

GROUND ZERO®

GERMAN ENGINEERING

DSP-SERIES AMPLIFIER

MANUAL

GZDSP 4.60ISO

Feature list

- 4-channel ISO Plug & Play amplifier with integrated signal processor (DSP)
- For vehicles with ISO connectors (without active OEM sound system)
- 4-channel high-level input (via ISO harness with auto-on function)
- 4-channel line output (RCA)
- AUX input (RCA)
- TOSLINK input (sampling rate up to 24-bit/96kHz)
- Plug for optional wireless interface (for music streaming)
- 8-channel signal processor (DSP) - Cirrus Logic single core 32-bit/192 kHz
- Realtime setup of all functions (via PC)
- Simple handling one-page graphical user interface (Windows compatible)
- 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)
- Two optional remote control available (one with LED display or one with LCD color display with touch screen to adjust main and subwoofer level, select one of the presets and the input mode)
- Power and status indicator (protection circuit)
- High temperature / short circuit / overload protection circuit)

Package contents

- 1 x GZDSP 4.60ISO amplifier
 - 1 x Universal ISO harness
 - 1 x USB cable (A- to Mini-B connector) 1.5 m / 4.92 ft
 - 1 x 4-channel line output harness
 - 1 x AUX input harness (incl. remote connection)
 - 1 x CD-ROM incl. PC software and driver package (for Windows)
 - Owner's manual (German and English)
- Optionally available:
- Remote control unit **GZDSP Remote** 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)

Table of contents

Important safety notes and installation instructions	4
Audio connections	5
ISO harness connection	5
Note about the vehicle's ISO plug pinout	6
Note about the current requirement	7
PC software installation	8
Connecting the unit with a Windows PC	8-9
USB port selection	9
Wrong COM port error message	10
Software user interface	11
Channel selection	12
Channel matrix	13
Channel configuration (level adjustment and time alignment)	14
Application example (time alignment)	15
Adjustment of the crossover	16
Frequency chart and equalizer	17
File dropdown menu	18
Preset memory saving and loading	18
Remote setting / Application examples of the GZDSP 4.60ISO	19
Technical specifications	20
Error diagnosis	21
Warranty conditions	22

Required parts and tools for the installation

- screwdriver
- electric drill, 3 mm / 0.12" carbide drill bit
- mounting screws

IMPORTANT!

- Disconnect the vehicle battery before starting the installation! (Note the vehicles operating manual)
- Never drill any holes into the fuel tank, brake pipes, wiring or any other sensitive parts of the vehicle!
- Keep the installed wires away from any sharp edges!

WARNING!

High powered audio systems in a vehicle are capable of generating "Live Concert" levels of sound pressure. Continued exposure to excessively high volume sound levels may cause hearing loss or damage. Also, operation of a motor vehicle while listening to audio equipment at high volume levels may impair your ability to hear external sounds such as horns, warning signals or emergency vehicles! This may lead to potential traffic hazards. In the interest of safety, consumer electronics recommends listening at lower volume levels while driving.

Selecting a mounting position

Select a suitable location that is convenient for mounting, is accessible for wiring and has an ample room for air circulation and cooling. The unit must not be covered or mounted close to heat emitting objects. Because of the high operation temperature (up to 80°C), it is important to ensure sufficient distance to any heat-sensitive object. Especially the distance between GZDSP 4.60ISO and any plastic part or electronic component should be at least 3 cm (1.18").

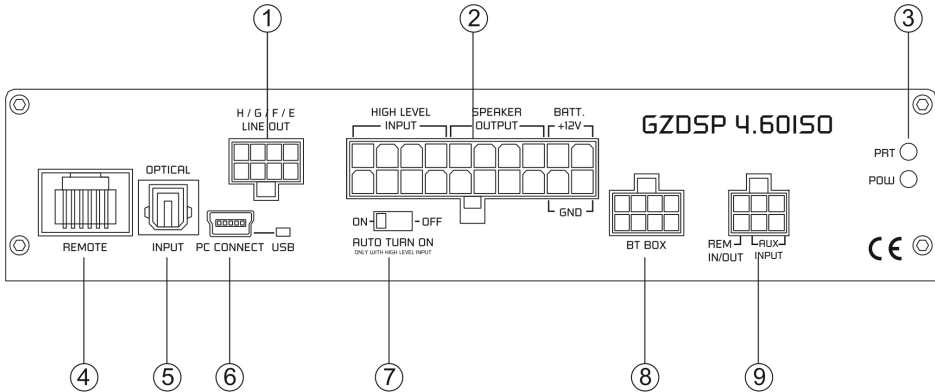
Mounting the Unit

You may use the unit as a template to mark the mounting holes, then remove it and drill the marked holes. Finally mount the unit with the mounting screws.

