A-1002/1004

1.7A a 230Vac y 3.4A a 115Vac

A-1602/1604

3A a 230Vac y 6A a 115Vac

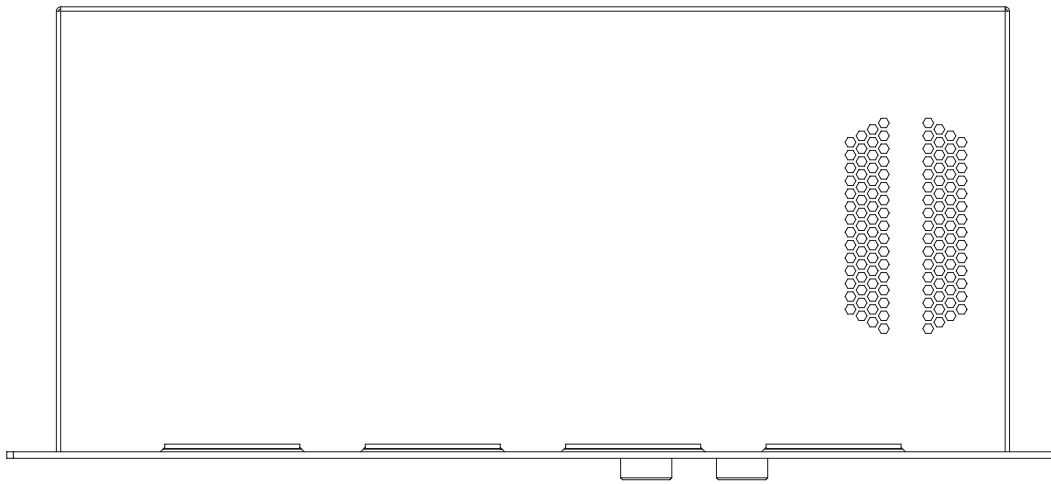
INTEGRAL Installation

Specifications

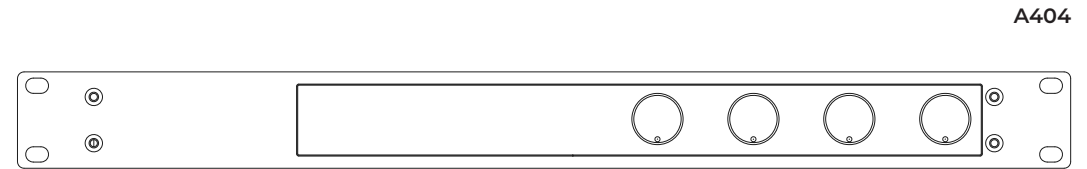
| Model | A-402 | A-404 | A-1002 | A-1004 | A-1602 | A-1604 |
|---|---|-----------------|---|-----------------|--|-----------------|
| Output power Stereo Mode | | | | | | |
| 4 ohm | 2 x 200W | 4 x 100W | 2 x 500W | 4 x 250W | 2 x 800W | 4 x 400W |
| 8 ohm | 2 x 100W | 4 x 50W | 2 x 250W | 4 x 125W | 2 x 400W | 4 x 200W |
| Output power Bridge Mode | | | | | | |
| 8 ohm | 1 x 400W | 2 x 200W | 1 x 1000W | 2 x 500W | 1 x 1600W | 2 x 800W |
| 100/70V | 1 x 400W | 2 x 200W | 1 x 1000W | 2 x 500W | 1 x 1600W | 2 x 800W |
| THD+N(%) 4ohm 1kHz full power | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 |
| Amplifier Gain dB | 30 (31.2x) | 30 (31.2x) | 30 (31.2x) | 30 (31.2x) | 32 (40x) | 32 (40x) |
| Frequency response - 20Hz to 30kHz (dB) | 0 / -0.5 | 0 / -0.5 | 0 / -0.5 | 0 / -0.5 | 0 / -0.5 | 0 / -0.5 |
| Input Impedance - Active balanced (k ohms) | 20 | 20 | 20 | 20 | 20 | 20 |
| Input Sensitivity (V/dBu) | 1.38/5 | 1.38/5 | 1.38/5 | 1.38/5 | 1.38/5 | 1.38/5 |
| AC power requirements | 1.52A @ 230V (3.04 @ 115V) | | 1.75A @ 230V (3.5 @ 115V) | | 3A @ 230V (6 @ 115V) | |
| Dimensions (H x W x D) | 44.2 x 483 x 208mm (1.74 x 19 x 8.2 in) | | 88.4 x 483 x 208mm (3.48 x 19 x 8.2 in) | | 8.4 x 483 x 208mm (3.48 x 19 x 8.2 in) | |
| Weight | 2.7 kg (5.9 lb) | 2.9 kg (6.4 lb) | 3.5 kg (7.7 lb) | 3.7 kg (8.2 lb) | 3.4 kg (7.5 lb) | 3.8 kg (8.4 lb) |

