

HYDROGEN SERIES

5-channel class D amplifier
with built-in DSP

GZHA MINI FIVE-DSP

Owner's Manual

(AWV4.1)

Main Features

- High-efficient 5-channel class D amplifier with built-in 8-channel DSP
- 2 ohms stable (channels 1-4)
- 1 ohm stable (subwoofer channel)
- 2x stereo RCA input / 1x stereo RCA output / 4-channel high-level input
- Auto-on function (available for speaker input only)
- Thermal protection / short circuit protection / overload protection
- Digital signal processor (DSP) / 2x Analog Devices SigmaDSP
- Realtime setup of all functions (via PC or APP*)
- Simple handling, one-page graphical user interface (Windows® compatible)
- Parametric equalizer for each channel (8x 10 bands)
- Time alignment (0-8 ms / 0-272 cm / 0-107") for each channel
- Adjustable crossover (HPF / LPF / BPF from 20 Hz to 20 kHz)
- Selectable crossover slope (6 to 24 dB/oct)
- 3 filter characteristics (Butterworth/Bessel/Linkwitz-Riley)
- Selectable phase shift for each channel (0° or 180°)
- Memory for 6 user presets (selectable via remote control, PC or APP*)
- Remote output
- Wired multifunction remote control GZDSP REM 4-8XII-S available separately
- Wireless music streaming via GZDSP BTS 4-8XII-S available separately

GROUND ZERO GZHA MINI FIVE-DSP

Introduction

Thank you for choosing a great GROUND ZERO product! We hope you will enjoy this product from the HYDROGEN series.

This owner's manual contains information you need to use this product. Please read it carefully in order to achieve the best possible result. Your car audio specialist or our customer support will answer further questions about the product and its use.

Amplifiers are an important part of your car audio system. Please keep in mind, however, that they can only achieve their full performance if all other components of the entire system are carefully coordinated with one another. It is therefore recommended consulting a car audio specialist dealer or workshop for the assembly of the system and its installation and sound adjustments.

HYDROGEN series – High-Grade Technology



Products of the GROUND ZERO HYDROGEN series meet the requirements of even the most demanding customers. All models are characterized by an astonishing performance, great sound quality and extremely high sound pressure whenever required. The subwoofers have been developed to handle a huge amount of input power reaching extremely high bass levels to be used successfully even under competition conditions but also for everyday music reproduction. For limited installation space, the HYDROGEN series offers powerful but small and installation-friendly amplifiers for most applications.

Safety instructions

Safety instructions: Keep all parts of the content and the packaging away from children and pets to avoid accidents and the risk of suffocation. Permanently extreme levels of over 85 dB can lead to irreparable damage to the hearing. Music systems with high amplifier output power can reach levels of 130 dB or more. Extreme levels can also hinder the perception of important traffic noises and distract from what is happening on the road. Ground Zero GmbH and its sales partners expressly assume no responsibility for hearing damage, physical damage or any damage to property or consequential damage resulting from improper or careless use or improper installation of its products. In particular, any claims are forfeited through the use under competitive conditions.

Manufacturer's declaration: Herewith Ground Zero GmbH declares that this product complies with the directive 2014/30/EU (EMC) and further declares that this product is in conformity with the rules of the EU directives (including all applicable amendments) 2011/65/EU RoHS2 and 2001/95/EC General Product Safety directive. The full text of the Declaration of Conformity (EU) is available at the following internet address: www.ground-zero-audio.com. Electronic products contain valuable raw materials and must not be disposed of with normal household waste. At the end of its service life, please bring the device to your local recycling facility.

Terms of warranty

The limited warranty for this product is covered by GROUND ZERO's regional distribution partners and their terms and conditions. For further information contact your local retailer or distributor

