AS-DSP SERIES

DSP 4.6, DSP 8.12 UND X-80.4DSP

MANUAL

THANK YOU

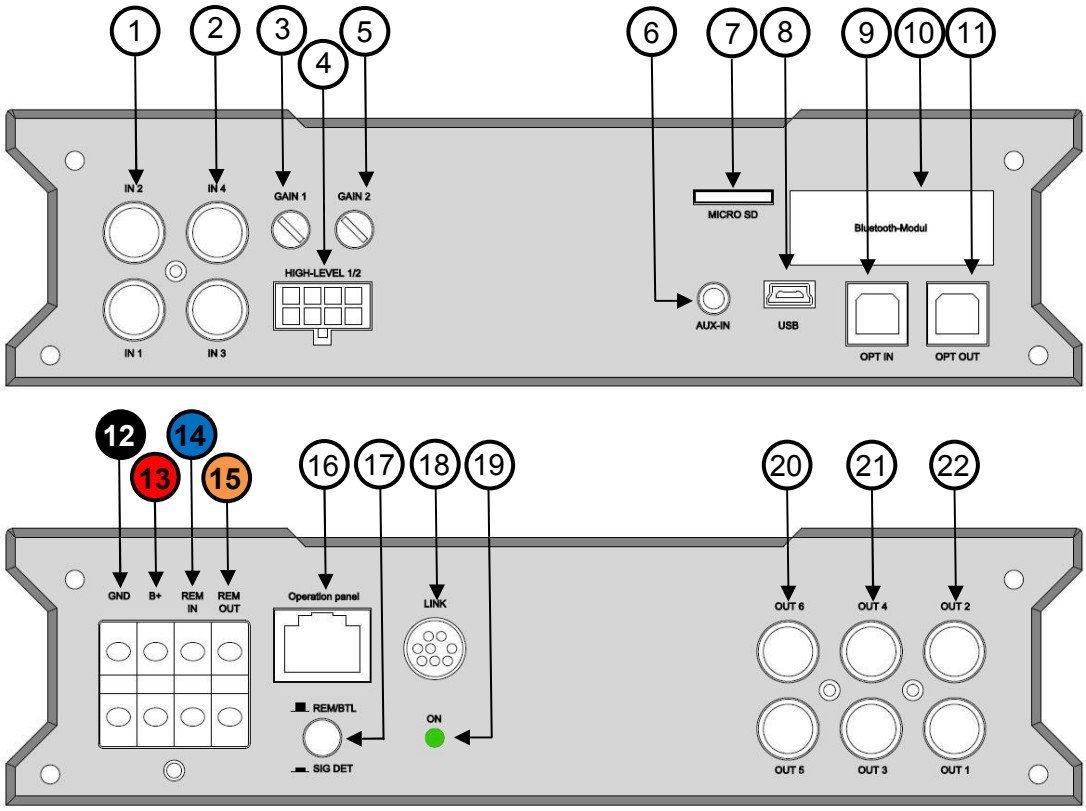
Congratulation on purchasing a high quality AUDIO SYSTEM product.

IMPORTANT: Completely read this operating instruction before installation and use of the device.
CAUTION: Pay attention to advices and instructions of the car manufacturer. Check the polarity when connecting the loudspeakers.
IMPORTANT: You will need your purchase receipt as proof of purchase for all warranty repairs and for insurance purposes. Keep your receipt, owner´s manual and packing materials in a safe location for possible future use.
CAUTION: Use of sound components can impair your ability to hear necessary traffic sounds and may constitute a hazard while driving your automobile. AUDIO SYSTEM Germany accepts no liability for hearing loss, bodily injury or property damage as a result of use or misuse of our products.
We recommend installing the equipment by an authorized service center or dealer. A professional fitting and connection is the requirement for further warranty and perfect sound.
WARNING: This speaker-system is able to produce a high level of loudness. Long-term and excessive exposition can lead to injury of hearing.

WARNING: If the AS-DSP is improperly set, the connected loudspeakers can be destroyed. We recommend to have the AS-DSP set up by a qualified technician.

CAUTION: The AS-DSP is intended for use in motor vehicles whose 12 volt negative pole is connected to ground. Using the AS-DSP on other systems can damage your AS-DSP. In order to install the AS-DSP and connect it to the power supply of your motor vehicle, please be sure to follow the instructions in the installation manual.

CONNECTORS AND CONTROL ELEMENTS 4.6



1	RCA input 1 and 2	12	**Ground** (Minus pol car battery)
2	RCA input 3 and 4	13	**+12 VOLT** (Plus pol car battery)
3	Gain for input 1 and 2	14	**Remote IN**
4	High-level input 1,2,3 and 4	15	**Remote OUT**
5	Gain for input 3 and 4	16	RJ50 connector for remote control
6	AUX input	17	Input selector BTL/SE
7	Micro SD slot	18	8-pol Mini DIN Link connector
8	Mini-USB connector for Computer	19	Operation indicator
9	Optical SPDIF input	20	RCA output 5 and 6
10	Slot for bluetooth module (optional)	21	RCA output 3 and 4
11	Optical SPDIF output	22	RCA output 1 and 2

CONNECTORS AND CONTROL ELEMENTS 4.6

1+2

Low-level RCA preamplifier input IN 1, IN 2, IN 3 and IN 4. For connection with external signal sources such as a headunit or another source with RCA output. Use an RCA cable to connect the output of your signal source, for example the headunit, with the RCA jacks of the AS-DSP.

ATTENTION: The maximum input voltage must not exceed 5 Volt! A signal with higher power leads to distortion and thus to bad sound. Should the source generate a higher power, please use the high-level inputs (4).

3

With this controller, the input sensitivity of both the low-level inputs IN 1 and IN 2 as well as the high-level inputs 4 are adapted to the output power of the signal source. Please handle this setting with great care. The better this matching is, the better the sound quality will be.

4

High-level pre-amplifier input. For connection of externally amplified signal sources, for example the speaker outputs of an OEM headunit. Here, signal sources can be connected which have an output power of between 5 and 20 volts.

5

Using this controller, the input sensitivity of both the low-level inputs IN3 and IN4 as well as the high-level inputs 4 are adapted to the output power of the signal source. Please handle this setting with great care. The better this matching is, the better the sound quality will be.

6

AUX input: For connecting an external source with 3.5mm jack. Here, e.g. external navigation devices, hands-free devices, a hard disk or an MP3 player.

7

This micro SD card slot is used to load a setup by computer. When the AS-DSP is turned on, it ALWAYS first read the setup from the SD card. This is done regardless of the last setup. With the SD card, a setting stored on the computer can be transferred to the AS-DSP without having the computer connected to the AS-DSP.

ATTENTION: This SD card slot is only intended for suitable micro SD cards. The Micro SD card AS-DSP SD is not part of the scope of delivery and can be purchased separately.

8

Through this mini USB port, a computer or laptop can be connected to the AS-DSP. For this purpose, the AS-DSP has a corresponding cable. If the AS-DSP and the computer are connected to each other, the AS-DSP can be softly configured using our software AS-DSP SOFT.

9

Optical SPDIF input for connection to sources with digital output. The sampling rate of this input can be between 12 and 192 kHz. It is not necessary to adjust the sampling rate manually, this is done automatically.

IMPORTANT. To be able to control this digital input in volume, a source with a controllable digital output or one of our optional control parts Z-DSP IR, Z-DSP SW or Z-DSP CONTROL is necessary.

10

Behind the front panel there is a mounting space for the optional Bluetooth module Z-DSP BT. With the Z-DSP BT, music streaming e.g. from the smartphone to the AS-DSP is possible. As a transmission protocol for Bluetooth, the Z-DSP BT offers both A2DP and aptX. In addition, the AS-DSP can be set using the Z-DSP BT and an APP (expected to be available from the end of 2017).

CONNECTORS AND CONTROL ELEMENTS 4.6

11

Optical SPDIF output for connecting sources with digital input. This output is provided, e.g. a second AS-DSP with signals if 2 units AS-DSP are linked together. However, an amplifier with digital input can also be supplied with signals via this connector.

IMPORTANT. This output is not regulated! The signal is routed through 1:1.

12

Ground connector: This connection must be connected on the body of your vehicle. Make sure that this location is blank and not isolated.

13

Plus-connector: Please connect the **+** pole of the vehicle battery (12 volt vehicle voltage).

14

Remote IN: If a remote line is to be used to switch on the AS-DSP, please connect it here.

15

Remote OUT: Remote line for additional power amplifiers.

16

The DSP BOX can be connected to this RJ50 connector. The DSP BOX is available as an option.

At the DSP BOX you can connect either the DSP IR the DSP SW or the DSP CONTROL.

- DSP IR: Is an infrared receiver with hand transmitter.
- DSP SW: Is an interface between the steering wheel remote control of your vehicle and the AS-DSP.
- DSP CONTROL: Is a simple volume control (encoder) that can be installed anywhere in the vehicle.
- DSP-DISPLAY: Is a display the settings can be visualized with. In addition, the operating conditions of the DSP can be checked with the display.

17

Selector switch REM / BTL or SIG DET: The AS-DSP has a automatic signal detection.
If a switching voltage is applied to the remote IN (see point 14) or if the superimposed 6 V voltage is present at the high-low input than switch to REM / BTL. (Released position)

If the AS-DSP is to be activated via signal detection, please **PRESS** the SIG DET (Signal Detection) switch.

