HADA Series

NETWORKABLE AMPLIFIERS

Digital Amplifiers

USER MANUAL

TABLE OF CONTENTS

1. PRECAUTIONS

1.1 Important Notice

WARNING: SHOCK HAZARD - DO NOT OPEN

AVIS: RISQUE DE CHOC ÉLECTRIQUE - NE PAS OUVRIR

The flashing light with an arrowhead symbol inside an equilateral triangle on it is intended to alert the user of the presence of non-insulated “dangerous voltage” within the enclosure, which might be of sufficient magnitude to pose a risk of electric shock to users.

The exclamation mark within an equilateral triangle is intended to alert the user of the requirement for important operating and maintenance (servicing), for which instructions may be found in the literature accompanying the appliance.

WARNING (If applicable): The terminals marked with symbol “ ” may be of sufficient magnitude to pose a risk of electric shock. The external wiring connected to terminals requires installation by a technician, or the use of ready-made leads or cords.

WARNING: To prevent fire or shock hazard, do not expose this equipment to rain or humidity.

WARNING: A device with Class I manufacturing ought to be connected to a mains socket outlet with a protective earthing connection.

WARNING: Ecler products have a long lifetime of more than 10 years. This product must never be discarded as unsorted urban waste, but must be taken to the nearest electrical and electronic waste treatment centre.

1.2 Key Safety Directions

1. Read the following directions.
2. Keep the following directions.
3. Heed all warnings.
4. Follow all directions.
5. Do not use this device in proximity to water.
6. Clean only with a dry cloth.
7. Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.
8. Do not install near any heat sources such as radiators, heat registers, stoves, or other devices (including amplifiers) that may release heat.
9. Do not defeat the safety purpose of the polarized or grounding type plug. A polarized plug has two blades, being one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade or the third prong are provided for your safety. If the provided plug does not fit into your outlet, contact a qualified electrician for a replacement of the obsolete outlet.
10. Protect the power cord from being walked on or pinched, particularly at the plugs, convenience receptacles, and at the point of exit from the device.
11. Only use attachments/accessories specified by the manufacturer.
12. Unplug the device during lightening sorts or when unused for long periods of time.
13. Refer all servicing to qualified personnel. Servicing is required when the device has been damaged in any way, such as power supply cord or plug damage, liquid spillage or objects onto the device, the device has been exposed to rain or humidity, does not operate normally, or has been dropped.
14. Disconnecting from mains: When switching off the POWER switch, all the functions and light indicators of the unit will be stopped, but fully disconnecting the device from mains is done by unplugging the power cable from the mains input socket, therefore, it should always remain easily accessible
15. Equipment is connected to a socket-outlet with an earthing connection by means of a power cord.
16. The marking information is located at the bottom of the unit.
17. The device shall not be exposed to dripping or splashing liquids, and no liquid-filled objects, such as a filled up glass, shall be placed on top of the device.

1.3 Cleaning Directions

Clean the unit with a soft, dry clean cloth or slightly wet with water and neutral liquid soap only, then dry it with a clean cloth. Be careful that water never gets into the unit through any hole. Never use alcohol, benzine, solvents or abrasive substances to clean this unit.

NEEC AUDIO BARCELONA, S.L. accepts no liability for any damage that may be caused to people, animal, or objects due to failure to comply with the warnings above.

2. WARRANTY & ENVIRONMENT

Thank you for choosing Ecler Hada Series!
We greatly value your trust.

It is **VERY IMPORTANT** to carefully read this manual and to fully understand its contents before any connecting takes place in order to make the best use of this equipment, as well as to get the best performance from it.

To ensure optimal operation of this device, **we strongly recommend that its maintenance be carried out by our authorised Technical Services.**

All ECLER products are covered by warranty, please refer to www.ecler.com or the warranty card included with this product for the period of validity and conditions.

Ecler is truly committed with the environment and planet sustainability, energy saving and CO_2 emission reduction. Recycling materials and using non-contaminant components are also top priorities in our green crusade.

Ecler has deeply evaluated and analyzed the environmental impacts of all the processes involved in the production of this product, including packaging, and has alleviated, reduced and/or compensated for them.

3. PACKAGE CONTENTS

- 1 unit of one of the HADA Series models.
- EU mains cords.
- Euroblock Connectors (inputs /outputs)
- Desktop feet, rack 19" installation hardware.
- First Steps Guide.
- Warranty card.

4. DESCRIPTION & FEATURES

HADA Series is a family of digital amplifiers, with different power levels: **HADA-4B150** with 125W, **HADA-4B250** with 250W, **HADA-4B400** with 400W, **HADA-4B500** with 500W and **HADA-4B750** with 750W.

All the models include 4 amplified channels that support Hi-Z and Low-Z loads down to 4 ohms. Thanks to the power sharing technology, the total amount of power of the first or the second couple of channels can be shared or, for example, can be used in only one channel without using bridge connections. For Hi-Z lines, bridge connection is required.

A powerful DSP allows to manage the routing and the processing of the inputs and outputs through the HADA DSP Manager Software. Routing functionality includes a matrix mixer for selecting which input channels to allocate to the outputs. Processing includes 10-band EQ, HP and LP filters, limiters, multi-band compressors, delay up to 2 sec, and factory and end-user configurable presets.

All models include a remote output volume control via the front potentiometers. It is also possible to connect external potentiometers in the rear panel, for the remote volume control of the outputs. Via an external contact, it is also possible to perform a general mute of the outputs, for emergency functions or integration purposes.

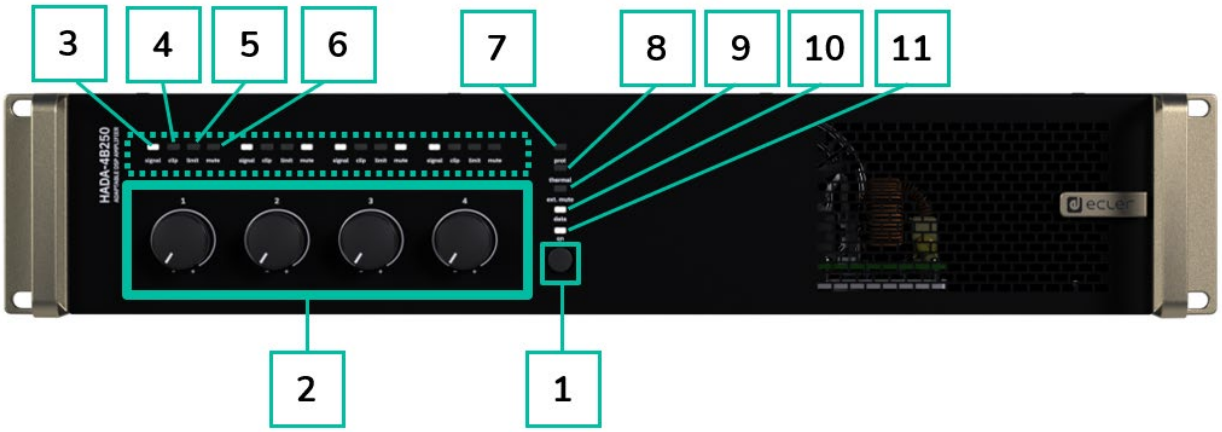
Another control option is network control via TCP/IP which allows to control the amplifier from third party control systems through customized user interfaces.

4.1 Main Features

- 4 amplified outputs in Lo-Z or 2 amplified outputs in Hi-Z.
- 4 balanced analogue inputs on Euroblock connectors.
- 4 GPI for remote volume control
- Internal matrix mixer and signal processing.
- HADA DSP Manager software for device configuration and control
- Third party TCP/IP control.

5. PANEL FUNCTIONS

5.1 Front Panel



1. **ON/Standby Button:** the equipment is switched on by default just switching to ON the rear power switch.
   - When the ON LED of the front panel is lit in white, the device is operational.
   - To enter in standby mode, press and hold the ON button of the front panel until all LEDs on the front panel blink once. The prot. LED (red) will illuminate together with the ON LED (white) to indicate that standby mode is active.
   - To exit standby mode, repeat the process.
2. **Control knobs (1-4):current**

   Each front panel LEVEL knob allows to control the correspondent amplified audio outputs. When two channels are bridged, potentiometer 1 or 3 will be the one taking control of the bridged channel pair, and 2 or 4 will be then inactive. For further information see HADA DSP Manager chapter.

