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GROUND ZERO®
GERMAN ENGINEERING

DSP AMPLIFIER

GZDSP 4.80A-PRO

Owner´s manual

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Features

- 4-channel amplifier with integrated 8-channel signal processor (DSP)
- High-efficient 2 Ohm stable class D amplifier
- 5-channel line input (RCA) / 4-channel line output (RCA)
- 6-channel high-level input with smart diagnosis-detection
- Auto-on function / Soft delayed remote turn-on
- AUX input (3.5 mm socket)
- Optical digital input (sampling rate up to 24-bit/192kHz)
- Coaxial digital input (sampling rate up to 24-bit/192kHz)
- Suitable for start-stop equipped vehicles
- 8-channel digital signal processor (DSP) - Cirrus Logic 32-bit/192 kHz single core chipset
- Simple handling user interface (Windows® compatible)
- Realtime setup of all functions (via PC)
- Channel separated parametric equalizer (6x 31 band / 2x 11band)
- Channel separated time alignment (0-15 ms / 0-510 cm)
- Adjustable crossover (HPF / LPF / BPF) in the range of 20 Hz to 20 kHz
- Selectable crossover slope (6 to 48 dB/Oct)
- Selectable phase shift for each channel (0° or 180°)
- Memory for 10 user presets (selectable with optional remote control)
- Optional wireless interface for music streaming available
- LED power and status indicator (protection circuit)
- High temperature / short circuit / overload protection circuit)

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Product description

The GZDSP 4.80A-PRO is a 4-channel amplifier with integrated digital signal processor increasing the sound quality of the vehicle´s audio equipment. Based on the 32-bit DSP processor in combination with a 24-bit AD and DA converter. Due to its audio summing function combining 6 high-level channels and 31-band equalizing on each channel (11-bands on the subwoofer channels), the GZDSP 4.80A-PRO can be integrated into most OEM sound systems even with OEM DSP feature.

Package contents

- 1 x GZDSP 4.80A-PRO amplifier
- 1 x USB cable (5 m length)
- 1 x 4-channel line output harness
- 1 x 6-channel high-level input harness
- 1 x CD-ROM incl. PC software and driver package (for Windows)
- 1 x Owner´s manual (German and English)
- 1 x Fastening Kit

  Optionally available:
- Remote-control unit GZDSP Remote PRO/X with LED display incl. connection wire
- Remote-control unit GZDSP Touch-Remote with color LCD display incl. connection wire
- Interface GZDSP BT-Box with connecting cable (for wireless music streaming)

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General mounting instructions

- As a precaution, it is recommended to disconnect the vehicles 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 a hole to the vehicle´s gas tank or brake lines, to wirings or any other important vehicle parts!
- Never pass wires over sharp edges or vehicle parts due 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.

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GZDSP 4.80A-PRO

Technical Specifications

Model	GZDSP 4.80A-PRO
Type	4-channel amplifier with integrated signal processor (DSP)
Frequency range	20 Hz – 20 KHz (-3 dB)
RMS Power @ 4 Ω CEA Standard CEA-2006-A	4 x 80 W (1% THD+N)
RMS Power @ 2 Ω CEA Standard CEA-2006-A	4 x 130 W (1% THD+N)
Processor type	Cirrus Logic single core 32 bit, 8-channel, 192 kHz
Sensitivity	High level input: 2 – 15 V RMS AUX input: 0.6 – 5 V RMS
Input resistance	>47 kΩ (low level input)
Output	4-channel speaker output 4-channel line output (RCA)
Input	6-channel high level input / 5-channel line input (RCA) AUX input (3.5 mm socket) Digital input: Optical and coaxial input (max. 24bit/192 kHz)
Remote out	max. 130mA
Recommended fuse(s)	2 x 30 A
Dimensions (heatsink only) w x h x l	185 x 39 x 201 mm 7.28″ x 1.54″x 7.91″
Dimensions (whole unit) w x h x l	185 x 42 x 237 mm 7.28″ x 1.77″x 9.33″
Software compatibility	Microsoft Windows™ XP SP3, Vista, 7, 8, 8.1,10
Preset	10 x individually adjustable
Gain range	-40 to +12dB
Equalizer	6 x 31 bands / output A - F (20 – 20000Hz), -18 bis +12dB, Q 0.5 - 9 2 x 11 bands / output G&H (20 – 200Hz), -18 bis +12dB, Q 0.5 - 9
Time alignment	0 – 15 ms / 0 – 502 cm per channel
Active crossover	6 / 12 / 18 / 24 / 30 / 36 / 42 / 48 dB/oct (BPF / LPF / HPF Butterworth) 20 – 20000 Hz
Phase shift	0° / 180° per channel
Optionally available remote control units	GZDSP Remote PRO/X or GZDSP Touch-Remote (main level, subwoofer level, source selection and preset selection)

