DLM-26

ORDERCODE D2010

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DAP Audio

DAP Audio DLM-26 Product Guide

WARNING

SAFETY INSTRUCTIONS

Every person involved with the installation, operation and maintenance of this system has to:
- be qualified
- follow the instructions of this manual

Before you initial start-up, please make sure that there is no damage caused by transportation. Should there be any, consult your dealer and do not use the system.

To maintain perfect condition and to ensure a safe operation, it is absolutely necessary for the user to follow the safety instructions and warning notes written in this manual.

Please consider that damages caused by manual modifications to the system are not subject to warranty.

This system contains no user-serviceable parts. Refer servicing to qualified technicians only.

IMPORTANT:

The manufacturer will not accept liability for any resulting damages caused by the non-observance of this manual or any unauthorized modification to the system.

- Never let the power-cord come into contact with other cables! Handle the power-cord and all connections with the mains with particular caution!
- Never remove warning or informative labels from the unit.
- Never use anything to cover the ground contact.
- Do not insert objects into air vents.
- Do not connect this system to a dimmerpack.
- Do not switch the system on and off in short intervals, as this would reduce the system's life.
- Do not open this device. Risk: hazardous radiation exposure.
- Do not run the output of any amplifier channel, back into another channel's input.
- Do not connect (parallel or series) an amplifier output with any other amplifier output.
- Only use system indoor, avoid contact with water or other liquids.
- Avoid flames and do not put close to flammable liquids or gases.
- Always disconnect power from the mains, when system is not used. Only handle the power-cord by the plug. Never pull out the plug by tugging the power-cord.
- Make sure you don't use the wrong kind of cables or defective cables.
- Make sure that the signals into the mixer are balanced, otherwise hum could be created.
- Make sure you use DI boxes to balance unbalanced signals; All incoming signals should be clear.
- Make sure that the available voltage is not higher than stated on the rear panel.
- Make sure that the power-cord is never crimped or damaged. Check the system and the power-cord from time to time.
- Avoid flames and do not put close to flammable liquids or gases.

- Before connecting or disconnecting the power cord, make certain the ON / OFF switch is in the OFF position.
- Before switching on or off make certain the sound system's amplifiers are off or turned down: this will avoid signal peaks, which are annoying and sometimes dangerous (particularly for speaker enclosures).
- Avoid installing your equipment very near radio or TV sets, mobile phones, etc., as these can cause RF (radio frequency) interference.
- When connecting the other parts of your sound system, watch out for the so-called "ground loops".
- The best way (even if not always feasible) to avoid ground loops is to connect the electric ground of all the equipment to a single central point ("star" system). In this case, the central point can be the mixer.
- To avoid or solve hum and buzzing troubles, try different combinations of lifting grounds on units that are supplied with ground lift switches or make sure all chassis are connected to earth ground, either through the A.C. power cord ground or by the front panel rack mount screws.
- Before changing your grounds around, always turn your amplifiers down.
- Keep this user's manual for future consultation. Also remember that the crossover will get a better price on the secondhand market if (as well as being in good condition) it has its original documentation and packaging.
- Always operate the unit with the AC ground wire connected to the electrical system ground.
- Do not drive the inputs with a signal level bigger, than required to drive the equipment to full output.
- In system setup, the amplifier's output power must be 50%-100% more than the loaded loudspeakers rated power.
- Please turn off the power switch, when changing the power cord or signal cable, or select the input mode switch.
- Sometimes, when you want to send one signal to more than one amplifier, you should use a signal distributor.
- Extreme frequency boosts in connection with a high input signal level may lead to overdriving your equipment. Should this occur, it is necessary to reduce the input signal level by using the INPUT control.
- To emphasize a frequency range, you don't necessarily have to move its respective sliding control upward; try lowering surrounding frequency ranges instead. This way, you avoid causing the next piece of equipment in your sound path to overdrive. You also preserve valuable dynamic reserve ("headroom")
- For replacement use fuses of same type and rating only.
- Prevent distortion! Make sure that all components connected to the DLM-26 have sufficient power ratings. Otherwise distortion will be generated because the components are operated at their limits.
- Avoid ground loops! Always be sure to connect the power amps and the mixing console to the same electrical circuit to ensure the same phase!
- If system is dropped or struck, disconnect mains power supply immediately. Have a qualified engineer inspect for safety before operating.
- If the system has been exposed to drastic temperature fluctuation (e.g. after transportation), do not switch it on immediately. The arising condensation water might damage your system. Leave the system switched off until it has reached room temperature.
- Repairs, servicing and electric connection must be carried out by a qualified technician.
- WARRANTY: Till one year after date of purchase.

OPERATING DETERMINATIONS

If this system is operated in any other way, than the one described in this manual, the product may suffer damages and the warranty becomes void.
Any other operation may lead to dangers like short-circuit, burns, electric shock, etc.

You endanger your own safety and the safety of others!

Improper installation can cause serious damage to people and property !

Description of the device

Features

The DLM-26 is a professional Digital Loudspeaker Management System:

• Active frequency filter with slopes up to 48 dB/octave split up the audio-signal into different frequency
  bands
• 60 user programs can be memorized
• Up to 630 ms signal delay for the inputs and outputs adjustable
• Both inputs or a sum of both can be split up into a maximum of 6 frequency bands
• Up to 38 frequency bands for fine-tuning the frequency range adjustable
• Lock-function for protecting the program settings
• Phase Invert switch per output
• Delay displayed in milliseconds, meters, feet and frame/second
• Output limiter with adjustable limits and automatic attack and release settings as overload protection for
   your amplifying system
• XLR input and output jacks.

Overview

1) Input LEDs
2) Output LEDs with MUTE-button
3) LCD-Display: To display functions and operating status.
4) Jog-wheel: For adjusting the parameters. Turning the jog-wheel to the right increases the parameter
   value, turning to the left decreases the value.
5) ◄ - Button
6) ► - Button
7) SAVE / ENTER-Button
8) PREV-Button
9) NEXT-Button
10) RECALL-Button
11) Power ON/OFF

4

Backside

12) IEC Connector + Fuse
13) RS232-SOCKET
14) MIDI OUT
15) MIDI THRU
16) MIDI IN
17) 6x XLR Output Socket
18) 2x XLR Input Socket

LED Input Barographs

The input barographs respond to –30dB input and also indicate digital clipping.

These show the input level: -30dB, -20dB, -12dB, -6dB, -3dB, LIMIT, OVER (=CLIP).

In addition, the CLIP lights function both as analog input clip indicators and to show if there is clipping in the digital signal path. If both A & B CLIP LED's flash, but the LED directly below the CLIP does not, this would indicate that the DSP is clipping and not the analog input circuitry. This situation would most likely be caused by excessive digital gain or EQ in one or more outputs.
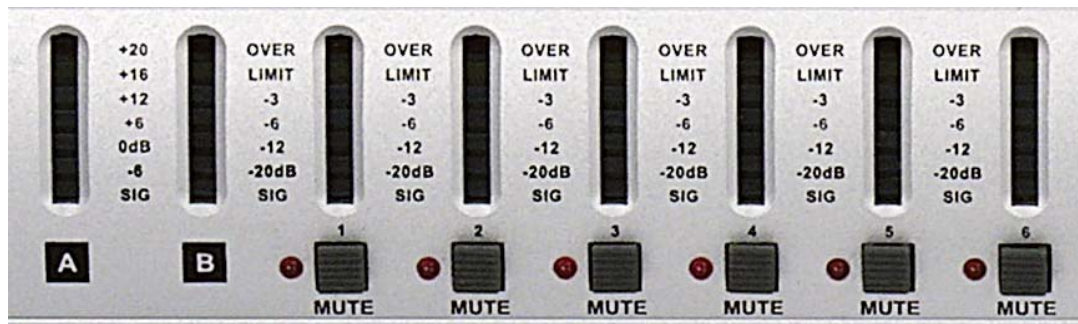
LED Output Barographs

The Output barographs represent signal level relative to limiter threshold.

