

DMP 64

ProDSP™ DIGITAL MATRIX PROCESSOR

Versatile 6x4 Audio Matrix Mixer with Powerful ProDSP™ for Professional Audio Systems

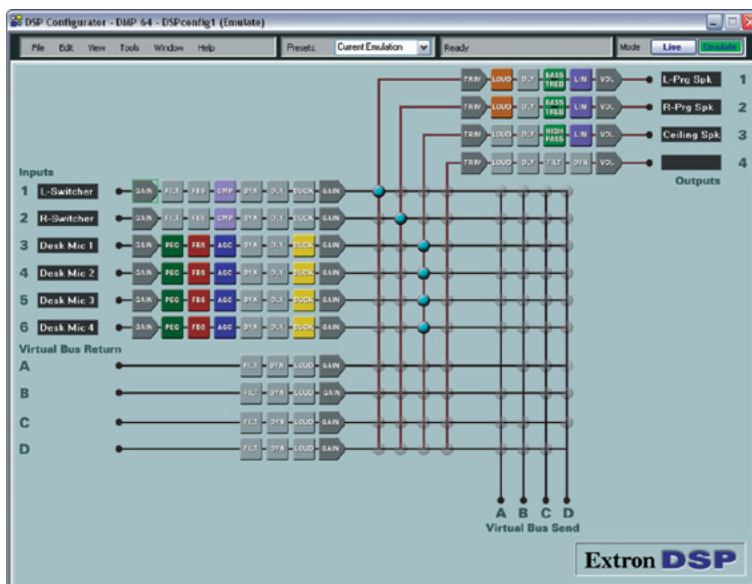
- ProDSP audio signal processing:
 - 32/64-bit floating point digital signal processing engine
 - Fixed, low latency DSP processing

Extensive selection of audio

DSP tools:

- Dynamics
- Ducking
- Loudness
- Filters
- Delay
- Feedback suppression
- 32 DSP Configurator presets

- DSP Configurator™ Software for fast configuration
- Live and Emulate operation modes
- Intuitive Graphical User Environment
- SpeedNav™ keyboard navigation
- Dual matrix design:
 - 6x4 mic/line audio matrix mixer
 - Four virtual routing paths



Extron® Electronics
INTERFACING, SWITCHING AND CONTROL

Introduction

The **DMP 64** Digital Matrix Processor is a 6x4 audio matrix mixer featuring Extron **ProDSP™**, a powerful digital signal processing platform for audio signal routing and control. The DMP 64 offers a configuration approach to DSP in order to simplify mixing, routing, and room optimization. Quick and intuitive configuration allows the DMP 64 to be deployed in very little time, with easy-to-learn adjustments that can be heard in real-time. The DMP 64 is ideal for presentation applications that require advanced line and microphone audio matrix mixing with DSP in a small form factor.



ProDSP

Extron's exclusive ProDSP is engineered from the ground up using a powerful 32/64-bit floating point DSP engine to provide very wide dynamic range and reduce the potential for clipping. ProDSP also utilizes studio grade 24-bit audio converters with 48 kHz sampling to maintain audio signal transparency. ProDSP is loaded with powerful, easy-to-configure tools to control level, dynamics, filters, delay, ducking, loudness, and feedback suppression.