18

This connector can be used to connect 2x AS-DSP units. Depending on which AS-DSP are linked together, up to 16x RCA inputs and up to 24x RCA outputs are possible. To link two AS-DSP units an optional link cable called Z-DSP LINK is available from your authorized AUDIO SYSTEM partner.
CAUTION: Even if two AS-DSP units are linked together, the setting has to be made separately for each AS-DSP via the software!

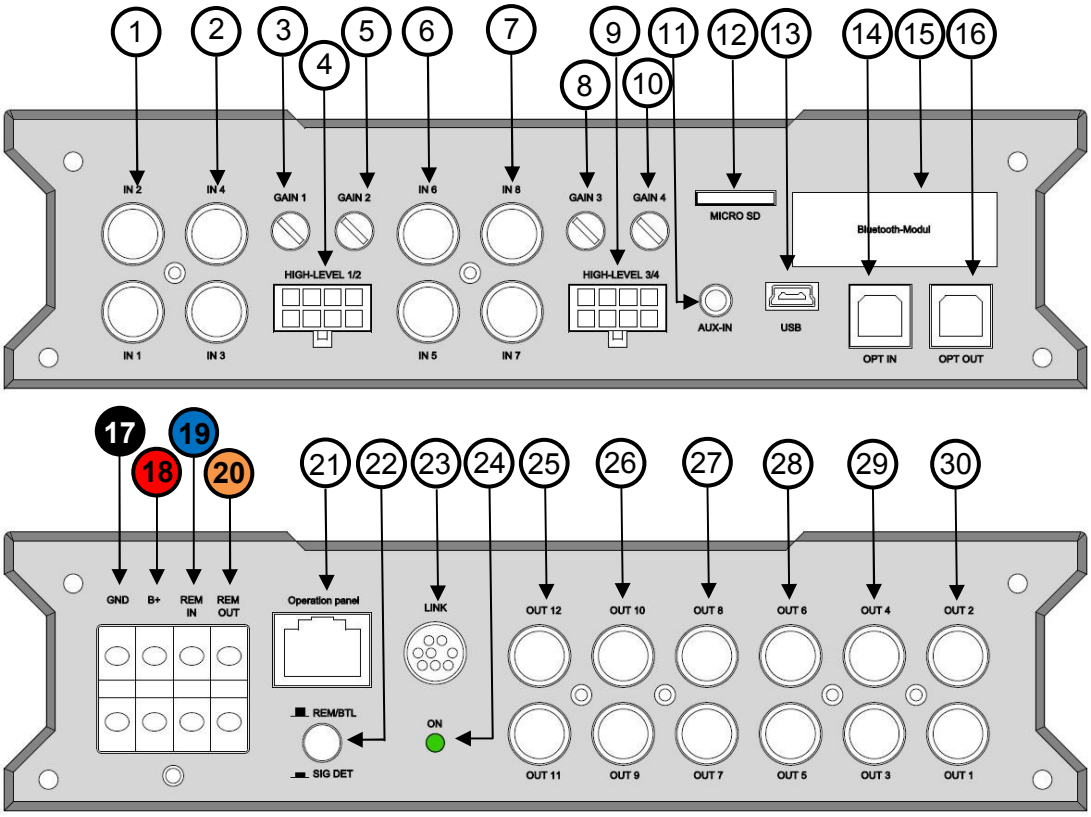
19

LED: This display informs you about the operating state of the AS-DSP. When the AS-DSP is ready for operation, the indicator lights green. In the event of a fault, the indicator lights up red.

20, 21 und 22

Low-level RCA preamp output OUT5 and OUT6 (17), OUT3 and OUT4 (18) as well as OUT2 and OUT1 (19). Use an RCA cable to connect the output of your AS-DSP to the RCA sockets of the power amplifier. The assignment of the inputs to the outputs of your AS-DSP is largely free via the matrix mixer in the software AS-DSP SOFT.

CONNECTORS AND CONTROL ELEMENTS 8.12



1	RCA input 1 and 2
2	RCA input 3 and 4
3	Gain for input 1 and 2
4	High-level input 1,2,3 and 4
5	Gain for input 3 and 4
6	RCA input 5 and 6
7	RCA input 7 and 8
8	Gain for input 5 and 6
9	High-level input 5,6,7 and 8
10	Gain for input Eingang 7 and 8
11	AUX input
12	Micro SD slot
13	Mini-USB connector for Computer
14	Optical SPDIF input
15	Slot for bluetooth module (optional)
16	Optical SPDIF output
17	**Ground** (Minus pol car battery)
18	**+12 VOLT** (Plus pol car battery)
19	**Remote IN**
20	**Remote OUT**
21	RJ50 connector for remote control
22	Input selector BTL/SE
23	8-pol Mini DIN Link connector
24	Operation indicator
25	RCA output 11 and 12
26	RCA output 9 and 10
27	RCA output 7 and 8
28	RCA output 5 and 6
29	RCA output 3 and 4
30	RCA output 1 and 2

ANSCHLUSS- UND BEDIENELEMENTE AS-DSP 8.12

1+2

Low-level RCA preamplifier input IN 1, IN 2, IN 3 and IN 4. For connection with external signal sources such as a headunit or another source with RCA output. Use an RCA cable to connect the output of your signal source, for example the headunit, with the RCA jacks of the AS-DSP.

ATTENTION: The maximum input voltage must not exceed 5 Volt! A signal with higher power leads to distortion and thus to bad sound. Should the source generate a higher power, please use the high-level inputs (4).

3

With this controller, the input sensitivity of both the low-level inputs IN 1 and IN 2 as well as the high-level inputs 4 are adapted to the output power of the signal source. Please handle this setting with great care. The better this matching is, the better the sound quality will be.

4

High-level pre-amplifier input. For connection of externally amplified signal sources, for example the speaker outputs of an OEM headunit. Here, signal sources can be connected which have an output power of between 5 and 20 volts.

5

Using this controller, the input sensitivity of both the low-level inputs IN3 and IN4 as well as the high-level inputs 4 are adapted to the output power of the signal source. Please handle this setting with great care. The better this matching is, the better the sound quality will be.

6+7

Low-level RCA preamplifier input IN 5, IN 6, IN 7 and IN 8. For connection with external signal sources such as a headunit or another source with RCA output. Use an RCA cable to connect the output of your signal source, for example the headunit, with the RCA jacks of the AS-DSP.

ATTENTION: The maximum input voltage must not exceed 5 Volt! A signal with higher power leads to distortion and thus to bad sound. Should the source generate a higher power, please use the high-level inputs (9).

8

With this controller, the input sensitivity of both the low-level inputs IN 5 and IN 6 as well as the high-level inputs 9 are adapted to the output power of the signal source. Please handle this setting with great care. The better this matching is, the better the sound quality will be.

9

High-level pre-amplifier input. For connection of externally amplified signal sources, for example the speaker outputs of an OEM headunit. Here, signal sources can be connected which have an output power of between 5 and 20 volts.

10

Using this controller, the input sensitivity of both the low-level inputs IN7 and IN8 as well as the high-level inputs 9 are adapted to the output power of the signal source. Please handle this setting with great care. The better this matching is, the better the sound quality will be.

11

AUX input: For connecting an external source with 3.5mm jack. Here, e.g. external navigation devices, hands-free devices, a hard disk or an MP3 player.

CONNECTORS AND CONTROL ELEMENTS 8.12

12

This micro SD card slot is used to load a setup by computer. When the AS-DSP is turned on, it ALWAYS first read the setup from the SD card. This is done regardless of the last setup. With the SD card, a setting stored on the computer can be transferred to the AS-DSP without having the computer connected to the AS-DSP.

ATTENTION: This SD card slot is only intended for suitable micro SD cards. The Micro SD card AS-DSP SD is not part of the scope of delivery and can be purchased separately.

13

Through this mini USB port, a computer or laptop can be connected to the AS-DSP. For this purpose, the AS-DSP has a corresponding cable. If the AS-DSP and the computer are connected to each other, the AS-DSP can be softly configured using our software AS-DSP SOFT.

14

Optical SPDIF input for connection to sources with digital output. The sampling rate of this input can be between 12 and 192 kHz. It is not necessary to adjust the sampling rate manually, this is done automatically.

IMPORTANT. To be able to control this digital input in volume, a source with a controllable digital output or one of our optional control parts Z-DSP IR, Z-DSP SW or Z-DSP CONTROL is necessary.

15

Behind the front panel there is a mounting space for the optional Bluetooth module Z-DSP BT. With the Z-DSP BT, music streaming e.g. from the smartphone to the AS-DSP is possible. As a transmission protocol for Bluetooth, the Z-DSP BT offers both A2DP and aptX. In addition, the AS-DSP can be set using the Z-DSP BT and an APP (expected to be available from the end of 2017).

16

Optical SPDIF output for connecting sources with digital input. This output is provided, e.g. a second AS-DSP with signals if 2 units AS-DSP are linked together. However, an amplifier with digital input can also be supplied with signals via this connector.

IMPORTANT. This output is not regulated! The signal is routed through 1:1.

17

Ground connector: This connection must be connected on the body of your vehicle. Make sure that this location is blank and not isolated.

18

Plus-connector: Please connect the **+** pole of the vehicle battery (12 volt vehicle voltage).

19

Remote IN: If a remote line is to be used to switch on the AS-DSP, please connect it here.

20

Remote OUT: Remote line for additional power amplifiers.

21

The DSP BOX can be connected to this RJ50 connector. The DSP BOX is available as an option.

At the DSP BOX you can connect either the DSP IR the DSP SW or the DSP CONTROL.