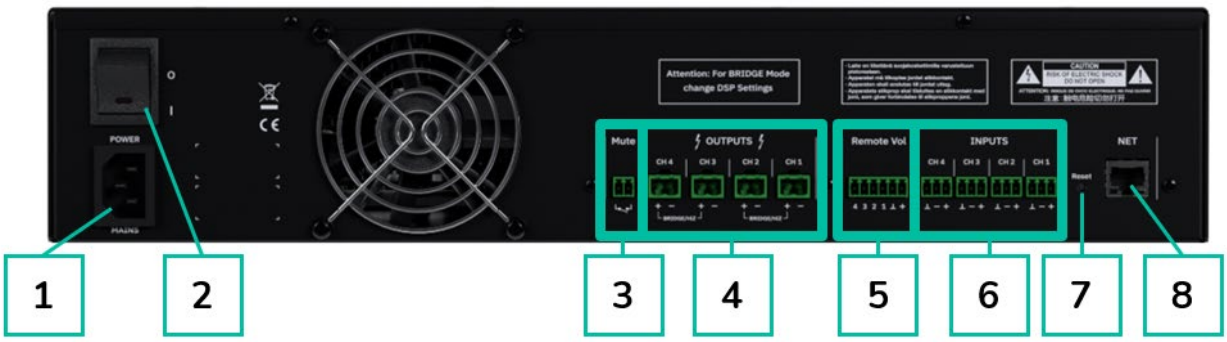
   The **front panel knobs can be disabled** by holding down the ON button until all front panel LEDs flash three times. The same procedure will enable them again.

3. **Signal indicator LED**: indicates signal presence in the amplification output. These indicators light up in white colour when the input signal exceeds -36dBV threshold.
4. **Clip indicator LED**: lights up in red colour when the input signal exceeds +18dBV.
5. **Limit indicator LED**: lights up in red colour when the output signal reaches the limit set by software in the output limiter section. In case that any limiters are set, the LED lights up when the maximum power is reached.

   Depending by the output mode configuration (Dual or Bridge Mono) **and the output settings** (4 Ohm, 8 Ohm, 8 Ohm Bridge, 70V or 100V) **the behaviour of the limit LED changes**. Please ensure that the output configuration matches with the load in use.

6. **Mute indicator LED**: lights up in white colour when the amplified output is muted.
7. **Prot. indicator LED**: lights up in red colour when any protection of the power module is active (along with the mute LEDs of the channels that are failing), or when the standby mode is active (along with the ON LED).
8. **Thermal indicator LED:** lights up in red colour when temperature limiter is activated.
9. **Ext. Mute LED**: lights up in white colour when the external mute is active.
10. **Data indicator LED**: lights up in white colour to indicate that the software HADA DSP Manager is online.
11. **On indicator LED**: in white colour indicates power energy activity.

5.2 Rear Panel



1. Mains socket base
2. Power switch
3. External mute port
4. Amplified outputs, OUT 1-4, 2-pin Euroblock
5. Remote Volume ports REMOTE 1-4, 6-pin Euroblock
6. Analogue inputs, IN 1-4, 3-pin Euroblock, balanced.
7. Reset button
8. RJ-45 ethernet network port, NET, RJ-45

6. INSTALL & CONNECT

The **equipment must be correctly grounded** (ground resistance, Rg = 30 Ohm or less). The environment must be dry and dustless. Do not expose the unit to rain or water splashes, and do not place liquid containers or incandescent objects like candles on top of the unit.

Do not obstruct the ventilation grilles with any kind of material. If the device requires any intervention and/or connection/disconnection, it must be first powered off.

Do not handle the speaker output terminals with your device turned on, there are high voltages. The output cabling should be connected by a qualified technician. Otherwise only use pre-made flexible cables. There are no user serviceable parts inside the amplifier.

⚠ **Non-compliance with the instructions or neglecting warnings may cause malfunction or even damage the unit**.

- **Avoid turning on the device without the speakers connected to its outputs** and without having previously set the volume/gain controls to minimum level.
- **Always use shielded cables** to make connections between devices.
- **In an amplifier, avoid placing the speaker output cables close to other signal cables** (micro, line...). This may cause the system to oscillate, damaging the amplifier and speakers.

6.1 Location, Assembly and Ventilation

HADA series devices have a **19" rack format (2RU).**

It is very important not to enclose the amplifier or expose it to extreme temperatures as it generates heat. It is also necessary to encourage the airflow through the ventilation holes of the chassis. The ventilation system forces the airflow, front to back, through the unit.

If multiple products are installed in the same rack or in a cabinet with closed doors, it is highly recommended to install fans in their upper and lower ends for a forced airflow from the bottom up. This upward air flow will help to dissipate the heat generated inside.

⚠ **It is advisable not to place power amplifiers under other appliances**, but upon these ones. Hada amplifiers **can be stacked one on top of the other, leave one rack unit empty every 3 to guarantee an adequate heat sink.**

⚠ **Regular maintenance of dust removal is highly recommended** as dust can impede airflow and hinder heat dissipation.

6.2 Mains Connection

HADA operates on alternating voltages from 90 to 264V and 47 to 63Hz. This device is equipped with an oversized power supply capable of adapting **without any type of adjustment to the mains voltage of any country in the world.**

On the **rear panel**, there is an **on/off switch** for the unit.

In the **front panel** there is the **button ON** with its LED indicator that **illuminates when the unit is in operation.**

To enter in standby mode, press and hold the ON button until all LEDs on the front panel blink once. The prot. LED (red) will illuminate together with the ON LED (white) to indicate that standby mode is active.

To exit standby mode, repeat the process.

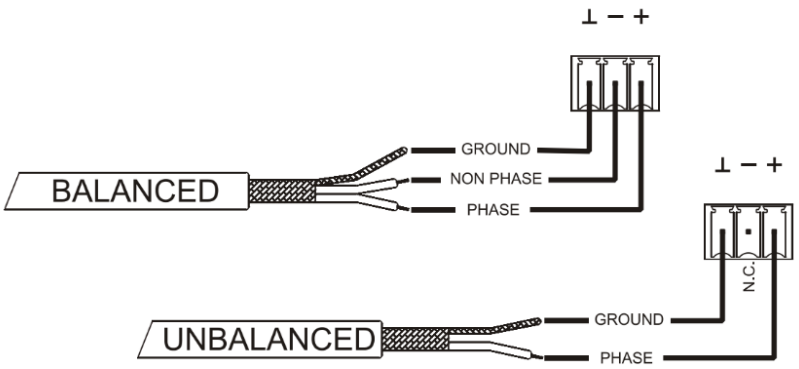
Do not allow the mains cable to run parallel to the shielded cables carrying the audio signal, as this may cause humming.

6.3 Analogue Input Connections

HADA **rear panel provides analogue, balanced, line level signal inputs**. The selection of hardware inputs and their routing and mixing towards either amplifier channel is performed from its embedded web application. For further information, please refer to HADA DSP Manager chapter.

Signal input connectors are 3 position screw terminal block. The wiring is:

Live or direct signal	>	Pin	+
Cold or inverted signal	>	Pin	-
Ground	>	Pin	⊥



⚠ For **unbalanced connection** short-circuit pin ⊥ to pin – as reported on the picture.

6.4 Amplified Output Connections

The rear panel is fitted with **two position screw terminal block for each amplified output.**

Always respect the relative polarity for outputs (+ and - on each output connector), wiring and speakers.

6.4.1 Out Configurations

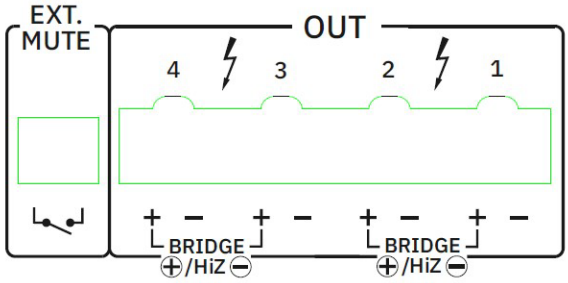
HADA DSP Manager software allows to configure the amplifier to operate in high impedance/bridge mode, or low impedance.

Select the appropriate operation mode to do not damage the loudspeakers. **Never connect loads below 4 ohms when working in low impedance mode**.

HiZ and Bridge modes must use the first or the second pair of channels. Please connect the loudspeakers as reported on the silkscreens when HiZ mode or Bridge mode is required.

Make sure to match the impedance of the total load connected to the loudspeakers, when working in low impedance for a correct performance. If impedance values do not match, select the closer one above.

6.4.1.1 Operation Example



AMP **OUT1-2**: HiZ-100V

When OUT 1-2 are configured in bridge, use both + pins to connect the loudspeakers. The + on the left is the positive.

AMP **OUT3**: LoZ-8ohm

AMP **OUT4**: LoZ-4ohm

When LoZ is selected the channels operate independently with declared maximum power.

The connection cable that joins the amplifiers outputs and the loudspeakers must be of good quality, sufficient section and as short as possible. This is most important when the distances to cover are long ones i.e., up to 10 meters it is recommended to use a section not inferior to 2.5mm^2 and for superior distances 4mm^2.

6.5 Remote Volume

HADA **rear panel provides four remote control ports**, labelled "REMOTE VOL 1-4", to which you can connect analogue devices such as the WPa series wall panels or common 10 Kohm linear potentiometers. These ports **allow to control the volume of the output channels**: each REMOTE VOL input is associated with its own corresponding output channel.