GROUND ZERO GZHA MINI FIVE-DSP

General mounting instructions

- As a precaution, it is recommended to disconnect the vehicle's battery before mounting the amplifier.
Note: For new vehicles, disconnecting the battery might cause various errors in your vehicle's electric system that can be cleared only by authorized service partners of your vehicle's manufacturer! Please ask your service partner first before disconnecting the battery!
- The power supply wire (+12 V) has to be protected within max. 20 cm / 8" by a main fuse holder with a fuse value matching the recommendation for your amplifier
Note: If there is more than one amplifier connected using this power wire, the main fuse value must be equal to the sum of the recommended fuses of all connected devices. However, make sure the diameter of your power wire will be enough for the required current!
- If necessary, replace a defective fuse by a fuse with identical quality and value
- Never drill holes to the vehicle's gas tank, brake lines, to wirings or any other important vehicle parts!
- Never pass wires over sharp edges or vehicle parts due to avoid any kind of damage
- Keep the wiring away from the antenna and electronic devices contributing to radio reception
- Lay the power supply wiring always separated from speaker wiring to avoid disturbance
- The amplifier contains a temperature protection circuit that turns the device off in case of overheating. After a certain cooling time, it will turn on automatically. To avoid heat build-up, enough air supply for cooling must be provided. Never cover the surface of the amplifier's heatsink entirely
- The amplifier should **NEVER** be mounted onto a vibrating part or surface such as a subwoofer enclosure. This might lead to malfunction due to loosened electrical parts inside the amplifier.
- Some amplifiers offer a high-level input option, however if a pre-amplified output (RCA) is available (at the head unit), it is strongly recommended to make use of them.

Recommended wiring

Speaker wires	min 1.5 mm ² / 2.5 mm ² for subwoofer channel min 13 AWG / 12 AWG for subwoofer channel
Power supply wires	min 35.0 mm ² / 2 AWG
High-level input wires	min 1.00 mm ² / 18 AWG
Remote wire	min 0.75 mm ² / 20 AWG

List of content

- 1 x GZHA MINI FIVE-DSP
- 1 x USB cable (A to B connector)
- 1 x High-level input harness
- 1 x Owner's manual (German/English)
- 1 x Fastening kit (screws and washers)

Available separately

- *GZDSP BTS 4-8XII wireless music streaming and app control interface (USB dongle)
- GZDSP REM 4-8XII(-S) wired remote control

GROUND ZERO GZHA MINI FIVE-DSP

Specifications of the amplifier

Model	GZHA MINI FIVE-DSP
Amplifier type	5-ch class D amplifier with built-in 8-ch DSP
RMS Power @ 4 Ω CEA Standard (CEA-2006-A)	4 x 75 W (1% THD+N)
RMS Power @ 2 Ω CEA Standard (CEA-2006-A)	4 x 125 W (1% THD+N)
RMS Power @ 4/2/1 Ω (CEA-2006-A) Subwoofer channel	190/320/500 W (1% THD+N) 600 W @ 1 Ω (10% THD+N)
Damping factor	> 100
Frequency response	20 Hz – 20 kHz
Input sensitivity (RCA)	300 mV – 1.0 V
Wired multi-function remote control	available separately
Fuse(s)	2x 40A (internal)
Dimensions w x h x l (mm)	135 x 52 x 322
Dimensions w x h x l (inch)	5.32 x 2.05 x 12.68

