User Manual

DAP 26
Digital Audio Processor

KME-Control
Remote Software Mainframe

DAP 26 HW	Version 1.2 r0026
DAP 26 MC	Version 1.1 r0052
KME-Control	Version 1.00 Build 0073
DAP 26 Plug	Version 1.00 Build 0149
Manual Rev.	Version 1.00 EN
Stand:	12.04.2005 service@kme-sound.com

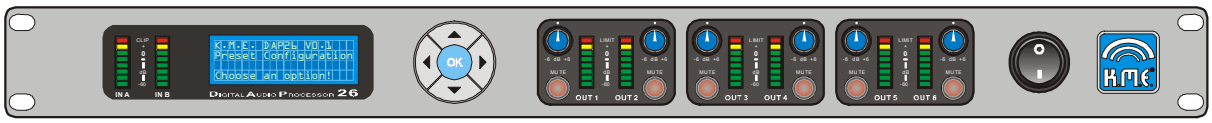
Functional units

The DAP 26 offers a lot of functional units for general audio processing using a powerful DSP mainframe such as 9 filter banks with each 5 configurable filters of 9 different types, 6 crossover units with two combinable filters out of 3 types, 3 master delays (up to 2000 ms / 685 meters), 6 channel delays (up to 500 ms / 170 meters) and 6 dynamic processors (compressor / limiter / noise gate).

All this functional units can be programmed either directly on the hardware unit or by using the real-time control software *‚KMEControl'*..

Switches and Knobs

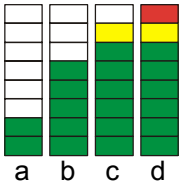
Front side



Input level meters

Two 10-digit digital level meters help to set the correct input level on the analog audio inputs or to monitor the digital audio input level.

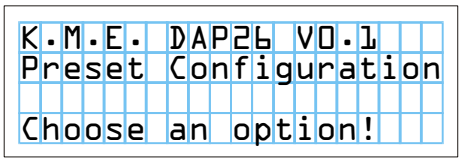
The graphic below shows different peak input levels on your unit:



a) too less input level
b) input level OK
c) maximum input level
d) too much input level – clipping may occur

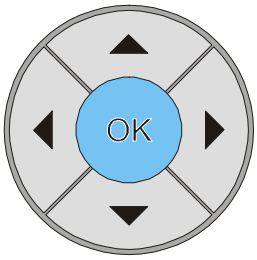
The analog input circuit contains a limiter unit for preventing the A/D- converters from clipping. Nevertheless the analog input level must not exceed the red LED of the input level meter to prevent reproduction of a distorted signal. Set the source level that only the yellow LEDs light up in peaks.

Display



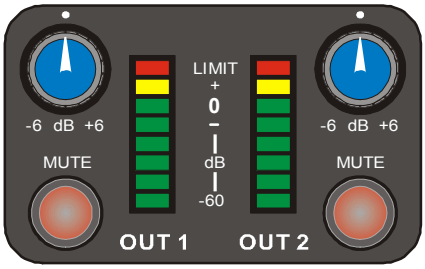
A 4x20 back-lighted LCD display shows the navigation menu. You can set all software parameters on the unit itself. Arrows in the lower right corner show the directions to navigate to submenus. (see appendix ‘navigation structure’). Use the navigation pad to move between the menus. Press the ‘OK’ button to select a parameter if you are asked by the unit.

Navigation Pad



The navigation pad is to be used for accessing and changing parameters on the display of the hardware unit. Press the OK button if you are asked by the software. See also the appendix ‘menu structure’!

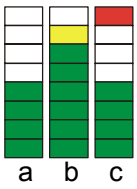
Level meter 1-6
Level correction 1-6
Mute switch 1-6



The level correction pot adjusts the output level of the corresponding channel by +/- 6 dB. This is done on digital signal level and independent from the gain correction in the software plug-in.

Pressing the mute switch mutes the corresponding output channel. The level meter still displays the output level to avoid unintentional triggering of the switches.

There is a 10-digit LED bar-graph for each output channel which displays the following information:



a) there is an output signal on channel X (if the mute switch is not activated)
b) the signal on output X exceeds the maximum output level (if the mute switch is not activated)

c) there is an output signal on channel X, the dynamic processor (Compressor/ Limiter) is activated and works

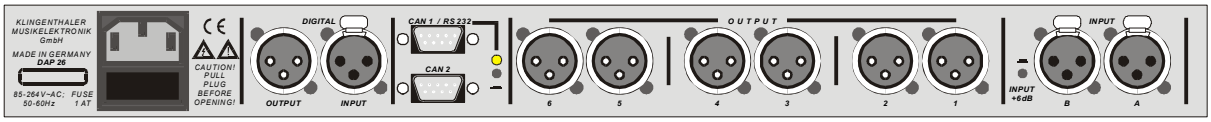
Mains switch

Use this switch for powering up the hardware unit. We included a power-up delay which prevents clicks or plops in the speakers efficiently, nevertheless we recommend switching on your power amplifiers after the DAP.

The backlighting of the display shows that the DAP is switched on and the mains power is within the useable range. If the display does not light check your mains voltage and / or the mains fuse which is located in the mains connector.

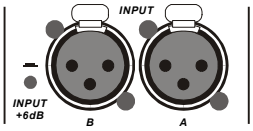
Connectors

Rear side



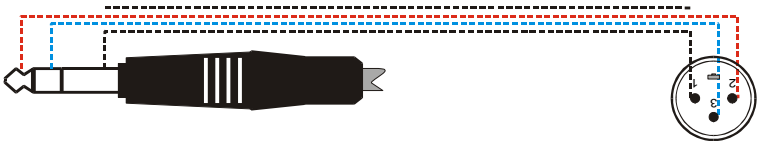
There are all connectors located on the rear side of the unit.

Analog inputs / level select switch



The audio inputs of the DAP 26 are electronically balanced. Unless it is necessary we do not recommend unbalanced audio connections. The inputs have to be operated with an nominal audio level of either 775 mV (0 dB) or 1.55V (+6 dB) which you can select using the switch beside the connector “b” corresponding to the signal level your source units work with.

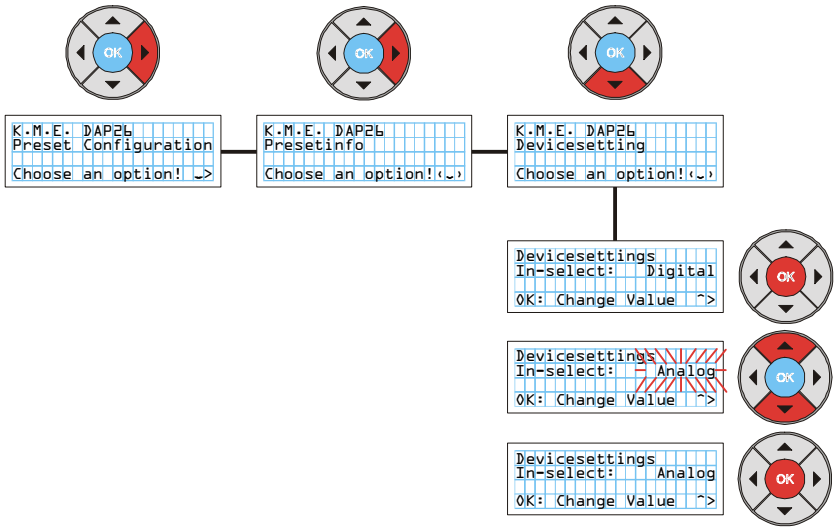
XLR-to- XLR balanced audio connection



Jack-to-XLR balanced audio connection

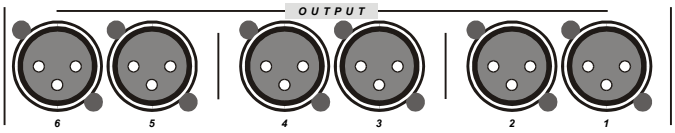
Use one of this cables for connecting the analog audio inputs of the DAP 26 to your mixer / stagebox or to another signal source.

Switching inputs to *‚analog'* (factory preset)



Follow this navigation scheme to activate the analog audio inputs (factory preset) ?after using the digital audio input sometimes?. This is one of the few settings that can only be done on the hardware unit itself.

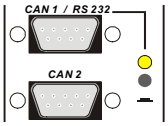
Analog outputs 1-6



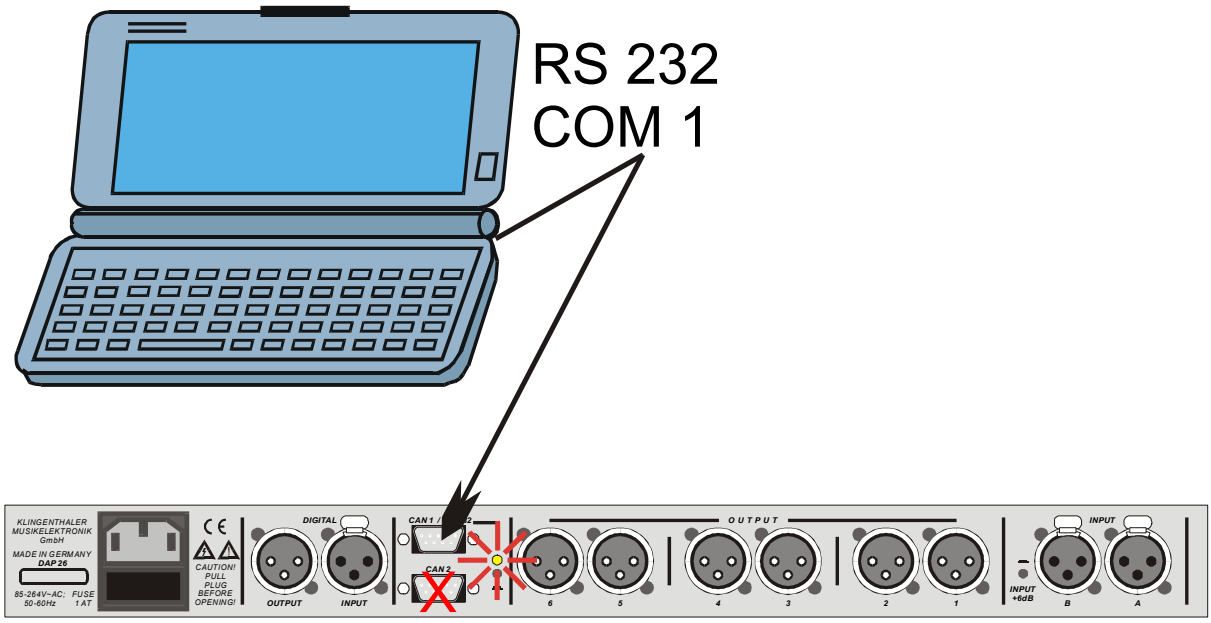
The analog audio outputs 1-6 are electronically balanced, male XLR sockets. We do not recommend connecting unbalanced destination devices to the DAP 26. The nominal output level is reached if the yellow LED in the level meter lights up.

XLR-to- XLR balanced audio connection

Computer connection,
selector RS 232 – CAN



• programming the unit (on PC using RS 232)



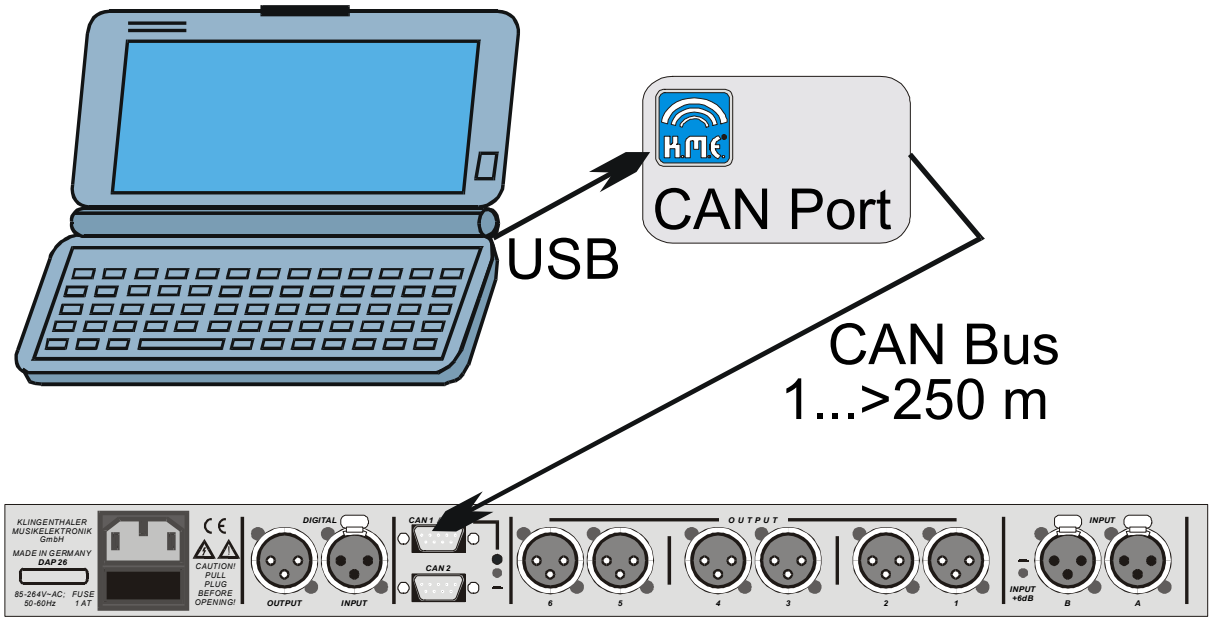
Connect the DAP 26 to a free COM port of your PC using the supplied RS232 cable. You must only use the upper connector labelled ‘RS232/CAN’. Make sure that the yellow LED beside the connector GLOWS BEFORE connecting the unit to your PC! If the LED does NOT glow, operate the switch which is located just below this LED using a suitable tool.

