
DYNACORD DSP 244
24 BIT DIGITAL SOUND SYSTEM PROCESSOR
DYNACORD
DSP 244
EDIT
SELECT
PARAMETER
STORE
OPTION
LOCK
INPUT 1
INPUT 2
CLIP
LIMIT
MUTE
SIGNAL PROCESSING
SIGNAL PROCESSING

DSP 244

Providing 48-bit algorithms, 24-bit AD/DA conversion and a dynamic range that exceeds 115 dB, the DSP 244 sets new standards in digital loudspeaker controlling and loudspeaker signal processing.

Universal "Tool-Box"

Its 2-in-4-design and a dynamic range that exceeds 115dB, the DSP244 is the ideal controller and manager in any active 2-, 3- or 4-way audio system installation. The freely configurable routing allows assigning a single input or the summed signal of both inputs to each of the 4 outputs. Together with its extensive filtering capabilities, which can also be applied to the input signals, the DSP244 represents the convincing toolbox for the classical management of any loudspeaker system set-up. Whether in theatres or concert halls and no matter if used in mobile or fixed installations, the DSP244 represents always the optimum solution.

Reliable Operation

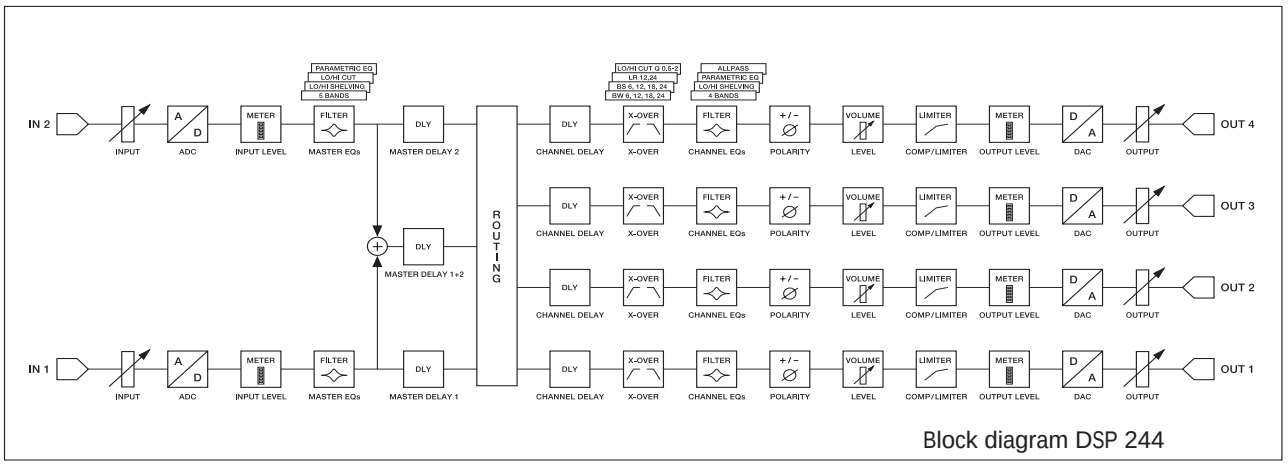
Comprehensive controls and a large-scale graphic display (120 x 32 dots) ensure convenient editing and control over all parameters. The status-LEDs in each output continuously indicate the momentary configuration of the corresponding channel (sub, low, mid, hi or full range). Backlit muting switches, convenient rotary controls and a 5-segment LED-chain allow "hardware-based" controlling the outputs. In addition to the 50 Dynacord loudspeaker system configuration presets, it is possible to store 30 user presets. The DSP244's locking function offers convenient protection against unallowed operation.

Comprehensive Signal Processing

Each input signal can be affected by 5 EQ-filters that can be individually utilized as parametric EQs, Lo/Hi-shelving EQs or Lo/Hi-Cuts. It is possible to divide and assign the maximum overall delay time of 5.4 sec. to either input signal, the summed signal or to all 4 outputs.
Each output provides separate Hi- and Lo-Pass filters, offering the choice between the following characteristics: Linkwitz-Riley, Butterworth or Bessel filters (6, 12, 18, 24 dB/oct. slope). Each output channel offers 4 additional filters, which can be configured as parametric EQs, Lo/Hi-shelving EQs, Lo/Hi-Cuts but also as All-Pass filters. Next to matching output level and polarity, each output is controlled by a compressor/ limiter with editable threshold, attack and release times.

