Dx38

EV®

DIGITAL SOUND SYSTEM PROCESSOR

24 BIT DIGITAL SOUND SYSTEM PROCESSOR

powered by

RACE
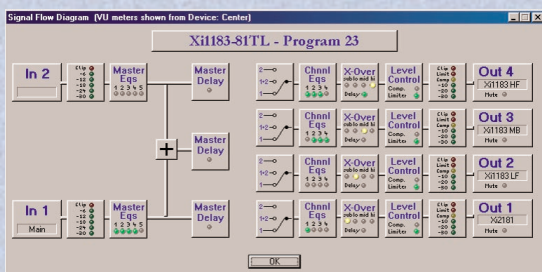**Software**

Dx38 — THE NEW STANDARD IN DIGITAL SOUND PROCESSING

EV's Dx38 digital sound system processor sets new standards for digital sound processing, with a dynamic range in excess of 115 dB, multiple filter functions, and exclusive **RACE** (**R**ealtime **A**coustic **C**luster **E**ditor) software.

Signal Flow Window

RACE's signal flow window provides a clear overview of all available parameters. Five master equalizers are available per input immediately after input metering. Each of these filters can be set as a hi- or lo-pass filter (6 dB/12 dB peak), as a hi- or lo-shelf filter (6/12 dB), or as a full parametric equalizer. A green LED symbol indicates whether each filter is activated.

The master delay allows each input or the sum of both inputs to be delayed separately up to 900ms. Fully flexible routing allows each input or the sum of both inputs to be routed to any of the four outputs. Each of the four filters per output provide the same filter functions as the master equalizers, as well as an all-pass filter for phase corrections. The crossover section provides a hi- or lo-pass filter for each channel and an output delay for alignment. The dynamics section provides independent compressors and limiters to ensure speaker protection.

The output meter display works like the whole editor in realtime. Level control and mute are available for each channel.
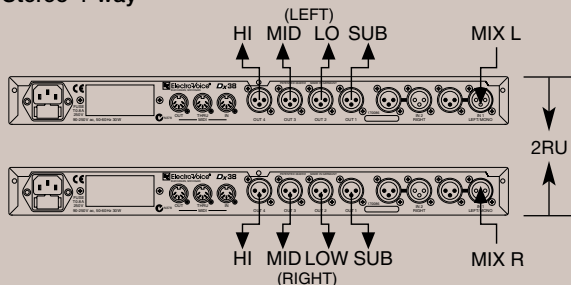
You don't need a PC to use the Dx38! The Dx38's parameters can all easily be edited on the front control panel. Once you try **RACE** software, however, you may never again want to work without it!
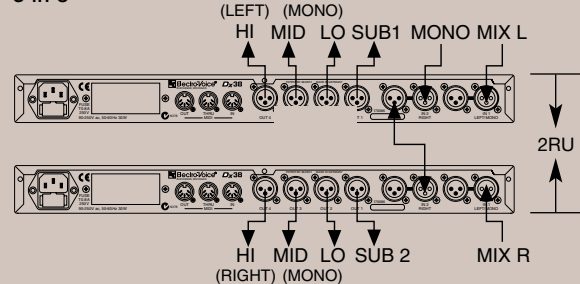
Applications
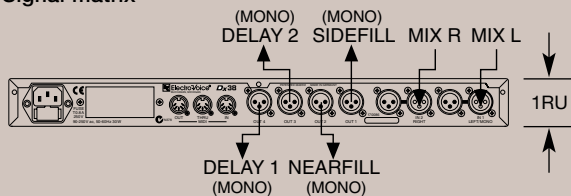
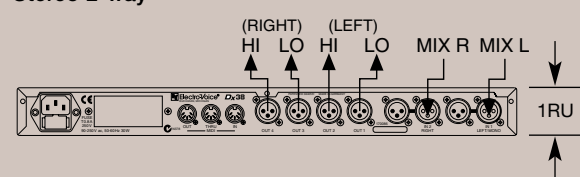# Dx38 Digital Sound System Controller with exclusive RACE software!