Caution

Choose a mounting position where all electric wires are protected from being damaged by sharp edges, heat or other conditions. +12 Volt DC electrical connections must be fused on the battery side. Make sure your head-unit and all other devices will remain turned off while connecting parts of the system. If it is necessary to replace any fuse make sure to use only an equivalent one. Using inferior fuses may cause serious damage to your unit, wiring or even your cars electric. Any kind of damage traced back on disregard of these notes will not be covered by the warranty!

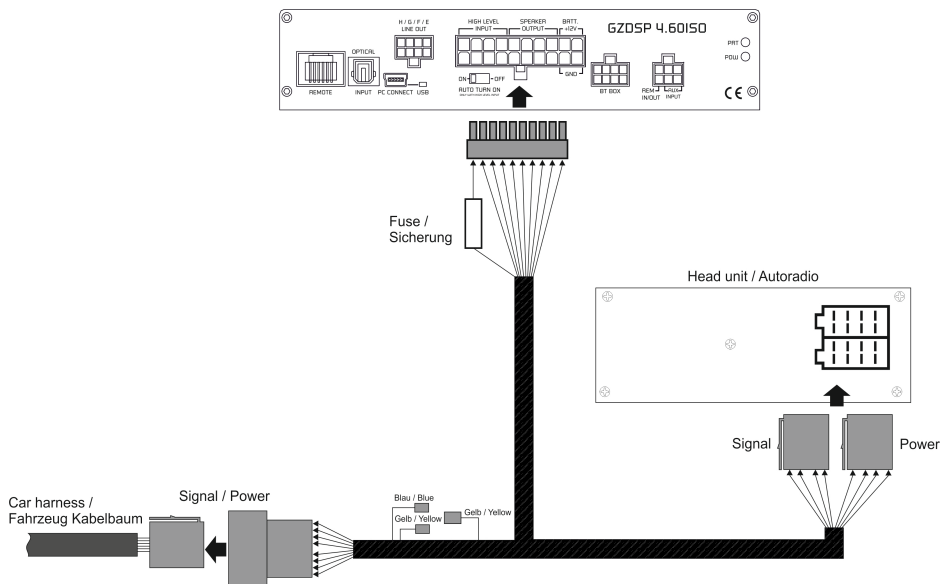
Audio connections



1	LINE OUT socket	To connect the included 4-channel RCA line out harness delivering the audio signal of channel E/F and G/H for further amplifiers. The signal can be set using the PC software
2	MAIN INPUT socket	To connect the included ISO harness for power and high-level input as well as speaker output
3	POW & PRT status indicator	The amplifier is in operation mode as soon as the POW indicator turns on. When the amplifiers protection circuit is activated the PRT indicator turns on (see chapter Error diagnosis)
4	REMOTE socket	To connect one of the optionally available remote-control units GZDSP Remote or GZDSP Touch-Remote
5	OPTICAL INPUT socket (TOSLINK)	To connect a digital audio source using the optical signal (SPDIF / stereo PCM) Attention: If the digital audio source has no level control, we strongly recommend using one of the available remote-control units. Otherwise the audio reproduction will be applied at max level!
6	PC CONNECT (MINI USB socket) and status indicator	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 PC can be disconnected when the adjustment is done. The USB cable should not be extended to ensure an accurate communication between the DSP unit and the PC. The indicator next to the MINI USB socket will turn blue as soon as the connection has been established.
7	AUTO TURN ON switch	Selects the turn-on mode. When ON has been selected the amplifier will turn on automatically as soon as an audio signal is detected at the high-level input. In OFF position, the amplifier has to be turned on using a separate remote wire (via AUX harness).
8	BT BOX socket	To connect the wireless audio interface GZDSP BT-Box or remote control GZDSP Touch-Remote – both of them are available optionally.
9	AUX INPUT socket (REM IN/OUT)	To connect the 2-channel RCA AUX harness for an additional audio source. AUX can be selected as audio source using the PC software or one of the available remote-control units. If the input is limited to the AUX input, the auto-on switch must be in OFF position and a separate remote wire has to be connected to the AUX harness (remote in). The remote out wire can be used to turn on further amplifiers when the DSP unit is in operation. A wire diameter of at least 0.5 mm ² is required. The current of the remote out wire is limited to 130 mA . In case of using several units with a common current exceeding the limitation, an additional relay is required.

ISO harness connection

The GZDSP 4.60ISO will be connected directly to the wiring of the factory or after market head unit (power and speaker cables) by integrating the included ISO harness as shown below. Cars with other than ISO connectors (e.g. Quadlock) require an optional adapter available at your car audio dealer.



ATTENTION!

Please note that the GZDSP 4.60ISO cannot be used in vehicles with a factory active system installed. That might lead to serious defects of the amplifier as well as of the vehicle's electronic system. In case of uncertainty contact your car audio dealer or the car's manufacturer.

Note about the vehicle's ISO plug pinout

Please note, that the pinout of the car specific ISO plug may vary in some cases. Amongst some others the cars of the VAG group (VW, Audi, Seat, Skoda) the pins for constant and accessory power are inverted. This has to be noticed previous to the installation of the GZDSP 4.60ISO. For this reason, the according wires (blue and yellow) can be repositioned at the ISO harness (see above / chapter ISO harness connection).