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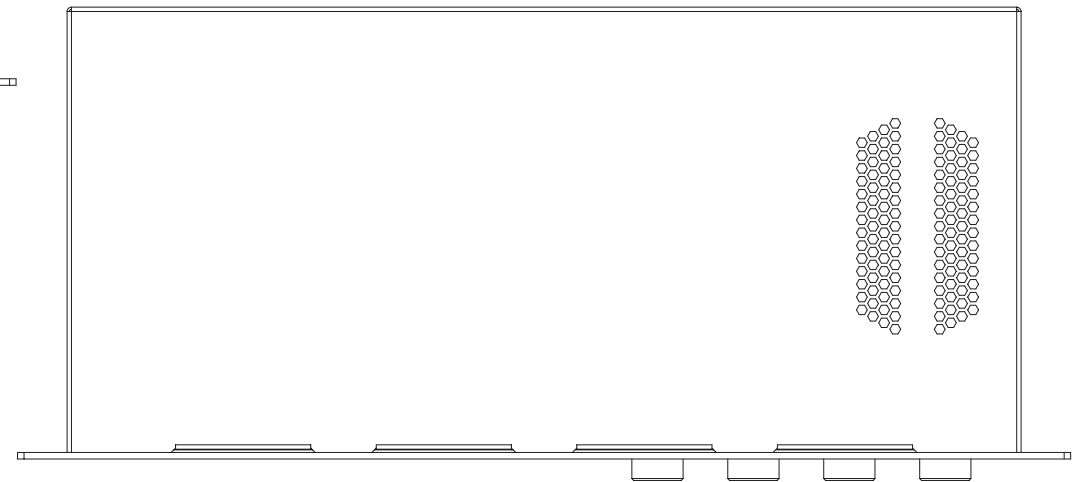
Dibujo de líneas



A402

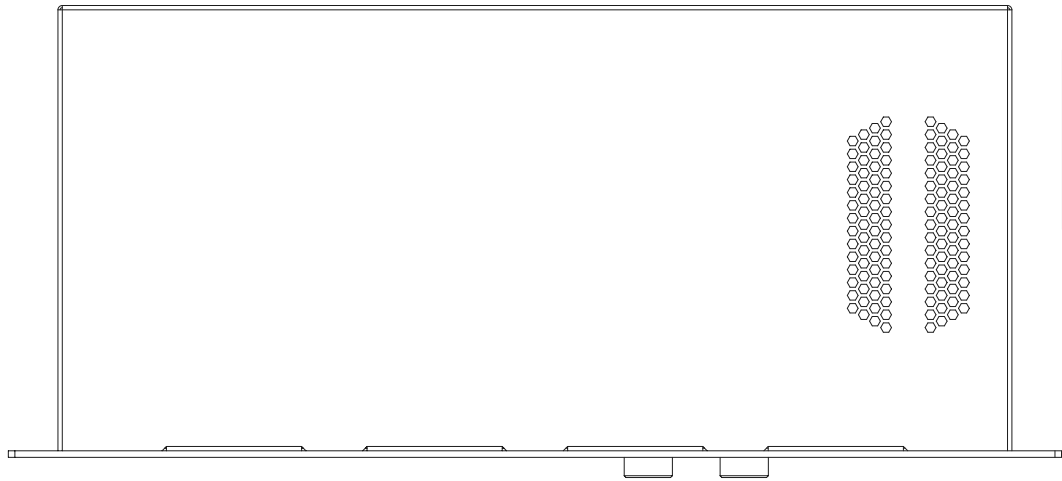
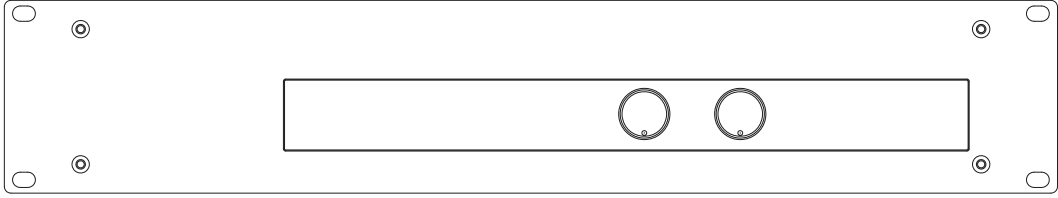


