

DMP 44 LC

Four-Line Input and Four-Line Output
Digital Matrix Processor



Extron® Electronics
INTERFACING, SWITCHING AND CONTROL

Safety Instructions • English

 This symbol is intended to alert the user of important operating and maintenance (servicing) instructions in the literature provided with the equipment.

 This symbol is intended to alert the user of the presence of uninsulated dangerous voltage within the product's enclosure that may present a risk of electric shock.

Caution

Read Instructions • Read and understand all safety and operating instructions before using the equipment.

Retain Instructions • The safety instructions should be kept for future reference.

Follow Warnings • Follow all warnings and instructions marked on the equipment or in the user information.

Avoid Attachments • Do not use tools or attachments that are not recommended by the equipment manufacturer because they may be hazardous.

Consignes de Sécurité • Français

 Ce symbole sert à avertir l'utilisateur que la documentation fournie avec le matériel contient des instructions importantes concernant l'exploitation et la maintenance (réparation).

 Ce symbole sert à avertir l'utilisateur de la présence dans le boîtier de l'appareil de tensions dangereuses non isolées posant des risques d'électrocution.

Attention

Lire les instructions • Prendre connaissance de toutes les consignes de sécurité et d'exploitation avant d'utiliser le matériel.

Conserver les instructions • Ranger les consignes de sécurité afin de pouvoir les consulter à l'avenir.

Respecter les avertissements • Observer tous les avertissements et consignes marqués sur le matériel ou présents dans la documentation utilisateur.

Eviter les pièces de fixation • Ne pas utiliser de pièces de fixation ni d'outils non recommandés par le fabricant du matériel car cela risquerait de poser certains dangers.

Sicherheitsanleitungen • Deutsch

 Dieses Symbol soll dem Benutzer in der im Lieferumfang enthaltenen Dokumentation besonders wichtige Hinweise zur Bedienung und Wartung (Instandhaltung) geben.

 Dieses Symbol soll den Benutzer darauf aufmerksam machen, daß im Inneren des Gehäuses dieses Produktes gefährliche Spannungen, die nicht isoliert sind und die einen elektrischen Schock verursachen können, herrschen.

Achtung

Lesen der Anleitungen • Bevor Sie das Gerät zum ersten Mal verwenden, sollten Sie alle Sicherheits- und Bedienungsanleitungen genau durchlesen und verstehen.

Aufbewahren der Anleitungen • Die Hinweise zur elektrischen Sicherheit des Produktes sollten Sie aufbewahren, damit Sie im Bedarfsfall darauf zurückgreifen können.

Befolgen der Warnhinweise • Befolgen Sie alle Warnhinweise und Anleitungen auf dem Gerät oder in der Benutzerdokumentation.

Keine Zusatzgeräte • Verwenden Sie keine Werkzeuge oder Zusatzgeräte, die nicht ausdrücklich vom Hersteller empfohlen wurden, da diese eine Gefahrenquelle darstellen können.

Instrucciones de seguridad • Español

 Este símbolo se utiliza para advertir al usuario sobre instrucciones importantes de operación y mantenimiento (o cambio de partes) que se desean destacar en el contenido de la documentación suministrada con los equipos.

 Este símbolo se utiliza para advertir al usuario sobre la presencia de elementos con voltaje peligroso sin protección aislante, que puedan encontrarse dentro de la caja o alojamiento del producto, y que puedan representar riesgo de electrocución.

Precaucion

Leer las instrucciones • Leer y analizar todas las instrucciones de operación y seguridad, antes de usar el equipo.

Conservar las instrucciones • Conservar las instrucciones de seguridad para futura consulta.

Obedecer las advertencias • Todas las advertencias e instrucciones marcadas en el equipo o en la documentación del usuario, deben ser obedecidas.

Evitar el uso de accesorios • No usar herramientas o accesorios que no sean específicamente recomendados por el fabricante, ya que podrían implicar riesgos.

安全须知 • 中文

 这个符号提示用户该设备用户手册中有重要的操作和维护说明。

 这个符号警告用户该设备机壳内有暴露的危险电压，有触电危险。

注意

阅读说明书 • 用户使用该设备前必须阅读并理解所有安全和使用说明。

保存说明书 • 用户应保存安全说明书以备将来使用。

遵守警告 • 用户应遵守产品和用户指南上的所有安全和操作说明。

避免追加 • 不要使用该产品厂商没有推荐的工具或追加设备，以避免危险。

Warning

Power sources • This equipment should be operated only from the power source indicated on the product. This equipment is intended to be used with a main power system with a grounded (neutral) conductor. The third (grounding) pin is a safety feature, do not attempt to bypass or disable it.

Power disconnection • To remove power from the equipment safely, remove all power cords from the rear of the equipment, or the desktop power module (if detachable), or from the power source receptacle (wall plug).

Power cord protection • Power cords should be routed so that they are not likely to be stepped on or pinched by items placed upon or against them.

Servicing • Refer all servicing to qualified service personnel. There are no user-serviceable parts inside. To prevent the risk of shock, do not attempt to service this equipment yourself because opening or removing covers may expose you to dangerous voltage or other hazards.

Slots and openings • If the equipment has slots or holes in the enclosure, these are provided to prevent overheating of sensitive components inside. These openings must never be blocked by other objects.

Lithium battery • There is a danger of explosion if battery is incorrectly replaced. Replace it only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

Avertissement

Alimentations • Ne faire fonctionner ce matériel qu'avec la source d'alimentation indiquée sur l'appareil. Ce matériel doit être utilisé avec une alimentation principale comportant un fil de terre (neutre). Le troisième contact (de mise à la terre) constitue un dispositif de sécurité : n'essayez pas de contourner ni de désactiver.

Déconnexion de l'alimentation • Pour mettre le matériel hors tension sans danger, déconnectez tous les cordons d'alimentation de l'arrière de l'appareil ou du module d'alimentation de bureau (s'il est amovible) ou encore de la prise secteur.

Protection du cordon d'alimentation • Acheminer les cordons d'alimentation de manière à ce que personne ne risque de marcher dessus et à ce qu'ils ne soient pas écrasés ou pincés par des objets.

Réparation-maintenance • Faire exécuter toutes les interventions de réparation-maintenance par un technicien qualifié. Aucun des éléments internes ne peut être réparé par l'utilisateur. Afin d'éviter tout danger d'électrocution, l'utilisateur ne doit pas essayer de procéder lui-même à ces opérations car l'ouverture ou le retrait des couvercles risquent de l'exposer à de hautes tensions et autres dangers.

Fentes et orifices • Si le boîtier de l'appareil comporte des fentes ou des orifices, ceux-ci servent à empêcher les composants internes sensibles de surchauffer. Ces ouvertures ne doivent jamais être bloquées par des objets.

Lithium Batterie • Il a danger d'explosion s'il y a remplacement incorrect de la batterie. Remplacer uniquement avec une batterie du même type ou d'un type équivalent recommandé par le constructeur. Mettre au rebut les batteries usagées conformément aux instructions du fabricant.

Vorsicht

Stromquellen • Dieses Gerät sollte nur über die auf dem Produkt angegebene Stromquelle betrieben werden. Dieses Gerät wurde für eine Verwendung mit einer Hauptstromleitung mit einem geerdeten (neutralen) Leiter konzipiert. Der dritte Kontakt ist für einen Erdanschluß, und stellt eine Sicherheitsfunktion dar. Diese sollte nicht umgangen oder außer Betrieb gesetzt werden.

Stromunterbrechung • Um das Gerät auf sichere Weise vom Netz zu trennen, sollten Sie alle Netzkabel aus der Rückseite des Gerätes, aus der externen Stromversorgung (falls dies möglich ist) oder aus der Wandsteckdose ziehen.

Schutz des Netzkabels • Netzkabel sollten stets so verlegt werden, daß sie nicht im Weg liegen und niemand darauf treten kann oder Objekte darauf- oder unmittelbar dagegengestellt werden können.

Wartung • Alle Wartungsmaßnahmen sollten nur von qualifiziertem Servicepersonal durchgeführt werden. Die internen Komponenten des Gerätes sind wartungsfrei. Zur Vermeidung eines elektrischen Schocks versuchen Sie in keinem Fall, dieses Gerät selbst öffnen, da beim Entfernen der Abdeckungen die Gefahr eines elektrischen Schlags und/oder andere Gefahren bestehen.

Schlitz und Öffnungen • Wenn das Gerät Schlitze oder Löcher im Gehäuse aufweist, dienen diese zur Vermeidung einer Überhitzung der empfindlichen Teile im Inneren. Diese Öffnungen dürfen niemals von anderen Objekten blockiert werden.

Lithium-Batterie • Explosionsgefahr, falls die Batterie nicht richtig ersetzt wird. Ersetzen Sie verbrauchte Batterien nur durch den gleichen oder einen vergleichbaren Batterietyp, der auch vom Hersteller empfohlen wird. Entsorgen Sie verbrauchte Batterien bitte gemäß den Herstelleranweisungen.

Advertencia

Alimentación eléctrica • Este equipo debe conectarse únicamente a la fuente/tipo de alimentación eléctrica indicada en el mismo. La alimentación eléctrica de este equipo debe provenir de un sistema de distribución general con conductor neutro a tierra. La tercera pata (puesta a tierra) es una medida de seguridad, no puentearla ni eliminarla.

Desconexión de alimentación eléctrica • Para desconectar con seguridad la acometida de alimentación eléctrica al equipo, desenchufar todos los cables de alimentación en el panel trasero del equipo, o desenchufar el módulo de alimentación (si fuera independiente), o desenchufar el cable del receptáculo de la pared.

Protección del cables de alimentación • Los cables de alimentación eléctrica se deben instalar en lugares donde no sean pisados ni apretados por objetos que se puedan apoyar sobre ellos.

Reparaciones/mantenimiento • Solicitar siempre los servicios técnicos de personal calificado. En el interior no hay partes a las que el usuario deba acceder. Para evitar riesgo de electrocución, no intentar personalmente la reparación/mantenimiento de este equipo, ya que al abrir o extraer las tapas puede quedar expuesto a voltajes peligrosos u otros riesgos.

Ranuras y aberturas • Si el equipo posee ranuras o orificios en su caja/alojamiento, es para evitar el sobrecalentamiento de componentes internos sensibles. Estas aberturas nunca se deben obstruir con otros objetos.

Batería de litio • Existe riesgo de explosión si esta batería se coloca en la posición incorrecta. Cambiar esta batería únicamente con el mismo tipo (o su equivalente) recomendado por el fabricante. Descharar las baterías usadas siguiendo las instrucciones del fabricante.

警告

电源 • 该设备只能使用产品上标明的电源。设备必须使用有地线的供电系统供电。第三条线(地线)是安全设施,不能不用或跳过。

拔掉电源 • 为安全地从设备拔掉电源,请拔掉所有设备后或桌面电源的电源线,或任何接到市电系统的电源线。

电源线保护 • 妥善布线, 避免被踩踏, 或重物挤压。

维护 • 所有维修必须由认证的维修人员进行。设备内部没有用户可以更换的零件。为避免出现触电危险不要自己试图打开设备盖子维修该设备。

通风孔 • 有些设备机壳上有通风槽或孔,它们是用来防止机内敏感元件过热。不要用任何东西挡住通风孔。

锂电池 • 不正确的更换电池会有爆炸的危险。必须使用与厂家推荐的相同或相近型号的电池。按照生产厂的建议处理废弃电池。

FCC Class A Notice

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. Operation is subject to the following two conditions:

- 1.** This device may not cause harmful interference.
- 2.** This device must accept any interference received, including interference that may cause undesired operation.

The Class A limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

NOTE: This unit was tested with shielded cables on the peripheral devices. Shielded cables must be used with the unit to ensure compliance with FCC emissions limits.

For more information on safety guidelines, regulatory compliances, EMI/EMF compliance, accessibility, and related topics, [click here](#).

Conventions Used in this Guide

In this user guide, the following are used:

NOTE: A note draws attention to important information.

TIP: A tip provides a suggestion to make working with the application easier.

CAUTION: A caution indicates a potential hazard to equipment or data.

WARNING: A warning warns of things or actions that might cause injury, death, or other severe consequences.

Commands are written in the fonts shown here:

`^AR Merge Scene,,0p1 scene 1,1 ^B 51 ^W ^C`

`[Ø1] R Ø004 00300 00400 00800 00600 [Ø2] 35 [17] [Ø3]`

`Esc[X1*[X17*[X20*[X23*[X21CE←`

NOTE: For commands and examples of computer or device responses mentioned in this guide, the character “Ø” is used for the number zero and “O” represents the capital letter “o.”

Computer responses and directory paths that do not have variables are written in the font shown here:

`Reply from 208.132.180.48: bytes=32 times=2ms TTL=32`

`C:\Program Files\Extron`

Variables are written in slanted form as shown here:

`ping xxx.xxx.xxx.xxx -t`

`SOH R Data STX Command ETB ETX`

Selectable items, such as menu names, menu options, buttons, tabs, and field names are written in the font shown here:

From the **File** menu, select **New**.

Click the **OK** button.

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Introduction

This section describes this guide and the DMP 44 LC, including:

- [About This Guide](#)
- [About the DMP 44 LC Digital Matrix Processor](#)
- [Features](#)
- [DMP 44 LC Application Diagram](#)

About This Guide

This guide contains installation, configuration, and operating information for the Extron DMP 44 LC Digital Matrix Processor, software controlled digital audio processor.

In this guide, the DMP 44 LC may also be referred to as "the DMP" or "device."

About the DMP 44 LC Digital Matrix Processor

The DMP 44 LC is a standalone audio matrix processor with four line inputs and four line outputs. Using high-quality 24-bit A/D converters sampling at 48 kHz, input signals are converted into the digital domain where Digital Signal Processing algorithms process and mix the signals. The DMP 44 LC uses a matrix design providing audio signal processing available in any of the input and output signal paths. A matrix mixer provides extremely flexible architecture, allowing for versatile processing, mixing, and routing scenarios.

An RS-232 port on the rear panel, plus a USB port located on the front panel provide convenient high-speed access. Three digital input ports permit connection of switches and sensors to provide input to the system for triggering a variety of actions within the device.

The DMP 44 LC has no front panel controls, therefore all configuration of DSP processors and the matrix mixer is performed using the Extron DSP Configurator™ program from a host computer via the RS-232 or USB communication ports.

Two operational modes, Live and Emulate, allow a user to work offline from the device to set up a configuration and create presets and group controls as needed before placing the configuration in the DMP 44 LC. DSP Configurator settings developed offline can be saved to disk as a job file that can be uploaded to the device at a later time, or can be transferred directly to the device by switching to Live mode. Up to 16 full or partial presets and up to 16 group master controls can be created, loaded into and stored in the DMP 44 LC. Control systems connected to the device by RS-232 can control a subset of DMP 44 LC functions using Extron Simple Instruction Set (SIS™) commands.

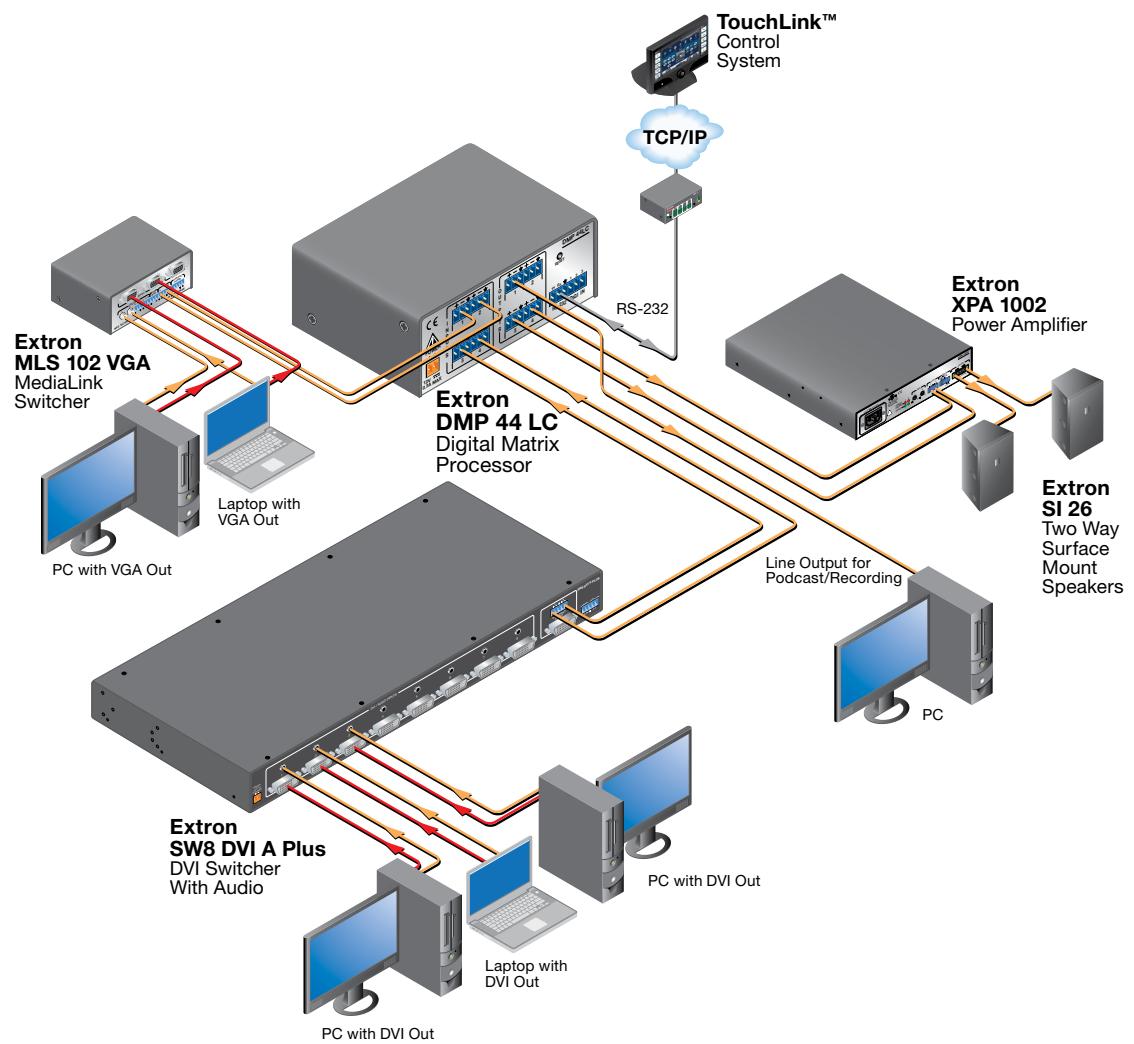
Features

- **Consumer and professional audio compatibility** — Line inputs provide gain settings to accommodate consumer (-10 dBV) and professional (+4 dBu) operating line level sources.
- **Inputs** — Four balanced or unbalanced line on 3.5 mm, 6-pole captive screw connectors.

- **Outputs** — Four balanced or unbalanced line on 3.5 mm, 6-pole captive screw connectors.
- **4x4 line level audio matrix mixer** — The DMP 44 LC is a compact matrix processor with DSP. It features four line level inputs that can be processed, mixed, and routed to four line level outputs.
- **DSP audio signal processing** — The DMP 44 LC provides digital signal processing on all input and output paths.
- **24-bit/48 kHz analog-to-digital and digital-to-analog converters** — High performance converters preserve audio signal integrity in input and output signal conversion, while maintaining latency under 1 ms.
- **Three digital input ports for remote triggering** — Three configurable digital input ports are provided, so that external switches and sensors can be connected to the mixer for remote triggering of functions within the DMP 44 LC.
- **Building Blocks processor templates** — A collection of pre-designed processor templates optimized for a specific type of input or output device, such as microphones and Extron speakers, with preset levels, filters, dynamics, and more. Flexible building blocks are available on each I/O strip and allow system designers to fully customize and save their own building blocks, further streamlining audio system design and integration.
- **Console View with gain settings, metering, and routing in a single window** — An optional view within the DSP Configurator software that allows system designers to see all gain settings and routing, together with live metering in a single window. Console view provides overload indication, numeric values for levels, and also mute status for each input, gain stage, mix point, and output, so that settings between inputs and outputs can be easily compared and adjusted in one view.
- **Live and Emulate operation modes with configuration file saving** — Allows settings to be configured offline, then uploaded to the DMP 44 LC. The software also backs up configurations from the device for archiving.
- **Low latency DSP processing** — The DSP engine supports an array of concurrent audio processing within an audio channel and across multiple channels, while maintaining extremely low latency from input to output.
- **DSP Configurator Software** — Powerful, user-friendly PC-based software tool for managing all audio operations of the DMP 44 LC. The software enables complete setup and configuration of digital audio processing tools, as well as routing and mixing.
- **Intuitive Graphical User Environment** — The DSP Configurator software features a graphical user environment with 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 all audio activities without having to access multiple windows or menus.
- **SpeedNav™ keyboard navigation** — SpeedNav enables user-friendly, keyboard-based navigation of the DSP Configurator software without the need for a mouse or touchpad. Using keyboard navigation keys and shortcuts, a user can access any input or output, mixing points, and all audio DSP tools. Using only the keyboard for software access can help expedite audio system setup and commissioning while on-site using laptop.
- **Copy and paste for processing blocks** — To help speed up 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.

- **16 DSP Configurator presets** — Using the DSP Configurator software, parameters for DSP processing, signal levels, or audio routing can be saved as presets. These settings can be saved for the entire system, or any selected group of inputs, outputs, mixing points, and DSP blocks.
- **Group masters** — The DMP 44 LC provides the capability to consolidate gain or mute control throughout the system. Any gain or mute block within the graphical user environment can be selected and added to a group master, which can then be controlled by a single master fader and mute control. Sixteen group master controls are provided. Each group master can have up to eight members.
- **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.
- **Flexible control options** — The DMP 44 LC can be controlled using the DSP Configurator software and a PC connection to the RS-232 serial port, or to the USB 2.0 port on the front panel.
- **Front panel USB configuration port** — Enables configuration without having to access the rear panel.
- **RS-232 serial control port** — Using serial commands, the DMP 44 LC can be integrated into third-party control systems using SIS commands.
- **Versatile mounting options** — Rack-mountable 1U, quarter rack width metal enclosure.

DMP 44 LC Application Diagram



Installation

This section describes the installation of the DMP 44 LC, including:

- **Mounting the DMP 44 LC**
- **Rear Panel Features and Cabling**

Mounting the DMP 44 LC

The 1U high, quarter rack width, 3.0 inch deep DMP 44 LC Digital Matrix Processor can be:

- Set on a table,
- Mounted on a rack shelf,
- Mounted under a desk or tabletop, or
- Mounted on a projector bracket.

See “[Mounting](#)” in the “[Reference Information](#)” section for detailed mounting instructions.

Rear Panel Features and Cabling

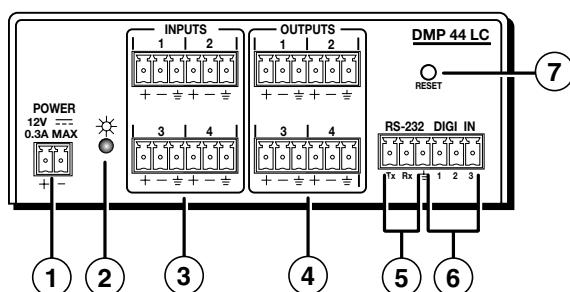


Figure 1. DMP 44 LC Rear Panel

- ① **Power connector** — Connect the included 12 VDC external power supply into the 2-pole 3.5 mm captive screw connector. Be careful to observe the correct polarity.

