MANUAL

Hoellstern®

AUDIO AMPLIFIERS

Hoellstern® amplifies.
Unusually good – strikingly audiophile – with superior cost-effectiveness.

Hoellstern® audio amplifiers are „engineered and made in Germany". This means for you:
designed and manufactured in premium quality. The no-compromise component selection and a circuit design according to space technology criteria provide ultimate reliability.

Since January 2004 Hoellstern® audio amplifiers have proven their high reliability under the toughest conditions – live.

- Extremely audiophile signal amplification.
- Load stable – high-current capable outputs.
- Unique, faithful loudspeaker libraries with all system-relevant features.

Amplifier (Option)	In x Out	Output Power							
		8 Ohm	6 Ohm	4 Ohm	2,7 Ohm	2 Ohm	1,6 Ohm	1 Ohm	Bridged
DELTA6.2-DSP	2x2	850 W	1,275 W	1,700 W	2,550 W	3,400 W	–	–	6,800 W
DELTA7.2(-DSP)	2x2	1,000 W	1,325 W	2,000 W	3,000 W	4,000 W	5,000 W	–	10,000 W
DELTA12.2(-DSP)	2x2	2,200 W	2,900 W	4,400 W	6,300 W	8,000 W	–	–	16,000 W
DELTA12.4(-DSP)	4x4	600 W	800 W	1 150 W	1,700 W	2,200 W	2,600 W	4,400 W	8,000 W
DELTA8.4-DSP	4x4	1,300 W	1,700 W	1 700 W MODE: OFF	–	–	–	–	3,400 W MODE: OFF
DELTA13.4(-DSP)	4x4	1,300 W	1,700 W	2,600 W	3,800 W	3,400 W MODE: OFF	–	–	7,600 W
DELTA14.4(-DSP)	4x4	1,300 W	1,700 W	2,600 W	3,800 W	5,000 W	–	–	10,000 W
DELTA20.4(-DSP)	4x4	2,200 W	2,900 W	4,400 W	6,300 W	8,000 W	–	–	16,000 W

Optionen	Description
-DSP	2 channel amplifier: 2 IN – 2 OUT DSP build-in loudspeaker management
	4 channel amplifier: 4 IN – 4 OUT DSP build-in loudspeaker management
DSP-Library	Unique, true-to-original Hoellstern® loudspeaker libraries for more than 25 loudspeaker manufacturers. Including FIR filter and system-specific settings and free user settings.
Software	Hoellstern® Konfigurator2 – for Windows and Macintosh OS.

AC mains input	180 VAC to 265 VAC, operative from 70 VAC	iCVP®
AC grid current draw	Highly efficient power supply and amplifier technology: Halved power consumption with 10 A or 16 A of average current draw.	iCVP®
Size and Weight	Width: 19" – Height: 2 RU – Depth: 30 cm (!) Weight: 10 – 12 kg	

Hoellstern®
AUDIO AMPLIFIERS

ENGINEERED & MADE IN GERMANY

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AUDIO AMPLIFIERS

Manual

☐		☐	DELTA6.2-DSP
☐	DELTA7.2	☐	DELTA7.2-DSP
☐		☐	DELTA8.4-DSP
☐	DELTA12.2	☐	DELTA12.2-DSP
☐	DELTA12.4	☐	DELTA12.4-DSP
☐	DELTA13.4	☐	DELTA13.4-DSP
☐	DELTA14.4	☐	DELTA14.4-DSP
☐	DELTA20.4	☐	DELTA20.4-DSP

Serial number:

1. Introduction

Dear audio friend and audio technician.

Congratulations on your decision to use Hoellstern amplifiers. First-class tools are a solid foundation for professional audio productions.

The Hoellstern GmbH located near Freiburg designs, produces and distributes the Hoellstern amplifiers. It is our philosophy to supply top-quality audio products.

Hoellstern amplifiers present modern, efficient amplifier technology in combination with efficient, strong switching power supplies. The technical dimensioning and the circuit design are based upon criteria from the aerospace and automotive industries. Together with an uncompromising circuit layout and high-quality components the result is a top-grade audio product. Only the quality of our products and the resulting customer satisfaction have the highest priority for us.

Hoellstern amplifiers meet numerous requirements, from the viewpoint of a sound engineer and also of a buyer:

- Performance, sound, size and weight
- Features, operation and flexibility
- Reliability, stability of value, cost effectiveness

Please take your time to read the manual attentively prior to putting the unit into service. This way you will become familiar with the technical details and use the amplifiers optimally. For permanent installations we ask you to solicit further information from us if needed.

Please do observe all safety notes before bringing the unit into operation!

Please take care of your amplifiers, aspirate the air filters regularly and make sure the amplifiers are mounted correctly. Every additional warming by 10 Kelvin will typically halve the service life of electronic components.

We wish you much success.