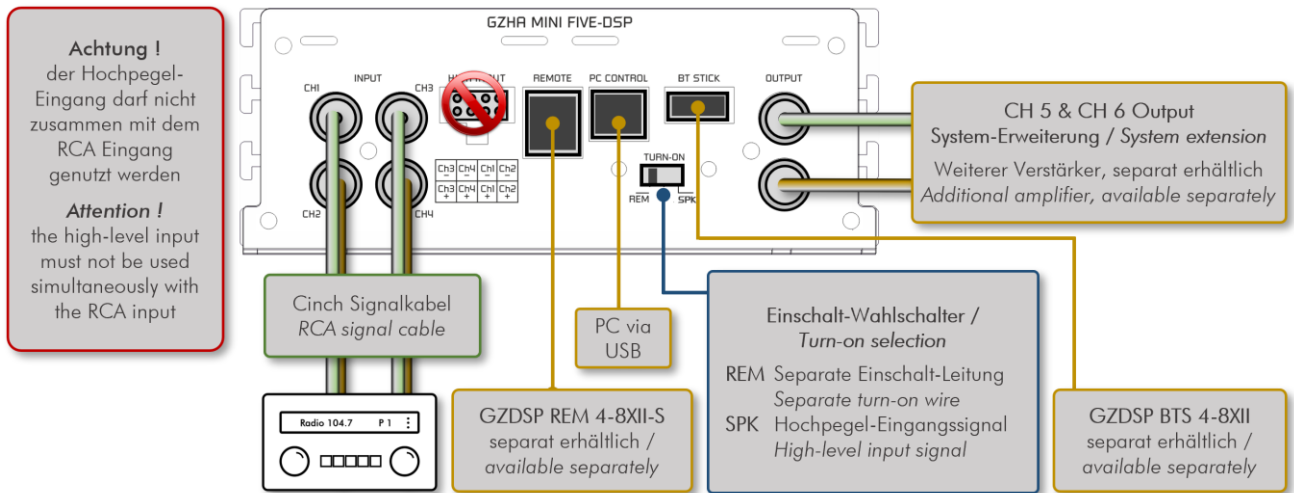
GROUND ZERO GZHA MINI FIVE-DSP

Specifications of the internal DSP

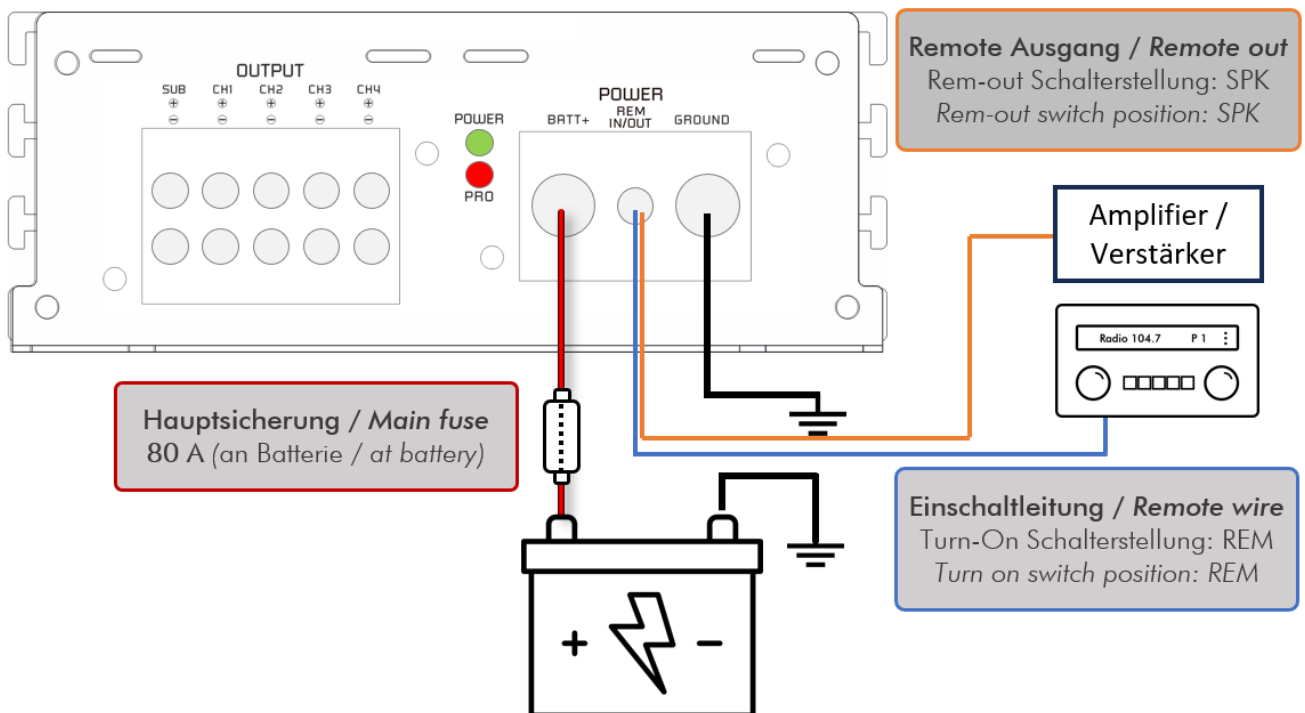
Type	8-channel signal processor (DSP) with 4 input channels Sampling frequency 48 kHz / 56-bit resolution
Frequency range	20 Hz – 20 kHz (-3 dB)
SNR / line input	≥ 115 dB
SNR / high level input	≥ 105 dB
THD / line input	0.002 %
THD / high level input	0.010 %
DSP chipset	2x Analog Devices SigmaDSP
Input impedance	Line input (RCA) ≥ 20 k Ω High-level input 39 Ω
Remote input voltage	> 10 V
Switching voltage / speaker input	> 1.3 V
Turn on delay	8 seconds
Software compatibility	Microsoft Windows™ XP SP3, Vista, 7, 8, 8.1, 10
Preset memory	6 presets (individually assignable)
Gain range	-60 bis +6 dB
Equalizer	8x 10 band EQ (20 Hz – 20 kHz) with adjustable Q
Time delay	0 – 8 ms / 0 – 272 cm / 0 – 107"
Crossover	6 / 12 / 18 / 24 dB/oct. slope with selectable filter characteristic
Phase correction	0° / 180°
Optionally available accessory	GZDSP BTS 4-8XII GZDSP REM 4-8XII-S