Jog-wheel

This jog-wheel changes all parameters. If this control is pressed, it will step through the input and output modes (also see page 7). If held down and turned it will enable fast switching through the available modes.

Prev, Next, ◄ , ►

The PREV/NEXT-buttons (**8+9**) enable you to scroll through the various screens and select a parameter you want to adjust. If you want to adjust the value of the currently selected parameter, press ◄ / ► (**5+6**). Where the parameter is non-numeric, these keys scroll through a list of options.

RECALL and SAVE/ENTER
These buttons are used to save edited programs to a new memory location and to recall saved setups from the internal memories.
To select a reconfigured Program press the RECALL-button (**10**). If the device is brand-new it does not contain any preset programs; if the unit has been used before it may contain user-preprogrammed setups. Use the PREV/NEXT buttons (**8+9**) to choose the correct program. Press RECALL (**10**) again to enable the program.
The SAVE-button (**7**) is also used as an ENTER-Button (**7**) to confirm certain operations. Pressing the SAVE-button (**7**) when in recall-mode will exit the operation and pressing RECALL (**10**) in a save operation will achieve the same result.

Mute
Press any of the Mute buttons (**2**) on the front panel to toggle the channel in and out of mute. The button will light red when the output is muted.

Installation
Remove all packing materials from the DLM-26. Check that all foam and plastic padding is removed.
Screw the equipment into a 19" rack. Connect all cables.
Always disconnect from electric mains power supply before cleaning or servicing.
Damages caused by non-observance are not subject to warranty.

Set Up and Operation
Before plugging the unit in, always make sure that the power supply matches the product specification voltage. Do not attempt to operate a 120V specification product on 240V power, or vice versa.
Install this device on a flat surface, not bending or curved.
Do not supply power before all components of the system are set up and connected properly.

Make sure to power-up before your power amplifier is turned in order to avoid loud transients, which could damage your speakers or annoy your audience.

System test
After connecting all cables, you should carry out a system test. Press all Mute-buttons in order to mute all outputs. Activate the HF-outputs first. In case of wrong cabling, High Frequency (HF) signals will come out of bass-speakers that cannot be harmed this way. Vice versa, the Low Frequency (LF) signals would destroy your HF-speakers.

LCD Display
The display can be divided into 4 working areas

1. The top left shows the mode the DLM-26 is in: Input or Output Mode.
2. The bottom left displays the currently selected parameter associated with the above mode.
3. The top right only displays information relating to the current state of the DLM-26.
4. The bottom right indicates the value associated with this parameter.

1. MODE   IN SUM A+B   *   3. Information

2. Parameter   Delay   2.14 ms   4. Value

Software DLM-26

Insert the CD in your computer and install the CD by clicking on the DLM Setup icon.
Within 5 seconds this handy piece of software is installed.
Be sure to connect the DLM-26 via a RS232-cable to your computer.
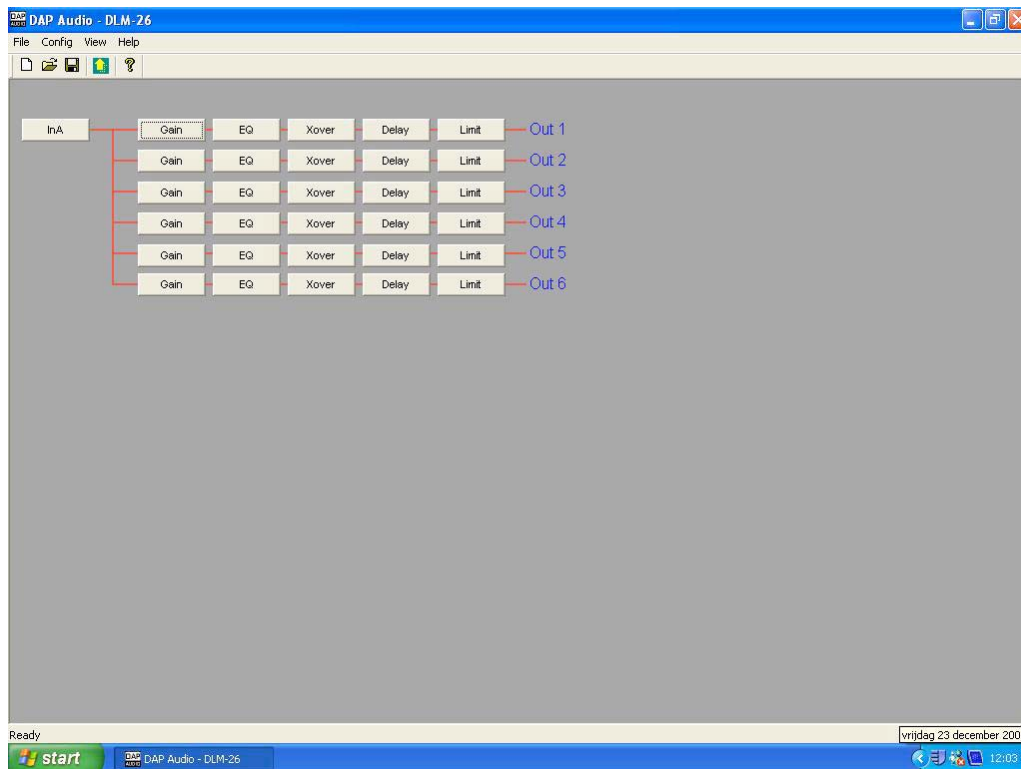

