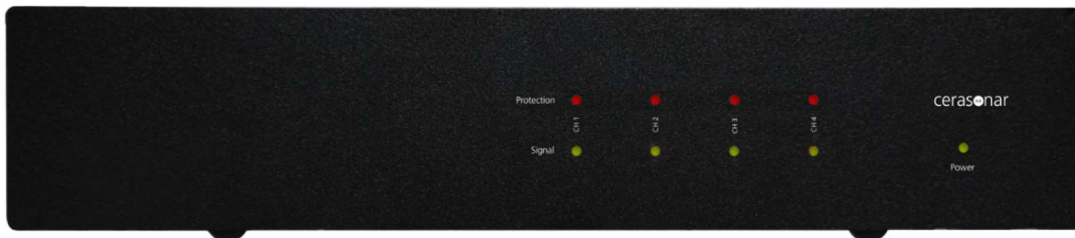




cerasonar  
invisible speakers



## cerasonar cs-500dsp4

4 channel DSP amplifier

## Important Safety Instructions

- Read these instructions
- Keep these instructions
- Heed all warnings
- Follow all instructions
- Do not use this apparatus near water
- Clean only with a dry cloth
- Do not block any ventilation openings. Install in accordance with the manufacturer's instructions
- Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat
- Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the apparatus
- Only use attachments/accessories specified by the manufacturer
- Unplug this apparatus during lightning storms or when unused for long periods of time
- Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped
- This apparatus shall not be exposed to dripping or splashing, and no object filled with liquids, such as vases or glasses, shall be placed on the apparatus

## Safety Symbols



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



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



Caution, to reduce the risk of electric shock, do not remove the top cover. There are no user-serviceable parts inside. Refer servicing to qualified personnel.



Recycling notice: If the time comes and this apparatus has fulfilled its destiny, do not throw it out into the trash. It has to be carefully recycled for the good of mankind, by a facility specially equipped for the safe recycling of electronic apparatus. Please contact your local or state recycling leaders for assistance in locating a suitable nearby recycling facility. Or, contact us and we might be able to repair it for you.

## When Installing the Unit

- Never plug in nor remove the power supply plug with wet hands, as doing so may cause electric shock.
- When unplugging the power supply cord, be sure to grasp the power supply plug; never pull on the cord itself. Operating the unit with a damaged power supply cord may cause a fire or electric shock.
- When moving the unit, be sure to remove its power supply cord from the wall outlet. Moving the unit with the power cord connected to the outlet may cause damage to the power cord, resulting in fire or electric shock. When removing the power cord, be sure to hold its plug to pull.
- Avoid installing the unit in humid or dusty locations, in locations exposed to the direct sunlight, near the heaters, or in locations generating sooty smoke or steam as doing otherwise may result in fire or electric shock.
- To avoid electric shocks, be sure to unplug the unit's power supply cord when connecting speakers.
- Be sure to follow the instructions below when rack-mounting the unit. Failure to do so may cause a fire or personal injury.
  - Install the equipment rack on a stable, hard floor. Fix it with anchor bolts or take other arrangements to prevent it from falling down.
  - When connecting the unit's power cord to an AC outlet, use the AC outlet with current capacity allowable to the unit.
  - No rack-mounting screws are supplied with the unit. Separately prepare the appropriate screws for the rack.
- Make sure that the ventilation slots as well as the fan is not blocked by any objects that may obstruct air flow to prevent that the unit overheats.

## When the Unit is Installed

- Do not place heavy objects on the unit as this may cause it to fall or break which may result in personal injury and/or property damage. In addition, the object itself may fall off and cause injury and/or damage.
- Do not operate the unit for an extended period of time with the sound distorting. This is an indication of a malfunction, which in turn can cause heat to generate and result in a fire.
- If dust accumulates on the power supply plug or in the wall AC outlet, a fire may result. Clean it periodically. In addition, insert the plug in the wall outlet securely. internal temperature rise.
- Switch off the power, and unplug the power supply plug from the AC outlet for safety purposes when cleaning or leaving the unit unused for 10 days or more. Doing otherwise may cause a fire or electric shock.

## Maintenance and Repair

- **WARNING!** Advanced technology, e.g., the use of modern materials and powerful electronics, requires specially adapted maintenance and repair methods. To avoid a danger of subsequent damage to the apparatus, injuries to persons and/or the creation of additional safety hazards, all maintenance or repair work on the apparatus should be performed only by a Cerasonar authorized service partner. Cerasonar is not responsible for any injury, harm or related damages arising from any failure of the customer, owner or user of the apparatus to facilitate those repairs.