Note about the current requirement

The GZDSP 4.60ISO amplifier has been developed to be installed using the factory wiring. For some vehicles however, it might be necessary to connect the power wires of the GZDSP 4.60ISO directly to the car's battery and the ground wire to the car's body.

ATTENTION

- *The factory's wiring of the head unit should have a fuse with a value of at least 20A. Otherwise the power supply might be insufficient for an accurate operation of the amplifier. (see fuses / car's owner's manual)*
- *If there are further aftermarket units like a handsfree, GPS system, charging cable or similar consumers connected to the head unit's factory wiring, the current might exceed the fuse value.*
- *It is not possible to install more than one GZDSP 4.60ISO using the factory's head unit wiring. If further amplifiers are to be installed, the power wire has to be connected directly the battery and ground wire directly to the car's body.*
- *For the best result, it is recommended to connect the power wire of the GZDSP 4.60ISO directly to the battery and the ground wire to the car's body. For this, the cable connectors of the harness have to be dispatched and connected to separate wires (not included). Please, contact your car audio installer if necessary.*

PC software installation

In order to install and use the PC software, a Windows™ XP (SP3) operating system (or later) with a USB port is required. The installation will need about 25 MB free memory space. We recommend using a laptop for easier handling. Insert the enclosed CD-ROM into the CD drive of your PC. If there is no CD drive available, the software can be downloaded from the following link: www.ground-zero-audio.com

Run the **setup.exe** file. The installation wizard will install the software for the DSP as usual. We recommend creating a desktop icon. The drivers will be installed automatically during the DSP software installation. The PC requires a restart after the installation of the software

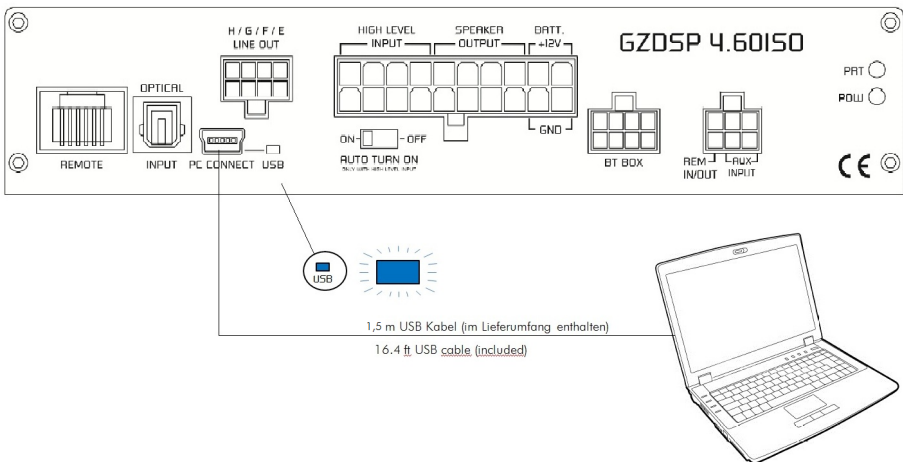
Important note for 64 bit operating systems:

It might be necessary to install the 64 bit driver manually. The driver can be found on the CD-ROM or: www.ground-zero-audio.com

Software update:

It's strongly recommended running always the latest DSP software. The actual version can be downloaded here: www.ground-zero-audio.com

Connecting the DSP to the PC



Note about the USB connection:

The included USB cable should not be extended to avoid any kind of malfunction of the communication between the DSP unit and the PC. The LED next to the USB port on the unit will light up blue as soon as the GZDSP 4.60ISO has established a connection to the PC.

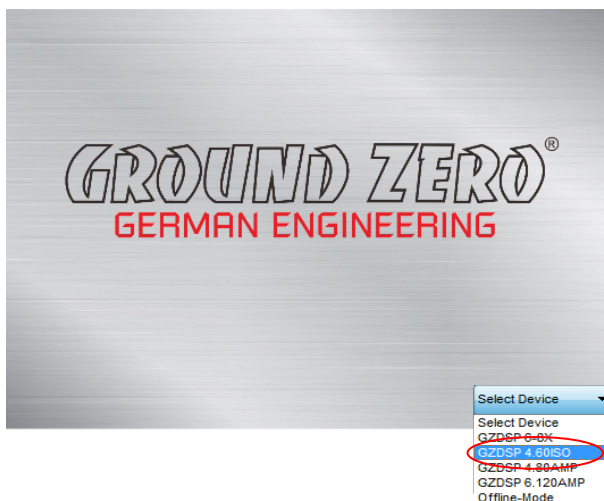
In order to configure the DSP, the GZDSP 4.60ISO has to be connected to the PC with the DSP software installed using the included USB wire.

The head unit and the DSP unit have to be turned on before running the DSP software on the PC.

The DSP software starts by double click on the desktop icon.