GROUND ZERO GZHA MINI FIVE-DSP

Connections



Power supply wiring



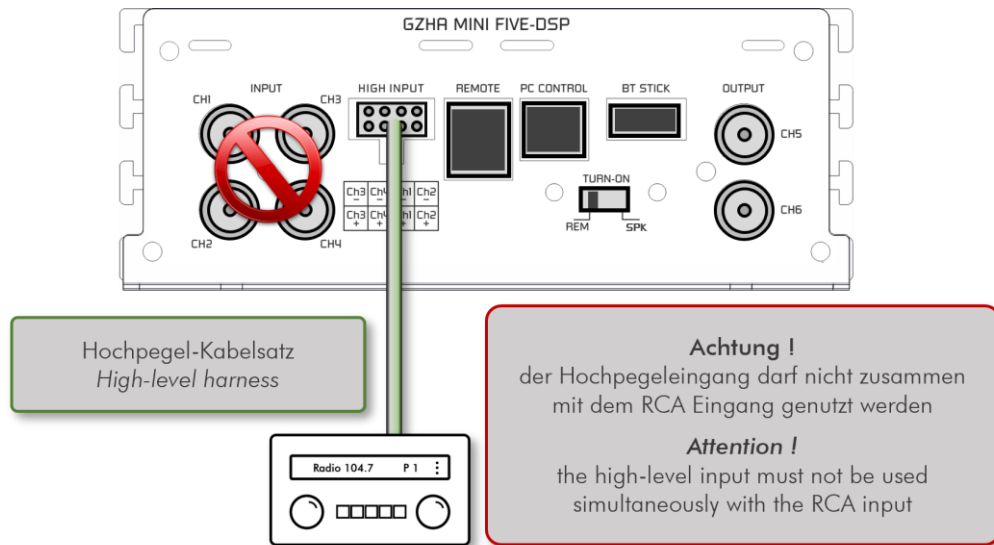
Einschalt-Wahlschalter / Turn-on selection

- REM Separate Einschalt-Leitung / separate turn-on wire
- SPK Hochpegel-Eingangssignal – keine Einschalt-Leitung notwendig / high-level input signal – no remote wire required

*REMOTE OUT can switch an external amplifier on/off when High-level is used as input source (selector switch "SPK").