You can already make a few different choices in the Start-up screen.
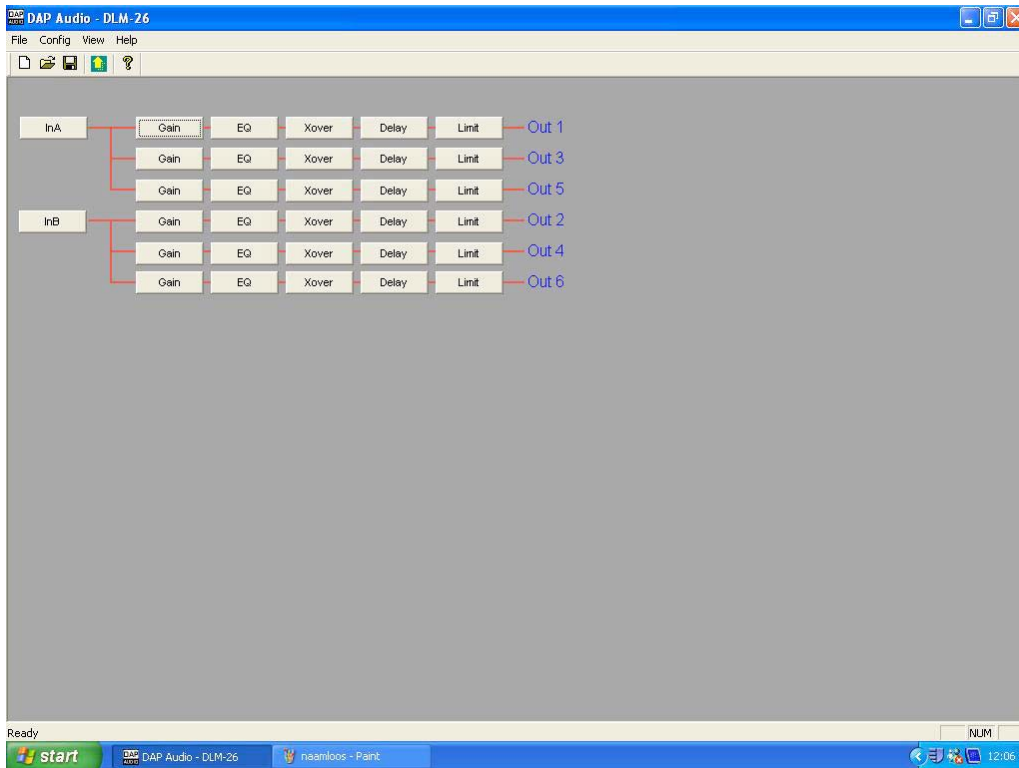You can either choose: **A)** Mono
                           B) 2 Channel 3 Way
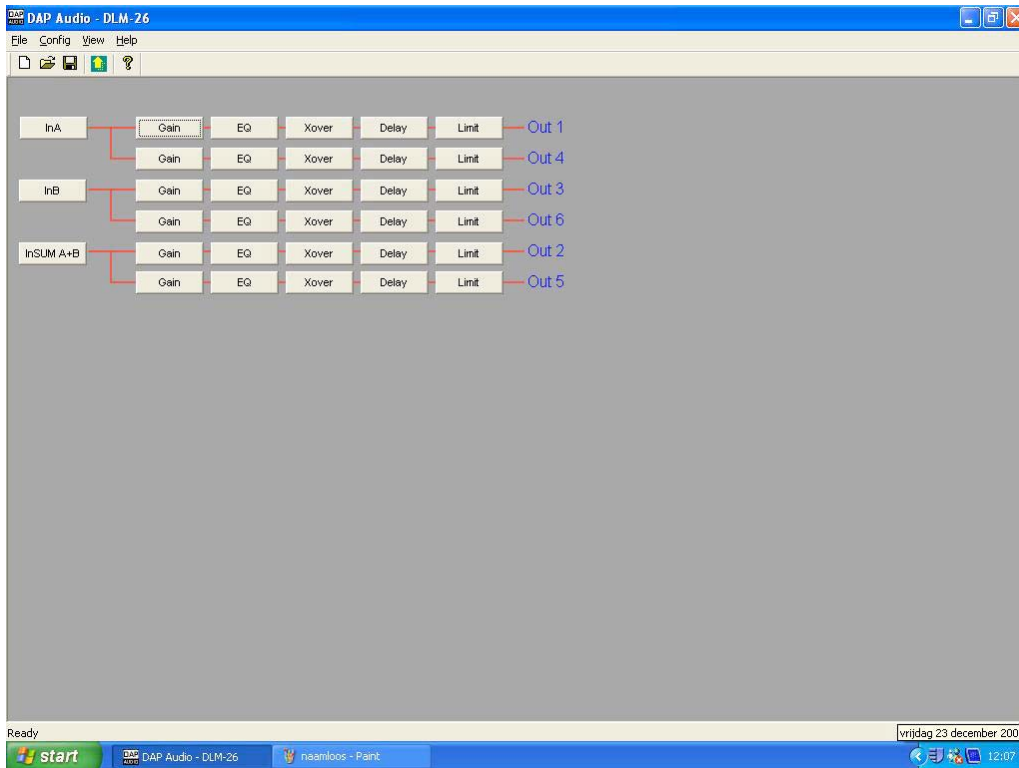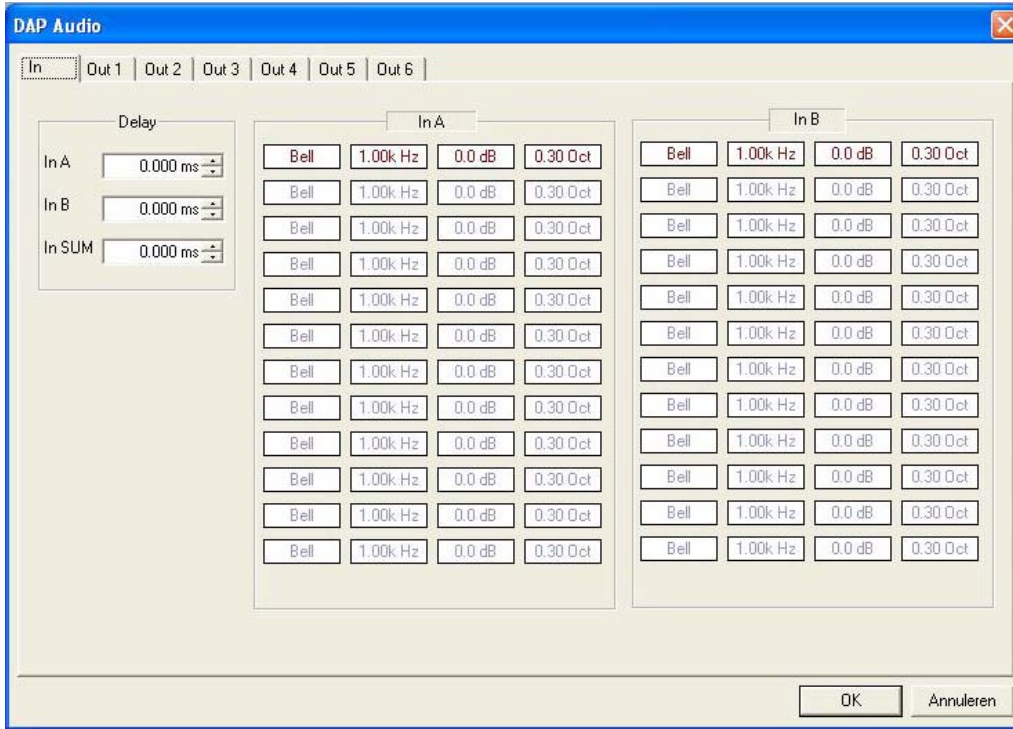   **C)** 3 Channel 2 Way

Mono Setting

2 Channel 3 Way

3 Channel 2 Way

Mono IN

Mono OUT 1&2

2 Channel 3 Way IN

2 Channel 3 Way OUT 1&2

3 Channel 2 Way IN

3 Channel 2 Way OUT 1&2

Programs

Saving programs

You can save up to 60 programs in the memory of the DLM-26. Press the SAVE/ENTER-button (**7**) to store the program in the memory. The display shows you the last used program on the screen. Press the PREV/NEXT-buttons (**8+9**) for adjusting program 1-60. With these buttons, you can also rename the program. In order to move the cursor (e.g. for entering the next letter or correcting the last letter), press the ◄ / ► - buttons (**5+6**) or the jog-wheel.
Confirm your setting by pressing the SAVE/ENTER-button (**7**).
The little star in the top right corner indicates that the current program has not been saved since the last modification.

```
SAVE
    1 MINISTRY
```

Naming programs

The program can be given a name up to 8 digits in length. To make a new name, press the ► - button (**6**) to move the cursor into the name area of the LCD. The LCD display will display the current name of the program that is being edited and the cursor will stand under the first character to be modified. Characters can be changed by either using the PREV/NEXT-buttons (**8+9**) or the jog-wheel (**4**). The next/previous character can be selected by using the ◄ / ► - buttons (**5+6**).
Press the SAVE/ENTER (**7**) a second time, will save the settings if the program location is not locked.

Locking programs

In order to avoid overwriting your settings, you can lock a program. After saving, you can choose Locked or Unlocked. Choose your selection with the jog-wheel (**4**) or with the ► - button (**6**) and then press the SAVE/ENTER-button (**7**) to confirm your setting.
Saving a program will fail when the SAVE/ENTER-button (**7**) is pressed and the lock character is shown in the display. After this message has disappeared, you can unlock the program with the jog-wheel (**4**).

```
PROGRAM LOCKED!
    1 PLASA
```

```
STORE UNLOCKED?
    LOCKED
```

Recall programs

You can recall a program via the Recall-button (**10**). Select the desired program by using the PREV/NEXT-buttons (**8+9**) or the jog-wheel (**4**). You can only make a selection from the already saved programs.
Press the Recall-button (**10**) a second time in order to recall the desired program. There will always be a default program in the unit's memory.

```
RECALL
    1 UNUSED
```

Delete programs
In Setup-mode, press either the ◀ - button (**5**) or turn the jog-wheel (**4**) clockwise. You will enter the Delete Program mode.

```
SETUP
DELETE PROS   NO
```

```
ENTER TO DELETE
   1 MONITORS
```

Choose the Program to be deleted using the ◀ / ▶ - buttons (**5+6**).
Press ENTER (**7**) to delete a program.