You can now run the *‘KME-Control’* software and activate the communication (see software).

9-pole D-sub cable 1:1 as supplied with the DAP 26. The pins shown in this drawing have to be connected, the other pins may be connected but do not affect the communication at all.

The maximum length of such a cable MUST NOT EXCEED 5 meters or the communication may be interfered!

• Remote use (PC with USB- port and K.M.E. CAN- Interface)



AFTER the installation of the KMEControl mainframe software you can connect the USB port on your computer with the K.M.E. CANport interface using the supplied USB cable. All necessary device drivers will be loaded automatically when connecting the interface for the first time. Make sure that the yellow LED does not light before connecting the CANport interface to your DAP 26 using the supplied or a modified cable. Connect the supplied CAN terminator plug to the lower socket of your DAP 26. If there are more DAPs daisy-chained, connect the CAN terminator plug to the free connector of the last device in your CAN chain!

You can now run KMEControl software and activate the communication (see software).

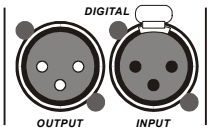
CAN Bus Link cable

This cable can be used connecting the DAP 26 to the CAN port interface box. Use such cable also for linking the CAN bus from unit to unit. Do not forget connecting the CAN terminator plug to the free connection port of the last unit, otherwise the CAN transmission could be disturbed.

Note: By using a self-made cable make sure to connect the pins needed for CAN transmission. They are different than in RS232 mode unless using 9 wire cable!

This cable can be used connecting the DAP 26 to the CAN port interface box, using your multicore system (i.e. XLR). Use such cable also for linking the CAN bus from unit to unit. Do not forget connecting the CAN terminator plug to the free connection port of the last unit, otherwise the CAN transmission could be disturbed.

Digital Audio Input
Digital Audio Output

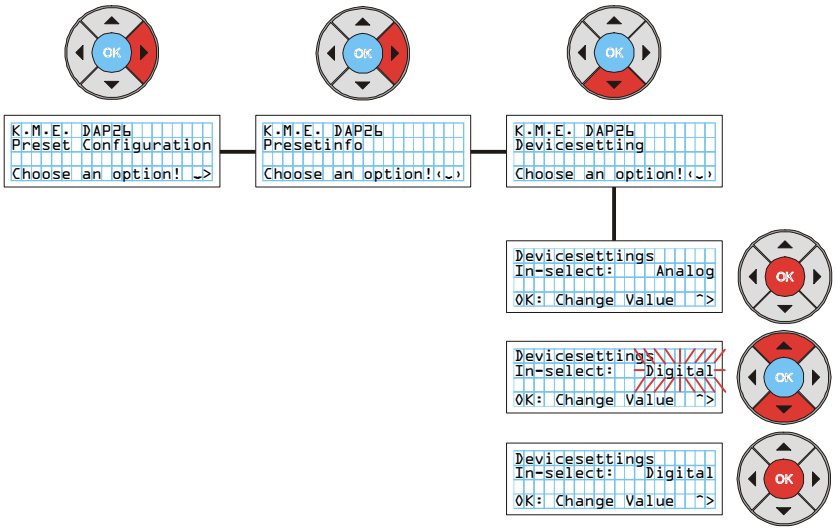


The digital input accepts digital audio signals according to AES/EBU with a bit rate of 16 to 24 and a sampling frequency of 32 to 96 kHz using an internal format-/sample rate converter chip. The digital audio output loops the selected input (analog/digital) as a 24-bit/96 kHz AES/EBU signal for cascading additional units or recording the signal to a studio digital recorder. All digital connections are transformer- balanced for maximum protection against ground loops.

Digital Audio Connection Cable (AES/ EBU) w. 110 Ohms

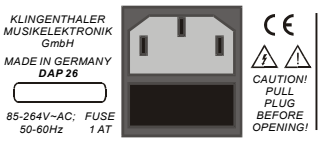
We do not recommend using “normal microphone cable” for AES/EBU connections also when it ‘seems’ to work. Only specified 110 Ohms digital audio cable will give a proper connection without data loss and digital drop-outs.

Switching the inputs to ‚digital':



Follow this navigation scheme for selecting the digital audio input of the DAP 26. This is one of the few actions that can only be used on the hardware unit itself!

Mains power connector / fuse



Connect the supplied mains power cable to this socket. If the supplied cable is not conform to your local mains allocation, use another cable which fits to the necessary specification or ask a technician to change the mains plug. The DAP 26 works with all types of mains power between 100 and 250 volts without pre-selection.

If the fuse breaks, replace it by using an 1 amp slow-blow fuse of the 5x20 shape. Do NOT use fuses different to that type and do NOT try things like ‘patching' the broken fuse with aluminium foil etc. because this may lead to risk of fire or electric shock!

If the new fuse burns out again then there might be a damage inside the unit! There are no user-serviceable parts inside the DAP 26! Contact the K.M.E. support in this case!

Handling

Functional units (digital)
All of this functional units are to be set directly in the hardware unit or using the K.M.E. Control software. The names refer to the MENU PROMPT.

Input Channels
DSP- functions in the input channels

Delay
Channel [1 … 3]
Value [0 – 2.000 ms]
Time-delay in the input and all output channels routed to this input channel (Master – Delay).

Mute
Channel [1 … 3]
Value [Mute Off … Mute On]
Mute in the input and all output channels routed to this input channel (Master – Mute).

Gain
Channel [1 … 3]
Value [-60 dB ... +10 dB]
Gain in the input and all output channels routed to this input channel (Master – Gain). The output level pots are to be used independently!

Filters
Channel [1 … 3]
Filter [1 ... 5]

Type	[Filter type – see chapter ‚Filters']
Frequency	[20 Hz ... 44 kHz]
Q (bandwidth)	[0,1 … 20]
Gain (boost/cut)	[-20 dB … +12 dB]

Equalizer of the Input and all output channels routed to this input (Master – EQ). This EQ can be used as ‘main’ equalizer for the PA system . More information to the filters is given in the chapter ‚Filters'!

Output Channels
DSP- functions in the output channels

Delay
Channel [1 … 6]
Value [0 - 500 ms]
Time-delay in the output

Mute
Channel [1 … 6]
Value [Mute Off … Mute On]

Mute of the output

Gain

Channel [1 … 6]

Value [-60 dB ... +10 dB]

Gain level of the output

Phase

Channel [1 … 6]

Phase [0° (In Phase) … 180° (Out of Phase)]

Polarity of the output

Filter

Channel [1 … 6]

Filter [1 ... 5]

Type	[Filter type – see chapter ‚Filters']
Frequency	[20 Hz ... 44 kHz]
Q (bandwidth)	[0,1 … 20]
Gain (boost/cut)	[-20 dB … +12 dB]

Equalizer of the Output which can be used for correction of different speaker output ways. More information to the filters is given in the chapter ‚Filters'!

Xover

Channel [1 … 6]

LP-Type	[Bypass; Butterworth; Linkwitz- Riley; Bessel]
LP-Freq	[20 Hz ... 44 kHz]
LP-Order	[1 ... 8] (filter-depending)
HP-Type	[Bypass; Butterworth; Linkwitz- Riley; Bessel]
HP-Freq	[20 Hz ... 44 kHz]
HP-Order	[1 ... 8] (filter-depending)

Frequency crossover networks for the different output channels. Using a single filter (low-pass or high-pass) or a valid combination of both filter banks (band-pass) a powerful tool for controlling PA systems is given to the user.

The user can select a filter of the types Butterworth / Bessel and Linkwitz / Riley. For users without profound knowledge of filter theory we recommend using the Linkwitz- Riley filter algorithm for most applications.

Dynamic

Channel [1 … 6]

Type	[Bypass; Limiter; Compressor]
Gain	[-10 dB … +10 dB]
Threshold	[-40 dB … +10 dB]
Knee	[0 dB …10 dB]
Ratio	[1:1 … 10:1] (nur Compressor)
Attack	[0,1 ms … , 1000 ms]
Release	[1 ms … 10000 ms]

Dynamic processor of the output.

Depending to the setting of the parameters a dynamic processing of the input material will occur when the audio signal level exceeds the adjusted threshold value. The gain reduction works corresponding to the selected algorithm (compressor or limiter). The limiter works with a ratio of infinite:1 what means that the input level may be theoretically be increased by any value without a change in the output level which can be specified using the threshold and gain slider.

The knee value describes the shape of the regulation curve. A knee value of 0 means a hard compression / limiting (the processing starts immediately after exceeding the threshold level), a higher knee value describes a curve which is more soft and sounds normally better depending on the program material.

The attack/release time draw the speed of the gain regulation mechanism. A longer attack time will let some signal peaks pass which may sound more powerful, a short attack time will give more protection to the speakers.

A longer release time is advantageous for maximum protection of speaker components, on the other hand a short release time increases the average sound level (using the compressor algorithm).

Noisegate

Channel [1 … 6]

Type	[Bypass; Gate On]
Threshold	[-85 dB … -35 dB]
Close	[1 ms … 1000 ms]
Hold	[1ms … 10000 ms]

Noise gate of the output. Due to the setting of threshold level the noise gate can be used for gating disturbing background noise or even audio sources of low level. Just set the threshold to the level you want to gate – set a hold time (the processor “waits” this time before fading out the audio signal) and a close time (length of the fade-out itself). When the audio level is above the threshold again, it is faded in quickly and automatically!

Filter features

The DSP of the DAP 26 comes with many different filter types which are combinable as desired. In the following you can find some short information about the filters and their usage.

Context between bandwidth and the „Q“ factor

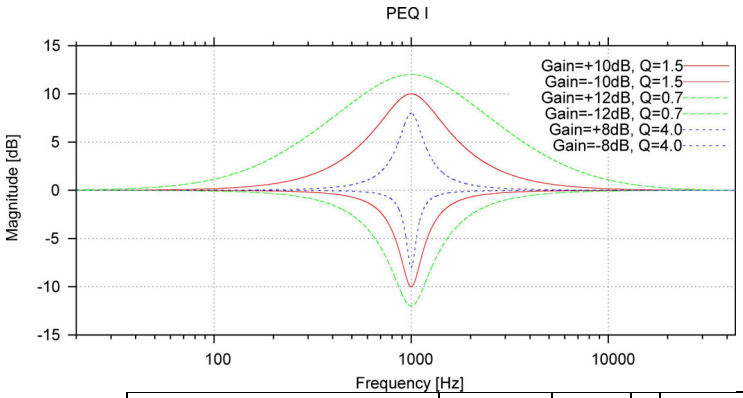
Bandwidth (octaves)	Q factor	comment		Q factor	Bandwidth (octaves)	comment
0,5	2,9	Narrow		0,4	3,0	wide
1,0	1,4	...		1,4	1,0	...
1,5	0,9	...		2,4	0,6	...
2,0	0,7	wide		4,4	0,3	narrow

Parametric filters
The so called ‚parametric' filters are widely used in professional audio equipment, for example in mixing desks or speaker processors. The curve of this filter is described with certain parameters, mainly the centre frequency, the bandwidth and the gain (boost/cut) of the filter. Combinations of these parameters can control the frequency response of an acoustical system.

PEQ I

Parametric Equalizer Type I

Full-parametric equalizer with different bandwidth for boost (normal) and cut (more narrow) to create more subtle changes in the audio material. We recommend using this filter for ‘standard’ audio requirements.



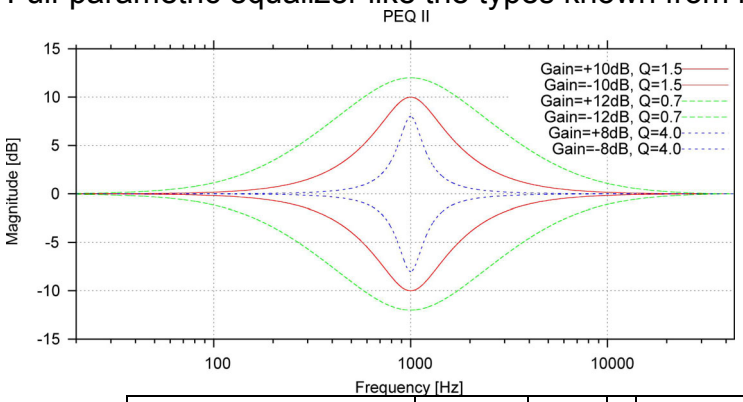
Centre frequency	20	Hz	-	44	kHz
Boost/cut	+ 12	dB	-	- 20	dB
bandwidth „Q“	0,1		-	20	

It is recommended to set the value for „Q“ between 0.4 (wide) – 1.4 (normal) – 4.0 (narrow). Higher / lower “Q” values are not recommended unless the user has enough knowledge using this special filters.

PEQ II

Parametric Equalizer Type II

Full-parametric equalizer like the types known from mixing desks.



Centre frequency	20	Hz	-	44	kHz
Boost/cut	+ 12	dB	-	- 20	dB
bandwidth „Q“	0,1		-	20	

It is recommended to set the value for „Q“ between 0.4 (wide) – 1.4 (normal) – 4.0 (narrow). Higher / lower “Q” values are not recommended unless the user has enough knowledge using this special filters.

Shelv- filter
A shelv filter can be found in nearly every mixing desk, normally for low and high frequency adjustment. They can boost or cut a wide frequency range above (high shelv) or below (low shelf) the mid- frequency. Furthermore we added shelv filters with adjustable bandwidth (*LSQ* and *HSQ*) which are, corresponding to the value of the „Q“ facto (we recommend values between 0,4 and 4,0), either more “flat” than “normal” shelvs (Q=0.7) or with a higher “Q” (1.0 to 4.0) they create an useful “peak” around the mid frequency.