When GPIs are used in combination with front potentiometers, the potentiometer set at the lower value between the two, is the one that defines the maximum output level.

6.5.1 Connecting the REMOTE VOL Control Ports

The **REMOTE VOL connectors are Euroblock type**. The assignment of the connection is as follows:

Positive, + 3.3 VDC	>	Pin	+
Variable voltage, 0-3.3 VDC	>	Pin	1-4
Ground	>	Pin	⊥

The **connection cables can be up to 500m long** if a section of 0.5mm^2 is used.

6.6 External Mute

HADA has on its rear panel a control input, or **EXT. MUTE port which allows the activation / deactivation of the mute of audio outputs (zones) of the unit** by means of a push button, relay, or external potential free contact closure.

The EXT. MUTE works as normally open contact.

6.7 Ethernet Ports

The **RJ-45-type ETHERNET connector on the rear panel**, named NET, **allows the equipment to be connected to an Ethernet network, or directly to a computer or other device** with an Ethernet interface, point-to-point.

This connection enables, within a local network, the following:

- **Global programming and management of the HADA units** using Windows® software HADA DSP Manager.
- **Connection of third-party devices for integration in control systems** (Crestron®, Extron®, AMX®, Vity®, Medialon®, etc., registered trademarks by their manufacturers), using the third party TCP/IP control embedded in HADA devices. Refer to the Telnet Control chapter for more information.

6.8 Reset

The **RESET button on the rear panel, allows to restore the network settings**.

In case you have set a fixed network address and have forgotten it, holding down the reset button for more than 10 seconds will allow you to set the network interface to DHCP mode as from the factory. In this way, using the HADA DSP Manager software in a PC with its network card set as a DHCP client, it will be possible to perform amplifier discovery and change the network settings again.

A factory default of the DSP parameters can be performed by uploading a factory default preset through HADA DSP Manager.

7. START-UP & OPERATION

7.1 Start-up

When the **rear panel Power switch is ON,** the amplifier is powered, and **it will automatically switch on.**

When the ON LED of the front panel is lit in white, the device is operational.

To enter in standby mode, press and hold the ON button until all LEDs on the front panel blink once. The prot. LED (red) will illuminate together with the ON LED (white) to indicate that standby mode is active.

To exit standby mode, repeat the process.

In a complete audio installation, **it is important to start up the equipment in the following sequence**:

1. sound sources
2. mixer
3. equalizers
4. active filters
5. processors
6. power amplifiers.

To turn them off the sequence should follow an inverse pattern.

7.2 HADA DSP Manager Configuration

Once the physical connections have been made, the HADA units must be configured using the HADA DSP Manager software.

The HADA network interface comes from the factory in DHCP client mode. This means that if a DHCP server is present in the network, it will automatically provide the IP address to the device. In the absence of a DHCP server, as in standard networks, the HADA network interface will take a random address in the 169.254.x.y class.

If your PC's network card is also configured in DHCP mode, **through the automatic discovery of the HADA DSP Manager software you can easily find all your networked amplifiers** which will appear as a list in the main software window.

Once the list of amplifiers in the network is ready, you can click on the arrow to the right of each one to open the configuration window.

In case your HADA amplifier cannot be found by the software, please reset the unit. For further details see chapter Reset.

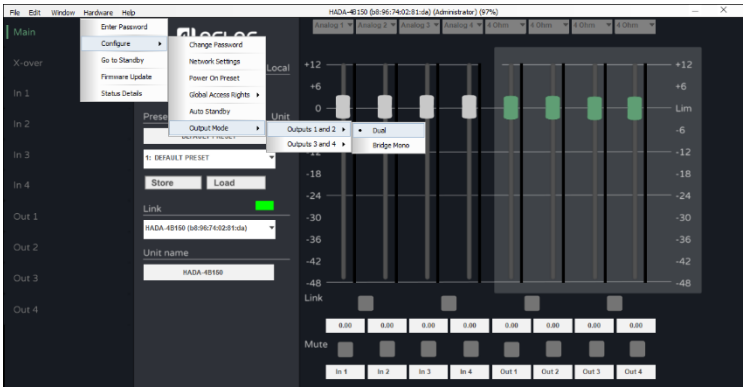
Please refer to HADA DSP Manager chapter **for information about parameters, settings and available features**.

7.3 Bridge Mode and Hi-Z Mode

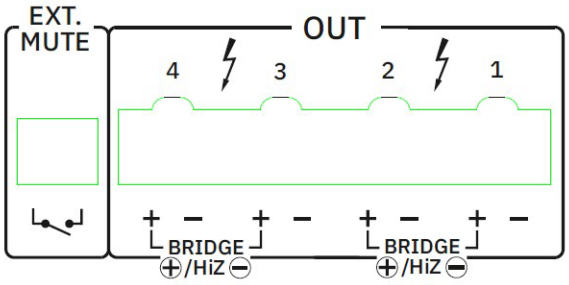
Bridge or HiZ mode, which **allows 100V/70V line loudspeakers to be connected, must be set via the** HADA DSP Manager **software.**

Please **configure the correct output mode via software before connecting the loudspeakers line:**

- **Dual:** Each channel work as a single channel in low impedance mode.
- **Bridge Mono**: Two channels are coupled in bridge for high impedance lines of loudspeakers.



Once the Bridge Mono mode is set, connect the loudspeakers line at 100V or 70V as indicated below:



- The Positive pin ⊕ of the output in bridge mode is the left one.
- When channel 1 and 2 are set as bridge, the input connector to use is the Input 1 and the volume control is the one of channel 1.
- When channel 3 and 4 are set as bridge, the input connector to use is the Input 3 and the volume control is the one of channel 3.

After selecting the desired output mode, please remember to set the right load on each output. These settings will allow the amplifier's internal parameters to be adapted to work optimally with different types of load.

The selection of the load type for each output is available only by logging into HADA DSP Manager with administrator credentials.

7.4 Recovery Mode

In case that a firmware issue appears, or a firmware update fails, the HADA unit will automatically load an emergency firmware called "Recovery Mode".

This allows to connect with Ecler HADA DSP Manager and update the firmware again with the correct firmware of each HADA model.

When the unit is in this special state, all the front LEDs of the unit (Prot., Thermal, Ext. Mute, Data and ON) will blink at the same time. Audio signal will be processed by the DSP and a special limitation of all the outputs will avoid damaging the amplifier modules.

To exit from recovery mode, please enter the administrator credentials and update the firmware of the unit.

Each HADA unit needs to be updated with the right firmware related to each model.

8. TECHNICAL DATA

8.1 Technical Specifications

8.1.1 HADA-4B150

HADA-4B150

INPUTS	
Number of Inputs	4 analogue input channels
Analogue input connection type	IN1-4: 3-pin Euroblock, balanced, pitch 3,5 mm.
Input configuration	Digital matrix 4 in x 4 amp. out (Settings by HADA DSP Manager)
AMPLIFIED OUTPUTS	
Number of amplified outputs	4
Amplified output connection type	2-pin Euroblock.
Output configuration	Lo-Z/Hi-Z, 70V/100V, 4Ω/8Ω Output mode selection per channel/couple by software (Settings by HADA DSP Manager)
OUTPUT POWER (all channels driven @ 1%THD)	
Max output power @ 8Ω	125W
Max output power @ 4Ω	125W
Max output power @ 8Ω bridge mode	250W
Max output power @ 100V	250W (Bridge Mode)
Max output power @ 70V	250W (Bridge Mode)
SIGNAL	
Voltage gain	27 to 37 dBV 29,2 to 39,2 dBu
Input sensitivity	-12 to 12 dBV -9,8 to 14,2 dBu 0,25 to 3,98 Vrms @ Nominal power
Input impedance	21k (balanced)
Max input level	22 dBV 24,2 dBu
Frequency response	20Hz-20kHz (-3dB, 1W any load)
THD + Noise	< 0,01 0.015 Typ (@ 1kHz, from 0,1W to Full Power)
Crosstalk	>60dB (@ 1kHz)
ELECTRICAL	
Power supply	Universal, SMPS with PFC
AC mains requirement	100-240 V @ 50-60Hz (±10%)
Power factor correction	> 0,92
AC mains connector	IEC C14 inlet
POWER CONSUMPTION @230VAC	
Power Consumption (1/4 POWER, @ 4Ω)	TBC (all channels driven)
Power Consumption (1/8 POWER, @ 4Ω)	TBC (all channels driven)
Power Consumption (IDLE)	TBC
Power Consumption (STBY)	TBC

