This compact module offers two channels of independent DSP and attaches to the back of most 2-channel DataPort equipped QSC amplifiers—without occupying any additional rack space.

Capitalizing on the success of our DSP-3, the second-generation DSP-4 provides several enhancements in functionality and performance while also incorporating the universally popular XLR balanced connectors. These enhancements include new A/D and D/A converters for improved signal-to-noise performance and upgraded software that significantly increases the unit's operational characteristics.

### Powerful

Simple to install, compact, and featuring "set-and-forget" convenience, the DSP-4's powerful processor enables you to perform a wide range of signal processing functions; and with its new A/D and D/A converters, its noise floor improves. Whether you need speaker crossovers, EQ, signal delay, or infrasonic filters, the DSP-4 is as flexible as your system's needs.

Each channel includes:

- Crossover filtering
- Compression and limiting
- Multiple Parametric EQs
- Precision attenuation
- Shelf filtering
- Mixing
- Multiple Delays (up to 910 ms)
- Tone and noise generation

### Configurable

The DSP-4's processing horsepower is dynamically assignable so you are not limited by a fixed signal chain. Simply use QSC's powerful PC-based Signal Manager software to easily configure multiple processing functions and signal flow with "drag-and-drop" tools.

### Cost-effective

The power and flexibility of the DSP-4 eliminates the need for expensive outboard processing gear, reducing cost and installation time for almost any application. The compact DSP-4 also plugs directly into the back of most QSC DataPort-equipped amplifiers for use in systems where rack space is a premium.



*Save space and weight by mounting the DSP-4 onto the back of most 2-channel DataPort equipped QSC amplifiers. Or use multiple DSP-4s as a stand-alone,rack-mounted DSP solution.*

# DSP-4

**Multiple Parametric Filters**, assignable anywhere in the signal chain:

| | |
|---|---|
| Variable Frequency | Bypass all EQs |
| Variable Gain | Add EQ |
| Variable Q | Delete EQ |
| Bypass one EQ | Show Response |

**Multiple Delays**, assignable anywhere in the signal chain:
20.83 µsec incremental
910 msec maximum (total of all delays)

**Compressor**, assignable anywhere in the signal chain:

| | |
|---|---|
| Gain | Release Time |
| Threshold | Show Response |
| Ratio | Bypass |
| Attack Time | |

**Output Peak Limiter**, assignable anywhere in the signal chain:

| | |
|---|---|
| Gain | Release Time |
| Threshold | Show Response |
| Attack Time | Bypass |

**High and Low-Pass Crossover Filters**, assignable anywhere in the signal chain:
Butterworth 6, 12, 18, 24 dB per octave slope
Bessel 6, 12, 18, 24 dB per octave slope
Linkwitz-Riley 12 and 24 dB per octave slope

| | |
|---|---|
| Bypass one EQ | Delete EQ |
| Bypass all EQ's | Show Response |
| Add EQ | Cutoff Frequency |

**High and Low-Pass Shelf Filters**, assignable anywhere in the signal chain:

| | |
|---|---|
| Variable Corner Frequency | Bypass all EQs |
| Variable Gain | Add EQ |
| Variable Q | Delete EQ |
| Bypass one EQ | Show Response |

**Signal Mute**

**Attenuation** 0.1 dB steps

**Mix Post Crossover Audio** (2→1 Mixer)

**Signal Splitter**

**Built-in Noise Generator** (Pink & White)

**Built-in Variable Frequency Tone Generator**

**Signal Polarity Reversal**

**Frequency Response**

**Clip and Protect Indication** of the amplifier's output

**Predictive Delay Feature** — produces less signal distortion than analog compressor/limiters — especially for fast attack times

## Hardware

Two independent channels of DSP

48 kHz, 24-bit converters

No turn on pops or "zipper" noise

If the memory or hardware fails, unit turns on muted to prevent driver damage

Host interface via RS-232 or QSControl Audio Network System via CM16a Amplifier Network Monitor

Electronically balanced XLR inputs

Contact closure to trigger preset changes

Post DSP output signal for daisy chaining

Selectable input sensitivity: 1.5, 4, 9, 18 Vrms; 6, 14.5, 21.5, 27.5 dBu; 3.5, 12, 19, 25 dBV

Output signal gain

## Software

"Drag-and-drop" configuration software

DSP processing power and memory is dynamically assigned to signal processing functions — eliminating the limitations imposed by fixed signal chain designs