The start screen will appear and the GZDSP 4.60ISO should be selected as device (Select Device).

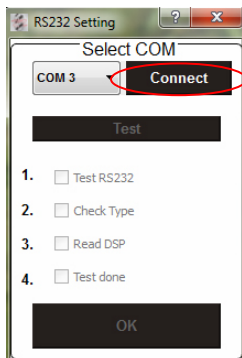
The latest software version can be downloaded from this page:
www.ground-zero-audio.com



Demo Mode (Off-Line Mode):

It's possible to use the software in offline mode without having the GZDSP 4.60ISO connected to the PC to become familiar with most of the features and to create sample setups.

USB port selection



After having the DSP unit selected at the **Select Device** menu, the **RS232 Setting** window will appear.

Usually the correct COM port will be selected automatically. The port number may vary depending on the computer's environment. It can be selected manually using the drop down menu.

Note:

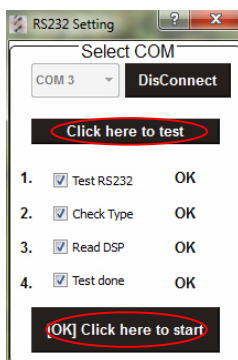
The COM port will be assigned automatically by the Windows operating system. Please note that this should be one of the ports COM1 to COM9. In case of any problem, please follow the instructions on the next page.

A click on the **Connect** button will start the automatic connection process of the GZDSP 4.60ISO to the PC.

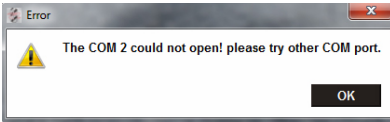
Next click on **Click here to test** connects the unit to the PC.

A number of automatic tests will be initiated now and each of them marked as **OK** after successful examination.

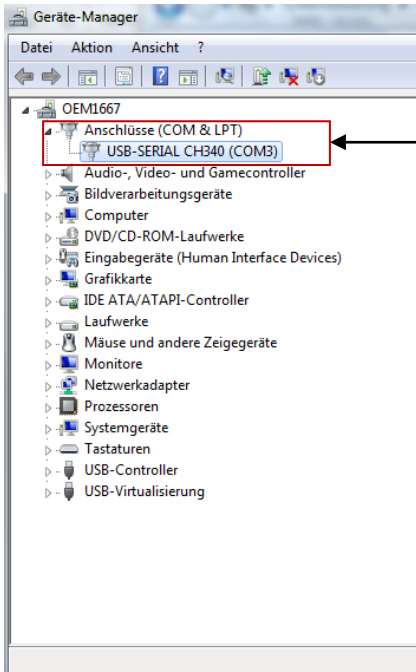
Finally, a click on **[OK] Click here to start** will open the user interface of the DSP software.



Wrong COM-Port error message

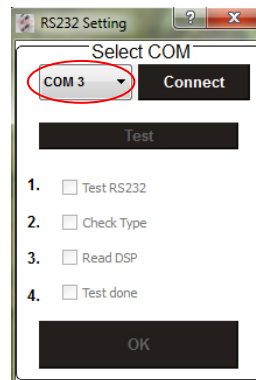


If this message will appear, the operating system assigned the wrong COM port or it was not possible to assign one of the COM1 to COM9 ports due to environmental issues of the PC. The COM port assignment may be checked with the operating system's device manager.



In this case the correct COM port is number 3

Close the pop-up window by clicking **OK**. Now it is possible to select the correct COM port at the Select COM window.

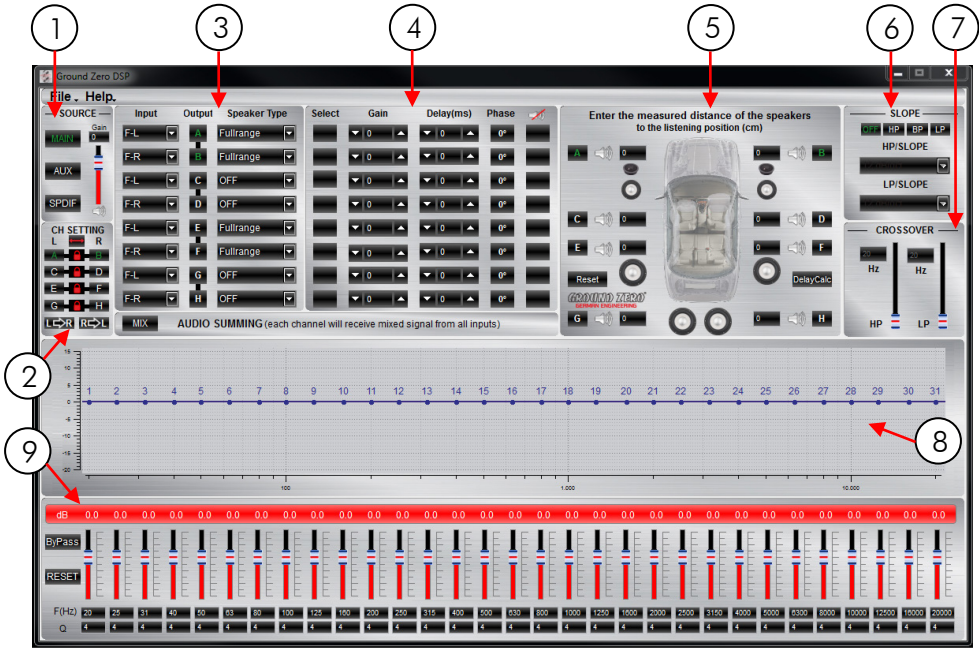


Important note:

If the assigned COM port will be COM10 or even higher one of the unused COM ports 1 to 9 has to be deleted in order to change the previously automatically assigned COM port for the **USB-SERIAL CH340** device.

Subsequently, the COM port can be selected in the **properties** of the **USB-SERIAL CH340** device (right click on the device at the device manager).

Software user interface



1 SOURCE

Input selection



- MAIN** - high-level audio input (via ISO harness)
- AUX** - RCA input (via AUX harness)
- SPDIF** - optical input (TOSLINK socket)

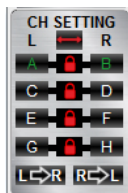
Main volume control


Gain - Main volume (-40dB to +12dB).

Caution: The controls have to be used carefully to avoid damaging the speakers.

② CH SETTING

Channel selection




Clicking the -Icon will link the relevant pair of channels allowing function adjustments simultaneously (Crossover / Slope / Equalizer) for both channels.




Simultaneous adjustment of channel A and B



Independent adjustment of channel A and B

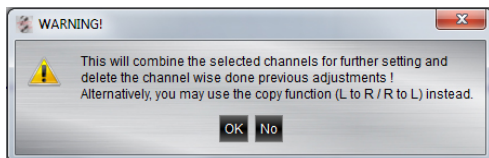
Clicking  will copy the current adjustment of the left channel to the right channel.



Clicking  will copy the current adjustment of the right channel to the left channel.

Clicking the -Icon will invert the left and right inputs.

Warning

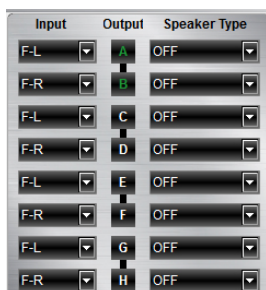
Trying to synchronize (link) two channels, which have already been adjusted separately, will cause a pop-up warning.



Confirming this with OK will reset all channel wise done previous adjustments. This cannot be revoke. Therefore, either a separate adjustment is recommended or alternatively the copy-functions  or  can be used.

3 CHANNEL MATRIX

Configuration of in- and outputs



Input – Assignment of the corresponding input channel to the respective output A – H.

The following input options are available:

- Channel A/B : F-L (Front-L) and F-R (Front-R)
- Channel C/D/E/F : F-L (Front-L) and F-R (Front-R)
or R-L (Rear-L) and R-R (Rear-R)
- Channel G/H: F-L (Front-L) and F-R (Front-R)
or R-L (Rear-L) and R-R (Rear-R)
or F-L+R (sum of Front-L and Front-R)
or R-L+R (sum of Rear-L and Rear-R)
or F+R-L (sum of Front-L and Rear-L)
or F+R-R (sum of Front-R and Rear-R)

The following options will be displayed and might be selected as well. However, these cannot be used with the GZDSP 4.60ISO amplifier.

- SUB-L and SUB-R
- SUB-L+R (sum of SUB-L and SUB-R)

MIX AUDIO SUMMING (each channel will receive mixed signal from all inputs)

Input-MIX – Input summing of filtered signals

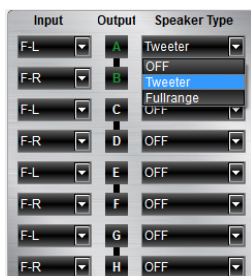
This setup should be chosen if the head unit has filtered (HPF/LPF/BPF) speaker output channels. All 4 high level input channels will be summed to a full-range audio signal.

Outputs A+C+E+G receive a summed audio signal from the input channels FL+RL
Outputs B+D+F+H receive a summed audio signal from the input channels FR+RR

We recommend connecting the input channels as follows
Front left and Front right: Highpass filtered audio signal
Rear left and Rear right: Bandpass filtered audio signal

Output:

Clicking the corresponding channel will allow adjustments of crossover, slope and equalizer functions. Same as CH Setting (2) function.

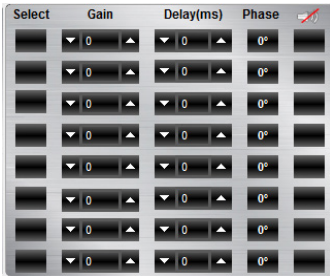


The mentioned information to channel A, B, C and D refer to the speaker output of the GZDSP 4.60ISO. The signal of channel E, F, G and H will be available at the RCA line output (via line out harness).