Optional Extensions

The DSP244 comes with RS-232 and a complete MIDI-interface. The latter allows linking up to sixteen DSP244s and to easily save and load presets. The RS-232 interface provides the possibility to remote control and configure the DSP244 via supplied PC editing software program (WIN95/98/NT/WIN2K).
Additionally, these interfaces also allow installing new software and presets.
Optionally available for retrofitting are a RS-485 interface or control inputs which allow to remotely control program changes and mute commands.



Block diagram DSP 244

SPECIFICATIONS

	DSP 244
Mains Voltage	90 - 250 VAC / 50 - 60 Hz
Power Consumption	20W
Safety Class	I
Inputs	2 x XLR IN, electronically balanced, transformer optional 2 x XLR OUT (Direct Out)
Nominal Input Voltage	1.55 V / + 6 dBu
Max. Input Voltage	24.5 V / + 30 dBu
Input Impedance	20 kΩ
Common Mode Rejection	> 40 dB
A/D Conversion	24-bit, Sigma-Delta, 128 times oversampling, linear phase
Outputs	4 x XLR OUT, electronically balanced
Nominal Output Voltage	1.55 V / + 6 dBu
Max. Output Voltage	8.7 V / + 21 dBu
Output Impedance	< 100 Ω
Min. Load Impedance	600 Ω
D/A Conversion	24-bit, Sigma-Delta, 128 times oversampling
Frequency Response	20 Hz - 20 kHz (-0.5 dB)
S/N Ratio	115 dB (typical)
THD without transformer	< 0.01 %
THD with transformer	< 0.05 %
X-over	6, 12, 18, 24 dB/oct. slope; Butterworth, Bessel, Linkwitz-Riley
Filters	26 parametric equalizers low-shelving equalizer, switchable for LPN (Lowpass-Notch-Filter) operation, hi-shelving equalizer, switchable to 6 / 12 dB slope, lo-cut filter (B-6 alignment switchable), hi-cut filter, all-pass filter
Compressor / Limiter	4 digital compressors / 4 digital limiters
Delay	3 master delays (2 ms - 900 ms) 4 channel delays (0 ms - 900 ms) delay - increment 21µsec
Data Format	24-bit linear A/D - D/A conversion, 48-bit processing
Sample Rate	48 kHz
MIDI IN / OUT / THRU	data dump, master / slave operation / remote control
RS-232	data dump, remote control, firmware upgrade
Display	122 x 32 dots, graphic LC - Display with LED - backlight
Dimensions	483 x 43.6 x 374 (W x H x D in mm), 19“, 1 RU
Weight	5 kg
Protection Function	password lock
Accessories	PA 1 fiber glass - cover lid 1 RU
Options	RS-485 Interface (NRS 90247) Contact Closure Interface (NRS 90246) Input Transformer (NRS 90244)

CrossMax Controller Software

The CrossMax software is a unique audio-tool for creating DSP244 preset-configurations, offering clear graphic indication of all utilized filter, delay and level parameters and additionally allows integrating acoustic frequency and phase responses for the controlled DYNACORD loudspeaker system per output. These "sheer" component-values result from DYNACORD's own free-field measurements, without any room acoustics influence. CrossMax calculates the complex sum of the actual filter, level and delay parameters in relation to the original speaker data. Thus, not only that the filter parameters are presented on the screen, but, for the first time ever in real-time, the acoustic frequency response of the controlled speaker system is also displayed; any minor change in a filter's or delay's setting becomes instantly visible and audible. Even though the desired combination is not included, being one of the 50 factory presets, loudspeaker presets are of course available for any current DYNACORD speaker system.

CrossMax – a network for controlling 124 outputs

In combination with the RS-485 option, the CrossMax also allows controlling and monitoring complex, large-scale loudspeaker systems. Next to displaying all parameters and the frequency response of a DYNACORD speaker system, input and output levels plus compressor and limiter thresholds of all DSP244s are indicated in real-time as well – total control of up to 124 controller outputs.

Block Diagram Indication

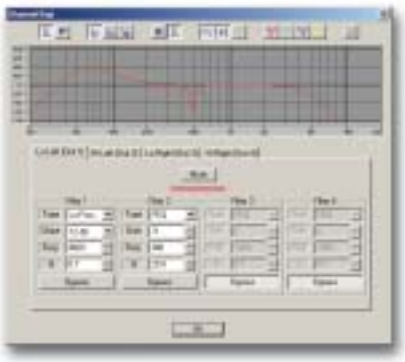
Most editable DSP244 parameters are clearly displayed in a block diagram. Following the input level indication are five individual filters per input, which can be used as Hi- or Lo-Pass (6dB/12dB-Peaking), Hi- or Lo-Shelving (6/12dB-LPN), or fully parametric EQs.