Setting the bandwidth outside of Q <0,4 und Q >4,0 is *not* recommended.

LS 6dB

Lo- Shelv- Filter 6 dB

mid frequency	20	Hz	-	44	kHz
Boost/cut	+ 12	dB	-	- 20	dB

LSQ 12dB

Lo- Shelv- Filter 12 dB with adjustable “Q” factor

mid frequency	20	Hz	-	44	kHz
Boost/cut	+ 12	dB	-	- 20	dB
bandwidth „Q“	0,1		-	20	

At Q= 0,7 you have a „normal“12dB- Shelv- Filter.
Setting the bandwidth outside of Q <0,4 und Q >4,0 is *not* recommended.

HS 6dB

Hi- Shelv- Filter 6 dB

mid frequency	20	Hz	-	44	kHz
Boost/cut	+ 12	dB	-	- 20	dB

HSQ 12dB

Hi- Shelv- Filter 12 dB with adjustable “Q” factor

mid frequency	20	Hz	-	44	kHz
Boost/cut	+ 12	dB	-	- 20	dB
bandwidth „Q“	0,1		-	20	

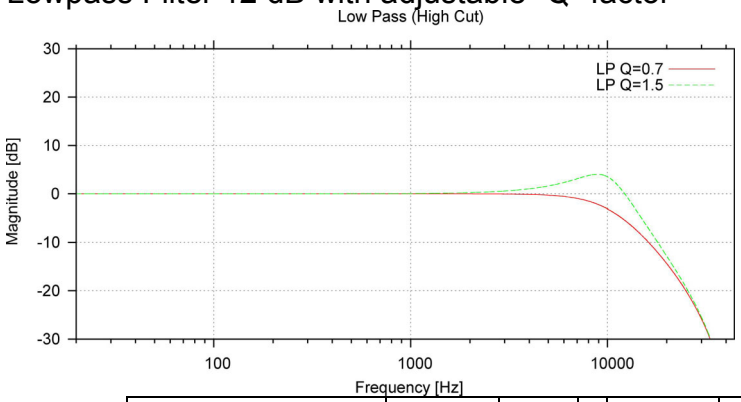
At Q= 0,7 you have a „normal“12dB- Shelv- Filter.
Setting the bandwidth outside of Q <0,4 und Q >4,0 is *not* recommended.

High-pass and Low-pass

To restrict the frequency response of an acoustic system in the low or the high end, the high pass (which actually means “low-cut”) and the low pass filter is implemented.

LP

Lowpass Filter 12 dB with adjustable *“Q”* factor

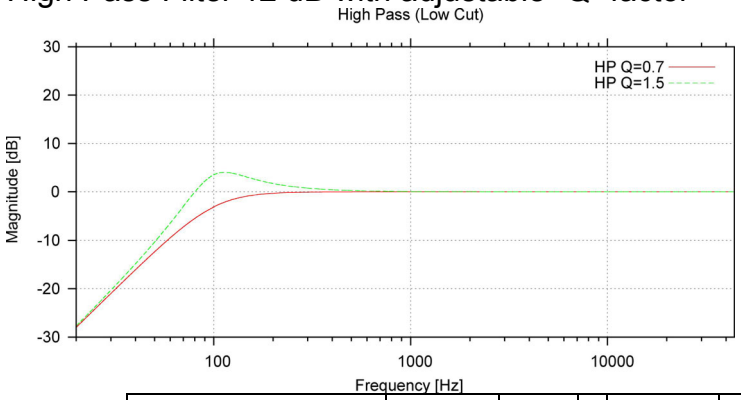


mid frequency	20	Hz	-	44	kHz
bandwidth „Q“	0,1		-	20	

At Q= 0,7 you have a „normal“ low pass filter like you find it in some professional mixing consoles (High-Cut).
Setting the bandwidth outside of Q <0,4 und Q >2,0 is *not* recommended.

HP

High Pass Filter 12 dB with adjustable “Q” factor



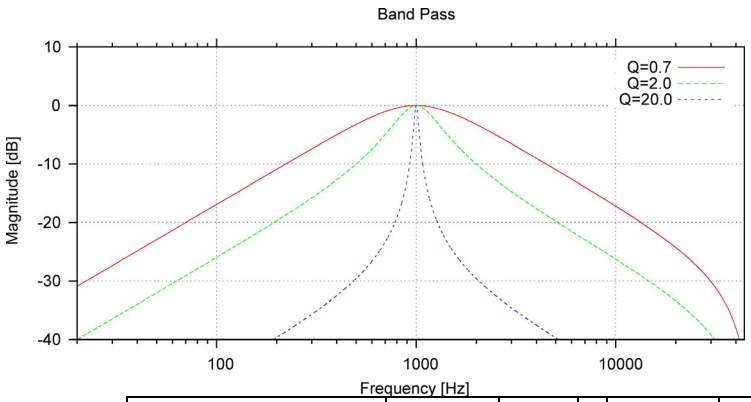
mid frequency	20	Hz	-	44	kHz
bandwidth „Q“	0,1		-	20	

At Q= 0,7 you have a „normal“ low pass filter like you find it in some professional mixing consoles (Lo-Cut).
Setting the bandwidth outside of Q <0,4 und Q >2,0 is *not* recommended.

BP

Bandpass- Filter with adjustable *“Q”* factor

The band-pass filter is rarely used in professional audio technology. The band-pass filter lets, in opposite to the notch filter, pass a audio band defined by the mid frequency and bandwidth.

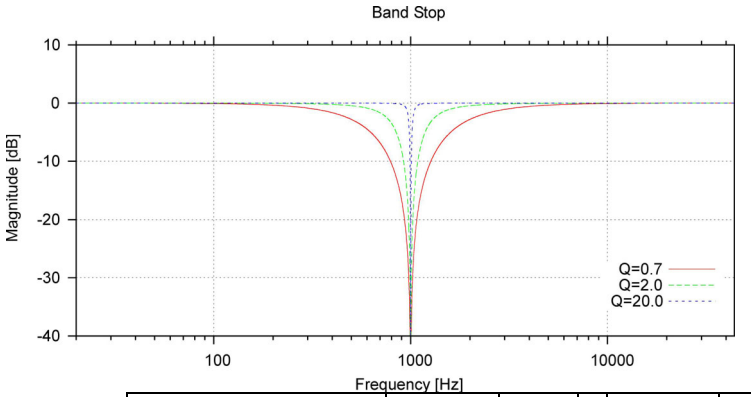


mid frequency	20	Hz	-	44	kHz
bandwidth „Q“	0,1		-	20	

BS

Notch Filter

The notch filter filters out a frequency range defined by the mid frequency and the bandwidth. With a *“Q”* factor above 5 this filter is very narrow, allowing the user to filter out unwanted frequencies (i.e. mains hum at 50 Hz and certain harmonics) completely. With a *“Q”* factor below 5 the filter response is quite wide but this set-up is seldom used in professional audio systems.



mid frequency	20	Hz	-	44	kHz
bandwidth „Q“	0,1		-	20	

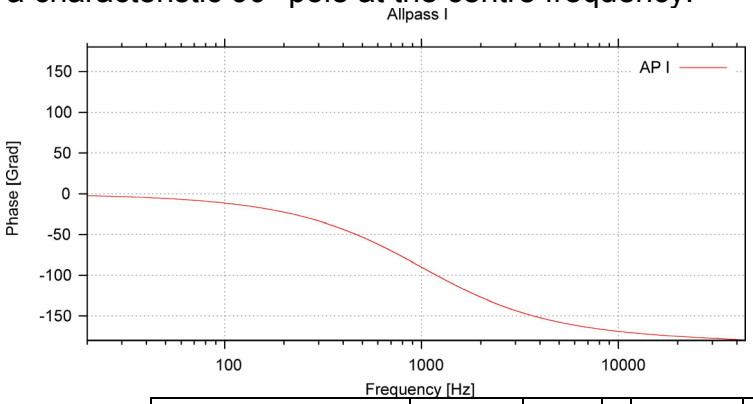
All-pass filters do not change the frequency response of an acoustoelectric system at all but the phase response. They can be used to influence the phase response. This is a complex field in filter theory and so all-pass filters should only be used by engineers who have ‘enough’ theoretical background. Incorrect all-pass filtering may not damage the sound system but affect the sound in a negative way.

The mode of action is presented here:

AP I

All-pass filter Type I

This filter creates a quite flat, smooth phase shift over the whole frequency range with a characteristic 90° pole at the centre frequency.

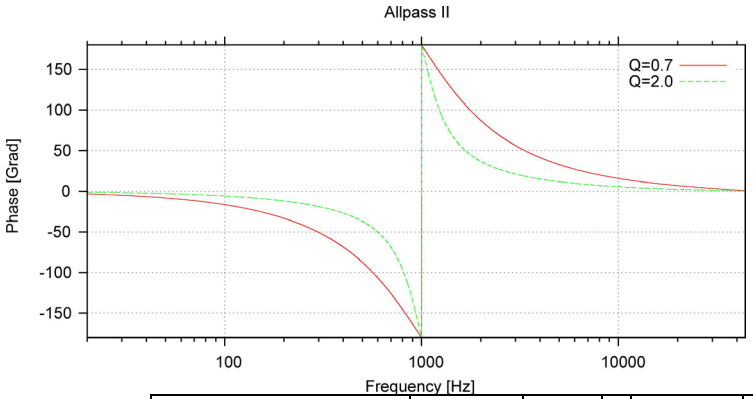


mid frequency	20	Hz	-	44	kHz

AP II

All-pass filter Type II

This filter creates a steep phase shift at the centre frequency. The course of the phase curve may be affected by the „*Q*“ factor.



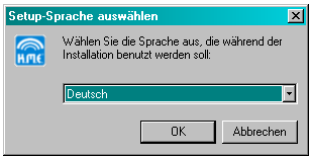
mid frequency	20	Hz	-	44	kHz
bandwidth „Q“	0,1		-	20	

The software - KME Control

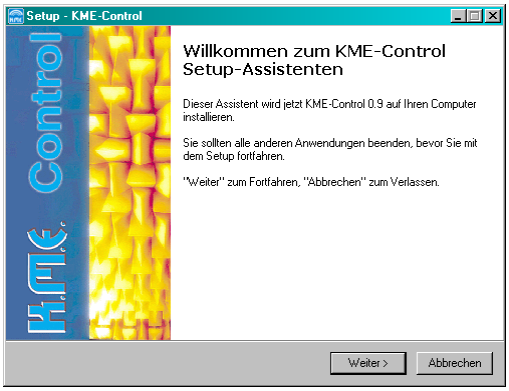
KME Control is a flexible software mainframe to be completed with different plug-ins which can control different K.M.E. products. At present there are plug-ins for the DAP 26 and the RCM Network Remote Control Module available.

Installation

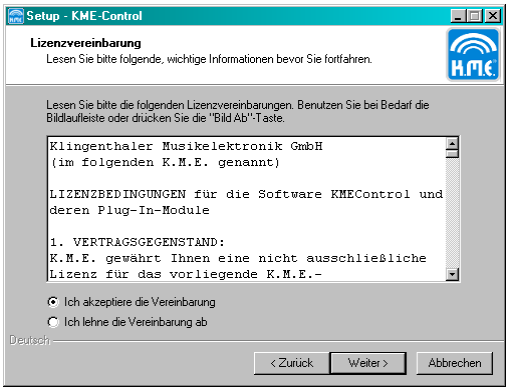
Start the program '*KME-Setup.exe*' which you have received together with the DAP 26 (Installation CD) or from the Internet download.



Select the installation language (German/English) and press *'OK'*!

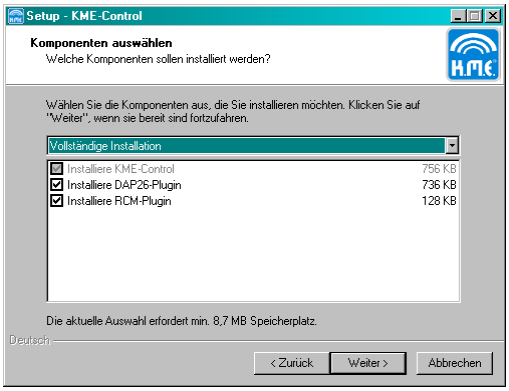


Follow the installation assistant – click *‚Continue>'*.

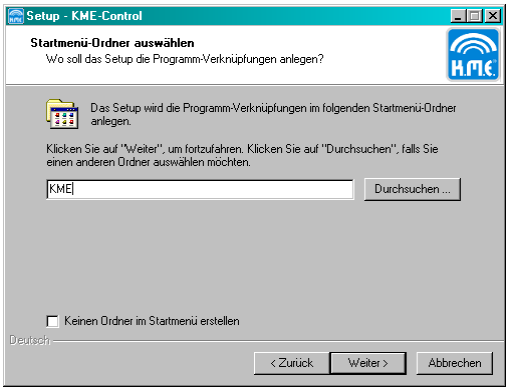


Please accept the licence agreement and click *‚Continue>'*.

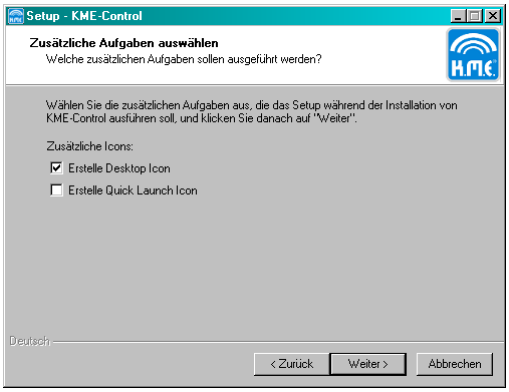
Select an installation folder in your system hard disc. We recommend using the folder suggested by the installation assistant. Click *'Continue>'*.