Pressing the PREV/NEXT buttons (**8+9**) at any time will exit the Delete Program mode.

Note: Locked programs have to be unlocked before they can be deleted, this applies to Program lock and OEM/Owner locks.

Setup-menu
Press the PREV/NEXT-buttons (**8+9**) in order to navigate in the setup-menu.
Adjust your setting with the ◄/► - buttons (**5+6**) or the jog-wheel (**4**). Press the Recall-button (**10**) in order to leave a mode.

```
SETUP

CONFIG        MONO
```

```
CHANGE TO 3-WAY?
ENTER TO CONFIRM
```

Stereo-link
The stereo-link links two outputs with each other depending on the selected operation mode.
In 2-way mode, the outputs 1 and 3, 4 and 6 and 2 and 5 are linked.
In 3-way mode, the outputs 1 and 2, 3 and 4 and 5 and 6 are linked.

You've got 2 kind of links, which are differing from parameter to parameter:
1. A step-link is a fixed link between two channels, i.e. if a parameter value is changed, the same parameter of the other channel automatically changes to the same value.
2. An offset-link is a relative link between the channels, i.e. if a parameter value is changed, the same parameter of the other channel automatically receives the relative value.

PARAMETER	LINK	3-WAY MODE	2-WAY MODE
Input Delay	Offset	A-B	A-B
Input EQ Type	Step	A-B	A-B
Input EQ Frequency	Offset A-B	A-B	
Input EQ +/-	Offset	A-B	A-B
Output Name	Offset	1-2, 3-4, 5-6	1-3, 4-6
Output Source	Offset	A(1, 3&5) / B(2, 4&6)	A(1&4) / B(2&6) / A+B(3&5)
Output Gain	Offset	1-2, 3-4, 5-6	1-3, 4-6
Output Limit	Offset	1-2, 3-4, 5-6	1-3, 4-6
Output Delay	Offset	1-3, 3-5, 2-4, 4-6	1-4, 2-5, 3-6
Output Delay Link	Offset	1-3, 3-5, 2-4, 4-6	1-4, 2-5, 3-6
Output Polarity	Step	1-2, 3-4, 5-6	1-3, 4-6
Output Lo Shape	Step	1-2, 3-4, 5-6	1-3, 4-6
Output Lo Frequency	Offset	1-2, 3-4, 5-6	1-3, 4-6
Output Hi Shape	Step	1-2, 3-4, 5-6	1-3, 4-6
Output Hi Frequency	Offset	1-2, 3-4, 5-6	1-3, 4-6
Output EQ Type	Step	1-2, 3-4, 5-6	1-3, 4-6
Output EQ Frequency	Offset	1-2, 3-4, 5-6	1-3, 4-6
Output EQ +/-	Offset	1-2, 3-4, 5-6	1-3, 4-6
Output EQ Width	Offset	1-2, 3-4, 5-6	1-3, 4-6

Configuration

Selection of the operation mode (Config)

The DLM-26 can be adjusted in the following operation-modes: Mono
                                                                  2 Channel 3 Way
                                                                  3 Channel 2 Way

Note: if you change the operation-mode, all routings and links will be changed, too. Always select the operation-mode first. Afterwards, you can adjust the output adjustments, routings, delay-links and output designations.

Select the desired operation-mode in the setup-menu Config and confirm by pressing the SAVE/ENTER-button (**7**).

Mono -mode

In the Mono mode, input channel A is routed to all outputs 1-6.
• All crossover frequencies are switched off, i.e. Full Range-signal at all outputs.
• All delay links are switched off.
• Stereo Link is not available.
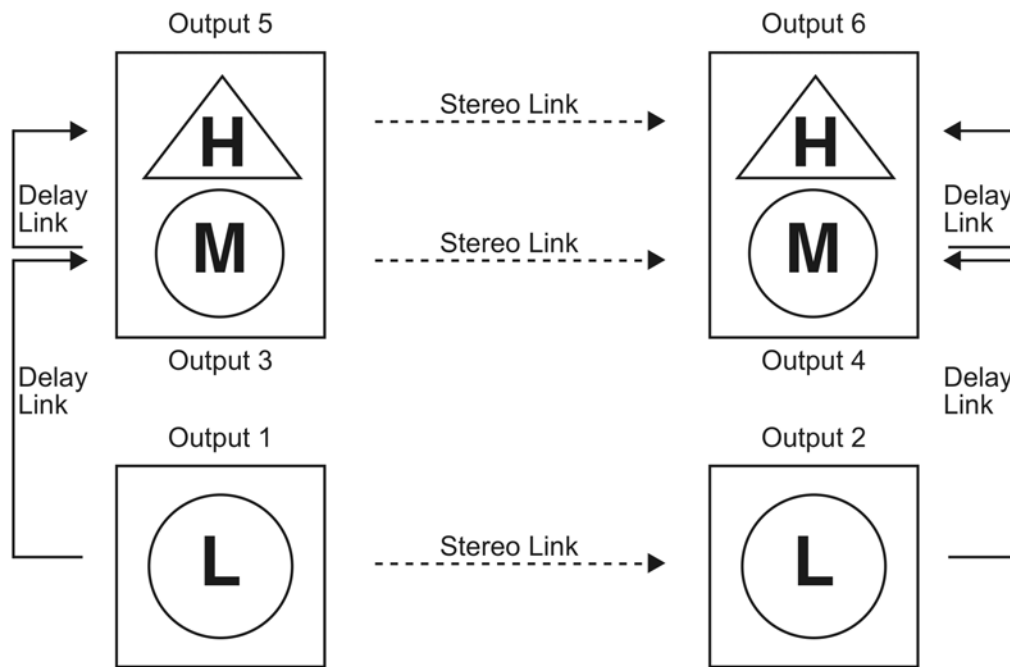• The outputs are named Band 1-Band 6.

Operation-mode 2-way
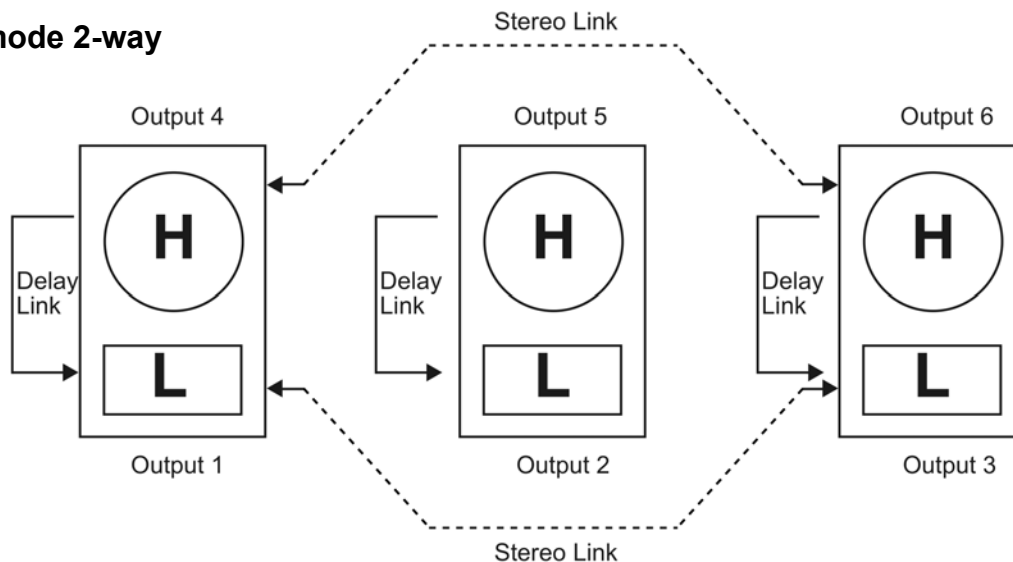
In the operation-mode 2-way, input channel A is routed to outputs 1 and 4. Input channel B is routed to outputs 5 and 6. Outputs 2 and 5 receive a sum signal of inputs A&B. All delay links are switched off. Stereo Link is switched on. The outputs are named Low and High.