Graphical representation of DSP resources

Firmware upgrades via RS-232

Hard copy printout of signal flow layout or parameter settings

## System Requirements

Windows® 98, NT4 (SP6), and 2000 (SP1)*

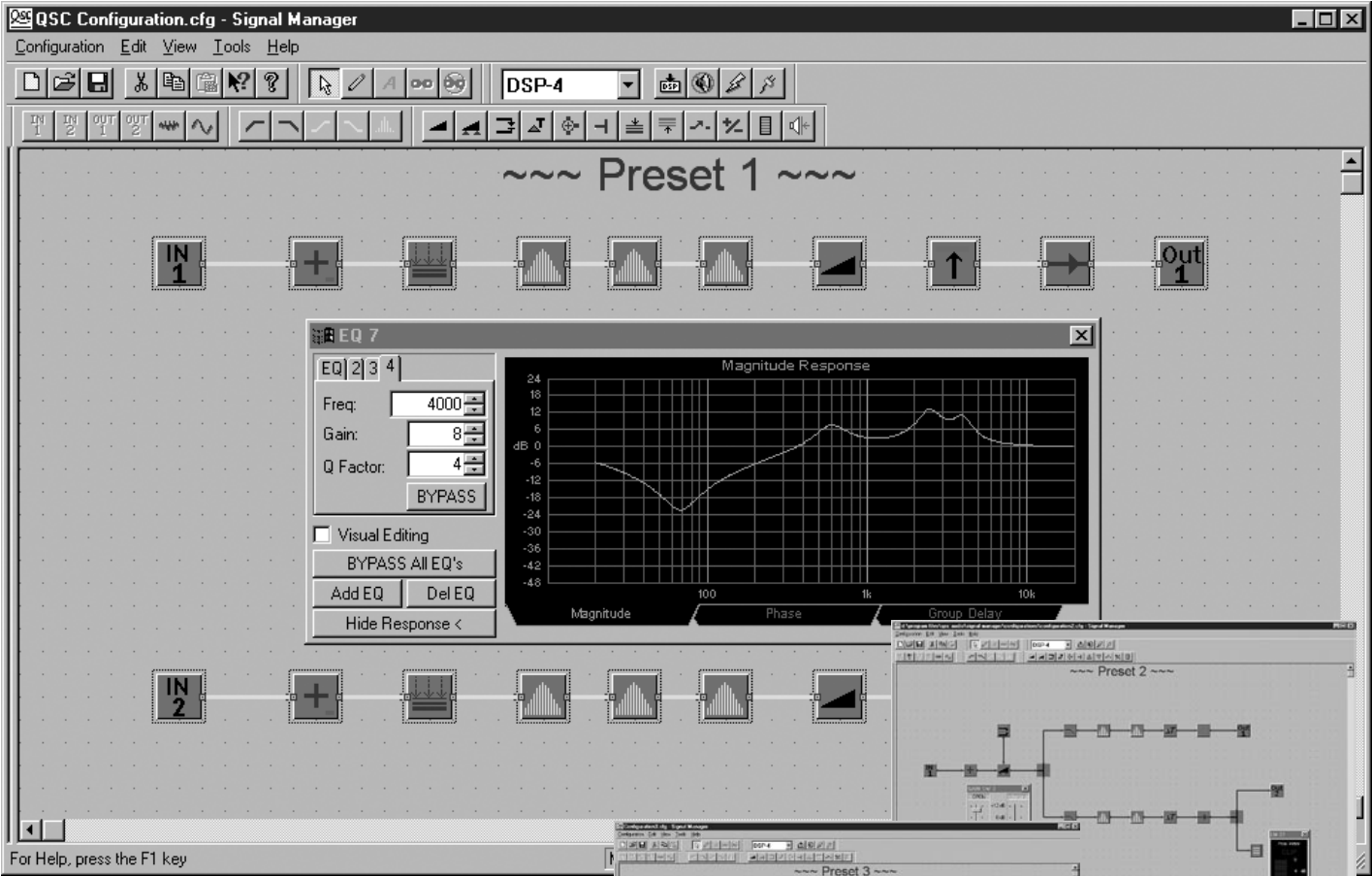SVGA monitor at 800 x 600 (min.); 1024 x 768 recommended

CD-ROM drive

32 MB RAM (min.)

10 MB free hard disk space (min.)

Available RS-232 COM port

Male to female 9-pin serial cable (for programming)

*Windows Me not supported*

*The DSP is configured with an easy-to-use software interface. Signal processing icons from the toolbar are dropped onto the workspace and the signal path is routed with simple drawing tools.*

## Signal Manager

### Advanced "Drag and Drop" Software Configuration

DSP configuration is made simple with a PC-based "drag-and-drop" software program called Signal Manager. Users can access a DSP "toolbox" and simple drawing tools to configure processing functions and signal flow. DSP processing power and memory is dynamically assigned to signal processing functions and any combination of functions may be configured until the total capacity is used. DSP resources are graphically displayed at the bottom of the screen.

Configurations can be downloaded directly to the DSP-4 via an RS-232 serial port or through a QSControl Audio Network System via a CM16a Amplifier Network Monitor for added simplicity. The software package also offers real-time control and set-and-forget convenience. Configurations can be saved and recalled for future use.

