

SR-1000

Standalone Integrated Media Block™

The time-tested IMB with proven consistent performance



GDC Technology has been at the forefront of cinema technology development since the advent of digital cinema. From a commitment to introducing first-to-market solutions to providing outstanding customer services and technical support, GDC is recognized globally as a leader in Integrated Media Block (IMB) technology. The SR-1000 is the company's sixth-generation digital cinema media server designed for near-zero maintenance and minimal total cost of ownership. The SR-1000 supports playback of SMPTE and Interop digital cinema packages (DCP) at bit rates up to 500 Mbps¹, showcasing the high quality standard in the industry.

With its future-proof flexible architecture, the SR-1000 offers several affordable options, including 4K, a built-in diskless 2TB/4TB CineCache™ storage, and built-in DTS cinema audio options such as DTS Surround and DTS:X for IAB formats. Its DTS:X for IAB Immersive Audio solution supports SMPTE ST2098-2 immersive audio bitstream (IAB) standard, which was developed to deliver a single interoperable audio format for global theatrical distribution.



SR-1000 IMB: Highest Performance in Reliability
Certified by SGS for 100,000 Hours Mean-Time-Between-Failure

¹ Depending on the SR-1000 option chosen.



GDC Technology manufacturing facility is ISO 9001:2015 certified.

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Key Benefits of SR-1000 Standalone IMB™

High Reliability

With built-in embedded power electronics used in medical and military products, the overall system stability is ensured. The SR-1000 is SGS certified for 100,000 hours Mean Time Between Failures (MTBF).



Compatibility with Series 1, 2, 3 and 4 Projectors

The SR-1000 IMB seamlessly integrates with Series 1, 2, 3 and 4 DLP Cinema® projectors including Barco, Christie and NEC to ensure highly reliable and secure content delivery.

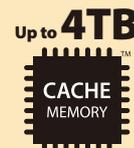


Different options to optimize storage capacity to improve content access and processing speeds.

Up to 4TB built-in CineCache with benefits such as

1 Movie ingest in just 30 minutes without interrupting concurrent playback

CineCache enables incredibly fast content ingest during playback. Content ingest and playback can be performed concurrently without local HDD storage. One average+ movie can be ingested within 30 minutes without interrupting playback. It is no longer necessary to wait for the movie playback to end to ingest content.



2 Incredibly fast content transfer across IMBs

For IMBs with CineCache, content can be copied at lightning speed across IMBs via 1Gbps LAN without any IMB playback interruption. An average+ movie only takes approximately 30 minutes to be transferred between IMBs.

3 High-speed and high-reliability playback of HFR and HDR contents

CineCache is a superior technology providing high-reliability playback of content with high frame rates and data rates that are much higher than standard DCPs.

Up to 6TB through seamless integration with external RAID SSD Storage

The compact and lightweight RAID SSD Storage PSD-4000-SSD Series offering RAID-5 3TB, 4TB, and 6TB. Exhibitors can conveniently move the PSD-4000-SSD box to instantaneously share the entire library of content with other auditoriums.



Supports the Playback of Thousands of Movies

Take full advantage of show scheduling with Ultra Storage technology which is capable of storing over 2,000 movies when combined with Cinema Automation CA2.0. The content is available for playback on any screen, at any time. You no longer need to ingest content to each screen for playback, saving hours of time for content management operation.



*The running time of an average movie is between 90 and 120 minutes.

Built-in DTS Cinema Audio Options

The SR-1000 offers three built-in cinema audio processing options: 1) DTS Surround, 2) 15.1 cinema audio processor with DTS:X for IAB rendering, or 3) a built-in DTS:X for IAB rendering up to 32 channels. These options are cost effective solutions for premium large format and specialty auditoriums for DTS:X for IAB immersive audio and DTS Surround Cinema, providing the cinema with superior audio quality.



Built-in Wi-Fi with Intuitive Web-based User Interface

Both audio and video features can be configured and controlled remotely through the easy-to-use web-based UI. The web-based UI connected to the SR-1000 built-in Wi-Fi is user-friendly and intuitive. With drag-and-drop, filtering and navigating functions, operators can easily switch between tabs or pages. Other than accessing the UI through a computer or a laptop, wireless access is also enabled by using handheld devices such as a smartphone or a tablet.



Field Upgradable Built-in Cinema Audio Processor Options

The cinema audio processor license can be procured remotely from GDC Technology, unlocking the optional built-in cinema audio processor's features.

