



DSP FACTORY

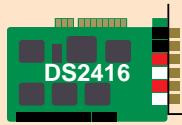
featuring the DS2416 Digital Mixing Card



SYSTEM EXAMPLES

Basic System

By itself the DS2416 provides all the basics for high quality recording and playback.



Control

Application Software

Input

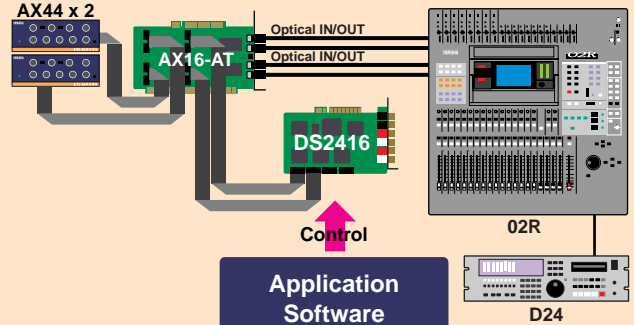
DIGITAL Inputs (COAXIAL)
Line Inputs x 2

Output

DIGITAL Outputs (COAXIAL)
Line Outputs x 2

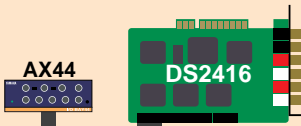
DS2416 + AX44 x 2 + AX16-AT

THRU switches on the AX16-AT enable switching between optical I/O and analog I/O.



DS2416 + AX44

Audio expansion capability lets you have additional physical inputs and outputs.



Control

Application Software

Input

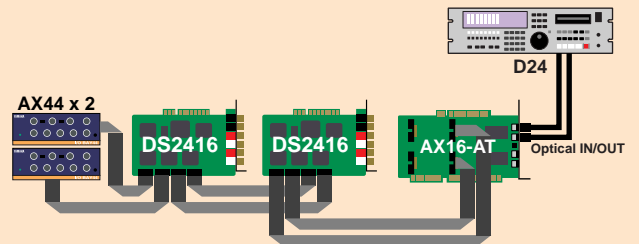
DIGITAL Inputs (COAXIAL)
Line Inputs x 4
Mic/Line Inputs x 2

Output

Headphones Out
DIGITAL Outputs (COAXIAL)
Line Outputs x 6

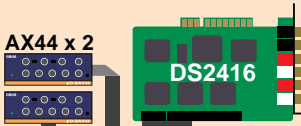
DS2416 x 2 + AX44 x 2 + AX16-AT

Up to two DS2416s can be cascaded via the serial I/O.



DS2416 + AX44 x 2

It's easy to double the physical inputs and outputs.



Control

Application Software

Input

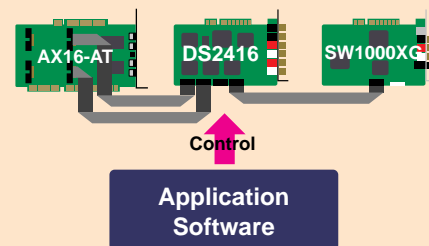
DIGITAL Inputs (COAXIAL)
Line Inputs x 6
Mic/Line Inputs x 4

Output

Headphones Out x 2
DIGITAL Outputs (COAXIAL)
Line Outputs x 10

DS2416 with SW1000XG Card + AX16-AT

The SW1000XG's tone generator sounds can be routed to the DS2416's mixer input.



The DSP Factory lets you put all of your multitrack recording, mixing and sound processing tools in one place — on your computer's desktop.

The Yamaha DSP Factory is a unique range of audio card and expansion components that, with special control software, literally turn a standard personal computer into a truly professional digital multitrack recording and mixing system.

It all comes at a revolutionary low price that will not only satisfy the most budget-conscious recording professional, but also puts highest quality recording and mixing within reach of Serious musicians and sound designers everywhere.

■ DS2416 Digital Mixing Card

At the heart of the DSP Factory is the breakthrough DS2416 Digital Mixing Card with powerful recording, mixing and sound processing engine built right in.