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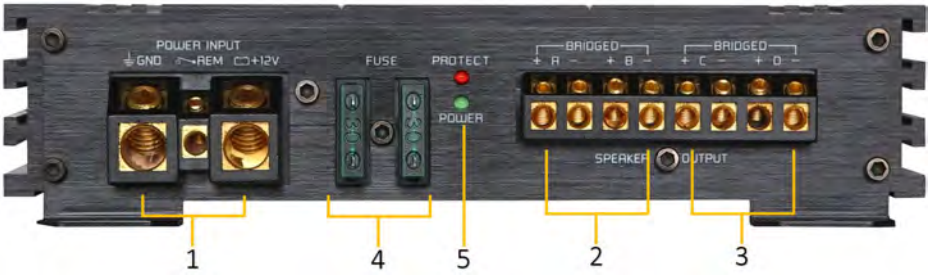
Recommended wiring

	GZDSP 4.80A-PRO
Speaker wire	min 1.5 mm² / 15 AWG
Power supply wire	min 20.0 mm² / 4 AWG
High-level input wire	min 1.00 mm² / 18 AW
Remote wire	min 0.75 mm² / 20 AW

Audio connections (input)

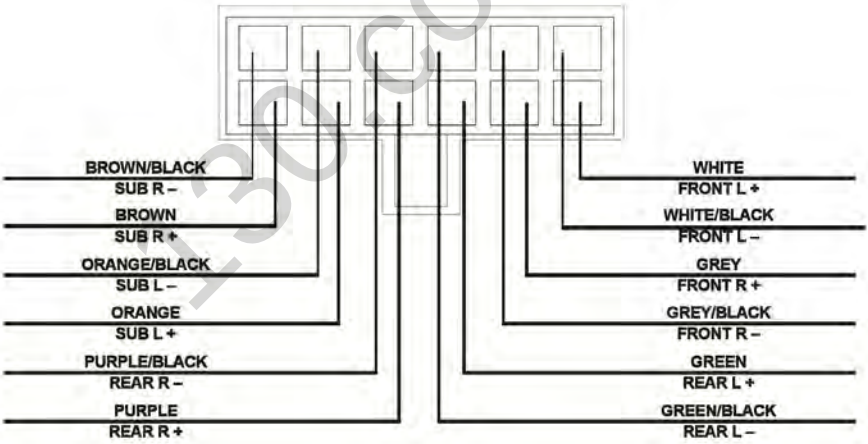
1	Optical Digital Input	To connect a digital audio source. **Attention: If the digital audio source has no level control, we strongly recommend using one of the available remote-control units**
2	Coaxial Digital Input	To connect a digital audio source. **Attention: If the digital audio source has no level control, we strongly recommend using one of the available remote-control units**
3	Line Input Front	To connect the front line output (RCA) of the head-unit (if available)
4	Line Input Rear	To connect the rear line output (RCA) of the head-unit (if available)
5	Line Input Subwoofer	To connect the subwoofer line output (RCA) of the head-unit (if available)
6	AUX input	To connect an additional source unit (3.5 mm stereo jack). **Attention: If the analog audio source has no level control, we strongly recommend using one of the available remote-control units**
7	High-Level Input	To connect the head unit´s speaker wire output if there is no line output (RCA) available. Using the high-level input, the unit will turn on automatically recognizing the DC level. It´s not necessary to connect the 12V remote wire to the power terminal. **Caution: The high-level input and the line input (RCA) cannot be used simultaneously. This may lead to malfunction and cause serious damage to the unit**
8	BT-Box connector	To connect the wireless audio interface **GZDSP BT-Box** or the remote-control unit **GZDSP Touch-Remote** (available optionally)
9	Line Out	To connect the 4-channel line out harness delivering the audio signal of channel E/F and G/H for further amplifiers
10	PC Connect (USB socket)	To adjust the audio setting the unit must be connected to a PC using the included USB cable (compatible Windows PC with installed DSP software from the CD). The USB cable should not be extended to ensure an accurate communication between the DSP unit and the PC. Always close the PC software first before powering off the amplifier to avoid data loss and flash memory errors
11	Auto Turn On	To turn on/off the auto-on function
12	Remote Control	To connect one of the optionally available remote-control units **GZDSP Remote PRO/X** or **GZDSP Touch-Remote**
13	Reset Button	In case the unit does not work properly. Power off the amplifier, push and keep pushed the button while powering on the unit. Release the button after 3 to 4 seconds