Hoellstern GmbH

1.1 General Information

Manual version 2.10 / 04 / 2015 for the Hoellstern amplifier models:

- DELTA 6.2-DSP

- DELTA 7.2 / DELTA 7.2-DSP

- DELTA 12.2 / DELTA 12.2-DSP

- DELTA 8.4-DSP

- DELTA 12.4 / DELTA 12.4-DSP

- DELTA 13.4 / DELTA 13.4-DSP

- DELTA 14.4 / DELTA 14.4-DSP

- DELTA 20.4 / DELTA 20.4-DSP

All information contained herein have been compiled to the best of our knowledge.
Specifications, dimensions and weights do not represent guaranteed features.
Hoellstern GmbH reserves the right to changes which take the current state of the art into account.

Published by:

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Table of contents

2. Safety Notes

Before using the product, please read this manual attentively and follow all safety notes. Their purpose is to keep the user safe and help avoid technical defects and consequential damages caused by incorrect operation. Make sure teep this manual for future reference.

Caution: **The amplifier is a protection class 1 unit. While in operation, make sure the unit's protective conductor (earth) is connected properly. A missing protective conductor may cause hazardous voltages to occur on the case and controls!**

Caution: **Make sure all units of your system are grounded correctly to avoid the risk of an electric shock!**

Caution: **Never connect any output of an amplifier to an output, input or ground contact of any other amplifier. Otherwise you will expose yourself to the risk of an electric shock or technical defect.**

Caution: **All connected cables must be laid out in such a way that they cannot be bruised by objects or be stepped upon! Replace damaged cables at once, don't use them!**

Caution: **Keep the unit away from dust, moisture, water and other liquids! If despite all care liquid has got into the unit, immediately pull the mains plug to disconnect the unit safely from mains. Contact Hoellstern to consult about further measures. Do no longer use the unit under any circumstances, as fire hazard or injury through an electric shock may result otherwise! For additional safety the printed circuit boards and components are coated.**

Caution: **Never open the housing, there are no serviceable parts inside the unit! Leave such works to a qualified technician.**

Caution: **Use only suitable cables with a copper cross section of at least 4 mm^2 to connect the loudspeakers. Due to the high output power, fire hazard or injury through an electric shock may result with an undersized copper cross section! Molten insulations can produce short circuits, causing equipment or personal damages. The cables must guarantee a long-term isolation voltage of at least 250 V AC.**

Caution: **Use mains cables with a sufficient copper cross section of at least 1.5 mm^2. For cable lengths greater than 20 m, 2.5 mm^2 are advisable. Cable drums and the like must be unwound completely, otherwise fire hazard or injury through an electric shock may occur!**

Caution: **According to VDE regulations, the Neutrik PowerCON mains connector must not be hot-plugged nor pulled out hot! This is especially true under load. The PowerCON is not a plug-and-socket device designed in accordance with the VDE regulations against burn-up due to possible spark gaps.**
For greater safety and reliability all Hoellstern amplifiers feature an internal mains voltage monitoring and will cut out almost with no delay in case of a cable interruption. Hence spark gaps caused by disconnecting the mains supply will be avoided best or put out as quickly as possible.

Caution: **No sensitive signal and data lines, transmitters and receivers must be laid out or built in close proximity to the loudspeaker and mains cables. Persons with a cardiac pacemaker must keep a distance of at least 3 m from loudspeaker and mains cables. Otherwise the high currents (up to 125 A in speaker cables) and the associated magnetic AC fields may produce malfunctions.**

Caution: **Before connecting the units to mains voltage, make sure that the respective mains outlet delivers the correct voltage and has a correct protective earthing conductor. This is especially critical when working at different venues or with power generators. When exceeding the permissible maximum input voltage, fire hazard or injury through an electric shock may result!**

Note: **In the following cases it will be necessary to return the unit to the manufacturer or to a producer-authorised specialised company for inspection. You will find the contact data on the manufacturer's homepage www.hoellstern.com.**

- The unit was dropped or otherwise mechanically mistreated or damaged.

- The mains cable or mains plug was damaged.

- Objects or liquids have got into the unit.

- The device does not function as usual.

- The unit signals internal faulty conditions on the LED display.

3. Mounting into a 19" Rack or a 19" Cabinet

All devices can be mounted into standard 19" cases (racks and cabinets). Screw the units into place using the two mounting holes on each of the frontside rack ears. Use only screws with a large head diameter and locking washers. Please contact us regarding the optional mounting of retainer plates on the back. Never use too long screws; these might internally damage and destroy the electronics.

3.1 Ventilation of the Units

The amplifiers have a temperature-controlled forced air cooling. NOTE: The direction of the airflow is from front to back. The fan speed is controlled depending on the internally measured temperatures. Make sure not to obstruct the air influx and outlet when installing the units. Never use electronic devices in the warm airflow of the amplifiers since it is hotter than the ambient temperature. For manual function control and during the power-up phase the fans will momentarily run at a higher speed. Hoellstern amplifiers which offer several operating modes use different fan speed curves depending on their operating mode and the potential power output.

3.2 Air Filters

The air filters are locked in place by hexagonal perforated steel spring plates. The easiest way to clean the filters is to vacuum them while mounted. If the open-pore air filter is to be changed, pull the perforated steel plate off the front panel aperture using a pair of pliers and a screwdriver. A replacement for worn-out air filters may be ordered from the manufacturer.