Easy-to-use DSP Configurator Software

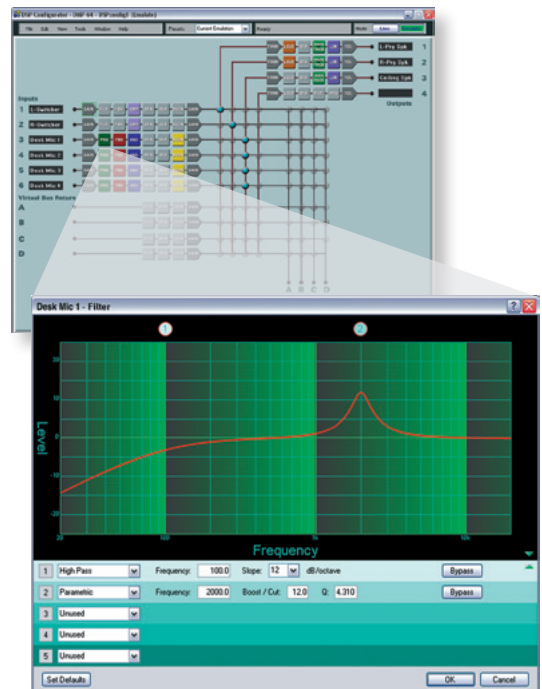
The power of ProDSP is easily harnessed with the DSP Configurator Software. The flexible on-screen layout offers fast access to all of the digital audio signal processing tools including level control, dynamics, filters, delay, ducking, loudness, feedback suppression, and audio matrix mixing. Designers can quickly get a snapshot view of the entire audio system including processing blocks, routing ties, and mixing matrix assignments all at once.

Flexible Routing

The DMP 64 features six mono mic/line inputs with phantom power, each of which can be mixed into any or all four mono line outputs. Six microphone or mono line level signals can be matrix mixed into four mono buses to create finely tuned audio zones for each of the four outputs. Four "virtual" buses are available for additional routing capability. The virtual buses add powerful versatility to the DMP 64, enabling designated inputs to be grouped and processed together as an ensemble. Filter, Dynamics, Loudness, and Gain blocks are available on each virtual bus.

Versatile Control Options

The DMP 64 can conveniently be controlled and configured via RS-232 serial control, IP Link® Ethernet control, or USB. It also includes digital I/O ports which allow for external triggering such as mic activation and muting.



The DSP Configurator Software allows integrators to fine-tune audio parameters for the unique properties of the room. Within this window, users can quickly view all input and output paths, define matrix mixing assignments, and apply audio processing with customized parameters.

What is ProDSP™

The DMP 64 features Extron's ProDSP, a powerful digital signal processing platform based on a 32/64-bit floating point DSP engine. ProDSP provides an extensive array of digital processing tools for audio system design, configuration, and commissioning. The DSP Configurator Software is the user interface to ProDSP for full control and management of the DMP 64 and all of its DSP functions, including gain, dynamics, filtering, delay, ducking, loudness, and feedback suppression.

An integral part of the DSP Configurator Software is the Graphical User Environment, which allows for quick and easy visualization of all input and output signal paths inside a single window. Working within this user-friendly environment, an audio engineer or installer can clearly view and adjust all input levels, audio DSP processing parameters, audio and video I/O ties, microphone mixing points, and output levels. To simplify these adjustments, SpeedNav keyboard navigation ensures efficient and fast navigation through the Graphical User Environment, using just the keyboard on a laptop.

Highest Quality Converters Plus Floating Point DSP

The DMP 64 features studio grade ADCs - analog-to-digital converters and DACs - digital-to-analog converters using professional level 24-bit resolution and 48 kHz sampling, fully preserving the integrity of the original audio signal.

The processing power of the 32/64-bit floating point DSP engine allows for simultaneous audio processing algorithms within the same channel and across multiple channels without compromising sound quality. Overall latency – the normal delay of audio signals due to audio processing – is always constant regardless of the number of active channels or processes, so that the audio is kept in sync with the video. This powerful DSP engine also delivers very wide dynamic range to prevent clipping and fully maintain audio signal quality.

Fixed Yet Flexible DSP Architecture

The DSP Configurator Software features a fixed layout of DSP processing blocks for each input and output signal chain. Each block in the Graphical User Environment represents a Gain, Dynamics, Delay, Filter, Ducking, or FBS - Feedback Suppression algorithm within the DSP engine. While this architecture is fixed, each block offers flexible options and customizable parameters. For example, the Filter block contains three, five, or nine individual filters depending on the input or output, each of which can be customized as parametric EQ, low pass, high pass, or bass or treble shelving. Each block and each individual filter can be selectively bypassed.