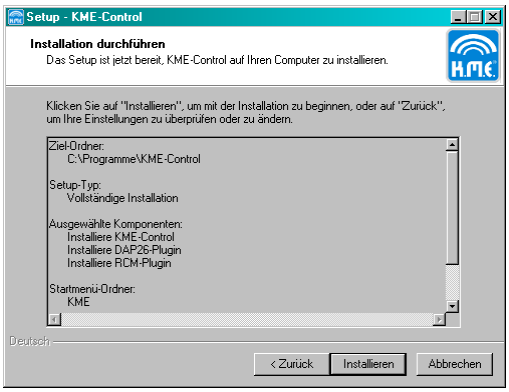
Select the modules you want to install within the mainframe. The modules may vary with different software releases. To work with the DAP 26 you must install the DAP plug-in. You cannot deselect the installation of the mainframe KME Control.



Select the entry in your *‚Start'* Menu. We recommend accepting *‚KME'*. Click *'Continue>'*.



Select if you want to create a Quick Launch icon or an icon on your desktop.

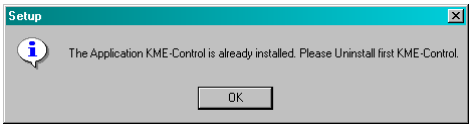


In this window you can check all installation details before you proceed. If everything is set up right, click the *'Installation'* Button to start the software installation on your computer.

After the installation has finished successfully, this window is shown. You can select if you want to start KME Control now by clicking the *'Finish'* Button. You can also deselect the checkbox if you want to start KME Control later.

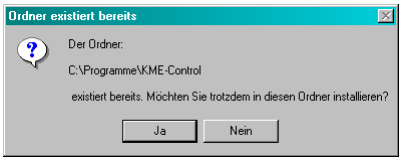
Installation Problems:

• Program cannot be installed, following window appears:



De-install an older version of KME Control first. Select *'Start' 'Programs' ,KME'* (or your installation folder) *,Remove KME Control'* and follow the de-installation assistant.

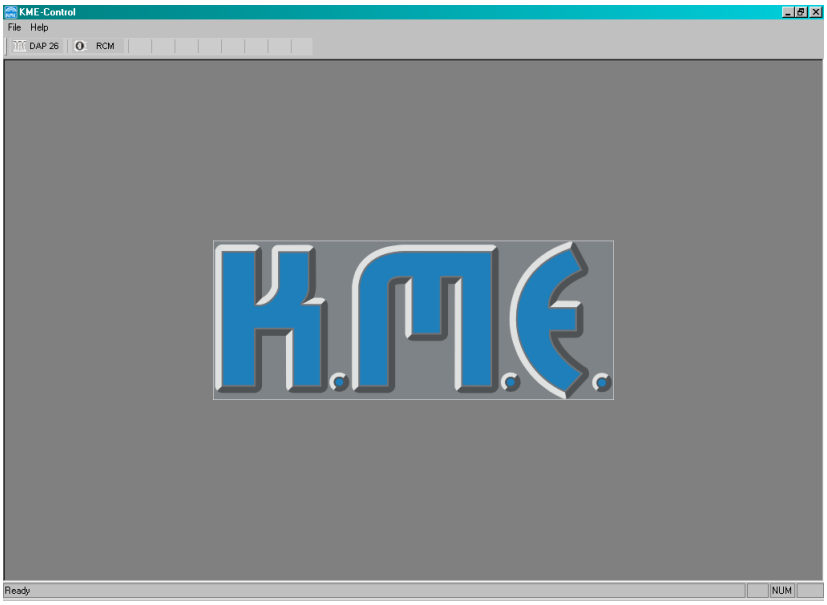
Close KME Control first before trying to install a new plug-in or update. We also recommend closing all other programs during an installation process of new software.



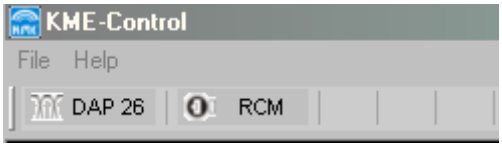
If you receive this message you can select *,Yes'* without caring about your user presets stored in this folder to be deleted. They will not be deleted, even by de-installation of the software. To erase the software completely from your computer, this folder has to be deleted manually using the Explorer window. All of your user data will be lost.

Software operation

Start KMEControl.



On the mainframe window you find the installed plug-ins in a bar below the main menus. In this example the plug-ins DAP 26 and RCM are installed.

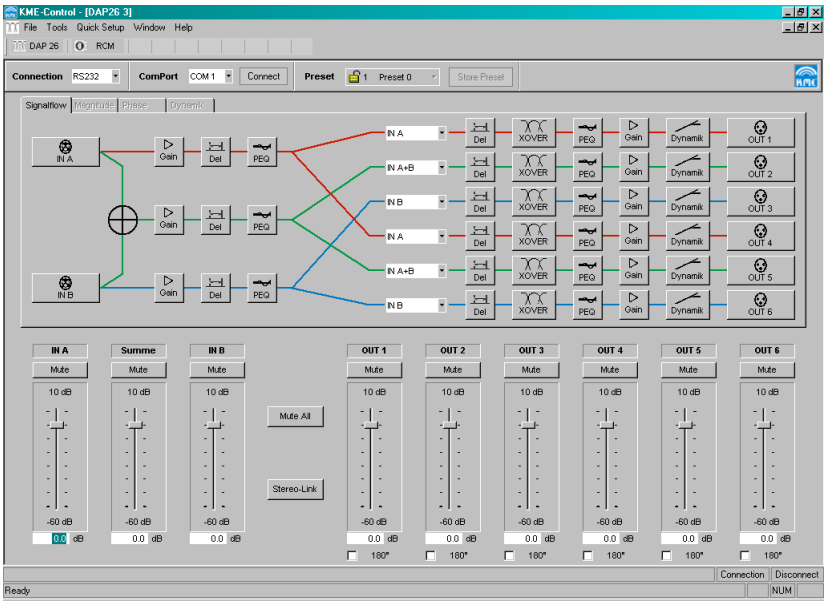


Clicking on the DAP 26 symbol the plug-in will be loaded into the mainframe window. The plug-in may be activated more than once, in the actual release you can select up to four active windows (limited to screen capabilities).

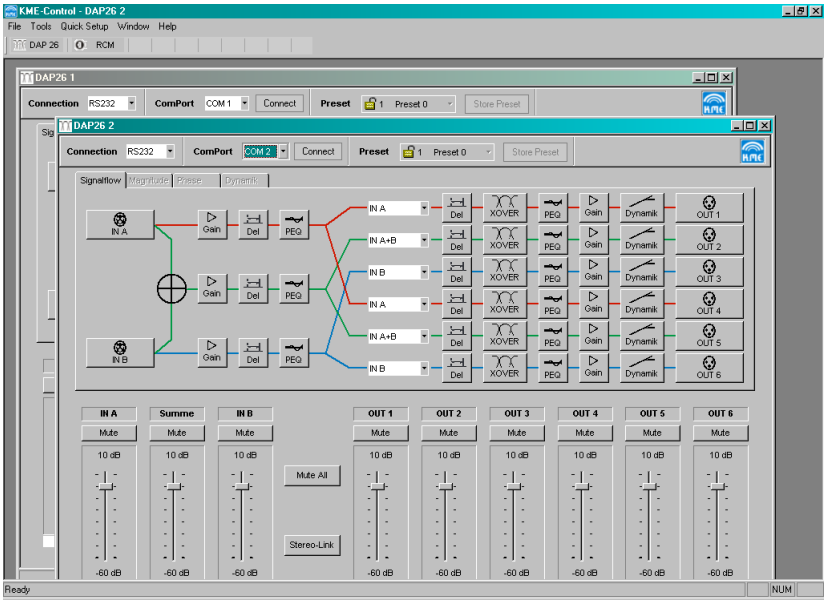
In RS 232 mode you can connect up to four DAP units to your computer (if enough COM ports are present).

By adding the CAN Bus option the user is able to use up to 63 hardware units on one host computer. Refer to the CAN Bus part of this manual for additional information.

The mainframe window with loaded DAP 26 plug-in:

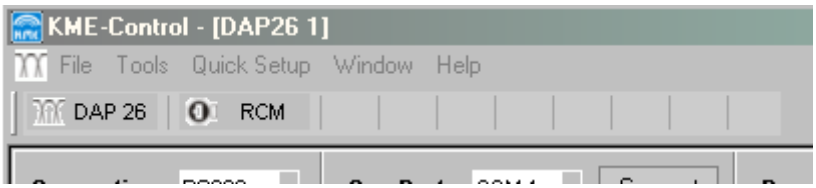


Example: Connecting two DAP 26 on different COM ports:



Functions in the main Window

Menu bar:

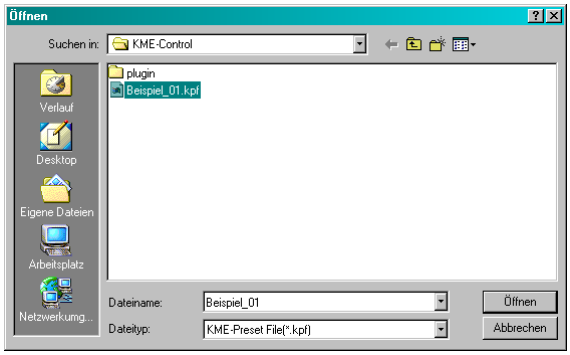


File

Open Preset

Opens a preset from a local drive of your computer. You are being asked if you want to overwrite the actual (which means the preset inside the active window) preset. If you are not sure that you want to discard your last changes, select *'No'* and save your preset to disc using *'Save Preset'*.

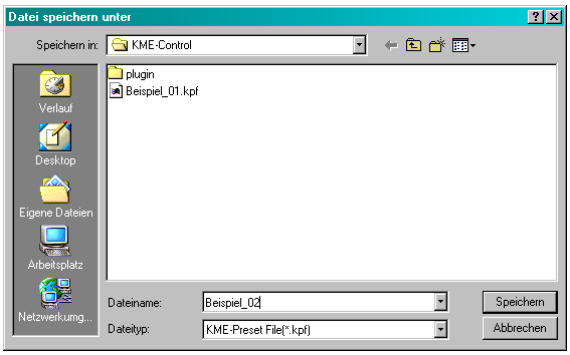
If you choose *,Yes'* the *,Open'* dialogue window will be opened. Navigate to the location of the preset file you want to load and click *'Open'*. The only files to be loaded are *.KPF which means K.M.E. preset file.



Select the preset you want to load and click ,*Open*'.

Save Preset

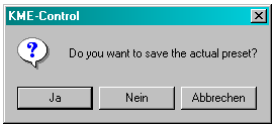
Saves your actual preset to a disc of your computer. You can send this preset file to the technical support later or archive it for future use.



Select a file name for your preset that shall be saved, and click *‚Save'*. We recommend saving presets to the main KME Control installation directory. During upgrades and de-installations of KME Control this preset files will not be deleted!

Close

Closes the active DAP 26 plug-in window. A dialogue appears to ask if you want to save your last changes to the preset.

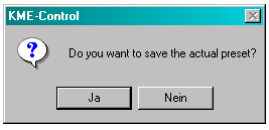


Selecting *‚Yes'* opens the *‚Save'* dialogue, *‚No'* closes the plug-in window and *‚Cancel'* returns to the plug-in window without changes.

Exit

Terminates the KME Control mainframe. You will be asked if you really want to exit.

Selecting *‚No'* returns to the program, *‚Yes'* terminates the program. If there are data unsaved you will be asked to save or discard them.

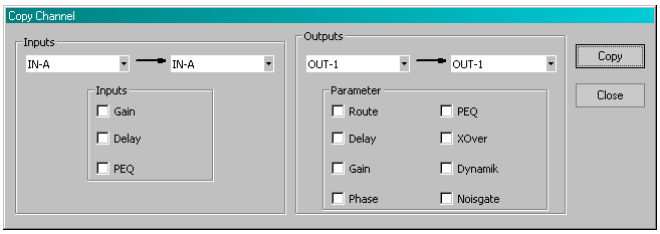


If you are not sure that you did save your changes select *‚Yes'* and use the *‚Save'* function.

Tools (some tools are only activated in online mode)

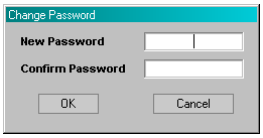
Copy Channel Setup
Following example shows the usage of this clever tool:

Assuming you have created an input EQ curve and a master delay setting in Channel A and you want to copy the same settings to channel B – just select *'Input A'* → *'Input B'*, select the modules you want to copy (here: delay and PEQ) and click the *'Copy'* button – ready. Same procedure also works for the outputs.



Set Password (only in online mode)

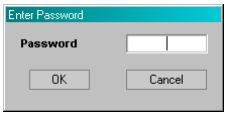
The tool *'Set password'* protects your DAP 26 from programming by other persons. This may be useful for a rental system to prevent the customer from changing the settings and possibly damaging parts of your PA system. Setting a password is quite easy: Go online to the connected DAP 26 first and then select *'Set password'*. The following window should appear:



Enter a 4-digit (only numbers are accepted) password in the field *,New password'*. Enter the password again into the field *'Confirm password'* and press *'OK'*. Your DAP 26 is now password-protected.

When trying to connect the DAP 26 to the computer again you are asked for the password to enter. Without this password you can not change any setting in your DAP.