TECHNOLOGIES	
Amplification technology	Class D
Cooling	Fan (Forced air, front to back airflow. Temperature controlled continuously variable speed)
Maximum fan noise	46 dB (Maximum acoustical noise @1m)
PROTECTIONS	
DC protection	Yes (Protects loudspeaker and installation against DC and infrasonic signals at the outputs)
HF protection	Yes (Protects the loudspeakers against non-audible, strong, non-musical high frequency signals)
Short-circuit protection	Yes (Protects the amplifier from overcurrent, short circuit or other stressful events for the output stages with output reduction or MUTE (automatic protection reset))
Thermal protection	Yes (Output power reduction when output stages operating temperature up to 90 °C (194 °F) Mute when output stages operating temperature up to 100 °C (212 °F))
REMOTE CONTROL CONNECTIONS	
ON / OFF	No
GPIs	x4 GPIs (0-3.3V) (5-pin Euroblock connector, rear panel)
External MUTE	Yes, dry contact (2 pins Euroblock connector, rear panel. Euroblock pitch 3,5 mm)
LOCAL CONTROL	
Attenuators	Front panel knobs (Defaults: Amplified OUTs attenuators)
Output mode settings	Lo-Z/Hi-Z, 70V/100V, 4Ω/8Ω Output mode selection per couple of channels (Software)
RUN/SLEEP mode	Yes, front panel push-button (Operates when pressed more than 3 seconds)
Power ON/OFF	Yes, back panel switch (Red LED indicator)
CONNECTIVITY	
Ethernet	Ethernet Base-Tx 100Mb (CAT5 up to 100m. Settings by embedded web application)
Programming and control	HADA DSP Manager Application
MONITORING	
Signal Present	SP LED (White) per channel (trigger @- 40 dBV)
Clipping	CLIP LED (Red) per channel
Limit	LIMIT LED (Red) per channel
Mute	MUTE LED (White) per channel
Prot.	PROT. LED (Red) per unit
Thermal	THERMAL LED (Red) per unit (Temperature limiter)
Ext. Mute	Ext. MUTE LED (White) per unit (OFF NO WIRE, ON when MASTER, BLINK when SLAVE)
Data	DATA LED (White) per unit (ON when DATA)
On	ON LED (White) per unit (ON when RUN, SLOW BLINK when SLEEP by BUTTON, FAST BLINK when SLEEP by AUTOSTBY, VERY FAST BLINK when HW Fault)
DIGITAL ENGINE	
Processor	Dual core 64bits

AUDIO CONVERTERS	
Sampling rate	96 kHz
Resolution	24 bit
Dynamic range	113 dB
PROCESSING	
Digital processing	64 bit
Latency	500uS (Analogue IN to analogue OUT)
Inputs processing	Delay, Parametric EQ, Limiter, Multiband compressor (Settings via HADA DSP Manager)
Outputs processing	Delay, Parametric EQ, Limiter, Multiband compressor (Settings via HADA DSP Manager)
Others	Preset management, 4x4 Matrix Mixer (Settings via HADA DSP Manager)
PHYSICAL	
Operating temperature	Min. 0ºC; 32ºF Max. 40ºC; 104ºF (performance may be reduced above 40°C)
Operating humidity	5 - 80% RH, non-condensing
Storage temperature	Min. -10ºC; 14ºF Max. 50ºC; 122ºF
Storage humidity	5 - 85% RH, non-condensing
Installation options	Rack 19" installation & desktop
Included accessories	EU Main cord, Euroblock Connectors (inputs /outputs), Desktop feet, rack 19" installation hardware.
Optional accessories	-
Dimensions (WxHxD)	482.6 x 88 x 281,5 mm / 19 x 3.46 x 11.08 in.
Weight	4.7 Kg / 10.36 lb
Shipping dimensions (WxHxD)	495 x 125 x 560 mm. / 19.48 x 4.92 x 22.05 in.
Shipping weight	6,8 kg / 14.9 lb

8.1.2 HADA-4B250

HADA-4B250

INPUTS	
Number of Inputs	4 analogue input channels
Analogue input connection type	IN1-4: 3-pin Euroblock, balanced, pitch 3,5 mm.
Input configuration	Digital matrix 4 in x 4 amp. out (Settings by HADA DSP Manager)
AMPLIFIED OUTPUTS	
Number of amplified outputs	4
Amplified output connection type	2-pin Euroblock.
Output configuration	Lo-Z/Hi-Z, 70V/100V, 4Ω/8Ω Output mode selection per channel/couple by software (Settings by HADA DSP Manager)
OUTPUT POWER (all channels driven @ 1%THD)	
Max output power @ 8Ω	250W
Max output power @ 4Ω	250W
Max output power @ 8Ω bridge mode	500W
Max output power @ 100V	500W (Bridge Mode)
Max output power @ 70V	500W (Bridge Mode)
SIGNAL	
Voltage gain	30 to 37 dBV 32,2 to 39,2 dBu
Input sensitivity	-12 to 12 dBV -9,8 to 14,2 dBu 0,25 to 3,98 Vrms @ Nominal power
Input impedance	21k (balanced)
Max input level	22 dBV 24,2 dBu
Frequency response	20Hz-20kHz (-3dB, 1W any load)
THD + Noise	< 0,01 0.015 Typ (@ 1kHz, from 0,1W to Full Power)
Crosstalk	>80dB (@ 1kHz)
ELECTRICAL	
Power supply	Universal, SMPS with PFC
AC mains requirement	100-240 V @ 50-60Hz (±10%)
Power factor correction	> 0,92
AC mains connector	IEC C14 inlet
POWER CONSUMPTION @230VAC	
Power Consumption (1/4 POWER, @ 4Ω)	TBC (all channels driven)
Power Consumption (1/8 POWER, @ 4Ω)	TBC (all channels driven)
Power Consumption (IDLE)	TBC
Power Consumption (STBY)	TBC
TECHNOLOGIES	
Amplification technology	Class D
Cooling	Fan (Forced air, front to back airflow. Temperature controlled continuously variable speed)
Maximum fan noise	40 dB (Maximum acoustical noise @1m)

PROTECTIONS	
DC protection	Yes (Protects loudspeaker and installation against DC and infrasonic signals at the outputs)
HF protection	Yes (Protects the loudspeakers against non-audible, strong, non-musical high frequency signals)
Short-circuit protection	Yes (Protects the amplifier from overcurrent, short circuit or other stressful events for the output stages with output reduction or MUTE (automatic protection reset))
Thermal protection	Yes (Output power reduction when output stages operating temperature up to 90 °C (194 °F) Mute when output stages operating temperature up to 100 °C (212 °F))
REMOTE CONTROL CONNECTIONS	
ON / OFF	No
GPIs	x4 GPIs (0-3.3V) (5-pin Euroblock connector, rear panel)
External MUTE	Yes, dry contact (2 pins Euroblock connector, rear panel. Euroblock pitch 3,5 mm)
LOCAL CONTROL	
Attenuators	Front panel knobs (Defaults: Amplified OUTs attenuators)
Output mode settings	Lo-Z/Hi-Z, 70V/100V, 4Ω/8Ω Output mode selection per couple of channels (Software)
RUN/SLEEP mode	Yes, front panel push-button (Operates when pressed more than 3 seconds)
Power ON/OFF	Yes, back panel switch (Red LED indicator)
CONNECTIVITY	
Ethernet	Ethernet Base-Tx 100Mb (CAT5 up to 100m. Settings by embedded web application)
Programming and control	HADA DSP Manager Application
MONITORING	
Signal Present	SP LED (White) per channel (trigger @- 40 dBV)
Clipping	CLIP LED (Red) per channel
Limit	LIMIT LED (Red) per channel
Mute	MUTE LED (White) per channel
Prot.	PROT. LED (Red) per unit
Thermal	THERMAL LED (Red) per unit (Temperature limiter)
Ext. Mute	ext. MUTE LED (White) per unit (OFF NO WIRE, ON when MASTER, BLINK when SLAVE)
Data	DATA LED (White) per unit (ON when DATA)
On	ON LED (White) per unit (ON when RUN, SLOW BLINK when SLEEP by BUTTON, FAST BLINK when SLEEP by AUTOSTBY, VERY FAST BLINK when HW Fault)
DIGITAL ENGINE	
Processor	Dual core 64bits
AUDIO CONVERTERS	
Sampling rate	96 kHz
Resolution	24 bit
Dynamic range	113 dB

PROCESSING	
Digital processing	64 bit
Latency	500uS (Analogue IN to analogue OUT)
Inputs processing	Delay, Parametric EQ, Limiter, Multiband compressor (Settings via HADA DSP Manager)
Outputs processing	Delay, Parametric EQ, Limiter, Multiband compressor (Settings via HADA DSP Manager)
Others	Preset management, 4x4 Matrix Mixer (Settings via HADA DSP Manager)

PHYSICAL	
Operating temperature	Min. 0ºC; 32ºF Max. 40ºC; 104ºF (performance may be reduced above 40°C)
Operating humidity	5 - 85% RH, non-condensing
Storage temperature	Min. -10ºC; 14ºF Max. 50ºC; 122ºF
Storage humidity	5 - 80% RH, non-condensing
Installation options	Rack 19" installation & desktop
Included accessories	EU Main cord, Euroblock Connectors (inputs /outputs), Desktop feet, rack 19" installation hardware
Optional accessories	-
Dimensions (WxHxD)	482.6 x 88 x 281,5 mm / 19 x 3.46 x 11.08 in.
Weight	5.0 Kg / 11.02 lb
Shipping dimensions (WxHxD)	495 x 125 x 560 mm. / 19.48 x 4.92 x 22.05 in.
Shipping weight	6,8 kg / 14.9 lb