A heavily soiled air filter will reduce the cooling capacity and may cause overtemperature. Never use the unit without an air filter, otherwise there is a risk of the electronics becoming polluted. A malfunction may be the consequence. Please replace faulty air filters immediately.

3.3 Ventilation of Racks and Equipment Cabinets

Equipment cabinets and 19" racks must be adequately vented. The units may be stacked upon each other. The housings do not serve as heatsinks.

3.4 Important Mounting Instructions and Tips

Protection of other units from thermal stress:
Do not mount other sensitive electronic devices in close contact with the top lids of the amplifiers. Due to the internal warming the housing cover will also warm up. If the mains supply is disconnected immediately after high strains, this will inevitably cause further warming up of the case lid. The heat will be dissipated to devices mounted in direct contact, causing possible malfunctions or defects in those devices. In general it is advisable not to disconnect the mains supply immediately after heavy stressful conditions for amplifiers, as the trailing fans will prevent an internal heat build-up.

Protection from mechanical stress:
Screw two suitable aluminium angle sections laterally into the 19" cabinet which serve as sliding rails and contact faces for the units. On these rails you can slide the units into place. Several units may be pushed in stacked upon each other.

4. Wiring of the Audio Inputs

The audio input connections are made via XLR-3 connectors on the rear panel of the amplifier. Each audio channel has a Neutrik full-metal XLR female socket and a full-metal XLR male socket for slaving the signal. The input signal of the female XLR socket is internally directly wired through to the corresponding XLR male socket. The inputs are balanced and wired as follows:

4.1 Balanced Input Signals

With a balanced audio source pin 2 (hot) and pin 3 (cold) are used to carry the signals. Pin 1 is the common signal and chassis ground. Always pay attention to a correct shielding.

4.2 Unbalanced Input Signals

If there is only an unbalanced audio source available, the audio signal must be put to pin 2 (hot). Pin 3 (cold) must be connected to pin 1 (signal mass). Always pay attention to a correct shielding.

5. Output Wiring and Damping Factor

The output connections are made via Neutrik high-current SpeakON sockets. To keep the cable losses in the loudspeaker cables low and to ensure safety, we recommend using a cable cross section of 4 mm^2. Hoellstern amplifiers are equipped with scoop-proof high-current SpeakON sockets which have a very low contact resistance of typically 1milliohm per contact. For your own safety use original Neutrik connectors exclusively.

The best audiophile results and maximum sound pressure levels will be achieved through minimum cable resistance values. The resistance is proportional to the cable length or inversely proportional to its cross section. Use therefore preferably large copper cross sections and keep your cables as short as possible.

CAUTION: **All contacts of the SpeakON connectors are hot. Never connect the amplifier outputs with any other outputs, ground or signals!**

CAUTION: **A safe, fully insulated line must be used. When laying cables out in the open, use watertight and UV resistant cable insulations. Please observe by all means the relevant national guidelines and CE regulations!**

CAUTION: **To avoid the risk of an electric shock, the amplifier should not be used if blank cable ends are visible. The inputs and outputs must be wired only when the amplifier is turned off and not connected to mains. Never touch the output voltages at the SpeakON connectors during operation to avoid the risk of an electric shock!**

CAUTION: **Use only suitable cables with a copper cross section of at least 4 mm^2 to connect the loudspeakers. Due to the high output power, fire hazard or injury through an electric shock may result with an undersized copper cross section! Molten insulations can produce short circuits, causing personal or equipment damages.**

CAUTION: **No sensitive signal and data lines, transmitters and receivers must be laid out or built in close proximity to the loudspeaker and mains cables. The high currents (up to 120 A in speaker cables) and the associated magnetic AC fields may produce malfunctions.**

6. Configuration

A Hoellstern DELTA 4-channel amplifier contains two identical amplifier modules. Module 1: C 1 / C 2 and module 2: C 3 / C 4. Both modules are fed from a common power supply. A Hoellstern DELTA 2-channel amplifier contains one amplifier module. Each amplifier module has two channels. Each amplifier module may be operated in bridge mode. If on a 4-channel amplifier one module is operated in bridge mode and the other module in stereo mode, we have a three-channel amplifier. If both amplifier modules are bridged, we have a two-channel amplifier.

Owing to special circuit technologies, Hoellstern amplifiers achieve almost double the output power at halved impedance (load stable *i*CVP® technology). For this reason Hoellstern amplifiers can be used in a very flexible and cost-efficient manner, and they sound excellent even at low impedance loads over the entire frequency range.