## Delivery Content

The cs-500dsp4 comes with the following content:

- Amplifier, cerasonar cs-500dsp4
- Removable terminal plug (4P), 2 pcs
- Removable terminal plug (5P), input adapter with RCA cable connected, 2 pcs
- IEC-type detachable power cord
- Installation manual
- Adapter rack ear for 19" rack mounting (1x amplifier 1U)
- Adapter rack ear for 19" rack mounting (1x amplifier 1U)
- Adapter amp connector for 19" rack mounting (1x amplifier 1U)

Save the carton and polystyrene inserts for future safe transport in case the amplifier is moved or requires shipping for repair.

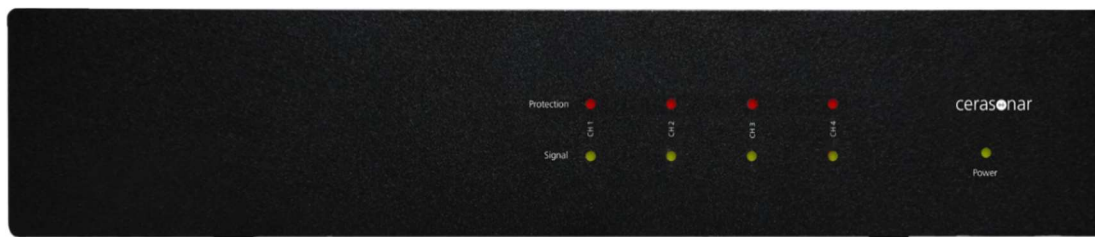
## Introduction

Thank you for purchasing the cerasonar cs-500dsp4 which is a 4-channel DSP amplifier that convinces with its performance and compact dimensions. A preset can be selected for our cerasonar loudspeakers to ensure optimal sound in any room. The digital overload protection guarantees operational safety.

The power output is 125 watts per channel into 4 and 8 ohms, furthermore the amplifier can also be used for 70/100V applications. There are 4 balanced inputs, the RCA adapters included in the package can be used for up to two stereo RCA inputs. If the default standby automatic is not desired, the amplifier can also be switched on and off by 12V trigger. Control via Control4 is possible as well. The amplifier connects to the network via LAN and can be configured locally from any internet browser, no additional PC software is necessary.

Adapters are included for installation in a 19" rack. One or two amplifiers per 1U can be installed. The amplifier is also suitable for stand-alone use, as it is passively cooled and does not cause any disturbing noise. In the configuration interface the fine tuning of the loudspeakers can be done (max. power limit, DSP filter, volume) and the input channels can be assigned to the output channels via matrix.

## Functions



(front panel view)

### **PROTECT/LIMIT LED**

Each channel (A, B, C and D) has a protection/clip limiter LED. Whenever this red indicator lights up, it implies that the internal protections have been triggered to protect the device against damage. Should this protection turn on, please check if the amplifier is being overdriven or if there is any short circuit in speaker cables.

Whenever this red indicator is blinking, it implies that the limiter starts clipping. The limiter only responds to actual clipping, and automatically compensates for load and voltage variations. Clip limiting is generally recommended, especially to protect high frequency drivers. It illuminates red whenever the amplifier reaches the selected power limit.

## SIGNAL LED

Each channel has a signal LED. It illuminates green when a signal is present and beyond a default input threshold level.



(back panel view)

## FACTORY RESET

Please turn to page 14

## IEC 4-PIN RECEPTACLE

The cs-500dsp4 amplifier has an auto-switch 115/230VAC power supply that operates on mains from 100 - 240 V at 50Hz or 60 Hz. The IEC receptacle on the rear panel accepts the supplied IEC cord which terminates in a connector plug appropriate for the country of sale.

**CAUTION:** This unit is a Class 1 device. Do not defeat the safety connector or use a power cord without the safety ground pin.

## AC FUSE & HOLDER

The main power supply fuse may be checked or replaced. Make sure that the power cord is unplugged from the AC mains first. Then use a flat-headed screwdriver to undo the fuse carrier from the fuse holder. Inspect the fuse and replace with the exact same type indicated on the unit. The use of any other type of fuse may lead to an unsafe condition. If the fuse blows again immediately, then unplug the power cord and contact the dealer for service. Do not open the unit, as there are no user-serviceable parts inside, and dangerous voltages exist.

**CAUTION:** Only replace with the same type fuse.

## BALANCED TERMINAL BLOCK INPUT A, B, C AND D

There are two five-pin Euro-style connectors labeled CH1 through CH4 providing the audio inputs to the amplifiers. A single input can be mixed to one or a combination of outputs. You can use from one to four of the inputs. The inputs are 10 k $\Omega$  balanced or unbalanced.