Emulate and Live Modes

The DSP Configurator Software features an Emulate mode, which provides complete audio system design while working offline on a PC. When connected to the DMP 64, Live mode enables real-time control of all settings, file updates and archiving, plus active metering of all input and output channels. In Live mode, integrators can “push” all or part of a configuration to the DMP 64 from the PC, while preserving the existing file. Emulate and Live modes give audio system designers the flexibility to create an entire project from their PC in advance of installation, and then, once they are on site, use the same software to provide accurate system setup and final commissioning.

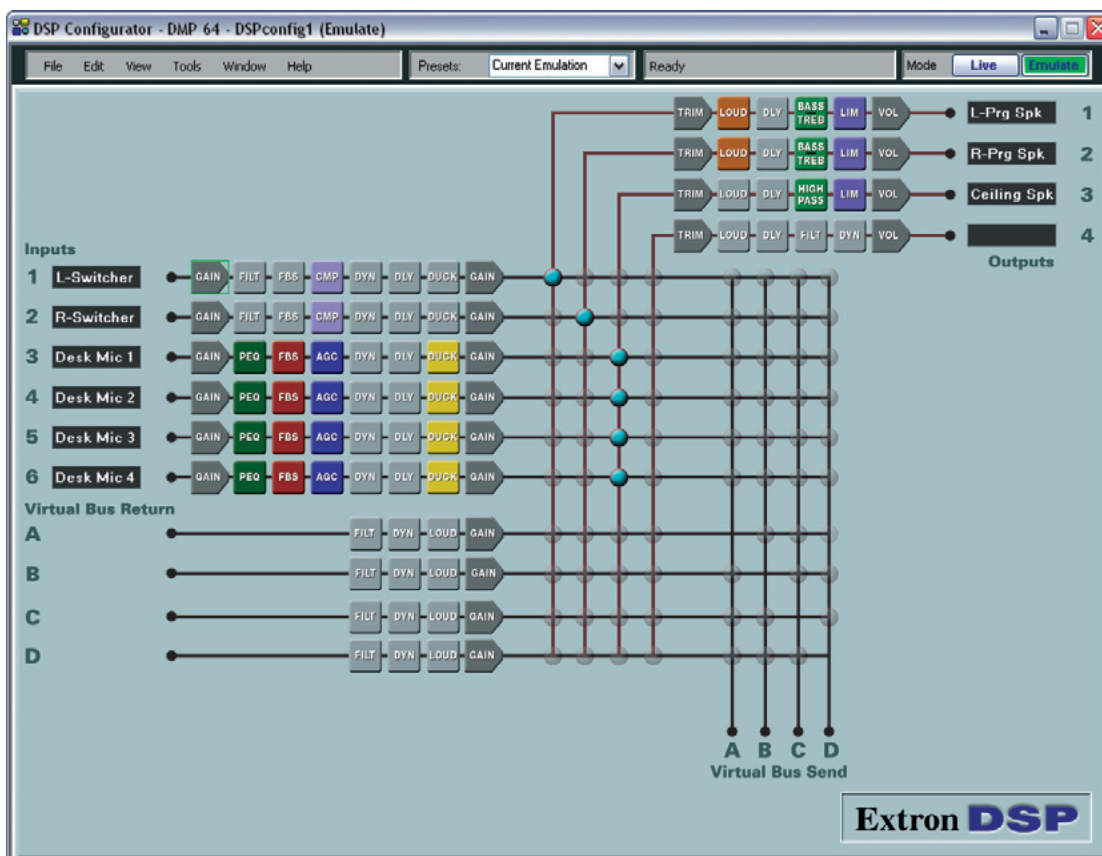
SpeedNav for easy operation without a mouse



One of the challenges of on-site sound system setup is the lack of sufficient workspace for a PC and mouse. An integrator or sound technician often has to work with a laptop balanced on their lap, while trying to use the touch pad to navigate through windows and menus of the DSP software. Working in this environment can be time-consuming and even frustrating.

SpeedNav simplifies this task by allowing the use of only the keyboard to access the software features through directional keys and shortcuts. It is designed with A/V technicians and sound system designers in mind. With SpeedNav, users will experience faster, easier setup and system optimization while working in the field with laptop PCs to configure sound systems and refine audio DSP settings.