GROUND ZERO GZHA MINI FIVE-DSP

High-level input

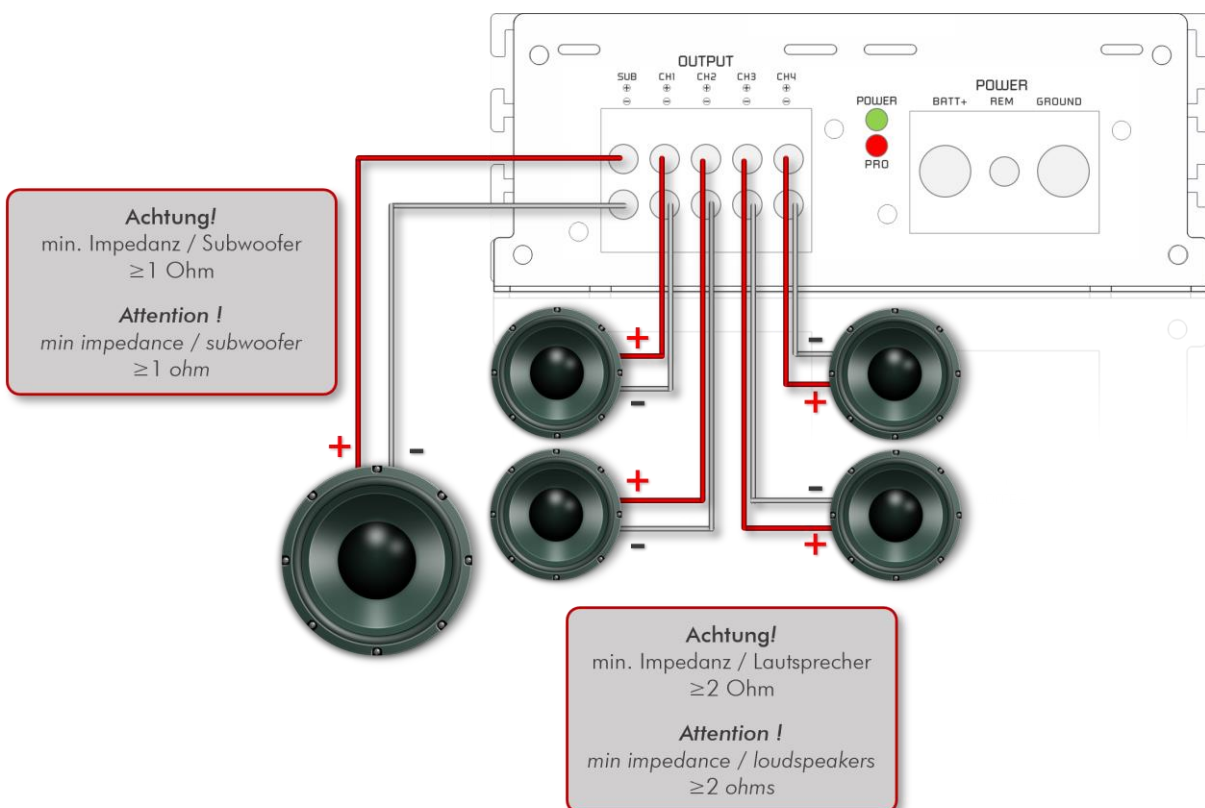


Hochpegel-Kabelsatz / High-level harness

Sollte das verwendete Radio nicht über Vorverstärkerausgänge (Cinch) verfügen (z.B. OEM, also originale Geräte des Fahrzeugherstellers), kann statt des Cinch-Einganges alternativ der Hochpegel-Eingang genutzt werden. Es können hierbei 2 oder 4 Kanäle des Einganges belegt werden. Die Signalverteilung der Kanäle kann anschließend im DSP Setup über die Software vorgenommen werden.

If the radio used doesn't offer RCA pre-outputs (e.g., OEM original devices of vehicle manufacturers), the high-level input can be used instead of the RCA input. On this occasion, 2 or 4 channels of the input harness can be connected. The signal routing of the channels can be set using the DSP software.

Loudspeaker wiring



GROUND ZERO GZHA MINI FIVE-DSP

PC software installation

The software can be downloaded from the support area at our Ground Zero web page: www.ground-zero-audio.com

* compatible operating systems: Microsoft Windows® XP SP3 / Vista / 7 / 8 / 8.1 / 10 / 11

PC requirements: min. 1.5 GHz processor with 1 GB main memory (RAM) and graphic cards with a resolution of 1024x600 pixels or more

Note: We strictly recommend using the latest DSP software available from the web page.

USB connection

USB connection: We don't recommend using any passive extension cable together with the included USB wire, as the proper function can't be ensured.

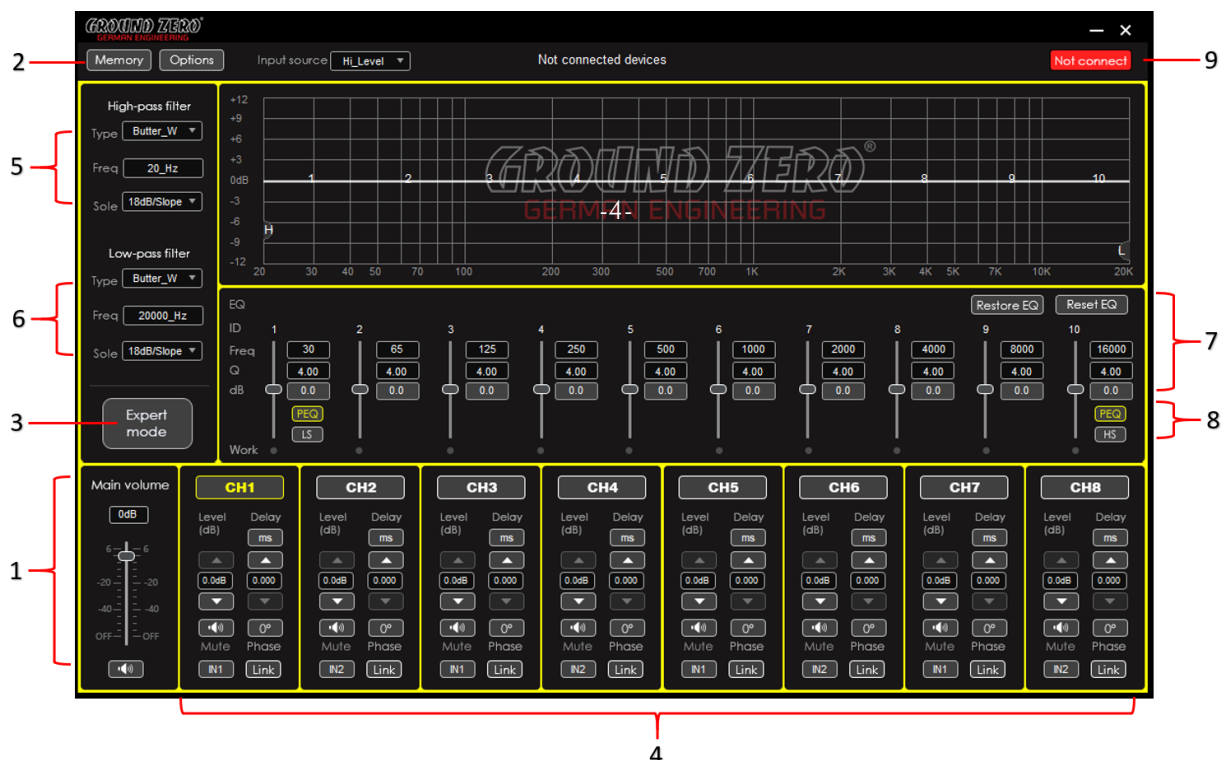
DSP setting: The unit must be connected to a PC with the DSP software installed using the included USB wire. To adjust any setting the unit must be in operation mode. Click the program icon on the desktop or select the program from the software list to start. The starting window appears.