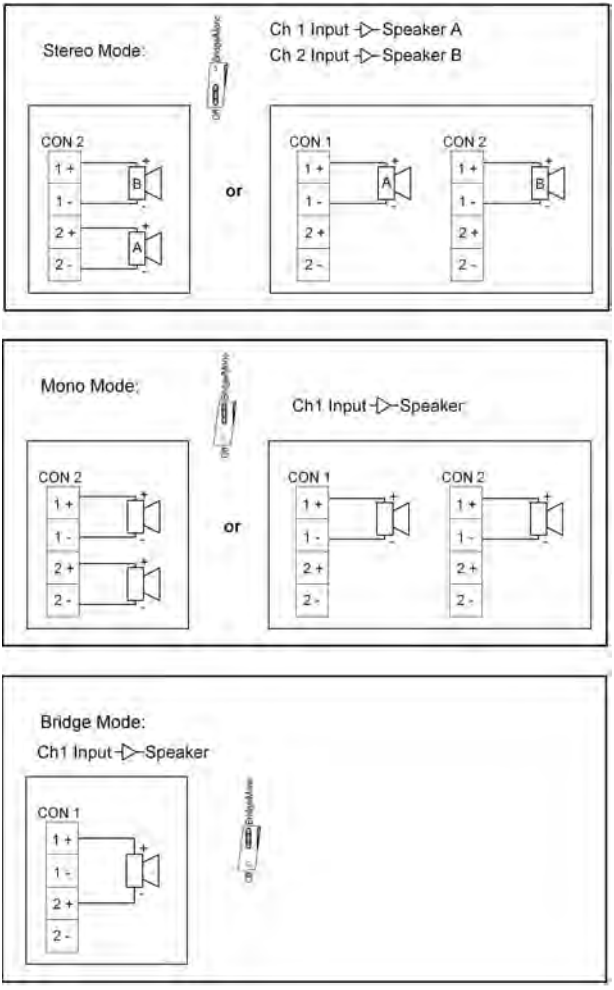
Via the terminal assignment of the SpeakON output sockets and the positions of the configuration switches on the rear panel different operating modes can be configured. Each amplifier module has two Neutrik high-current SpeakON sockets and a quad configuration switch. The contacts of the encapsulated toggle switches are gold-plated for optimum contact safety and have a typical lifetime of 20,000 cycles.

Each amplifier module may be operated in one of the following modes:

Stereo:	2 channels with 2 independent inputs.
Mono:	2 channels mono parallel, with one input CH 1 or CH 3 resp. The other input (CH 2 or CH 4 resp.) has no function.
Bridge:	1 channel in bridge mode, with one input CH 1 or CH 3 resp. The other input (CH 2 or CH 4 resp.) has no function.
	Exception: With models DELTA 14.4 and DELTA 14.4-DSP the CH3 / CH4 module has no Bridge / Stereo configuration switch. The module always works in stereo mode. If you wish to work in MONO mode, the channels must be slaved with short XLR cables.

6.1 Connecting Channels 1 to 4 (amplifiers produced until 07/2011)

Channels 3 and 4 are connected just like channels 1 and 2. Only the pictured wiring options are permitted. The wiring options are printed on the back panel of the unit.

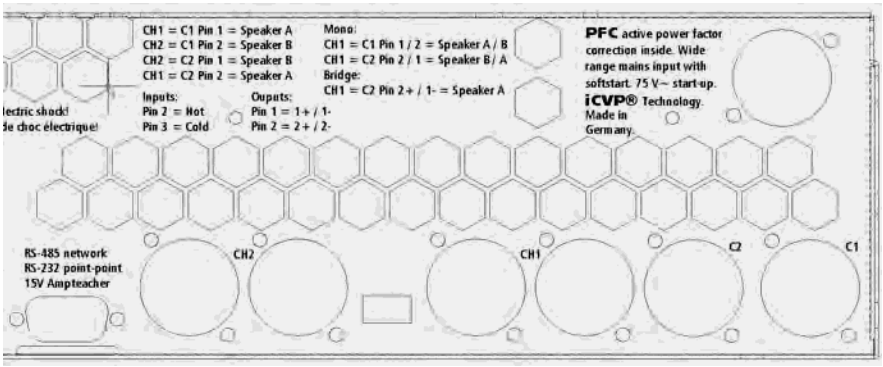


Alternatively, in bridge mode connector C2 pin 2+/ 1- or connector C4 pin 2+/ 1- can be used.
(Compatible with amplifiers produced from 07 / 2011)

6.2 Connecting Channels 1 to 4 (Amplifiers produced from 07/2011)

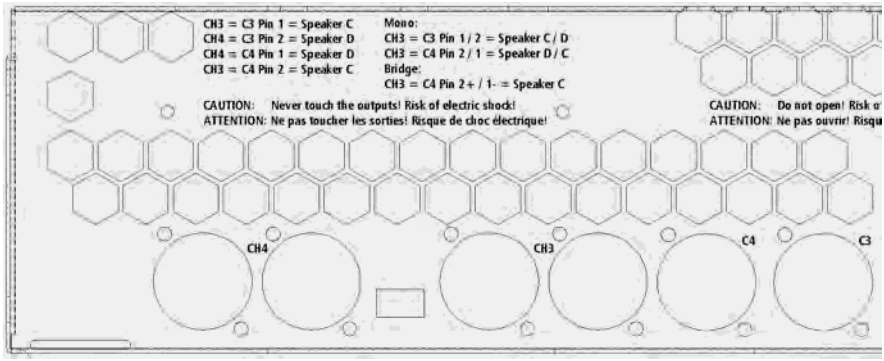
Configuration Channels 1 and 2:

Only the pictured wiring options are permitted. The wiring options are printed on the back panel of the unit.