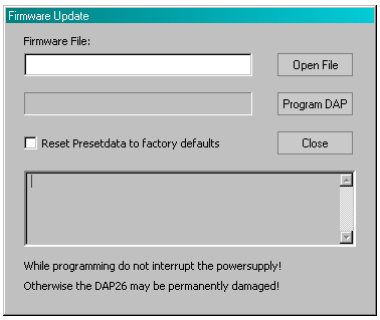
Changing or deactivating the password is just as easy: Connect the DAP to the computer and activate online connection. You are asked for the password. Enter the password and select *'Set password'* in the menu. Enter NO password in the field 'new password' and click *'OK'*. The password will now be deleted.



Enter NO password in the field *'New password'* and click *'OK'*. The password will now be deleted.

Attention!
If you forget the password there is NO chance to re-activate the unit unless you send it in to the K.M.E. support for factory re-initialisation. All user data (presets,…) inside the unit will be lost afterwards.

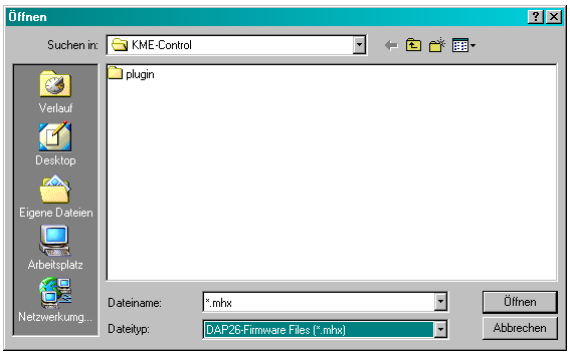
Firmware Update
For future upgrades of your DAP 26 you can use the firmware update which renews the DSP software inside the unit.



The firmware update is easy to do. If you have received a new firmware file with an e-mail from the K.M.E. support or by download from the Internet you can program it to your hardware using the *'Firmware update'* procedure from the main menu. If there is a firmware update manual included to the firmware download please read this file first and follow the manual whilst doing the update procedure.

Attention! The unit must be connected using RS 232 COM port. Firmware update is NOT possible by using CAN connection.

Click *'Open File'* and navigate to the location of the new firmware file (**.mhx*).



Klick *'Open'* and then *'Program DAP'*. Do EXACTLY the action the program is asking you to do. Transmitting the firmware to the DAP may take several minutes.

Attention!
Do not interrupt the mains power and/or the serial connection between the DAP and your computer during the update process. Avoid running unnecessary programs on your computer during the update.

After the DAP has received the complete new firmware it does the update procedure and the new functions will be ready after powering the unit off and on again.

Remote Watch (only available in online mode)
The function module ‚remote watch' shows the front of a remote located DAP 26 with its meters and output gain pots in real-time. In this mode the user may control input/output levels or compressor/limiter thresholds from the remote location (only useful when connecting the units by CAN Bus for distances up to 400 meters).

Quick Setup
The menu *‚Quick setup'* contains pre-prepared configurations for various PA applications. They include routing and crossover standard settings for all channels. This may save time creating new set-ups. To load a set-up from the list just click on it. You are being asked if you want to overwrite the actual preset.

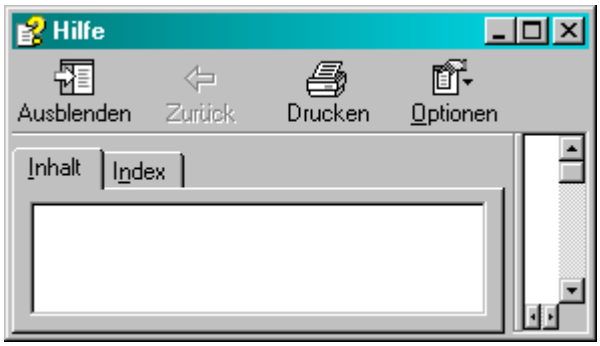
Select *‚No'* if you want to save your actual preset first. Selecting *'Yes'* loads and initialises the selected set-up. The different quick set-ups are described in the appendix *'Quick Setup'*.

Window
You find window-based commands like '*New Window*', ‚*Cascade*', ‚*Tile*' and ‚*Arrange Icons*' in this menu. Use them to change the style of display on your PC screen.

Help

Help Topics

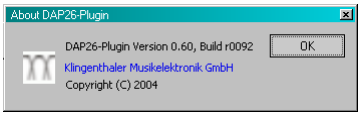
This menu opens the help window containing a quick reference to most program functions.



You can terminate the help window using the ‚*Close*' button on the top right corner.

About DAP 26

The ‚About' function shows the version number and revision of the DAP 26 plug-in. This information may be required contacting the K.M.E support.



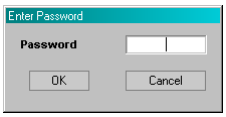
Click *'OK'* to close this window or click the blue link to visit the K.M.E. homepage (requires active Internet connection).

Going 'Online' (using RS 232 as an example)

(assuming the communication line RS232 is already connected and working)

Set the ‚Connection' field of the DAP 26 plug-in to *'RS232'* and the *'Com Port'* field to *'COM1'* (or the COM port your DAP 26 is connected to). Click *'Connect'*.

If you did set a password in a previous session you will be asked for it..



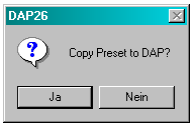
Enter the 4-digit password and click ‚*OK*' to start the connection.

After entering a wrong password you will get a notice window for two times. You have three trials, after that you need to restart the software and initialise the communication again. If you forgot the password you will have to send the hardware unit to the K.M.E. support for factory re-initialisation.

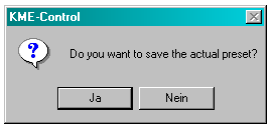
Please refer also to the chapter *‚Set password'* of this manual!

If everything is OK with the communication the following window will appear, showing that data is exchanged between the DAP 26 and your PC.

If the connection is set-up, you are being asked if you want to copy the actual preset (which you probably just made in your PC) to the DAP 26. Click *'Yes'* if you want to do so.

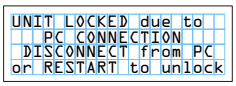


If you select *‚No'* you can load a preset from the DAP 26 to make changes. Before any data is loaded from the hardware unit to your PC you are being asked if you want to save your actual work.



Selecting *‚Yes'* opens the *‚Save'* dialogue, selecting *‚No'* starts the transmission of the presets from the DAP 26 to the PC. You can select the number of the preset to change.

While you are in online mode you cannot change any settings in the DAP 26 by hardware. The unit is locked, the display shows:

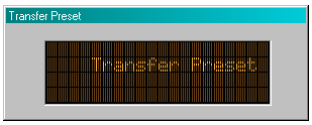


To make settings on the hardware unit you have to go *‘Offline'* pressing the *‘Disconnect'* button.

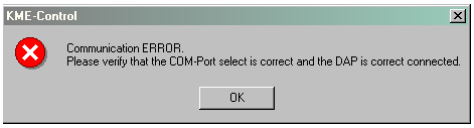
Clicking into the *‚Preset'* list box allows the user to load another preset into the software plug-in by selecting one out of the list.

The selected preset will be loaded.

When you have made your changes to the preset you can save the preset in the hardware unit by clicking the ‚store preset' button. The software sends the preset back to the DAP 26 and stores it in the internal memory.



When there is a communication problem between the DAP 26 and your PC the following window will be displayed:



There might be one (or more) of the following problems:

- **the DAP 26 is switched off**
  Solution: switch ’on’ the DAP you want to communicate with

- **the DAP 26 is not connected to the selected COM port**
  Solution: check the connection between the DAP 26 and your computer. Did you use the correct COM port? Is there any software to be installed using a USBtoRS232 converter on systems without ‘native’ COM ports (refer to the manual of the specific converter).

- **COM port is used by another application**
  Solution: Some programs, especially serial MIDI device drivers block COM ports. If possible deactivate all programs you do not need at the time you want to use your computer programming a DAP 26. Try using another COM port or use a USBtoRS232 converter connected to the USB port of your computer.

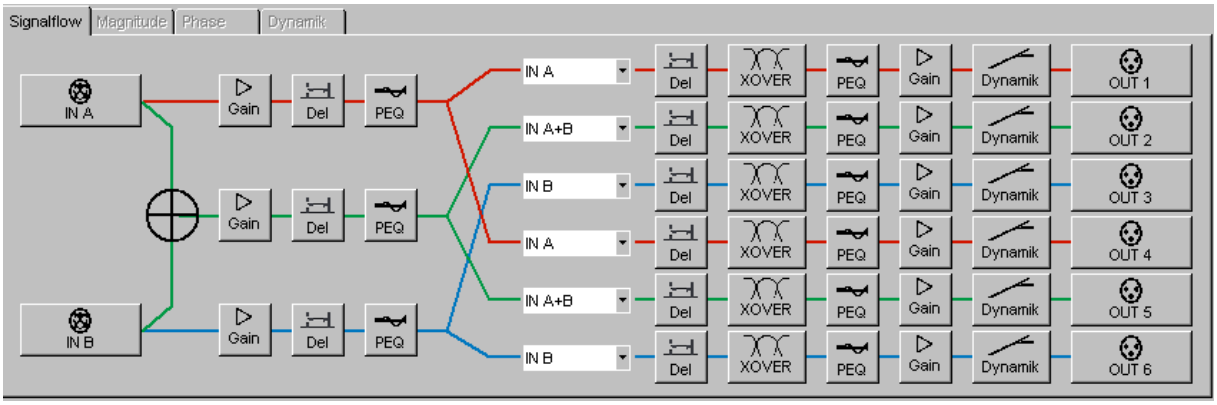
- **You are using the wrong cable**
  Solution: Do only use cables according to the K.M.E. specification to avoid communication errors or even damages of both the DAP 26 or your computer.

- **You are using the wrong communication port on the DAP 26**
  Solution: Only use the upper connector labelled ‚RS232/CAN’ for serial communication with a PC COM port. Make sure that nothing is connected to the lower port in RS232 mode!

- **The DAP 26 is not in RS 232 mode (LED does not light)**
  Solution: Operate the switch beside the connectors to activate RS 232 mode. The yellow LED must light up if you want to use RS 232 communication.

- **There is another problem...**
  Solution: Contact the K.M.E. support.

Signal Flow



The register tabs can be accessed out of all functional modules. The tab *'Signal flow'* includes the routing matrix and the activation of all other audio modules by clicking.

Magnitude

The tab *,Magnitude'* is active within the modules *'Equalizer'* and *'Crossover'* and shows the frequency response of the selected channel affected by crossover networks and / or filters. This tab includes drag-and-drop functionality with the mouse.

Phase

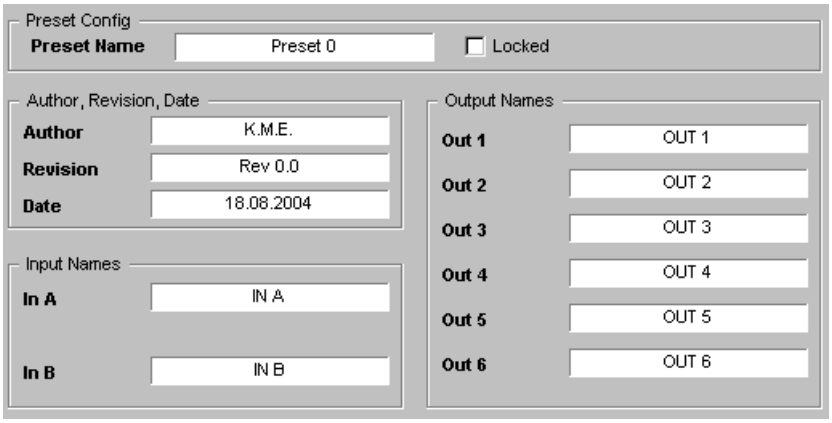
The tab *,Phase'* is active within the modules Equalizer and Crossover and shows the phase response of the selected channel affected by crossover networks and/or filters. Drag-and-drop is deactivated on the *'Phase'* tab.

Dynamic

The register tab *,Dynamic'* is activated in the dynamic processor module only. It shows the characteristic of the selected compressor/limiter function.