Windows® user account control (UAC): In case the PC operating system is set to restricted security clearance regarding software with unknown source or without digital signature a window will appear each time at the program is starting. Please confirm with >Yes< (language depends on your local setting) to run the program

USB port

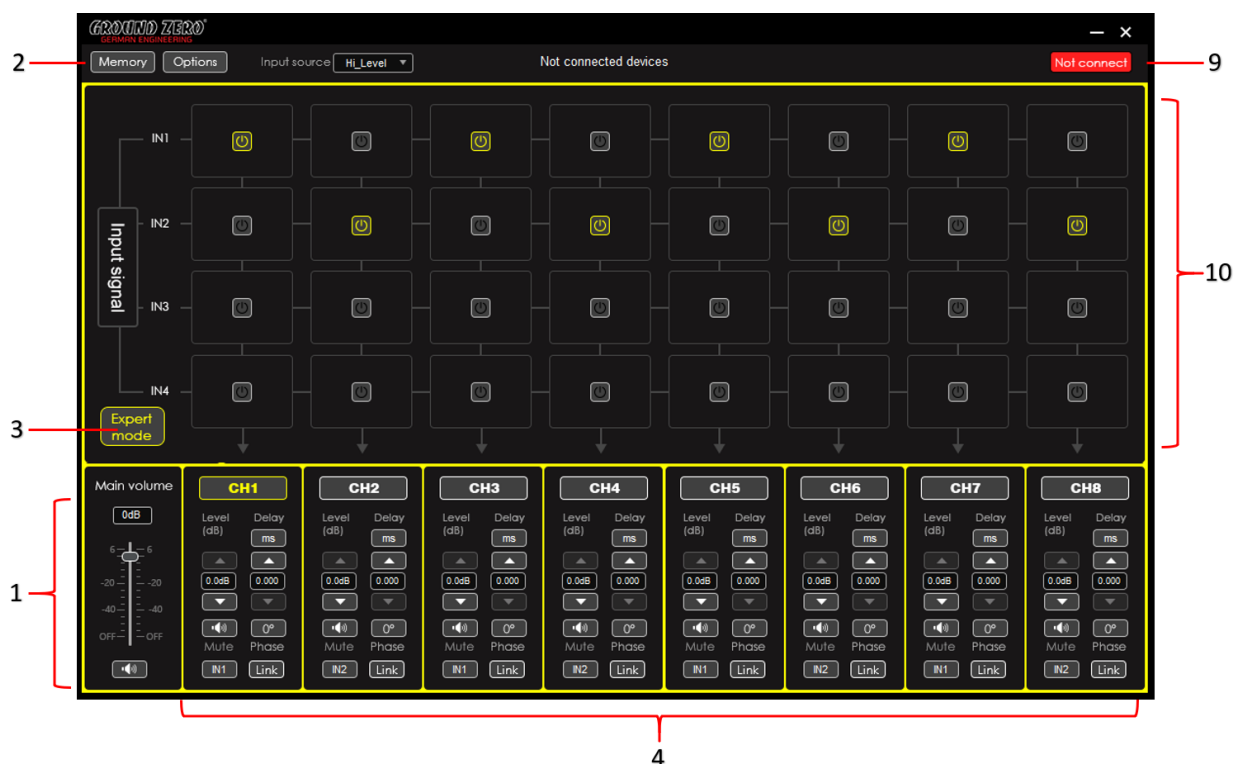
In order to use the software, a communication to the PC must be established. Therefore, an unused USB port is required. During the connection of the USB cable the system will assign a USB port, automatically.