Audio connections (output)



1	Power Supply Terminal	GND REM +12V	ground terminal remote wire (to be used as remote output when using the high-level input) positive terminal of the battery
2	Speaker Terminal	To connect the speaker wires of the according channels	
3	Speaker Terminal	To connect the speaker wires of the according channels	
4	Fuse(s)	Defective fuses must be replaced by identical values	
5	Status indicator	POWER PROTECT	green - ok (operation mode) red - error (protection mode)

High-level input harness



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PC software installation

The PC software is compatible* to Windows™ XP (SP3) operating systems (or later). One USB port and 25 MB free memory space is required for the installation. The files are located on the included CD-ROM. If there is no CD drive available, the software can be downloaded from the Ground Zero web page:
www.ground-zero-audio.com

* compatible operating systems: Microsoft Windows® XP SP3 / Vista / 7 / 8 / 8.1 / 10
PC requirements: min. 1.5 GHz processor with 1 GB main memory (RAM) and graphic cards with a resolution of 1024x600 pixels or more

Run the **setup.exe** file. The installation wizard will install the GUI software for the DSP on the PC system. The driver will be installed by clicking INSTALL at the appearing window. Restart the PC after the installation has been finished.

Important note:
We strictly recommend using the latest DSP software available from the web page for GZDSP 4.80A-PRO

Connecting the unit to the PC

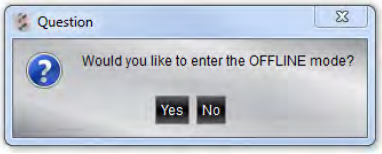
USB connection: We don´t recommend using any passive extension cable together with the included USB wire, as the proper function can´t be ensured.

DSP setting: The GZDSP 4.80A-PRO must be connected to a PC with the DSP software installed using the included USB wire. To adjust the settings, the amplifier must be in operation mode. Double click on the software icon or select from the software list to start. The program 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.

Setup note: The first time the GZDSP 4.80A-PRO is turned on and the software is started there is no audio signal on the output channels (RCA) available unless the channels are activated in the software.

Demo Mode (offline mode): The software can be used in offline mode without having the GZDSP 4.80A-PRO connected to the PC to become familiar with most of the features and to create sample setups. Select >Yes< when the start window appears.



USB connection and COM port / Windows device manager

In order to use the software, the GZDSP 4.80A-PRO must establish a communication to the PC. Therefore, an unused USB port is required. During the connection of the USB cable the system will assign automatically a USB port. To avoid misbehavior during the communication, it´s recommended to select a COM port number between 1 and 9. The assigned COM port number can be checked at the system´s device manager. The GZDSP unit will appear as "USB-SERIAL CH 340" device (at the COM&LPT list). The COM port can be changed at the properties manually if necessary.

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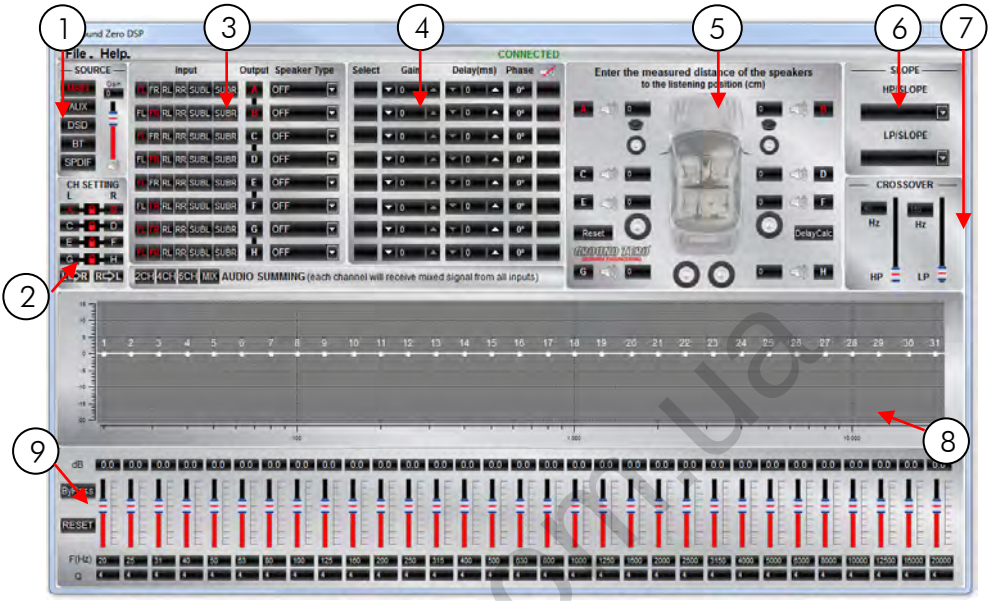
Graphical software user interface (GUI)