- DSP IR: Is an infrared receiver with hand transmitter.
- DSP SW: Is an interface between the steering wheel remote control of your vehicle and the AS-DSP.
- DSP CONTROL: Is a simple volume control (encoder) that can be installed anywhere in the vehicle.
- DSP-DISPLAY: Is a display the settings can be visualized with. In addition, the operating conditions of the DSP can be checked with the display.

CONNECTORS AND CONTROL ELEMENTS 8.12

22

Selector switch REM / BTL or SIG DET: The AS-DSP has a automatic signal detection.
If a switching voltage is applied to the remote IN (see point 14) or if the superimposed 6 V voltage is present at the high-low input than switch to REM / BTL. (Released position)

If the AS-DSP is to be activated via signal detection, please **PRESS** the SIG DET (Signal Detection) switch.

23

This connector can be used to connect 2x AS-DSP units. Depending on which AS-DSP are linked together, up to 16x RCA inputs and up to 24x RCA outputs are possible. To link two AS-DSP units an optional link cable called Z-DSP LINK is available from your authorized AUDIO SYSTEM partner.
CAUTION: Even if two AS-DSP units are linked together, the setting has to be made separately for each AS-DSP via the software!

24

LED: This display informs you about the operating state of the AS-DSP. When the AS-DSP is ready for operation, the indicator lights green. In the event of a fault, the indicator lights up red.

25

Low-level RCA preamp output OUT11 and OUT12 . Use an RCA cable to connect the output of your AS-DSP to the RCA sockets of the power amplifier. The assignment of the inputs to the outputs of your AS-DSP is largely free via the matrix mixer in the software AS-DSP SOFT.

26

Low-level RCA preamp output OUT9 and OUT10 . Use an RCA cable to connect the output of your AS-DSP to the RCA sockets of the power amplifier. The assignment of the inputs to the outputs of your AS-DSP is largely free via the matrix mixer in the software AS-DSP SOFT.

27

Low-level RCA preamp output OUT7 and OUT8 . Use an RCA cable to connect the output of your AS-DSP to the RCA sockets of the power amplifier. The assignment of the inputs to the outputs of your AS-DSP is largely free via the matrix mixer in the software AS-DSP SOFT.

28

Low-level RCA preamp output OUT5 and OUT6 . Use an RCA cable to connect the output of your AS-DSP to the RCA sockets of the power amplifier. The assignment of the inputs to the outputs of your AS-DSP is largely free via the matrix mixer in the software AS-DSP SOFT.

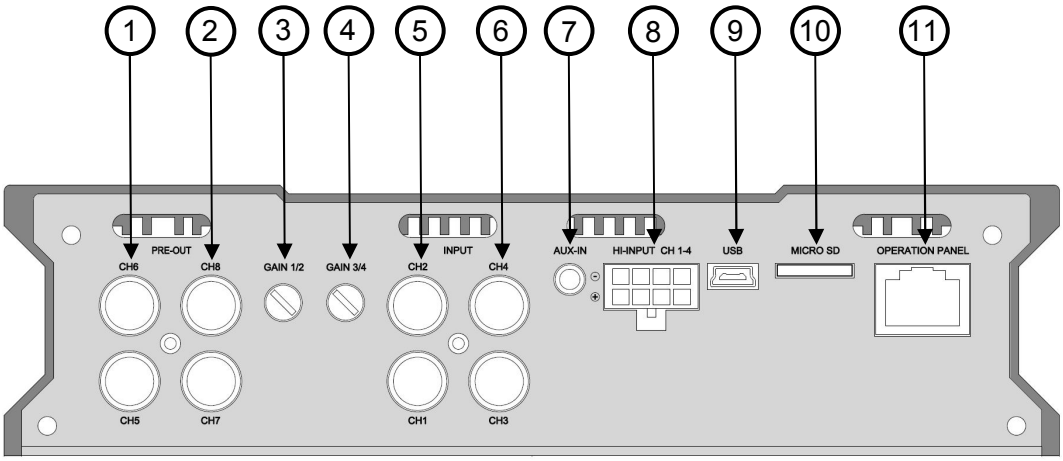
29

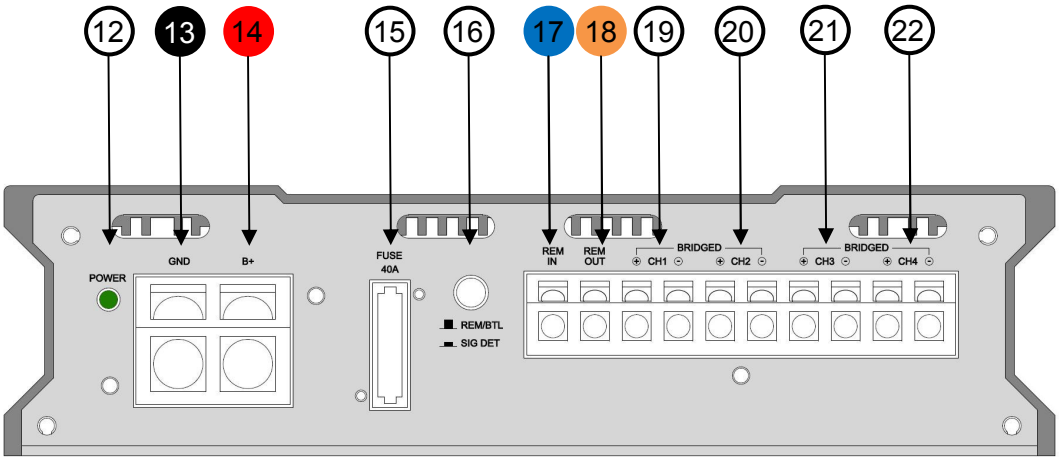
Low-level RCA preamp output OUT3 and OUT4 . Use an RCA cable to connect the output of your AS-DSP to the RCA sockets of the power amplifier. The assignment of the inputs to the outputs of your AS-DSP is largely free via the matrix mixer in the software AS-DSP SOFT.

30

Low-level RCA preamp output OUT1 and OUT2 . Use an RCA cable to connect the output of your AS-DSP to the RCA sockets of the power amplifier. The assignment of the inputs to the outputs of your AS-DSP is largely free via the matrix mixer in the software AS-DSP SOFT.

ANSCHLUSS- UND BEDIENELEMENTE X-80.4 DSP





1	RCA output 5 and 6	12	Indicator light
2	RCA output 7 and 8	13	**Minus** (Minus of car power)
3	Gain-Regler input 1 and 2	14	**+12 VOLT** (Plus of car power)
4	Gain-Regler input 3 and 4	15	Fuse (40 Ampere)
5	RCA input 1 and 2	16	Selector switch REM/BTL and SIG DET
6	RCA input 3 and 4	17	**Remote IN**
7	AUX input	18	**Remote OUT**
8	High level input 1 to 4	19	Powerchannel 1
9	Mini-USB jack to Computer	20	Powerchannel 2
10	Micro SD-slot	21	Powerchannel 3
11	Remote jack	22	Powerchannel 4

CONNECTORS AND CONTROL ELEMENTS X-80.4DSP

1+2

RCA preamp output. For connecting external amplifiers with RCA / Cinch connection. Connect the input of your amplifier to the RCA / RCA sockets of the AS-DSP with an RCA cable of appropriate length. These outputs are fully adjustable via the DSP channels 5, 6, 7 and 8 of the internal DSP.

3

This knob adjusts the input sensitivity of both the low-level inputs CH1 and CH2 as well as the high-level inputs CH1 and CH2 to the output power of the signal source. Please carry out this setting with great care. The better this balance is, the better the sound quality is in the sequence.

4

This knob adjusts the input sensitivity of both the low-level inputs CH3 and CH4 as well as the high-level inputs CH3 and CH4 to the output power of the signal source. Please carry out this setting with great care. The better this balance is, the better the sound quality is in the sequence.

5+6

Low-level RCA preamplifier input CH1, CH2, CH3 and CH4. For connecting external signal sources, such as the car radio or any other source with RCA / Cinch connection. Using an RCA / RCA cable of appropriate length, connect the output of your signal source, e.g. of the car radio, with the RCA / RCA sockets of the X-80.4DSP.

ATTENTION: The maximum input voltage must not exceed 5 volts! A signal with higher power leads to distortion and thus to a bad sound. If the source generates higher power please use the high level inputs 8.

7

AUX input. For connecting an external source with 3.5mm jack. Here, e.g. external navigation devices, hands-free devices, a hard disk or even an MP3 player can be connected.

8

High-level preamp input. For connecting externally amplified signal sources e.g. the speaker outputs of an OEM car radio. Here signal sources can be connected, which have an output power between 5 and 20 volts.

9

This mini USB port connects a computer or laptop to the X-80.4 DSP. For this purpose, the as-dsp includes a corresponding cable. Use only the enclosed cable. When the X-80.4 DSP and the computer are connected together, the X-80.4 DSP can be configured using our AS-DSP SOFT software.

10

This Micro SD card slot is used to load a computer-generated setup. Turning on the X-80.4 DSP, **ALWAYS** read the setup from the SD card. This happens regardless of the last setup used. Using the SD card, a setting stored on the computer can be transferred to the X-80.4 DSP without the need to connect the computer to the X-80.4 DSP.

ATTENTION: This SD card slot is only for use with suitable micro SD cards. The Micro SD card AS-DSP SD is not included and can be purchased separately. Please contact your audio system dealer.

11

The DSP BOX can be connected to this RJ50 connector as an option.

To the interface DSP BOX either DSP IR, DSP SW, DSP-DISPLAY or DSP CONTROL can be connected

- DSP IR: Is an infrared receiver with remote control.
- DSP SW: Is an interface between the steering wheel remote control of your vehicle and the AS-DSP.
- DSP CONTROL: Is a simple volume control (encoder) that can be installed anywhere in the vehicle.
- DSP-DISPLAY: Is a display the settings will be visualized. In addition, operating states of the X-80.4 DSP can be checked with the display.