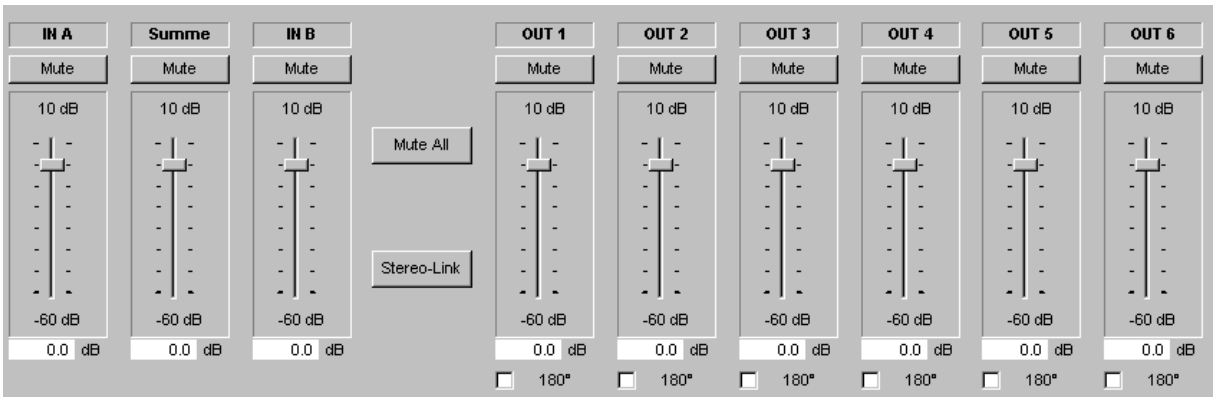
Functional units

In/Out



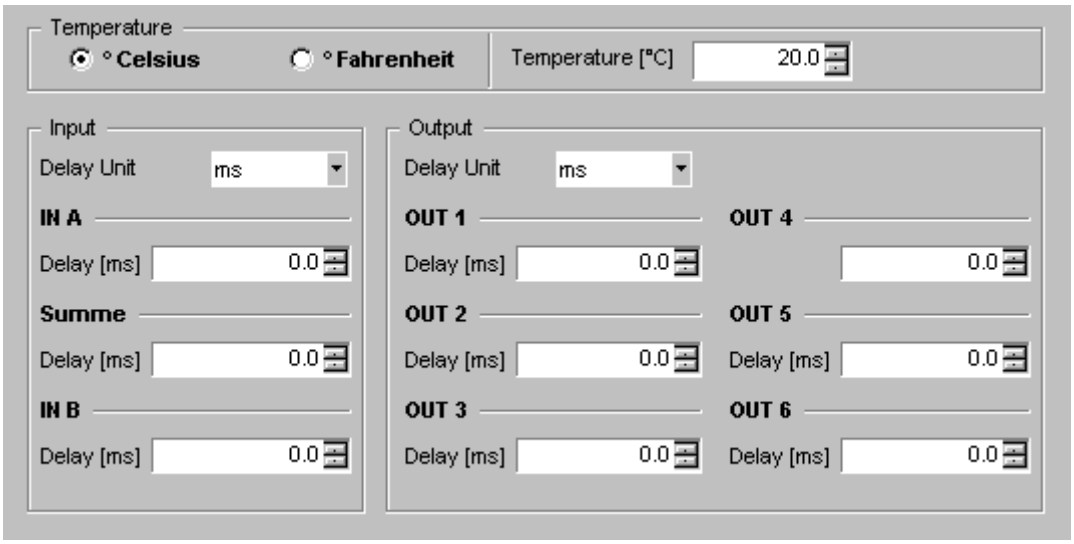
In this window the user can rename the input and output lines of the processor or name the actual preset and add information about author/date. The values are stored in the hardware unit and can be read out by other users.

Gain



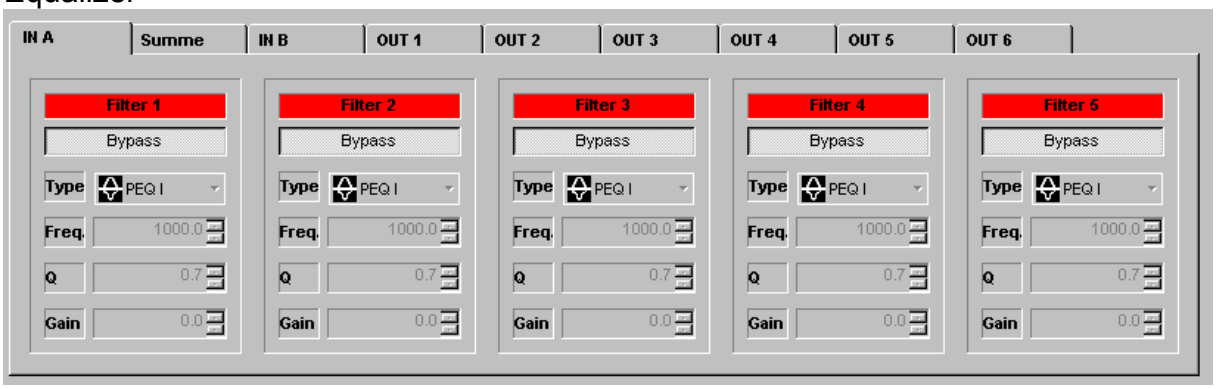
In this window the input / output levels can be either set by mouse, writing the specified gain value in the *'dB'* field or using the cursor keys for fine adjustment of the pre-selected fader. You can operate the *'Mute'* buttons, *'Polarity'* switches and *'Stereo link'* / *'Mute all'* buttons as desired.

Delay



In this window you can set the time delays for all channels. This can either be done by clicking the up/down arrows behind the fields or entering the delay values into the fields. As delay units you can select µ*s, ms, s, cm, m* and *feet.* While the sound velocity is depending on temperature, this field corresponds to the delay units cm, m and feet.

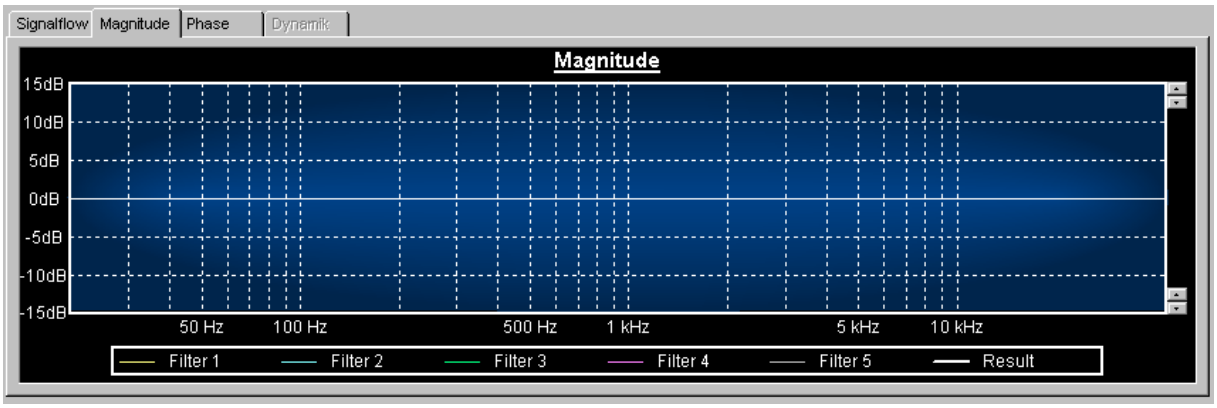
Equalizer



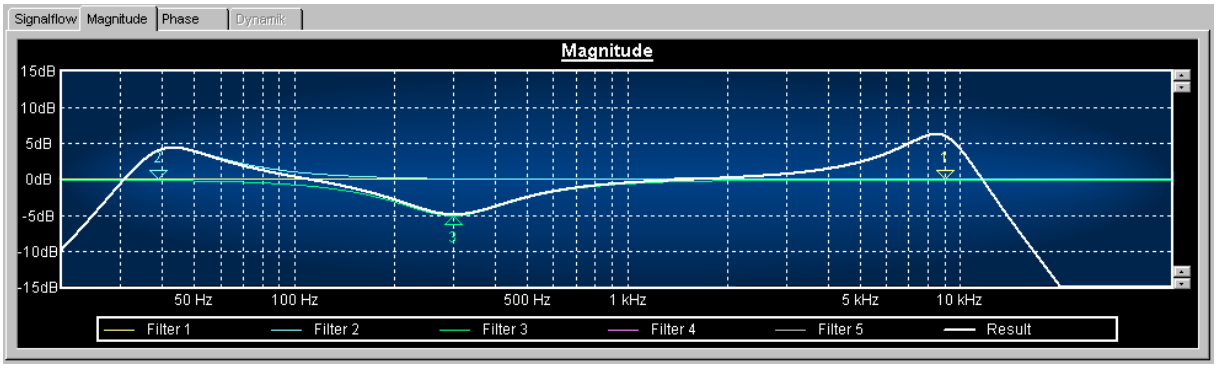
In this window you find 9 register cards where you can make the EQ settings for the corresponding channel. For each channel you may combine any 5 filters of the available filter types. The filter types are described in the chapter ‘filters’. To activate a filter, first select the channel in which you want to add the filter by selecting a register card. Then activate one of the 5 filters by clicking into the grey *‘Bypass’* field below the red field labelled *‘Filter X’*. This field will change to green to signalise the filter is working.

Select in the field ‘Filter type’ the filter algorithm you want to use and adjust the values for *‚Freq.’*, *‚Gain’* and. *‚Q*’.

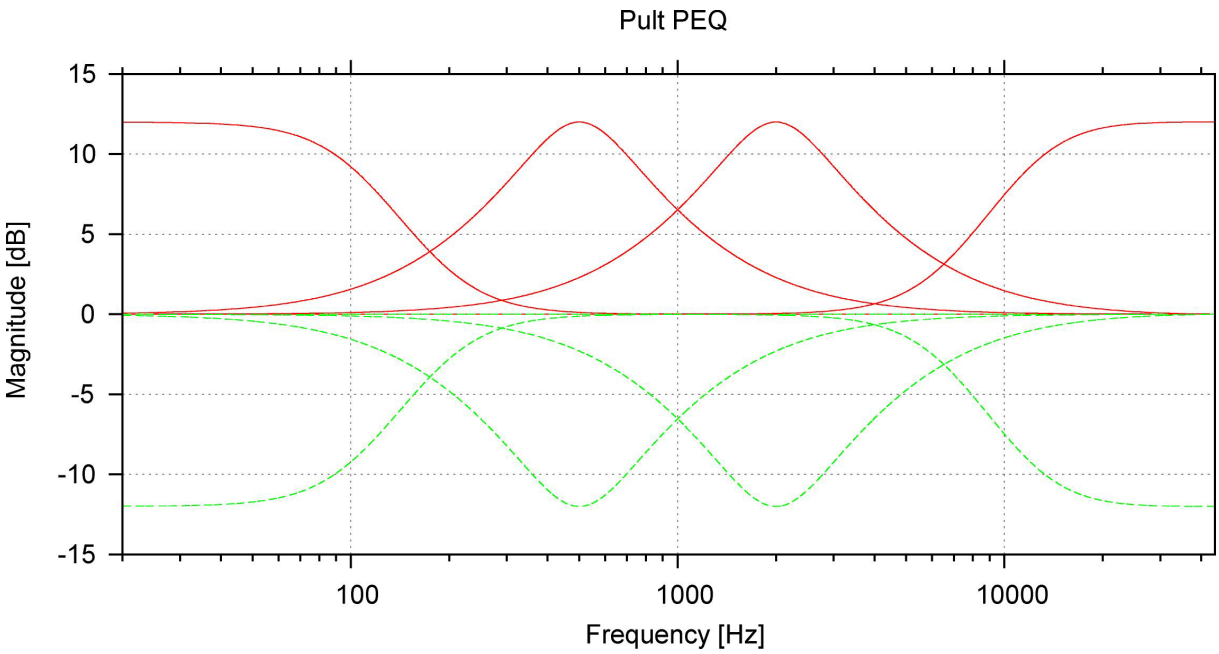
Select the register card ‚Magnitude’ to view the influence of the activated filters to the frequency response of the selected channel.



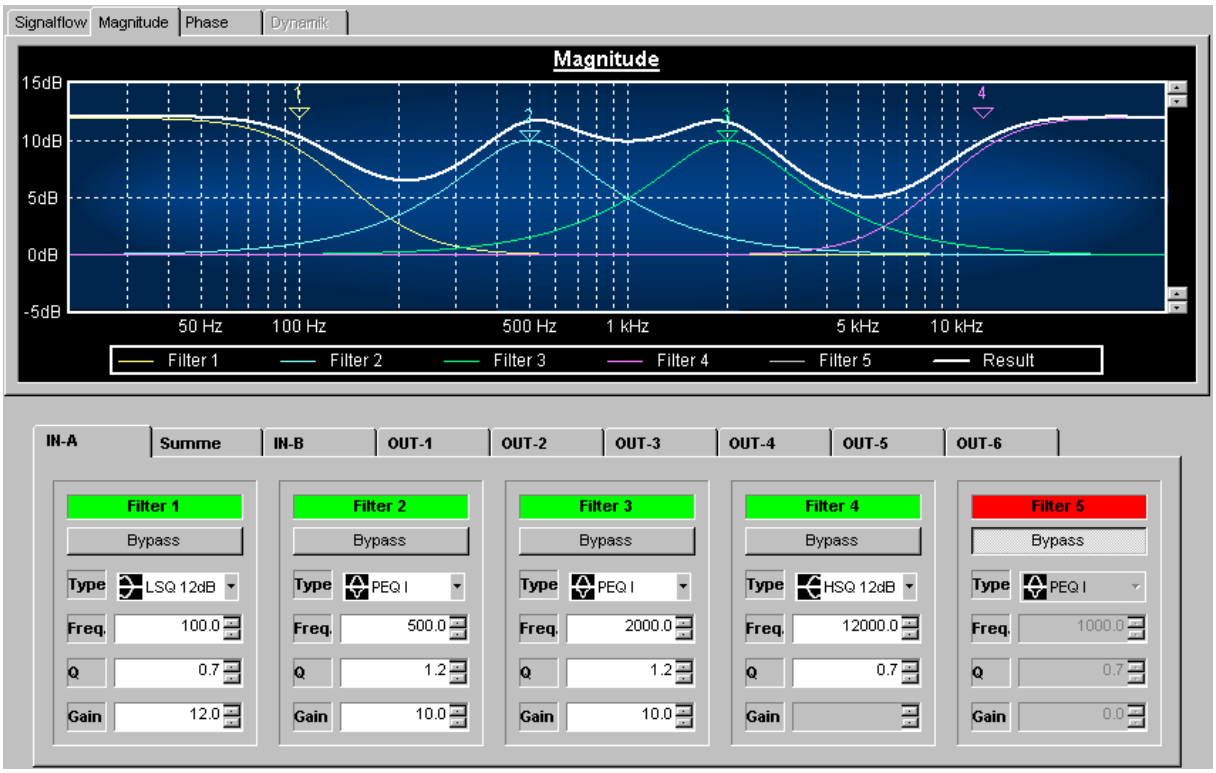
The coloured triangles are named with the specific filter number. It is possible to move this points with the mouse and monitor the acoustic changes in real-time after releasing the mouse button when the DAP26 is online.