EV's Dx38 digital sound system processor sets new standards for digital sound processing, with a dynamic range in excess of 115 dB, multiple filter functions, and exclusive RACE (Realtime Acoustic Cluster Editor) software.

Configuration window

The clearly organized Configuration window allows the user to name each output for its connected speaker. Space is provided for adding notes, and additional windows allow access to filter and delay settings.
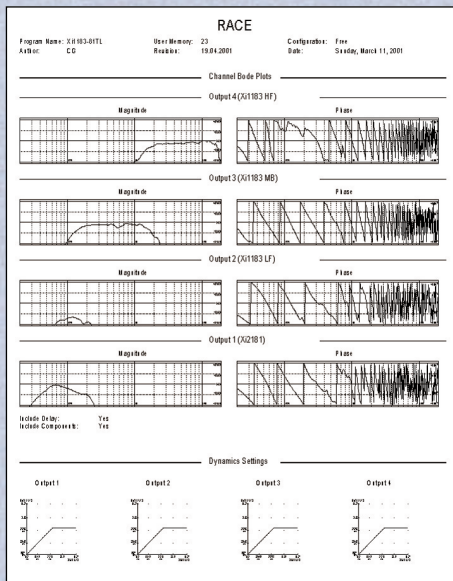
Documentation

Full documentation of up to seven pages can be printed. Printed information includes listings of all parameters, as well as all filter and frequency responses for the EV speakers used in the system.

Versatile Applications

With its 2-in/4-out architecture, the Dx38 is the perfect system controller for multi-way loudspeaker arrays. It also works perfectly for signal distribution in larger sound systems with delay lines, since it allows the sum of inputs A&B to act as a virtual third input. And one central PC can control as many as 31 units (up to 3,930 feet away) through RS-232, MIDI, or (optional) RS-485 interfaces.

The Dx38's optional contact closure interface allows remote switching of presets or muting. The Dx38 comes with 50 factory presets for EV speaker systems and can store another 30 user presets. The Dx38 is always shipped with the latest version of RACE software, but it's easy to upgrade or try RACE out — RACE is available as a free download at www.electrovoice.com.
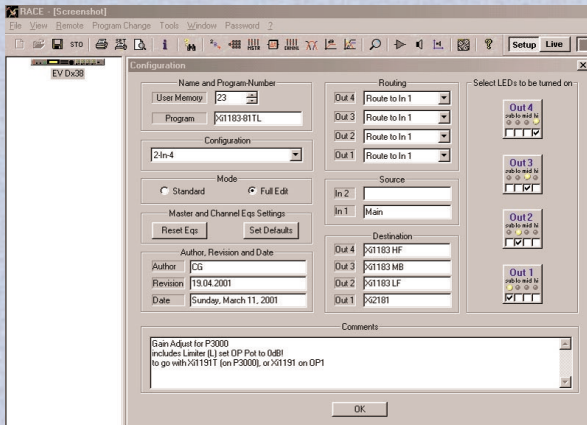
Easy Operation without a PC

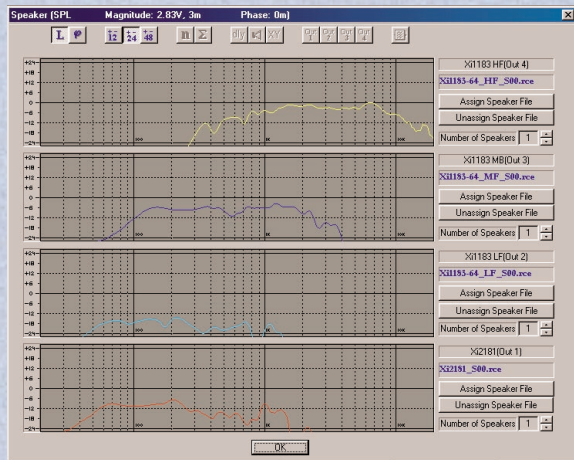No computer available? The Dx38 can be easily used without one. A clearly arranged graphic display helps in editing all parameters. Four LEDs monitor the status of each output (Sub, Low, Mid, Hi, or any combination) for quick output assignment. The output level control pots are push pots that send dedicated output information directly to the display for editing. And the Dx38 can be locked to prevent unauthorized changes.