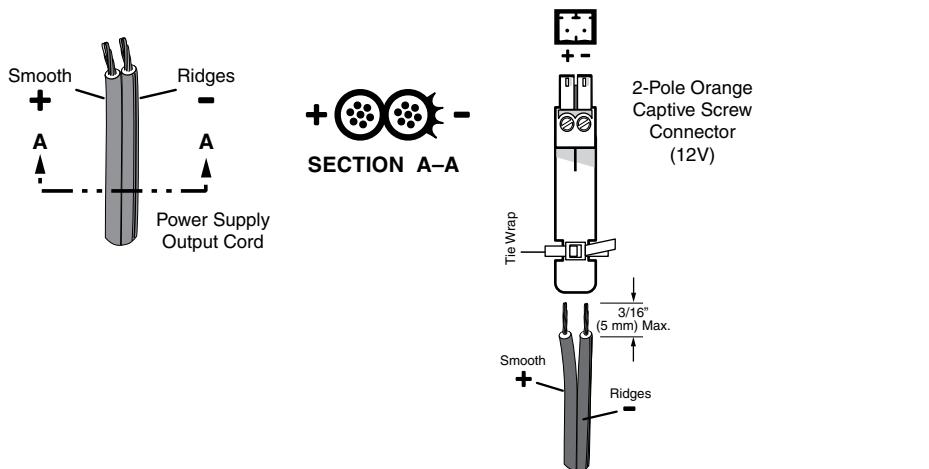


Figure 2. Power Supply Wiring

WARNING: The two power cord wires must be kept separate while the power supply is plugged in. Remove power before wiring.

- CAUTIONS:**
- Always use a power supply supplied by or specified by Extron. Use of an unauthorized power supply voids all regulatory compliance certification and may cause damage to the supply and the end product.
 - Unless otherwise stated, the AC/DC adapters are not suitable for use in air handling spaces or in wall cavities. The power supply is to be located within the same vicinity as the Extron A/V processing equipment in an ordinary location, Pollution Degree 2, secured to the equipment rack within the dedicated closet, podium or desk.
 - The installation must always be in accordance with the applicable provisions of National Electrical Code ANSI/NFPA 70, article 75 and the Canadian Electrical Code part 1, section 16. The power supply shall not be permanently fixed to building structure or similar structure.

CAUTION: When connecting the power supply, voltage polarity is extremely important. Applying power with incorrect voltage polarity could damage the power supply and the DMP 44 LC. Identify the power cord negative (ground) lead by the ridges on the side of the cord or a black heat shrink wrapping around it.

CAUTION: The length of the exposed (stripped) copper wires is important. The ideal length is 3/16 in (5 mm). Longer bare wires can short together. Shorter wires are not as secure in the direct insertion connectors and could be pulled out. Do not tin the stripped power supply leads. Tinned wires are not as secure in the captive screw connectors and could be pulled out.

NOTE: To verify the polarity before connection, check the no load power supply output with a voltmeter.

Use the supplied tie-wrap to strap the power cord to the extended tail of the connector.

NOTE: To avoid losing adjustments when configuring the DMP 44 LC via SIS commands issue a 2FF or if using the DSP Configurator, select **Tools > Save Changes to Device** to store the latest changes to the device. Wait several minutes after saving the adjustments before disconnecting power.

- ② **Power/Reset LED** — The green LED indicator duplicates the front panel LED operation (see the “[Reset Actuator and LED](#)” section for additional information).
- ③ **Line 1-4 input connectors** — 6-pole 3.5 mm double-stacked captive screw connectors accept balanced or unbalanced mono line level signals. Line inputs provide gain settings to accommodate consumer (-10 dBV) and professional (+4 dBu) operating line level sources. Up to four mono line inputs, balanced and unbalanced in any combination may be connected to these inputs (see the following diagram for wiring instructions).

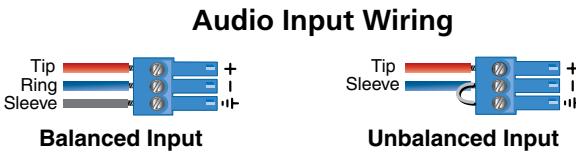


Figure 3. Wiring Balanced or Unbalanced Line Inputs

- ④ **Mono output connectors (1-4)** — 6-pole 3.5 mm captive screw connectors provide balanced or unbalanced connections for mono line level output signals.

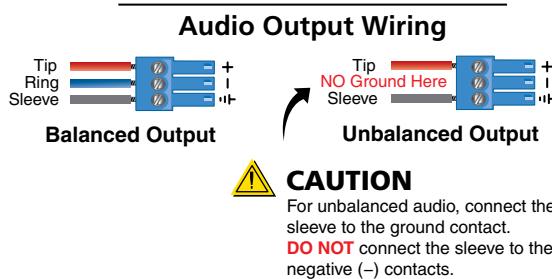


Figure 4. Output Connector Wiring

CAUTION: Connect the sleeve to ground (Gnd). Connecting the sleeve only to a negative (-) terminal will damage the audio output circuits.

- ⑤ **RS-232 connector** — A 6-pole 3.5 mm captive screw connector for bidirectional RS-232 (± 5 V) serial control. Default baud rate is 38400.

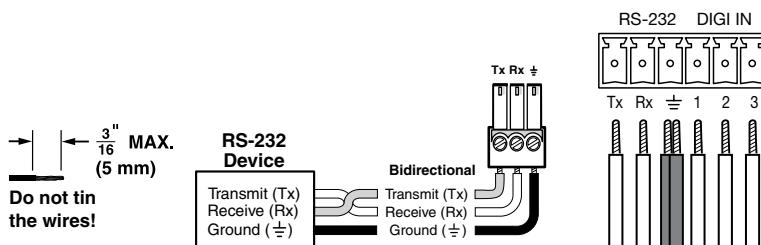
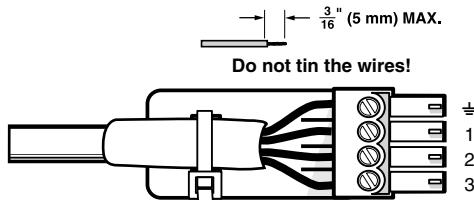


Figure 5. RS-232 Wiring

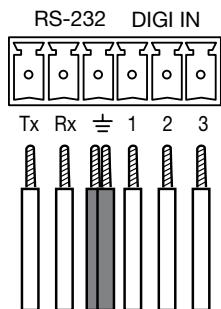
- ⑥ **Digital input connector** — A 6-pole 3.5 mm captive screw connector (shared with the RS-232 port) provides three configurable input ports allowing connection to various devices including motion detectors, alarms, buttons, photo (light) sensors, and temperature sensors. This connector shares a common ground with the RS-232 connector (④).

The digital input port is used to monitor TTL level digital signals. Voltages greater than 2 V indicate a logic “high” signal while voltages less than .8 V indicate a logic “low.”

NOTE: These ports are configured via DSP Configurator (see the “[Digital input ports](#)” section for additional information).



Both the RS-232 and digital input connectors may be used simultaneously by using a 6-pin captive screw connector with two wires sharing the same ground connector (see the diagram below).



- ⑦ **Reset button** — The recessed reset button is used to access various modes of resets. The single green power LED on both the front and rear panels indicates what mode of reset was accessed (see the “[DMP 44 LC Hardware Reset Modes](#)” section for additional details).

USB Configuration port (front panel)

A front panel configuration port uses an Extron USB A Male to USB Mini B Male Configuration Cable, **26-654-06** for connection to a PC computer via the USB port. The DMP USB driver must be installed prior to using the port (see the “[Install the USB Driver](#)” section for USB driver installation details).

Operation

This section describes the operation of the DMP 44 LC, including:

- [DMP 44 LC Operation](#)
- [Front Panel Operation](#)
- [Rear Panel Operation](#)
- [DSP Processing/Signal Flow](#)
- [Processor Blocks](#)
- [Mix Matrix](#)
- [Line Output Channels](#)

DMP 44 LC Operation

The DMP 44 LC does not have physical controls. Configuration and operation are accomplished using a PC running Windows® XP or better and the DSP Configurator software (available on the included disc or at www.extron.com), or the Extron Simple Instruction Set (SIS) using HyperTerminal or DataViewer.

The DMP 44 LC is configured for immediate operation, with each input routed to its respective output (input 1 routed to output 1, input 2 routed to output 2, and so on). While these settings allow the device to pass audio when first connected, it rarely meets the needs of most applications. The DMP 44 LC can be fully configured using the DSP Configurator software.

The DSP Configurator software, when first launched, gives you a blank configuration with no processing and no mixing or routing. All gain stages are set to “unity gain,” or 0 dB of gain. Input and output gain stages provide metering in dBFS that will assist you in configuring the device for optimal operation. The DMP 44 LC is a digital device, therefore optimal operating levels are close to 0 dBFS without ever going over 0 dBFS (0 dB “full scale” on the input or output meters). Levels above 0 dBFS cause clipping, which is always audible on a digital device.

All gain stages in the DMP 44 LC are mono. Gain may also be controlled using a Group master, which is configured with the DSP Configurator software. Group masters can be used to group multiple gain or mute controls, group multiple bass or treble boost/cut controls, gang two gain or mute controls for stereo operation, or even to control a single gain point. Soft limits can be applied to group masters. Sometimes a particular gain range may be too great, allowing for settings that are too loud or too soft, while in some instances the loudest settings may cause feedback or clipping. Soft limits can be used to limit the gain range for smoother operation.

Finally, the DMP 44 LC provides a comprehensive set of DSP processing tools. Use the filter tools to shape the tonal quality of your source material or EQ the room to compensate for acoustic gain. Use the dynamics processors for level control or system protection. The DMP 44 LC is a versatile matrix processor for many applications.

Front Panel Operation



Figure 6. DMP 44 LC Front Panel

- ① **Power/Reset LED** — Green power indicator lights when the DMP 44 LC is operational.
- ② **Configuration connector** — The USB 2.0 port uses a mini type-B connector to connect to a host computer for control. The DMP 44 LC USB driver must be installed prior to using the port (see the "[Install the USB Driver](#)" section for details).

The DMP 44 LC appears as a USB peripheral with bi-directional communication. The USB connection can be used for software operation (see "[Windows-based Program Control](#)"), and SIS control, (see "[Software Control](#)").

Rear Panel Operation

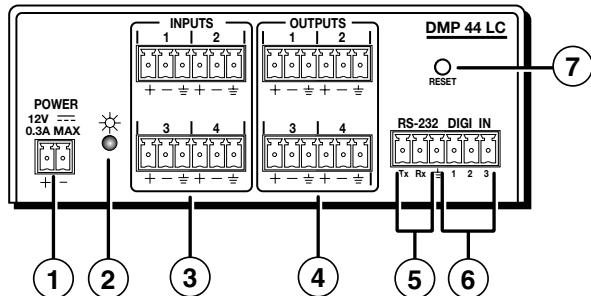


Figure 7. DMP 44 LC Rear Panel

- ① ② ③ ④ ⑤ ⑥ — See the "[Rear Panel Features and Cabling](#)" section for further details.
- ⑦ **Reset** — The reset actuator initiates system reset (see the "[Reset Actuator and LED](#)" section for additional information).

Power Cycle

Current mixing and audio processor settings — the current state of the device — are saved in nonvolatile memory. When the unit is powered off, all settings are retained. When the unit is powered back on, it recalls settings from the nonvolatile memory. If a configuration was in process during the power down, these saved mix, audio level, and audio DSP processor settings become active.

On power up, the power/reset LED (②) lights solid when the unit is available for operation or configuration.

Firmware Updates

The firmware of the DMP 44 LC can be updated through USB or RS-232 connection. The user can obtain new firmware from the Extron website. After obtaining the new firmware, upload it to the unit using the **Firmware Loader** option in the DSP Configurator program (see the “**Software Control**” section), or using the Extron standalone Firmware Loader application available on the included disc or at www.extron.com.

Reset Actuator and LED

A recessed button on the rear panel (⑦) initiates two reset modes. The green front panel LED (⑧) and rear panel (⑨) LED blink to indicate the reset modes as described in the following section. See the previous front and rear panel diagrams.

Hardware Reset Modes

With power on, when the reset button is held down the front and rear panel LEDs pulse (blink) every three seconds and put the unit in a different reset mode . The DMP 44 LC defaults back to the base firmware that shipped with the unit from the factory, allowing the user to recover a unit that has incorrect code or updated firmware running.

NOTE: Control software may not function correctly if using an earlier firmware version.

MODE 1 — Firmware reset: Disconnect power to the DMP 44 LC. Press and hold the reset button while applying power to return the firmware to the version shipped with the unit from the factory. This allows recovering a unit with incorrect or corrupt firmware. All user files and settings are maintained.

MODE 5 — Factory default reset: With power on, press and hold the reset button until the reset LED blinks 3 times (~9 seconds). Each flash will last for 0.25 seconds. Release, then momentarily (<1 second) press the reset button to return the DMP 44 LC to factory default conditions. If the second momentary press does not occur within 1 second, the reset is exited.

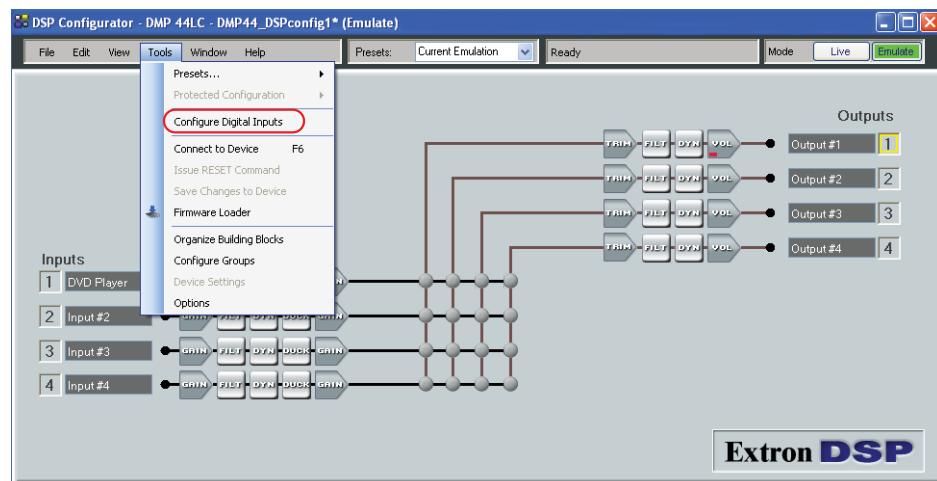
The default (reset) state of the device is:

- Inputs 1 to 4 are mixed to corresponding outputs 1 to 4 (all other mix-points are set to 0 dB gain and muted).
- All inputs are active (unmuted, 0 dB gain).
- All outputs are active (unmuted, 100% volume).
- No inserted or active DSP processing.
- Group master memory is clear (empty).
- No presets.
- Digital input ports are not active and not configured.

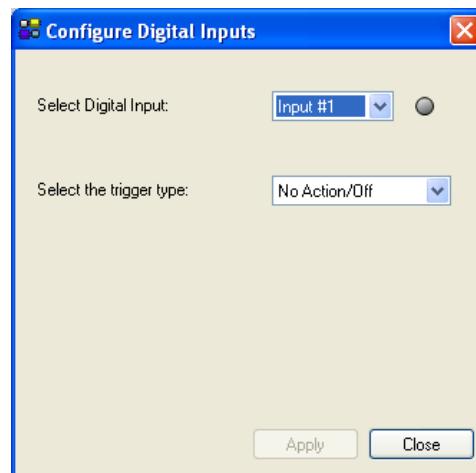
Digital Input Ports

The three-pin Digital Input port is used to monitor or drive TTL level digital signals. The port consists of three input pins with the fourth pin being used as a ground providing three inputs total. The DSP Configurator software provides a selection of functions to be loaded to the DMP 44 LC (see the “[Software Control](#)” section).

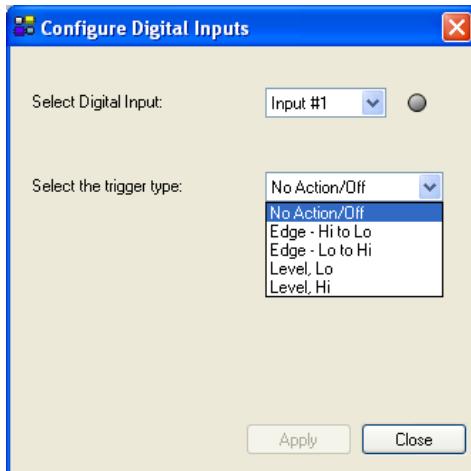
- From the menu bar, click **Tools > Configure Digital Inputs** to access the Configuration utility.



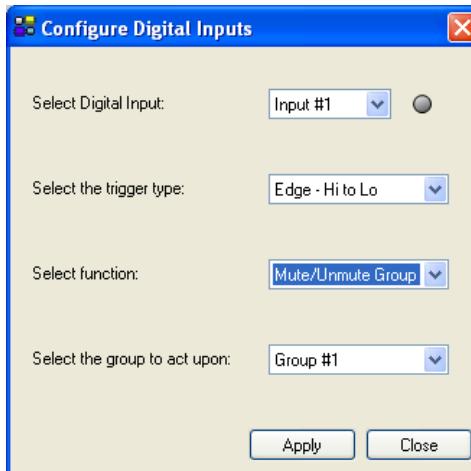
- Select the digital input to configure.



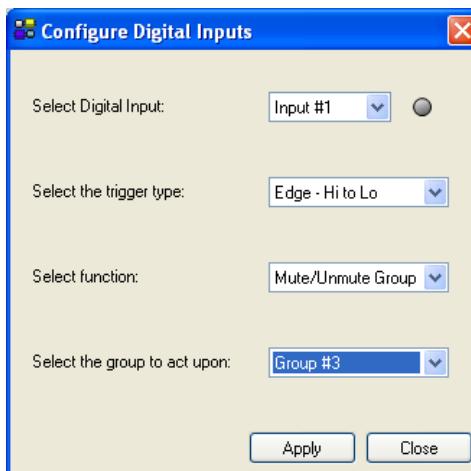
- 3.** Select the event or “trigger” to configure the input.



- 4.** Select the action that results when the trigger occurs.



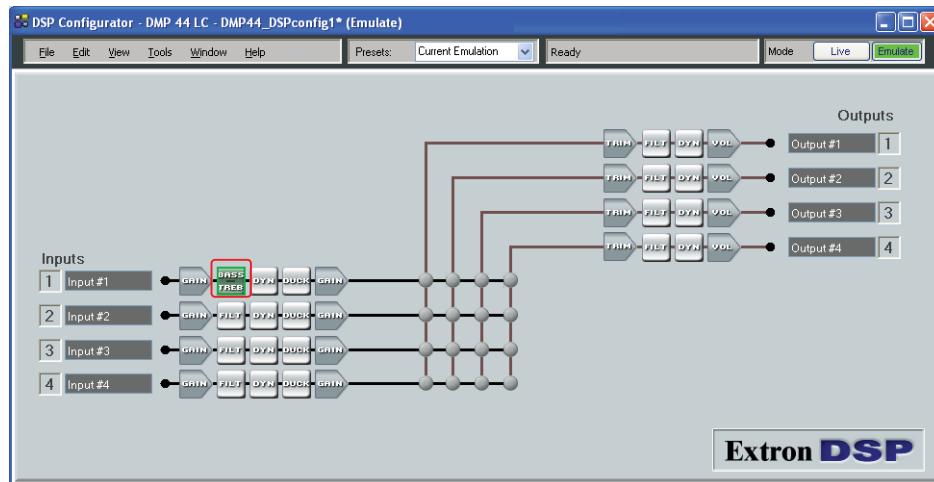
- 5.** Select the group to act upon when the trigger event occurs.



- 6.** Select **Apply** to accept the changes.

DSP Processing and Signal Flow

The diagram below shows the signal flow and DSP processing per signal chain. Signal chains and the matrix are described in the following sections.



All signal routing, processing, and level control (gain/trim/volume), are accomplished using software control from a PC connected to the DMP 44 LC via the USB configuration port or the RS-232 port. The DSP Configurator program provides complete control while SIS commands provide more limited control.

This section describes the signal processing including parameter ranges, and how to mix inputs and outputs using the DSP Configurator control program. To install the DSP Configurator program (see the “[Software Control](#)” section).

Line Input Signal Chain



Input signal chain GUI elements from left to right are as follows:

- **Gain (GAIN)** – Mono gain control with a range from -18 to +24 dB includes a mute button. Step resolution is 0.1 dB. A polarity switch (+ or -) is provided. Gain control is provided pre-meter and mute control is provided pre-meter.
- **Filter (FILT)** – Up to three filters can be inserted in any combination of High Pass, Low Pass, Bass & Treble shelving (tone), or Parametric Equalizer.
- **Dynamics (DYN)** – One compressor per block per channel. Dynamics processors vary the dynamic level (the range of loudest to softest signals).
- **Ducking (DUCK)** – One ducker per block, per channel. Each ducker can function as either a source or a target. Three levels of priority are available, where a ducker can function as both a source and a target (as an example, one source may be ducked by another source, and also trigger ducking on program channels).
- **Gain (GAIN)** – One pre-mixer gain control per channel with a range of -100 dB to +6 dB. The step resolution is 0.1 dB.

Mix Matrix

The line input process routes incoming signals through a mix matrix to the line outputs. The mix matrix contains 16 mix-points, one for each input to each output bus with each mix-point containing a single fader with a range of -24 dB to +12 dB, plus a mute control. The step resolution is 0.1 dB.

Line Output Chain



Line output chain elements from left to right are as follows:

- **Trim (TRIM)** – One post-mixer mono gain control per channel with a range of -12 dB to +6 dB. The step resolution is 0.1 dB.
- **Filter (FILT)** – Up to nine frequency filters can be inserted in any combination of High Pass, Low Pass, tone (Bass & Treble shelving), or Parametric Equalizer.
- **Dynamics (DYN)** – One limiter per block per channel. The limiter prevents clipping and protects a system against component or speaker damage.
- **Volume (VOL)** – One output volume control per channel with a range of -100 dB to 0 dB. The step resolution is 0.1 dB. Gain control is provided pre-meter. Mute control is provided post-meter. A polarity switch (+ or -) is provided.

Processor Blocks

Processor blocks are placed in the signal chain to perform specific tasks. There are level control blocks, signal processor blocks and mix-point matrix blocks (with level control). Level control processors do not have to be inserted, they are always active. The following sections provide details of navigation, menus, and other interface operations. The processor blocks, while performing different functions, have several common elements.

- **Insert** — All blocks (except level controls) may be inserted by right-clicking on the desired box and selecting from the context menu or by double-clicking and making a selection.
- **Remove a process** — Active processors can be removed by right-clicking on the box and selecting **Delete** or by selecting the block and pressing delete on the keyboard. This sets the parameters back to default and removes or “deactivates” the block. An active processor may be replaced by right-clicking and inserting a new processor. A warning appears to indicate the previous processor is about to be replaced.
- **Mute** — When a level block (gain, trim or volume) is muted, all signal flow is blocked. When mute is active a red mark appears in the lower left of the block. Mix-point mute is indicated by shadowing the mix-point.
- **Bypass** — When bypass is active, signal flow passes through the block without processing, regardless of the settings. When bypass is removed, the signal will be processed according to the parameter settings. A red mark appears in the lower left of the block (shown below) to indicate it has been inserted, but is currently bypassed.



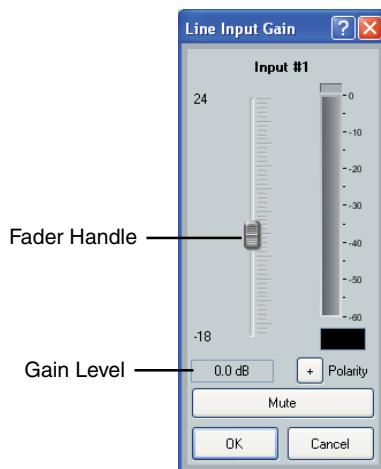
Line Input Channels

There are four (4) mono line input channels. Channel controls and processing blocks described in the following sections are identical for each of the four inputs.



Line (Input) Gain

Line inputs provide gain settings to accommodate consumer and pro line level sources. Each input channel gain block provides a mono long-throw fader for gain and attenuation. Range for the control is -18 to +24 dB. Step resolution is 0.1 dB. Adjustments are made using the slider or by entering the desired dB level directly into the indicator box.

