Immersive Sound – New Trend in Digital Cinema

Since the introduction of monophonic sound, every movie audio format has attempted to improve the sense of reality by adding more channels and speakers around the auditorium. Over the last few decades, most cinemas converted to the 5.1 channel format that DTS® helped popularize, starting in 1993 with the release of *Jurassic Park*. In 2010, 7.1 surround sound was introduced and two years later, a new sound technology – immersive sound – was launched to further enhance the cinema experience. The move to immersive sound formats, which adds height speakers on the side walls or ceiling of the auditorium, is now the hottest topic in the industry.

GDC Immersive Sound Solution Overview

GDC Technology, a world leading digital cinema solutions provider, and DTS are working together to offer a premier immersive sound - DTS:X® to cinemas worldwide.

GDC + dts:X = GDC featuring dts:X

GDC Immersive Sound Solution Playback System Configuration

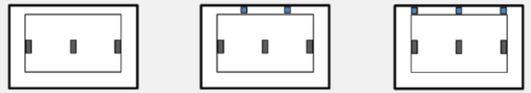
dts:X Technology

Advantages of dts:X

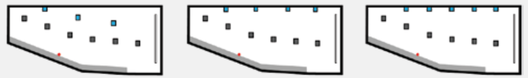
- Flexible speaker configurations enable installation in auditoriums of all different sizes.
- Retrofit theatres at lower cost, saving up to 50% compared to other 3D sound systems.
- Higher accuracy on conveying sound movement, with object-based audio technology.
- Backward compatible with 5.1 and 7.1 systems.

dts:X – Highly Flexible Speaker Configurations##

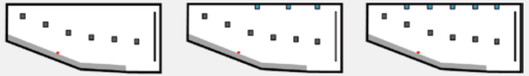
- DTS:X is based on 2 layers : the base layer and the height layer.
- The base layer covers all the speakers in a typical 5.1 or 7.1 cinema.
- The height layer covers all the speakers added to support height effects.



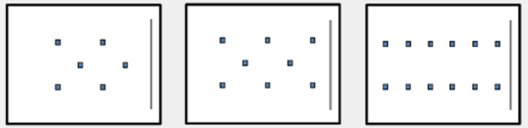
Front views showing screen wall speaker options



Side views showing side wall speaker options for cinemas that do not use ceiling speakers



Side views showing side wall speaker options for cinemas that include ceiling speakers



Ceiling speaker options

GDC Immersive Sound Solution

SX-4000 Standalone Integrated Media Block™

GDC SX-4000 Standalone Integrated Media Block (IMB) is designed to future-proof today's digital cinema.

- Next-generation design and hardware, which enables faster processing speed for handling tasks more quickly. This additional processing power opens options for advanced integration, theatre automation, and other value-added capabilities.
- Total 18 audio channels / outputs.*
- Ability to handle high-quality live streaming contents such as MPEG4, MPEG2 in 2D or 3D.
- Faster I/O interface such as USB3.0 for faster content ingestion and "live play" from storage devices in emergency situations.
- Additional Gigabit LAN port that can be used for dedicated ingest, theatre automation, and other external devices.
- Upmix capability from 5.1/7.1 to 16 channels for alternative and pre-show contents.
- Built-in full 16 channel immersive sound decoder for DTS:X (optional).
- Supports SMPTE's new "Digital Sync Signal and Aux Data Transfer Protocol" standard (ST 430-14:2015) (optional).

XSP-1000 Cinema Processor

GDC XSP-1000 Cinema Processor is a 16-channel digital audio processor specially designed for digital cinema application.

- Low noise digital processing with up to 96 kHz sample rate to ensure superb presentation.
- Robust audio processing engine consisting of audio gain, EQ, and delay controls for accurate theatre calibration.
- Runs on Windows operating systems, allows for complete system configuration, monitoring and firmware upgrades over USB and Ethernet.
- Supports multiple immersive sound formats.

XSP-1000
Cinema Processor
Technical Specifications

Dimensions

Standard 2RU rack-mount chassis

Power Requirement

100-240VAC, 50/60Hz, 30 watts maximum (18 watts typical, 7.5 watts sleep)

Audio Inputs

- PA Microphone - XLR 0.7mV sensitivity
- Calibration Microphone - 3.5mm stereo jack 0.7mV sensitivity with 10V power
- Non-Sync analog input - RCA 75mV to 4.775V
- Auxiliary analog input - RCA 300mV
- Eight-channel analog input - DB25F 300mV
- COAX1 - RCA PCM decoding
- COAX2 - RCA PCM decoding
- TOSLINK - Optical PCM decoding
- AES/EBU 16 Channel 48-96KHz sample rates

16-Channel Analog Audio Output

- 16-Channel Balanced 300mV adjustable. Configurable as 5.1, 7.1 broadband, bi-amp three or five screen channels, tri-amp three screen channels or 13.1

Communication Ports

- DB25F pulse automation
- Serial control - RS-232
- USB for laptop setup
- Ethernet 10/100 - RJ45

Format Selection

- Digital (COAX1, COAX2, TOSLINK, 8 or 16 Channel AES/EBU)
- Analog (8-channel, Non-Sync, Auxiliary, Microphone)
- User 1, User 2 (Configurable in software, e.g., digital 16 channels at lower level, 7.1, 13.1, etc.)