In the Speaker window, **RACE** displays a complete system's acoustical response by assigning each speaker's acoustical data (phase and magnitude) to the appropriate output. The data is measured in a free field, and all influences of filter functions, levels and delay settings are then calculated. **RACE** thus displays the system's acoustical response — including all parameters used on the Dx38, but without any room influence — in realtime. The Speaker window works exclusively with EV speaker systems and helps optimize the use of all digital parameter functions.
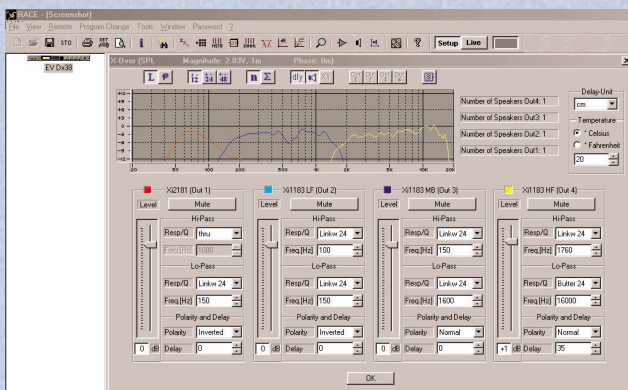
In this example of a 4-way system (an EV Xi-1183 3-way with an EV Xi-2181 sub), **RACE**'s X-Over window clearly displays each output's filter functions, including master and channel EQ settings. Resolution can be set at ±12 dB, ±24 dB, or ±48 dB, and it's easy to toggle between frequency and phase response. Although the output from other speakers in the system can be excluded from the view, the example uses all four outputs. (This slightly complex example shows a combination of conventional crossovers with a wide overlap between Sub (Xi-2181) and Lo (Xi-1183 LF) inputs).
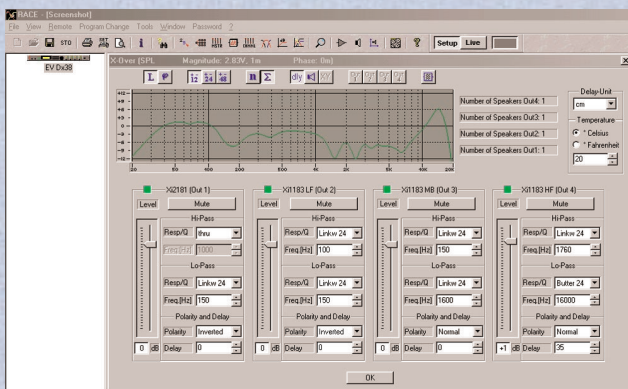
The example shows the electrical transfer function of the Dx38 for this system through the complex summation of its filters, levels, and delays.
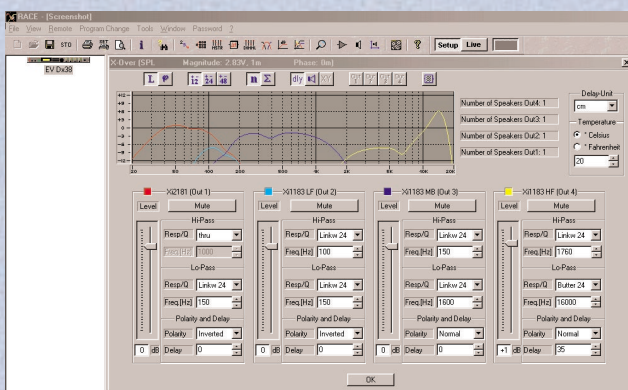
It is difficult to derive any idea of the sound quality from the previous window. But once the acoustical data of the raw components and amplifiers is added, the window displays the system's real acoustical response according to the actual parameter settings. Parameter alterations are immediately visible and audible.

RACE, an industry first, is therefore unique in that it can show the true frequency response of EV components in realtime as they behave in a free field. With all system data and parameters entered, the user can understand how the system will perform independently of any room influence.