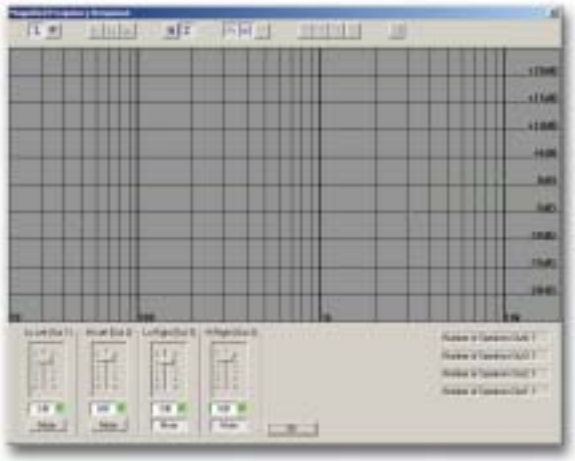
The Master-Delay offers delay times till up to 900 ms. The summed signal of the two inputs is handled as virtual third input and has its own delay time setting. The flexible routing allows assigning any input signal, including the sum-signal to each output. Four filters are provided for each output. A selectable All-Pass filter for matching group delay times that occur with overlapping frequency bands complements the filters of the Master-EQ. Following the crossovers (Hi- and Lo-Pass filters per output, each) and the output delay is a discrete compressor and a limiter for changing the audio signal's dynamic, which provides additional overload-protection for the connected loudspeaker components. Output level indication is provided in real-time – equivalent to the editor – while level control and mute-function complete the user interface.

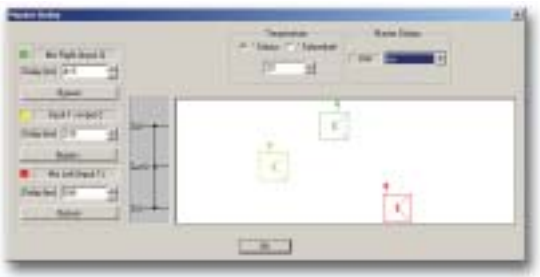
Clearly Structured Configuration

Next to versatility, it is especially the easy and reliable handling that is vital for a software product's success.
In network operation (RS-485), the user can choose from two screen-modes. Live mode provides display of all units with their relevant level indication. Output levels and mute-function can be adjusted, likewise to the functionality that an appliance installed in a side-rack shelf would offer. All other functions, like altering parameters or loading different presets are only available in the password-protected "Set-Up" mode.

Speaker SPL
To be able to display the sonic frequency response of the entire system, allocating the data records (phase and frequency response) of the connected speaker systems to their individual outputs is necessary. On a similar page it is also possible to assign the data for the employed DYNACORD power amps. CrossMax displays the actual sonic performance of a loudspeaker system in real-time, without characteristic spatial influence and in dependence to all used DSP244 parameters. This indication is exclusively provided for DYNACORD speaker systems, offering a unique way to be one hundred percent sure of optimally using the digital filters.







Filter Functions
Clear and comprehensive display of filter function per output channel including master and channel EQs is provided. The resolution can be changed from +/- 12 dB to +/- 24 dB or +/- 48 dB. Displaying phase and frequency responses and fading out loudspeaker outputs that are not included in the overall system is also possible. Adding the sonic data of loudspeaker systems and power amps to the electrical transfer function reveals the sound system's actual sonic performance. Any parameter change is immediately visible and audible, while spatial independence represents the major advantage of display mode.

CrossMax is the only editor software that is capable of displaying the frequency response of a DYNACORD speaker system in real-time – exactly the way, the system would behave in the free-field. Any parameter change, like volume, filters, or delay times is immediately indicated: even complex set-ups can be easily accomplished. Fine-adjustments "on the spot" are mostly reduced to +/- 1dB for each frequency band.

Placement Function
The CrossMax Placement Window offers additional assistance to determine the optimum positioning. All CrossMax data refers to a speaker's centre of the front grille. Different from the real frequency and phase indication, in this case a spherical radiation pattern of low-frequency sonic signals is presumed. Moving the "listener's head" on the loudspeaker system axis results in the display of the heard frequency response at that position. Display of the level distribution for frequencies up to 150 Hz and depending on the actual speaker position is additionally possible.