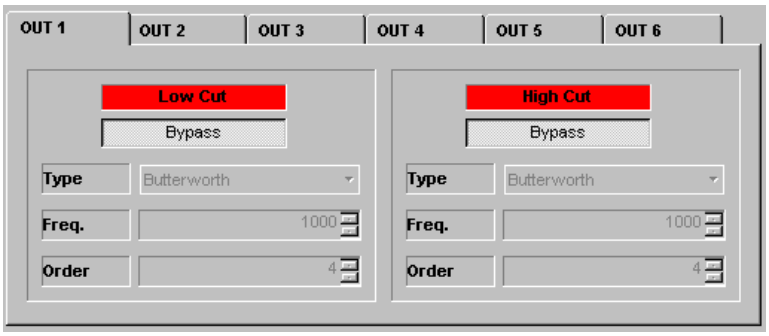
Here is an example how to create a “classic”, mixing desk- type equalizer using the filter banks of the DAP 26:



Filters 1-4 are to be set to the values specified below. The remaining filter could be used as a Low- Cut i.e. at 80 Hz.



XOVER

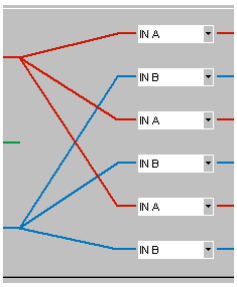


In this window you find 6 register cards for setting up the crossover functions of the output channels. Each filter bank consists of a ‘LowCut’ and a ‘HighCut’ type filter which can be activated and programmed to your needs.

The set-up of the crossover section shall be described using an easy example:

Assuming that you want to set output channels 1&2 for the bass and 3&4 for the mid/high systems.

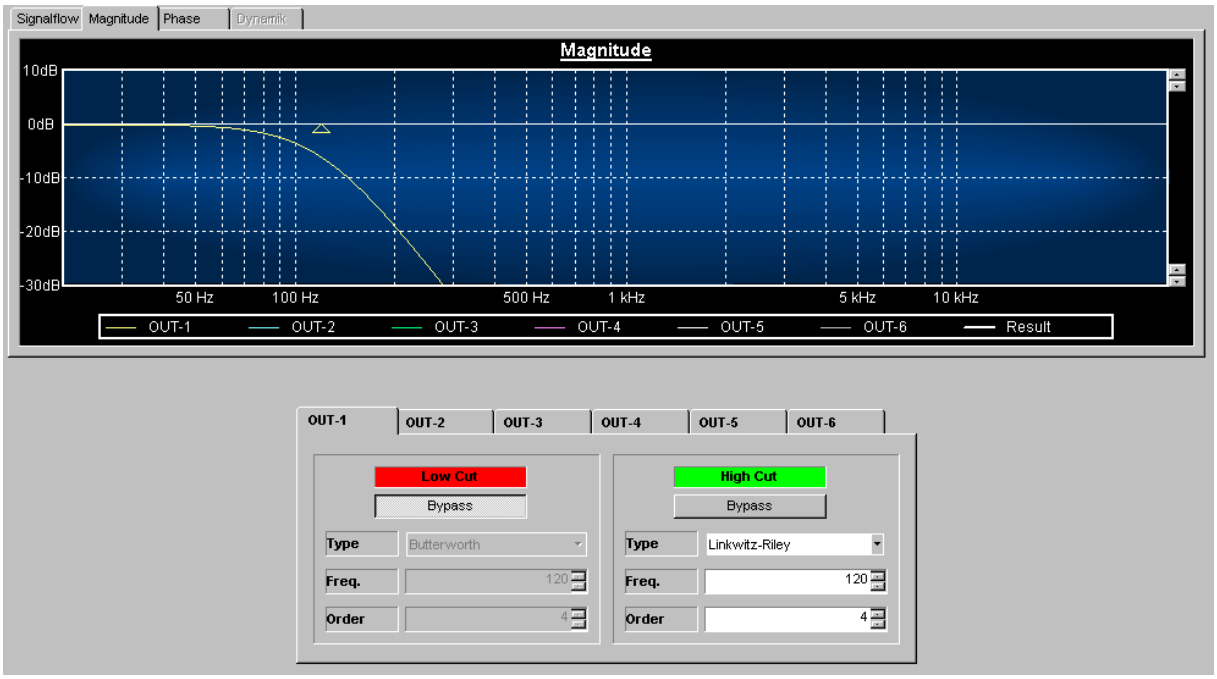
Prior to the crossover adjustment you already set the correct signal flow in the routing matrix (see below).



To assign an output to a “bass” channel simply activate the *‚High Cut’* Filter by clicking into the grey *‚Bypass’* button below the red control field labelled *‘High Cut’*. This field will change to green when the filter is activated.

We recommend using the filter type *‘Linkwitz- Riley’* for any standard crossover applications. For this example set the filter frequency to 120 Hz. This can be done by entering ‘120’ into the *‘Freq.’* field or by using the mouse in the graphical *‘Magnitude’* display clicking on a curve and dragging it to the correct position. This operates in real-time when the DAP 26 is online.

This example would look in the software like this:

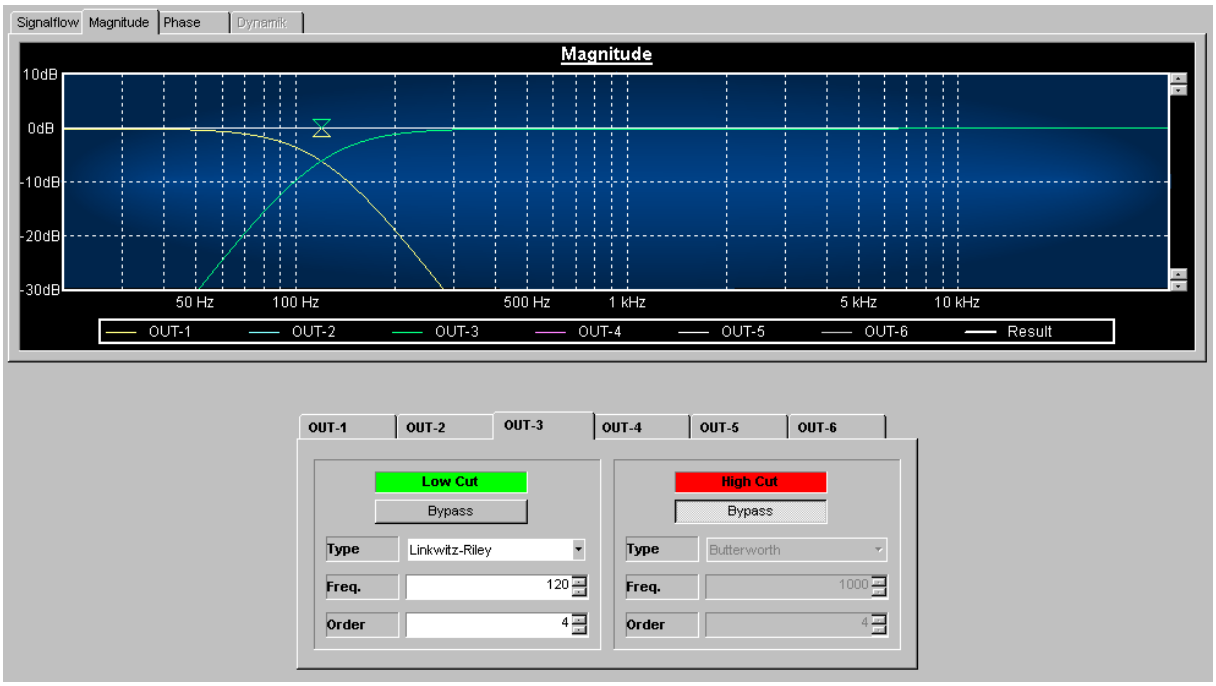


As you can see the output channel 1 contains only the bass frequencies below 120Hz.

The settings may be copied to channel 2 using the *‚Copy Parameter'* dialogue or setting it manually.

To operate channels 3&4 as Mid/High outputs proceed as described above but use the *'Low Cut'* Filter instead using the same parameters.

This setting would look like this:



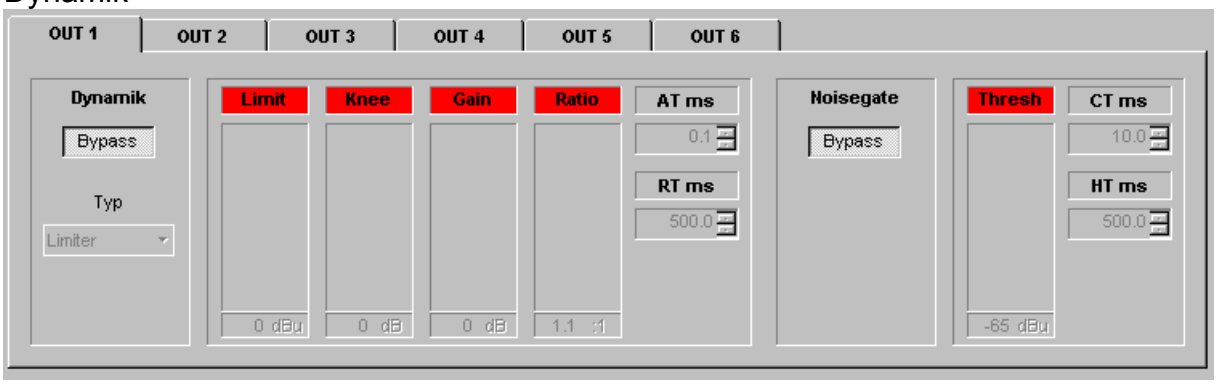
As you can see the output channel 1 contains only the bass frequencies below 120Hz.

The settings may be copied to channel 4 using the *‚Copy Parameter'* dialogue or setting it manually.

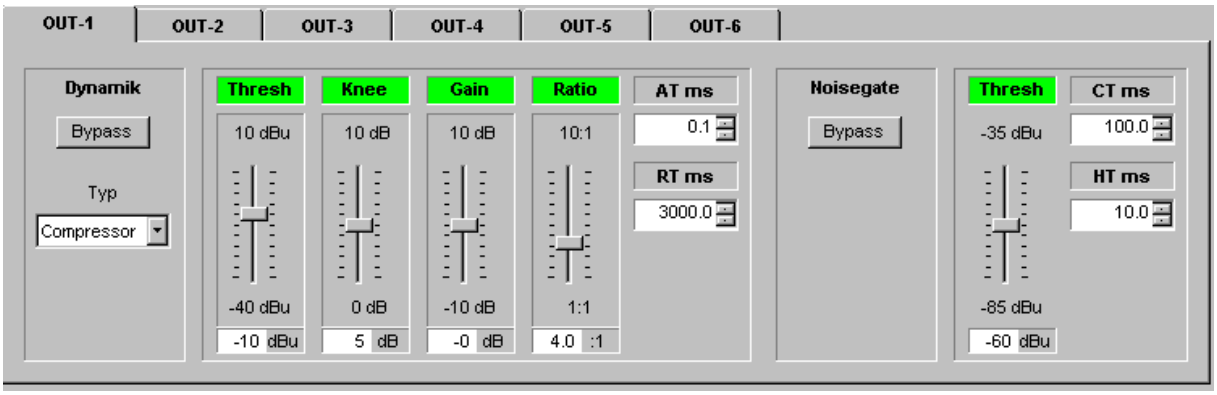
→ The same result you may obtain much easier by using the *'Quick Setup'* dialogue (here: '2 Way Stereo')!

Attention!
For inexperienced users we do not recommend „experimenting" around with the crossover section when you are online with the DAP 26 and a sound system is connected and running. In this case all settings are transmitted to the DAP in real-time and a 'wrong' filter may damage the speakers.

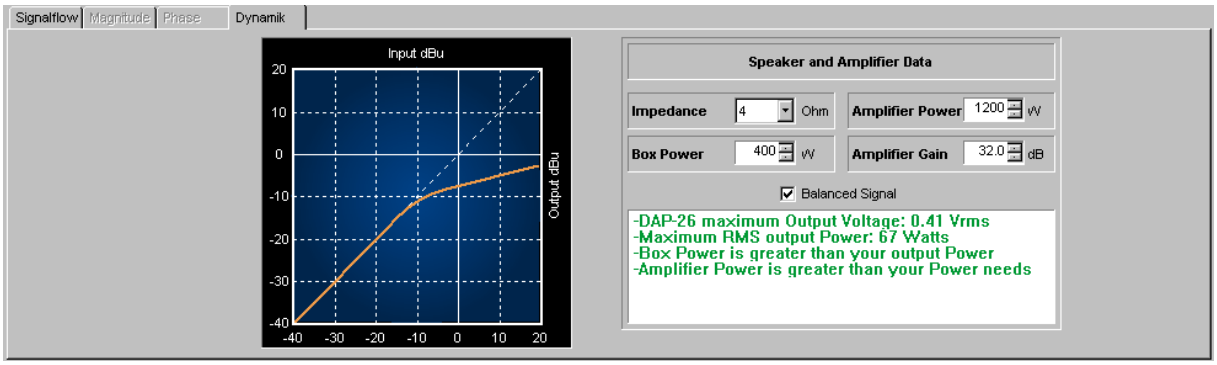
Dynamik



In this window you can activate the dynamic processing units of all output channels. To activate a dynamic processor simply select the register card of the channel you want to process and click the grey *'Bypass'* button. The red fields will change to green when the processor is activated.