- Make sure your audio source devices are powered off.
- The unit comes with two preinstalled RCA to euro style connectors, you can use these for any RCA sources, e.g. Sonos Connect

## BALANCED TERMINAL BLOCK OUTPUT A, B, C AND D

The output is used to loop through the input signal (without altering it). This is practical, for example, if several amplifiers are needed in a large zone.

## INPUT LEVEL POTENTIOMETERS

Use these potentiometers to adjust the gain of input A, B, C and D, respectively.

## SPEAKER OUTPUT A, B, C AND D OUTPUT

There are two sets of removable speaker wire terminals, one for two amplifier outs, either amplifier A and B or amplifier C and D. The terminals accept speaker wires up to 14 AWG in size. Each terminal has four screw-down connections for speaker wire: One positive (+) and one negative (-) for each speaker. Unscrew the connection, insert the appropriate bare speaker wire, then tighten firmly.

**Warning: The negative (-) terminal is not Ground. Please do not short the negative (-) terminals.**



**WARNING!** When the AC power is on, there is a potential of having dangerous voltage at the output terminals on the back of the amplifier. Use caution not to touch these contacts. Turn off the AC Mains disconnect switch prior to making any connections.

## NETWORK CONTROL

An RJ45 jack is supplied for connection to an Ethernet network for external control and monitoring, either by a direct wired connection or via an external WiFi access point. Any device with a modern web browser can be used. LEDs below the connector indicate valid network connection (LINK) and network activity (ACT). When several network devices are connected to a network, a switch with a built-in DHCP server should be used. The cs-500dsp4 is set to DHCP mode on delivery, which means that the network router assigns an IP address to the device. Please make sure that enough free IP addresses are available. With a suitable network search/scanner tool you can find the amplifiers that are connected to your network. If there is no DHCP service available, the IP address of the unit will be 192.168.14.1

After the amp is set up correctly and turned on, you can access the unit via a web browser. Make sure that both units are connected to the **same** local network.

### Step 1:

Type in the IP address of the amp (use a scanner tool if you don't know it), if the ip address would be: 192.168.1.50, type in this address to your webbrowser:  
<http://192.168.1.50>

### Step 2:

Use the following login data to access the amps control panel:

user: "admin"

password: "admin"

### Step 3:

You should now be able access the cerasonar cs-500dsp4 web GUI.

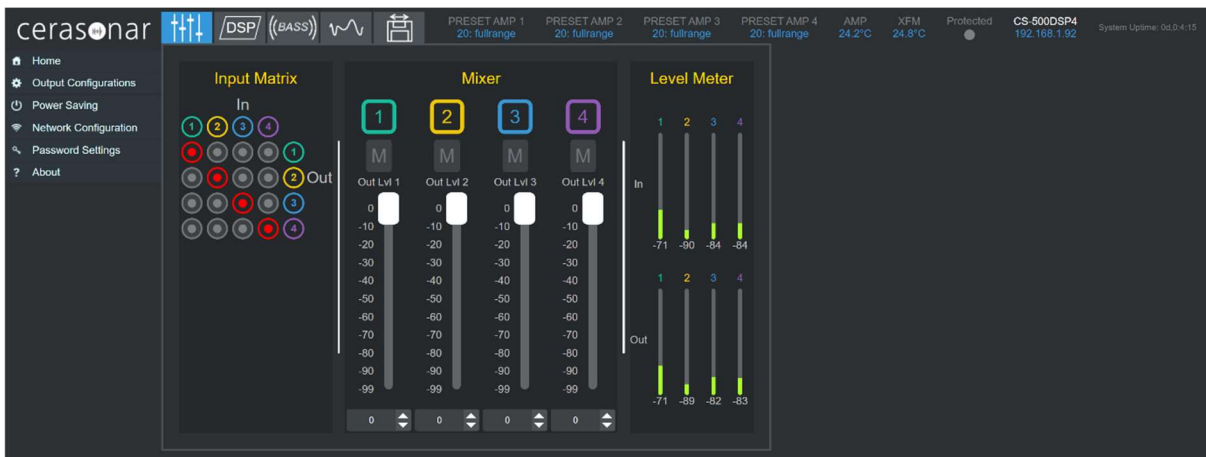


## Web GUI Controls

### START SECTION

The cerasonar cs-500dsp4 is easy and fast to configure due to the sleek and straightforward GUI design. On the start page you have the input matrix to route the input signal(s) to the desired output channel(s). In the mixer section, the output channel(s) volume can be adjusted or the amp channel muted. The level meter shows the input signal/source strength and the output signal strength, on the top bar the selected preset, the temperatures and the ip address as well as the system uptime and protection are displayed.