When using a derived center cluster feed such as in LCR (Left, Center, Right) installation, the configuration can be changed to a 3 channel 2 way configuration, where the center channel is a sum of A and B.
• Outputs 1 and 4 are routed from Input A.
• Outputs 3 and 6 are routed from Input B,
• Outputs 2 and 5 will be routed from Input sum A+B.
• All delay linking defaults to off.
• Stereo Link will be switched on.
• Band Names will be set to 'Low' and' High'.

Operation-mode 3-way

• In the operation-mode 3-way, input channel A is routed to outputs 1, 3 and 5.
• Input channel B is routed to outputs 2, 4 and 6.
• All delay links is switched off.
• Stereo Link is switched on.
• The outputs are named Channel 1 - Low, Channel 2 - Mid, Channel 3 - High, Channel 4 - Low,
 Channel 5 - Mid, Channel 6 - High.

Crossover mode

Crossover mode allows you to link the crossover frequencies of the associated bands together for ease of setting. For example, when in 'Both' mode (=linked) changing the frequency of the Hi slope of an output channel set up as say 'low' band will also change the frequency of the Lo slope in the adjacent 'Mid' band output channel. The bands do not necessarily need to actually crossover at the same frequency as an offset can be maintained between them.

Edge mode allows you to adjust all crossover frequencies individually. This mode is useful in initial system set up to tune a driver/cabinet's individual response.

Example: When you change the crossover frequency of the Lo-Output in Both-mode, the frequency of the Mid-Output is autmatically changed, too. This must not necessarily be the same frequency, as an offset may be adjusted between the two crossover frequencies.
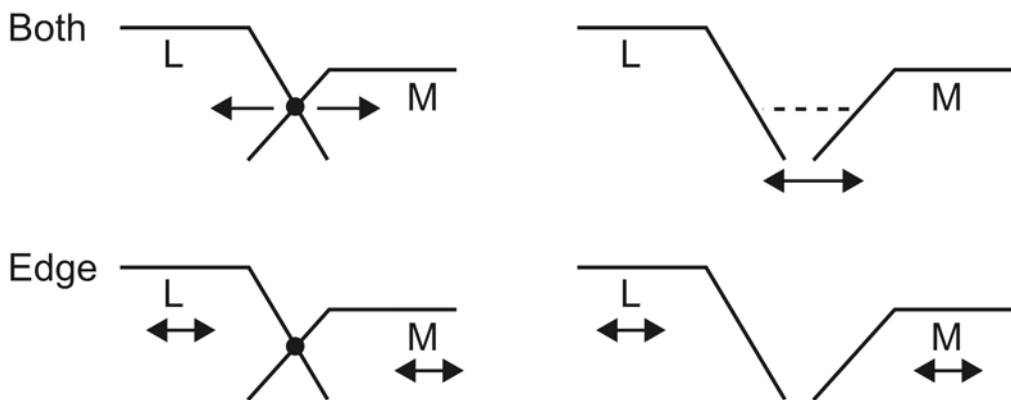
Delay-units

You can adjust the delay in different units: milli seconds (ms)
feet (ft)
meters (m)
frames per second (24, 25 and 30 fps).

Use the ◀ / ▶ - buttons (**5+6**) or the jog-wheel (**4**) to select the preferred measurement units.
Returning to the delay parameter will then allow the delay value to be viewed and adjusted in the selected units.

Contrast
For adjusting the display contrast.

Safety options

The DLM-26 offers 3 levels of security to protect the programs and parameters from adjustments from any unqualified or unauthorized access:
• Lockout, the simplest level, e.g. directly at the event.
• OEM Lock (♦)
• The Owner Lock (🔒)

The last 2 are to lock individual programs or parameters.
Example: You can give the password for Owner Lock to somebody, but keep the password for the OEM Lock secret. In this way, you can protect especially sensitive areas of your programming.

Lock Out
If the lockout is activated, no program's parameter can be adjusted. This lock is used for avoiding unintended/unwanted changes to the DLM-26. When lockout is activate, only the display contrast or the Lock Out can be adjusted.
Mutes and trims are inactive and no Programs can be stored or recalled.
If you want to save a new program on a locked one, the display shows Program Locked. After this message has disappeared, you can unlock the program with the NEXT-buttons (**9**) or with the Jog-wheel (**4**).

```
SETUP
LOCK OUT    OFF
```

OEM-lock (♦)
If the OEM lock is activated, either an individual or all parameters of a program can be locked.
Press the ▶ - button (**6**) in order to enter the password-area.

```
SETUP
OEM LOCK    OFF
```

The standard password is OEM. Enter the new password by moving the cursor with the ◀ / ▶ - buttons (**5+6**) and change the letters by pressing PREV / NEXT-buttons (**8+9**). Confirm the password with the Save/Enter-button (**7**). The display shows the following message and then enters the Lock All mode.

```
LOCK SETUP  OEM
ENTER WHEN DONE
```

Note: If you activate the OEM-lock (♦) and save the program (with OEM-lock), the DLM-26 is completely locked. There is no more possibility to unlock the OEM-lock (♦) as described above. In order to make memory available, you can only delete the program.
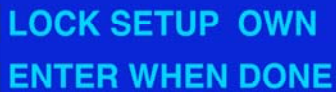
Owner Lock (🔒)

If the owner lock is activated, either an individual or all parameters of a program can be locked.
This lock is used for avoiding unintended/unwanted changes to the DLM-26. When Owner Lock is activated, only the display contrast or the Owner Lock can be adjusted.
Press the ▶ - button (**6**) in order to enter the password-area. The standard password is SOMA. Enter the new password with the ◀ / ▶ - buttons (**5+6**) and confirm with the Save/Enter-button (**7**).

Note: Please write down the new password and keep it in a safe place. There is **no possibility** to override a password you have entered.
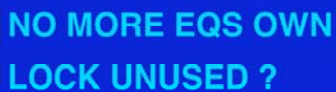
The display shows.

LOCK SETUP OWN
ENTER WHEN DONE

If you want to lock all parameters, set the selection Lock All? to Yes. If several parameters were locked before, you can unlock all parameters by changing the selection from Yes to No and save with the Save/Enter-button.

If you want to unlock individual parameters, select the respective level by pressing the jog-wheel.
Set the Owner lock to OFF and Enter the Password (SOMA).

If you want to lock individual parameters, select No. Select the respective level by pressing the jog-wheel.
Select the desired parameter via the Prev / Next - buttons. Set the lock of the individual parameter by turning the jog-wheel. The display shows ✔. Then press the SAVE/ENTER-button (**7**).
If the memory is sufficient to adjust more equalizers, you have the possibility to lock this feature.

NO MORE EQS OWN
LOCK UNUSED ?

Confirm with the SAVE/ENTER-button (**7**).
Note: all locked parameters will not be displayed during the operation.
In order to unlock the DLM-26, press the ▶ - button (**6**) to enter the password section. Enter the password via the parameter knob and the ◀ / ▶ - buttons (**5+6**) and confirm via the Save/Enter-button.

Midi Channel
Midi can be used to transmit and receive programs or to send the complete memory to another DLM-26 (Sys-Ex Dump).
Adjust the Midi-channel with the ◄ / ► - buttons (**5+6**). Both the sending and receiving device needs to be set to the same MIDI channel to communicate correctly.