Configuration Channels 3 and 4:

Only the pictured wiring options are permitted. The wiring options are printed on the back panel of the unit.



6.3 Rear Panel Configuration Switches

For configuration, each amplifier module has a quad configuration switch located on the rear panel. The individual switches are labelled and have the following meanings (from left to right):

Channels C3 / C4:

MISC:

Models DELTA 7.2 and DELTA 7.2-DSP: Labelled MISC:
No function, reserved.

Models DELTA 12.4, DELTA 12.4-DSP: Labelled SYM:
Configuration of operating mode and output power.

Models DELTA 8.4-DSP, DELTA 13.4, DELTA 13.4-DSP: Labelled ON:
Configuration of operating mode and output power.

Models DELTA 14.4, DELTA 14.4-DSP: Labelled ON:
Configuration of operating mode and output power.

Models DELTA 20.4, DELTA 20.4-DSP: Labelled ON:
No function, reserved.

BRIDGE:

DELTA 8.4-DSP, DELTA 12.4, DELTA 12.4-DSP, DELTA 13.4, DELTA 13.4-DSP, DELTA 20.4, DELTA20.4-DSP:
Lower position: Stereo mode, no bridge mode.
Upper position: Bridge / mono mode.

Bridge mode: Mind the correct pin assignment of the SpeakON sockets! Use the right SpeakON sockets! A faulty pin assignment may cause 180° phase errors! A faulty pin assignment may damage the unit.

DELTA 14.4, DELTA 14.4-DSP: Labelled ON:
Configuration of operating mode and output power.

Channels C1 / C2:

MISC:

Selection of the serial communication interface:
Upper position: RS-232 interface active.
Lower position: RS-485 interface active.

BRIDGE:

Lower position: Stereo mode, no bridge mode.
Upper position: Bridge / mono mode.

Caution: Mind the correct pin assignment of the SpeakON sockets! Use the right SpeakON sockets! A faulty pin assignment may cause 180° phase errors! A faulty pin assignment may damage the unit.

Channels C1 / C2 and C3 / C4:

GAIN:

Lower position: Default gain setting of the respective channel is 26 dB in stereo and mono mode and the associated gain control (front panel) at 0 dB (right-hand stop).

Upper position: Default gain setting of the respective channel is 32 dB in stereo and mono mode and the associated gain control (front panel) at 0 dB (right-hand stop).

If the module is operated in bridge mode, another 6 dB must be added to the basic gain because of the double output voltage of the bridged circuit.

6.4 DELTA8.4-DSP amplifier configuration:

The DELTA8.4-DSP amplifier offers two different operating modes.

Configuration is made via a switch located on the left-hand rear panel between channel 3 and 4.

Impedance	4 channels					Switch position Operating mode
	C1	C2	C3	C4	C1/2 and C3/4 bridged	
8,0	1.300 W	1.300 W	1.300 W	1.300 W	2 x 3.400 W at 12 ohms	ON
6,0	1.700 W	1.700 W	1.700 W	1.700 W	-	
4,0	-	-	-	-	-	
2,0	-	-	-	-	-	
	C1	C2	C3	C4	C1/2 and C3/4 bridged	Operating mode
8,0	850 W	850 W	850 W	850 W	2 x 3.400 W	OFF
4,0	1.700 W	1.700 W	1.700 W	1.700 W	-	
2,7	-	-	-	-	-	
2,0	-	-	-	-	-	

All power specifications are measured in practical burst mode above certain total outputs.

6.5 DELTA 12.4(-DSP) configuration

The DELTA 12.4(-DSP) amplifier offers two different operation modes. Configuration is done via a labelled switch located on the left side of the rear panel between channels C3 and C4.

Impedance	Channel					Switch position Operating mode
	C1	C2	C3	C4	C1/2 and C3/4 bridged	
8.0	600 W	600 W	600 W	600 W	2 x 2,200 W	OFF Asymmetrical current carrying capacity
4.0	1,150 W	1,150 W	1,150 W	1,150 W	2 x 4,400 W	
2.7	1,700 W	1,700 W	1,700 W	1,700 W	1 x 6,000 W at 2.7 ohms C1/2 plus 1 x 4,400 W at 4 ohms C3/4	
2.0	2,200 W	2,200 W	2,200 W	2,200 W	1 x 8,000 W at 2.0 ohms C1/2 plus 1 x 4,400 W at 4 ohms C3/4	
1.6	2,600 W	2,600 W	2,600 W	2,600 W	-	
1	4,000 W	4,000 W	2,600 W @ 1.6 ohms	2,600 W @ 1.6 ohms	-	
Impedance	C1	C2	C3	C4	C1/2 and C3/4 bridged	SYM MODE Symmetrical current carrying capacity
8.0	400 W	400 W	400 W	400 W	2 x 1,500 W	
4.0	800 W	800 W	800 W	800 W	2 x 3,000 W	
2.7	1,200 W	1,200 W	1,200 W	1,200 W	2 x 4,500 W	
2.0	1,600 W	1,600 W	1,600 W	1,600 W	2 x 6,000 W	
1.6	2,000 W	2,000 W	2,000 W	2,000 W	-	
1	3,000 W	3,000 W	3,000 W	3,000 W	-	

All power specifications are typical and measured in practical burst mode above certain total outputs.