1	Source selection	**MAIN** - RCA input or high-level input **AUX** - 3.5 mm socket **DSD** - Coaxial input **BT** - Optionally available interface for wireless music streaming **SPDIF** - Optical input Level adjustment (-40 dB up to +12 dB) **Attention!** Set up the level carefully to avoid any kind of damage to the loudspeakers. Recommended value = 0 dB
2	Channel setting	At factory setting (two channels linked = lock is closed) the adjustments will affect both channels (crossover and equalizer). By clicking the locking symbol, the channels can be split to do adjustments for each channel separately. Using the copy buttons positioned below adjustments can be copied according the arrow symbols shown from one channel to the other.
3	Input routing Channel selection Speaker setting	**Input:** Select the input signal source by clicking the according channel. Red highlighted channels show the selected channels. At the factory setting the inputs 1 and 2 are used for each output channel. **Output:** Click on the channel (or pair of channels) to select for adjustments. **Predefined input:** Clicking one of the input buttons below selects a predefined input setting, automatically. The **MIX** function enables the audio summing of the 6 input channels. **Speaker Type**: Predefined output settings for connected loudspeakers There are several settings available: OFF – channel deactivated Fullrange – HP/LP/BP filters available - select the required filter (point 6) Tweeter – high pass filter 3000 Hz (12 dB/oct.) Midrange – bandpass filter 250 / 3000 Hz (12 dB/oct.) Kickwoofer – bandpass filter 80 / 250 Hz (12 dB/oct.) Subwoofer – bandpass filter 20 / 80 Hz (12 dB/oct.)

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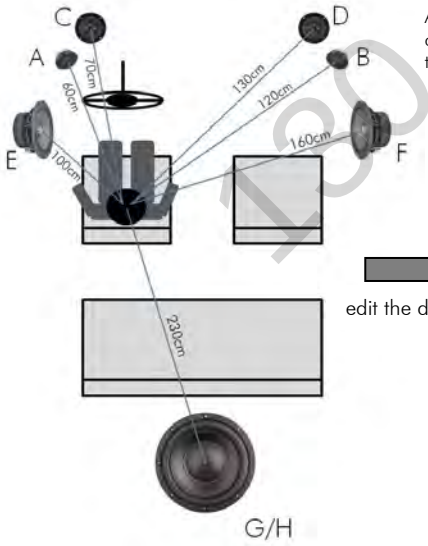
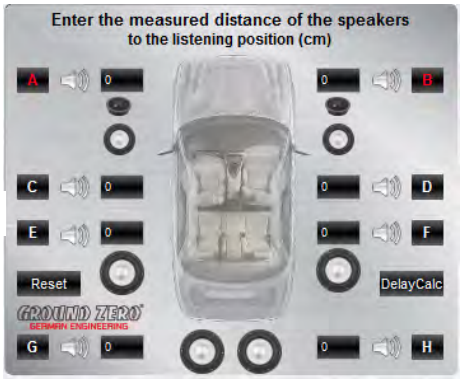
4	Gain setting Time alignment Phase control	**Select:** Click to highlight the channels creating a group for common adjustments. **Gain:** Level adjustment using the arrows up to required value (max=0) **Delay(ms):** Time alignment for each channel using the arrows. The value can be edited directly, as well. It´s recommended editing the real distance from the listening point to the according speaker prior to the adjustment of the **Delay(ms)** in detail **Phase:** Clicking the phase buttons inverts the channel´s phase **Mute:** Highlighting the function button mutes the channel
5	Speaker distance	**Editing the speaker distance for the time alignment:** Prior to the detailed setting of the time alignment (point 4), all measured distances of the connected speakers should be edited. Measure the exact distance between the listening position (head) to the center of the speaker. The according time alignment is continuously calculated automatically. The calculated alignment values can be adjusted in detail (check example below). The >Reset< function deletes the time alignment setting. Further adjustments remain unchanged.
6	Crossover slope	Prior to the filter selection it´s required to set a speaker type (point 3). In order to use both, the high pass and the low pass filter (bandpass configuration) select **Fullrange.** The according slope of the crossover can be set at the dropdown menu between 6 and 48 dB/oct. **Note:** The higher the value of the slope, the steeper the roll-off of the signal (reduction of the level)
7	Crossover setting	Use the sliders to adjust the crossover point between 20 and 20000 Hz. activate the crossover filter, first (point 6). The value can be edited directly, as well or be changed at the frequency chart by keeping the yellow or turquoise button clicked and moved to the desired frequency point at the chart.
8	Frequency chart	The frequency chart shows the estimated response of the 31-band equalizer (point 9) and the crossover adjustments (point 7) of the selected channel (or pair of channels)
9	Equalizer	The level of each equalizer band can be adjusted to the desired dB value using the slider. Additionally, the Q of the filter can be selected. Use the arrow buttons or edit the value directly. By clicking >Bypass< the equalizer will be deactivated without deleting the setting. >Restore< activates the equalizer again. >Reset< deletes the equalizer setting