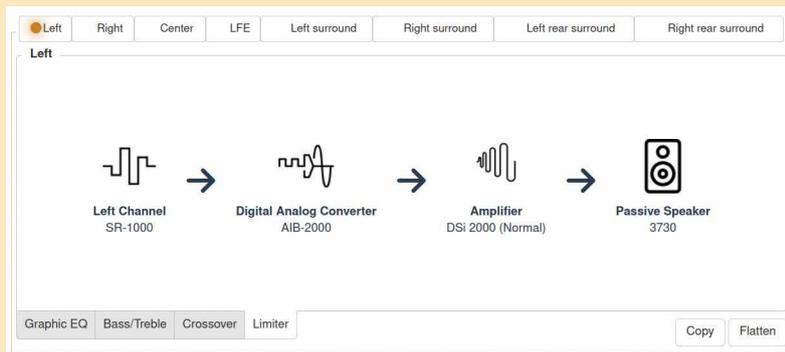
DTS Surround Audio Processor

A built-in DTS Surround audio processor option provides superior 5.1/7.1 surround sound reproduction for uncompromising quality of DTS Surround. With bass management feature enabled, the DTS Surround audio processor precisely redirects low frequencies from the surround channels to dedicated left and right bass management subwoofers, compensating for the limitations of surround speakers in reproducing deep bass tones.

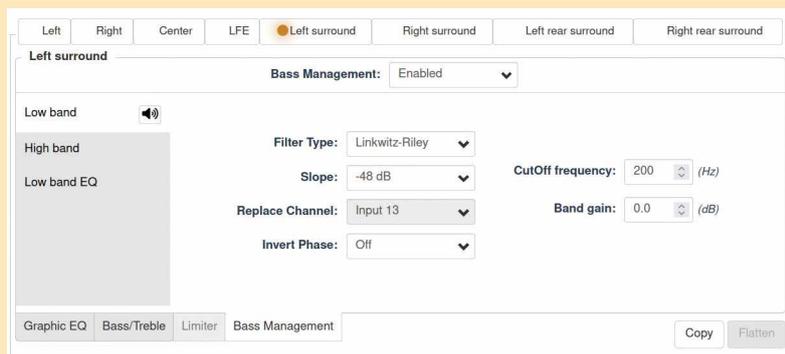


The embedded robust audio processing engine can achieve precise sound system calibration of the theatre via user-friendly SR-1000 user interface supporting

- DTS Surround bass management with independent selection of Filter Type, Slope, Cut Off Frequency, Gain and Phase for the high and low bands of each surround channel as well as 3 band parametric EQ
- 8-channel audio limiter**
- State-of-the-art DTS Surround tuning practices
- 1/3-octave graphic EQ with independent bass and treble controls (non-LFE channels)
- Parametric EQ (choice of dedicated general LFE settings or SMPTE standard LFE settings for LFE channel)
- 2-way crossover with selectable filter type and configurable slope
- Fader (gain adjustment), global and individual channel delay
- Booth monitor output
- Built-in signal generator, mute with configurable fade-in/fade-out times, wide dynamic range
- Audio input level display, easy configuration backup and restore
- Channel routing & duplication



Audio limiter:
safeguard audio equipment and
enhance audio quality



Bass management:
extend low frequency response of
surround channels

15.1 Cinema Audio Processor

A built-in 15.1 cinema audio processor is available to replace an external cinema processor for a DTS:X for IAB immersive audio installation.



** Applicable for active speakers or passive speakers with a built-in crossover.

A DTS Surround Cinema Auditorium

To achieve certification as a "DTS Surround Cinema", the speaker layout must be designed to adhere to the DTS Surround Cinema guidelines. This layout encompasses full-range surrounds and meticulously follows the DTS target curve for optimal audio performance. Furthermore, the certification process for a DTS Surround Cinema entails a comprehensive onsite evaluation conducted by an authorized DTS technician to ensure adherence to the highest standards.

Key Benefits

1 Using Existing DCP Formats

Theatres using the built-in DTS Surround audio processor and certified DTS Surround Cinemas can playback SMPTE and interop standard DCPs with 5.1/7.1 surround audio track.

2 Every Movie will Sound as Intended

Featuring DTS target curve and state-of-the-art tuning practices delivers a stunning sound quality to significantly improve the listening experience in DTS Surround Cinema.

3 A Stepping-stone to DTS:X for IAB

Certified DTS Surround Cinemas feature the core components of DTS:X installations and are easily upgradable to DTS:X for IAB.

4 Strong Identity to Moviegoers

- Since 1993, the DTS brand has been synonymous with innovation and the highest quality sound.
- Marketing materials including a theatre plaque are provided to promote DTS Surround Cinema.

DTS Surround Cinema

Approx. **70%** of

Cinema Industry Professionals' Choice



Disclaimer: Approx. 70% is based on a study conducted during two separate blind testing sessions involving over 200 cinema industry professionals to determine audience preferences for sound quality at CineAsia 2023, held in Bangkok.