6.6 DELTA 13.4(-DSP) configuration

The DELTA13.4 (-DSP) amplifier offers two different operating modes.
Configuration is made via a switch located on the left-hand rear panel between channel 3 and 4.

Impedance	4 channels					Switch position
	C1	C2	C3	C4	C1/2 and C3/4 bridged	Operating mode
8,0	1.300 W	1.300 W	1.300 W	1.300 W	2 x 5.200 W	ON
4,0	2.600 W	2.600 W	2.600 W	2.600 W	2 x 7.600 W at 5,3 ohms	
2,7	3.800 W	3.800 W	3.800 W	3.800 W	-	
2,0	-	-	-	-	-	
	C1	C2	C3	C4	C1/2 and C3/4 bridged	Operating mode
8,0	850 W	850 W	850 W	850 W	2 x 3.400 W	OFF
4,0	1.700 W	1.700 W	1.700 W	1.700 W	2 x 6.800 W	
2,7	2.500 W	2.500 W	2.500 W	2.500 W	-	
2,0	3.400 W	3.400 W	3.400 W	3.400 W	-	

All power specifications are measured in practical burst mode above certain total outputs.

6.7 DELTA 14.4(-DSP) Configuration

The DELTA 14.4 amplifier offers four different operation modes. Configuration is done via two switches located on the left side of the rear panel between channels C3 and C4.

Impedance	4-channel operation				Switch	Switch
	C1	C2	C3	C4	A	B
8.0	1,300 W	1,300 W	1,300 W	1,300 W	ON	ON
4.0	2,600 W	2,600 W	2,600 W	2,600 W		
2.7	3,800 W	3,800 W	2,500 W @ 4 ohms	2,500 W @ 4 ohms		
2.0	5,000 W	5,000 W	2,500 W @ 4 ohms	2,500 W @ 4 ohms		
	C1	C2	C3	C4	A	B
8.0	1,300 W	1,300 W	1,300 W	1,300 W	ON	OFF
4.0	2,600 W	2,600 W	2,600 W	2,600 W		
2.7	3,800 W	3,800 W	3,800 W	3,800 W		
2.0	-	-	-	-		
	C1	C2	C3	C4	A	B
8.0	1,000 W	1,000 W	1,000 W	1,000 W	OFF	ON
4.0	2,000 W	2,000 W	2,000 W	2,000 W		
2.7	3,000 W	3,000 W	3,000 W	3,000 W		
2.0	4,000 W	4,000 W	3,000 W @ 2.7 ohms	3,000 W @ 2.7 ohms		
	C1	C2	C3	C4	A	B
8.0	850 W	850 W	850 W	850 W	OFF	OFF
4.0	1,700 W	1,700 W	1,700 W	1,700 W		
2.7	2,500 W	2,500 W	2,500 W	2,500 W		
2.0	3,400 W	3,400 W	3,400 W	3,400 W		

All power specifications are typical and measured in practical burst mode above certain total outputs.

6.8 Rear side of DELTA6.2-DSP, DELTA 7.2(-DSP) and DELTA 12.2-DSP

6.9 Rear side of DELTA 8.4-DSP

6.10 Rear side of DELTA 12.4(-DSP)

6.11 Rear side of DELTA 13.4(-DSP)

6.12 Rear side of DELTA 14.4(-DSP)

6.13 Rear side of DELTA 20.4(-DSP)

7. Indicators and Controls

7.1 Gain Controls

Each amplifier channel has its own gain control on the front panel. In bridge/mono mode the C2 or C4 control has no effect on the gain. The gain controls are controlled and analysed by microprocessors. A change in the position will only be taken over with a short delay. Always let the rotary knob perceptibly latch in the desired position (21 positions). In-between positions are not permitted and useless. The first three positions counterclockwise from right-hand stop are equivalent to 0 dB attenuation, i.e. the basic gain (see 26 dB / 32 dB selector switch on the rear side) is active. Every other position counterclockwise will reduce the gain. The left-hand stop is equivalent to mute (100 dB attenuation).

7.2 LED Indicators

ON-STBY
- Green flashing: The amplifier is connected to a mains outlet and switched to standby mode.
- Green on: The amplifier is connected to a mains outlet and the amplifier module is active (ON).

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SIG
- Green on: A signal is present at the corresponding XLR audio input. The display is filtered and reacts with a delay.

- 6, -3, 0 dB

Level meter of the corresponding channels. The detection of the 0 dB full drive mark is done without filtering and very precise. If the 0 dB peak value is exceeded for more than 10 µsec, this will be digitally cached and indicated delayed on the display for one second. Compared to all conventional analogue 0 dB meters, this 0 dB reading is much more sensitive and precise.