Easy-to-use DSP Configurator Software for Fast Setup



Intuitive Graphical User Environment - The DSP Configurator Software features a Graphical User Environment that offers a clear view of all input and outputs, audio processing blocks, routing, mix points, and virtual routing in a single window. This allows a designer or installer to quickly view the entire configuration without having to access multiple windows or menus.

Extron's ProDSP includes all the essential DSP tools needed to set up and fine-tune audio systems. These tools, or processing blocks, allow for control and management of gain, dynamics, filtering, delay, ducking, and feedback suppression. The DMP 64 serves as the DSP center for sound system setup and optimization. This can simplify system designs and save money by eliminating more complicated DSP equipment. This easy-to-use configuration approach saves time during system tuning.

Filter, FBS, Dynamics, Delay, Ducking, and Gain blocks are available for each input. Loudness, Delay, Filter, Dynamics, and Gain blocks are available for each of the four outputs. Selecting any of these blocks opens a dedicated pop-up window with a range of options and customizable parameters. Multiple windows can be open at the same time. Input and output levels can be monitored at any time by simply opening any of the input or output Gain or Volume windows, or the convenient meter bridge.

EXTENSIVE ARRAY OF DSP TOOLS

GAIN STAGES	4 gain stages across input-to-output paths Gain control at mix points 3 gain stages across virtual paths
DYNAMICS	AGC - Automatic Gain Control Compressor Limiter Noise gate
DUCKING	1 ducking processor per input, multiple priority levels
LOUDNESS	1 loudness processor per output
FILTERS	5 filters per input, 3 filters per virtual path, 9 filters per output High pass Low pass Shelving Parametric EQ
DELAY	1 processor per input and output up to 200 ms each
FEEDBACK SUPPRESSION	1 anti-feedback processor per mic/line input
PRESETS	32 presets store entire DSP configuration or selected DSP settings

ProDSP™ Features

Powerful Floating Point Audio DSP Engine

The DMP 64 features 32/64-bit floating point audio DSP processing, which maintains very wide dynamic range and audio signal transparency, to simplify management of gain staging while reducing the possibility of DSP signal clipping.

Fixed, Low Latency DSP Processing

Latency within the DMP 64 is constant regardless of the number of active channels or processes. Fixed, low latency processing keeps audio in sync with video, and prevents distractions to the presenter resulting from delayed live audio.

Copy and Paste for Processing Blocks

To help speed audio system design and setup, parameter settings can be quickly copied between individual processing blocks or identical groups of blocks within the Graphical User Environment, using conventional cut-and-paste commands.

32 DSP Configurator Presets

Using the DSP Configurator Software, any parameters for DSP processing, levels, or routing can be saved as presets. These settings can be saved for the entire system, or any selected group of inputs, outputs, mix points, and DSP blocks.

Six Digital I/O Ports

Six configurable digital I/O ports are provided, so that the DMP 64 can be programmed to sense and then respond to external triggers such as mic activation, muting, and recall of presets.

Dual Matrix Design Provides Primary and Virtual Routing Options

The DMP 64 employs a dual matrix design that offers substantial flexibility in routing, mixing, and processing audio input sources. A primary matrix routes each input to any, or all four outputs. If desired, any of the six inputs can first be directed into a secondary matrix, which routes the inputs to four virtual buses,

before being mixed back into the outputs via the primary matrix. Virtual buses allow for inputs to be grouped together and then processed with the same DSP settings and parameters, simplifying system setup and control.

Group Masters

The DMP 64 provides the capability to consolidate gain or mute control throughout the system. Gain or mute controls can be selected and added to a group master, which can then be controlled by a single master fader or mute control. Each group master can have up to 16 members, and up to 32 group masters can be created.