**WARNING:** If you only want to use the basic functions, please go to the “PRESET SECTION” to select the appropriate preset for the cerasonar speaker. If the amp is not correctly configured, this may harm the speakers and/or lead to damage!



### DSP SECTION

In this section, some basic DSP functions can be configured. First of all the HPF (highpass filter) can be individually selected for all channels with the desired frequency. Please make sure to turn it on by pressing on “HPF” (it will turn to yellowish). With the tone control, the treble and bass level can be adjusted. The limiter can be used to limit the max. power output.

- 0 dB = full power, e.g. ~ 125 watts
- 3 dB = half power, e.g. ~ 62,5 watts
- 6 dB = quarter power, e.g. ~ 31,25 watts
- 9 dB = eighth power, e.g. ~ 15,625 watts

Other additional functions: Polarity and delay

To ensure a perfect frequency response, it is important that all speakers and subwoofers are "in phase". A rough adjustment can be made by changing the polarity. The change is especially noticeable in the crossover area (speaker and sub).

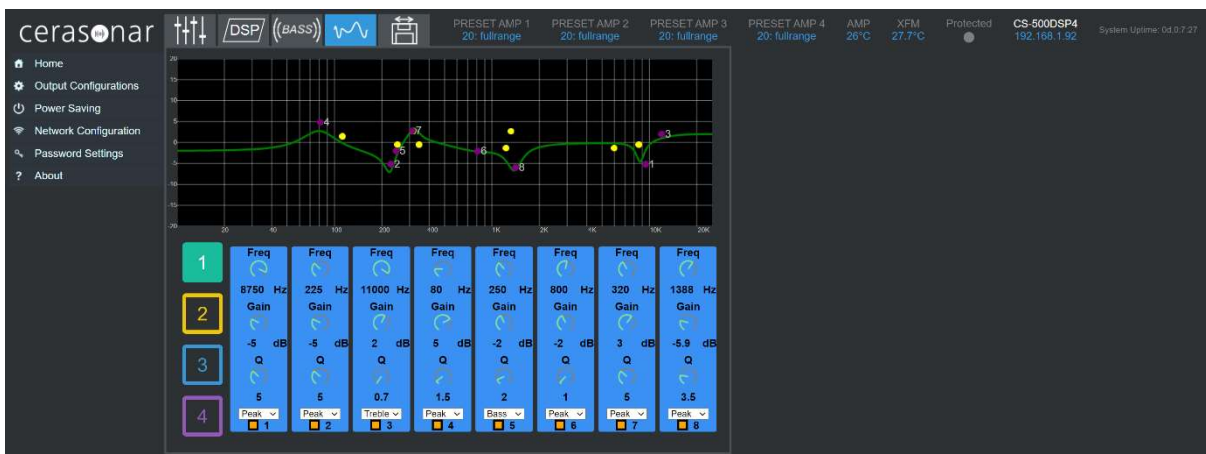
A delay should only be adjusted with a measuring device. In general, exciter-based speakers are faster than subwoofers, so the speakers need a delay in order for the sound waves to reach the listener at the same time.



## EQ FILTER SECTION

If required, EQ filters can be used. Eight filters are available per channel, the LPF and HPF are each 12 dB per octave. With a suitable measurement system, the frequency response should be measured at different points in the room. Afterwards, filters should only be set if a certain tendency is visible on all measurements. We recommend checking the changes with a known music song, for this purpose the filters can be switched on and off in real time.