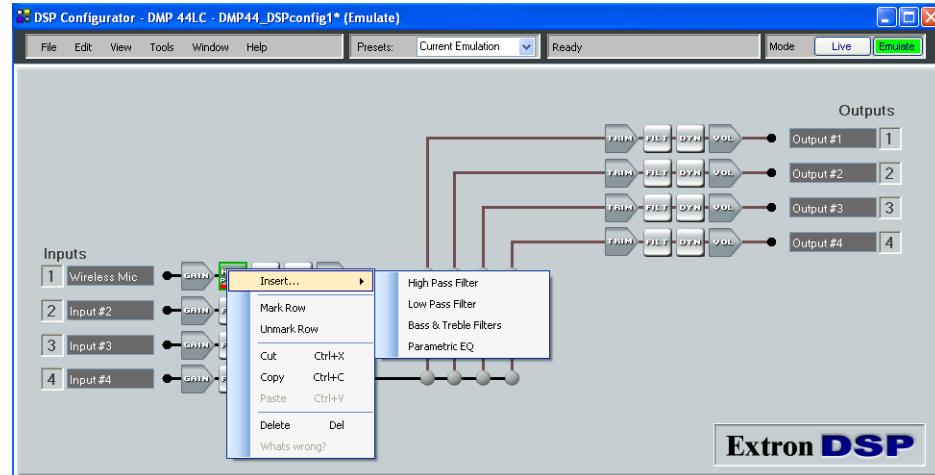


Clicking the fader handle or clicking within the fader area brings focus to the fader. The input signal level can be adjusted using any of the following methods:

- Direct adjustment. Click and hold the fader handle, then drag it to the desired level in 0.1 dB steps.
- Click or tab to the fader handle, then <up arrow> or <down arrow> to the desired level in 1 dB steps. <Page Up> and <Page Down> increases/decreases level in 10 dB steps.
- Click in or tab to the signal level readout field. Type a new value, then press <Enter> or <Tab> to another area.

Filter Block

Each line input channel filter block allows a total of five filters.



The first filter is inserted from a processor list that appears when the block is double-clicked or via a context window/processor list when the block is right-clicked. After the processor is inserted, double-clicking opens the setup dialog box.

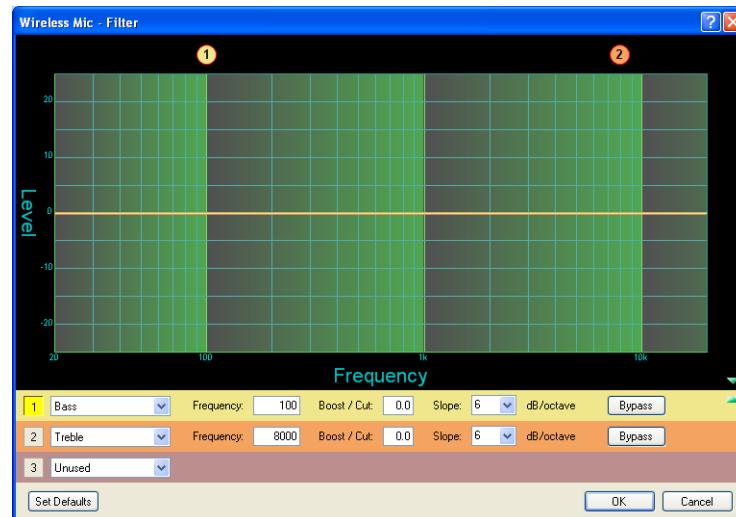


Figure 8. Filter Block Dialog Box

Additional filters are inserted by opening the filter block dialog box, then selecting a filter type from the drop-down filter selection list. All filter parameters are modified via the Filter block dialog box. Each filter loads with all applicable default parameters displayed to the right of each drop-down filter selection list.

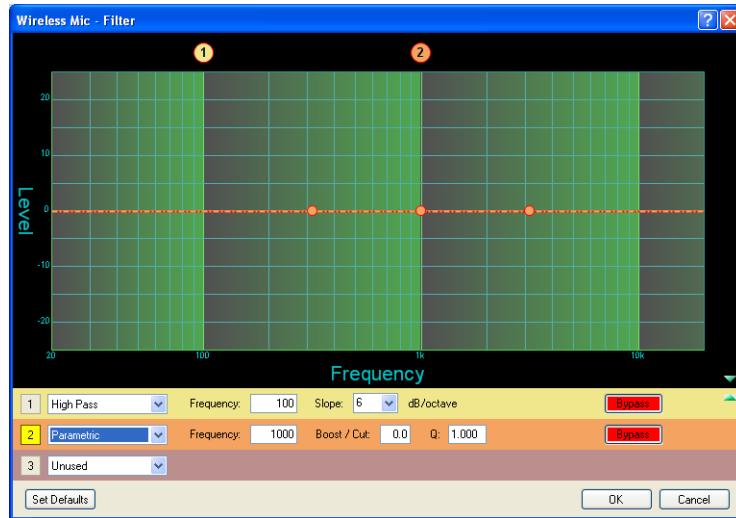


Figure 9. Filter Dialog Box, Filters Added

Within the dialog box, a filter is focused when a filter type is inserted, or is focused by clicking the filter number to the left of the filter selection drop-down list. Note how filter 3 in the figure below is highlighted in yellow, indicating it is the filter in focus. The results of the filter in focus (independent of other filters) shows in the graph as a dotted line of the same color as its filter row when bypassed. When active (not bypassed), the line is solid.

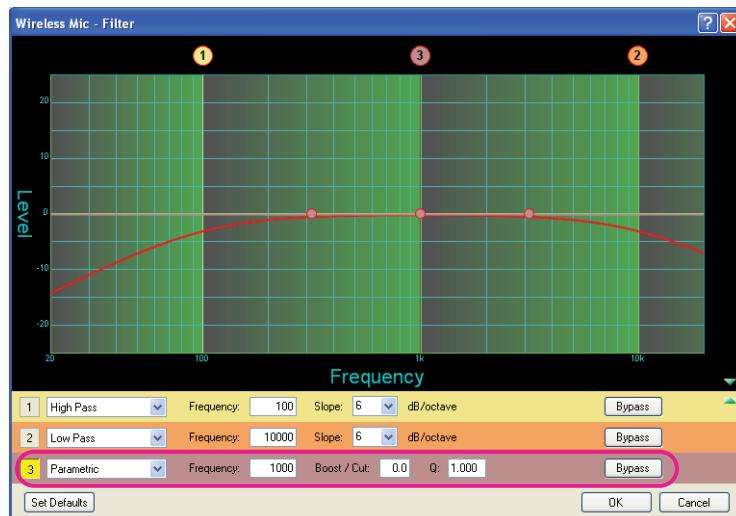


Figure 10. Filter Dialog Box, Filter Not Bypassed

When multiple filters are enabled, the graph indicates the focused filter result (independent of other filters) in the color of the filter row in the type/parameters table. The composite response of all filters is displayed in red.

Above the graph, each filter has a "handle" (circled in red above) placed directly above the cutoff or center frequency whose number corresponds to the filter number (outlined in red). Clicking a handle or clicking the table row brings focus to that filter. Click+hold+dragging the handle horizontally changes the cutoff or center frequency to a new position on the x axis.

Parametric (Equalizer)

Up to three parametric filters can be placed in the filter box at one time. Each may be set to a different frequency creating a 3 band parametric equalizer. The control will boost or cut the center frequency, and by changing the Q value, the range of affected frequencies can be widened or narrowed around the center frequency. In general, the higher the Q, the narrower the affected bandwidth.

To demonstrate how Q affects the filter, see the following filter block below containing three parametric filters centered at different frequencies but with the same Q of 1.0. The filter in focus (②) has a center frequency of 1000 Hz boosting that frequency +12 dB over a Q of 1.0. Note the markers on either side of the peak frequency are at 200 Hz on the left and 5000 Hz on the right, a bandwidth of about 4800 Hz.

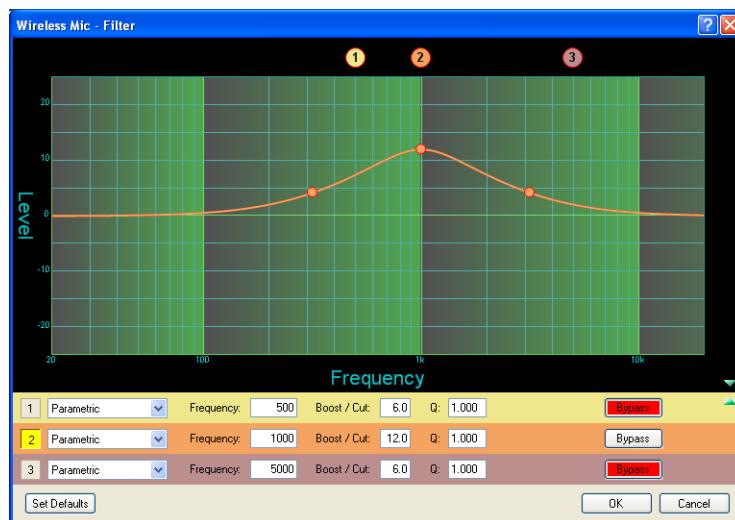


Figure 11. Parametric Filter Dialog Box, 1000 Hz

The above dialog box shows the frequency curve for the single active filter. To add its effect to the overall frequency response, remove the bypass on the other filters, as shown in the following illustration.

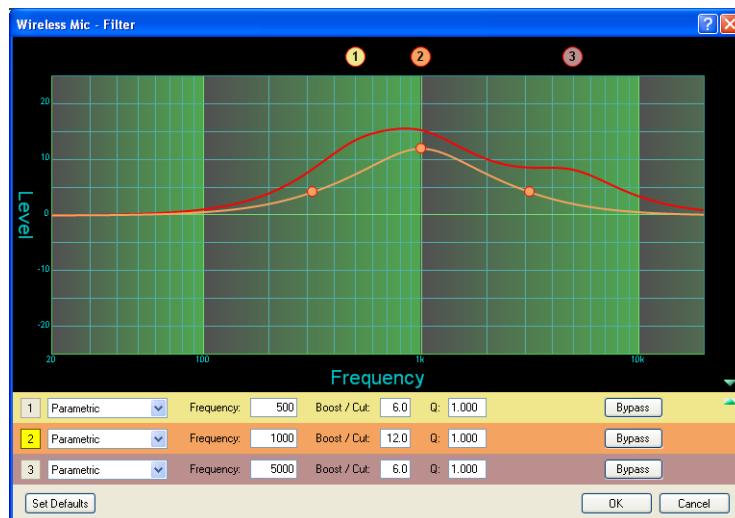


Figure 12. All Parametric Filters Active

The overall frequency response is now shown as a solid red line with the filter in focus, located in row 2, shown in the color of its table row.

The parametric filter allows frequency selection accurate to 0.1 Hz and either 6 or 12 dB of slope. Notice at the specified frequency (100 Hz) the signal is 3 dB down, typical operation for high pass filters. The 3 dB down point will remain constant regardless of the slope setting. Only the steepness of the frequency attenuation curve will change.

High Pass

The high pass filter is the opposite of the low pass filter. All frequencies below the specified frequency are attenuated allowing higher frequencies to pass.

In the figure below, the frequencies lower than the specified frequency, 1 kHz, are attenuated leaving the higher frequency response flat.

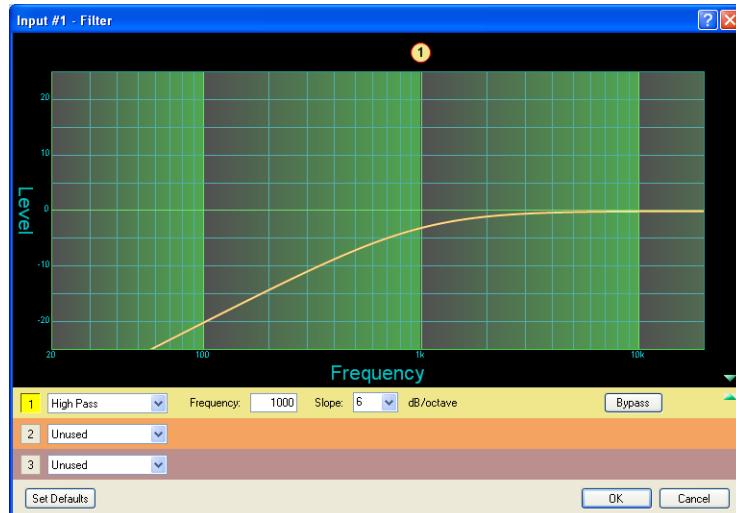


Figure 13. High Pass Filter Response Curve

Low Pass

The low pass filter is the opposite of the High Pass filter. All frequencies above the specified frequency are attenuated allowing lower frequencies to pass.

In the figure below, the frequencies higher than the specified frequency, 10 kHz, are attenuated leaving the lower frequency response flat.

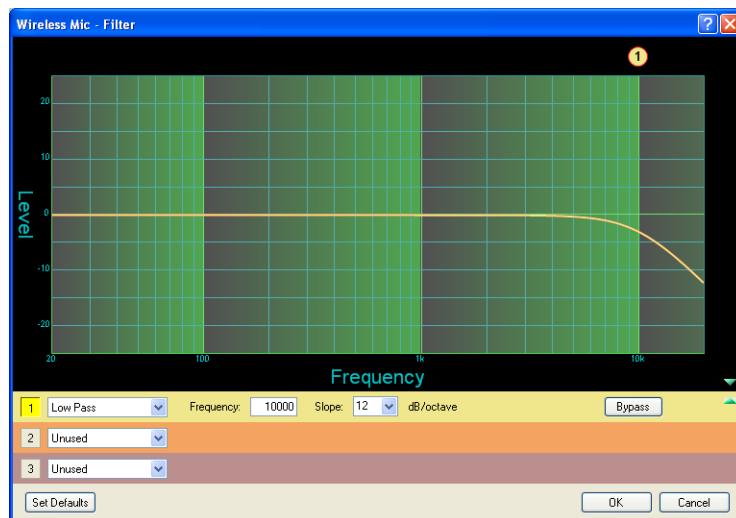


Figure 14. Low Pass Filter Response Curve

Bass and Treble Shelving

Bass and treble shelving may be added to the filter, as shown below. Adding this filter automatically inserts both bass and treble controls in the dialog box. If only a bass or only a treble filter is required, either bypass the unneeded control or set it to **unused** in the selection box.



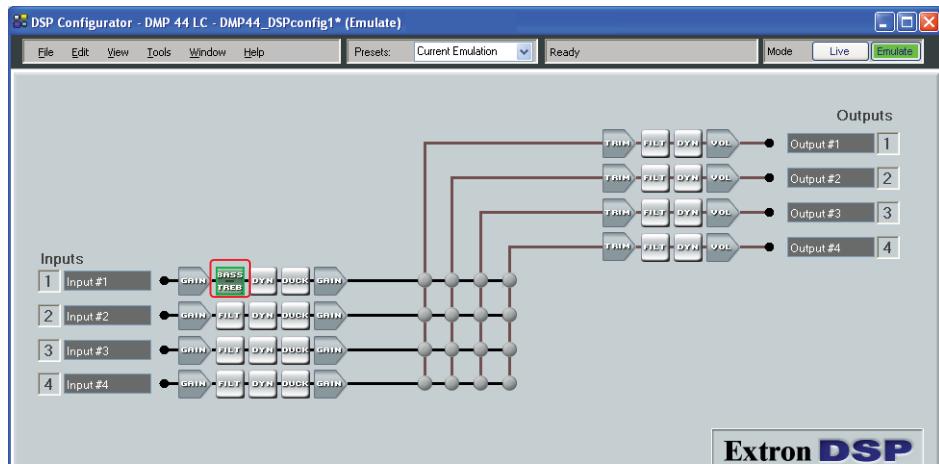
Figure 15. Bass and Treble Shelving

The corner frequency of the controls may be selected to 0.1 Hz accuracy. Two slopes, 6 and 12 dB/octave are available along with the ability to boost or cut the signal up to 24 dB.

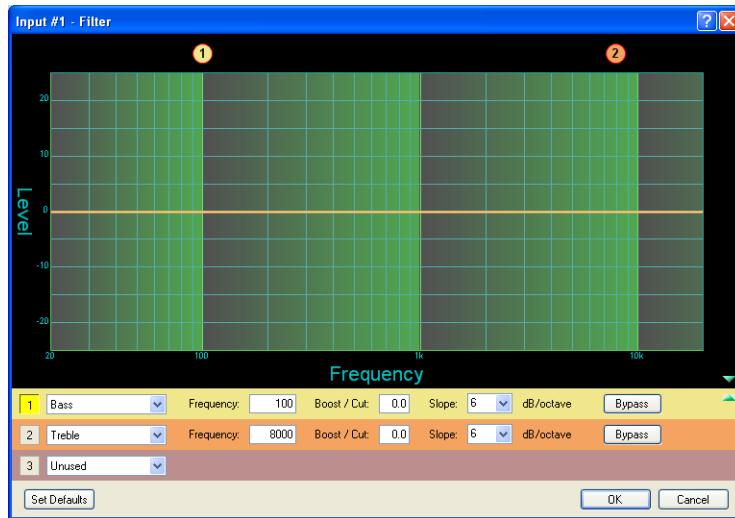
Setting bass and treble filters

To set bass and treble filtering:

1. Check that bass and treble filtering have been defined.

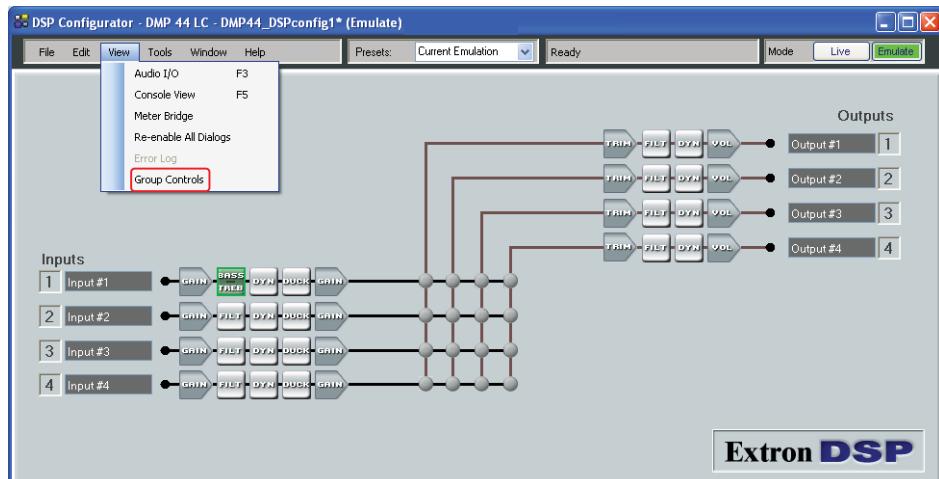


- Specify bass and treble filters if necessary.

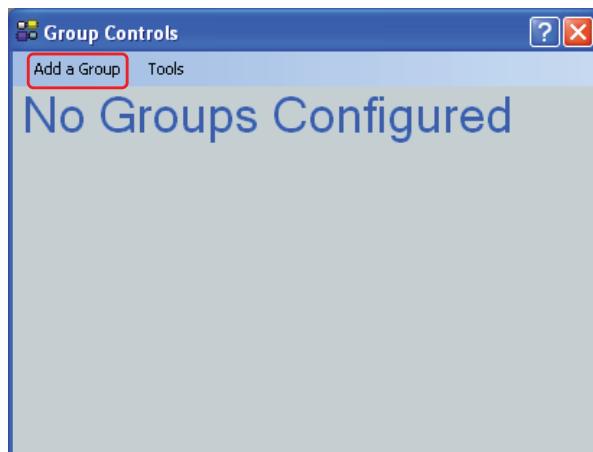


Configuring Groups

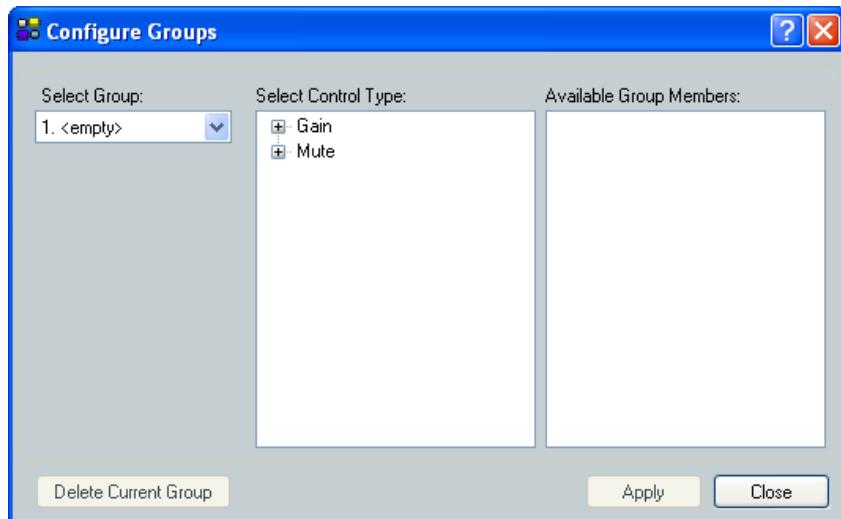
- From the **View** menu, select **Group Controls**.



- To add a new group, select **Add a Group**.

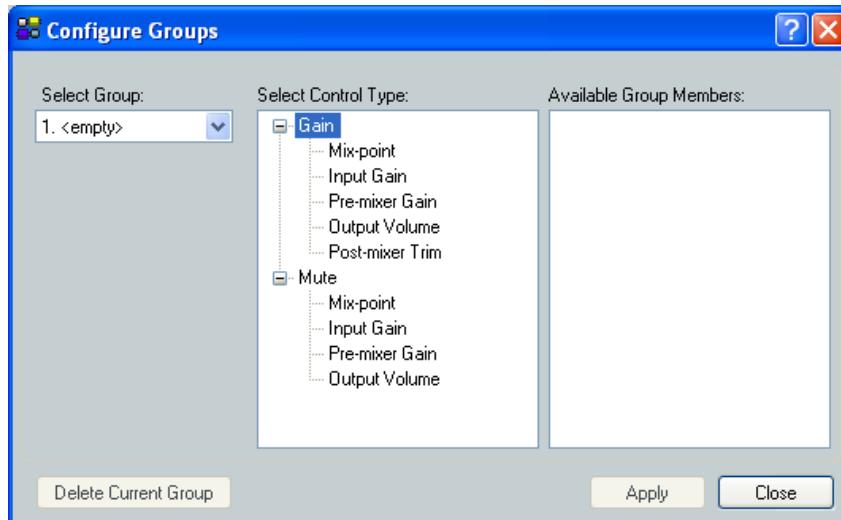


- 3.** Select a group to configure.

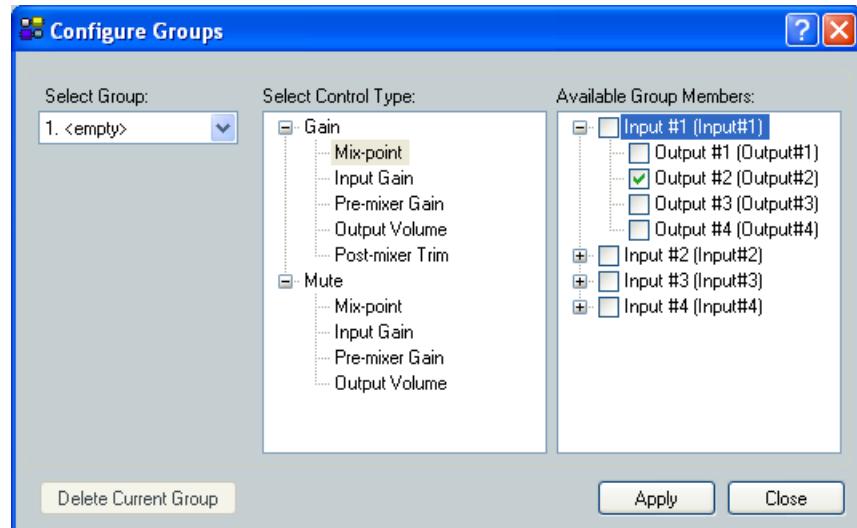


NOTE: To configure Bass and Treble groups, see "[Configuring Bass and Treble Groups](#)."