The DS2416's mixer provides the power of the industry standard Yamaha 02R digital mixer - and much, much more - on a desktop platform. This includes 24 channels of digital mixing with a full range of on-board digital effects and dynamics processors, along with everything else professionals need, including a generous 16 tracks of 32-bit hard disk recording.

A built-in audio-streaming engine provides 8-tracks of simultaneous recording and 16 tracks playback of up to 32-bit audio to and from the computer's disk drive. On-board effects include 12 reverb types, 11 modulation types, 2 distortion types, 3 dynamics types, and 12 special combination types.

What's more, unlike most other audio cards, the DS2416 runs on its own power and not the computer's CPU, which ensures that all functions of the card are available simultaneously, to provide a level of flexibility and performance previously not possible. And certainly not at this price.

■ Easy installation and operation

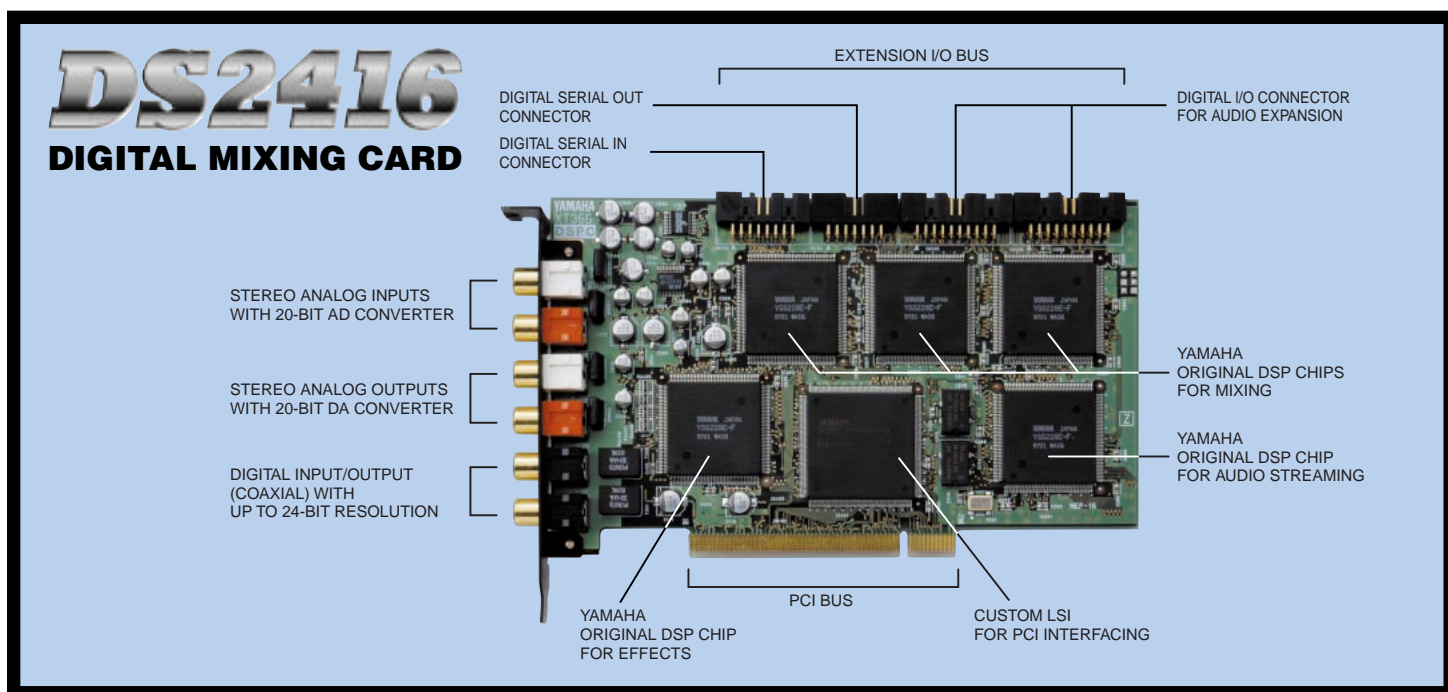
The DS2416 Digital Mixing Card supports the Windows® 95/98/NT and Macintosh® platforms and quickly installs in the PCI card slot of a standard personal computer.