CONNECTORS AND CONTROL ELEMENTS X-80.4DSP

12

LED: This display informs about the operating status of the X-80.4 DSP. When the X-80.4 DSP is ready for use, the indicator lights green. In case of faults, the indicator lights up red.

13

Ground connection: This connection must be connected to the bodywork of your vehicle. Make sure that this spot is blank, means not isolated.

14

Plus connection: Please connect the + pole of the vehicle battery (12 Volt on-board voltage) here.

15
Fuse (40 amps). In the event of overloading or incorrect polarity, this fuse triggers.

ATTENTION: When replacing the fuse, ALWAYS use a fuse of the same value NEVER use a fuse of higher value. Before you replace the fuse make sure that the reason for the fault is eliminated!

16

Selector switch REM / BTL or SIG DET: The X-80.4 DSP has a build in automatic signal recognition.
If a switching voltage is applied to the remote IN (see point 14) or if the 6-volt superimposed voltage is applied to the high-low input, please switch to REM / BTL.
If the X-80.4 DSP is to be switched on via the signal detection, please press the switch SIG DET (Signal Detection).

17

Remote IN: If a remote line is to be used to switch on the DSP, please connect it here.

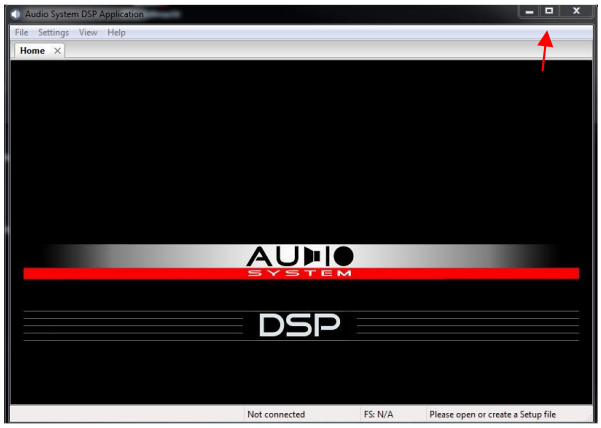
18

Remote OUT: Remote for additional amplifiers.

19, 20, 21 and 22

Amplifier channels CH1, CH2, CH3 and CH4. These channels also run on the DSP but are amplified with 80 watts per channel.

SETTINGS



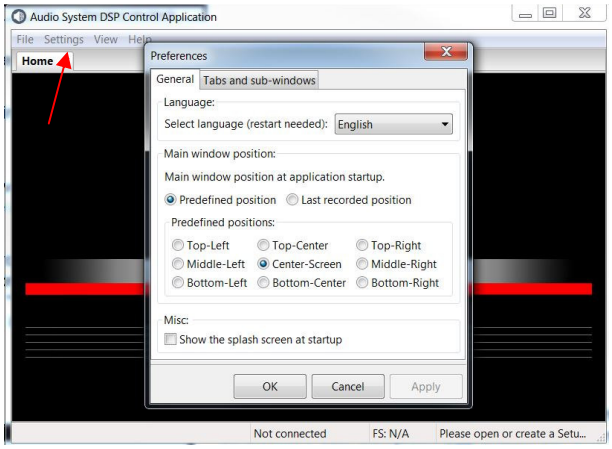
12.01: Principles of application.
The GUI of the application can be adapted to your personal needs and / or preferences.
The software can be operated completely with the keyboard as well as the mouse! Many things can be done using short commands. A list of keyboard shortcuts can be found on the last page of this manual.
With the "Maximize" button (red arrow in the picture on the left), the GUI can always be viewed in full screen mode. This is completely independent of the selected screen resolution.
Further adjustment possibilities are explained in the following.

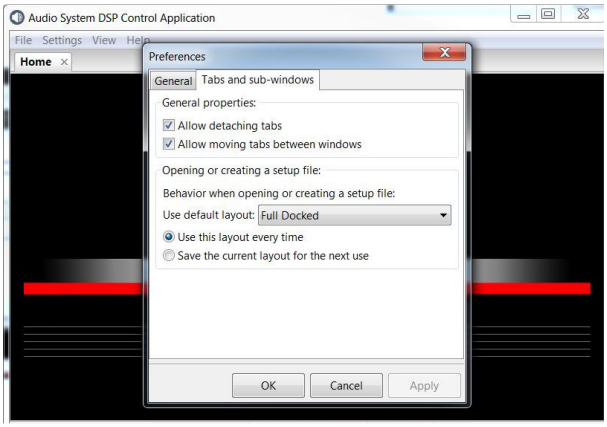
12.02: Clicking on "Settings" opens the adjacent selection box.

General: Here you can define in which language and in which design your application opens.

Select language: There are several languages. If you have changed the language, you must restart the application.

Main windows position: Here you can choose between 2 options. Either you select a “Predefined position” from the displayed list, or choose "Last recorded position". If you have selected "Last recorded position" the application will open the way you have closed it the last time.





12.03: You have the option to work with several individual windows, or to have each tab displayed individually on a screen or on several screens

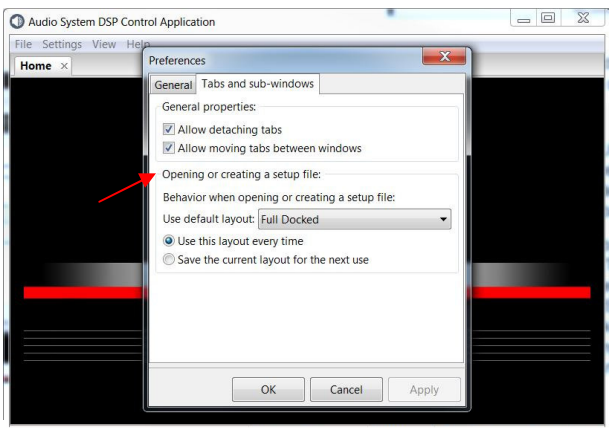
General properties:

- Allow detaching tabs: If this box is checked, the individual tabs can be moved back and forth on the screen. This allows you to customize the application to your liking.
- Allow moving tabs between windows: When this box is ticked, the tabs can be moved back and forth between screens. This is very convenient when you use e.g. a measuring station with several screens. For example, you may Display the "output settings" on one screen, and display the “frequency response” on another screen.

12.04: Opening or creating a setup file:

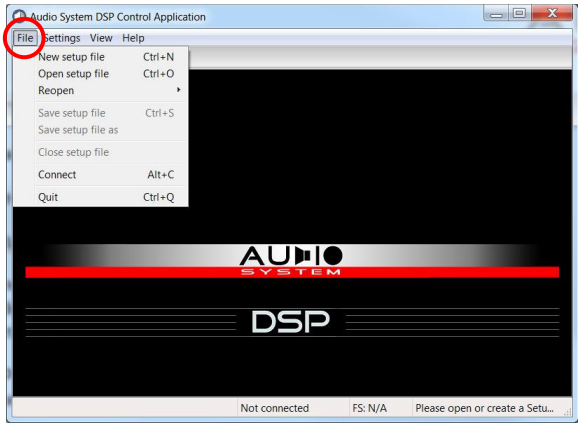
Clicking the "Use default layout" button opens a drop-down menu.

- Minimal: Shows up only the tabs which are necessary for the basic setting.
- • Full docked: Displays ALL tabs as a full image in the main window.
- Full detached: Opens each tab as a single window. You can then either arrange these windows on one screen, or spread them over several screens. Of course, you can also increase and decrease the tabs.



CREATING A NEW SETUP

13.01: Click on “File” opens adjacent selection.



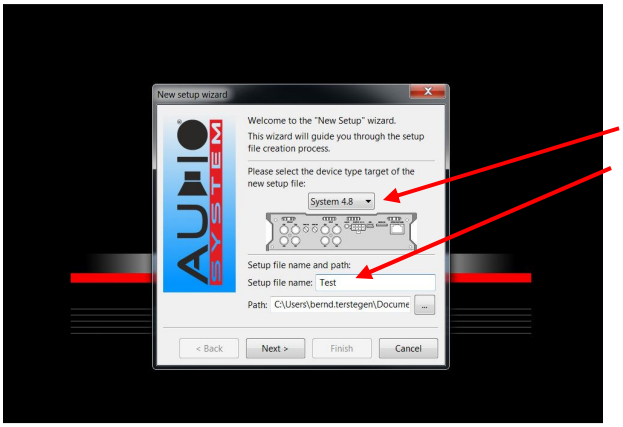
New Setup file: Allows you to create a new setup.

Open Setup file: Opens a saved setup e.g. from a memory stick.

Reopen: The DSP-AMP remembers the last 10 stored setups. Here you can recall and use one of these setups.

Connect: If an DSP-AMP is connected via cable to the computer click on “Connect” to also connected the AS-DSP to the software.

Quit: Exits the application.



13.02: When you create a new setup, you are supported by a wizard.

First, please specify which product you want to set. In this case the X-80.4DSP.

Setup file name: Enter a meaningful name in that field.

Path: Save the setup under the default path, or create a new path of your choice.