- 4.** Select a control type for the group.

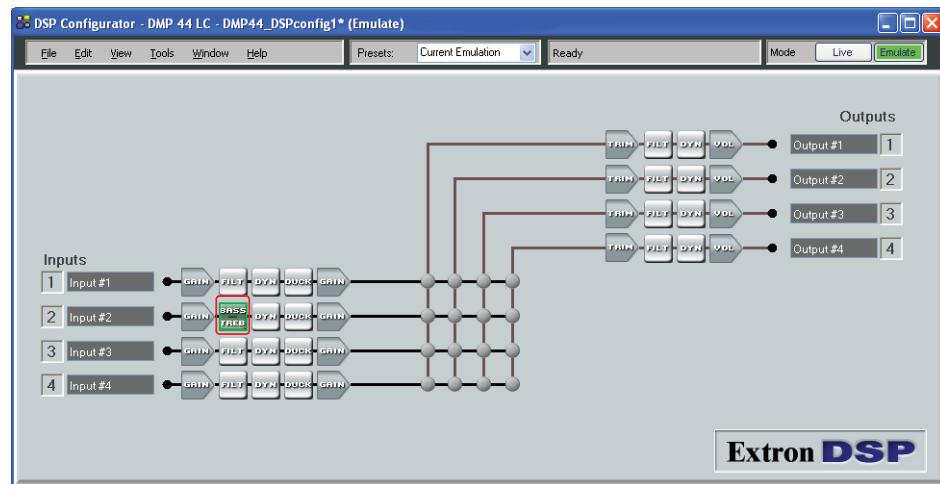


- Define the group members.

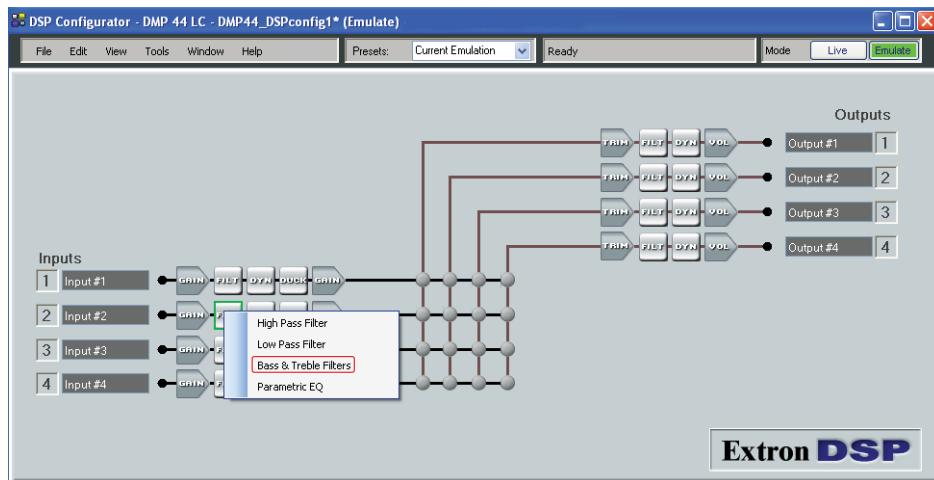


Configuring Bass and Treble Groups

- From the main DSP Configurator screen, select the Filters block, as shown below.

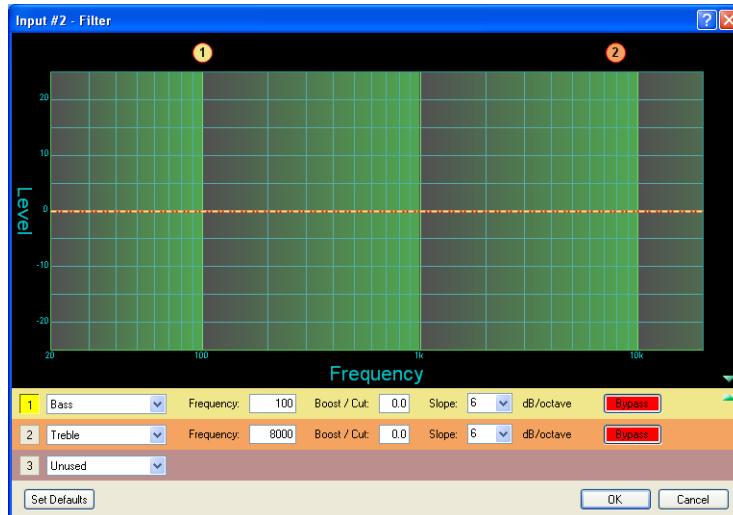


- From the drop down menu select **Bass & Treble Filters**.

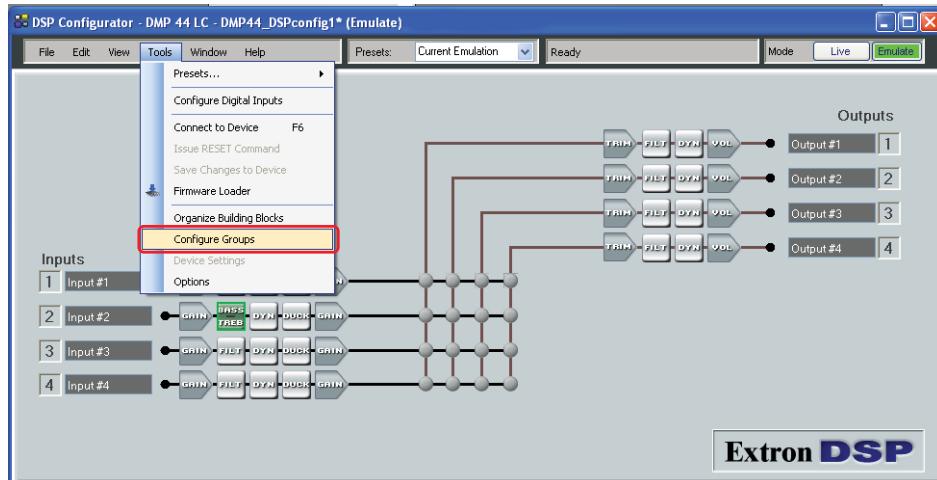


- Double-clicking the Filters processor opens the configuration screen. Configure the bass and treble parameters.

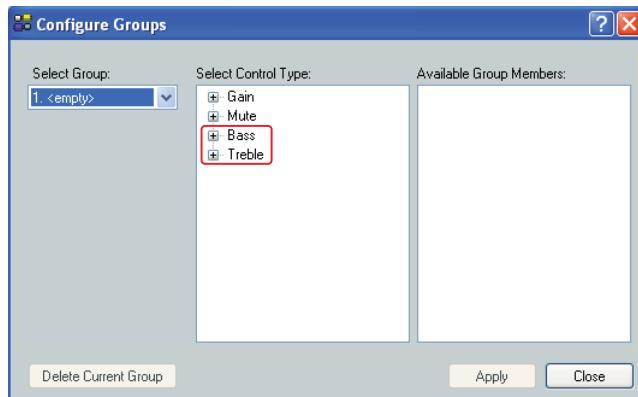
NOTE: The **Bypass** button is red when the filter is bypassed or not active.



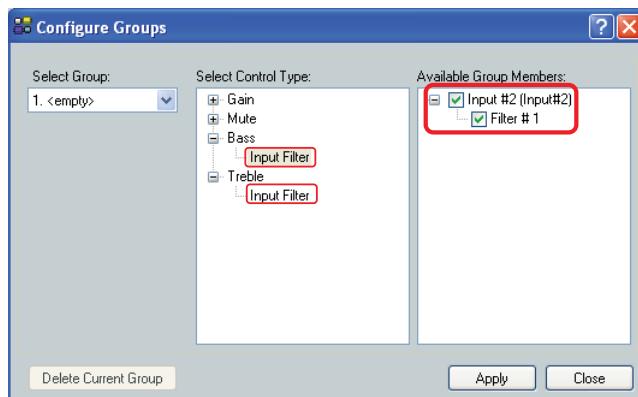
- To configure a control group member, select **Control Groups** from the **Tools** drop-down menu.



- Select the Bass or Treble control group.



- Select the group members.

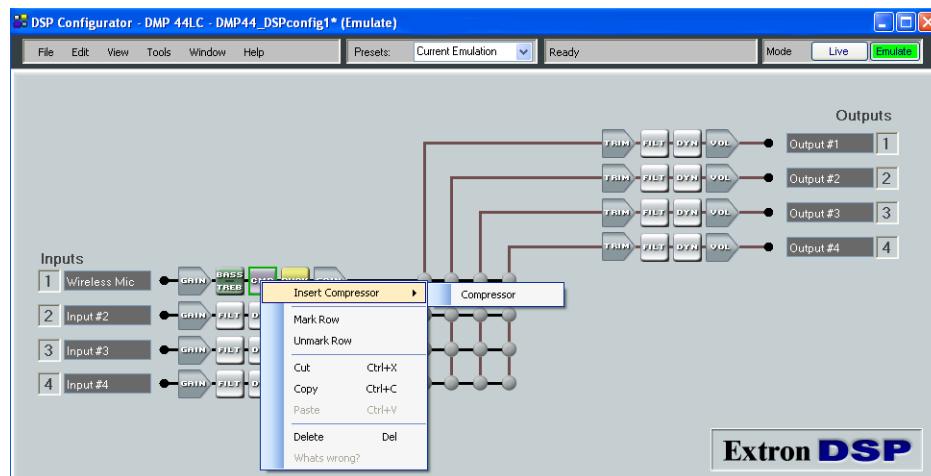


- Repeat steps 5 and 6 for the unselected control group (Bass or Treble).

Dynamics Processor

A dynamics processor alters the dynamic range, the difference between the loudest to the quietest portions of an audio signal. Each input channel offers one dynamics processor block that, when inserted, provides a compressor.

To insert a processor into an empty block, select from the processor menu (see the Insert Compressor option in the “Processor Blocks” section). The menu appears when the block is double-clicked, or is accessed from a context menu that appears when the block is right-clicked (see the diagram below).



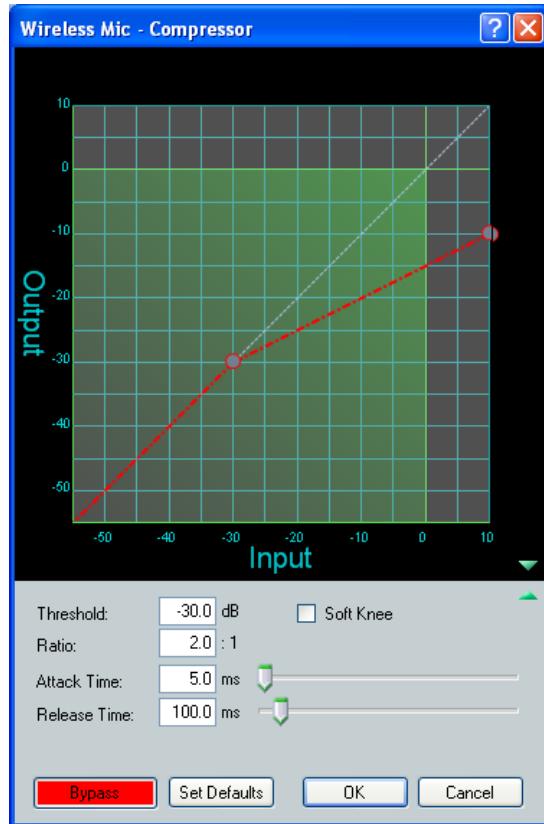
Once the processor has been inserted, individual processor parameters can be changed in the dialog box, which is accessed by double-clicking the processor block.

All parameters are displayed in a text box and have a resolution of 0.1 increments. Parameters can be set by direct entry in the text box to replace existing text, then pressing <Enter> or tabbing/clicking to another area. Threshold, gain/attenuation, target, and ratio parameters have adjustment points on the graph display. Use the mouse to click and drag the graph point to the desired destination/value. All time values have a horizontal slider allowing adjustment in 1 ms increments by either a click and drag of the slider handle, or focusing on the slider, then using <left arrow> and <right arrow> keys (<Page up> and <Page down> keys adjust in increments of 10 ms).

Compressor

The compressor regulates signal level by reducing the dynamic range of the input signal above a specified threshold. The input level to output level ratio determines the reduction in the dynamic range beyond the threshold setting. For example, in the diagram below, with a ratio setting of 2:1, for every 2 dB of input above the threshold, the compressor outputs 1 dB.

Compression is commonly used to contain mic levels within an acceptable range for maximum vocal clarity. A compressor can also make softer sounds louder in one of two ways. The dynamic range can be reduced by compressing the signal above the threshold while raising the post-compressor gain/trim (referred to as "make-up gain"). Alternately, the input signal can be increased while the compression ratio above the threshold is increased correspondingly to prevent clipping. Both techniques have the effect of making louder portions of a signal softer while at the same time increasing softer signals to raise them further above the noise floor.



Compression can also be used to protect a system or a signal chain from overload similar to a limiter.

Threshold — The input signal level above which compression begins (subject to attack time) and below which compression stops (subject to hold and release time).

Threshold level can be adjusted from -80.0 to 0.0 dB in 0.1 dB increments.

Default is -30.0 dB.

Ratio — The input signal level reduction when compression is engaged.

Ratio can be adjusted from 1.0 to 100.0 in 0.1 increments.

Default is 2.0:1.

Attack Time — Adjusts the time delay for compression to engage after the input signal level reaches or exceeds the threshold level. Attack time can be adjusted from 0.0 to 200.0 ms in 0.1 ms increments.

Default is 5.0 ms.

Release Time — Adjusts the time it takes to return the signal to normal (unprocessed) levels after the signal no longer exceeds the threshold level setting. Release time begins only after hold time is reached. Release time can be adjusted from 10 to 1000.0 ms in 0.1 ms increments.

Default is 100.0 ms.

Soft Knee — Click the **Soft Knee** check box to smooth and soften the transition from uncompressed to compressed output levels. There are no adjustments.

Limiter

The limiter restricts the input signal level by compressing its dynamic range above a specified threshold. The limiter is most commonly used to prevent clipping, protecting a system against component or speaker damage. While the limiter is closely related to the compressor, it applies a much higher compression ratio of $\infty:1$. The ratio is fixed and cannot be changed.

Threshold — The input signal level above which limiting begins (subject to attack time) and below which compression stops (subject to hold and release time). Threshold level can be adjusted from -80.0 to 0.0 dB in 0.1 dB increments.

Default is -10.0 dB.

Attack Time — Adjusts the time delay for limiting to engage after the input signal level reaches or exceeds the threshold level. Attack time can be adjusted from 0.0 to 200.0 ms in 0.1 ms increments.

Default is 2.0 ms.

Release Time — Adjusts the time it takes to return the signal to normal (unprocessed) levels after the signal no longer exceeds the Threshold level setting. Release time begins only after hold time is reached. Release time can be adjusted from 10 to 1000.0 ms in 0.1 ms increments.

Default is 50.0 ms.

Soft Knee — Click the **Soft Knee** check box to smooth and soften the transition from uncompressed to compressed output levels. There are no adjustments.

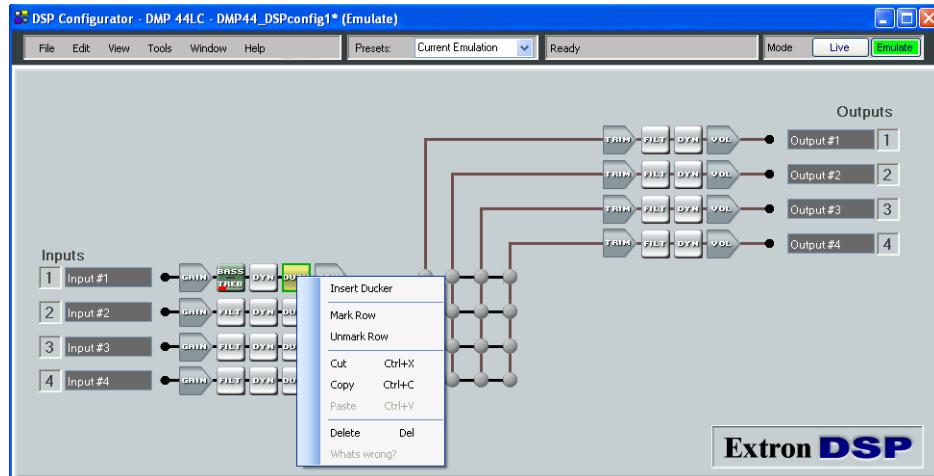
Ducking

Ducking provides a means to duck, or lower the level of one or more input signal targets when a specified source must take precedence. Ducking lasts for the duration of the ducking source signal (plus hold and release time) and restores the duck target(s) original level once the ducking source signal has ceased.

Ducking may be useful when:

- Program material needs to attenuate in order to accentuate the voice of a narrator,
- One microphone is used by a chairman or master of ceremonies, and needs to have priority over other mics, program material, or both, or
- A paging mic must attenuate all other signals.

Ducking processor blocks are individually inserted from a context menu, as shown in the following figure. Only a ducking source needs to be inserted. Ducking targets are enabled from the Ducker Configuration dialog box.



Ducking is configured in a window which opens when an active ducking processor block is double-clicked (see the following diagram). Ducking can be globally set up from a single configuration window, which opens when any of the active ducking processor blocks are double-clicked. When a ducking processor block is inserted, it is automatically set to **Enable Source Mic/Line**. All inactive ducking processor blocks have **Enable Source Mic/Line** unchecked by default.

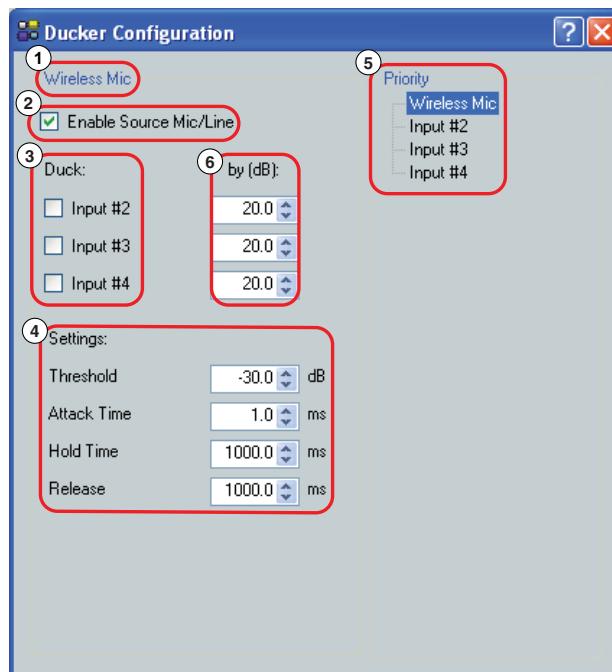


Figure 16. Ducker Configuration Dialog

Any of the four inputs can be ducking sources. Any or all of the remaining inputs can be targets.

Ducking Configuration Dialog

① Current source indicator

Shows the selected input. Ducker settings affect the input channel shown here. When a ducker dialog is opened for a channel, the current source defaults to that channel. The current source can also be selected via the priority readout/source selector (see the following figure).

② Enable source micline checkbox

When checked, ducking is enabled for the current source and the ducker processor block is lit. When unchecked, ducking is disabled for the current source and the ducker processor block is unlit.

③ Duck

Shows all potential input targets. Only inputs that are checked will be ducked. The current source is not available as a target (a source cannot duck itself). If the current source has been designated as a target of another input channel, that input channel is not available (a target cannot be the source).

④ Settings

Used to configure the parameter settings for the ducker source. When a ducker block is copied, these settings are transferred.

Threshold — Sets the input signal level, in dB, the ducking source must exceed before ducking begins. If ducking does not occur soon enough to avoid loss of speech or program material from the ducking source, decrease this setting. If ducking occurs too soon, allowing background noise to trigger ducking, increase the setting.

The range is -60 to 0 dB in 1 dB increments.
Default is -30 dB.

Attack Time — Adjusts the time to duck the targets once the threshold is exceeded.

The range is 0 to 3000 milliseconds in 1 millisecond increments.
Default is 1 millisecond.

Hold Time — Determines the time, in milliseconds, after a ducking source signal drops below the threshold before release time engages.

The range is 0 to 10000 milliseconds in 1 millisecond increments.
Default is 1000 milliseconds (1 second).

Release — Determines the time, in milliseconds, after the ducking source level is below the threshold and the hold time is met, the ducking targets take to restore signal levels.

The range is 10 to 10000 milliseconds in 1 millisecond increments.
Default is 1000 milliseconds (1 second).

⑤ Priority

Displays the hierarchy of ducking source to duck targets. Priority levels are displayed in tree fashion. Input channels that are targets being ducked by a source are shown as indented below the source. Any input channel displayed in the tree is an active link. Click any input channel to select that channel as the current source. The current source indicator (①) reflects the selected input channel.

⑥ By (Target gain reduction amount)

Individual attenuation settings for each duck target in dB. The default is 20.0 dB. If additional attenuation of the target(s) is required, increase this value.

The attenuation range is 80.0 to 0.0 dB in 0.1 dB increments.

Priority

In some cases, multiple levels of ducking may be required enabling an input source to take precedence over all but one other input.

In the example below inputs 2 and 3 are set to duck when input 1 has a signal above the ducking threshold. Input 2 is set to duck input 4.

Notice the priority tree in the illustration below (④). The inputs are arranged by their priority status. Input 1 has inputs 2 and 3 under it, therefore, if input 1 exceeds the threshold, it will trigger inputs 2 and 3 to duck. Similarly, input 2 has input 4 under it. Therefore, if input 2 exceeds the threshold, it will trigger input 4 to duck. Since input 2 has input 4 under it, input 1 triggers inputs 2, 3 and 4.

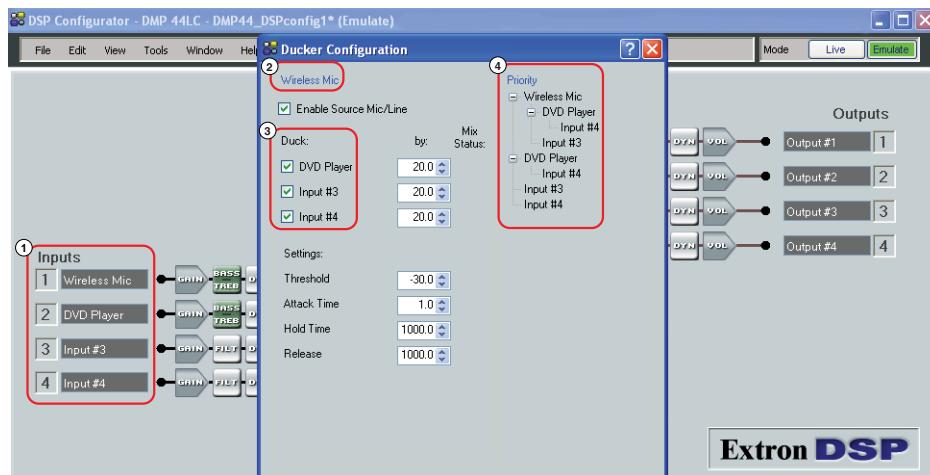


Figure 17. Ducker Configuration, Input Priority

Ducking attenuation is not additive. When an input target is ducked, regardless of how far down the priority line it is, the maximum attenuation is what is set in the **by:** column near the center of the dialog box.