Graphical user interface (GUI)



GROUND ZERO GZHA MINI FIVE-DSP

Graphical user interface (GUI)

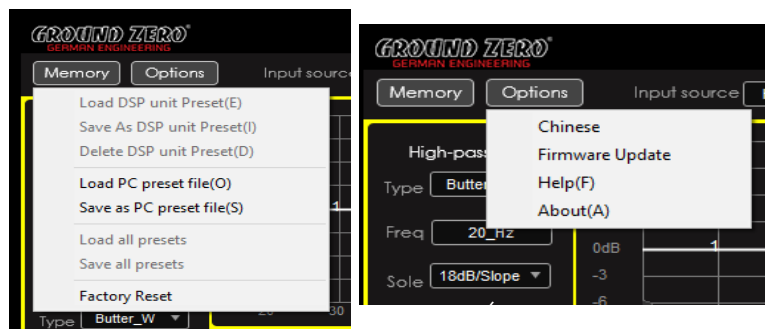


1	Main level adjustment	Setting the main level (input sensitivity) in between the range of -60 up to +6 dB (the adjustment is equal to the remote control setting between 0 and 66). The MUTE button deactivates the output
2	Memory / Options dropdown menu	Tap the button to open the dropdown menu. Further information about the dropdown menu is to be found at the section below
3	Expert mode	Switch to the channel matrix. Further information about the dropdown menu can be found below (at the Memory / Options topic)
4	Channel settings	<p>Channel: Select the required channel tapping the according button</p> <p>Level: Use the up/down buttons to adjust the output level of the channel</p> <p>Mute: Tap the button to deactivate the selected channel</p> <p>Input: The button is indicating the selected input channel. Tap repeatedly to select a channel</p> <p>Delay: The button indicates the selected unit of the time delay. Tap repeatedly to select a unit.</p> <p>Use the up/down buttons to adjust the time delay. The value can be entered to the display field directly, as well.</p> <p>Phase: Each tap inverts the phase (0°/180°)</p> <p>Link: Tap the button to link each pair of channels (e.g. 1 with 2, 3 with 4, etc.) to adjust both channels simultaneously</p> <p>Note: At factory setting channels 7 and 8 are linked for the subwoofer out</p>
5	High pass filter settings	<p>Type: Select the filter characteristic from the dropdown menu</p> <p>Freq: The required value can be entered to the display directly or selected using the scroll wheel of the PC mouse. The frequency chart shows the adjustments graphically (H=high pass)</p> <p>Slope: Select crossover slope by dropdown menu or deactivate the filter</p> <p>Note: Adjusting filters using the PC mouse at the frequency chart, directly</p>

GROUND ZERO GZHA MINI FIVE-DSP

6	Low pass filter settings	<p>Type: Select the filter characteristic from the dropdown menu</p> <p>Freq: The required value can be entered to the display directly or selected using the scroll wheel of the PC mouse. The frequency chart shows the adjustments graphically (L=low pass)</p> <p>Slope: Select crossover slope by dropdown menu or deactivate the filter</p> <p>Note: Adjust filters using the PC mouse at the frequency chart, directly</p>
7	Equalizer settings	<p>As soon as the equalizer setting is changed from default, the following button appears</p> <p>Bypass EQ: Resets the adjustments temporarily to default setting. At bypass position:</p> <p>Restore EQ: Restores the previous setting of the equalizer</p> <p>Reset EQ: Resets the equalizer setting to default</p> <p>Freq / Q / dB: Enter the required value to the display field directly or select the value using the scroll wheel of the PC mouse. The frequency chart shows the adjustments graphically</p> <p>Note: Settings can be changed at the chart directly using the PC mouse</p>
8	PEQ or LS/HS selection	Selecting one of the available modes for the first (1) and last (10) band, the default setting (PEQ) can be set to a variable shelf filter (LS/HS) instead with a slope of 6 or 12 dB/octave
9	Connect / Disconnect button	Tap the button to establish or separate the connection between the DSP unit and the PC via USB cable. The connection status is displayed at the top of the window
10	Input signal	Using the matrix, one or more input channels can be assigned for each output channel. If more than one channel is selected, the MIX-icon will be visible at the button