**WARNING:** Only for qualified users, wrongly set filters can make the speakers sound badly and might harm them!



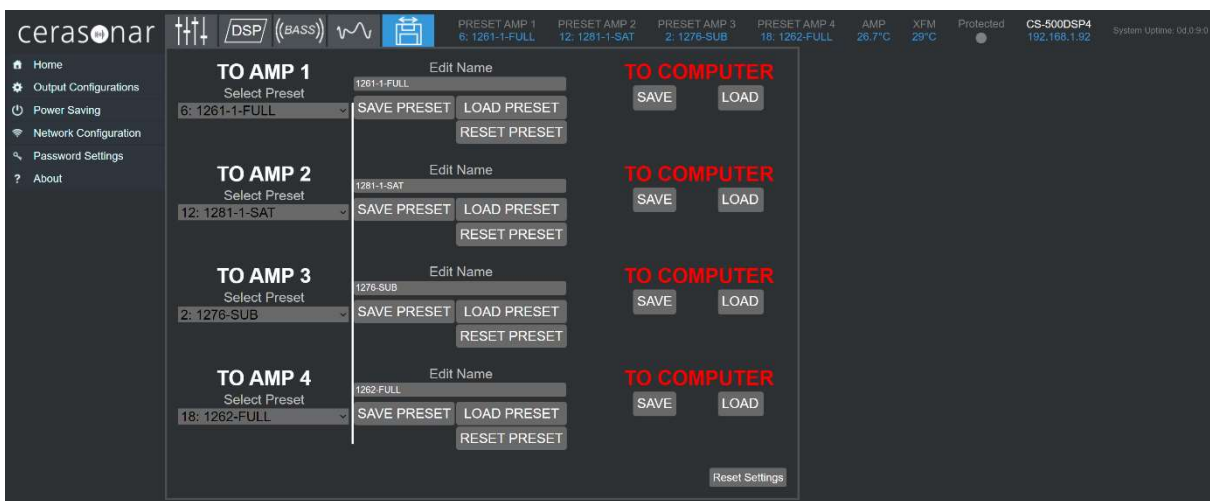
## PRESET SECTION

The amplifier is shipped with presets for various cerasonar products. These can be selected in this section. The presets can be loaded not only from the amplifier, but also from the data memory of the individual device.

An individual preset can be loaded for each amplifier output, so that different speakers or subwoofers can be driven by one amplifier.

If changes have been made to the settings of the amp, they can be saved here. We recommend that you also back up the data using the export function.

**WARNING:** Please double check your selection, since a wrong selection could damage the speaker.



## OUTPUT CONFIGURATION SECTION

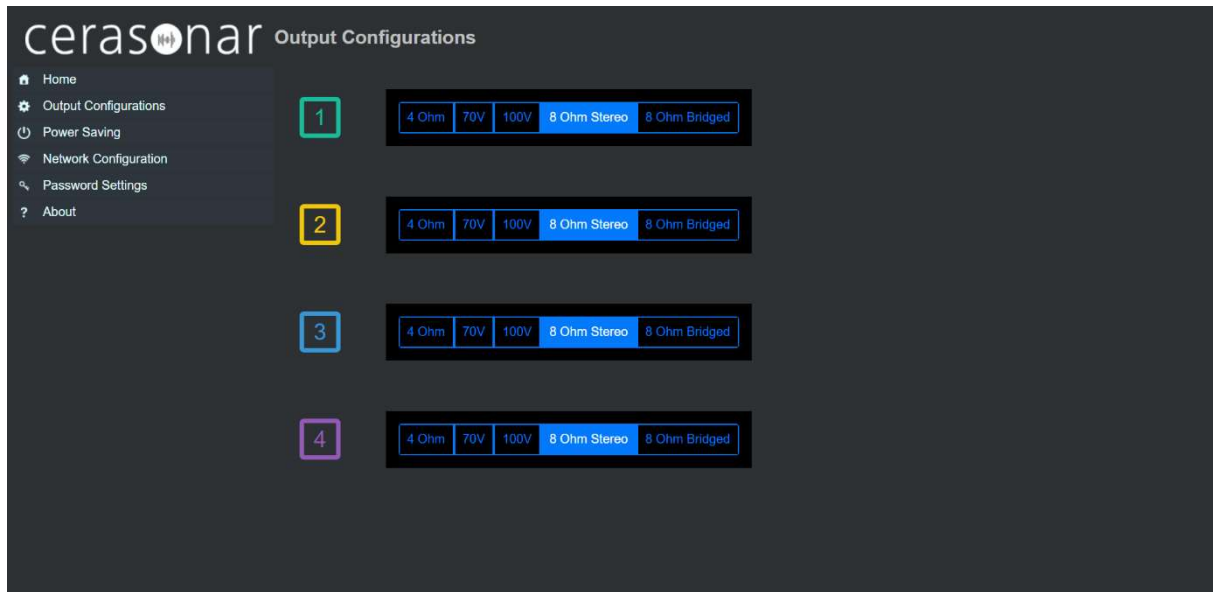
The speaker configuration is done on the rear side of the amplifier. For this purpose, the DIP switches have to be set to the desired configuration.

The following settings are available:

- 4x 125 watts into 4 ohms
- 4x 125 watts into 8 ohms
- 2x 250 watts into 8 ohms\* (4 ohms at your own risk)
- 2x 250 watts at 70 volts
- 2x 250 watts at 100 volts

\* to activate the bridge mode, the DIP switch must be set to "8 Ohm". Furthermore, the switch in the GUI menu item "Output Configuration" has to be changed from "8 Ohm Stereo" to "8 Ohm Bridged".