Mix Matrix

The DSP architecture contains a mix matrix that connects the line inputs to the line outputs. The DSP Configurator GUI provides control of the mix matrix, used to set mix levels from the post processing inputs, to each line output bus. Each of the four line inputs is connected to a mix-point for each of the four line outputs. In general, mix levels are set relative to each other, achieving a desired blend of input signals at an optimal output level, close to, but not exceeding 0 dBFS at the line output Volume block level meter (while accounting for processing that may occur in the line output signal chain).

Shown below is a drawing of the DMP 44 LC represented in DSP Configurator, with a red box indicating the mix matrix.

From the mix matrix, any or all of the four inputs may be routed to any or all of the four outputs.

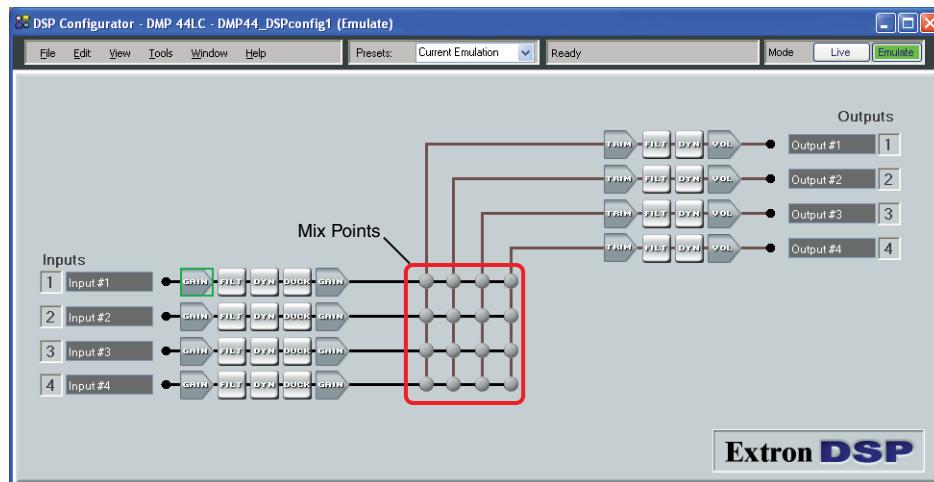
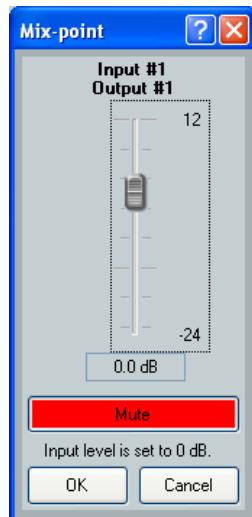


Figure 18. Mix Matrix (Outlined in Red)

Clicking a mix-point brings focus to that mix-point. Double-clicking a mix-point opens a configuration dialog window, as shown below, with the following components:



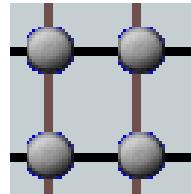
- **Mono Fader** — Sets mix level to the output bus. Gain range is -24 dB to +12 dB. Fader behavior is identical to the input channel gain block described in the line input section with the exception that coarse adjustment <Page up> or <Page down> increases or decreases in 5 dB increments.
- **Mute** — Mutes and unmutes the signal to the output bus.

- **OK/Cancel** — Click **OK** to accept changes and close the window. **Cancel** ignores changes and closes the window.

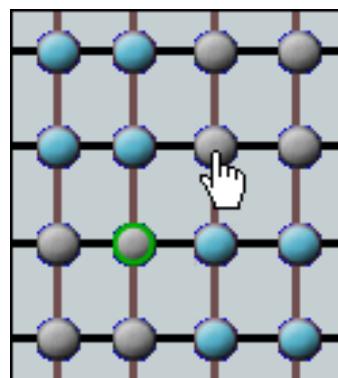
The title above the fader reflects the output channel name for the mix-point.

Mix-point GUI behavior:

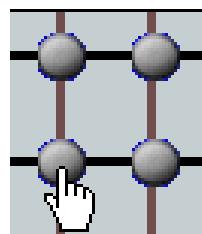
No mix information — A solid gray ball indicates that the mix-point is muted (contains no mix information).



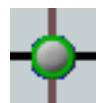
Mix information — A solid teal-colored ball indicates that the mix-point is unmuted.



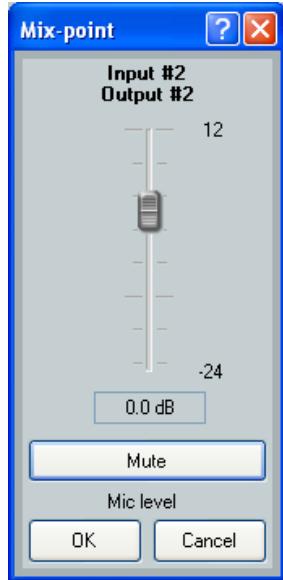
Mouse-over — The cursor changes to a hand when a mouse-over occurs at a mix-point whether the mix-point contains mix information or not.



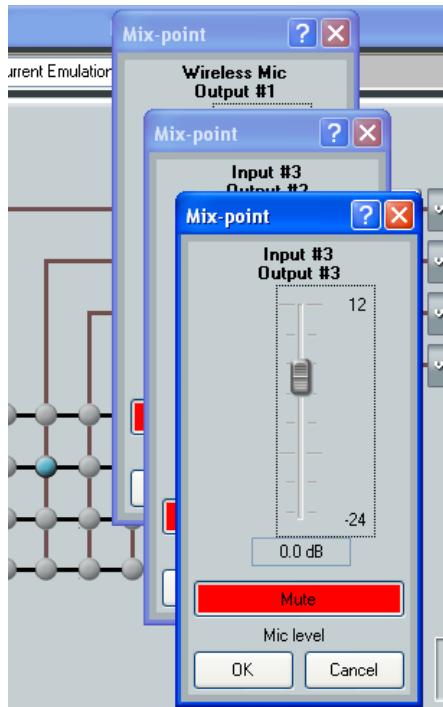
Single-click — A single click brings focus, indicated by a dark green circle around either the ball or bubble, depending on mix status.



Double-click — Double-click to open the mix-point dialog box. The focus circle turns light green in color to indicate the open dialog box, as shown in the following figure. If the mix-point is muted, the mix-point ball will be gray. If unmuted, the ball will be teal.



Multiple open dialog boxes — When multiple mix-point dialog boxes are open, the mix-point for the most recently opened dialog box receives the light green focus circle, while previously opened dialog boxes relinquish their focus. Focus can be returned by either clicking on a previously opened dialog box, or by double-clicking on a mix-point.



In order to understand how the mix-points work, the following figures provide examples of mixes.

In the first example figure below, input audio from mic input 1 is processed and arrives at the mix-point. Double-clicking on the mix-point opens the dialog box. When the **Mute** button is released (not red) on input 1 of the mix-point, the mix-point turns teal with a light green circle to indicate the open mix-point dialog box is the focus, and the signal is routed to output 1.

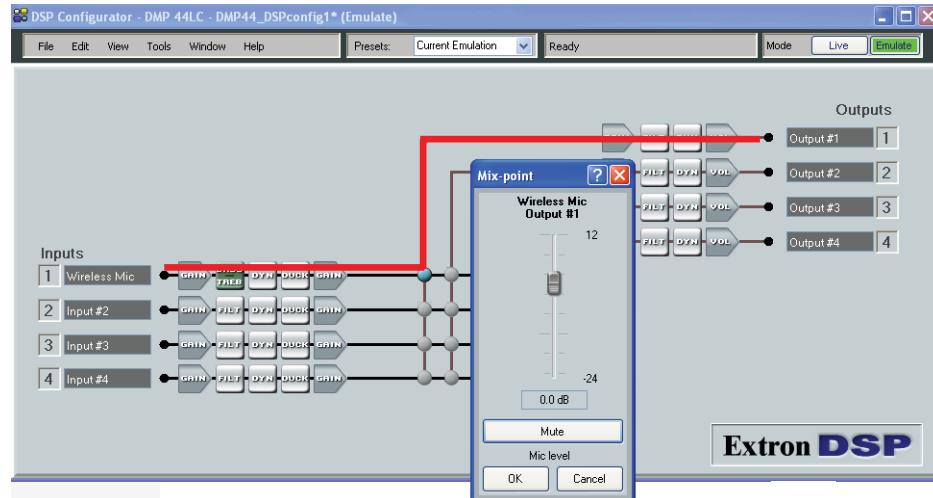


Figure 19. Input 1 to Output 1

In the next example figure below, input audio from all four line inputs is processed individually and arrives at the mix-point. When the individual mix-point mute buttons are released, the mix-point turns teal to indicate the routing, and all four signals are routed to output 1. Open the individual mix-point dialog boxes to adjust signal levels to the output.

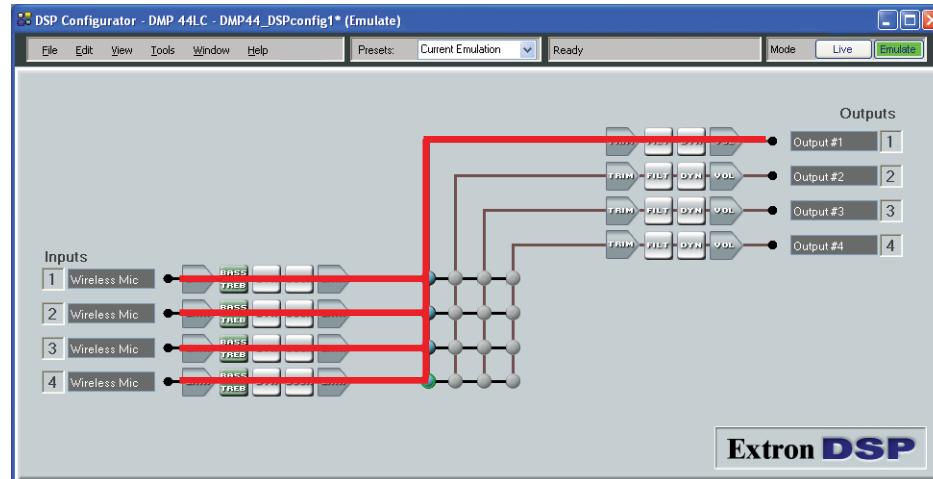


Figure 20. All Inputs to Output 1

In the example figure below, inputs 1 to 4 have been routed to outputs 1 through 4 by unmuting the mix-point for mic/line input 1 on each output (1 through 4) bus. Again, the mix-points are teal to indicate the routing.

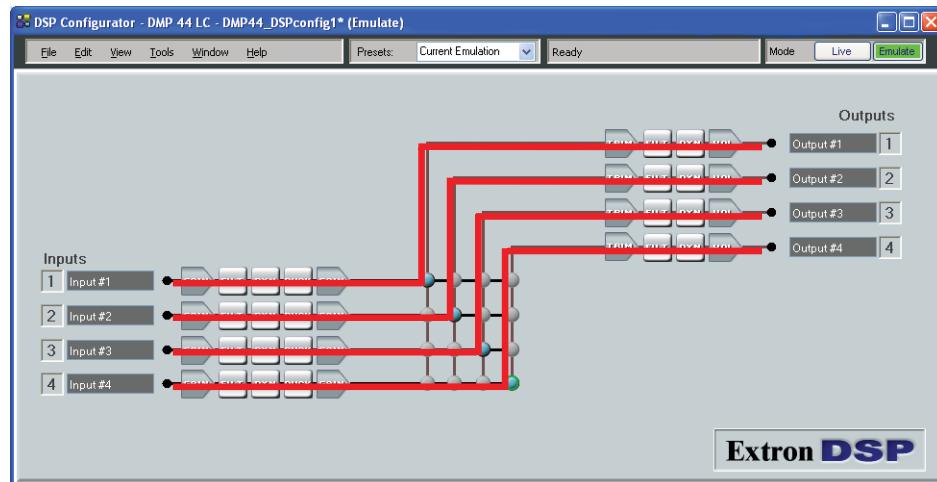


Figure 21. All Inputs to All Outputs

Line Output Channels

There are four mono line output channels. Controls and processing blocks, identical for each output channel, are described in the following sections.

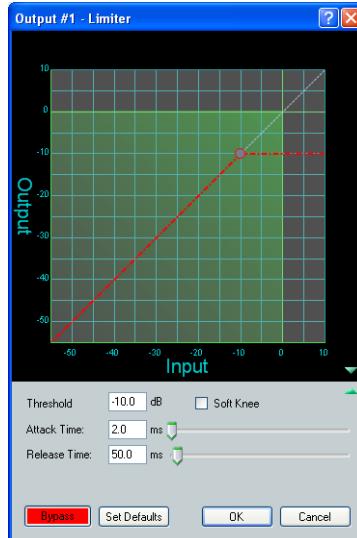


Filter

Filter function and interface is identical to the line input channel filter block, described in “[Filter Block](#)” However, there are a total of nine filters allowed in the output signal processor chain.

Dynamics

The output channel dynamics block provides a limiter function (see the diagram below) that restricts the input signal level by compressing its dynamic range above a specified threshold. The limiter is most commonly used to prevent clipping, protecting a system against component or speaker damage. While the limiter is closely related to the compressor, it applies a much higher compression ratio of $\infty:1$. The ratio is fixed and cannot be changed.



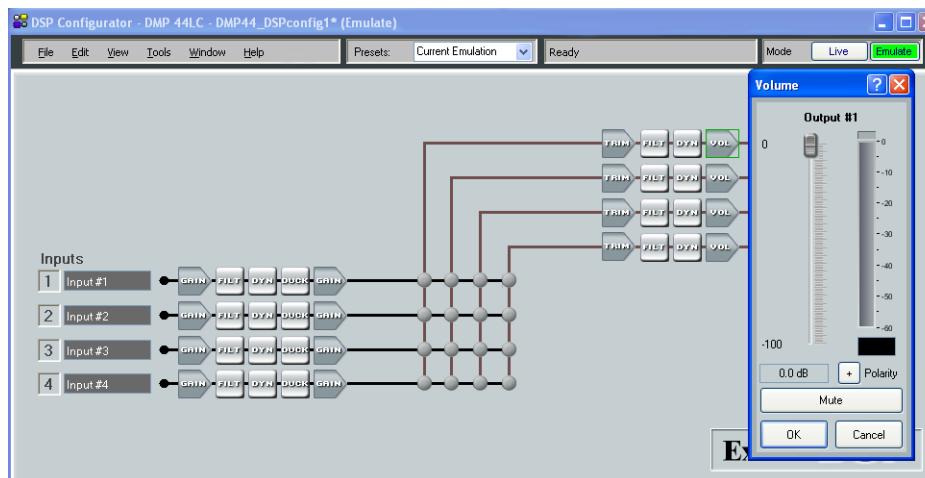
Volume

Each output channel volume block (see the following diagram) provides a mono long-throw fader with a range of 0 to 100 dB of attenuation, and a volume setting readout (in dB) below the fader. Volume level is adjustable with the slider or by entering a value directly into the field in 0.1 dB increments. Using the arrow buttons on the keyboard provides 1 dB increments.

An individual **Mute** button provides control of channel muting. Output polarity switching is also provided with a button that toggles between positive (+) and negative (-) polarity.

The default setting is unmuted, at 0 dB attenuation. A peak meter displays the real-time audio level from -60 to 0 dBFS.

The **OK** button accepts settings and closes the dialog with a single click, while the **Cancel** button ignores changes and closes the dialog.



SIS Programming and Control

This section describes SIS programming and control of the DMP 44 LC, including:

- [Connection Options](#)
- [Command/Response Table for Basic SIS Commands](#)
- [Special Characters](#)
- [Command/Response Tables for DSP SIS Commands](#)

Connection Options

The DMP 44 LC Digital Matrix Processor can be remotely connected via a host computer or other device (such as a control system) attached to the rear panel RS-232 port or the front panel USB Config port.

The DMP 44 LC can be set up and controlled using the Extron SIS (Simple Instruction Set) commands or DSP Configurator software. See the “[Rear Panel Features and Cabling](#)” section for pin assignments and details on the configuration and control port connections. For information on DSP Configurator see “[Software Control](#).”

SIS commands may be executed using the Extron Electronics DataViewer program, which may be found on the Software Products DVD included with the product.

DMP 44 LC RS-232 protocol:

- 38400 baud
- no parity
- 8 data bits
- no flow control
- 1 stop bit

NOTE: The rear panel configuration port supports 38400 baud communication. This is a higher speed than that of many other Extron Electronics products. If using HyperTerminal or a similar application, make sure the PC or control system connected to these ports is set for 38400 baud.

See “[RS-232 Port](#)” for additional details on connecting the RS-232 port.

USB port details:

The Extron USB driver must be installed before use (see “[Install the USB Driver](#)” for driver installation instructions).

RS-232 Port

The DMP 44 LC has one serial port that can be connected to a host device such as a computer running the HyperTerminal utility, DSP Configurator, or the DataViewer utility. The port makes serial control of the DMP possible. Use the protocol information listed above to make the connection. After the connection is made, see “[Using the Command/Response Tables](#)” later in this section for SIS programming details.

USB Port (front panel)

The DMP 44 LC has a front panel USB port that can be connected to a host device such as a computer running the HyperTerminal utility, DSP Configurator, or the DataViewer utility. The port makes serial control of the DMP possible. After the connection is established, see “[Using the Command/Response Tables](#)” later in this section for SIS programming details.

DMP 44 LC-initiated Messages

The DMP 44 LC initiates messages under specific conditions. No response is required from the host. The DMP 44 LC-initiated messages are listed here (underlined).

© Copyright 2011, Extron Electronics, DMP 44 LC, Vn.nn, 60-1095-01

Vn.nn is the firmware version number.

The DMP 44 LC sends the boot and copyright messages under the following circumstance: If the DMP 44 LC is off and an RS-232 connection is already set up (the PC is cabled to the DMP 44 LC and a serial communication program such as HyperTerminal is open), the connected unit sends these messages via RS-232 when first powered on.

Using the Command/Response Tables

SIS commands consist of a string (one or more characters per command field). No special characters are required to begin or end a command sequence. When the DMP 44 LC determines a command is valid, it executes the command and sends a response to the host device. All responses end with a carriage return and a line feed (CR/LF = ↲), signaling the end of the response character string.

When programming, certain characters are more conveniently represented by their hexadecimal rather than ASCII values. The following table shows the hexadecimal equivalent of each ASCII character:

ASCII to Hex Conversion Table											
Space →	20	!	21	“	22	#	23	\$	24	%	25
(28)	29	*	2A	+	2B	,	2C	-	2D
Ø	30	1	31	2	32	3	33	4	34	5	35
8	38	9	39	:	3A	;	3B	<	3C	=	3D
@	40	A	41	B	42	C	43	D	44	E	45
H	48	I	49	J	4A	K	4B	L	4C	M	4D
P	50	Q	51	R	52	S	53	T	54	U	55
X	58	Y	59	Z	5A	[5B	\	5C]	5D
‘	60	a	61	b	62	c	63	d	64	e	65
h	68	i	69	j	6A	k	6B	l	6C	m	6D
p	70	q	71	r	72	s	73	t	74	u	75
x	78	y	79	z	7A	{	7B		7C	}	7D
										~	7E
										DEL	7F

Figure 22. ASCII to Hex Conversion Table

Error Responses

When the DMP 44 LC is unable to execute the command, it returns an error response to the host. The error response codes and their descriptions are as follows:

Code	Description
E10	Invalid command
E11	Invalid preset
E12	Invalid port number
E13	Invalid parameter (number is out of range)
E14	Not valid for this configuration
E17	System timed out
E22	Busy
E25	Device is not present

Command/Response Table Overview

Although the DMP 44 LC uses the same structure for SIS commands, there are two variations. One is the global command structure documented in the “[Command/Response Table for Basic SIS Commands](#)” section that follows.

The second set of tables for DSP SIS commands uses the command structure outline beginning with [Command/Response Tables for DSP SIS Commands](#). While using the same structure of basic SIS commands, they differ in how the software addresses the individual processor blocks within the DMP 44 LC.

Command/Response Table for Basic SIS Commands

Symbol definitions

←	= CR/LF (carriage return/line feed) (hex 0D 0A)
←	= Carriage return (no line feed, hex 0D)
•	= Space character
	= Pipe (vertical bar) character
Esc	= Escape key (hex 1B)
∞	= Future capability (not currently available)
X1	= Version number Listed to two decimal places (for example, x.xx)
X2	= Version and Build number The least significant bits is the build number (for example, x.xx.xxxx)
X3	= Verbose/Response mode 0 = clear or none 1 = verbose mode (<i>not tagged, not broadcast</i>) 2 = tagged responses for queries (<i>tagged, not broadcast</i>) 3 = verbose mode + tagged responses for queries (<i>tagged and broadcast</i>) Default = 1 for RS-232 host control
NOTE: If ‘tagged responses’ is enabled, all read commands will return the constant string + the data, like setting the value does, for example, command: EscCN← response: lpn•X12←	
X4	= Baud rate 0 = 9600 1 = 19200 2 = 38400 (default) 3 = 15200

X5	= Internal temperature	Degrees Celsius
X6	= Dirty status	0 = RAM has been saved to Flash (OK to power off/reset) 1 = RAM needs to be saved to Flash
X7	= Unit name	A text string of up to 24 characters drawn from the alphabet (A-Z) digits (0-9), minus sign/hyphen (-). No blank or space characters are permitted as part of the name. No distinction is made between upper and lower case. The first character must be an alphabet character. The last character must not be a minus sign/hyphen.
X8	= Model name	
X10	= Preset number	16 presets (1-16)
X12	= Inputs	Four inputs (1-4)
X13	= Outputs	Four outputs (1-4)
X14	= Group number	Sixteen groups (1-16)
X15	= Parameter number	6 = G, 12 = M
X16	= Soft limit High value	
X17	= Soft limit Low value	
X18	= Group master value	For gain values with a resolution to 0.1, multiply by 10. Mute values: 0=Mute or 1 = unmute.

Special Characters

The HTML language reserves certain characters for specific functions. The device will not accept these characters as part of preset names, the device name, or locally created file names.

The DMP 44 LC rejects the following characters:

{space (spaces **are** acceptable for names)} + } ~ , @ = ' [{ } < > ' " semicolon (;)
colon (:) | \ and ? .

Command/Response Table for Basic DMP 44 LC SIS Commands

Command	ASCII Command (Host to Tuner)	Response (Tuner to Host)	Additional Description
NOTE: Commands can be entered back-to-back in a string, with no spaces. Example: TvrS25*11•3			
General commands			
Firmware Version, Part Number, and Model Information			
Query firmware version	Q	X1 ↵	Show the current firmware version.
Query firmware and build version	*Q	X2 ↵	Show the current firmware and build version.
Query part number	N	60-1095-01 ↵	Show the unit part number.
Query model name	1I	DMP44.LC ↵	Show the model name.
Query model description	2I	Digital.Matrix.Processor ↵	

Command	ASCII Command (Host to Tuner)	Response (Tuner to Host)	Additional Description
Setup Commands			
Set verbose mode	[Esc] X3 CV ←	Vrb X3 ←	Set verbose/response mode. 0 = clear 1 = verbose 2 = tagged responses 3 = verbose + tagged responses
View verbose mode	[Esc] CV ←	X3 ←	View verbose mode
Set unit name	[Esc] X7 CN ←	Ipn • X7 ←	Set the unit name.
Set unit name to factory default	[Esc] • CN ←	Ipn • X8 ←	Set unit name to factory default.
Bidirectional Serial Data Port			
Configure parameters	[Esc] X4 CP ←	Ccp X4 ←	X4 = baud rate: 0 = 9600 1 = 19200 2 = 38400 (default) 3 = 15200
View parameters	[Esc] CP ←	Ccp X4 ←	View baud rate.
ZAP Commands (Factory Defaults) and RAM Commands			
Delete all presets and names	[Esc] ZG ←	Zpg ←	Delete all presets and names.
Delete individual preset	[Esc] X10 ZG ←	Zpg X10 ←	Delete specific preset.
System reset (factory default)	[Esc] ZXXX ←	Zpx ←	Reset system to factory default.
Absolute system reset	[Esc] ZQQQ ←	Zpq ←	Similar to system reset .
Commit only RAM to Flash	[Esc] 2FF ←	Nvr X6 ← (responds when done)	X6 = 0 = RAM has been saved 1 = RAM has not been saved
Query whether RAM needs to be saved to Flash	[Esc] FF ←	X6 ←	
Name commands			
Write preset name	[Esc] X10, name NG ←	Nmg X10, name ←	Write preset name.
Read preset name	[Esc] X10 NG ←	Vrb mode 0/1: name ← Vrb mode 2/3: Nmg X10, name ←	Read preset name.
Write input name	[Esc] X12, name NI ←	Nmi X12, name ←	Write input name.
Read input name	[Esc] X12 NI ←	Vrb mode 0/1: name ← Vrb mode 2/3: Nmi X12, name ←	Read input name.
Write output name	[Esc] X13, name NO ←	Nmo X13, name ←	Write output name.
Read output name	[Esc] X13 NO ←	Vrb mode 0/1: name ← Vrb mode 2/3: Nmo X13, name ←	Read output name.