8.1.3 HADA-4B400

HADA-4B400

INPUTS	
Number of Inputs	4 analogue input channels
Analogue input connection type	IN1-4: 3-pin Euroblock, balanced, pitch 3,5 mm.
Input configuration	Digital matrix 4 in x 4 amp. out (Settings by HADA DSP Manager)
AMPLIFIED OUTPUTS	
Number of amplified outputs	4
Amplified output connection type	2-pin Euroblock.
Output configuration	Lo-Z/Hi-Z, 70V/100V, 4Ω/8Ω Output mode selection per channel/couple by software (Settings by HADA DSP Manager)
OUTPUT POWER (all channels driven @ 1%THD)	
Max output power @ 8Ω	400W
Max output power @ 4Ω	400W
Max output power @ 8Ω bridge mode	800W
Max output power @ 100V	800W (Bridge mode)
Max output power @ 70V	800W (Bridge Mode)
SIGNAL	
Voltage gain	31 to 38 dBV 33,2 to 40,2 dBu
Input sensitivity	-12 to 12 dBV -9,8 to 14,2 dBu 0,25 to 3,98 Vrms @ Nominal power
Input impedance	21k (balanced)
Max input level	22 dBV 24,2 dBu
Frequency response	20Hz-20kHz (-3dB, 1W any load)
THD + Noise	< 0,01 0.015 Typ (@ 1kHz, from 0,1W to Full Power)
Crosstalk	>80dB (@ 1kHz)
ELECTRICAL	
Power supply	Universal, SMPS with PFC
AC mains requirement	100-240 V @ 50-60Hz (±10%)
Power factor correction	> 0,96
AC mains connector	IEC C14 inlet
POWER CONSUMPTION @230VAC	
Power Consumption (1/4 POWER, @ 4Ω)	TBC (all channels driven)
Power Consumption (1/8 POWER, @ 4Ω)	TBC (all channels driven)
Power Consumption (IDLE)	TBC
Power Consumption (STBY)	TBC
TECHNOLOGIES	
Amplification technology	Class D
Cooling	Fan (Forced air, front to back airflow. Temperature controlled continuously variable speed)
Maximum fan noise	40 dB (Maximum acoustical noise @1m)

PROTECTIONS	
DC protection	Yes (Protects loudspeaker and installation against DC and infrasonic signals at the outputs)
HF protection	Yes (Protects the loudspeakers against non-audible, strong, non-musical high frequency signals)
Short-circuit protection	Yes (Protects the amplifier from overcurrent, short circuit or other stressful events for the output stages with output reduction or MUTE (automatic protection reset))
Thermal protection	Yes (Output power reduction when output stages operating temperature up to 90 °C (194 °F) Mute when output stages operating temperature up to 100 °C (212 °F))
REMOTE CONTROL CONNECTIONS	
ON / OFF	No
GPIs	x4 GPIs (0-3.3V) (5-pin Euroblock connector, rear panel)
External MUTE	Yes, dry contact (2 pins Euroblock connector, rear panel. Euroblock pitch 3,5 mm)
LOCAL CONTROL	
Attenuators	Front panel knobs (Defaults: Amplified OUTs attenuators)
Output mode settings	Lo-Z/Hi-Z, 70V/100V, 4Ω/8Ω Output mode selection per couple of channels (Software)
RUN/SLEEP mode	Yes, front panel push-button (Operates when pressed more than 3 seconds)
Power ON/OFF	Yes, back panel switch (Red LED indicator)
CONNECTIVITY	
Ethernet	Ethernet Base-Tx 100Mb (CAT5 up to 100m. Settings by embedded web application)
Programming and control	HADA DSP Manager Application
MONITORING	
Signal Present	SP LED (White) per channel (trigger @- 40 dBV)
Clipping	CLIP LED (Red) per channel
Limit	LIMIT LED (Red) per channel
Mute	MUTE LED (White) per channel
Prot.	PROT. LED (Red) per unit
Thermal	THERMAL LED (Red) per unit (Temperature limiter)
Ext. Mute	ext. MUTE LED (White) per unit (OFF NO WIRE, ON when MASTER, BLINK when SLAVE)
Data	DATA LED (White) per unit (ON when DATA)
On	ON LED (White) per unit (ON when RUN, SLOW BLINK when SLEEP by BUTTON, FAST BLINK when SLEEP by AUTOSTBY, VERY FAST BLINK when HW Fault)
DIGITAL ENGINE	
Processor	Dual core 64bits
AUDIO CONVERTERS	
Sampling rate	96 kHz
Resolution	24 bit
Dynamic range	113 dB

PROCESSING	
Digital processing	64 bit
Latency	500uS (Analogue IN to analogue OUT)
Inputs processing	Delay, Parametric EQ, Limiter, Multiband compressor (Settings via HADA DSP Manager)
Outputs processing	Delay, Parametric EQ, Limiter, Multiband compressor (Settings via HADA DSP Manager)
Others	Preset management, 4x4 Matrix Mixer (Settings via HADA DSP Manager)

PHYSICAL	
Operating temperature	Min. 0ºC; 32ºF Max. 40ºC; 104ºF (performance may be reduced above 40°C)
Operating humidity	5 - 80% RH, non-condensing
Storage temperature	Min. -10ºC; 14ºF Max. 50ºC; 122ºF
Storage humidity	5 - 85% RH, non-condensing
Installation options	Rack 19" installation & desktop
Included accessories	EU Main cord, Euroblock Connectors (inputs /outputs), Desktop feet, rack 19" installation hardware
Optional accessories	-
Dimensions (WxHxD)	482.6 x 88 x 281,5 mm / 19 x 3.46 x 11.08 in.
Weight	5.4 Kg / 11.91 lb
Shipping dimensions (WxHxD)	495 x 125 x 560 mm. / 19.48 x 4.92 x 22.05 in.
Shipping weight	7,5 kg / 16.53 lb

8.1.4 HADA-4B500

HADA-4B500

INPUTS	
Number of Inputs	4 analogue input channels
Analogue input connection type	IN1-4: 3-pin Euroblock, balanced, pitch 3,5 mm.
Input configuration	Digital matrix 4 in x 4 amp. out (Settings by HADA DSP Manager)
AMPLIFIED OUTPUTS	
Number of amplified outputs	4
Amplified output connection type	2-pin Euroblock.
Output configuration	Lo-Z/Hi-Z, 70V/100V, 4Ω/8Ω Output mode selection per channel/couple by software (Settings by HADA DSP Manager)
OUTPUT POWER (all channels driven @ 1%THD)	
Max output power @ 8Ω	250W
Max output power @ 4Ω	500W
Max output power @ 8Ω bridge mode	1000W
Max output power @ 100V	1000W (Bridge mode)
Max output power @ 70V	1000W (Bridge mode)
SIGNAL	
Voltage gain	31 to 37 dBV 33,2 to 39,2 dBu
Input sensitivity	-12 to 12 dBV -9,8 to 14,2 dBu 0,25 to 3,98 Vrms @ Nominal power
Input impedance	21k (balanced)
Max input level	22 dBV 24,2 dBu
Frequency response	20Hz-20kHz (-3dB, 1W any load)
THD + Noise	< 0,01 0.015 Typ (@ 1kHz, from 0,1W to Full Power)
Crosstalk	>80dB (@ 1kHz)
ELECTRICAL	
Power supply	Universal, SMPS with PFC
AC mains requirement	100-240 V @ 50-60Hz (±10%)
Power factor correction	> 0,92
AC mains connector	IEC C14 inlet
POWER CONSUMPTION @230VAC	
Power Consumption (1/4 POWER, @ 4Ω)	TBC (all channels driven)
Power Consumption (1/8 POWER, @ 4Ω)	TBC (all channels driven)
Power Consumption (IDLE)	TBC
Power Consumption (STBY)	TBC
TECHNOLOGIES	
Amplification technology	Class D
Cooling	Fan (Forced air, front to back airflow. Temperature controlled continuously variable speed)
Maximum fan noise	46dB (Maximum acoustical noise @1m)