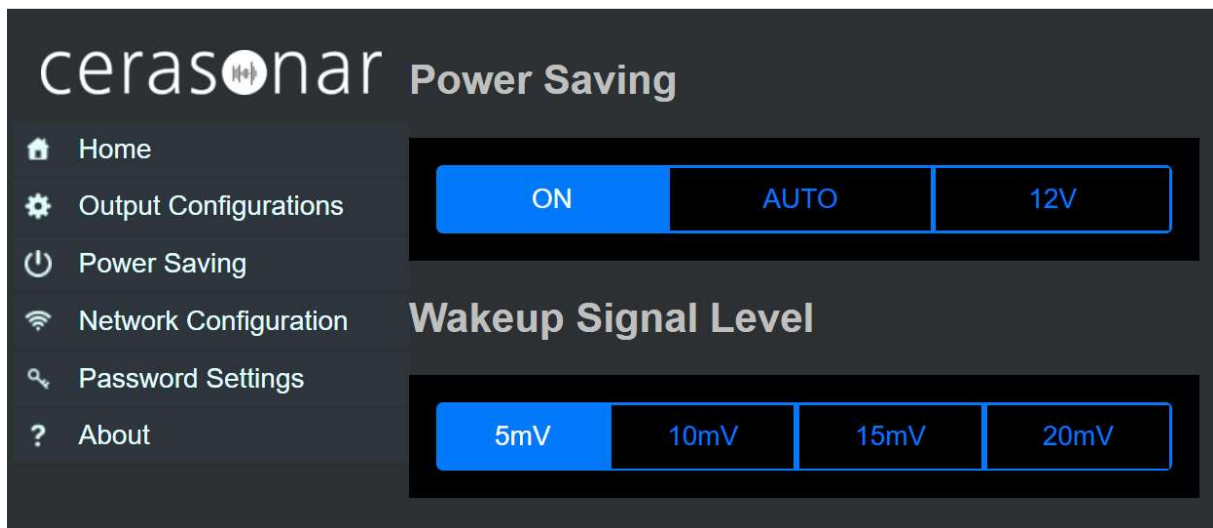
**WARNING:** Please check the displayed information, as an incorrect configuration could damage the amplifier or speaker.



## POWER SAVING SECTION

Again, the values set by DIP switches on the rear panel are only displayed. Please make sure that the configuration is correct so that the energy saving options can be utilised.

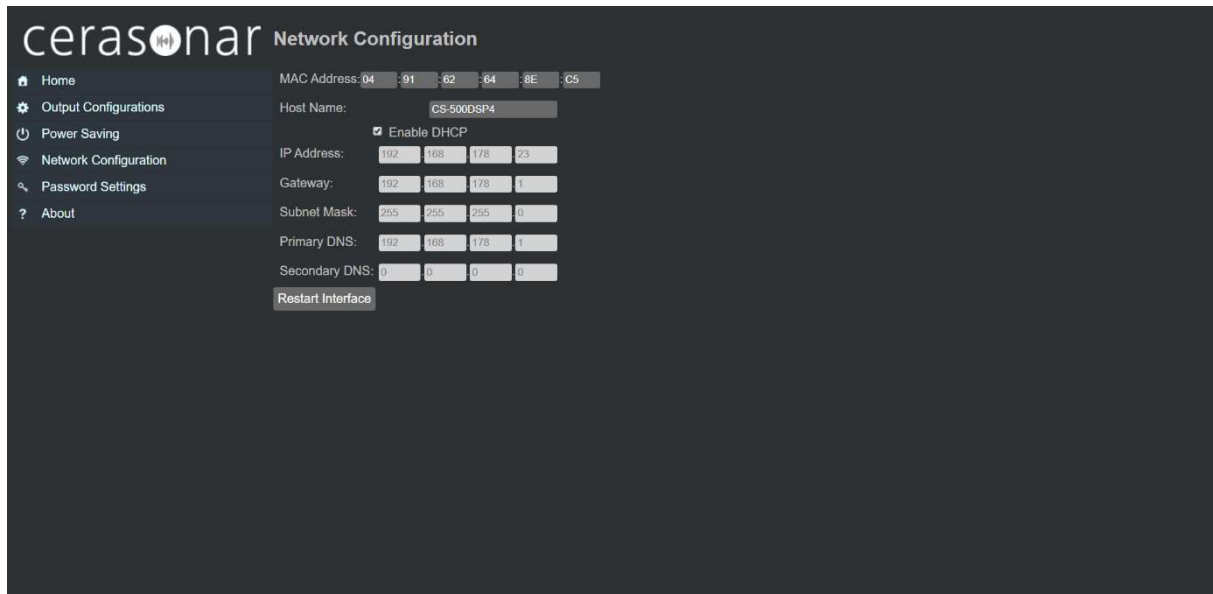
In "Auto" mode it is possible to adjust the sensitivity.