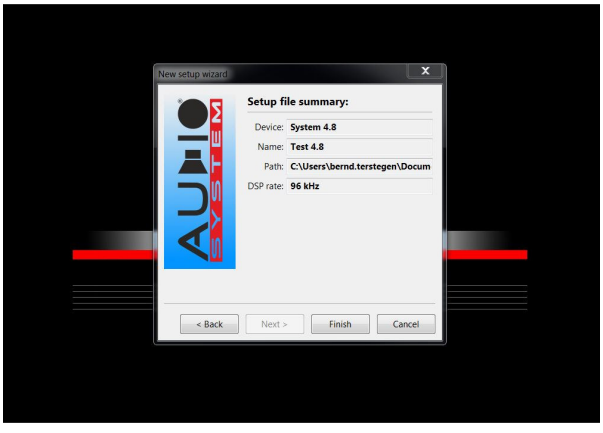
Click "Next" to go to the next window.

13.03: In this window, you can specify the following:

Sampling frequency: You can choose from 2 different sampling frequencies. 48kHz and 96kHz. The higher the sampling frequency, the more computing power is required by the DSP. A higher sampling frequency does **NOT** automatically mean better sound! Please select the sampling frequency according to your requirements. In the illustrated case it`s 96kHz.

In the lower checkbox, you can select whether the channel mapping dialog should be opened at the end of the wizard. See also chapter "Management of outputs"

Click "Next" to go to the next window.



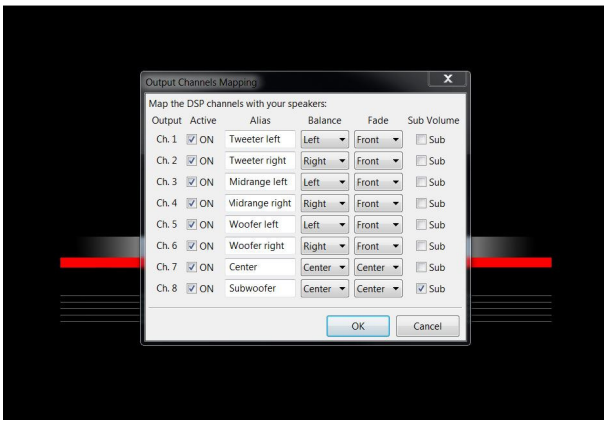
13.04: In the last window of the wizard you will see a summary of your selection.

Back: Select "Back" if you want to change your settings.

Finish: Terminates the setup wizard and saves your selected settings.

Cancel: Exits the setup wizard without saving the previous settings.

INPUT AND OUTPUT MANAGEMENT (The look depends on the selected DSP model)



14.01: In this window, you can specify the following:

Active: Which channel is switched on or off.

Alias: Here you can enter your own names for the output channels.

Balance /Fade: You can adjust the balance and fader via the software monitor and the optional remote controls. For this purpose, you must specify which loudspeaker is to be controlled.

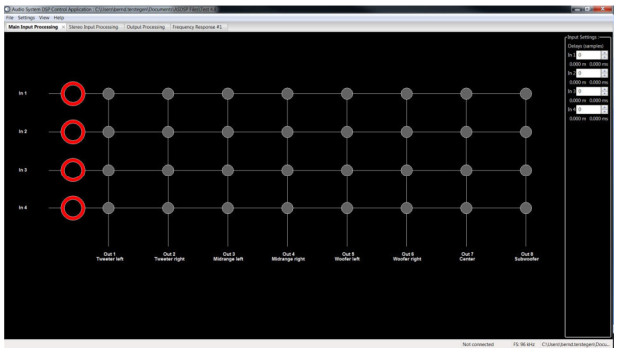
Sub Volume: Use the optional remote control to control the Main Level and the volume of the subwoofer separately. Each channel you select here is controlled via the "Subwoofer Level" control. Unselected channels are controlled via "Main Level".

MATRIX RCA INPUTS

14.02: You can use the matrix to set the following:

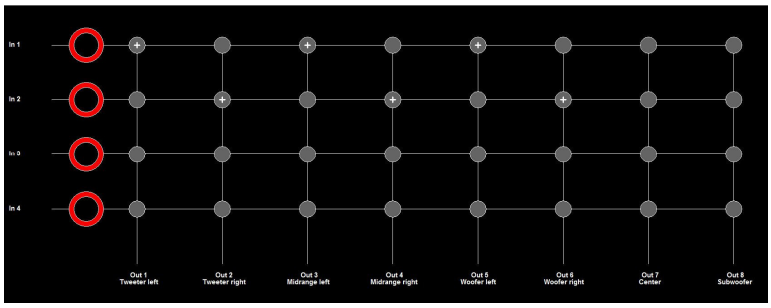
1. Which input is connected to which output. This is done on the **horizontal** line (x-axis).
2. Mix the channels (Mixer). This is done on the **vertical** line (y-axis).
3. A sum signal e.g. for a subwoofer.
4. Generate a differential signal e.g. for a center speaker.
5. Undo an existing time correction.

- A click in the corresponding field generates a **+.**
- Clicking again generates a **-**.
- Another click will clear the field.



Below are some examples.

MATRIX ROUTING RCA INPUTS



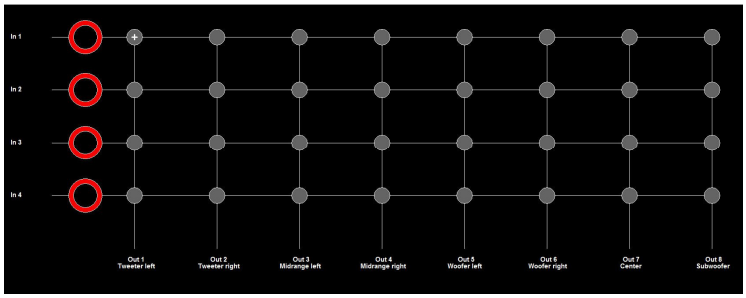
14.03: In this case, we have a classical assignment with a stereo input signal.
In1 (left channel) is 100% on Out 1, OUT3 and Out 5.
In 2 (right channel) is 100% on Out 2, Out 4 and OUT6

Why 100%? The next section "Matrix Mixer" shows you how to mix channels and why this can be useful.

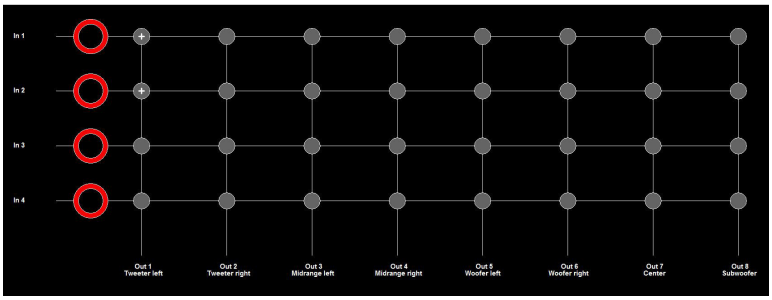
MATRIX MIXING RCA INPUTS

14.04: This is the simplest of all conceivable applications.

The name In1 to In4 on the left (y-axis) can also be found on the input side of the DSP-AMP. Out 1 to Out are meant for the internal amplified channels. The designation Out5 to Out8 (x-axis) can also be found on the output side of the DSP-AMP. With a click in the upper left field, as shown in the picture, you have assigned the input In1 to the output Out1 to 100%.



MATRIX MIXER RCA INPUTS

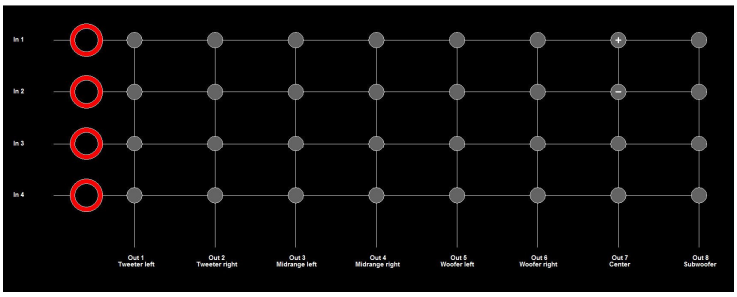


15.01: In this constellation, the frequencies were already split up in the factory system.
An example. Let's assume In1 is the left tweeter of the OEM music system. In2 is the midrange of the OEM music system. Let's say In1 goes from 2kHz to 20kHz and In2 from 20Hz to 2kHz. To get a full range signal from 20Hz to 20kHz of these 2 channels they must must be mixed.
In1 and In2 are 50% each (in total to 100%) on Out1. Now In1 and In2 were mixed to a full-range channel from 20Hz to 20kHz on Out1.
This can be carried out in any way up to the 8 inputs (then 12.5% each) of the AS DSP 8.12. The percentage distribution is automatic and symmetrical.

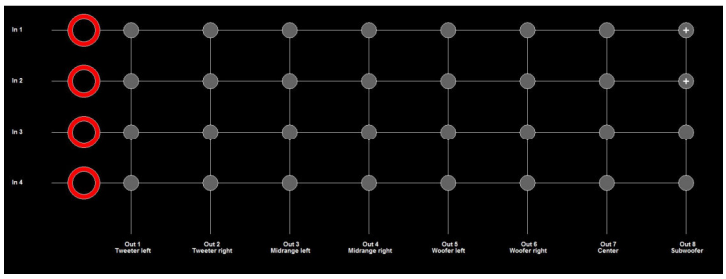
MATRIX MIXER DIFFERENTIAL SIGNAL

15.02: Now we would like to generate a center speaker.

To generate a center speaker, we need a differential signal. That means we take e.g. from the left channel the signal "in phase" and from the right channel the "inverted signal". In our example, we have merged IN1 as "in phase" (+) and IN2 as "inverted signal" (-). The result is a difference signal which is present at output Out7 in our example. This difference signal can now be used e.g. for a center speaker.