Soft Limits Provide Optimal Group Master Adjustment Range

The group master volume range can be limited using soft limits to maintain optimal minimum and maximum levels when using external volume control. This prevents operators from over or under-adjusting levels when using digital I/O or RS-232 control. The DSP

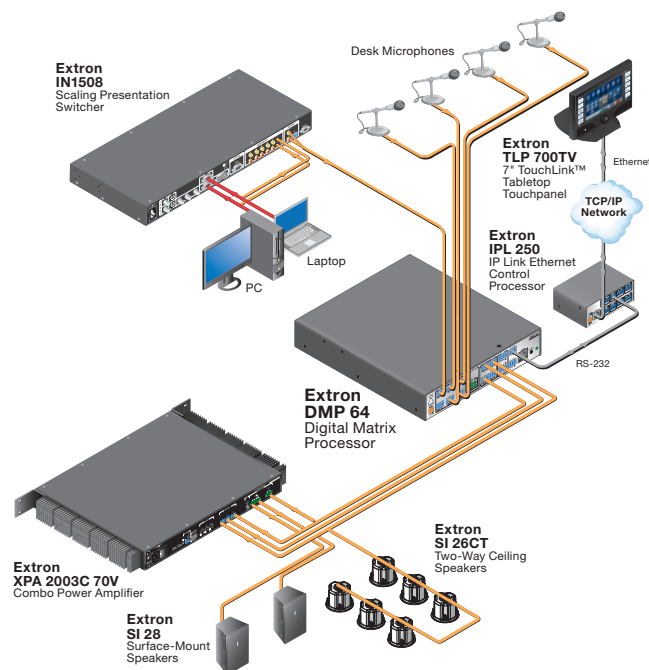
Configurator Software provides quick drag-and-drop adjustment of soft limits from the Group Controls screen.

Source and Output Signal Presence and Clipping LEDs

The DMP 64 provides LEDs on the front panel for each input and output, for real-time monitoring of signal presence. A separate LED illuminates as a warning whenever analog signal clipping is detected.

Flexible Control Options

The DMP 64 can be controlled using the DSP Configurator Software running on a PC connected to the IP Link Ethernet port, the RS-232 serial port, or the USB 2.0 port on the front panel. The DMP 64 can also be controlled through a third-party control system with Extron SIS™ - Simple Instruction Set commands, and by accessing the internal Web pages. With two RS-232 serial ports plus the IP Link Ethernet port, the DMP 64 offers possibilities for control in single and divisible room applications.



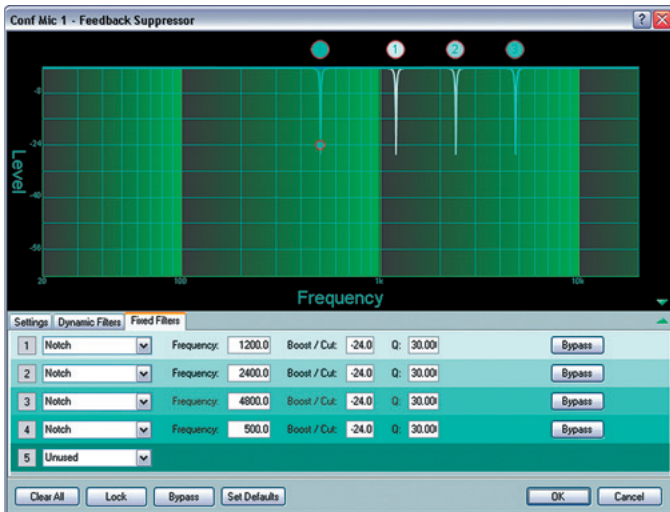
COMPLETE SYSTEM VISUALIZATION



The Graphical User Environment lets the designer or installer quickly and clearly follow the entire audio signal flow for all channels, from input to output, including all audio DSP processors and virtual buses. All of this is presented in a single window without the need to scroll or bring up multiple windows or menus.