## NETWORK CONFIGURATION

The set network values are displayed here and can also be changed.

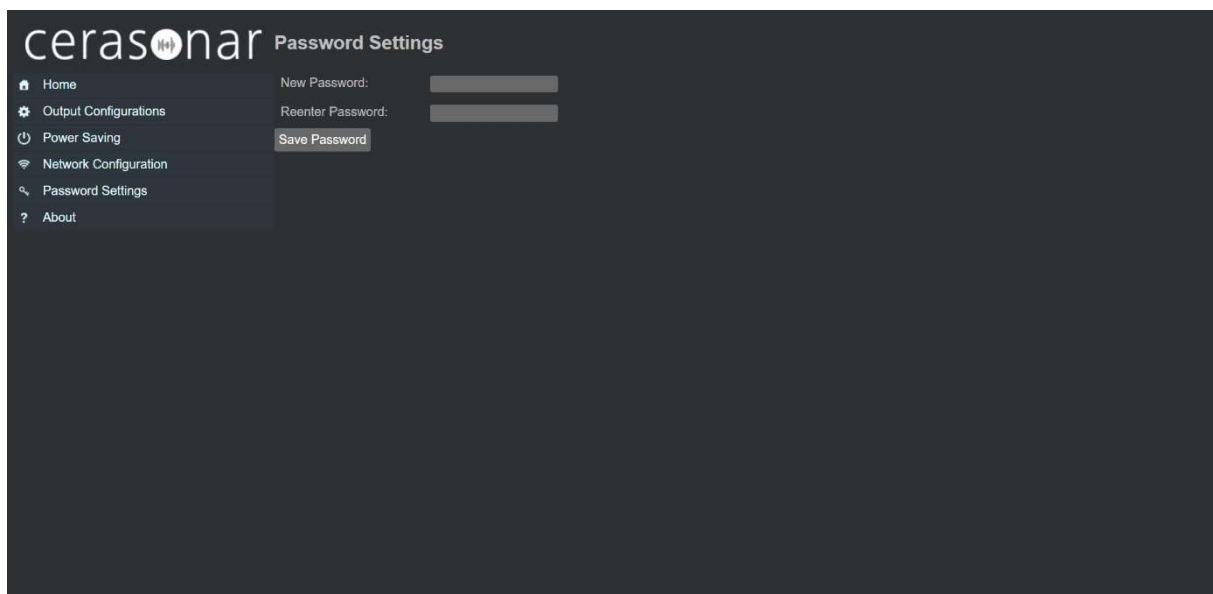
ATTENTION: Please make changes only by qualified users, since the amplifier may not be visible if it is configured incorrectly.



## PASSWORD SECTION

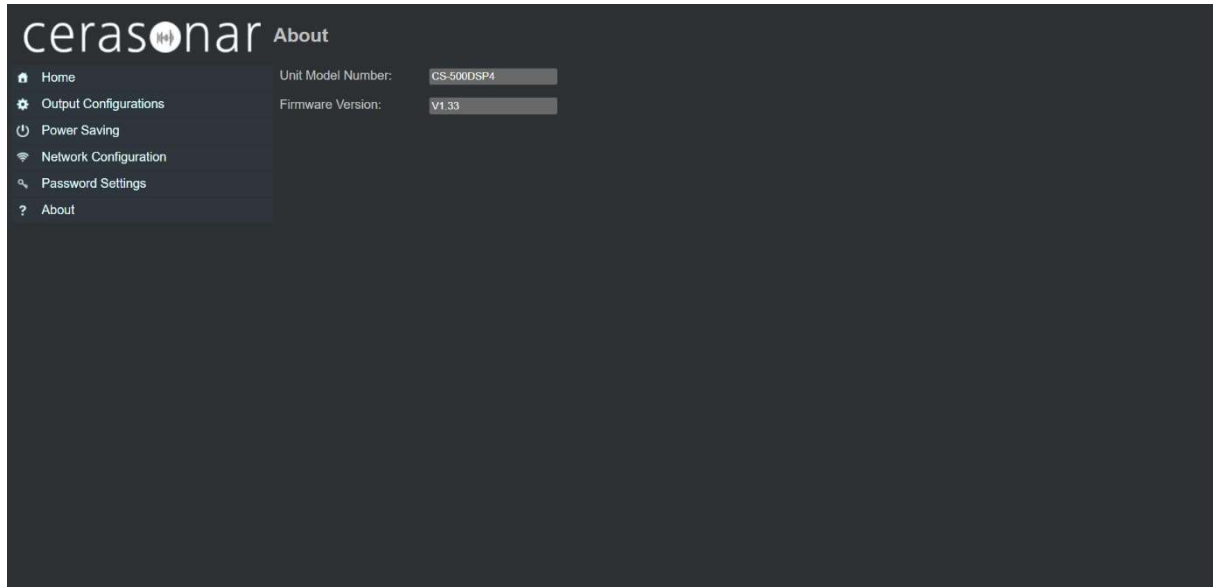
The device can be secured by a password in this section.