MATRIX MIXER SUM SIGNAL

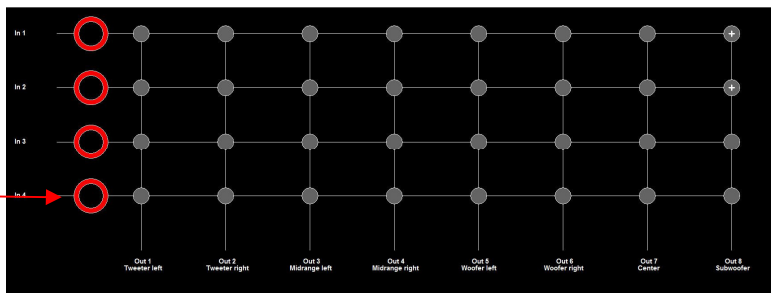


15.03: A sum signal is usually created for a subwoofer. This offers the advantage that the signals from both channels (right and left) are passed on to the subwoofer.

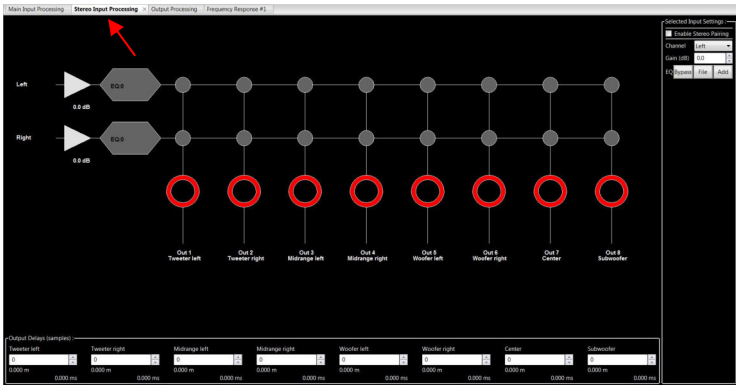
Example of creating a sum signal. In the left example, IN1 (left channel) and IN2 (right channel) were merged to OUT8 in 50% each so 100% in sum.

MATRIX MIXER DE-DELAY RCA INPUTS

15.04: As a further tool for optimizing the sound image, the DSP-AMP offers the possibility to undo a possible delay correction in the factory system. This is done through the red circles.



MATRIX MIXER STEREO INPUT



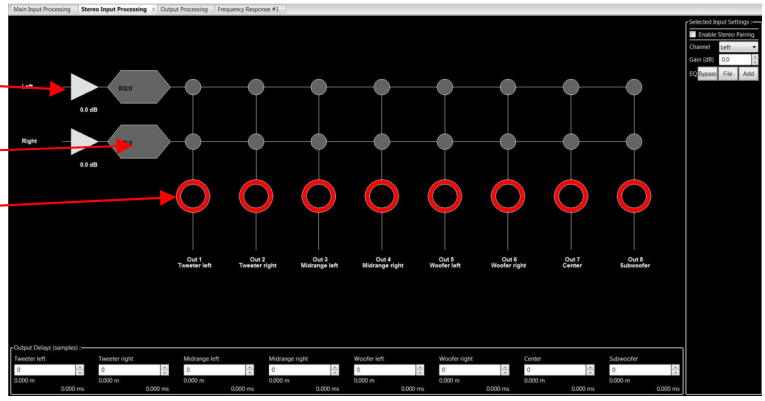
16.01: The “Stereo Input Processing” tab is used to enter the AUX and the Digital Input Matrix.
The procedure corresponds to the procedure for allocation to the RCA inputs.

MATRIX MIXER STEREO INPUT

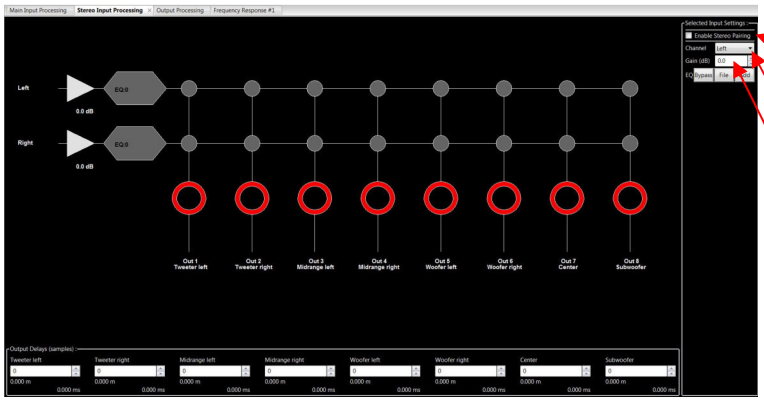
16.02: There are other possibilities in the Stereo Input Matrix.
You can change the input gain here.
Of course, separately for each channel.

De-Equing is also possible here.
If there is a delay at the INPUT signal this can be corrected (de-delayed) here.
Note: The de-delay has nothing to do with the delay correction of the output!

Attention: Use this tool only when you are a Pro in dealing with DSPs.



MATRIX MIXER STEREO INPUT



16.03: More settings

Enable stereo paring: Allows you to group channel 1 + 2. This facilitates the settings which are valid for both channels.

Chanel: Choose left or right chanel.

Gain (dB): This controls the gain of the inputs.

MATRIX MIXER STEREO INPUT

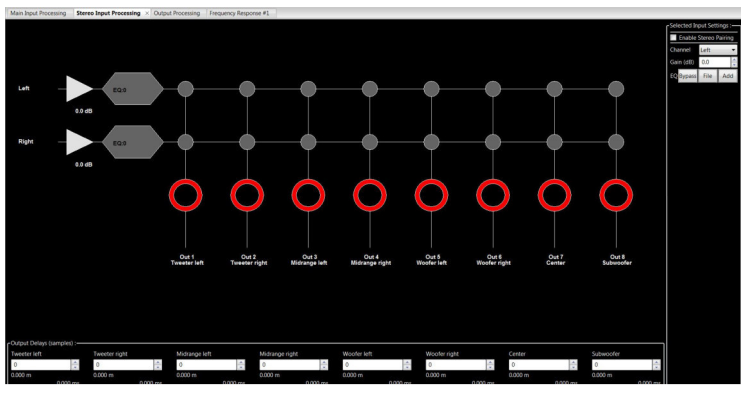
16.04: EQ:

This allows you to smooth the input signal if the input source already has an equalization.

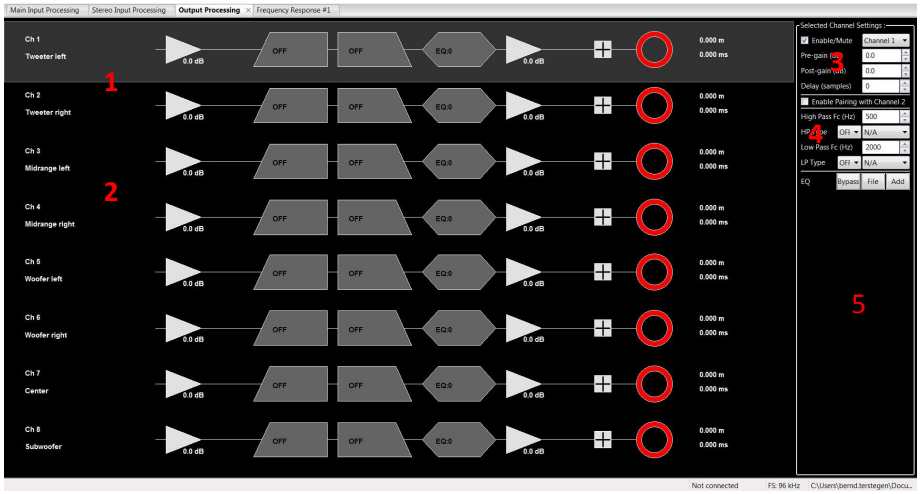
Bypass: Turns off all set EQ's.

File: Allows you to import a record.

Add: Adds an EQ.



OUTPUT SETTINGS

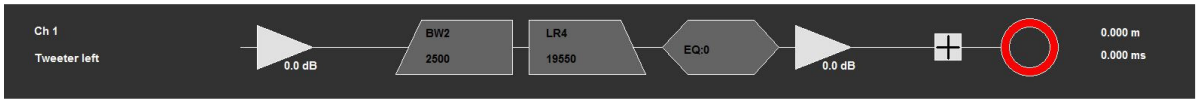


17.01: When the "Output Processing" tab is clicked, the following image appears.

The number of channels displayed depends on which **AS DSP** or **DSP-AMP** you are using. For a better overview, we split the picture into 5 sections and look at all sections individually.

Section 1 + 2: Channel window
Section 3: Volume and Gain
Section 4: Filter
Section 5: EQ

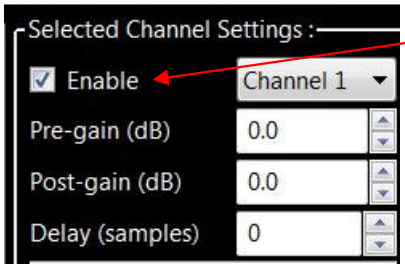
SECTION 1+2 CHANNELS



17.02: Channel window. Often, when looking at a DSP software, the question arises: "Where do I have to start?"
The **AS-DSP SOFT** is designed as we are used to from reading a book. From the left to right and one line after another. In a logical order one goes through step by step. There are always discussions about where step 7 has to be done! Many users are using step 7 instead of step 2, both methods have their specific properties.
Step 1: Gain input.
Step 2: High pass filter. In our example, a Butterworth 2nd order (12dB) filter has been set at 2500Hz.
Step 3: Low pass filter. In our example, a 3rd order Linkwitz- Riley (18dB) has been set at 19550Hz.
Step 4: EQ. Here you can see if and how many EQs are set.
Step 5: Gain output. Here you can adjust the gain of the output.
Step 6: Phase position: With each click in the box the phase position of the channel is rotated by 180 degrees.
Step 7: Runtime: Depending on the selected transfer rate, the runtime in steps of 7mm at 48kHz and 3.5mm at 96kHz.