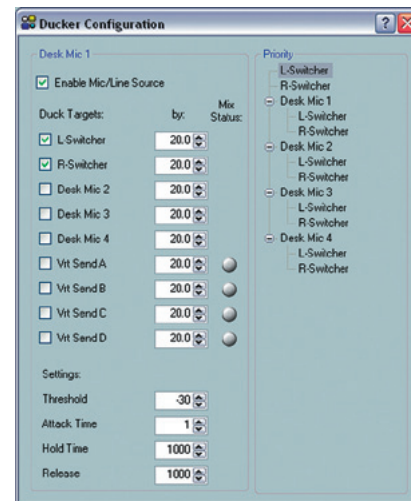
ProDSP™ Features

FBS Feedback Suppression



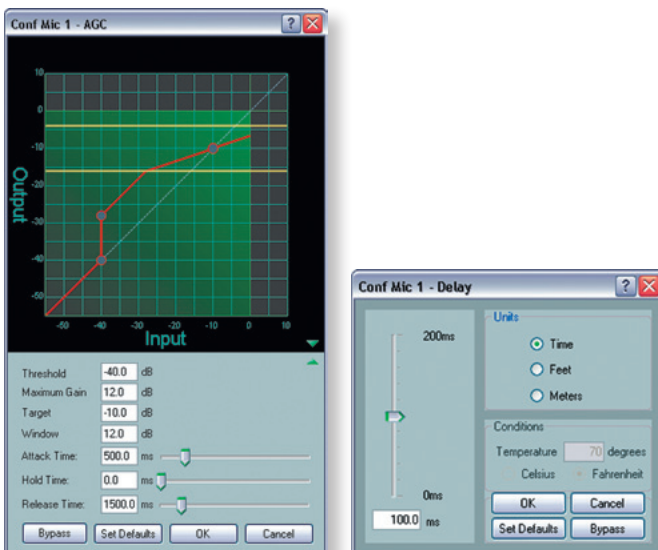
The FBS - Feedback Suppression block is used to counteract ringing due to frequencies cycling out of control through the microphone and speakers. The feedback suppression processor for the DMP 64 engages up to twenty notch filters with adjustable Q. Fifteen of the filters are dynamic, and the processor automatically detects and then reduces the ringing. Five additional fixed filters can be adjusted manually or transferred from the dynamic filters.

DUCK Ducking



The Ducking block is used to give priority to specific inputs by automatically attenuating the levels of other inputs, whenever the priority input is active. Ducking setup is performed for all mic/line inputs on a unique global setup page. An extensive range of customizable options for ducking is available.

AGC Dynamics and Delay



The DSP Configurator Software enables fine-tuning and adjustment of the dynamics of all incoming and outgoing signals. Two Dynamics processing blocks are available for each input. There is one dynamics block on each virtual bus and output. These blocks can be selected and customized to provide automatic gain control, compression, limiting, or noise gating.

A Delay processing block is available for each input and output. Each delay is adjustable up to 200 ms, and can be selected in units of time, feet, or meters. A temperature parameter is available for distance adjustments.

FILT Filtering

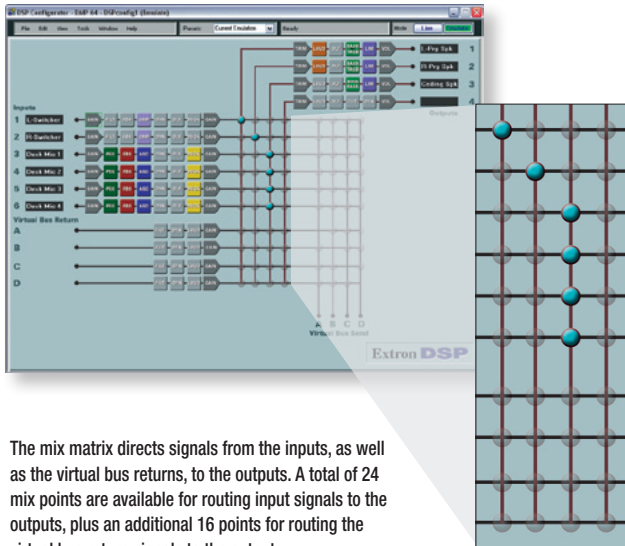


The Filter block offers five customizable filters for each input, three for each virtual bus, and nine for each of the four outputs. Each of these filters can be selected as parametric EQ, low pass, high pass, or bass and treble shelving. Standard parameters include frequency, roll-off slope, boost/cut, and Q, depending on the specific filter.