Memory / Options dropdown menu



Language	Select the GUI language
Update	To select the update file
Help	Webpage browser
About	Software version

Load DSP unit Preset	Loading a setup from the DSP memory
Save as DSP unit Preset	Saving a setup to the DSP memory Preset can be named individually
Delete DSP unit Preset	Deleting a preset from the DSP memory
Load PC preset file	Loading a preset from the PC memory
Save as PC preset file	Saving a setup to the PC memory
Load all presets	Loading all presets (from the PC to the DSP)
Save all presets	Saving all presets (from the DSP to the PC)
Factory Reset	<p>Caution:</p> <p>The unit will run through a number of routines. Some windows will appear and disappear. The process will last for about 15 seconds.</p>

GROUND ZERO GZHA MINI FIVE-DSP

Error diagnosis

Error	Control	Help / Solution
No function	PWR LED on?	<ul style="list-style-type: none"> -check the fusing -check the remote wire -check the +12 Volt connection and wire -check the ground connection and wire
No sound (PWR LED on)	Signal wire no contact or broken	-check the contact or replace the wire
	No audio signal from the head-unit	-check the audio output signal of the head-unit
	Amplifier not switched on	<ul style="list-style-type: none"> -check the remote out of the DSP -check the amplifiers power supply
	Non-operational source selected	-check the setting
	Activated >MUTE< function (User Interface)	-check the setting
	Adjusted level on optional remote control unit too low	-check the setting
Single channels with no function	Signal wire no contact or broken	-check the contact or replace the wire
	No audio signal from the head-unit	-check the audio output signal of the head-unit
	Balance or fader control of the head-unit not in center position	-check the setting of the head-unit
	Wrong setup of input and output mode	-check the setting
	>GAIN< level too low or >Mute< function (user interface) active	-check the setting
Impure sound, incorrect stereo reproduction	Inverted phase of one or more speakers	<ul style="list-style-type: none"> -check the polarity of the speaker connection -check the polarity of the high-level input -check the >PHASE< setting -check the >TIME ALIGNMENT< adjustment
Distorted sound quality	Speaker overload	<ul style="list-style-type: none"> -reduce the volume level -check the high pass filter and slope
	DSP input override (distortion)	<ul style="list-style-type: none"> -select the correct input mode -pay attention to the input sensitivity of the DSP unit
	Head-unit output override (distortion)	<ul style="list-style-type: none"> -reduce the volume level of the head-unit -set the sound controls of the head-unit to center position -deactivate the >Loudness< function of the head-unit
	Amplifier override (clipping)	<ul style="list-style-type: none"> -check the amplifiers input sensitivity -reduce the level
Increased noise level	>GAIN< level too high	-reduce the >GAIN< level
	Head-unit creates noise	<ul style="list-style-type: none"> -select a superior quality head-unit -use the optical output (if available) -let the audio store or manufacturer check the head-unit
Car specific interferences audible through the audio system	Diverse power supplies or ground connection	-the head-unit, the DSP and each amplifier should be wired up to a common ground and +12 Volt connection
	Signal wire no contact or broken	-check the contact or replace the wire
	Head-unit defective	-let the audio store or manufacturer check the head-unit
	Amplifier defective	-let the audio store or manufacturer check the amplifier
	DSP unit or amplifier mounted close to an automotive control unit	-choose another mounting position

GROUND ZERO GZHA MINI FIVE-DSP

Respect the Music



Listening to music can be emotional, impressive, relaxing or enjoyable. At that, it doesn't really matter what kind of music is the personal favorite, whether it's Instrumental, Jazz, Electro, Latin, Classic, Rock or any other music direction. However, audio reproduction quality at each desired volume is elementary. Some music styles require higher levels while others prefer the soft tones

GROUND ZERO considers all the different wishes of customers during the development of new products. Along with this, the target is to create the most realistic sound, to transfer the soul of the music and the intention of the performer. Summarized to one phrase: RESPECT THE MUSIC!



*GROUND ZERO products are engineered in Germany
GROUND ZERO - international sponsor of*



Ground Zero GmbH

Erlenweg 25, 85658 Eggenheim, Germany

Tel. +49 (0)8095/873 830

www.ground-zero-audio.com