SECTION 3 TIME DELAY AND GAIN

17.03: Selecting the channel setting. (See also page 15, chapter 15.03)



Channel selection: Enable or disable the channel.

Channel: After clicking on this drop-down, you can select the desired channel.

Pre-gain (dB): This is used to adjust the gain of the input.

Post-gain (dB): Sets the gain of the output.
Delay (samples): Sets the time delay in samples. The number of samples is entered directly. In addition to the red circle in the channel window, the value can be read in mm or ms.

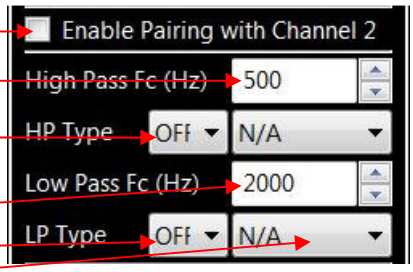
SECTION 4 FILTERS

17.04: Filter. Here the filters can be selected and adjusted.
If the checkbox is set here, the setting for both channels has the effect

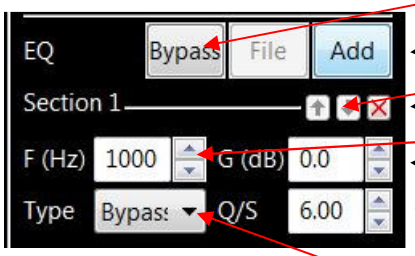
The cut-off frequency of the high-pass filter can be selected here.

Here you can set the filter characteristics of the High Pass. You can choose between, OFF, Butterworth, Bessel and Linkwitz-Riley. Also choose the flank slope here.

The cut-off frequency of the low-pass filter can be selected here.
Here you can set the filter characteristics of the Low Pass. You can choose between, OFF, Butterworth, Bessel and Linkwitz-Riley. Also choose the flank slope here.



SECTION 5 EQ



18.01: EQ

Bypass: Disables all EQ settings.

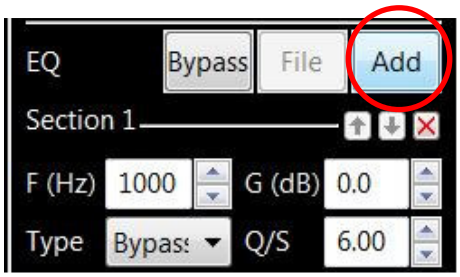
Add: Adds another EQ. You can choose up to 15 EQ`s.
This can be used to change the order of the EQs.
Here you can delete a set EQ.
Here the frequency of the EQ can be selected. In this case 5000Hz.
Select the gain for. Here + - 0.0dB.
Select the desired Q-factor. The Q factor influences how wide the EQ should work.

With this dropdown, the type of EQ can be selected. Choose:
Bypass to disable the chosen EQ.
PEQ for a parametric equalizer.
LoShelf affects ALL frequencies below the selected EQ intervention.
HighShelf influences ALL frequencies above the selected EQ intervention.

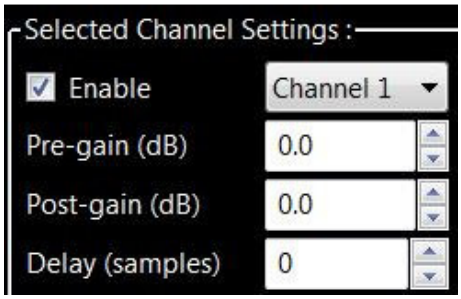
ADD AN EQ

18.02 Add an EQ.

Each click on the ADD button adds an EQ. You can select up to 18 EQs each channel. This applies without restriction to ALL channels. By default all EQs are switched off. Add the EQ you need and delete EQs that are not needed. An EQ needs computing power! Therefore, use the EQs sparingly.



GAIN INPUT AND OUTPUT



18.03: The GAIN in General.

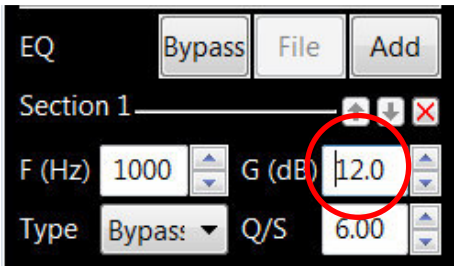
A few basic notes on GAIN. Whether it is the GAIN as a hardware controller or the GAIN in the software, there are a few things to consider.

1. The GAIN is not a volume control! The GAIN is used to adjust the components among each other.
2. In the case of multi-path systems, the loudspeakers should already have been matched with the hardware gain controllers. The gain control in the software is only used to adjust the different loudspeaker performance levels.

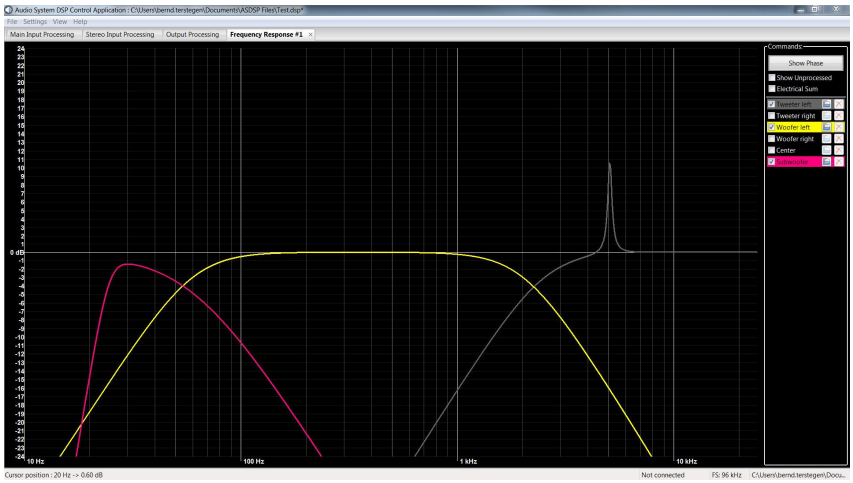
THE GAIN IN THE EQUALIZER

18.04: In the case of multi-path systems, the frequency response in the vehicle must generally be measured. Bursts or elevations can then be read from the measurement record. These bursts or elevations can then be compensated with the equalizer.
The following applies: Lowering is better than lifting! If you want to compensate a break-in with the equalizer, you should generally not raise more than 3 dB. In our example it`s set to 12dB which is the maximum possible but not recommended. The more you lift, the more the risk of distortion or noise. If your measurement has large dips or surveys, you should check the installation again:

- Is the phasing of the speakers correct?
- Are the transition frequencies selected correctly?
- Does the volume of the speakers match each other?



THE FREQUENCY RESPONSE TAB



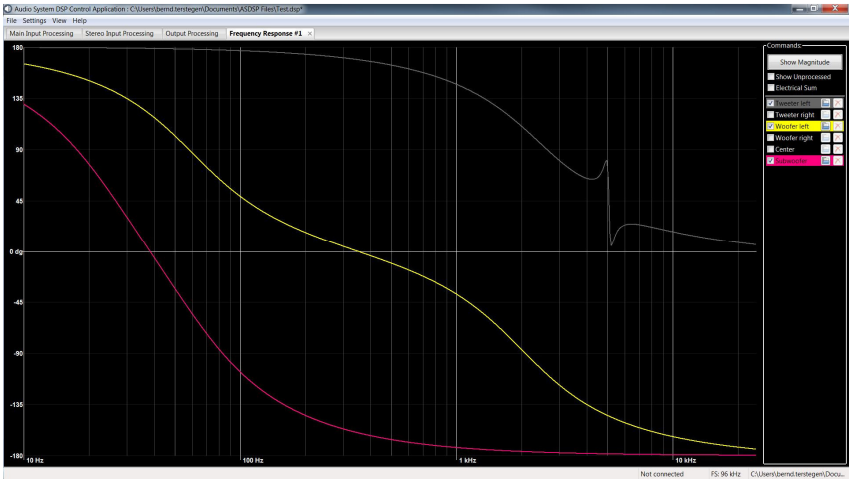
19.01: The Frequency Response tab can display many useful information.

Select the speaker (or speakers) whose settings you want to display. To select a channel, simply set a check mark in front of the corresponding channel.
In the example on the left the left tweeter, the left TMT and the subwoofer were chosen. Here you can see which filters have been set. In the high-frequency channel (shown in gray color) you also see the EQ we have set. A very narrowband PEQ with an intervention at 5kHz and a GAIN of 12dB. The EQ is narrowband because a high Q factor of 20 is chosen.