ProDSP™ Features

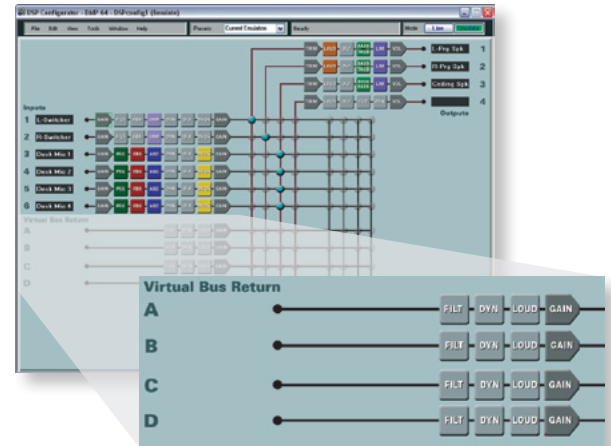
In addition to powerful digital audio processing control, the DSP Configurator Software offers full level control within the primary and secondary mix matrixes, so the audio integrator can apply finely-tuned, customized mixing of an input into an output, and provide routing to a virtual bus. Virtual bus routing allows integrators to route various signals to a common bus, so that filtering, dynamics, and gain can be uniformly applied to these signals. Dedicated mix and muting controls are available for each individual mix point. The DMP 64 also offers gain and muting control throughout the system, within each input, output, and virtual bus signal path.

Mix Matrix



The mix matrix directs signals from the inputs, as well as the virtual bus returns, to the outputs. A total of 24 mix points are available for routing input signals to the outputs, plus an additional 16 points for routing the virtual bus return signals to the outputs.

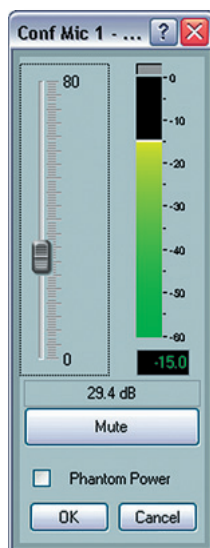
Virtual Bus



Four virtual buses are available for additional routing capability and to simplify group processing. Designers have the flexibility to group signals based on input type or on the processing requirements of the output destination. Signals are routed to the Virtual Bus Sends. Each input can be routed to any or all virtual buses. Relative levels between group members can be individually adjusted at each mix point, while master gain can be controlled in each virtual bus. Each virtual bus offers Filter, Dynamics, Loudness, and Gain blocks so that all the signals in the bus can be processed as a whole.

GAIN

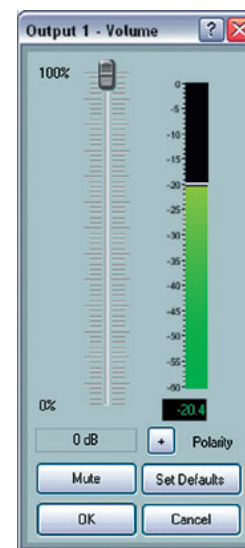
Input Gain



Audio gain adjustment as well as muting is available for each of the six inputs on the DMP 64. Input signal levels can be monitored through real-time meters with peak hold display.

VOL

Output Volume



The DMP 64 provides adjustment of output volume as well as muting for each of the four audio outputs, along with real-time metering. To monitor any or all input and output signal levels, a meter bridge window is also available.

Specifications

AUDIO

Gain	Unbalanced output: 0 dB; balanced output: +6 dB
Frequency response	20 Hz to 20 kHz, ± 0.1 dB
THD + Noise	<0.01% @ 1 kHz, at maximum output level
S/N	>105 dB, 20 Hz to 20 kHz, at maximum output, unweighted
Crosstalk	<-90 dB @ 1 kHz, fully loaded
CMRR	>70 dB @ 1 kHz