Command	ASCII Command (Host to Tuner)	Response (Tuner to Host)	Additional Description
Partial preset commands			
Recall preset	[Esc] X10.	Rpr [X10] ↵	Recall preset.
Group Master Commands			
Group Master Name			
Set name	[Esc] n [X14]* name GRPM ↵	GrpmN [X14]*name ↵	Set name
View name	[Esc] n [X14] GRPM ↵	name ↵	View name
View name (verb mode 2/3)	[Esc] n [X14] GRPM ↵	GrpmN [X14]*name ↵	View name (verb mode 2/3)
Set Master Value			
Set + or - dB	[Esc] d [X14]* + or - [X18] GRPM ↵	GrpmD [X14]* [X18] ↵	Set + or -
Set mute	[Esc] d [X14]* [X18] GRPM ↵	GrpmD [X14]* [X18] ↵	Set mute
Increment	[Esc] d [X14]* [X18] + GRPM ↵	GrpmD [X14]* [X18] ↵	Increment
Decrement	[Esc] d [X14]* [X18] - GRPM ↵	GrpmD [X14]* [X18] ↵	Decrement
View master value	[Esc] d [X14] GRPM ↵	Vrbmode 0/1: [X18] ↵ Vrbmode 2/3: GrpmD [X14]* [X18] ↵	View master value.
Set Group			
View group members	[Esc] o [X14] GRPM ↵	Vrb mode 0/1: <OID>*<OID> ...*<OID> ↵ Vrb mode 2/3: GrpmO [X14]*<OID>*<OID> ...*<OID> ↵	View group members
View soft limits	[Esc] l [X14] GRPM ↵	Vrb mode 0/1: [X16]*[X17] ↵ Vrb mode 2/3: GrmpL [X14]*[X16]*[X17] ↵	View soft limits

Digital Input Commands

Command	ASCII Command (Host to Tuner)	Response (Tuner to Host)	Additional Description
Configure digital input	<code>[Esc][X1]*[X2]*[X3]*[X4]GPIT ←</code>	<code>GPIT[X1]*[X2]*[X3]*[X4]←</code>	See table below
View digital input	<code>[Esc][X1]GPIT ←</code> Vrb mode 2/3:	<code>[X2]*[X3]*[X4]←</code> <code>GPIT[X1]*[X2]*[X3]*[X4]←</code>	View digital input
View I/O state	<code>[X1]*]</code> Vrb mode 2/3:	<code>[X5]←</code> <code>Sio[X1]*[X5]</code>	View I/O state

Digital Input Command Table

<code>X1</code> = Digital inputs 1–3	Inputs 1–3	
<code>X2</code> = Type of signal change to monitor for	0 = off (default) 1 = edge, hi to lo 2 = edge, lo to hi	3 = level lo 4 = level hi
<code>X3</code> = Function	0 = off (default) 1 = mute/unmute group 2 = increment group	3 = decrement group 4 = preset recall
<code>X4</code> = Preset or group number	preset range = 1–16 group range = 1–16 0 = off (default)	
<code>X5</code> = State	0 = hi (voltage) 1 = lo (voltage)	

Command/Response Tables for DSP SIS Commands

Many digital signal processor (DSP) functions (gain, mute, and group masters) can be controlled using SIS commands. These commands follow the same general rules as basic SIS commands, but the variables (**Xn**) tend to be more complex. Also, a comprehensive understanding of the audio signal flow is helpful in understanding the commands. The following figure shows the specific DSP processors available for SIS commands.

NOTE: The entire signal flow is described in more detail in the “[DSP Processing and Signal Flow](#)” section.

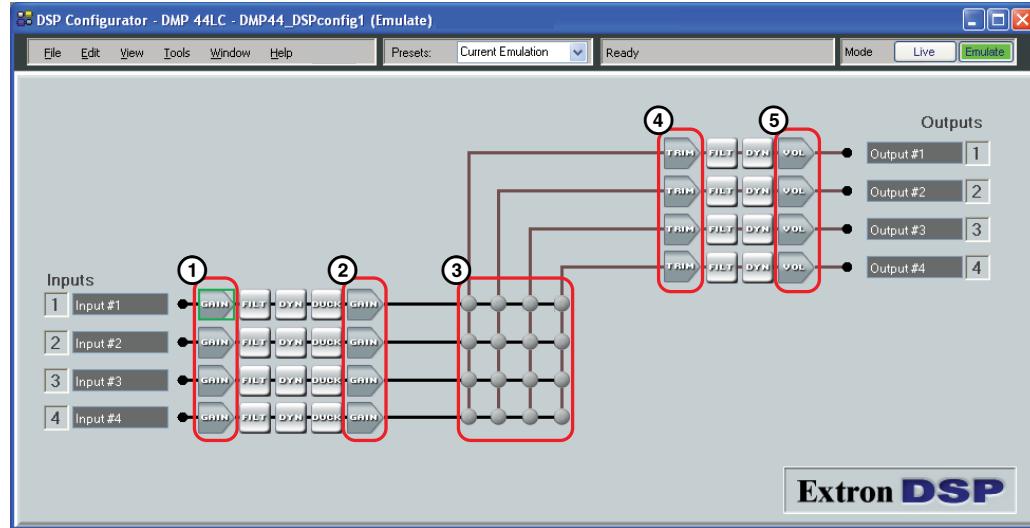


Figure 23. DSP Processors Addressable via SIS Commands

The DSP Configurator program window consists of an input signal processor chain, the mixer matrix, and an output signal processing chain. The following five processors can be controlled using the DSP SIS commands:

- ① **Line input gain control** – Provides level adjustment, mute and polarity.
- ② **Line input pre-mixer gain** – Provides basic level adjustment after the input audio processing chain and prior to the mix-point.
- ③ **Mix-points** – Provide level adjustment and signal routing from the inputs to the outputs.
- ④ **Output trim control** – Provides level adjustment after the line input audio processing.
- ⑤ **Output volume control** – Provides volume control of the variable output, mute, and polarity.

Command/Response Tables for Audio SIS Commands

DSP control commands are an extension to SIS commands. They differ only in their data string and the requirement to send each command with an "Au" suffix.

Symbol definitions

←	= CR/LF (carriage return/line feed) (hex 0D 0A)
←	= Carriage return (no line feed, hex 0D) (use the pipe character, , for Web browser commands))
•	= Space character
	= Pipe (vertical bar) character
[Esc]	= Escape key (hex 1B) (use W instead of Esc for Web browsers)

NOTE: The dB values of the level settings are in 0.1 dB increments using negative numbers but not decimal places. Multiply the desired level setting by ten for the SIS command value.

Example: To set an input level to 45.2 dB, use 452. To set an input level to -12.5 dB, use -125.

[X60]	= Gain and trim control or mix-point select	See " Table 1. Level Control and Mix-point Selection Tables ".
[X61]	= Level value in dB;	dB value, in 0.1 dB increments using negative numbers but not decimal places. The valid range depends on the type of gain block specified in the [X60] command: The valid range depends on the control or mix-point. ① = -180 to 240 (-18 to +24 dB) ② = -1000 to 60 (-100 to +6.0 dB) ③ = -240 to 120 (-24 to +12 dB) ④ = -120 to 60 (-12 to +6.0 dB) ⑤ = -1000 to 0 (-100 to 0.0 dB)
[X62]	= Input Polarity	0 = Standard 1 = Inverted
[X64]	= Mute status	0 = unmute 1 = mute
[X65]	= Group master group number	01 – 16
[X66]	= Group fader setting	dB value, in 0.1 dB increments using negative numbers but not decimal places. The valid range depends on the type of gain block that is assigned to the group number ([X65]) specified in the command: ① = -180 to 800 (-18.0 dB to +80.0 dB) ② = -1000 to 120 (-100.0 dB to +12.0 dB) ③ = -350 to 250 (-35.0 dB to +25.0 dB) ④ = -120 to 120 (-12.0 dB to +12.0 dB) ⑤ = -1000 to 000 (-100.0 dB to +0.0 dB)
<p>NOTE: Leading zeros are ignored.</p>		
[X67]	= Group fader increment	dB value, in 0.1 dB increments, to raise or lower a group fader
[X68]	= Group fader soft limit	dB value, in 0.1 dB increments. The valid range [X66] must be within the range for the gain block grouped in [X65].
[X69]	= Group type	6 = gain 12 = mute
[X70]	= Personal Identification Number (PIN)	Four numeric digits, default = 0000

Special Characters

The HTML language reserves certain characters for specific functions. The device will not accept these characters as part of preset names, the device name, passwords, or locally created file names.

The DMP 44 LC rejects the following characters:

{space (spaces **are** acceptable for names)} + } ~ , @ = ' [] { } < > ' " semicolon (;)
colon (:) | \ and ?.

Command/Response Table for DMP 44 LC DSP SIS commands

Command	ASCII Command (Host to Tuner)	Response (Tuner to Host)	Additional Description
Audio level control, and mix-point selection			
NOTES: <ul style="list-style-type: none"> The command format is the same regardless of the control or mix-point to be set; the acceptable adjustment range varies depending on the control or mix-point. See X61 in the previous section. All responses are shown with the DMP 44 LC in Verbose mode 2 or 3. 			
Set a trim or gain (excluding line inputs)	[Esc] G[X60]*[X61]AU←	DsG[X60]*[X61]←	Set trim or mix control [X60] to a value of [X61] dB.
<i>Example 1 (pre-mixer gain):</i>	[Esc] G30003*-8AU←	DsG30003*-8←	Set pre-mixer 4 gain to a value of -0.8 dB.
<i>Example 2 (mix-point gain):</i>	[Esc] G20001*165AU←	DsG20001*165←	Mix +16.5 dB of line 1 into output 2.
Set a line gain	[Esc] G[X60]*[X61]AU←	DsG[X60]*[X61]←	Set line gain control [X60] to a value of [X62] dB.
<i>Example:</i>	[Esc] G30001*240AU←	DsG30001*240←	Set the mic/line input 2 gain to a level of +24.0 dB.
Read a trim or mix (excluding line inputs)	[Esc] G[X60]AU←	DsG[X60]*[X61]←	DSP trim or mix control [X60] is set to a value of [X61] dB.
<i>Example 1 (post mixer trim control):</i>	[Esc] G60101AU←	DsG60101*55←	Output 2, post mixer trim is set to a value of +5.5 dB.
<i>Example 2 (mix control):</i>	[Esc] G20203AU←	DsG20203*92←	+9.2 dB of line 3 is mixed into output 4.
Read a line gain	[Esc] G[X60]AU←	DsG[X60]*[X62]←	Line gain control [X60] is set to a value of [X62] dB.
<i>Example:</i>	[Esc] G30000AU←	DsG30000*550←	Line input 1 gain is set to a value of +55.0 dB.
Audio mute			
NOTES: <ul style="list-style-type: none"> Post-mixer trim (④) cannot be muted. All responses are shown with the mixer device in Verbose mode 2 or 3. 			
Audio mute	[Esc] M[X60]*1AU←	DsM[X60]*1←	Mute audio point [X60] .
<i>Example:</i>	[Esc] M20301*1AU←	DsM20301*1←	Mute mix-point 4 to output 2.
Audio unmute	[Esc] M[X60]*0AU←	DsM[X60]*0←	Unmute audio point [X60] .
Read audio mute or level	[Esc] M[X60]AU←	DsM[X60]*[X64]←	0 = mute off, 1 = mute on

Command	ASCII Command (Host to Tuner)	Response (Tuner to Host)	Additional Description
Audio group master commands			
NOTE: <ul style="list-style-type: none"> See Group Masters, for more information about audio group masters. A group must have assigned members for these commands to have an effect. For X66, a positive (+) value is assumed unless a negative (-) value is specified. If entering a X66 value outside the valid range for the group or outside the soft limits, the DMP 44 responds with an “invalid parameter” (E13) error. X66, X67, and X68 values can be sent without leading zeroes; responses are always 5 digits. 			
Set a group fader control	[Esc] D X65*X66 GRPM ←	GrpmX65*X66←	Set the group fader to a value of X66 .
Example:	[Esc] D2* - 293GRPM ←	GrpmD02* - 00293GRPM←	Set the group 2 fader control to -29.3 dB.
Raise a group fader control	[Esc] D X65*X67+GRPM ←	GrpmX65*X66←	Increase the level of the X65 group fader by X67 dB..
Example	[Esc] D2*30+GRPM ←	GrpmD02* - 00263*GRPM←	Raise the group 2 fader 3 dB (from -29.3 dB to -26.3 dB, starting from the level set in the “Set a group fader control” example, above).
Lower a group fader control	[Esc] D X65*X67-GRPM ←	GrpmX65*X66←	Decrease the level of the X65 group fader by X67 dB.
View the group fader control level	[Esc] D X65 GRPM ←	GrpmX65*X66←	In verbose modes 1 and 2, the response is simplified to X66 ←.
Mute a group mute control	[Esc] D X65*1 GRPM ←	GrpmD X65*+00001	Mute all blocks in group X65 .
Clear (unmute) a group mute control	[Esc] D X65*0 GRPM ←	GrpmD X65*+00000	Unmute all blocks in group X65 .
View a group mute control	[Esc] D X65 GRPM ←	GrpmD X65*X64	For group masters, X64 is always expressed as a positive or negative 5-digit value.
Set soft limits	[Esc] L X65*X68upper*X68lower GRPM ←	GrpmL X65*X68*X68	Set the groups soft limits to X68 and X68 .
Example:	[Esc] L2*+60*-60GRPM ←	GrpmL2*+00060*-00060	Set the upper soft limit for the group 2 fader to +6.0 dB and the lower limit to -6.0 dB.
View soft limits	[Esc] L X65 GRPM ←	GrpmL X65*X68*X68	In verbose modes 0 and 1, the response is simplified to X68*X68 ←.
View group type	[Esc] P X65 GRPM ←	GrpmP X65*X69	Show the group type (X69) for group X65 . In verbose modes 0 and 1, the response is simplified to X69 ←.
View group members	[Esc] O X65 GRPM ←	GrpmO X65*X601*X602*...*X6016	X60 is the control or mix point. In verbose modes 0 and 1, the response is simplified to X60¹*X60²*...*X60¹⁶ ←.

Table 1. Level Control and Mix-point Selection Tables

① Input Gain Control	X60
Input 1	30000
Input 2	30001
Input 3	30002
Input 4	30003

② Pre-mixer Gain	X60
Input 1	30100
Input 2	30101
Input 3	30102
Input 4	30103

③ Main Mix-point	X60
Input 1 to Output 1	20000
Input 1 to Output 2	20001
Input 1 to Output 3	20002
Input 1 to Output 4	20003

③ Main Mix-point	X60
Input 2 to Output 1	20100
Input 2 to Output 2	20101
Input 2 to Output 3	20102
Input 2 to Output 4	20103

③ Main Mix-point	X60
Input 3 to Output 1	20200
Input 3 to Output 2	20201
Input 3 to Output 3	20202
Input 3 to Output 4	20203

③ Main Mix-point	X60
Input 4 to Output 1	20300
Input 4 to Output 2	20301
Input 4 to Output 3	20302
Input 4 to Output 4	20303

④ Post-mixer Trim	X60
To Output 1	60100
To Output 2	60101
To Output 3	60102
To Output 4	60103

⑤ Post-mixer Output Volume	X60
To Output 1	60000
To Output 2	60001
To Output 3	60002
To Output 4	60003

Software Control

This section describes the control software for the DMP 44 LC, including:

- **Software Control**
- **DSP Configurator Program**

Software Control

The DMP 44 LC can be controlled using the DSP Configurator software, SIS commands through HyperTerminal or DataViewer.

The DMP 44 LC has the following connection options:

- **RS-232** — One single stack 6-pole (shared with Digi In), 3.5 mm captive screw connector is used for bi-directional RS-232 (± 5 V) serial control.
See "[Rear Panel Features and Cabling](#)", for additional details on connecting the RS-232 port.
- **USB 2.0** — A Mini B-type USB connector located on the front panel provides high-speed USB 2.0 connectivity to a host computer, backward compatible to 1.0.

The DSP Configurator Control Program is compatible with Windows 2000, Windows XP, Windows Vista®, and provides remote control of the input gain and attenuation, output volume output adjustment, and other features.

DSP Configurator can control the DMP 44 LC via any of the two control ports, RS-232 or USB.

Updates to this program can be downloaded from the Extron website at www.extron.com.

Installing the DSP Configurator Program

The program is contained on the Extron Software Products DVD.

Install the software as follows:

1. Insert the DVD into the drive
2. Click the **Software** tab or software icon.

NOTE: If the DVD setup program does not start automatically, run **Launch.exe** from the DVD ROM directory in "My Computer" of the Windows operating system.

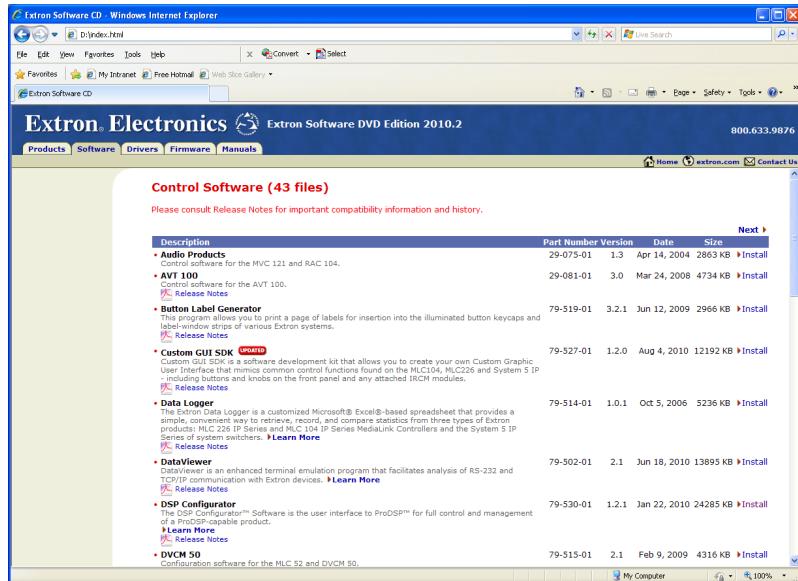


Figure 24. DVD Software Menu

3. Scroll to the DSP Configurator program and click the **Install** text to its right, as shown in the red boxes below.

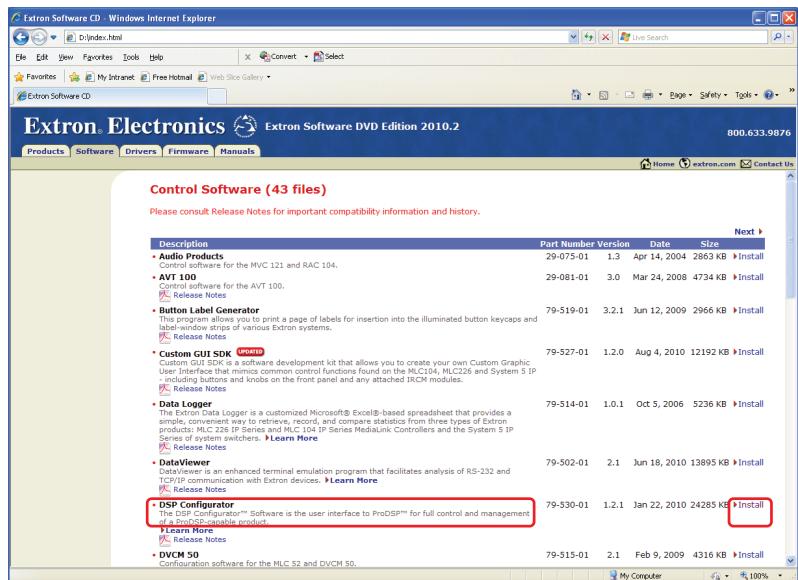


Figure 25. DVD Control Software Menu

4. Follow the on-screen instructions. By default, the Windows installation creates a **DSP_Configurator** folder in **C:\Program Files\Extron** for the DSP Configurator program files.
5. When the DSP Configurator installation is complete, the USB Installer starts automatically. It is recommended to install the USB drivers whether they are used immediately or not.

Install the USB Driver

To install the USB driver, follow these instructions.



Figure 26. USB Installer Splash Screen

1. After the DSP Configurator program installation is complete, click **Next** to proceed.



Figure 27. USB Installation

2. The USB driver installer launches. When the installer has completed the installation of the USB drivers, the following screen appears:

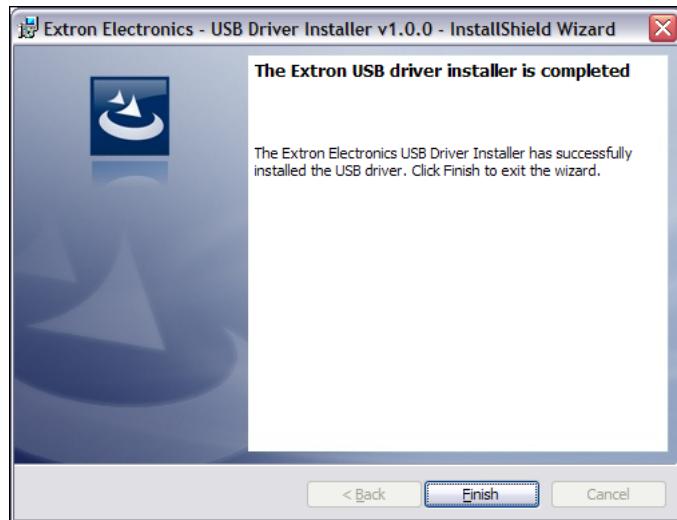


Figure 28. Successful USB Driver Installation

3. Click **Finish**.

USB driver installation is complete.

DSP Configurator Program

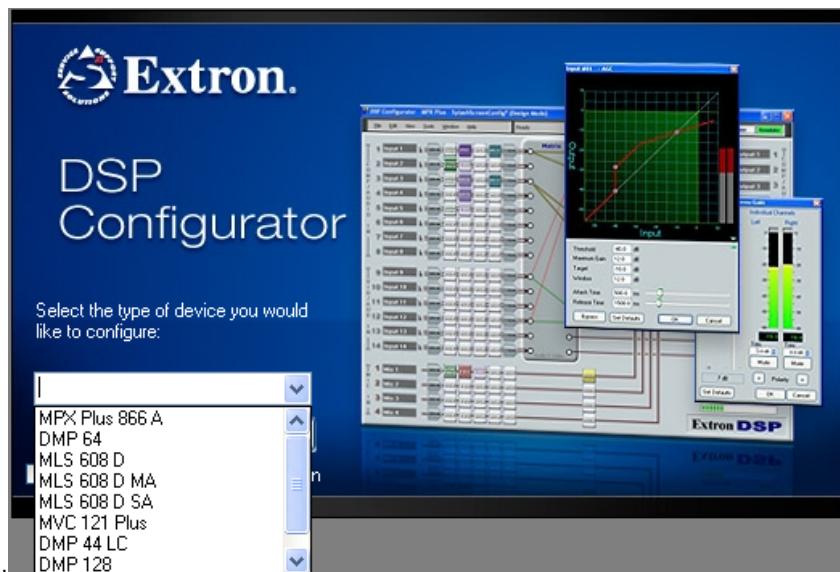
Starting the Program

1. To run the DSP Configurator Program, click **Start > Programs > Extron Electronics > DSP Configurator > DSP Configurator**.