Processing

- 96kHz processing
- One-third octave equalization on all channels except LFE, HI, and VI-N
- Parametric equalizers on LFE
- Synchronization delays for all inputs
- Surround delays for all surround channels
- Crossovers support bi-amp and tri-amp of up to five screen channels plus individual parametric equalization on one to three LFE outputs. Crossover includes a speaker library and allows for user defined speaker systems

Graphical User Interface

The XSP-1000 Graphical User Interface (GUI) operates under Windows XP, Windows 7, and Windows 8. It communicates with one or more XSP-1000 systems simultaneously over USB, Ethernet, or RS232. The GUI is used for system configuration including auditorium equalization (both manual and automatic equalization)

Dynamic Range

Typically 105dB

SX-4000
Standalone Integrated Media Block
Technical Specifications

Physical	
Dimensions	320 (W) x 240 (D) x 63.7 (H) mm
Weight	1.5 kg
Environmental	
Operating Temperature	0°C to 40°C (0°F to 104°F)
Operating Humidity	20% to 90%, non-condensing
Operating Altitude	10,000ft. (3,000m) above sea level**
Power	
Max Power Consumption	75W
Video Specifications	
JPEG 2000	4K - 24, 25, 30 (2D) (optional) 2K - 24, 25, 30, 48, 50, 60 (2D) 2K - 24, 25, 30, 48, 50, 60 (3D)
MPEG 2/MPEG 4	SD/HD
Packaging	SMPTE Digital Cinema Package (DCP), Interop DCP
Audio Output	
Digital Uncompressed Audio	16/24-bit AES/EBU, 18 channels*, 48/96 KHz 3 x RJ45
System Interfaces	
Ethernet	3 x RJ-45 (1000 BaseT)
eSATA	x 2
USB 2.0	2 x USB A-Type Female
USB 3.0	1 x USB A-Type Female
LTC	In & Out (2 x BNC)
REF	Passive loop output Video sync input (2 x BNC)
HDMI	x 1 (alternative content input)
3G-SDI	x 2 (alternative content input)
8-port GPI/Os (optional)	4 x RJ45 (8 GPIs and 8 GPOs)
Storage Options	Redundant hot swappable up to 32TB
Security	NexGuard® forensic watermarking DCI Compliant (FIPS 140-2)
Subtitles	Subtitle overlay Projector Cinecanvas support
User Interface	PC/ Mac/ VGA
Third-party Integration Options	
TMS	GDC, Third-party
3D System	RealD, Dolby® 3D, MasterImage 3D, active systems
4D System	D-BOX Motion Code™, CJ 4DX®
3D Sound	DTS:X, Dolby Atmos®
Closed Captioning Device	Supports SMPTE430-10

\# Use of this product feature requires an additional license from GDC
* Feature may not be available upon initial release
The configuration diagrams are for reference only
** Depending on specifications of the hard disk

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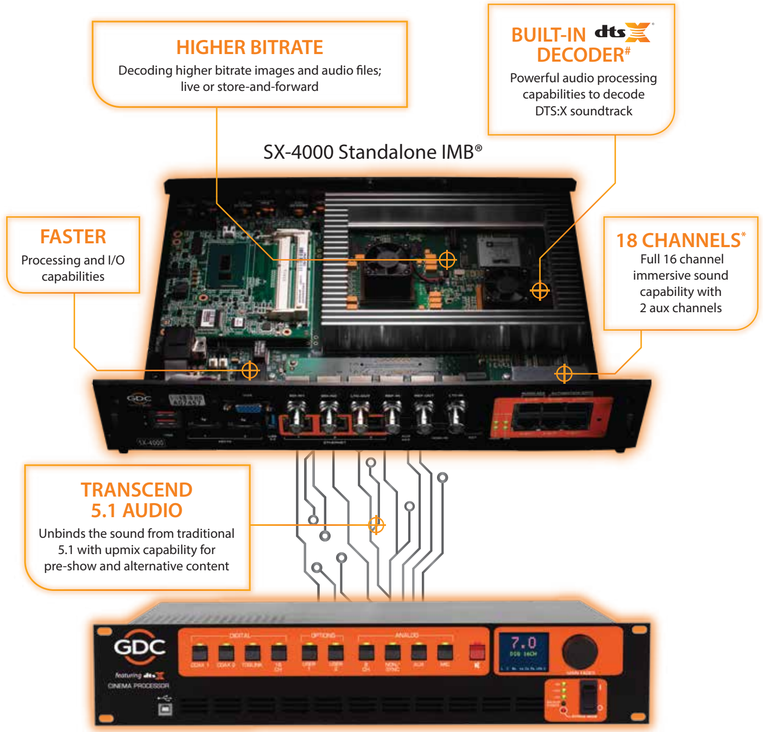
GDC Technology manufacturing facility is ISO 9001 : 2008 certified.

GDC SX-4000 immersive sound media server and XSP-1000 cinema processor

Make a sound investment in your future



XSP-1000 Cinema Processor

GDC featuring dts

Powering your digital cinema experience www.gdc-tech.com