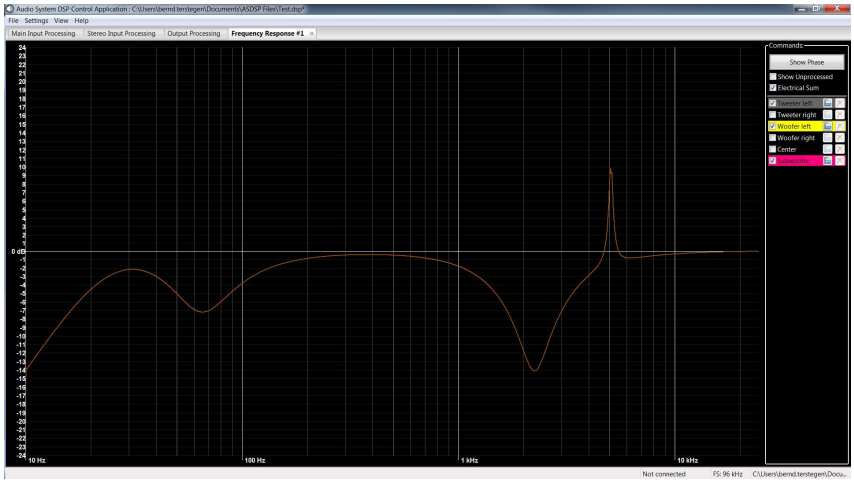
THE PHASE

19.02: For further information, you can look at the phasing of the channels.

To display the view as shown on the right, please use the "Show phase" button. Here you can check the phase position of the channels.
Clicking on the button now called "Show Magnitude" brings you back to the display from 16.01.



DISPLAY THE SUM SIGNAL

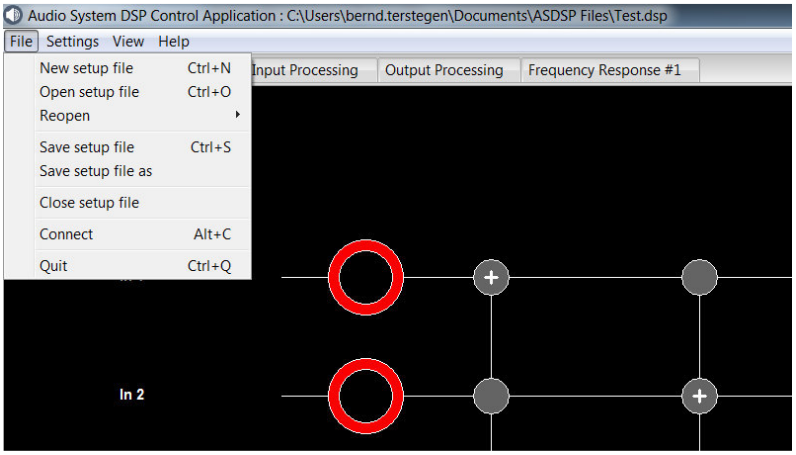


19.03: You can also display the sum signal of all selected channels.

In the display from chapter 16.01 you can choose between the display of the filters and the display of the resulting electrical sum. In order to display the electrical sum of the channels, please check the field "Electrical sum"
You will then see the display on the left.

CAUTION: All values shown above are calculated and not absolute values. Depending on the speakers you use, the mounting positions and other factors, the measured values in the vehicle may deviate from the above illustrations.

HOW TO STORE A SETUP TO YOUR PC



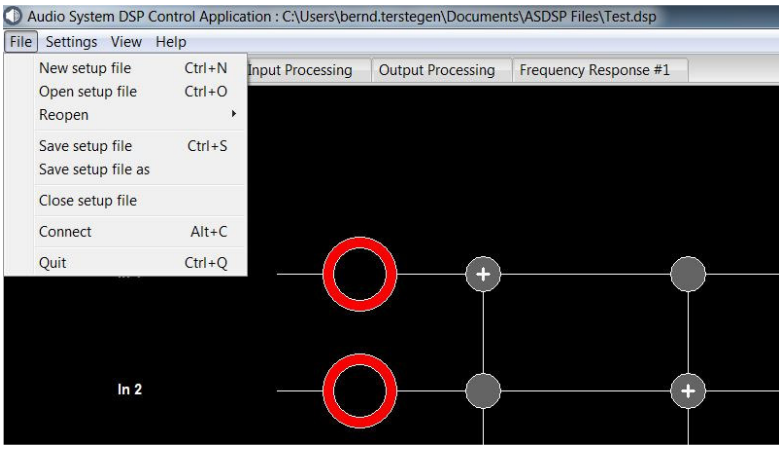
20.01: To save a setup on the PC, please proceed as described below.

To store a new created setup, click the "File" tab. In the drop-down menu that appears, click "Save setup file as". This opens the path you selected during installation. Now you can name the setup and save it.
If you just want to make changes to an open and already saved setup, click "Save Setup" in the dropdown menu or use the shortcut **Ctrl + S**

REOPEN A STORED SETUP

20.2: If you want to recall a previously saved setup.

Click on the "File" tab. In the drop-down menu that appears, click on "Open setup file". Now the path that you selected during the installation opens up and shows all the stored presets. Now you can choose the desired setup. The last 10 saved setups can also be opened by clicking "Reopen". In the window that appears, select the desired setup.



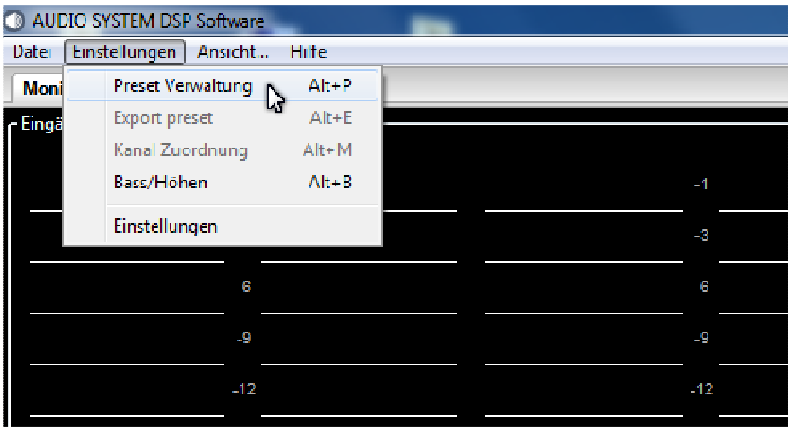
MUTING

ATTENTION: Please note the following:
Whenever you connect the DSP to the software, ALL channels are muted automatically. This is a safety setting to not damage the connected speakers. If you save your setup, this muting will persist! If you do not have a remote control, you MUST cancel the muting in the "Monitor" tab. If you have a remote control, you can cancel muting by simply increasing the volume. It does not matter if you use the DSP-IR or the DSP-SW.
For details on the "Monitor" tab, please see chapter 18 in this description.

HOW TO STORE A SETUP AT THE DSP

You can store up to 10 presets on the **AS-DSP**. In order to take advantage of several stored setups you need a remote control. You can then use the remote control to access the various setups. It does not matter whether you choose the wired remote control or the infrared remote control.

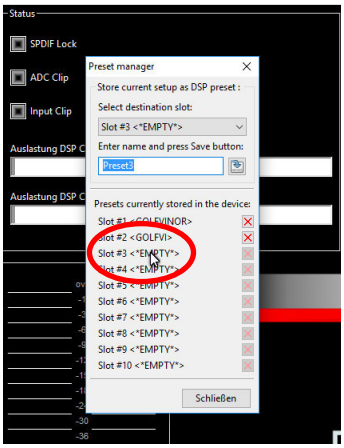
ATTENTION: Please note the following:
Preset 10 is provided for the SD card. When you insert a setup via the SD card, this is stored automatically on Preset 10. Any existing setup which is stored on preset 10 will be overwritten!



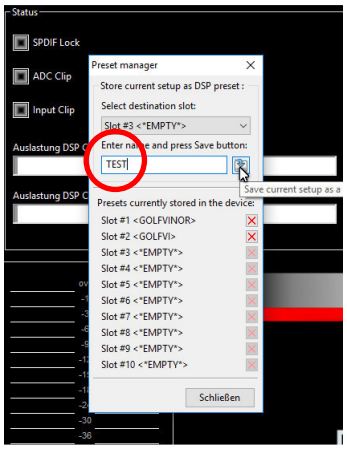
21.01: To save a setup on the **AS-DSP** please proceed as described below.

Click the "Settings" tab. In the dropdown menu that appears, click "Preset Management".

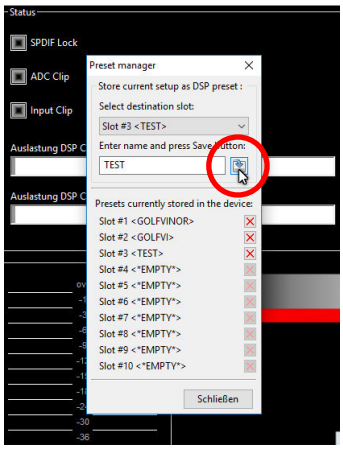
21.2: In the window that appears, please click on an empty slot (Preset)



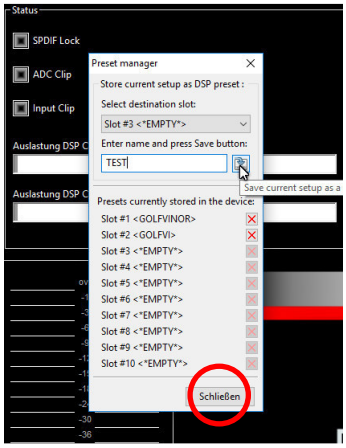
21.3: Assign a meaningful name. In this example, "TEST"



21.4: Click on the icon of the file folder to save the setup to the selected preset.



21.5: Now you can close the preset manager by clicking on "Close". The setup is saved.



shortcut	Function

Strg+N	Create a new setup
Strg+O	Opens an excisting setup file from database
Strg+S	Storing a setup file
Alt+C	Connects the DSP with the software
Alt+P	Opens the preset manager
Alt+M	Opens the output channel mapping
Alt+B	Opens bass and treble adjust
Alt+F1	About this software

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