Midi Mode
In MIDI mode, you can adjust the following settings:

> • **Off**
>   Only the memory content (Sys-Ex Dump) is transmitted, no other Midi-data.
> • **Prog**
>   Sys-Ex Dump and program change is possible.
> • **Thru**
>   Passes the data from Midi In on to Midi Out.
> • **Master**
>   The complete settings and changes are transmitted to other devices with the same Midi-channel.
> • **PC Port**
>   Activates the RS232-connection on the rear panel.

Sys-Ex Dump
With this function, you can transmit the memory content between two DLM-26 devices or to another Midi Sys-Ex compatible Sequencer or computer.

Note: a received Sys-Ex dump can delete all the settings of a device. If you do not wish that a device accidentally receives Sys-Ex data, switch it off or set the device to another Midi-channel.
Attach a MIDI cable from the MIDI Out-socket of the sending device to the MIDI In-socket of the receiving device.

```
SETUP          *

MIDI MODE    NO
```

Press the ► - button (**6**) of the sending device and the display shows:

```
MIDI DUMP ?

ENTER TO CONFIRM
```

In order to quit this mode, you can press the PREV / NEXT-buttons (**8+9**) at any time. Press the Save/Enter-button (**7**) in order to start the transmission.
The receiving device will ask you whether the dump must be accepted. Press the Enter-button for confirmation.

```
MIDI DUMP

PREPARING....
```

If you do not wish that the dump would overwrite the data in the device, press the ◄ - button (No). The device will then ignore the incoming data.
After the Sys-Ex Dump has been started, the display shows the progress in percent. When 100 % is reached, the transmission is finished and the sending device returns to the MIDI dump default screen.
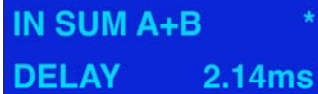
Note: a Sys-Ex dump received by another device can wipe all the settings of that device. If you have several different models linked together and you wish to perform Sys-Ex Dumps between them make sure that not all should receive the dump information. They have to be either switched off or set to another channel.

Input-adjustments

Input Mode
Press the jog-wheel. In the upper area, the display shows the actual mode (Input / Output). Below, the parameter with the corresponding value is displayed.

```
IN SUM A+B        *
DELAY      2.14ms
```

By pressing the jog-wheel repeatedly, you can select between IN A, IN B and IN SUM A+B.

Input Delay

```
IN B              *
DELAY      0.007M
```

By turning the jog-wheel or pressing the ◄ / ► - buttons (**5+6**), you can adjust the desired input delay. You can set the delay from 0-0.630 ms in 21 µs steps.

Input Equalizer

```
IN A & IN B       *
EQ1    BE11  SP12
```

Assignable equalizer
With the DLM-26, you can assign individual equalizers for every channel (IN A, IN B, OUT 1-6). The number of assignable equalizers depends on the available system memory. If the display shows „No more filters" you can clear system memory by deleting other programs or equalizers on other channels.
The equalizer types are Hi and Lo shelving filters with 6 or 12 dB per octave or full parametric Bell filters. The display shows LO6, LO12, Bell, HI6, HI12. The control area is ±15 dB in 0.2 dB steps. The bandwidth reaches from 0.05 to 3 octaves, adjustable in 0.05 steps (only Bell). The frequency range is from 15 Hz to 20 kHz.

Procedure:
By pressing the PREV-button (**8**), you enter the Input EQ menu (for Input A, B) and can adjust the width (Wd), boost and Gain (+/ -), frequency (Fq) and EQ-type (LO12, LO6, Bell, HI6, HI12) with the PREV- or NEXT-buttons (**8+9**) and adjust the individual values with the jog-wheel or the ◄ / ► - buttons (**5+6**). The first equalizer of a channel is preset to Bell, 1 kHz, 0 dB and 0.3 width. Adjust the equalizer to your requirements. Only after you have changed a value of this equalizer, it will be possible to adjust a second equalizer for this channel (PREV-button) (**8**).
In order to add the EQ to Input A+B, first adjust the settings in the individual input (A, B). The settings will then be added to Input A+B.

Delete an equalizer
You can delete an equalizer you do not need, by adjusting the value for boost and cut to 0 dB. The free filter can be used for another channel.
If you want to delete an equalizer from an input with Stereo-Link, it may be necessary to cancel the stereo link first.

Output-adjustments

By pressing the jog-wheel you can jump to Output 1-6.
If two outputs are linked, every equalizer change or crossover-frequency change affects both channels.
If you press the PREV / NEXT-buttons (**8+9**), you can choose from:

Name

Please select the best fitting name from the name list.
The Output Name is selectable from a pre-programmed list. Use the ◀ / ▶ - buttons (**5+6**) or jog-wheel to scroll through the list:

```
OUT 1 & 2    Band 1
NAME         Band 1
```

L Low, L Mid, L High
R Low, R Mid, R High
C Low, C Mid, C High
Subs, Low, Low Mid, Mid, Hi Mid, High
Mid + High
1" Horn, 1,5" Horn, 2" Horn
Bullet
Flat
Unused
Bar, Bstage
Delay
Center
Mono
Aux
Delay 1-6
10", 12", 15", 18", 21", 24"
L Subs, C Subs, R Subs

Source

You can select which combination of Input(s) (is sent) to the Output Channel: Input A, Input B or Input A&B.
When Stereo Linked in a 2 channel 3-way Mode, you normally choose Input A&B.

```
OUT 1 & 2  Band 1  *
SRCE IN    A&B
```

Gain

The Output Gain is adjustable from -15 dB to +15 dB in 0.2 dB steps. The nominal Output setting is 0 dB.

```
OUT 1 & 2  BULLET
GAIN       -13.4DB
```

Limiter

The DLM-26 has a limiter-function with independent limiters (one per output), which are adjustable between -10 and +20 dB.

```
OUT 1 & 2    AUX *
LIMIT        -6.2DBU
```

There are 2 primary reasons for using a limiter:
1. Prevention of amplifier clipping
2. Limit the amount of power transmitted to the speakers

The limiter serves as an additional clipping protection to avoid speaker damage. The signal level is always limited to the adjusted threshold-level.
In most cases, it is sufficient to adjust the threshold-value to the clipping level of the connected amplifier. Nevertheless make sure that the amplifier does not distort.
If the limiter is adjusted to e.g. +2,0 dB, the output signal level Limit corresponds to +2 dB and the levels -2, -6, -12 and -20 dB correspond -1, -4, -8 und -12 dB.

Note: Limiters are usually set slightly below their maximum settings.
Limiter Level Calculation: Limiting Threshold (dBu) = Transducer Voltage Limit (dBu) – Amplifier Gain (dB)

Delay

With the delay, it is possible to compensate differences in the running distances between different speaker-systems or speaker-systems at different installation spots.
The delay can be adjusted for both inputs and all outputs between 0 and 365 ms in 21 µs steps.
While the ◄ / ► - buttons (**5+6**) allow you to adjust the Delay in small 21µs steps, the jog-wheel allows you to adjust larger delays more quickly.

```
OUT 1 & 2  BAND 3 *
DELAY       4.958MS
```

How to calculate the delay-time:
The delay-time T equals the distance in meters (D) divided by the speed of sound (C).
T=D/C
How to calculate the speed of sound: C=20.6 * (273 + °C) in meter per second..

Delay-Linking
Via the delay-link you can link different channels in the delay.

```
OUT 2        C LOW *
DELAY LINK    TO 5
```

In this way, you can keep an already adjusted delay between driver and speaker of a cabinet for a delay between clusters.
An offset-link is a relative link between the channels, i.e. if a parameter value is changed; the same parameter of the other channel automatically receives the relative value.
The different channels can be linked as follows:

OUTPUT	MONO	2 CH. 3-WAY	3 CH.2-WAY
1	2	3	4
2	3	4	5
3	4	5	6
4	5	6	–
5	6	–	–
6	–	–	–

When using delay linking you have to use the following order:
1. Align Driver within cabinets
2. Align Driver within clusters
3. Align Driver between clusters. In 2 channel 3-way and LCR (Left Center Right) 2-way, the default settings include Delay Linking as well as Stereo Linking.