**WARNING:** We recommend to keep the password safely!



## ABOUT SECTION

Here the device name and the software version can be checked.



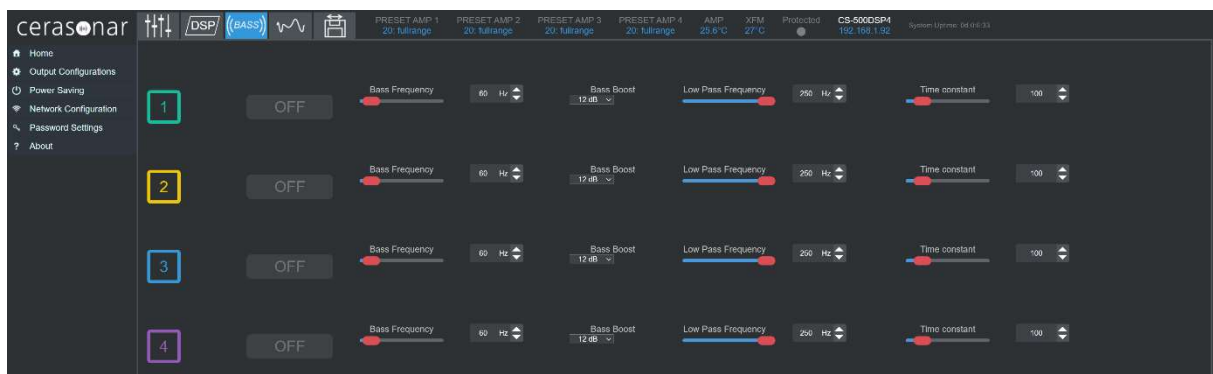
## FACTORY RESET

To perform a factory reset, follow these steps:

1. Remove the audio input adapter(s)
2. Power on the device
3. Use a safety pin to assert the hidden button on the rear panel for less than 2 seconds
4. The device will perform a factory reset and reboot afterwards

## DYNAMIC BASS BOOST

The dynamic bass boost can be used to amplify the low frequencies. This feature may only be used with cerasonar subwoofers and the ultimate series. The function can be activated or deactivated via the "ON" and "OFF" switch.



## Technical Specifications

Amplifier channels:	4 channels
Power Output:	125 watts x4 @1KHz/4ohm 125 watts x4 @1KHz/8ohm 250 watts (bridged) x2 @1KHz/8ohm 250 watts (bridged) x2 @1KHz/70V 250 watts (bridged) x2 @1KHz/100V
Signal-to-Noise Ratio:	≥ 96dB (A-weighted) @1KHz/100V
THD+N:	<1% @1KHz/rated power
Frequency Response:	20Hz to 20KHz ± 2dB
Crossovers:	12dB/oct
Crosstalk:	−80dB (@70V 1KHz Zone 1/Zone 2)
Amplifier gain:	selectable
Analog Inputs:	Sensitivity    Attenuation, 0dBV ~ ∞ Impedance    22K ohms Type    2x Phoenix 5-pin
Outputs:	2x Phoenix 4-pin
Indicators (LEDs):	(Front) Signal, Limit/Protection ,(Back) CLIP
Power amplifier:	class-d amp
DSP:	28-/56-bit, 50 MIPS HPF 8 PEQs per channel 4x4 input matrix mixer Limiter
Control Interface:	10/100M Ethernet
AC input:	115Vac or 230Vac (Auto-switch mode)
Power Supply Topology:	SMPS
Protections:	Over power, Over-current, Over-temperature, Soft-start protections, etc.
Display:	None
AC power requirements:	Idle: 18W~18.5W 1/8 rated power: 92W Full power: 750W
Fuse Rating on back panel:	T5AH/250V
Dimensions:	215(W) x 44(H) x 240(D) (mm)
Weight:	2.0Kg



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