A404



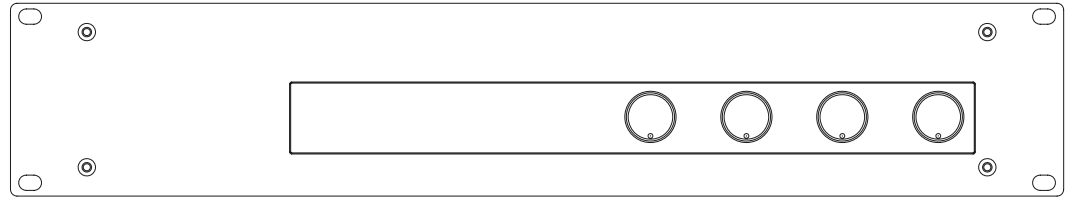
INTEGRAL

Dibujo de líneas



A-1002 / A-1602

A-1004 / A-1604



INTEGRAL

Troubleshooting

| Problem | Cause | Solution |
|--|---|--|
| No sound from the unit | <ol style="list-style-type: none">1. Signal source is not sending signal to the cable.2. Input gain controls are set to minimum.3. Signal cable is defective.4. Amplifier is not plugged in. | <ol style="list-style-type: none">1. Check that the source is not muted and is sending signal to the unit.2. Check input gain controls and set them to maximum level.3. Check that the source and the unit are correctly connected. Replace the cables if defective.4. Check the connections. |
| Full power cannot be achieved | <ol style="list-style-type: none">1. Signal source has insufficient output level.2. Input gain controls are set too low in volume. | <ol style="list-style-type: none">1. <i>Use balanced outputs from a mixer. Increase main source output level.</i>2. Set faders to higher positions. |
| Distorted sound | <ol style="list-style-type: none">1. Mixer or signal source is distorting.2. Output level of the mixer is too high.3. Amplifier clip showing on the channel. | <ol style="list-style-type: none">1. Turn down mixer's output and check that there are no channels distorting.2. Turn down mixer's output level.3. Turn down input gain controls or lower input signal level. |
| Hum or buzz when a mixer is connected to the unit. | <ol style="list-style-type: none">1. Console may have unbalanced outputs. You may be using an incorrect balanced to balanced cable.2. Mixer and unit are not plugged to the same mains outlet.3. Audio signal cable is either too long or too close to an AC cable. | <ol style="list-style-type: none">1. See appendix for un-balanced to balanced cable connections.2. Connect mixer and unit to the same mains outlet.3. Use a shorter cable and move audio signal away from the mains cables. |
| Hum or buzz when using lighting controls in the same building. | <ol style="list-style-type: none">1. Audio signal cable is either too long or too close to the lighting cable.2. On a sound system with three-phase AC, the lighting equipment and the unit are connected to the same phase. | <ol style="list-style-type: none">1. Move audio signal away from lighting cables. Try to find where the noise is leaking into the system.2. Connect sound system to a different phase. You may need the help of a professional electrician. |
| Low sound levels | <ol style="list-style-type: none">1. Signal cable is defective.2. Level controls are not set to maximum position.3. Low input signal level.4. Using speakers with transformer in stereo mode. | <ol style="list-style-type: none">1. Check cables and replace if necessary.2. Increase output level controls.3. Increase source level.4. Switch the amplifier from stereo to bridge mode (100 / 70V). |
| ON LED lights up orange indicating "Protection" | <ol style="list-style-type: none">1. Unit has activated thermal protection.2. Short circuit.3. Defective unit. | <ol style="list-style-type: none">1. Turn down input level and verify the amplifier is cooling correctly. Check the fan is running and that all the air inlets/outlets are not blocked.2. Check all connected cables, connectors and speakers.3. Contact an authorized distributor for service. |

Annex: Balanced and Unbalanced Connections

There are two common ways of carrying the audio signal with microphone or line level:

Unbalanced line: Uses a two-conductor cable, carrying the signal as a potential difference between the two wires. Electromagnetic noise (interference) from the surroundings can be picked up and added to the signal carried by the cables, appearing at the output of our system as noise. Connectors that carry unbalanced signal have two pins, such as RCA (Phono), and 1/4" (6.35 mm often referred to as jack) mono. Three-pin connectors, such as XLR (Cannon), may also carry an unbalanced signal when one of the pins is not in use.

Balanced line: Uses a three-conductor cable. One of the conductors, known as the ground conductor, acts as a shield against electromagnetic noise. The other signal wires have the same potential difference with respect to ground, but one of the signals is reversed in polarity. Noise that cannot be rejected by the shield affects both signal wires equally. Most professional audio electronic devices use balanced inputs. In these devices the input circuit recognizes only the potential difference between the two signal-carrying wires with opposite polarity, thus rejecting noise, with the same polarity on both wires. Connectors that carry a balanced signal have three pins, such as XLR (Cannon), and 1/4" stereo jack.



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