Speaker Type: Pre-selection of the connected speakers.
3 different options can be chosen.

- OFF – Channel deactivated
- Fullrange – All filters deactivated! (individually selectable)
- Tweeter (A/B) – Highpass filter preset 3000 Hz (12 dB/oct)
- Midrange (C/D) – Bandpass filter preset 250 / 3000 Hz (12 dB/oct)
- Kickwoofer (E/F) – Bandpass filter preset 80 / 250 Hz (12 dB/oct)
- Subwoofer (G/H) – Bandpass filter preset 20 / 80 Hz (12 dB/oct)

4 GAIN & DELAY



Channel configuration (level adjustments and time alignment)

Select:

Marking the channel as **Selected** allows grouping the respective channels together for combined adjustments of **Gain** and **Delay**.

Gain:

To adjust the output level of the respective channel

Delay(ms):

To adjust the time alignment of the respective channel.
Will be displayed in milliseconds.

Warning:

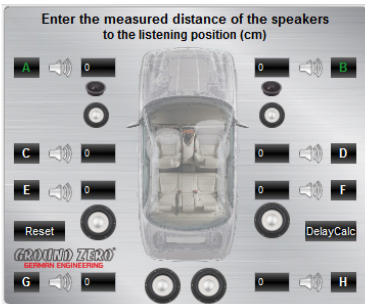
It is recommended to fill in the measured distances of the speakers to the listening position first **(5)** and realize detailed fine-tuning later at the **Delay(ms)**

Phase – 0 / 180° Phase inversion of the respective channel



– Mutes the respective channel

5 SPEAKER DISTANCE

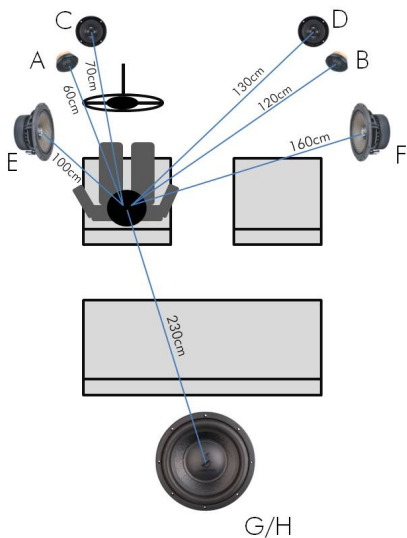


Speaker distance entry

Before realizing the fine-tuning of each speaker's time alignment in window 4 **Delay(ms)**, the measured distances of all connected speakers should be added to the graphic.

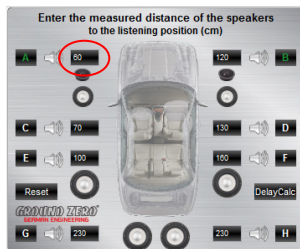
The exact distance between listening position (head) and cone center of each speaker must be measured.

The explanation of a correct implementation on the following page can be used as an application example.



Application example (time alignment)

All measured distances (cm) must be added to the graphic.



DelayCalc

Clicking the button will cause the calculation of the respective time alignment and transfer the data to the **Delay(ms)** list.

Select	Gain	Delay(ms)	Phase
▼	0	5.08	0°
▼	0	3.29	0°
▼	0	4.78	0°
▼	0	2.99	0°
▼	0	3.88	0°
▼	0	2.09	0°
▼	0		0°
▼	0		0°

Further adjustments can be edited to either the time alignment list or to the distance window.

Reset

The Reset button will delete all settings of the time alignment. Other DSP settings remain.

6 SLOPE



Adjustment of the crossover

Important:

Before choosing the filter, a **Speaker Type** must be defined in window 3.

When the setup consists of a front system connected to channel A/B and a rear speaker system connected to channel C/D, the **Fullrange** entry should be selected. According to the speakers and listeners request a high pass filter (HP) can be activated at the **Slope** window.

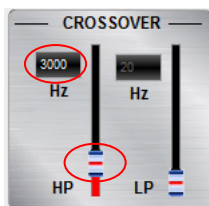
High pass (**HP**) / Bandpass (**BP**) and low pass (**LP**) can be chosen at the **Slope** window for the selected channel(s).

A slope of 6 to 48 dB/oct can be selected at the drop down menu.

Note:

The higher the selected value the steeper the slope starting at the crossover frequency.

7 CROSSOVER



Adjusting the cutoff frequency

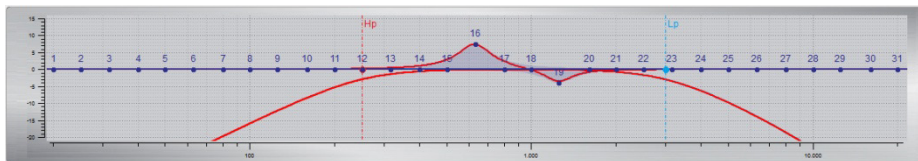
The filters can be adjusted continuously from 20 – 20000 Hz.