PROTECTIONS	
DC protection	Yes (Protects loudspeaker and installation against DC and infrasonic signals at the outputs)
HF protection	Yes (Protects the loudspeakers against non-audible, strong, non-musical high frequency signals)
Short-circuit protection	Yes (Protects the amplifier from overcurrent, short circuit or other stressful events for the output stages with output reduction or MUTE (automatic protection reset))
Thermal protection	Yes (Output power reduction when output stages operating temperature up to 90 °C (194 °F) Mute when output stages operating temperature up to 100 °C (212 °F))
REMOTE CONTROL CONNECTIONS	
ON / OFF	No
GPIs	x4 GPIs (0-3.3V) (5-pin Euroblock connector, rear panel)
External MUTE	Yes, dry contact (2 pins Euroblock connector, rear panel. Euroblock pitch 3,5 mm)
LOCAL CONTROL	
Attenuators	Front panel knobs (Defaults: Amplified OUTs attenuators)
Output mode settings	Lo-Z/Hi-Z, 70V/100V, 4Ω/8Ω Output mode selection per couple of channels (Software)
RUN/SLEEP mode	Yes, front panel push-button (Operates when pressed more than 3 seconds)
Power ON/OFF	Yes, back panel switch (Red LED indicator)
CONNECTIVITY	
Ethernet	Ethernet Base-Tx 100Mb (CAT5 up to 100m. Settings by embedded web application)
Programming and control	HADA DSP Manager Application
MONITORING	
Signal Present	SP LED (White) per channel (trigger @- 40 dBV)
Clipping	CLIP LED (Red) per channel
Limit	LIMIT LED (Red) per channel
Mute	MUTE LED (White) per channel
Prot.	PROT. LED (Red) per unit
Thermal	THERMAL LED (Red) per unit (Temperature limiter)
Ext. Mute	ext. MUTE LED (White) per unit (OFF NO WIRE, ON when MASTER, BLINK when SLAVE)
Data	DATA LED (White) per unit (ON when DATA)
On	ON LED (White) per unit (ON when RUN, SLOW BLINK when SLEEP by BUTTON, FAST BLINK when SLEEP by AUTOSTBY, VERY FAST BLINK when HW Fault)
DIGITAL ENGINE	
Processor	Dual core 64bits
AUDIO CONVERTERS	
Sampling rate	96 kHz
Resolution	24 bit
Dynamic range	113 dB

PROCESSING	
Digital processing	64 bit
Latency	500uS (Analogue IN to analogue OUT)
Inputs processing	Delay, Parametric EQ, Limiter, Multiband compressor (Settings via HADA DSP Manager)
Outputs processing	Delay, Parametric EQ, Limiter, Multiband compressor (Settings via HADA DSP Manager)
Others	Preset management, 4x4 Matrix Mixer (Settings via HADA DSP Manager)

PHYSICAL	
Operating temperature	Min. 0ºC; 32ºF Max. 40ºC; 104ºF (performance may be reduced above 40°C)
Operating humidity	5 - 80% RH, non-condensing
Storage temperature	Min. -10ºC; 14ºF Max. 50ºC; 122ºF
Storage humidity	5 - 85% RH, non-condensing
Installation options	Rack 19" installation & desktop
Included accessories	EU Main cord, Euroblock Connectors (inputs /outputs), Desktop feet, rack 19" installation hardware
Optional accessories	-
Dimensions (WxHxD)	482.6 x 88 x 281,5 mm / 19 x 3.46 x 11.08 in.
Weight	5.6 Kg / 12.35 lb
Shipping dimensions (WxHxD)	495 x 125 x 560 mm / 19.48 x 4.92 x 22.05 in.
Shipping weight	7,7 8 kg / 16.97 lb

8.1.5 HADA-4B750

HADA-4B750

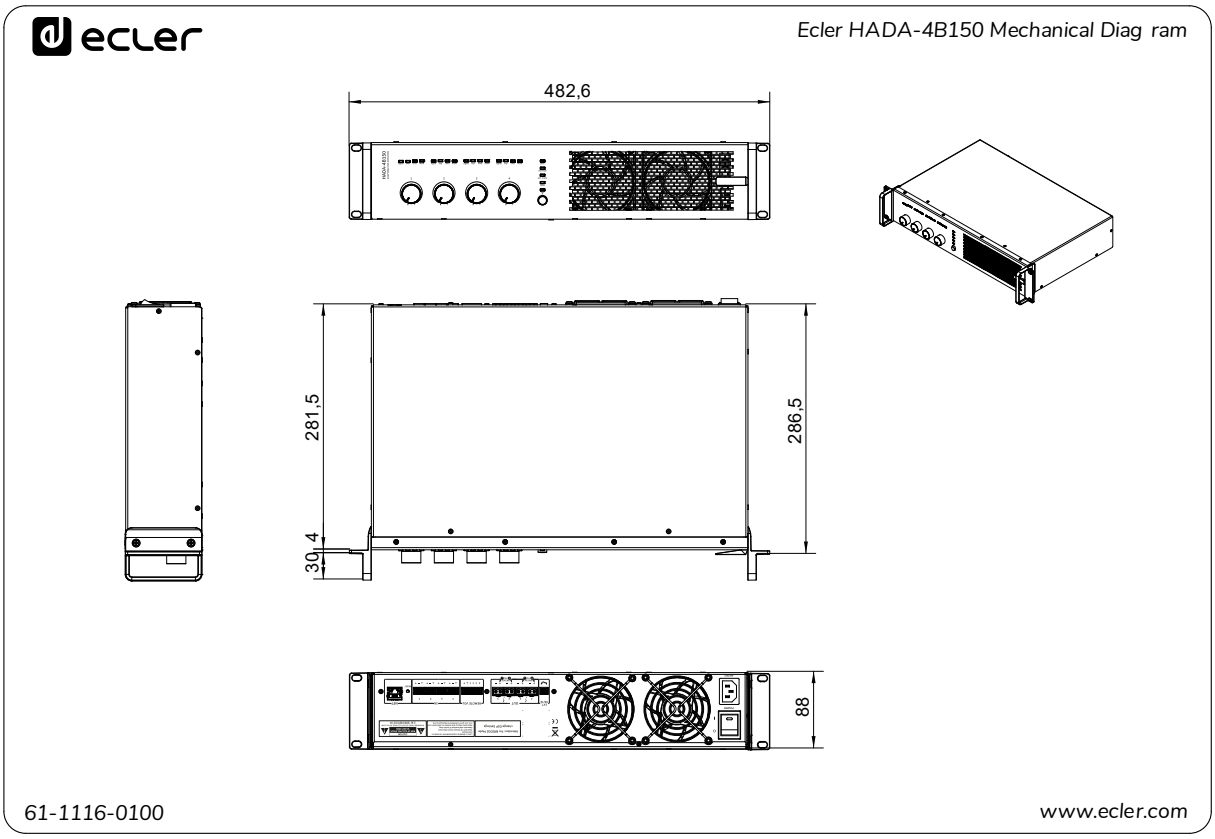
INPUTS	
Number of Inputs	4 analogue input channels
Analogue input connection type	IN1-4: 3-pin Euroblock, balanced, pitch 3,5 mm.
Input configuration	Digital matrix 4 in x 4 amp. out (Settings by HADA DSP Manager)
AMPLIFIED OUTPUTS	
Number of amplified outputs	4
Amplified output connection type	2-pin Euroblock.
Output configuration	Lo-Z/Hi-Z, 70V/100V, 4Ω/8Ω Output mode selection per channel/couple by software (Settings by HADA DSP Manager)
OUTPUT POWER (all channels driven @ 1%THD)	
Max output power @ 8Ω	400W
Max output power @ 4Ω	750W
Max output @ 8Ω bridge mode	1500W
Max output power @ 100V	1500W (Bridge Mode)
Max output power @ 70V	1500W (Bridge Mode)
SIGNAL	
Voltage gain	31 to 38 dBV 33,2 to 40,2 dBu
Input sensitivity	-12 to 12 dBV -9,8 to 14,2 dBu 0,25 to 3,98 Vrms @ Nominal power
Input impedance	21k (balanced)
Max input level	22 dBV 24,2 dBu
Frequency response	20Hz-20kHz (-3dB, 1W any load)
THD + Noise	< 0,01 0.015 Typ (@ 1kHz, from 0,1W to Full Power)
Crosstalk	>80dB (@ 1kHz)
ELECTRICAL	
Power supply	Universal, SMPS with PFC
AC mains requirement	100-240 V @ 50-60Hz (±10%)
Power factor correction	> 0,96
AC mains connector	IEC C14 inlet
POWER CONSUMPTION @230VAC	
Power Consumption (1/4 POWER, @ 4Ω)	TBC (all channels driven)
Power Consumption (1/8 POWER, @ 4Ω)	TBC (all channels driven)
Power Consumption (IDLE)	TBC
Power Consumption (STBY)	TBC
TECHNOLOGIES	
Amplification technology	Class D
Cooling	Fan (Forced air, front to back airflow. Temperature controlled continuously variable speed)
Maximum fan noise	46 dB (Maximum acoustical noise @1m)