Operated from the CRT, keyboard and mouse using appropriate control software available from the world's leading developers of hard disk recording applications, the DS2416 system lets you either stay with the interface you're already familiar with, or select one which best suits your personal composing, recording and mixing style.

The DS2416 card has stereo digital and 20-bit analog inputs and outputs which let you record and mix to and from a wide range of digital and analog two-channel sources. Two DS2416 cards can be linked to create a larger system, and expansion hardware components are separately available which permit multiple-channel digital and analog input and output options.

All in all, the DS2416 is the most convenient and affordable way for musicians, sound designers and audio production professionals to add top-performance non-linear recording - with its inherent creative advantages of easy editing and instant access to audio data - to their systems.

In fact, it's a truly viable replacement for conventional recorder, mixer and separate component systems.



FEATURES

Full scope of DS2416 capabilities depends upon control software specifications.

MIXER

The DS2416's mixer comes complete with literally all the professional effects and processing features you need. Relying on its own on-board processing power, all mixer functions are available simultaneously to provide unprecedented range and performance. Features include...

- 24 channel, 32-bit digital mixer
- 10 bus outputs and 6 aux sends
- 4-band parametric EQ on each input and stereo out
- Dynamics processors on each input and stereo out
- 2 effects processors equal in quality to the Yamaha REV500
- Channel delay on 20 channels
- Comprehensive metering
- Digital cross-patching for channel inputs and outputs
- 2 channel analog input (20-bit AD) and output (20-bit DA)
- Stereo DIGITAL (coaxial) input and output
- Optional interface hardware provides multi-channel analog and digital I/O

RECORDER

The DS2416's multi-track digital recorder is extremely powerful in its own right, including a built-in audio-streaming engine. Features include...

- 8-track simultaneous recording with up to 32-bit resolution
- 16-track playback from hard disk with up to 32-bit resolution
- Sample-accurate synchronization between tracks
- Signals to and from recorder and mixer remain in digital domain
- Synchronization to outside sources via the control software

SYSTEM EXPANDABILITY

Optional expansion units permit multiple-channel audio connections to and from the DS2416 to provide for connection of multi-channel digital equipment such as outboard digital multitrack recorders and signal processors. Currently existing possibilities include...

- A single DS2416 card with up to two AX44s can provide up to 12 external inputs and outputs
- The AX16-AT Audio Expansion card allows interface with digital multitrack recorders, external audio converters and digital recording consoles
- Two DS2416 cards can be cascaded to create a larger system
- Connection with other cards such as Yamaha XG PCI Sound Card SW1000XG

Effect List

Reverberation type effects

REVERB HALL	Simulation of large hall reverberation
REVERB ROOM	Simulation of smaller room reverberation
REVERB STAGE	A reverb type ideally suited to vocals
REVERB PLATE	A reverb type produced artificially by a plate reverberator
EARLY REF.	The first cluster of reflections before the reverb begins
GATE REVERB	Gate reverb setting of early reflections
REVERSE GATE	Reverse gate setting of early reflections
MONO DELAY	Very simple repeat delay, with one delay time
STEREO DELAY	Simple stereo delay, Lch and Rch are completely independent
MOD.DELAY	Delay time modulation in addition to simple repeat delay
DELAY LCR	3 taps (L, C, R) delay produces more complicated delay effects
ECHO	Stereo delay with cross feedback loop

Modulation type effects

CHORUS	A typical effect used to widen the sound
FLANGE	An effect which produces a pleasant "swirling" sound
SYMPHONIC	A broad, sweeping effect that adds a sense of dimension to the sound
PHASER	A phase-shift modulation adding extra animation to the sound
AUTO PAN	"Rotary" pan effect in addition to straightforward pan effects
TREMOLO	Tremolo effect sounds like an old guitar amp
HQ.PITCH	High quality pitch change effect
DUAL PITCH	2 voice independent pitch change
ROTARY	Rotary speaker simulation
RING MOD.	Sound is extremely changed by rapid amplitude modulation
MOD.FILTER	A filter controlled by LFO modulation