The controls can only be used if a filter (Slope/6) has been selected first.

Note: If a filter has been selected, it is possible to adjust the crossover frequency directly with the cursor at the frequency chart (8). Click and hold the red (HPF) or blue (LPF) dot with the cursor and move it to the desired point on the frequency chart.

Hint: Instead of using the crossover control, it is possible to adjust the crossover point by typing the required value directly into the box above and confirm with >ENTER< or by using the up/down cursor buttons.

8 FREQUENCY DIAGRAM

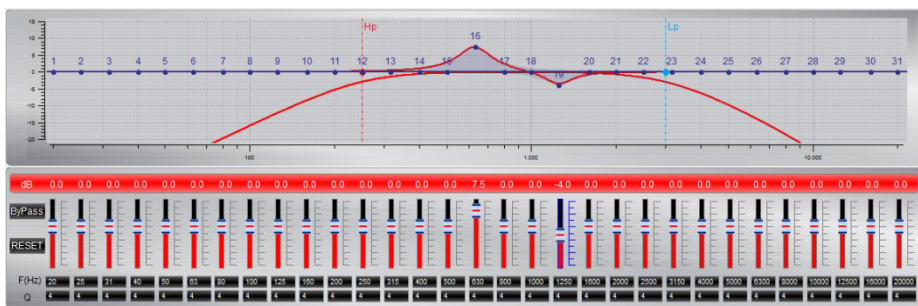


Function of the frequency diagram

The frequency chart displays the adjustments of the 31 band equalizer (9) and the setting of the crossover (7) for every output channel or a pair of output channels.

Furthermore the curves can be adjusted individually using the mouse (drag&drop).

9 EQUALIZER



Adjusting the parametric 31-band equalizer

The output channels A to F can be equalized by adjusting 31 frequency bands (20 - 20000 Hz) using the controls (-18 to +12dB) individually. The subwoofer output channels G/H offer 11 bands (20 - 200 Hz) to adjust the audio signal.

Each frequency can be adjusted individually in 1-Hz steps in the F(Hz) window.

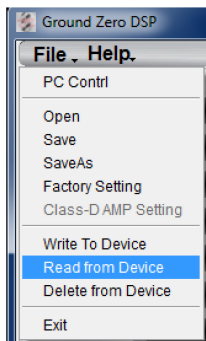
Additionally, it is possible to change the filter Q (bandwidth/slope) by typing the required value directly into the box below each band control (0,5/narrow - 9,0/wide) or by using the up/down cursor buttons.

Furthermore, the curves can be adjusted individually in window 8 using the mouse (drag&drop).

The EQ-function can be deactivated with the **Bypass** button without resetting the EQ-setup.

Using the **RESET** button will cause a full reset of the EQ-setup to factory setting. (Other adjustments are not affected).

FILE dropdown menu

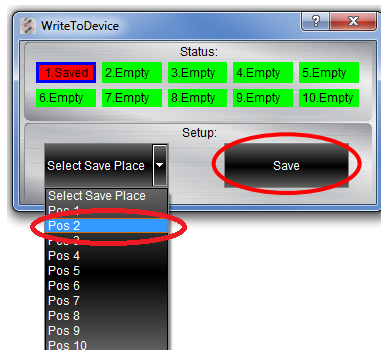
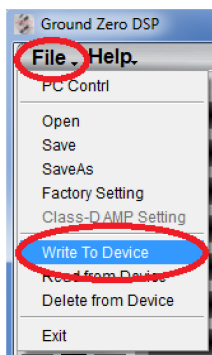


PC Contrl	Opens the „Select COM“ window (page 9)
Open	Opens a setup file that has been saved previously to the PC memory or an external drive
Save	Saves the current setup as a file to the PC with unmodified filename. If no filename has been selected yet, the dialogue will ask for the input.
Save as	Saves a setup file with a certain filename.
Factory setting	Sets the unit to default settings
Class-D AMP Setting	No function
Write to Device*	Saves the current setting to the preset memory of the GZDSP 4.60ISO unit. At the following window, the preset number can be selected.
Read from Device*	Opens one of the available presets from the memory of the GZDSP 4.60ISO. The preset can be selected from the following window. The blue frame indicates the actually selected preset number.
Exit	Closes the DSP software

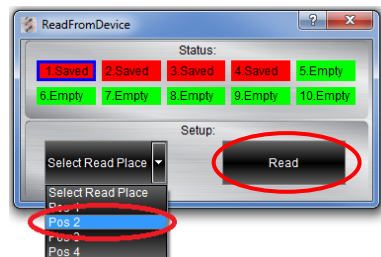
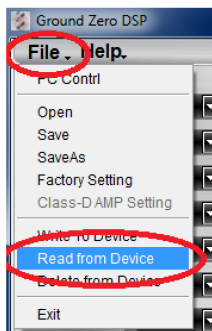
***Important:** The 10 presets can be used if the optional remote control GZDSP Remote or GZDSP Touch-Remote is connected. Without the remote-control unit, it is only possible to use and edit the last preset that has been saved.