What is DTS:X for IAB?

GDC Technology, a world-leading digital cinema solutions provider, and DTS, Inc. are working together to offer DTS:X that supports IAB which is an international immersive audio standard. Both DTS:X and IAB are object-based immersive sound formats that accurately conveys the fluid movement of sound to create a richer entertainment soundscape by moving sound objects to and through specific locations within - in front of, behind, above, and beside the audience, precisely where the mixer placed them.

GDC's integrated media block supports both the DTS:X and IAB immersive audio formats, and the latter represents a major milestone to deliver a single interoperable audio format. IAB allows motion picture studios to efficiently distribute immersive audio content to the DTS:X screens worldwide-exactly as the filmmakers intended.



A DTS:X for IAB Immersive Sound Auditorium

The SR-1000 IMB offers three DTS:X for IAB immersive audio upgrade options, enabling the creation of an auditorium equipped with DTS:X for IAB technology.

- 1 Built-in 15.1 cinema audio processor, eliminating the need for an external processor
- 2 Powerful DTS:X for IAB decoder supporting up to 32 channels
- 3 AES67 standard based Audio over Ethernet (AoE)

Key Benefits

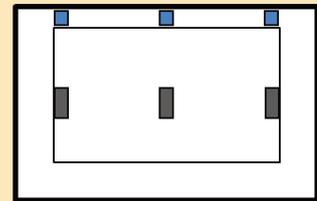
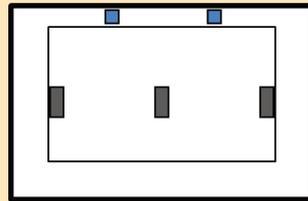
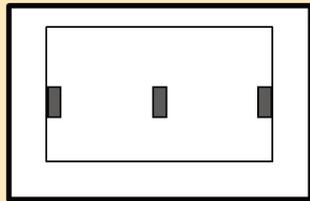
- 1 Higher accuracy in conveying sound movement, with object-based audio technology.
- 2 Flexible speaker configurations enable installation in auditoriums of all different sizes.
- 3 Retrofit theatres at lower cost, saving up to 50% compared to other immersive sound systems.
- 4 Backward compatible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



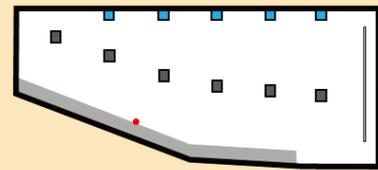
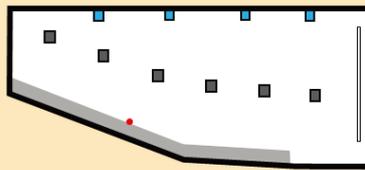
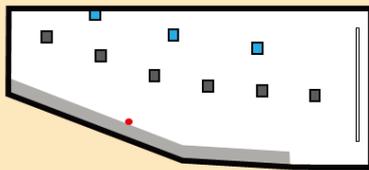
An Auditorium of DTS:X for IAB Immersive Audio

Highly Flexible Speaker Configurations[^]

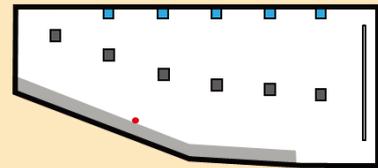
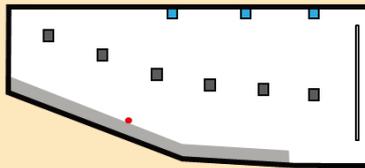
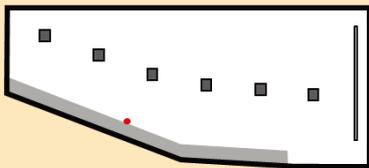
- 1 DTS:X supporting IAB is based on up to three layers: the base layer, a height layer and a top layer.
- 2 The base layer covers all the speakers in a typical 5.1 or 7.1 configuration.
- 3 The height and top layers cover all the speakers above the listeners and support height effects.



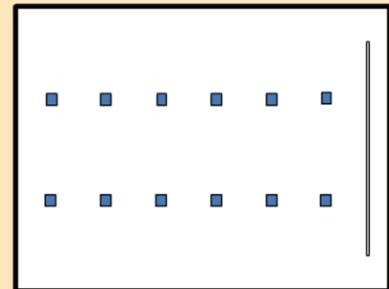
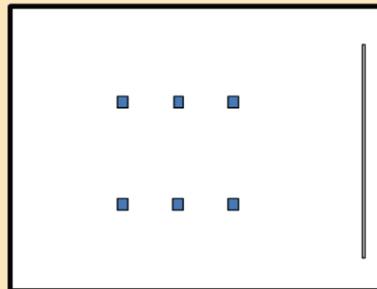
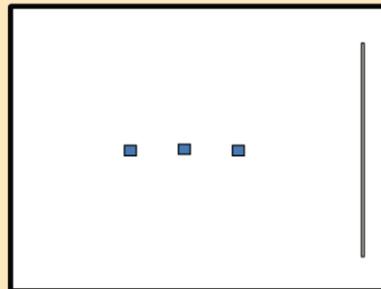
Front views showing screen wall speaker options