LIMIT
- Red on: The signal limiter is active. The gain of the corresponding channel is reduced. With the limiting function active, a channel continues to amplify linearly without any compression of the audio signal.

Indicates AC mains overload: As soon as the internal intelligent mains control recognises a potential mains fuse overload, the limiters on all four channels will respond at once and the gain is reduced. All four Limit LEDs will be lit. The typical current limit values of 16A automatic mains cut-outs (class B) will be observed.

HFLF
- Red on: A low frequency and / or high frequency audio signal with an excessive level is present at the output. To protect the loudspeakers the level is limited at the output. If a limit value is exceeded after a short waiting time despite active limiting, the module will turn off completely for safety reasons.

TEMP

TEMPERATURE
- Red flashing: The corresponding module has reached a critical heatsink temperature and the gain is reduced.
- Red on: The heat sink temperature has further gone up despite level limiting and the corresponding amplifier module switches to standby mode. After the heat sink has cooled down, the module will automatically turn on again. **Troubleshooting:** See chapters on filter cleaning, ventilation and mounting into 19” racks and equipment cabinets.

CUR

CURRENT
- Red on: The output current of the amplifier module was exceeded. The module will switch to standby for about 200 ms and then turn on again automatically. This procedure may be repeated up to 4 times. If overcurrent should still persist, the amplifier module will remain in standby mode. A quick OFF - ON using the standby switch on the front panel – wait a few seconds – will allow another power-up of the amplifier. **Troubleshooting:** Check all output channel assignments, check all connected cables and loudspeakers and correct them, if necessary. See also chapter on configuration.

MISC

MISCELLANEOUS
- Yellow on: **Bridge mode** active (Bridge switch in upper position).
- Off: **Stereo mode** active (Bridge switch in lower position).
- Flashing: The internal diagnose functions have detected an internal failure. The unit must be returned to the manufacturer for service. Please contact Hoellstern GmbH.

8. Power Supply

8.1 Mains Supply and Power Supply with *i*CVP® Technology

The devices feature an active power factor correction circuit (PFC). Therefore the amplifier will burden the mains supply almost like an ideal, purely ohmic load. This means that voltage and current flow are in phase. Only this way you can draw maximum power from mains with almost no reactive power. Thus mains will be saved and the automatic circuit breaker not unduly burdened. Furthermore, the mains input current is permanently controlled internally by an intelligent microprocessor. So before an automatic mains cut-out can trip due to an excessive current load, the output power of the amplifier will be reduced and then instantly raised again if permitted. However, during operation this will not even occur with very low loudspeaker impedances and heavily compressed music material. All limiter LEDs will light up together if the output power is reduced due to an imminent mains overload.

A reliable operation on 16 A (Class B) automatic mains cut-outs is permanently ensured, as long as the circuit breaker complies with the current regulations. For systems which serve the needs of personal safety at least class C circuit breakers must be used for safety reasons. A reserve will increase the system safety.

The unit can be operated already from 75 VAC and has a wide input voltage range. With high continuous output powers a sufficiently stable mains voltage must be applied. The minimum and maximum values are printed on the rear panel of the unit and listed in the chapter on technical data.

If other devices are connected to the same mains, make sure that the internal line resistance (in consequence of undersized mains cables, cable drums etc.) is not too high. Otherwise it can happen that other loads connected hereto will show malfunctions due to momentary mains voltage fluctuations. When using cable reels or other extension cables, the cable must be unwound completely. It is advisable to use a minimum copper cross section of 2.5 mm2 . For greater distances you need to contact authorised and skilled experts.

As soon as the unit is connected to the mains voltage, it is in standby mode. Only after the ON / Standby switch (front panel) is set to the ON position, intelligent protection circuits will perform a software-controlled check of all internal conditions before the unit will turn itself on completely (boot procedure). After a few seconds the amplifier will be ready for work and slowly increase the gain settings to the preset values.

8.2 Operation on Generators

When operating the amplifier on a generator, it must be taken into account that a high momentary mains current draw may occur, depending on the connected loudspeakers, the operating modes (bridge / single-ended), the drive level of the amplifier, the audio signal and the limiter settings of the signal controller. With high pulse-like output powers, undersized generators (too small a gyrating mass and too feeble peak current capability) can be slowed down to a halt. If this problem occurs and there is no other, more stable mains supply available, you may check two things as a possible interim remedy:

a) Adjust the limiters (RMS and Peak Limiter) in the signal path to more sensitive settings and gradually lower the maximum output voltage settings on the controller.

b) Use bridged channels (bridge mode) in single-ended mode. This will reduce the maximum output power to a ¼ of the initial value, thereby also lowering the mains current draw. Caution: Mind the pin assignment of the SpeakON socket!

9. Technical Specifications

For technical specifications please visit our website www.hoellstern.com or www.hoellstern.eu.

10. Integrated Digital Loudspeaker Management (-DSP)

All Hoellstern amplifiers are optionally available with a built-in digital loudspeaker management.