PROTECTIONS	
DC protection	Yes (Protects loudspeaker and installation against DC and infrasonic signals at the outputs)
HF protection	Yes (Protects the loudspeakers against non-audible, strong, non-musical high frequency signals)
Short-circuit protection	Yes (Protects the amplifier from overcurrent, short circuit or other stressful events for the output stages with output reduction or MUTE (automatic protection reset))
Thermal protection	Yes (Output power reduction when output stages operating temperature up to 90 °C (194 °F) Mute when output stages operating temperature up to 100 °C (212 °F))
REMOTE CONTROL CONNECTIONS	
ON / OFF	No
GPIs	x4 GPIs (0-3.3V) (5-pin Euroblock connector, rear panel)
External MUTE	Yes, dry contact (2 pins Euroblock connector, rear panel. Euroblock pitch 3,5 mm)
LOCAL CONTROL	
Attenuators	Front panel knobs (Defaults: Amplified OUTs attenuators)
Output mode settings	Lo-Z/Hi-Z, 70V/100V, 4Ω/8Ω Output mode selection per couple of channels (Software)
RUN/SLEEP mode	Yes, front panel push-button (Operates when pressed more than 3 seconds)
Power ON/OFF	Yes, back panel switch (Red LED indicator)
CONNECTIVITY	
Ethernet	Ethernet Base-Tx 100Mb (CAT5 up to 100m. Settings by embedded web application)
Programming and control	HADA DSP Manager Application
MONITORING	
Signal Present	SP LED (White) per channel (trigger @- 40 dBV)
Clipping	CLIP LED (Red) per channel
Limit	LIMIT LED (Red) per channel
Mute	MUTE LED (White) per channel
Prot.	PROT. LED (Red) per unit
Thermal	THERMAL LED (Red) per unit (Temperature limiter)
Ext. Mute	ext. MUTE LED (White) per unit (OFF NO WIRE, ON when MASTER, BLINK when SLAVE)
Data	DATA LED (White) per unit (ON when DATA)
On	ON LED (White) per unit (ON when RUN, SLOW BLINK when SLEEP by BUTTON, FAST BLINK when SLEEP by AUTOSTBY, VERY FAST BLINK when HW Fault)
DIGITAL ENGINE	
Processor	Dual core 64bits
AUDIO CONVERTERS	
Sampling rate	96 kHz
Resolution	24 bit
Dynamic range	113dB

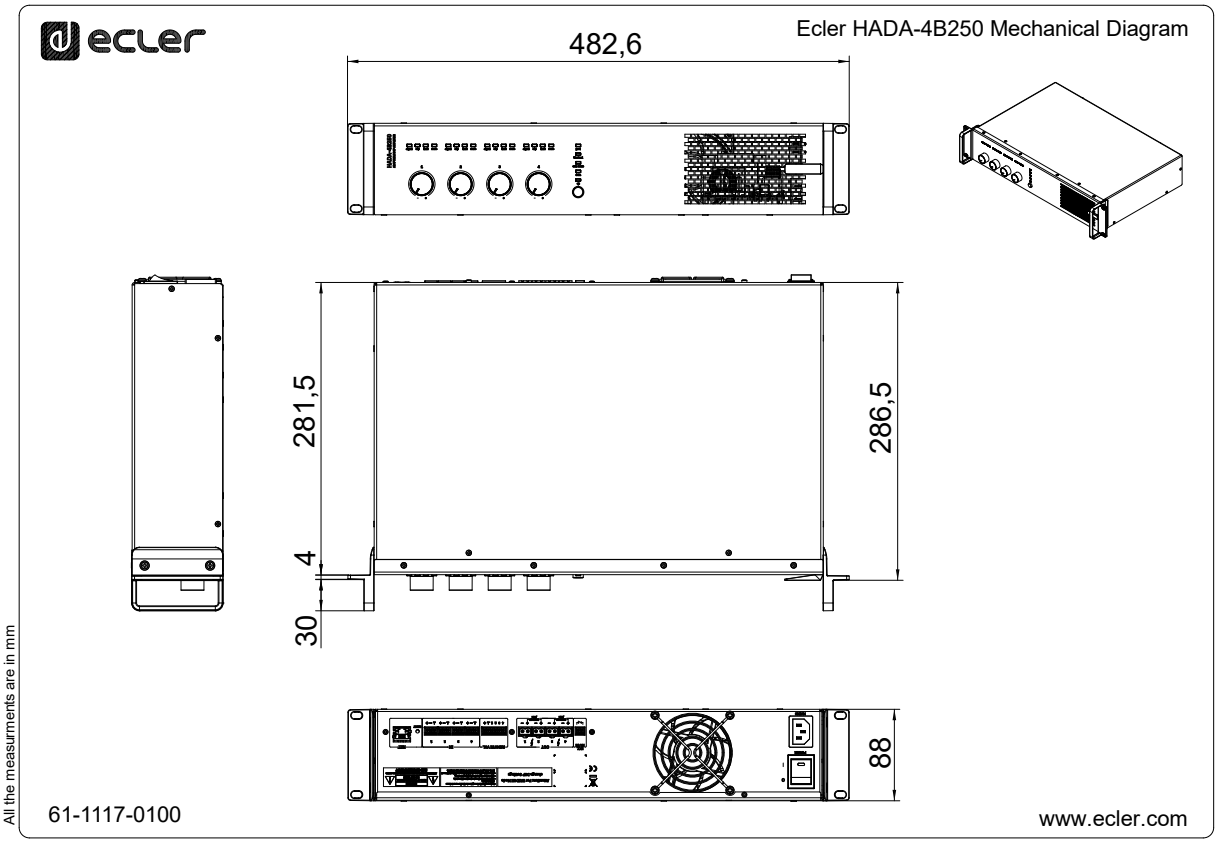
PROCESSING	
Digital processing	64 bit
Latency	500uS (Analogue IN to analogue OUT)
Inputs processing	Delay, Parametric EQ, Limiter, Multiband compressor (Settings via HADA DSP Manager)
Outputs processing	Delay, Parametric EQ, Limiter, Multiband compressor (Settings via HADA DSP Manager)
Others	Preset management, 4x4 Matrix Mixer (Settings via HADA DSP Manager)
PHYSICAL	
Operating temperature	Min. 0ºC; 32ºF Max. 40ºC; 104ºF (performance may be reduced above 40°C)
Operating humidity	5 - 80% RH, non-condensing
Storage temperature	Min. -10ºC; 14ºF Max. 50ºC; 122ºF
Storage humidity	5 - 85% RH, non-condensing
Installation options	Rack 19" installation & desktop
Included accessories	EU Main cord, Euroblock Connectors (inputs /outputs), Desktop feet, rack 19" installation hardware
Optional accessories	-
Dimensions (WxHxD)	482.6 x 88 x 281,5 mm / 19 x 3.46 x 11.08 in.
Weight	6.0 Kg / 13.22 lbs
Shipping dimensions (WxHxD)	495 x 125 x 560 mm / 19.48 x 4.92 x 22.05 in.
Shipping weight	8,1 kg / 17,85 lb