Time alignment setting (example)



All measured distances (cm) must be added to the graphic. The according alignment values will be continuously calculated and transferred to the **Delay(ms)** list to be adjusted in detail if necessary.

edit the distances



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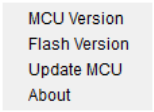
File dropdown menu

Open	To open a setup file that has been saved previously to the PC
Save*	To save the current setup as a file to the PC
Save as*	To save the current setup as a file with a certain file name
Factory Setting	To set the unit to default settings
Remote Setting	To choose the pair of channels effected by the subwoofer level adjustment of the wired remote control
Write to Device*	To write the current setup to the preset memory of the unit. At the following window, the preset number can be selected. The blue frame indicates the currently selected preset number
Read from Device**	To open one of the available presets from the memory of the unit. The preset can be selected from the following window. The blue frame indicates the currently selected preset number
Delete from Device	To delete one of the presets from the memory of the unit. The blue frame indicates the currently selected preset number
Chinese	To switch between Chinese and English language
Exit	Quit the software

***Note:** In order to use the memory function, it is necessary to edit a security code and a phone number, first. Check below (Memory access restriction)
**** Note:** To select one of the memory presets, one of the optionally available remote control units can be used, as well as soon as the USB cable has been disconnected (with GZDSP Remote Pro presets 1 to 9 are available only)

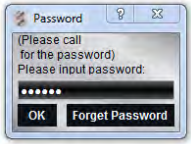
Help dropdown menu



MCU Version	To view the currently installed MCU firmware version
Flash Version	To view the currently installed Flash memory firmware version
Update MCU	To update the MCU. Select the firmware file in the following step
About	To view the current software version

Memory access restriction

The very first time the memory function is used, it is necessary to set a 6-digit security code to save a preset. Additionally, a phone number* shall be entered
(*Note: Instead of a phone number another numeric code can be entered as alternative)



After connecting the PC again later on, the code has to be entered at the software startup enabling to load the preset to the GUI software in order to change the settings.

Connection status

By clicking Connected (PC is currently connected) or Disconnected (PC is currently disconnected) the connection between the PC and the GZDSP 4.80A-PRO will be disconnected or established accordingly. After unintended detaching of the USB wire or turning off the unit you may proceed to change the adjustments this way.

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Error diagnosis

Error	Control	Help / Solution
No function	PWR LED on?	-check the fusing -check the remote wire (AUX mode only) -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
	non operational further amplifier	-check the remote OUT wire if used -check the further amplifier´s power supply
	non operational source selected	-check the selected source
	MUTE function activated (software)	-check the setting in the software
	adjusted level on optional remote control unit is too low	-check the setting at the remote control
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 (software) activated	-check the setting
Impure sound, incorrect stereo reproduction	inverted phase of one or more speakers	-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	-reduce the volume level -check the high pass filter and slope
	DSP input override (distortion)	-select the correct input mode -pay attention to the input sensitivity of the unit
	head-unit output override (distortion)	-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)	-max output power of the GZDSP 4.80A-PRO exceeded. -reduce the level to avoid damage to the amplifier or speakers
Increased noise level	GAIN level is too high	-reduce the GAIN level (software)
	head-unit creates noise	-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, GZDSP 4.80A-PRO and each further amplifier should be wired up to a common ground as well as +12 Volt connection
	signal wire no contact or broken	-check the contact or replace the wire
	defective head unit	-let the audio store or manufacturer check the head-unit
	defective amplifier	-let the audio store or manufacturer check the amplifier
	GZDSP 4.80A-PRO or futher amplifier mounted close to an automotive control unit	-choose another mounting position
	analog output of an OEM MOST head-unit connected	-connect the digital MOST audio signal to the digital input*

*Note:
Use an optional car specific interface to connect the digital MOST audio signal directly to the digital input of the GZDSP 4.80A-PRO

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Terms of warranty

The limited warranty for this product is covered by Ground Zero´s local distribution partners and their terms and conditions. For further information contact your local retailer or distributor.

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