## Compatible Amplifier Models

The DSP-4 mounts directly to the back of these models via the DataPort:

Full Feature
- Two-channel CX Series
- Two-channel DCA Series
- PowerLight 2 Series

Version 2 DataPort
- ISA (V2 DataPort – audio only; requires external power supply)

The following models require a Remote Rack Mounting Bracket:

Full Feature (DPX-2 cable required)
- 4-channel CX Series
- 4-channel DCA Series
- PowerLight Series
- 8-channel CX Series

Reduced Feature Set
- MX
- USA
- PLX
- RMX
- Non-QSC amplifiers

| | |
|---|---|
| Audio Converters | 24 bit, 48 kHz |
| Frequency Response | 3 dB below full scale input voltage |
|     XLR Output | 20 Hz -10 kHz, ± 0.3 dB / 20 Hz - 20 kHz, ± 0.7 dB |
|     DataPort | 20 Hz - 20 kHz, ± 0.2 dB |
| Distortion | < 0.02% THD+N at +4 dBu |
| Throughput Delay | 1.00 milliseconds (A/D – DSP – D/A) |
| Dynamic Range | > 104 dB, 20 Hz to 20 kHz, 1.5V sensitivity, unweighted |
|     AES-17 -60 dB Method | > 106 dB, 20 Hz to 20 kHz, all other sensitivities, unweighted |
| | > 107 dB, 20 Hz to 20 kHz, 1.5V sensitivity, A weighted |
| | > 109 dB, 20 Hz to 20 kHz, all other sensitivities, A weighted |
| Input Impedance | 8.3k ohm balanced / 3.7k ohm unbalanced |
| Commom Mode Rejection | > 50 dB minimum, 20 Hz – 20 kHz  \|  > 60 dB typical, 20 Hz – 20 kHz |
| Input Sensitivity (selectable) | 1.5, 4, 9, 18 Vrms \| 6, 14.5, 21.5, 27.5 dBu \| 3.5, 12, 19, 25 dBV |
| Crosstalk (inter-channel within DataPort pair) | > 62 dB separation, 20 Hz - 20 kHz |
| Audio Input Connectors | Two XLR female (1 for each audio channel)  \|  One HD-15 female DataPort*  \|  One RS-232 female (PC input) |
| Audio Output Connectors | Two XLR male (for daisy-chaining each audio channel out) |
| | One HD-15 male DataPort amplifier connection |
| Indicators | Front: Power (one blue) \| Signal (one green) |
| Contact Closure Inout | |
|     Inputs | 1 discrete input (pin #9 of RS-232 port) |
|     Configuration | Single-ended input, pull LOW (to GND, pin5) for closure detect |
|     Resistance for closure detect | < 150Ω |
|     Resistance for open detect TTL compatible thresholds with 9V DC max input | > 1.9k ohms |
| External Power Requirements (DPX-1 recommended) | 15 VDC, 0.3 A<br>Required only for PowerLight®, QSC non-DataPort amplifiers, or non-QSC amplifiers |
| DImensions (HWD) | 3.47" (8.81 cm) x 3.35" (8.51 cm) without flanges / 3.75" (9.52 cm) with flanges x 2.05" (5.21 cm) |
| Weight - Net / Shipping | 0.93 lbs (0.42 kg) / 1.3 lb (0.59 kg) |
| Construction | Steel chassis and back cover |

*DataPort input for use with CM16a Amplifier Network Monitor in QSControl audio network systems for remote management of QSC amplifiers and other audio devices*

*PowerLight is a registered trademart of QSC Audio Products Inc.*
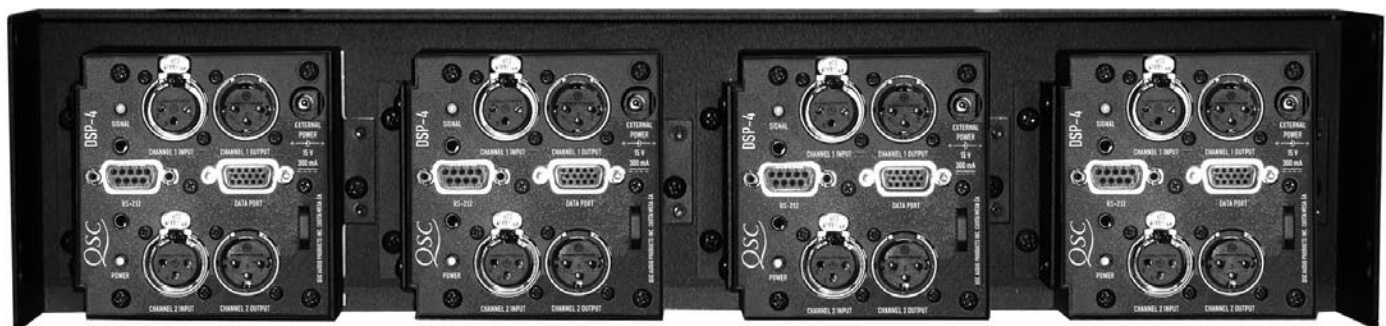


*A remote rack mounting bracket (the DPX-4) is available to use with PowerLight, 4-channel QSC amplifiers, or for non DataPort equipped amplifiers. Designed to be bolted to the rear of an amplifier rack, up to four modules can be mounted to each panel, providing up to **eight** channels of DSP processing in a three rack unit space.*