Preset memory saving and loading

***Note:** All presets must be covered in numerical order (Pos 1 > Pos 2 > Pos 3 > ...) without skipping a position, otherwise it will not be possible to access all presets with the remote control.

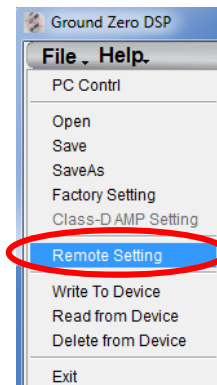


Open the dropdown menu at **Select Save Place** and choose one of the preset positions. Confirm by clicking **Save**



Open the dropdown menu at **Select Read Place** and choose one of the preset positions. Confirm by clicking **Read**

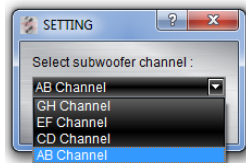
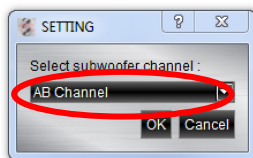
Remote setting / Subwoofer channel selection



One pair of channels can be selected as subwoofer output. These two channels are effected using the subwoofer level control of the optional remote control unit.

The dropdown menu offers the choice of four pairs of channels to select from.

The setting is finished by clicking **OK** as confirmation.



Application examples

GZDSP 4.60ISO offers various system configurations. Here is a description of the two most common applications:

		Front and rear speaker system + subwoofer (e.g. active sub)	2-way front system (active) + + subwoofer (e.g. active sub)
Channel	A/B	Front system at speaker output High pass filter HP: 50 – 80 Hz	Tweeter at speaker output High pass filter HP: 2500 – 4500 Hz
	C/D	Rear system at speaker output High pass filter HP: 50 – 120 Hz	Midwoofer at speaker output Bandpass filter HP: 50 – 80 Hz LP: 2500 – 4500 Hz
	E/F	-	-
	G/H	Subwoofer Bandpass filter HP: 10 – 30 Hz LP: 50 – 80 Hz	Subwoofer Bandpass filter HP: 10 – 30 Hz LP: 50 – 80 Hz

Note: The final crossover points depend on the speaker's capacity that have been installed. The technical specifications of the speakers will supply more information about possible applications and suggested crossover points. Above, these are just noncommittal examples. Ground Zero will not be legally responsible for any kind of damage of speakers or other components caused by wrong settings.

Technical Specifications

Model	GZDSP 4.60ISO
Type	4-channel amplifier with integrated DSP and ISO connection
Frequency range	20 Hz – 20 KHz (-3 dB)
RMS Power @ 4 Ω CEA Standard CEA-2006-A	4 x 40 W (1% THD+N)
RMS Power @ 2 Ω CEA Standard CEA-2006-A	4 x 50 W (1% THD+N)
Max. Power @ 2 Ω CEA Standard CEA-2006-A	4 x 60 W (10% THD+N)
Processor	Cirrus Logic single core 32 bit, 8-channel, 192 kHz
Sensitivity	High level input: 2 – 15 V RMS AUX input (RCA): 0.6 – 5 V RMS
Input resistance	> 47 k Ω (low level input)
Output	4 x high level output (via ISO harness) 4 x line output (RCA)
Input	4 x high level input (via ISO harness) AUX: 2 x RCA input (via AUX harness) Digital input: TOSLINK optical max. 24bit/96 kHz (PCM stereo)
Remote out	max. 130mA
Recommended fuse	20 A
Dimensions Heatsink only W x H x L	185 x 39 x 96 mm 7.28" x 1.54" x 3.78"
Dimensions Whole unit W x H x L	185 x 42 x 132 mm 7.28" x 1.65" x 5.20"
Software compatibility	Microsoft Windows™ XP SP3, Vista, 7, 8, 8.1, 10
Preset	10 x individually adjustable / selectable using the optionally available remote control unit GZDSP Remote or GZDSP Touch-Remote
Gain range	-40 to +12dB
Equalizer	6 x 31 bands at output A - F (20 – 20000Hz), -18 bis +12dB, Q 0.5 - 9 2 x 11 bands at output G&H (20 – 200Hz), -18 bis +12dB, Q 0.5 - 9
Time alignment	0 – 15 ms / 0 – 502 cm per channel
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 or GZDSP Touch-Remote (main level, subwoofer level, source selection and preset selection)

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)	no setup selected	select the setup using the DSP software
	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
Single channels with no function	adjusted level on optional remote control is too low	check the setting at the remote control
	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
Impure sound, incorrect stereo reproduction	GAIN level too low or Mute function (software) activated	check the setting
	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 4.60ISO 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 4.60ISO and each further amplifier should be wired up to a common ground as well as +12 Volt connections
	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 4.60ISO or further 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 4.60ISO

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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