Polarity-function
The polarity of every output can be inverted. If the polarity of a linked output will be inverted, the polarity of both channels will be inverted.

```
OUT 3 & 4      AUX *
POLARITY  NORMAL
```

Crossover types and frequencies

Low pass filter type
For the lower crossover frequency of the outputs, the following filter types are available:
• Bessel 12 and 24dB/octave,
• Butterworth 6, 12, 18, 24 and 48dB/octave
• Linkwitz-Riley 12 and 24 and 48dB/octave

```
OUT 5 & 6     HIGH *
LO SHAPE    L-R 24
```

The display shows the following different options:
• BUT 6
• BUT 12, BES 12, L-R 12
• BUT 18
• BUT24, BES24, L-R 24
• BUT48, L-R 48

Low pass filter frequency
The crossover frequencies can be adjusted between 15 Hz and 16 kHz in 1/6 octave steps. Below is Out and above OFF. OUT is at the bottom end and OFF is when adjusted > 16Khz

```
OUT 5 & 6      HIGH *
LO FREQ    8.00KHZ
```

Note: If the Low Edge Frequency is >16 KHz the channel output is switched OFF. In contrast to the mute-function, the LED-display does not show any output.

High pass filter type
For the upper crossover frequency of the outputs, the following filter types are available:
• Bessel 12 and 24dB/octave,
• Butterworth 6, 12, 18, 24 and 48dB/octave
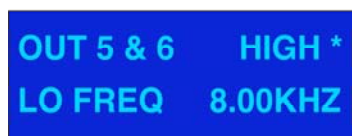• Linkwitz-Riley 12 and 24 and 48dB/octave

```
OUT 5 & 6      HIGH *
HIGH SHAPE  L-R 48
```

The display shows the following different options:
• BUT 6
• BUT 12, BES 12, L-R 12
• BUT 18
• BUT24, BES24, L-R 24
• BUT48, L-R 48

High pass filter frequency
This control adjusts the cut off frequency of the selected High Frequency crossover.
The crossover frequencies can be adjusted between 15 Hz and 16 kHz in 1/6 octave steps.

```
OUT 5 & 6      FLAT *
HI FREQ        OUT
```
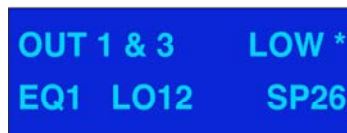
Assignable Equalizer
Multiple Equalizers can be assigned to individual Input and Output channels.

If there is no EQ on the currently selected channel (and there are filters available), the PREV-button will step into an unused Bell EQ with 1 KHz frequency, 0 dB cut/boost and width of 0.3. Further Equalizers can only be assigned to a channel after this EQ is used first by applying some degree of cut or boost, pressing the PREV-button then steps into a new EQ.

The parameters are in the following order: EQ Type, EQ frequency, EQ Cut/Boost amplitude and then EQ Width (for Bell type filters only)

EQ Type
The picture below shows that we have selected EQ1 on Outputs 1 & 3 (labeled as Low) and that it is assigned in stereo, denoted by the S, which also indicates that the two equalizers are in use (across the two channels).

```
OUT 1 & 3      LOW *
EQ1  LO12      SP26
```

A 12 dB/Octave low shelving type has been chosen and there are currently 26 spare DSP filters still channels.
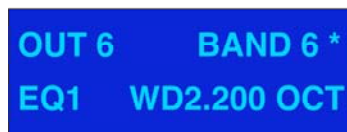
```
OUT 2        HIGH *
EQ1  FQ4     14KHZ
```

EQ Frequency
The frequency of the EQ is adjustable between 15 Hz and 16 kHz in 1/6 octave steps.
The picture below shows that the first EQ is on Output 2 (labeled as High). It has a frequency of 1 KHz.
If using a Low shelving filter this would be the 3 dB point.

EQ Cut/Boost
Selectable gain from –15dB to +15dB in 0.5 dB steps. Setting an EQ Cut/Boost to 0 dB effectively de-assigns the filter, and allows it to be assigned to another channel.

```
OUT 6       BAND 6 *
EQ1   WD2.200 OCT
```

EQ Bandwidth
The Width is only available for Bell type equalizers 0.05 to 3.00 octaves in 0.05 octaves steps.

```
IN A & IN B         *
EQ1    BE11  SP12
```
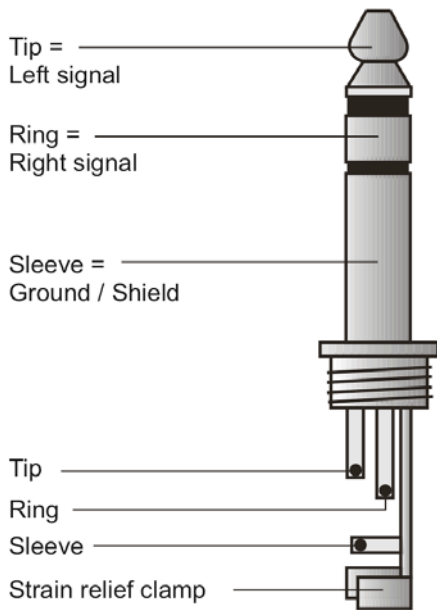
MIDI Implementation Chart

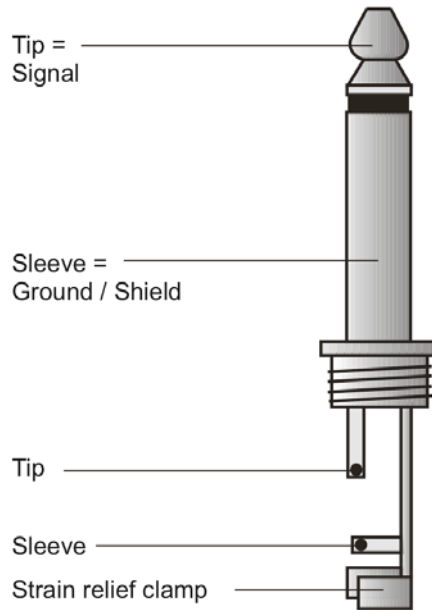| MIDI IMPLEMENTATION CHART DLM-26				
Function		**Transmitted**	**Recognized**	**Remarks**
Basic channel	Default Changed	1 1-16	 1-16	
Mode	Default Messages Altered	 X 	 X 	
Note number	 True voice	X X	X X	
Velocity	Note ON Note OFF	X X	X X	
After touch	Key's Channel	X X	X X	
Pitch bend		X	X	
Control change		X	X	
Prog Change	 True #	O 0-59	O 0-59	
SysEx		O	O	
Common	Song pos Song Sel Tune	X X X	X X X	
System real time	Clock Commands	X X	X X	
Aux Messages	Local ON/OFF All Notes OFF Active Sense Reset	X X X X	X X X X	
O:YES Mode 1: OMNI ON, POLY Mode 2: OMNI ON, MONO **X:NO Mode 3: OMNI OFF, POLY Mode 4: OMNI OFF, MONO**				