RACE

RACE Software (Realtime Acoustic Cluster Editor)

RACE software is EV's professional audio solution for modeling the response of loudspeaker systems both simple and complex within specific venue measurements, and for digitally controlling such systems through the Dx38. **RACE** enables engineers to seamlessly integrate room influence, speaker positioning, and parameter settings, and **RACE** system presets guarantee a solid, accurate basis from which to begin system tuning.

EV obtains specific acoustic data for all of its speakers by measuring each speaker separately in its large anechoic chamber and saving the information in a **RACE**-specific file. The user assigns individual components to **RACE** outputs using these files, and applies desired filter, delay, and level settings. **RACE** then calculates the complex summation of all settings applied to the components. At a glance, then, **RACE** users can view not only each component's (and the system's) electrical filter response, but also its true acoustic response! Any changes in parameters are immediately visible and audible. As well, **RACE** can display SPL dispersion for lower frequencies.

System presets can be prepared offline in advance. The user can employ one of the 50 pre-installed presets, or customize one from individual component files. Systems prepared in this way need only a little tweaking once speakers are in place. **RACE** makes quick setups a snap!
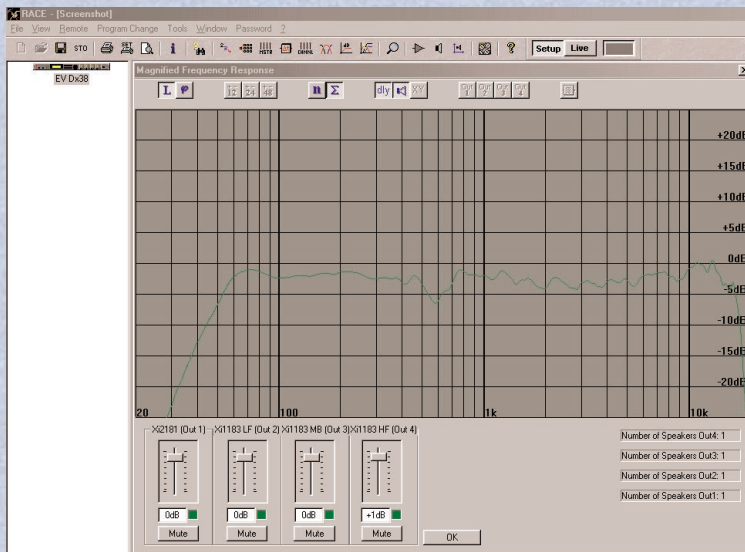
This example shows the Magnified Frequency Response window for a system that includes an EV Xi1183/64 plus an EV Xi2181 4-way. Any parameter changes, such as level, filter or delay tweaks, display immediately. Even very complex array settings can be tuned simply and accurately.
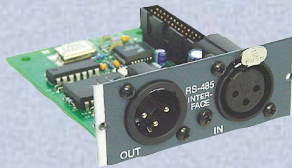
RACE Networks Control up to 124 Outputs

With the Dx38's optional RS-485 interface, **RACE** software permits control of large, complex speaker systems of up to 124 outputs. Access to complex networks is provided either by exchanging the factory-installed RS-232 interface with an optional RS-485 interface, or by connecting a DCN-485 converter (RS-232 to RS-485) to the PC's COM port. The RS-485 and the DCN-485 both provide XLR connector output. The DCN-485 requires no power supply.

With conventional microphone cables, units can be controlled over distances up to 655 feet. CAT-5 cabling allows control over control distances up to 3,930 feet. Realtime monitoring of all parameters — including frequency response, input and output metering, and compressor/limiter thresholds — provides a complete, up-to-the-second visual overview of the system.