8.2 Mechanical Diagrams

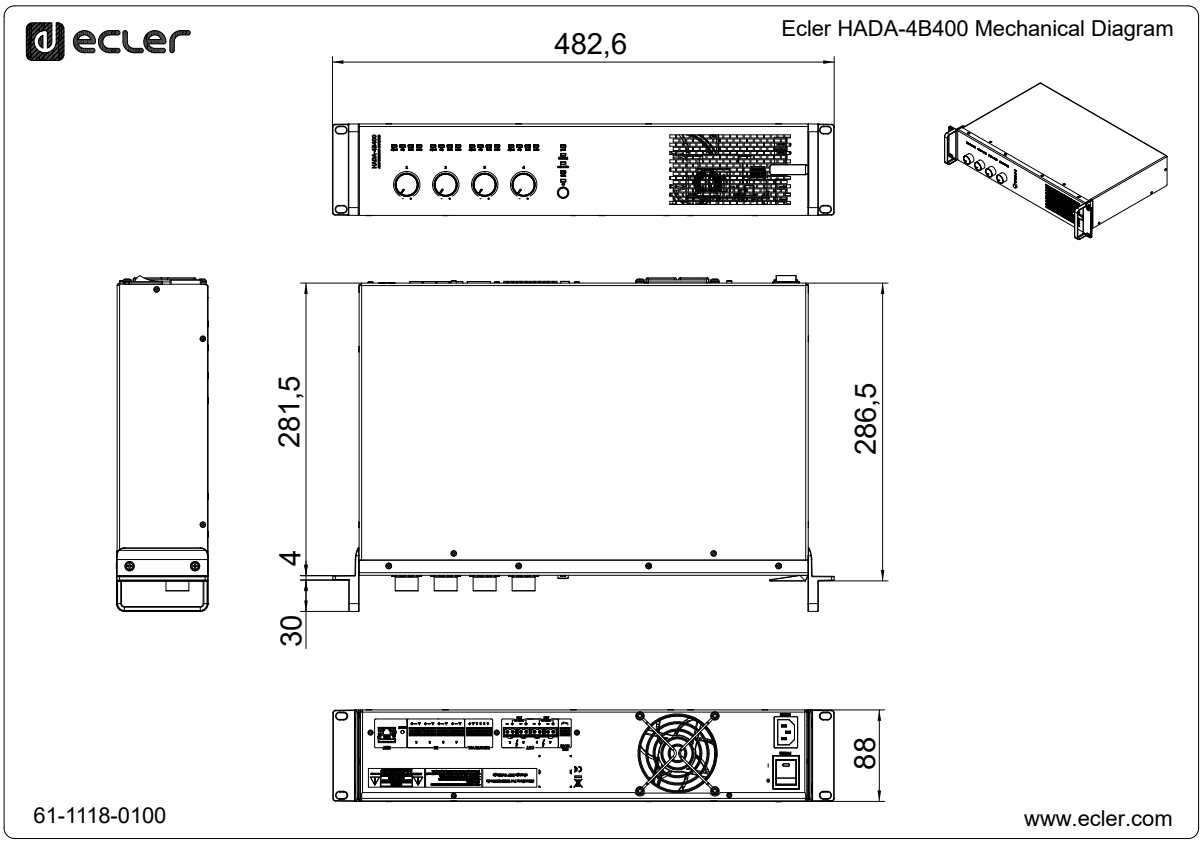
8.2.1 HADA-4B150



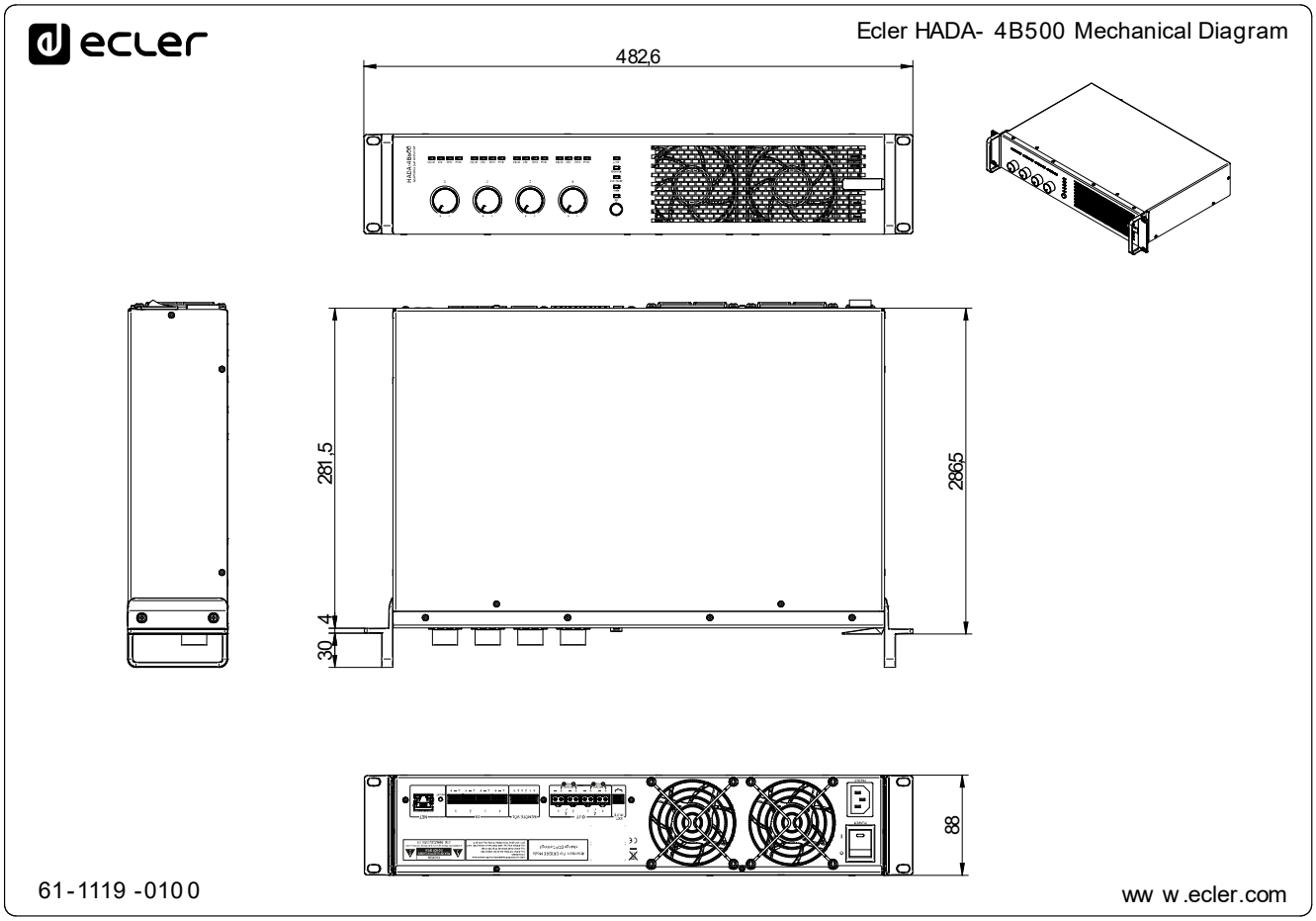
8.2.2 HADA-4B250



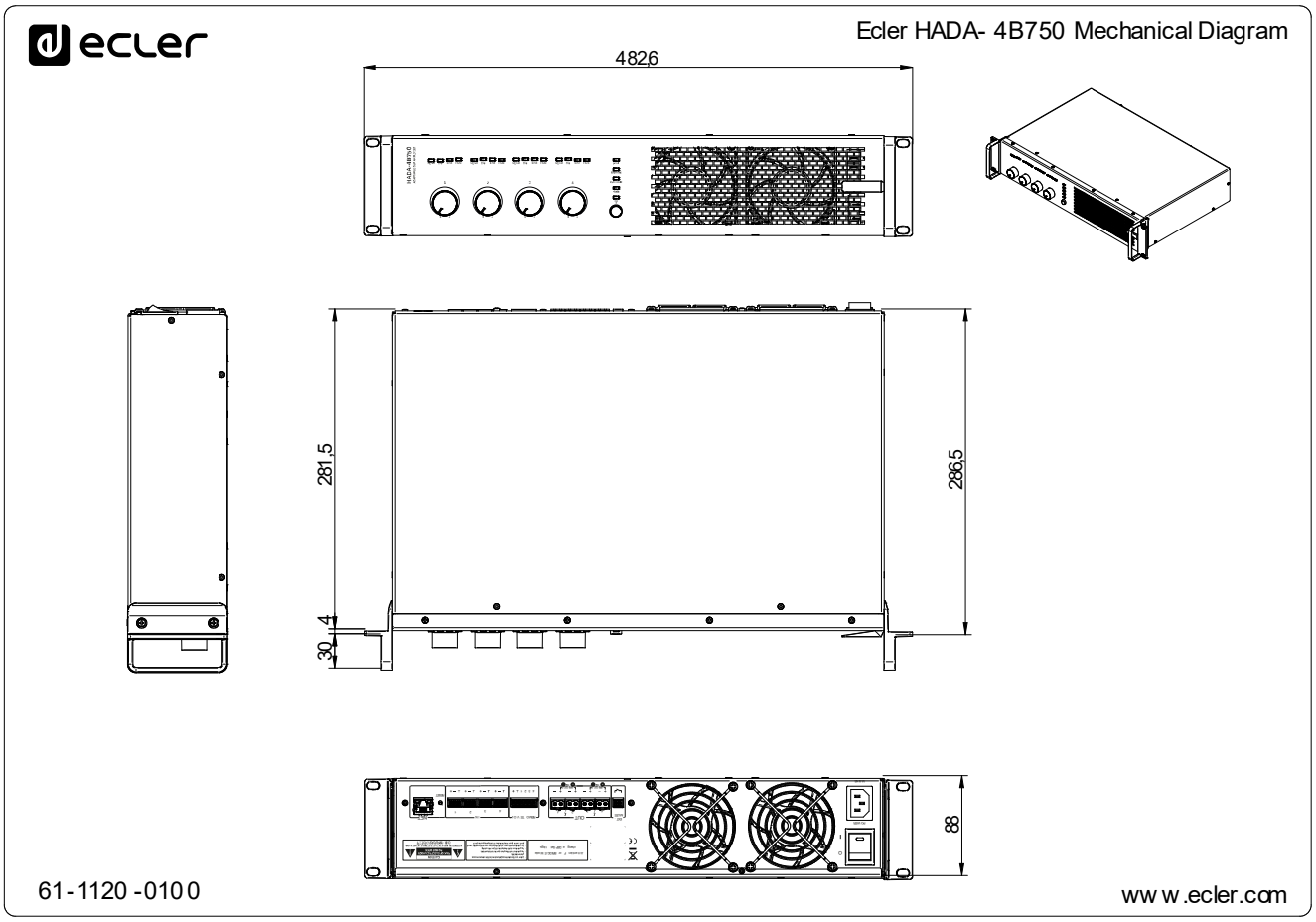
8.2.3 HADA-4B400



8.2.4 HADA-4B500



8.2.5 HADA-4B750



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