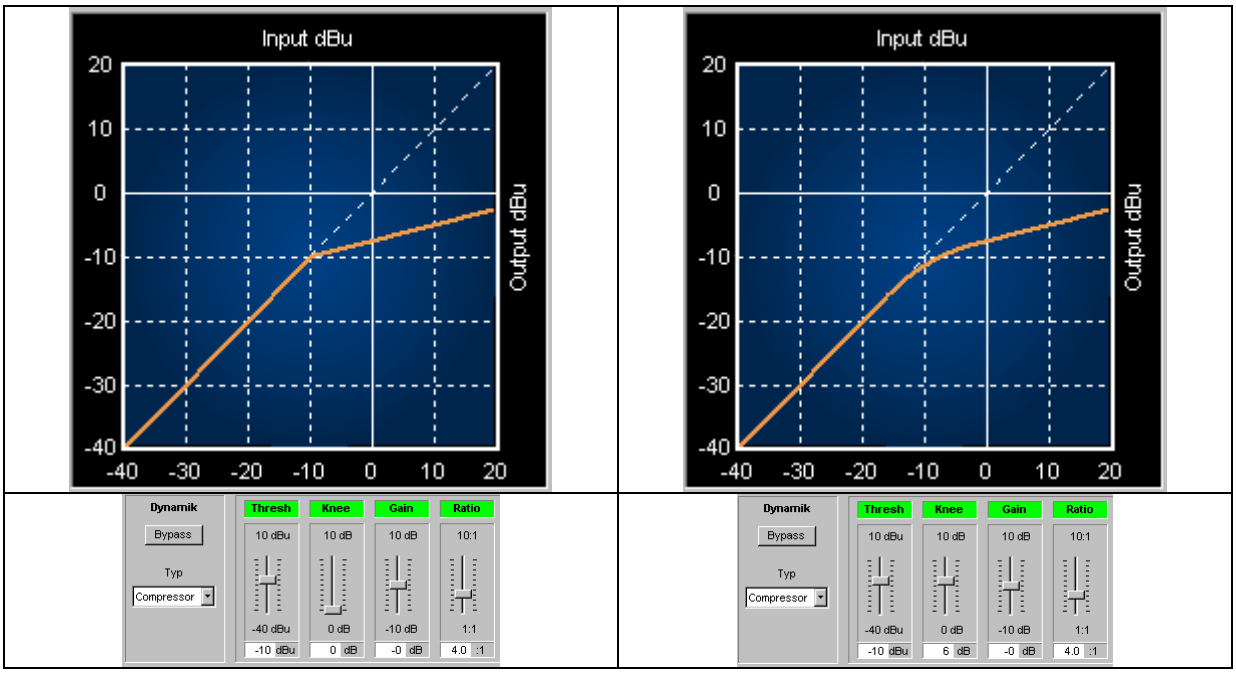
The *‚Dynamic'* Window displays the response of the selected dynamic processor and includes a simple but informative level calculator.



In the following some set-ups together with the corresponding curves are shown:

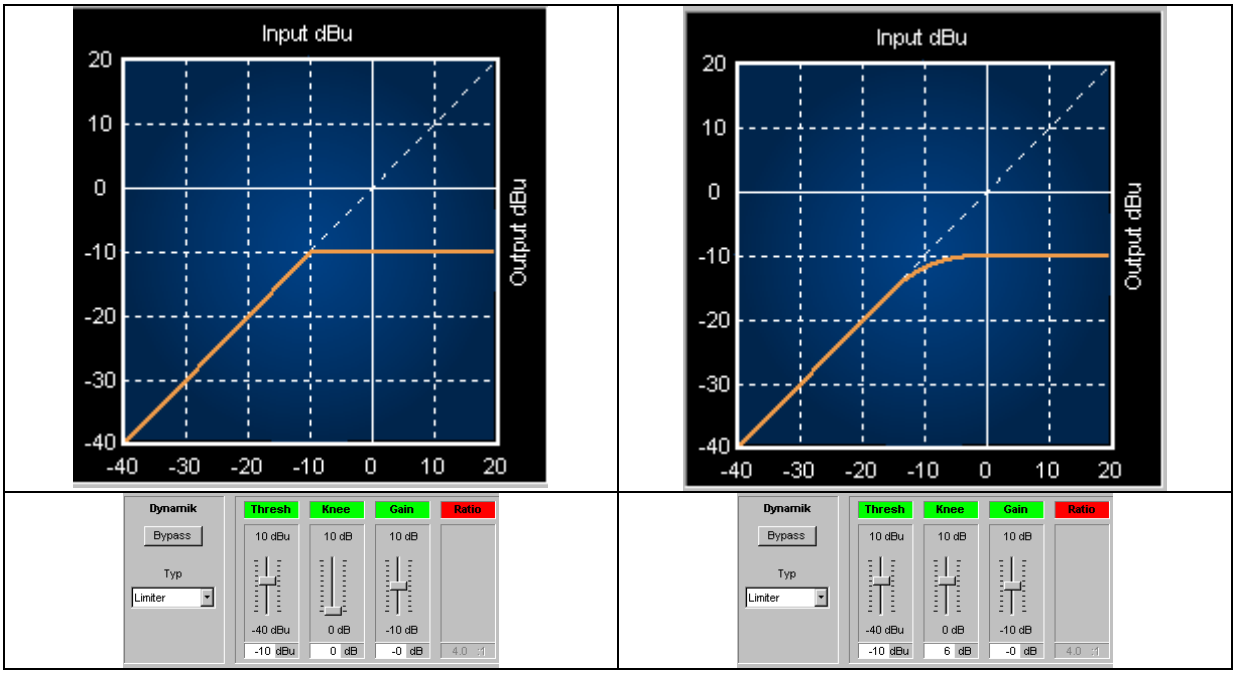
a) Compressor

The compressor behaves linear up to the adjusted *‚Threshold'* value. If this value is reached the compressor begins to control the level according to the compressing *'Ratio'* selected. If the ratio is i.e. 4:1 then the level has to increase by 4 dB to allow the output increasing by 1 dB. This is the *'compression'* mentioned. With higher ratio settings, the compression will be more 'audible' (which must not be negative at all).
The *'Knee'* value describes the point where the compression starts. A knee value of 0 starts the compression exactly at the threshold level. A higher knee value allows to start compression more softly, normally less audible.



b) Limiter

A limiter describes a compressor with a compression ratio of 1:infinite what does mean that no level above the threshold is allowed to pass. Limiters are used for maximum protection of speaker components or maybe for securing maximum sound pressure levels prescribed by law. The *'Knee'* value is comparable with the compressor too. Higher knee values allow to start limiting more softly, normally less audible.

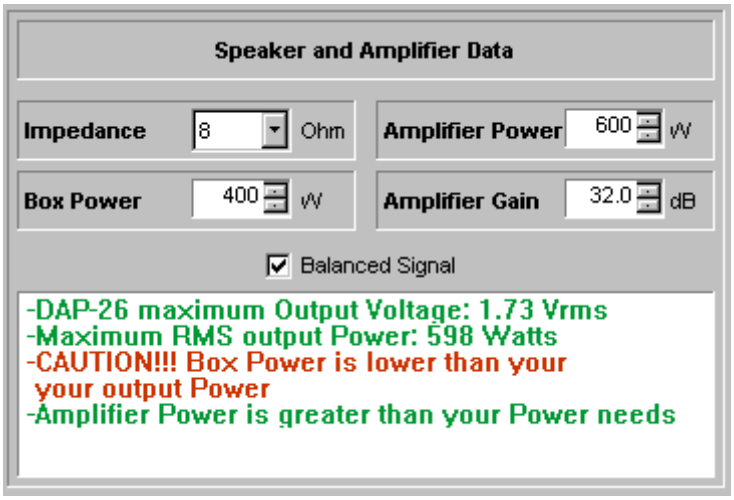


Attack Time
Release Time

This time-constants show the speed of the regulation process inside the compressor / limiter algorithms. A longer *'Attack'* time will let some peaks pass before compression / limiting occurs which may increase the average SPL level while a short attack time will give more overload protection to the components. The *'Release time'* should be adjusted to the program material used.

Speaker and Amp Parameter

In this window you find a level / power calculator.

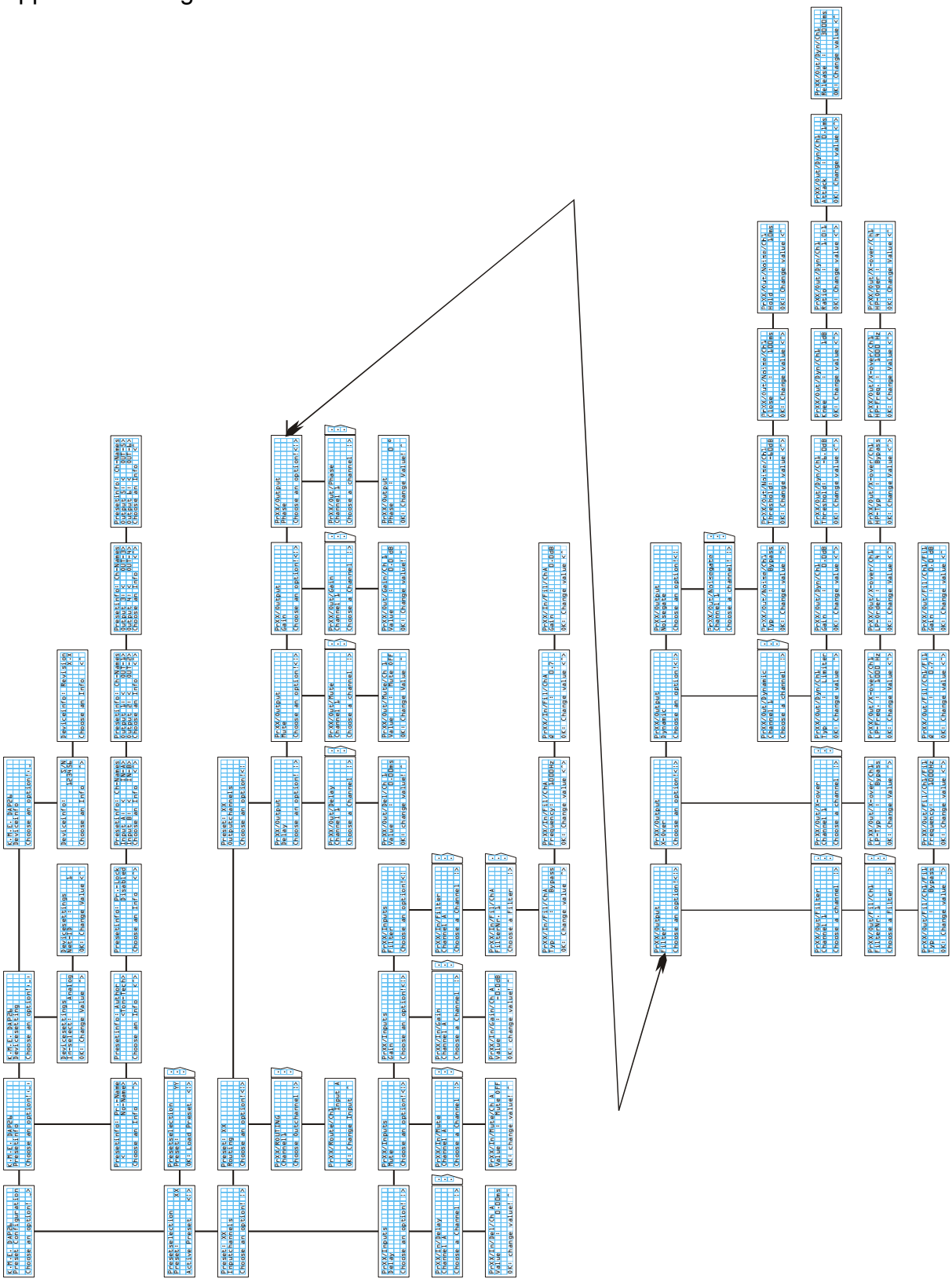


The values entered in this window do not affect the outputs at all but give useful information about the correct threshold level in the dynamic section together with the output level of the selected channel.

c) Noisegate
The noise gate can be activated by clicking into the grey *,Bypass'* field. The threshold slider will occur and the control field will change the colour to green when the noise gate is activated. The operation is easy – just set the threshold level (the minimum sound level above i.e. disturbing background noise). All audio material with a level below the threshold value will be faded out to silence, audio material above the threshold will not be processed.

The parameters ‚*Hold Time*' und ‚*Close Time*' affect the regulation process. '*Hold Time'* describes the time the unit „waits" before fading out signals below the threshold level and the *‚Close time'* describes the speed of the fade-out. Set this constants to taste depending to the program material transmitted.

Appendix – navigation structure on the hardware unit



Appendix – Technical Data

	Technical Data	**DAP 26 / 96**
Inputs	Analog inputs	2 (XLR)
	Input impedance balanced	20 kOhm
	max. input voltage	12 / 18 dBU
Outputs	Analog outputs	6 (XLR)
	Output impedance balanced	130 Ohm
	max. output voltage	12 dBU
Processor	DSP	2 x 32 bit floating point, 100 MHz clock
	Maximum Ground delay	0,7 ms
	Sampling	24 bit / 96 kHz
	converters	128 x Oversampling
	Digital input	AES/EBU / SPDIF with
		Format-/ Sample rate converter
Dynamic range	Analog Input to Output	>108 dB (A)
Distortion (THD)		< 0,001%
Preset Memory	User presets	32
Software	for PC mit	Windows 2000, XP
PC connection		serial (RS 232) 9 pin
details	displays	8-digit LED chains for inputs and outputs
		backlighted LCD- Display
	knobs	Navigation pad, mains switch, Gain pots
	Special features	Remote control using RS 232 or CAN Bus
Power	Switched mode power supply	90 - 250 Volt / 50 - 60 Hz
dimensions (mm)		483 x 44 x 330
weight (kg)		5

For your notes:

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