DCN 485 Converter

RS-485 Interface
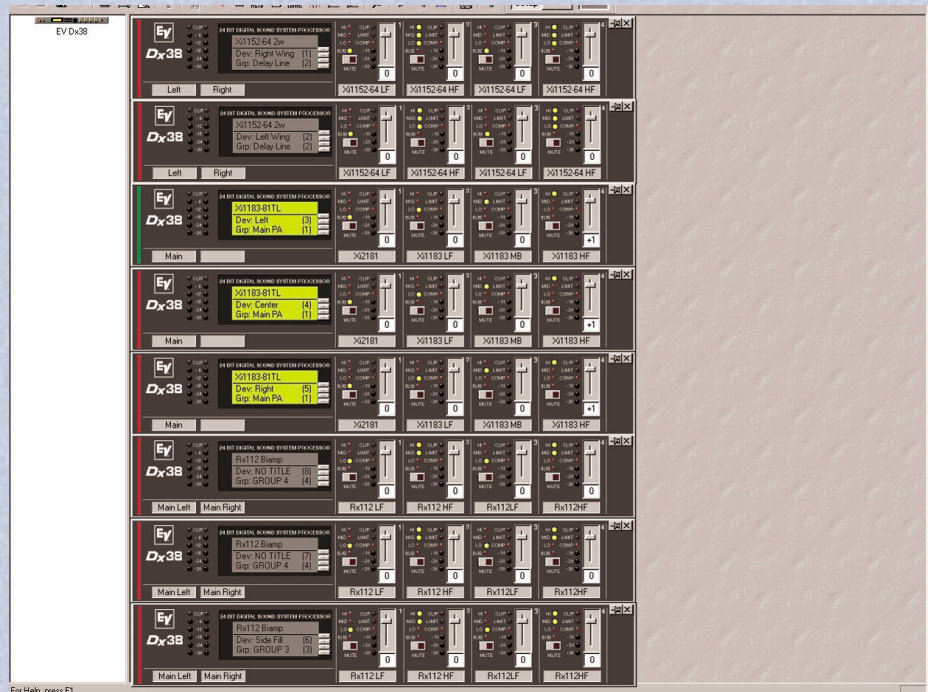
Network control is so easy and intuitive...
It`s like the controllers are in a side rack
just an arm´s length away!

Flexible, easy-to-use, and stable, **RACE** took several years to develop. It incorporates the suggestions of many audio professionals and active sound engineers. Every time a parameter is changed, a message asks the user to confirm that the change is intentional. Systems can be viewed in Live Mode or Setup Mode. Live Mode displays all units, includes realtime input and output metering, and allows mute and level adjustments just as if all units were nearby on a side rack. All other functions, such as parameter editing or changing presets, are available only in the password-protected Setup Mode.
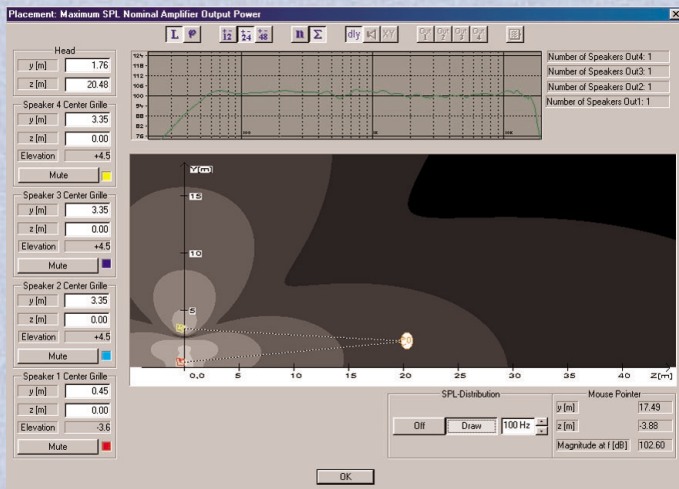
Placement Window:
Precise Speaker Positioning