Distortion type effects

DISTORTION	Most popular effect for electric guitars, it produces various types of distortion sounds (light crunch to heavy distortion)
AMP SIMULATE	Guitar amp simulator, useful for making any type of guitar sound

Dynamics type effects

DYNA.FILTER	A filter controlled by input dynamics like auto wahwah or VCF
DYNA.FLANGE	Flange effect controlled by input dynamics
DYNA.PHASER	Phase shifter controlled by input dynamics

Combination effects

REV+CHORUS	Parallel combination of reverb and chorus
REV→CHORUS	Series combination of reverb and chorus
REV+FLANGE	Parallel combination of reverb and flange
REV→FLANGE	Series combination of reverb and flange
REV+SYMPHO.	Parallel combination of reverb and symphonic
REV→SYMPHO.	Series combination of reverb and symphonic
REV→PAN	Series combination of reverb and auto-pan
DELAY+ER.	Parallel combination of delay and early reflections
DELAY→ER.	Series combination of delay and early reflections
DELAY+REV	Parallel combination of delay and reverb
DELAY→REV	Series combination of delay and reverb
DIST→DELAY	Series combination of distortion and modulation delay

CONTROL SOFTWARE



Cakewalk Pro Audio (Cakewalk)



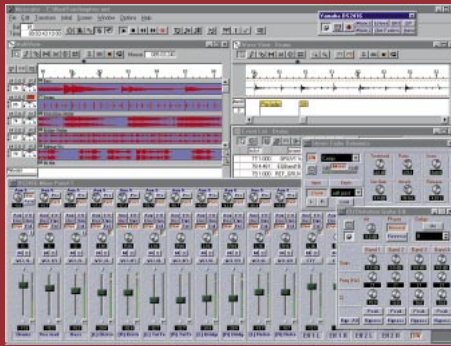
Cubase VST/24 (Steinberg)



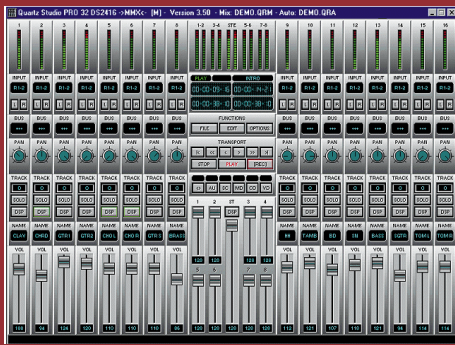
Logic Audio Platinum & Gold (Emagic)



MxTrax (Minnetonka)



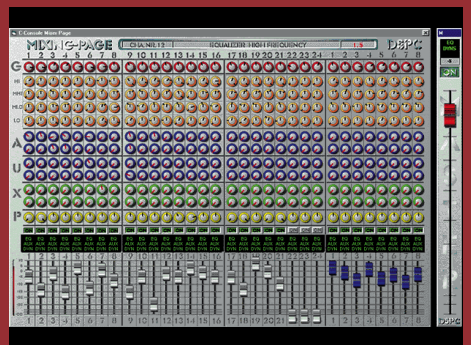
Musicator (Musicator)



Quartz Studio PRO DS2416 (Canam Computers)



Samplitude Studio (SEK'D)



C-Console (C-mexx)

Mixing and Effects functions of the DS2416 are controlled via dedicated software environments available from a wide range of software developers supporting the DSP Factory.

Windows 95/98



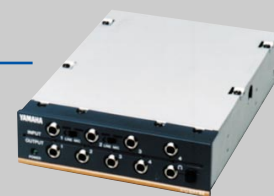
Macintosh



These companies have announced development of dedicated control functions for DSP Factory. For information about software specifications and availability, please contact the respective companies.