10.1 Hoellstern Loudspeaker Library

We offer comprehensive loudspeaker libraries for our Hoellstern amplifiers and configure them after consultation with our customers. For further information please visit our website www.hoellstern.com or www.hoellstern.eu and contact Hoellstern GmbH. The libraries are described and sorted by loudspeaker brands on the website. All DSP setups have been carefully compiled. The Hoellstern setups emulate precisely their originals in terms of transit time, phase and gain over the frequency. Likewise, the safety-relevant RMS and peak limiters have been carefully worked out. Therefore Hoellstern amplifiers may be universally used, offering a manufacturer-independent “plug and play“ operation in combination with any given loudspeaker systems.

10.2 DSP Configuration, Hoellstern Software Konfigurator1 and Hoellstern Konfigurator2

The digital signal processing unit (DSP) is configured via the serial interface (RS-232 or RS-485) on the amplifier.

11. Terms of Guarantee

11.1 Liability Declaration

Hoellstern GmbH shall not be held liable for personal or physical damages (to loudspeakers, amplifiers or other equipment) caused by careless operation, negligent installation, improper use or disregard of the manual.

When operating the amplifier in close proximity to HF transmitters (e.g. wireless microphones, mobile phones etc.) acoustic and functional disorders may occur. Damages to the unit are improbable, yet cannot be excluded.

11.2 Product Warranty

Current warranty terms, see:

www.hoellstern.com

or

www.hoellstern.eu

Important: *Please understand that prior to returning any units to Hoellstern GmbH, a return number must be asked for in writing, together with a description of the defect and the sales slip or an invoice copy enclosed. Otherwise we reserve the right to decline acceptance.*

12. Disposal

This is a b2b device in the sense of the Electrical and Electronic Equipment Act (ElektroG). The devices must not be delivered to the collecting points of the public waste management authorities nor be put by them into the containers which have to be collected by the producing companies free of charge. Consequently the producer shall not be obliged to collect discarded appliances at collecting points. If appliances are to be disposed of, we recommend to inform the producer despite this legal regulation.

13. Conformity Declaration

The appliance complies with the basic requirements laid down in the Council Directive on the Approximation of the Laws of the Member States relating to Electromagnetic Compatibility (2004/108/EG).
The appliance must not be altered with regard to its physical and electro-mechanic properties. The instructions and guidelines in this manual must be followed. The following standards are used:
DIN EN 55103-1:1996, E4 (Article 10 Supplement E, alternative measuring procedure: current transformers).
DIN EN 55103-2:1996, E4. The appliances have not been designed for living areas.
Serial number: Please refer to the cover sheet.

Accountable for this declaration is Hoellstern GmbH, March / Germany. Date: January 20th, 2009.

Environment

„The typewriter I'm using contains aluminium, probably from Jamaica or Surinam, iron from Sweden, magnesium from Czechoslovakia, manganese from Gabon, chrome from Rhodesia (today's Zimbabwe), vanadium from the USSR, zinc from Peru, nickel from New Caledonia, copper from Chile, tin from Malaysia, cobalt from Zaire, lead from Yugoslavia, molybdenum from Canada, arsenic from France, tantalum from Brazil, antimony from South Africa, silver from Mexico as well as traces of other metals from remote spots of the world.

The paint may contain titanium from Norway; the plastic parts are made of mineral oil which comes from the Middle East and which has been cracked by catalysts won from American mined rare earths; they contain chlorine that was separated by using mercury from Spain. The moulding sand for the cast metal frame comes from an Australian beach, the machine tools for the production contained tungsten from China, the coal for the required energy came from the Ruhr district – and the final product is now consuming too many Scandinavian spruce trees in the form of paper."

Thus wrote Armory B. Lovins, Head of the Rocky Mountain Institute in the USA in his book „Openpit Mining" in the year 1973. Already then he was aware of what has been proven in many studies today:

There are products which use up extremely many resources and therefore cause serious environmental issues in the end. Unfortunately, audio power amplifiers also fall into this category.

Copper which is used for transformers and chokes may serve as the best example:

For the extraction and production of 1 kg of copper we have to spend 1.18 tons of materials and resources.

The extraction of copper (Cu) takes place in several production phases. On the mining level (mines) coppery ore is lifted in surface (about 2/3) or underground mining (1/3).

The mined crude ores have a very low copper content between 0.5 % and 4 %. This low copper content of the crude ores necessitates a considerable use of energy during production and refinement.

For every ton of copper an average of 219 tons of mining waste accrue.

During the processing stage the crude ores are enriched to form concentrates with a copper content of mostly 25 % to 35 %.

This is followed by other beneficiation processes and hence more consumption of energy and resources and more emissions to provide copper for the production of e.g. transformers and chokes.

Likewise, for the production of aluminium and steel frightening figures could be presented. To this we still need to add the routes of transportation between mining, extraction and processing which also devour energy and are therefore pollutive.

By these examples it becomes clear very fast that digital high-performance power amplifiers which don't require heavy transformers and heat sinks and which also have a small frame size, go easy on the resources of our Earth.

The Hoellstern® audio amplifiers help to keep the emissions and the consumption of resources needed for their production and during their operation as low as possible.

Into the future with a good conscience!

Hoellstern®

AUDIO AMPLIFIERS

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