AUDIO INPUT

Number/signal type	6 mono, mic/line, balanced/unbalanced
Connector	(6) 3.5 mm captive screw connectors, 3 pole
Impedance	>10k ohms unbalanced/balanced
Nominal level	+4 dBu when level is set to 0 dB gain; adjustable from -60 dBu to +4 dBu
Maximum level	+24 dBu, balanced, when input gain is set to -3 dB
Noise level	<-120 dBV (1 μ Vrms) at 40 dB gain
Volume range	-18 dB to +80 dB, mic/line input, adjustable per input
Mic phantom power	+48 VDC, which can be switched on or off
NOTE: 0 dBu = 0.775 Vrms, 0 dBV = 1 Vrms, 0 dBV $\approx$ 2 dBu	

AUDIO PROCESSING

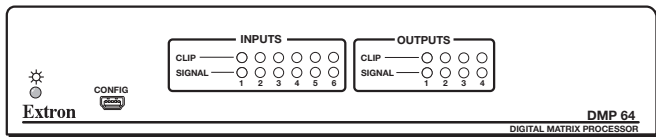
D/A conversion	24 bit, 48 kHz sampling
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AUDIO OUTPUT

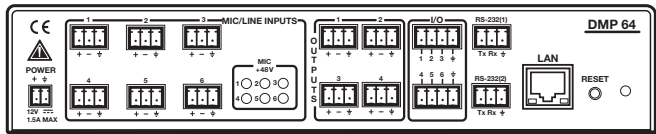
Number/signal type	4 mono, balanced/unbalanced
Connectors	(4) 3.5 mm captive screw connectors, 3 pole
Impedance	50 ohms unbalanced, 100 ohms balanced
Gain error	± 0.1 dB channel to channel
Maximum level (Hi-Z)	>+21 dBu balanced, >+15 dBu unbalanced

CONTROL/REMOTE – AUDIO PROCESSOR

Serial host control port	1 bidirectional RS-232, 3.5 mm captive screw connector, 3 pole
Baud rate and protocol	38400 baud; 8 data bits, 1 stop bit, no parity
Serial control pin configuration	Pin 1 = TX, 2 = RX, 3 = GND
USB control ports	1 front panel female mini USB B
USB standards	USB 2.0, low speed
Ethernet host port	1 RJ-45 female
Ethernet data rate	10/100Base-T, half/full duplex with autotdetect
Ethernet default settings	Link speed and duplex level = autotdetected IP address = 192.168.254.254 Subnet mask = 255.255.0.0 Default gateway = 0.0.0.0 DHCP = off
Web server	Up to 200 simultaneous sessions 6.5 MB nonvolatile user memory
Program control	Extron's control/configuration program for Windows® Extron's Simple Instruction Set (SIS™) Microsoft® Internet Explorer®, Telnet



DMP 64 - Front



DMP 64 - Back

GENERAL

External power supply	100 VAC to 240 VAC, 50-60 Hz, to +12 VDC, 2 A, regulated
Power input requirements	+12 VDC, 1.5 A
Temperature/humidity	Storage: -40 to +158 °F (-40 to +70 °C) / 10% to 90%, noncondensing Operating: +32 to +122 °F (0 to +50 °C) / 10% to 90%, noncondensing
Cooling	Convection, no vents
Mounting	
Rack mount	Yes, with optional 1U rack shelf
Furniture mount	Yes, with optional under-desk mounting kit
Enclosure type	Metal
Enclosure dimensions	1.7" H x 8.75" W x 9.5" D (1U high, half rack wide) (4.3 cm H x 22.2 cm W x 24.1 cm D) (Depth excludes connectors.)
Product weight	1.9 lbs (0.9 kg)
Shipping weight	4 lbs (2 kg)
Vibration	ISTA 1A in carton (International Safe Transit Association)
Regulatory compliance	
Safety	CE, c-UL, UL
EMI/EMC	CE, C-tick, FCC Class B, ICES, VCCI
Environmental	Complies with the appropriate requirements of RoHS, WEEE
MTBF	30,000 hours
Warranty	3 years parts and labor
NOTE: All nominal levels are at $\pm 10\%$	

Model	Version Description	Part number
DMP 64	ProDSP Digital Matrix Processor	60-1054-01

Specifications are subject to change without notice.



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