RACE's Placement window allows the user to optimize speaker positioning relative to a key listening position (the "listener's head"). The Placement feature combines response data from preset **RACE** speaker files (as measured from each enclosure's center grille) with the system's physical geometry (for example, with subs on the floor and flying top cabinets) to display the system's acoustic response at the position of the "listener's head." Dragging-and-dropping the "listener's head" displays the system's acoustic response for as many locations as the user wishes to check. SPL distribution for frequencies from 20 Hz to 152 Hz can be graphically displayed; the example shows SPL distribution at 100 Hz.
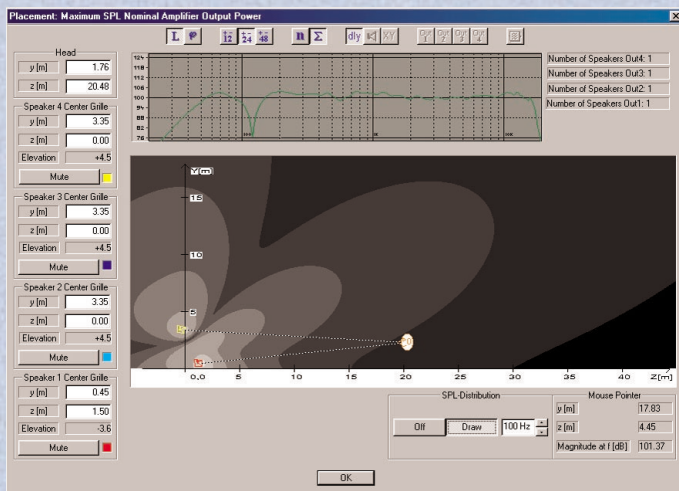
For example, in the setup at left, a subwoofer has been been placed near an emergency exit and has to be moved. The user moves the sub to a new location in the **RACE** Placement window, and **RACE** immediately displays the potential acoustic catastrophe…

The "listener's head" experiences a big sonic dip at about 100 Hz. As well, the usually inaudible 45° lobing towards the ceiling becomes definitely audible as 1st- and 2nd-order reflections, further distorting the sound at the listening position.

The user then changes the system's parameters to fix positioning and lobing issues. Once the sub in question is properly delayed, system response is again be optimized for the listener and the undesirable reflective lobing is eliminated.

Rear View

Specifications

AC voltage	90-250 V AC (50-60 Hz)
Power consumption	30 W maximum
Safety class	VDE/IEC Class I
Inputs	2 x XLR in, electronically balanced, transformers optional 2 x XLR OUT (Direct Out)
Nominal input voltage	1.55 V (+6 dBu)
Maximum input voltage	24.5 V (+30 dBu)
Input impedance	20 kΩ
Common-mode rejection	>40 dB (1 kHz)
A/D conversion	24-bit; 128x oversampled; linear phase
Outputs	4 x XLR out; electronically balanced
Nominal output voltage	1.55 V (+6 dBu)
Maximum output voltage	8.7 V (+21 dBu)
Output impedance	<100 Ω
Minimum load impedance	600 Ω
D/A conversion	24-bit; 128x oversampled; linear phase
Frequency response	20 Hz–20 kHz (-0.5 dB)
S/N ratio	>115 dB (typical)
THD without transformer	<0.01% (1 kHz)
THD with transformer	<0.05% (1 kHz)
Crossover	Independently adjustable high- and low-pass filters with Butterworth and Linkwitz-Riley 12- and 24-dB/octave slopes and Bessel 6-, 12-, 18- and 24-dB/octave slopes
EQ filters	Five filters per input; four filters per output: – Parametric EQ (20 Hz–20 kHz; Q 0.4–20.0; +/-12 dB) – Low shelf (20 Hz - 20 kHz; 6/12-dB slope; +/-12 dB); Hi shelf (6-dB slope; +/-12 dB) – High- and low-pass (6/12-dB slope; Q 0.4–2.0) – All pass (outputs only)
Compressors	One per output, with adjustable threshold, compression ratio, and attack/release times
Limiters	One per output, with adjustable threshold and release time
MIDI in/out/thru	Data dump/master-slave operation/remote control
Delay	3 master delays (2–900 ms) 4 channel delays (0–900 ms) Delay increment: 21 µsec
Data format	24-bit linear AD/DA conversion; 48-bit processing
Sample rate	48 kHz
Display	122 x 32 dots, graphic LCD display with LED backlight
Dimensions	1.72" (43.6 mm) x 19.0" (483 mm) x 14.8" (375 mm) hwd
Weight	11 lbs (5 kg)
Protection function	Password lock
Accessories (supplied)	RACE software (also free download from www.electrovoice.com) NRS 90243 RS-232 interface (installed)
Accessories (optional)	NRS 90247 RS-485 interface, DCN485 RS-232 to RS-485 converter NRS 90246 contact-closure interface NRS 90244 input transformer

Subject to change without prior notice.

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