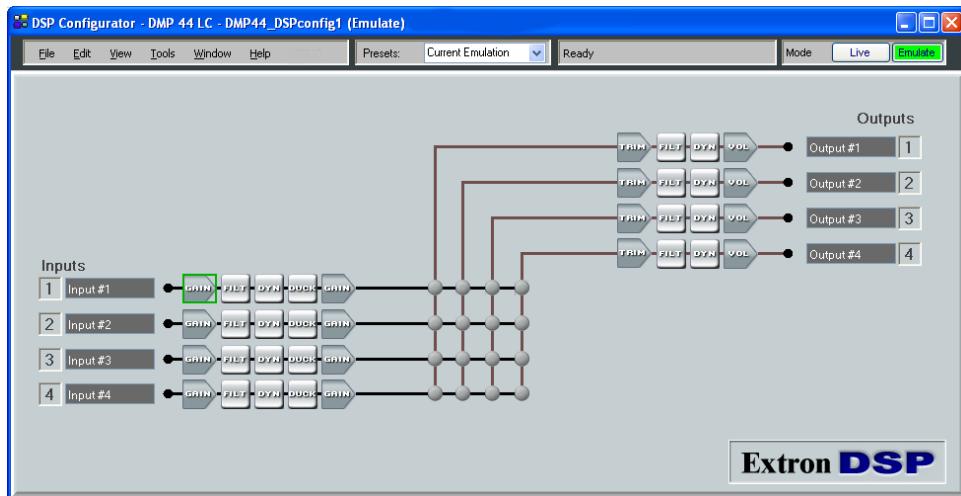


The DSP Configurator program starts in Emulate mode (see to "[Emulate Mode vs. Live Mode](#)").

2. Select the device to be configured and then click **OK**.



3. The program displays the following screen.



Using the Program

In Emulate mode, audio parameters may be selected, then transferred to the DMP 44 LC by going to Live mode (while connected to a DMP 44 LC). See the following section. Audio settings can also be tailored while connected to the DMP 44 LC, allowing real-time auditioning of the audio output as adjustments are made.

Emulate Mode vs. Live Mode

The DSP Configurator program has two operational modes, Live and Emulate. In Live mode, the program has established a connection and is synced with the DMP 44 LC. Changes affect the device in real-time and changes in the current state of the device are reflected in DSP Configurator. Emulate mode allows the user to work offline, creating or editing configurations that do not affect DMP 44 LC operation until they are uploaded to the device.

The DSP Configurator program always starts in Emulate mode. In Emulate mode, the program provides access to all functions of the DMP 44 LC without connecting to it. The user can build a configuration from the default screen, or open an existing file that contains a previously saved configuration. Settings and adjustments are saved to a configuration file on the PC. In Emulate mode when a previously saved file is opened, it becomes the current emulation in the Presets window. A new or previous file cannot be opened in Live mode.

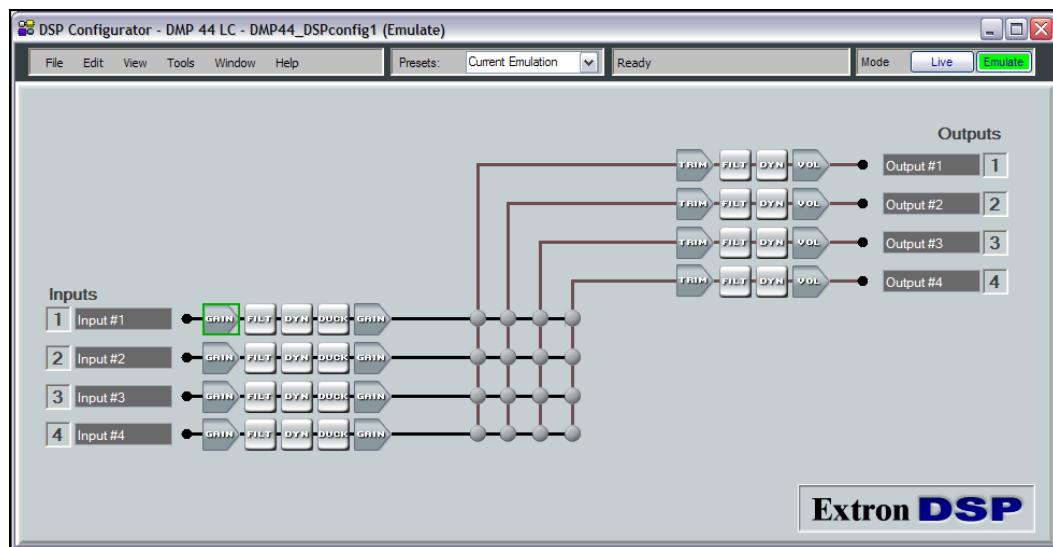


Figure 29. Main DSP Configuration Screen at Startup

The user can enter Live mode at any time after program launch, either with a blank configuration, after creating a configuration, or after loading a previously saved configuration file.

Synchronizing: Pull vs. Push

When switching to Live mode after making changes to the current configuration in emulate mode, either:

- Pull data from the device and update the DSP Configurator program configuration. This option downloads device settings from the DMP 44 LC and synchronizes it with the DSP Configurator program overwriting the current DSP Configurator settings, or
- Push data from the DSP Configurator program to the device, overwriting settings in the DMP 44 LC.

Live mode can also be used to tailor audio settings in real-time while listening to the audio output.

Selecting Live Mode and Pushing or Pulling a Configuration

To switch from emulate mode to live mode:

4. Click the **Live** button, see ① on the main DSP Configurator screen. The Connect to device... dialog box opens.

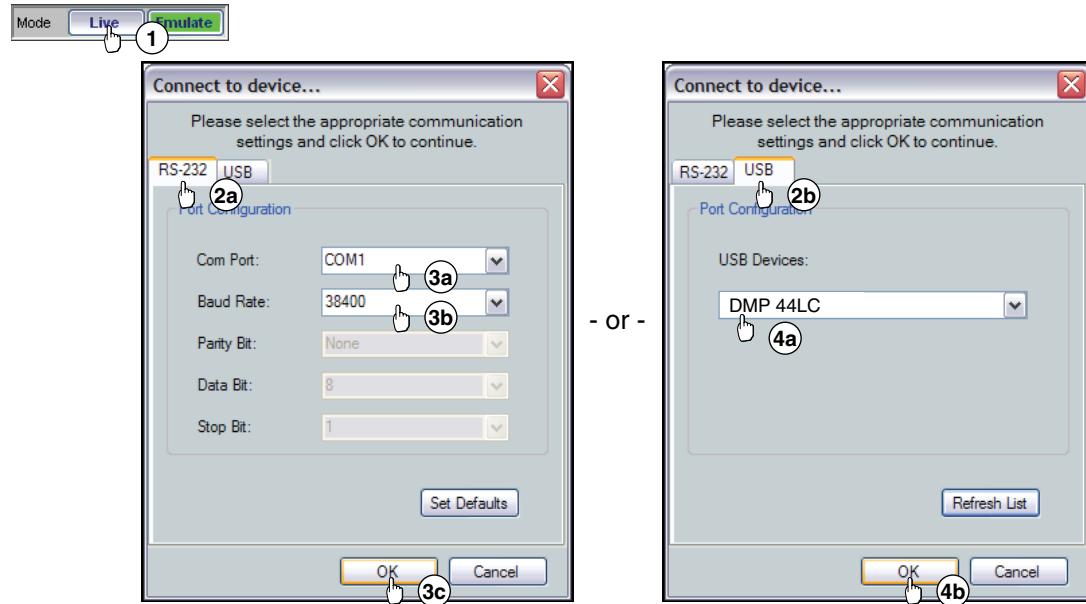


Figure 30. Selecting Live Mode

5. As needed, click either the:
 - a. **RS-232** tab (for connection to the rear panel RS-232 ports — proceed to step 3,
 - b. **USB** tab (for connection via the front panel configuration port — proceed to step 4).
6. If **RS-232** was selected in step 2:
 - a. Click the **Com Port** drop-down menu and select the PC com port connected to the rear panel RS-232 port.
 - b. Check the baud rate displayed in the **Baud Rate** field. If the baud rate does not match the device rate, click the **Baud Rate** drop-down menu and select the desired baud rate. The default is 38400.
 - c. Click **OK**.

The **Synchronize with Device** dialog box appears. Proceed to step 5.

7. If **USB** was selected in step 2:
 - a. Click the USB Device drop-down menu and select **DMP 44 LC** (or **Extron USB device**, if DMP 44 LC is not available),
 - b. Click **OK**.

The Synchronize with Device dialog box appears. Proceed to step 5.

Several options are now available for either configuring the DMP 44 LC or reconfiguring to suit current operating conditions.

8. Click either the:

- a.** **Pull** radio button to overwrite the open file with the current device configuration, then proceed to step **6**.

-Or-

- b.** **Push** radio button to overwrite the open file, then proceed to step **6**.

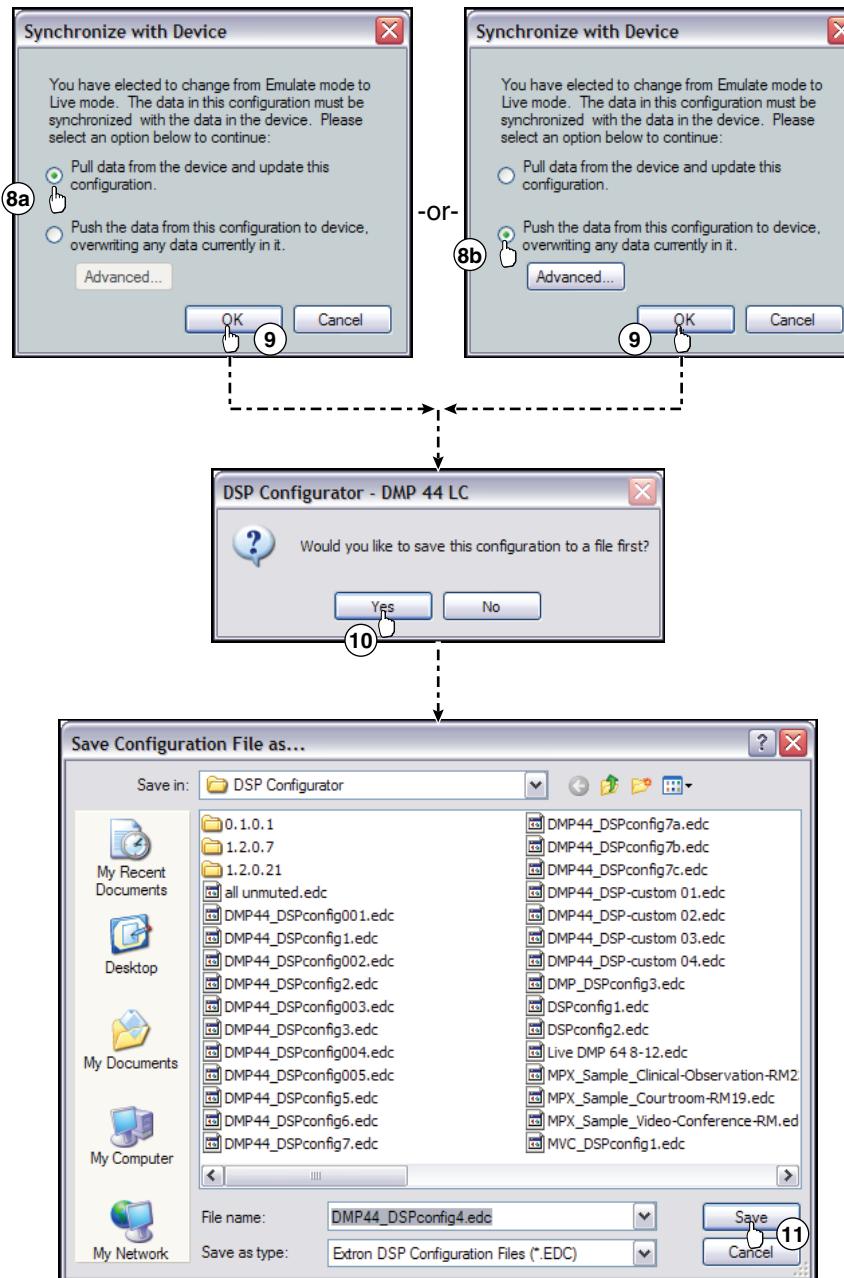


Figure 31. Selecting **Live Mode**, continued

9. Click **OK**. The DSP Configurator program is connected live to the device and the configuration and presets are pushed or pulled as selected.

- If **Pull** is selected, the program overwrites the currently open file with the configuration from the device. Proceed to step **7**.
- If **Push** is selected, the program overwrites the device configuration with the currently open file. Proceed to step **7**.

NOTE: In either case, the program and device configuration now reflects DSP Configurator changes in real-time.

If the file has been previously saved and has not changed, step **7** is skipped.

10. If changes have been made to the DSP parameters (including mix-point, gain or processor blocks) since the last file save, DSP Configurator prompts to save the file. Click **Yes** or **No**, as necessary,

- a. Click **Yes** to save the currently open configuration to an existing file or to create a new one, then proceed to step **8**.
- b. Click **No** to push the currently open configuration to the DMP 44 LC. After the configuration is complete, DSP Configurator remains connected to the DMP 44 LC in Live mode.

11. Either enter a new file name, or select an existing file from the list then click **Save**.

The DSP Configurator program uploads the current file to the DMP 44 LC. The file overwrites the configuration of the device, and DSP Configurator is now connected live. Further changes to the configuration will be reflected immediately in the device operation.

Presets

Presets are used to recall a group of frequently used settings. Presets created by DSP Configurator may contain all elements (gain blocks, processor blocks, and mix-points) or a portion of the elements available within the program. In Emulate mode, up to 16 presets can be created, then uploaded as a set and stored to the device or stored to disk as a configuration file. In Live mode, presets can be created one at a time from the current state. They can then be saved to a chosen preset number in the device, with the option to name, rename or save to disk.

When recalled, a preset only overwrites elements contained in the preset. Presets are useful when settings for a particular room or only certain elements of a configuration need to be changed regularly.

An additional preset contains current state information if reading from the device in Live mode, or the state of DSP Configurator if in Emulate mode (titled current emulation). Current emulation can be a configuration not yet saved as a preset (work in progress), the last preset or combination of presets recalled within DSP Configurator, or the current state of the device as a result of switching from Live to Emulate mode.

Presets may be created in Live or Emulate modes. In Emulate mode, the preset or presets are created, saved to a file, then pushed to the DMP 44 LC when connecting in Live mode.

When a Pull data synchronization is performed, preset data remains in the DMP 44 LC, with only the list of preset names pulled from the device. Presets in this state are marked with an asterisk until that preset is recalled (which pulls the preset data from the device), or until a backup is performed. Presets pulled from the device cannot be saved to disk until they have been recalled, at which time the preset data is pulled into DSP Configurator. Presets with no asterisk can be saved to disk.

Saved presets can be recalled via the DSP Configurator, or a control system sending an SIS preset recall command. Presets may also be saved and recalled via the embedded web page. Presets saved via the web page contain input gain, output volume, and the primary mix-point settings.

Previewing/Recalling a Preset

A preset can be previewed in either Live or Emulate mode by selecting the preset from the presets drop-down list.

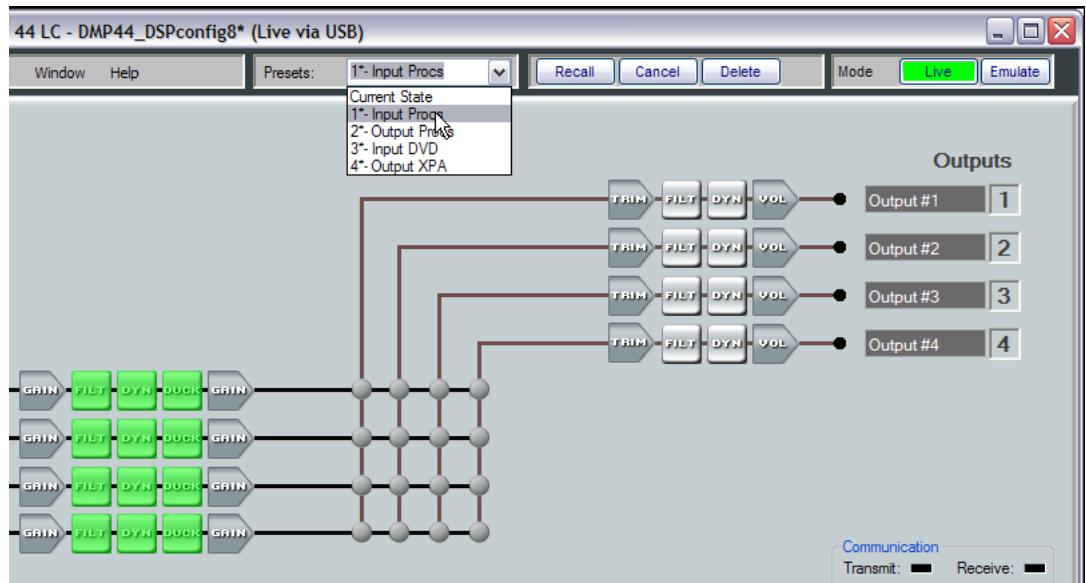


Figure 32. Preset Preview

The program indicates a view-only preset configuration by displaying each preset element with a translucent green mask over the block. In the example, the input processors are included in Preset 1 - Input Procs.

Behavior for previewing and applying presets is as follows:

- **Live Mode** — After selecting a preset, DSP Configurator displays the preset elements that will be affected by a preset recall with a translucent mask over the element, and leaves all other DSP Configurator elements unaltered. Elements without a translucent mask represent elements in the current state that will be unaffected by a preset recall. Real-time changes to the current state will not be reflected in the GUI while previewing a preset, and the user cannot alter GUI elements. To apply the preset, the user clicks **Recall1**. The preset reverts to “Current State.”
- **Emulate Mode** — After selecting a preset from the list, DSP Configurator displays the elements that will be affected by a preset recall with a green translucent mask, leaving all other elements (which represent the current emulation) unaltered. The user clicks **Recall1** to apply the viewed preset to the current emulation. The preset number reverts to “Current Emulation.”

Building a Preset

Only elements that are highlighted (given focus) will be saved as a preset. <Ctrl + A> highlights all elements within DSP Configurator.

To build a preset, highlight the desired DSP Configurator elements (gain/processor blocks, mix-points) using standard Windows keyboard and mouse actions as follows:

1. <Left click> on the desired block to select a single block,
2. <Ctrl + left click> to select multiple blocks that are not adjacent,
3. <Shift/hold + click> on the first block and click on the last block in either a vertical column or horizontal row to select multiple blocks, and
4. Click and drag a selection rectangle to select multiple adjacent blocks in either the vertical or horizontal direction.
5. Go to **Tools** > **Presets** and select **Mark All Items** or press <Ctrl + A>. This marks all elements within DSP Configurator, which saves a "full" preset,
6. To save the selection see "[Save Preset](#)" below.

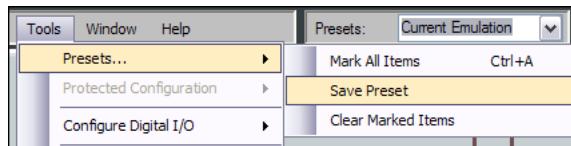
Save Preset

A preset may be saved in either Emulate mode or Live mode.

Saving a preset in Emulate mode stores that preset in the currently open file. The DSP Configurator file must then be saved to disk via **File** > **Save** (recommended), and/or pushed to the device after a connection is established. This differs from Live mode where the created preset is saved in real-time to the device and becomes part of the configuration file.

To save a preset use the following instructions:

1. Highlight the desired preset block by using left click, <Ctrl + left click>, <shift + left click> or drag around the desired blocks.
2. Select **Tools** > **Presets** > **Save Preset** in the menu bar.



3. Select a preset number. In the **Preset Name** field, unused presets are named "unassigned." To create a new preset, select an unused preset number and type a preset name. If no name is entered, a default name will be assigned. To overwrite an existing preset, select a preset with a name other than "unassigned."

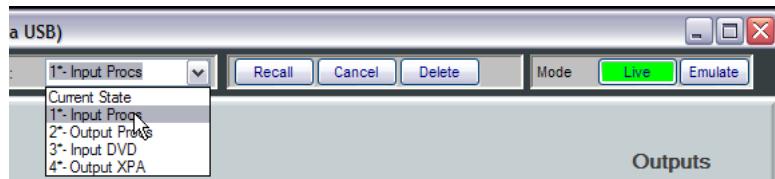


Figure 33. Save Preset

4. Click **OK** to save the preset, or **Cancel** to stop the save preset operation.

Managing Presets in the GUI

After the preset is created (whether or not the DSP Configurator file is saved), it appears in the preset list, available from the presets bar.



In Live and Emulate mode, after a preset is selected from the list, action buttons become available next to the presets bar.



The user can either Recall (make the preset active), Cancel (return to the current emulation or state) or Delete the preset.

In Live mode selecting Recall first applies the currently displayed preset elements ("marked" elements) from the stored preset and overwrites that portion of the current state, then switches the drop-down list to read "Current State."

In Emulate mode, the Recall action button applies the currently displayed preset elements ("marked" elements) from the file and overwrites the information contained in DSP Configurator as the current emulation, then switches the drop-down list to read "Current Emulation."

When a preset is being previewed, in either Live or Emulate mode, the **Delete** button is available. In Live mode, the preset is deleted from the hardware, which is reflected in software (it is removed from the preset list). After disconnecting from the device and before exiting the program, the file must then be saved to retain this change. In Emulate mode, the preset is deleted from the file in software, which must then be saved (before exiting) to retain this change. In either Live or Emulate mode, the **Cancel** button defeats the preview action and returns the user to the current state or current emulation, respectively.

Presets: Pull vs. Push or Create Live

When a preset is pulled from the device, the preset data remains in the device until the preset has been recalled. DSP Configurator pulls only the names of the presets. These presets cannot be saved to disk until they have been recalled.

An asterisk next to the preset name indicates that only the preset name has been pulled from the device, and the preset data only exists in the device (it has not been recalled). Presets pushed to the device or created in DSP Configurator while in Live mode have no asterisk. Presets with no asterisk can be saved to disk.

Push Configuration - Advanced, Push Presets, All

There are a number of advanced options available when pushing a configuration that enable the user to tailor the input, signal processing, signal mix, or output to a specific preset operation. This allows the user to push the currently open configuration, including all presets, to the DMP 44 LC or to customize the push to include either the configuration, selected presets, or both.