AX44 Audio Expansion Unit

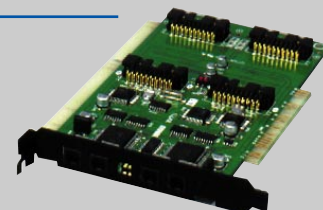
The AX44 installs into the drive bay of a PC tower and provides four quarter-inch analog inputs – two of which can accommodate microphones – and four quarter-inch analog outputs. There's also a stereo headphone jack. Two AX44 units can be connected to one DS2416 card to provide eight additional analog inputs and outputs.



AX16-AT Audio Expansion Card

The AX16-AT is a PCI card which allows the DSP Factory to be easily interfaced with a wide variety of professional audio devices including digital multitrack recorders, external audio converters, and digital recording consoles.

Providing two pairs of ADAT-format optical connectors for transferring 16 tracks of digital audio to and from the DS2416 audio card at resolutions as high as 24-bit, the AX16-AT offers a broad range of interfacing options, including letting the Yamaha 01V mixer become a 24 by 8 front-end featuring 12 mic pre-amps with phantom power, faders, additional EQ, effects, dynamics processing and routing.



SPECIFICATIONS

DS2416		PCI raw variable height short card
PCI Interface	PCI revision 2.1 compliant, half length	
Playback	16/32-bit Stereo x 8	
Record	16/32-bit Stereo x 4	
Analog Interface		
Input level	-10dBV (Nominal), +6dBV (Maximum)	
Output level	-10dBV (Nominal), +6dBV (Maximum)	
Connector	RCA pin jack (Unbalanced)	
D-Range	94dB (DA) / 93dB (AD+DA)	
Total Harmonic Distortion	0.02% (20 Hz-20kHz, Fs48kHz, +6dBV)	
Digital Interface (COAXIAL)		
Connector	RCA pin jack	
Digital Interface (Internal for expansion and cascading)		
IO-A, IO-B	4 / 8 channel ins and outs, up to 32-bit 20p MIL standard connector, for audio expansion	
SI/SO	8/16 channel ins and outs, up to 32-bit 16p MIL standard connector, for cascading	
Sampling Frequency		
	44.1/48kHz (Internal)	
	41.45-50.88kHz (Variable pitch)	
	30.08-50.88kHz (External)	
Dimensions (W x D x H)	125.92mm x 187.97mm x 21.59mm (5" x 7-2/5" x 4/5")	
Weight	170g (6 oz)	

AX44		Installable in half height 5.25" Bay
Analog Interface		
Input level	-10dBV (Nominal), +6dBV (Maximum)	
Output level	-10dBV (Nominal), +6dBV (Maximum), 23mW (Headphones, Maximum)	
Connector	1/4" phone jack (unbalanced)	
D-Range	106dB (DA)/100dB (AD+DA)	
Total Harmonic Distortion	0.01% (20 Hz-20kHz, Fs48kHz, +2dBV)	
Dimensions (W x D x H)	148mm x 185mm x 42.6mm (5-4/5" x 7-1/3" x 1-2/3")	
Weight	1kg (2 lbs, 3 oz)	

AX16-AT		Installable in PCI or ISA slot
Format		
ADAT IN/OUT A, B	ALESIS Proprietary Multichannel Optical Digital Interface Format	
THRU-A, B, IO-A, B	4 ch. Digital Audio I/O (2 ch. or 4 ch./line, MSB first x 2 lines)	
Switch		
Rear Panel	ADAT A/THRU A ADAT B/THRU B	
Board (Slide Switch)	A: Audio - Clock Fully / Half Interlocked (Default: Half Interlocked) B: Audio - Clock Fully / Half Interlocked (Default: Half Interlocked)	
Sampling Frequency Range	41.013 ~ 50.88 kHz	
Dimensions (W x D x H)		
PCI	125.9mm x 188mm x 21.6mm (5" x 7-2/5" x 4/5")	
ISA	127.7mm x 188mm x 21.6mm (5" x 7-2/5" x 4/5")	
Net Weight	120g (4-1/4 oz)	

YAMAHA Web Site

<http://www.yamaha.co.jp/english/>
<http://www.yamaha.co.jp/product/proaudio/homeenglish/>

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