Connection Cables

Take care of the connector cables, always holding them by the connectors and avoiding knots and twists when coiling them: This gives the advantage of increasing their life and reliability, which is always to your advantage.
Periodically check that your cables are in good condition, that they are correctly wired and that all their contacts are perfectly efficient: a great number of problems (faulty contacts, ground hum, discharges, etc.) are caused entirely by using unsuitable or faulty cables.
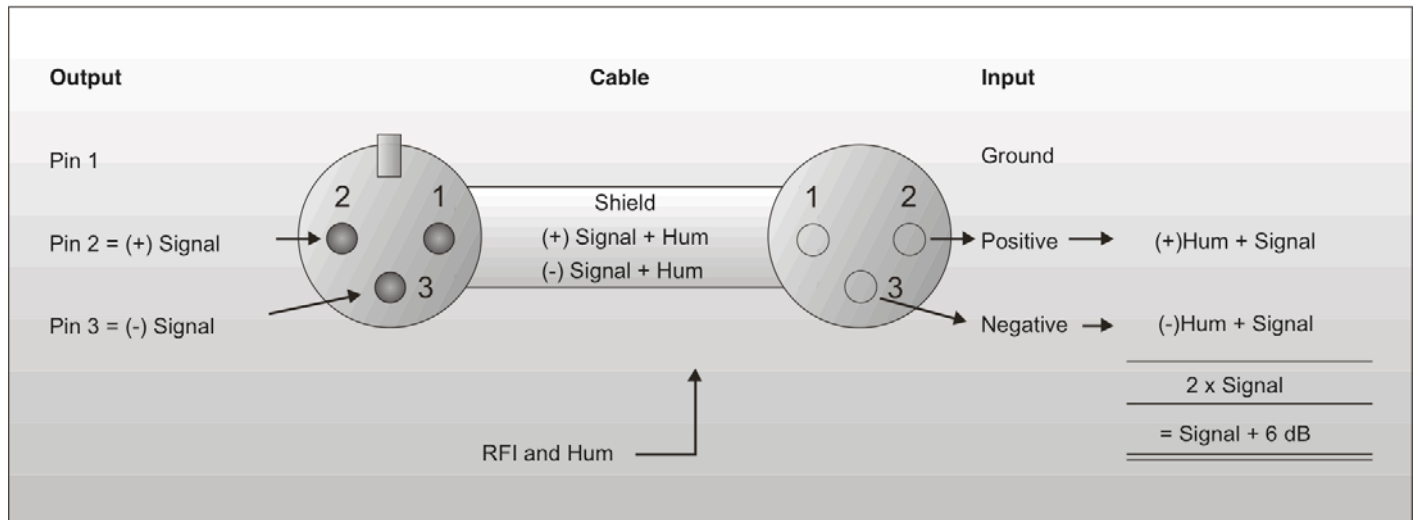
Headphones	Unbalanced mono 1/4" jack plug	Balanced mono 1/4" jack plug

Tip =
Left signal

Ring =
Right signal

Sleeve =
Ground / Shield

Tip
Ring
Sleeve
Strain relief clamp

Tip =
Signal

Sleeve =
Ground / Shield

Tip

Sleeve
Strain relief clamp

Tip =
hot(+ve)

Ring =
cold(-ve)

Sleeve =
Ground / Shield

Tip
Ring
Sleeve
Strain relief clamp

Output	Cable	Input

Pin 1

Pin 2 = (+) Signal

Pin 3 = (-) Signal

2   1

3

Shield
(+) Signal + Hum
(-) Signal + Hum

RFI and Hum

1   2

3

Ground

Positive →   (+)Hum + Signal

Negative →   (-)Hum + Signal

2 x Signal

= Signal + 6 dB

Compensation of interference with balanced connections

Balanced use with XLR connectors

1 = Ground / Shield
2 = hot (+ve)
3 = cold (-ve)

Output

Input
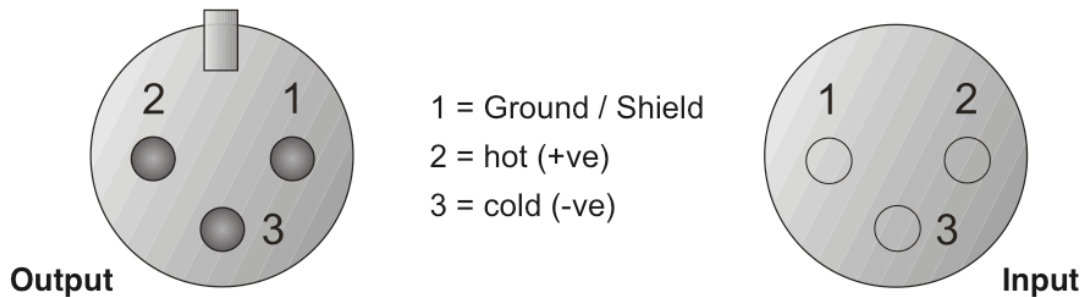
For unbalanced use PIN 1 and PIN 3 have to be bridged

Maintenance

The DLM-26 crossover requires almost no maintenance. However, you should keep the unit clean.
Disconnect the mains power supply, and then wipe the cover with a damp cloth. Do not immerse in liquid.
Keep connections clean. Disconnect electric power, and then wipe the audio connections with a damp cloth.
Make sure connections are thoroughly dry before linking equipment or supplying electric power.

Troubleshooting

Dap Audio DLM-26

This troubleshooting guide is meant to help solve simple problems.
If a problem occurs, carry out the steps below in sequence until a solution is found. Once the unit operates
properly, do not carry out following steps.
1. If the device does not operate properly, unplug the device.
2. Check the power from the wall, all cables etc.
3. If all of the above appears to be O.K., plug the unit in again.
4. If you are unable to determine the cause of the problem, do not open the DLM-26, as this may damage
the unit and the warranty will become void.
5. Return the DLM-26to your Dap Audio dealer.

Product Specifications
Model: DAP Audio DLM-26
Power consumption: 30W
Dimensions : 483 x 223 x 44.5 mm (LxWxH)
Weight : 3.6 kg

Input Section
Inputs: 2 active, balanced
Input Impedance: 10 KOhm, electronically balanced
Maximum Input Level: +20 dBu, 600 Ω or greater
Input Gain: +/- 15 dB, variable in 0.1 steps
CMRR: > 50 dB (30 Hz – 20 KHz)
Input Connector: XLR-3F (1=G, 2=+, 3=-)

Frequency response: 15Hz – 20KHz (+/- 0.25dB)
                                  15Hz – 40KHz (+/- 3dB)
Input Gain Range: -40 dB – +6 dB   ±0,5 dB

Output Section
Outputs: 6 active, balanced with automatic correction for unbalanced loading
Output Impedance: <50Ω, electronically balanced
Maximum Output Level: +20 dBu, 600 Ω or greater
Output Gain Range: +/- 21 dB, variable in 0.1 steps
Output Connector; XLR-3M (1=G, 2=+, 3=-)

Crossover Filters
Slopes; 6, 12, 18, 24 or 48 dB per octave (Filter type dependant)
Type: Bessel, Butterworth or Linkwitz-Riley

Delays
Delay Step: 21 µs
Max Delay time: 630 ms

EQ
Maximum number of EQ filters: 60 (depending on crossover slopes)
EQ Type: Parametric, Bell or shelving on any filter. 9 filters assigned to Dynamic EQ
EQ Gain: +/- 15 dB, variable in 0.5 dB steps
Q (bandwidth): 0.05 – 3 octaves, variable in 0.05 steps
EQ Frequency: 15 Hz – 20 KHz
Dynamic Slope: 2:1 – 20:1 (dynamic EQ's only)

General Performance with filters out
Frequency Response: 15 Hz – 20 KHz, +/- 0.25 dB 15Hz – 40 KHz, +/- 3 dB
Dynamic range: >112 dB unweighted 22 Hz – 22 KHz,   > 117 dB on AES/EBU input
Channel Separation: >80 dB, 30 Hz – 20 KHz
Distortion (THD): < 0.005%, 20 Hz – 20 KHz @ 10 dBu output
Input Metering: -20 dB, -12 dB, -6 dB, -3 dB, CLIP relative to Clip point (+20dBu)
Output Meter indication: SIG (-40dB), -20dB, -12 dB, -6 dB, -3 dB, 0 dB, OVER (+6dB)
                                  relative to limiter threshold setting

Design and product specifications are subject to change without prior notice.

CE