To use the advanced push feature:

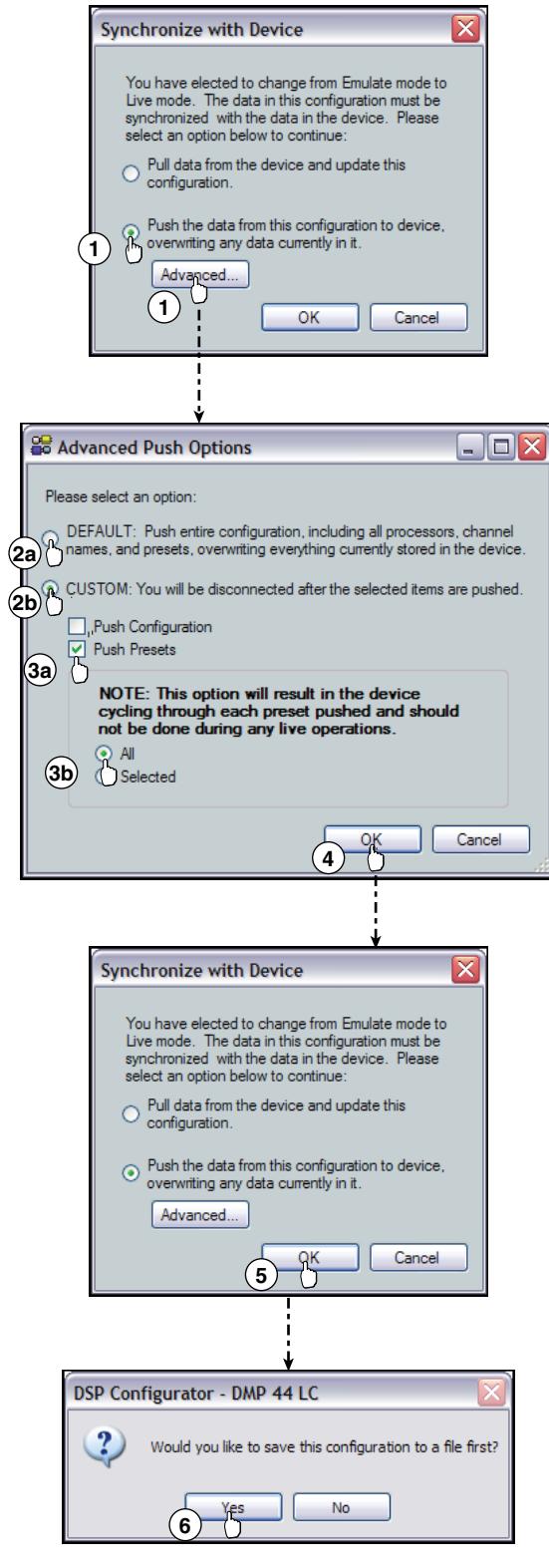
Connect the DMP 44 LC as described by steps **1** to **4** in the previous procedure for switching from Emulate mode to Live mode (see “[To switch from emulate mode to live mode:](#)”), then:

- 1.** Select the **Push** radio button, then click **Advanced**.

NOTE: Clicking **OK** at this time pushes the currently open configuration to the DMP 44 LC.

- 2.** The program asks you to choose an option:
 - a.** Choose **Default** to update the device configuration with the currently open file. Proceed to step **4**.
 - b.** Choose **Custom** for additional options. Proceed to step **3**.

NOTE: In either case, the program and device configuration now reflect DSP Configurator changes to the DMP 44 LC configuration in real-time.



3. There are three options now available; **Push Configuration**, **Push Presets** or both. In this example, **Push Configuration** is not selected and all presets will be pushed.

 - a. Select **Push Presets** only. This enables two additional options, **All** and **Selected**.
 - b. Select **All**. Push Presets-All uploads all stored presets from DMP Configurator to the device overwriting previous presets.
4. Click **OK**. The Synchronize with Device dialog box appears.
5. Leave all selections as they are and click **OK** again to push the presets to the device.
6. If changes have been made to the DSP parameters (including mix-point, gain or processor blocks) since the last file save, DSP Configurator prompts to save the file. Click **Yes** or **No**, as necessary,

 - a. Click **Yes** to save the currently open configuration to an existing file or to create a new one. The new configuration is pushed to the device.
 - b. Click **No** to ignore the file changes. The currently open configuration is pushed to the DMP 44 LC.

Push Configuration - Advanced, Push Presets, Selected

The next example shows how to customize a push to include only selected presets.

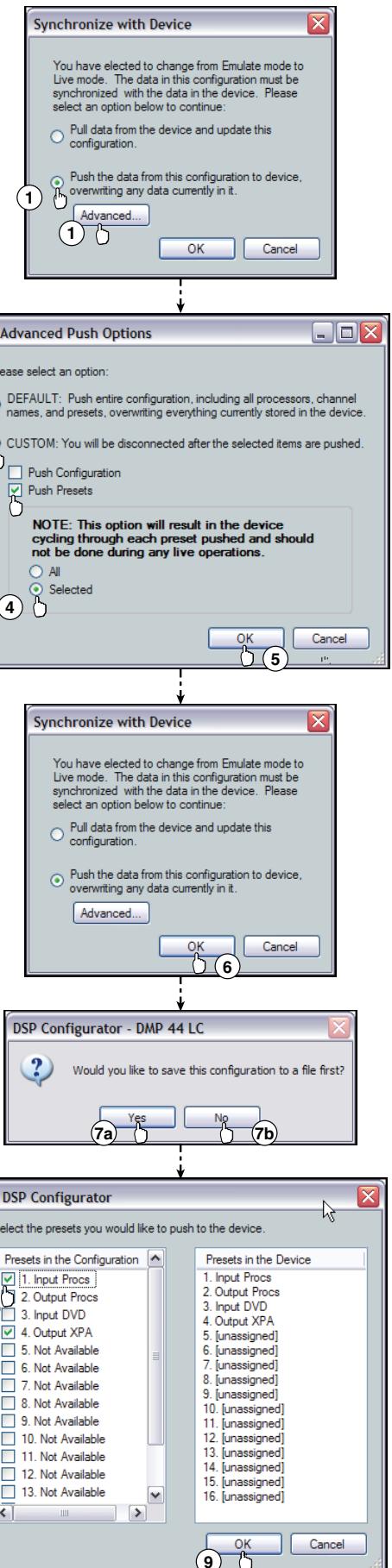
Connect the DMP 44 LC as described by steps **1** to **4** in the previous procedure for switching from Emulate mode to Live mode (see **"To switch from emulate mode to live mode:"**), then:

1. Select the **Push** radio button, then click **Advanced**.

NOTE: Pressing **OK** at this time pushes the currently open configuration to the DMP 44 LC.

2. Select the **Custom** radio button.
3. Select **Push Presets**.
4. Choose **Selected**.
5. Click **OK**. The Synchronize with Device dialog box appears.
6. If it is not selected, select the **Push the data...** radio button and click **OK** again.
7. If changes have been made to the DSP parameters (including mix-point, gain or processor blocks) since the last file save, the DSP Configurator prompts to save the file.
 - a. Click **Yes** to open the file selection box, see previous sections for the Save File as... dialog box instructions. Accept the name, choose an existing file name or create a new one and click **OK**. The new configuration is pushed to the device.
 - b. Click **No** to ignore the changes.
8. The Presets in the Configuration dialog box opens. Select the preset configurations to push to the DMP 44 LC. A checkmark appears for each selection. In this example, a checkmark has been placed in the **1. Input Procs** and **4. Output XPA** preset check boxes.
9. Press **OK**. The DSP Configurator program saves the configuration then updates the DMP 44 LC configuration, overwriting the configuration in the device. When the transmit and receive indicators stop flashing, the upload is complete and the DSP Configurator program is now connected live to the DMP 44 LC.

Changes to the configuration are reflected immediately in the device operation.



Reference Information

This section contains reference information for the DMP 44 LC, including:

- [Specifications](#)
- [Part Numbers and Accessories](#)
- [Mounting](#)
- [Firmware Loader](#)
- [DMP 44 LC Hardware Reset Modes](#)

Specifications

Audio

Gain.....	Unbalanced output: -6 dB; balanced output: 0 dB
Frequency response.....	20 Hz to 20 kHz, ± 0.3 dB
THD + Noise.....	<0.02% @ 1 kHz, at maximum output level
S/N.....	>100 dB, 20 Hz to 20 kHz, at maximum output, unweighted
Crosstalk.....	<-90 dB @ 1 kHz, fully loaded
CMRR	>60 dB @ 1 kHz

Audio input

Number/signal type	4 mono, line, balanced/unbalanced
Connector.....	(2) 3.5 mm captive screw connectors, 6 pole
Impedance	>10k ohms unbalanced/balanced
Nominal level	+4 dBu when level is set to 0 dB gain; adjustable from -20 dBu to +4 dBu
Maximum level.....	+21 dBu, balanced, when input gain is set to 0 dB
Volume range.....	-18 dB to +24 dB, line input, adjustable per input

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, line, balanced/unbalanced
Connectors	(2) 3.5 mm captive screw connectors, 6 pole
Impedance	50 ohms unbalanced, 100 ohms balanced
Gain error	± 0.2 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, 6 pole (uses 3 poles) (shared with digital input)
Baud rate and protocol.....	9600 to 115200 baud (38400 baud = default), 8 data bits, 1 stop bit, no parity, no flow control
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
Program control	Extron control/configuration program for Windows® Extron Simple Instruction Set (SIS™)

Control — digital input ports

Number/type.....	3 digital input (configurable)
Connector.....	(1) 3.5 mm captive screw connector, 6 pole (shared with RS-232 port, uses 4 poles)
Pin configuration.....	3 = GND; 4, 5, 6 = digital inputs 1, 2, 3
Digital inputs	
Input voltage range	0-24 VDC
Input impedance.....	10k ohms
Threshold low to high.....	>2.0 VDC
Threshold high to low.....	<0.8 VDC

General

Power	External Input: 100-240 VAC, 50-60 Hz Output: 12 VDC, 1 A
Power consumption	3.6 watts
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 4.3" W x 3.0" D (1U high, quarter rack wide) (4.3 cm H x 10.9 cm W x 7.6 cm D) (Depth excludes connectors.)
Product weight.....	0.6 lbs (0.3 kg)
Shipping weight.....	3 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 A, 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 ±10%.

NOTE: Specifications are subject to change without notice.

Part Numbers and Accessories

Included Parts

These items are included in each DMP 44 LC order:

Included parts	Replacement part number
DMP 44 LC Digital Matrix Processor	60-1095-01
3.5 mm, 5-pole captive screw connectors w/strain relief (5)	10-703-12LF
12 VDC, 1 A external power supply	70-775-01
DSP Configurator Control Software DVD	
Rubber Feet (4)	
Nylon tie wraps (5)	
Tweaker	
<i>DMP 44 LC Setup Guide</i>	

Accessories

These items can be ordered separately:

Adapters, power supplies, labels	Part number
USB A Male to USB Mini B Male Configuration Cable	26-654-06
MBU 123, Under-Desk Mount Kit	70-212-01
RSB 126, Basic Rack Shelf Kit for 6" deep products	60-604-11
RSU 126, Universal Rack Shelf Kit for 6" deep products	60-190-10

Mounting

The 1U high, quarter rack width, 3-inch deep DMP 44 LC Digital Matrix Processor can be:

- Set on a table,
- Mounted on a rack shelf,
- Mounted under a desk or tabletop, or
- Mounted on a projector bracket.

Tabletop Use

Each DMP 44 LC comes with rubber feet (not installed). For tabletop use, attach a self-adhesive rubber foot to each corner of the bottom of the unit.

UL Rack Mounting Guidelines

The following Underwriters Laboratories (UL) guidelines pertain to the safe installation of the DMP 44 LC in a rack.

1. **Elevated operating ambient temperature** — If installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than room ambient temperature. Therefore, install the unit in an environment compatible with the maximum ambient temperature ($T_{ma} = +122^{\circ}\text{F}, +50^{\circ}\text{C}$) specified by Extron.
2. **Reduced air flow** — Install the equipment in a rack so that the amount of air flow required for safe operation of the equipment is not compromised.
3. **Mechanical loading** — Mount the equipment in the rack so that a hazardous condition is not achieved due to uneven mechanical loading.
4. **Circuit overloading** — Connect the equipment to the supply circuit and consider the effect that circuit overloading might have on overcurrent protection and supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.
5. **Reliable earthing (grounding)** — Maintain reliable grounding of rack-mounted equipment. Pay particular attention to supply connections other than direct connections to the branch circuit (such as the use of power strips).

Rack Mounting

For optional rack mounting, do not install the rubber feet. Mount the DMP 44 LC on a 19" Universal 1U or Basic rack shelf (Extron RSU 126, part number **60-190-10**; or Extron RSB 126, part number **60-604-11**).

To rack mount the DMP 44 LC:

1. If rubber feet were previously installed on the bottom of the DMP 44 LC, remove them.
2. Mount the DMP 44 LC on the rack shelf, using two 4-40 x 3/16 inch screws in opposite (diagonal) corners to secure the unit to the shelf.

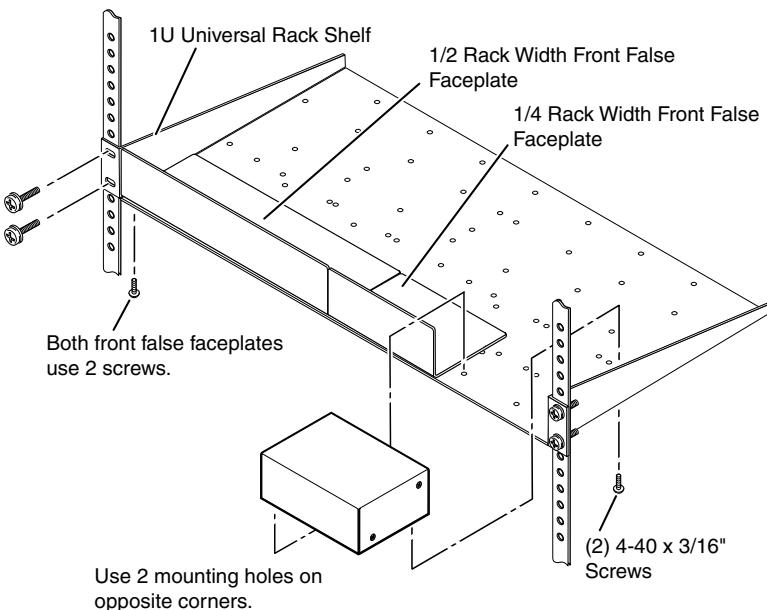


Figure 34. Mounting the DMP 44 LC on a Universal Rack Shelf

3. Install blank panesl or other units on the rack shelf.

Furniture Mounting

Furniture mount the DMP 44 LC using the optional mounting kit (Extron MBU 123, part number **70-212-01**, as follows:

1. Attach the selected mounting brackets with the machine screws provided.
2. If feet were previously installed on the bottom of the cabinet, remove them.
3. Hold the unit with the attached brackets against the underside of the table or other furniture, or against the wall. Mark the location of the screw holes of the bracket on the mounting surface.
4. Drill 3/32 inch (2 mm) diameter pilot holes, 1/4 inch (6.4 mm) deep in the mounting surface at the marked screw locations.
5. Insert #8 wood screws into the four pilot holes. Tighten each screw into the mounting surface until just less than 1/4 inch of the head of the screw protrudes.
6. Align the mounting screws with the slots in the brackets and place the unit against the surface, with the screws through the bracket slots.
7. Slide the unit slightly forward or back, then tighten all four screws to secure it in place.

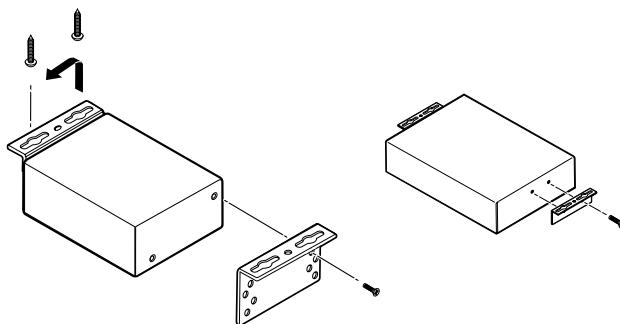


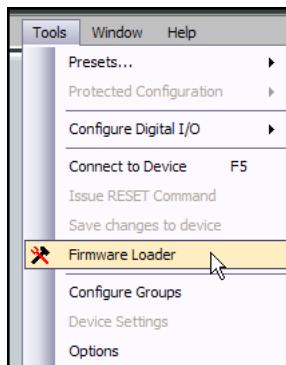
Figure 35. MBU 123, Under-Desk Mounting

Firmware Loader

The DSP Configurator program includes a firmware loader program which allows replacing the firmware without taking the DMP 44 LC out of service. Download the desired firmware file from the Extron website, (see the Firmware Upgrade Page on the website for instructions.)

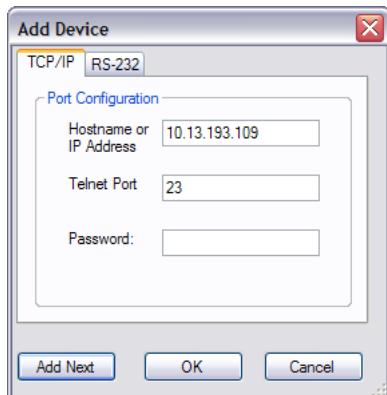
To access the firmware loader:

1. Select **Tools**, then **Firmware Loader**.

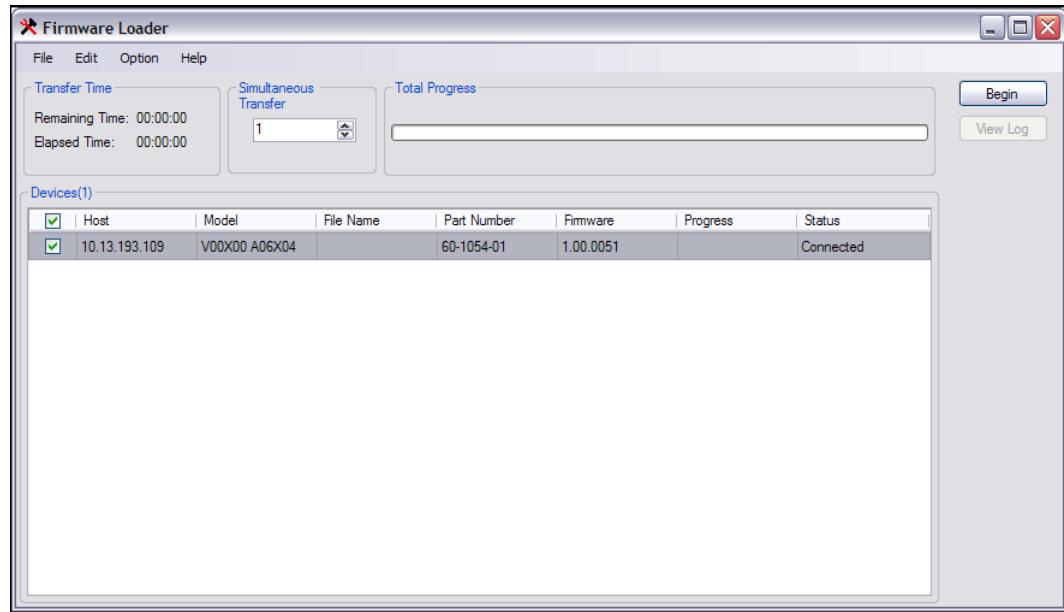


2. The Add Device dialog box appears. Type the IP address of the DMP 44 LC, then click **OK**.

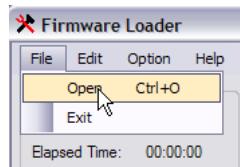
NOTE: If the IP has not been changed, the default IP address is: 192.168.255.255.



The Firmware Loader screen appears.



3. From the toolbar, select **File > Open**.



4. Locate the downloaded firmware file and click on it.
5. Click **Begin** on the main screen. The total progress bar tracks the loading progress.
6. When the upload is finished, exit the program by selecting **File > Exit**.

The firmware upload is complete.

DMP 44 LC Hardware Reset Modes

DMP 44 LC Reset Mode Summary			
	Mode Activation	Result	Purpose/Notes
Use Factory Firmware	<p>1 Hold the reset button while applying power.</p> <p>NOTE: After a mode 1 reset, update the DMP 44 LC firmware to the latest version. DO NOT operate the firmware version that results from this mode reset.</p>	<p>The DMP 44 LC reverts to the factory default firmware. Event scripting does not start if the DMP 44 LC is powered on in this mode. All user files and settings (drivers, adjustments, IP settings, etc.) are maintained.</p> <p>NOTE: If you do not want to update the firmware, or perform a mode 1 reset by mistake, cycle power to the DMP 44 LC to return to the firmware version running prior to the reset.</p>	<p>This mode reverts to the factory default firmware version if incompatibility issues arise with user-loaded firmware.</p> <p>NOTE: User-defined Web pages may not work correctly if using an earlier firmware version.</p>
Reset to Factory Defaults	<p>5 Press and hold the Reset button for about 9 sec. until the Power LED blinks three times (once at 3 sec., again at 6 sec., again at 9 sec.), then release and within 1 second press Reset momentarily (< 1 sec.).</p> <p>NOTE: The reset procedure is aborted if the second momentary press does not occur within one second.</p>	<p>Mode 5 performs a complete reset to factory defaults, except for firmware:</p> <ul style="list-style-type: none"> • Does everything mode 4 reset does. • All mix-points set muted and set to 0 dB. • All outputs unmuted and set to 0 dB. • DSP processing returned to defaults and bypassed. • All inputs muted and set to 0 dB. • All presets and group master memory cleared. 	<p>Useful to start over with configuration or uploading, and to replace events.</p>

Extron Warranty

Extron Electronics warrants this product against defects in materials and workmanship for a period of three years from the date of purchase. In the event of malfunction during the warranty period attributable directly to faulty workmanship and/or materials, Extron Electronics will, at its option, repair or replace said products or components, to whatever extent it shall deem necessary to restore said product to proper operating condition, provided that it is returned within the warranty period, with proof of purchase and description of malfunction to:

USA, Canada, South America, and Central America:

Extron Electronics
1001 East Ball Road
Anaheim, CA 92805
U.S.A.

Japan:

Extron Electronics, Japan
Kyodo Building, 16 Ichibancho
Chiyoda-ku, Tokyo 102-0082
Japan

Europe, Africa, and the Middle East:

Extron Europe
Hanzeboulevard 10
3825 PH Amersfoort
The Netherlands

China:

Extron China
686 Ronghua Road
Songjiang District
Shanghai 201611
China

Asia:

Extron Asia
135 Joo Seng Road, #04-01
PM Industrial Bldg.
Singapore 368363
Singapore

Middle East:

Extron Middle East
Dubai Airport Free Zone
F12, PO Box 293666
United Arab Emirates, Dubai

This Limited Warranty does not apply if the fault has been caused by misuse, improper handling care, electrical or mechanical abuse, abnormal operating conditions, or if modifications were made to the product that were not authorized by Extron.

NOTE: If a product is defective, please call Extron and ask for an Application Engineer to receive an RA (Return Authorization) number. This will begin the repair process.

USA: (714) 491-1500

Asia: +65.6383.4400

Europe: +31.33.453.4040

Japan: +81.3.3511.7655

Units must be returned insured, with shipping charges prepaid. If not insured, you assume the risk of loss or damage during shipment. Returned units must include the serial number and a description of the problem, as well as the name of the person to contact in case there are any questions.

Extron Electronics makes no further warranties either expressed or implied with respect to the product and its quality, performance, merchantability, or fitness for any particular use. In no event will Extron Electronics be liable for direct, indirect, or consequential damages resulting from any defect in this product even if Extron Electronics has been advised of such damage.

Please note that laws vary from state to state and country to country, and that some provisions of this warranty may not apply to you.

Extron Headquarters +1.800.633.9876 (Inside USA/Canada Only) Extron USA - West +1.714.491.1500 +1.714.491.1517 FAX	Extron Europe +800.3987.6673 (Inside Europe Only) +31.33.453.4040 +31.33.453.4050 FAX	Extron Asia +800.7339.8766 (Inside Asia Only) +65.6383.4400 +65.6383.4664 FAX	Extron Japan +81.3.3511.7655 +81.3.3511.7656 FAX +65.6383.4664 FAX	Extron China +4000.398766 Inside China Only +86.21.3760.1568 +86.21.3760.1566 FAX	Extron Middle East +971.4.2991800 +971.4.2991880 FAX	Extron Korea +82.2.3444.1571 +82.2.3444.1575 FAX	Extron India 1800.3070.3777 Inside India Only +91-80-3055.3777 +91 80 3055 3737 FAX
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