Side views showing sidewall speaker options for cinemas that do not use ceiling speakers^{^^}



Side views showing sidewall speaker options for cinemas that include ceiling speakers



Ceiling speaker options

[^] The configuration diagrams are for reference only

^{^^} DTS strongly recommends the use of ceiling speakers, this option is used for special project and is subject to DTS approval

Comprehensive Audio Solutions for the SR-1000 IMB

GDC presents a comprehensive range of optional audio converters specifically designed for the SR-1000 ensuring compatibility and smooth integration across multiple audio formats:

The Audio Interface Boxes AIB Series are equipped with either an 8-channel or 16-channel high-quality digital-to-analog converter (DAC) and offers auxiliary audio inputs, such as analog amplifiers, microphones, and media players, etc.

The Digital-to-Analog Converter DAC Series features 8, 12, 16, 24, and 32-channel configurations for analog output.

The AE-6703 32x32-channel Bidirectional Converter is engineered to bridge the gap between AES3 and AES67 audio standards.



Remote Fader Control

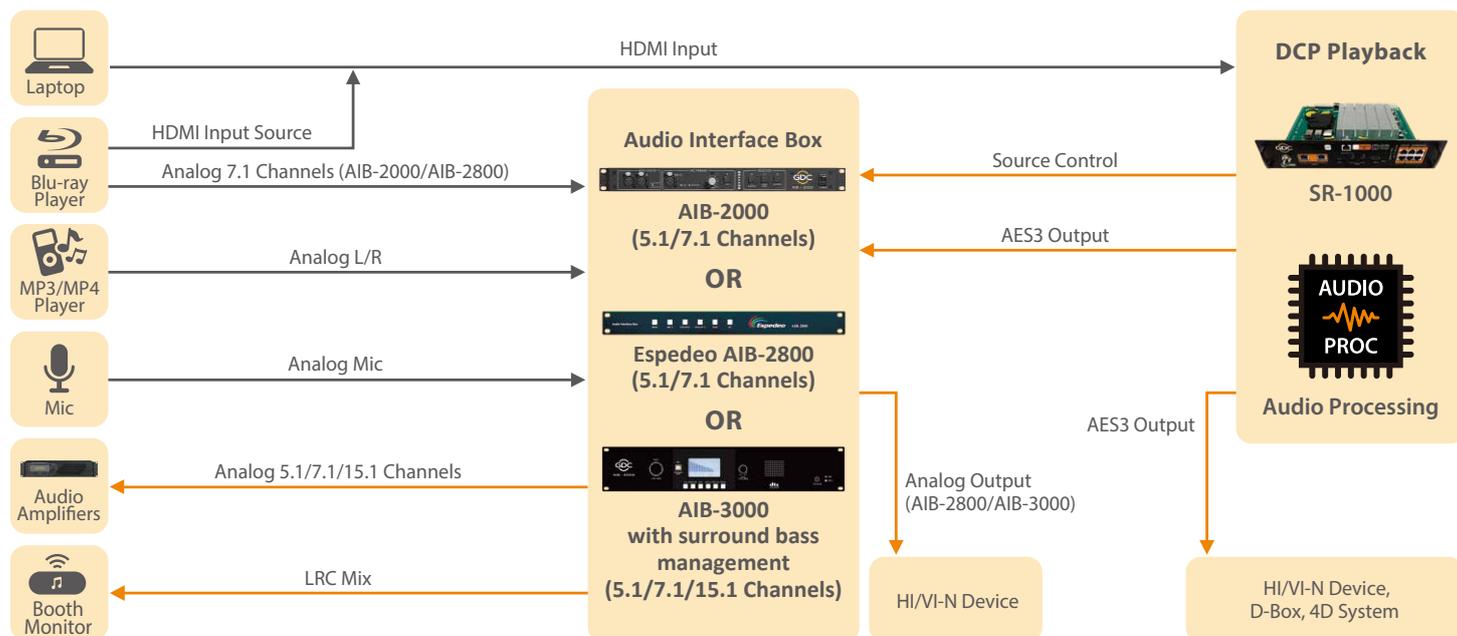
Introducing the Fader Remote FR-1000, designed to seamlessly integrate with GDC media blocks featuring built-in cinema audio processing.

Key Benefits

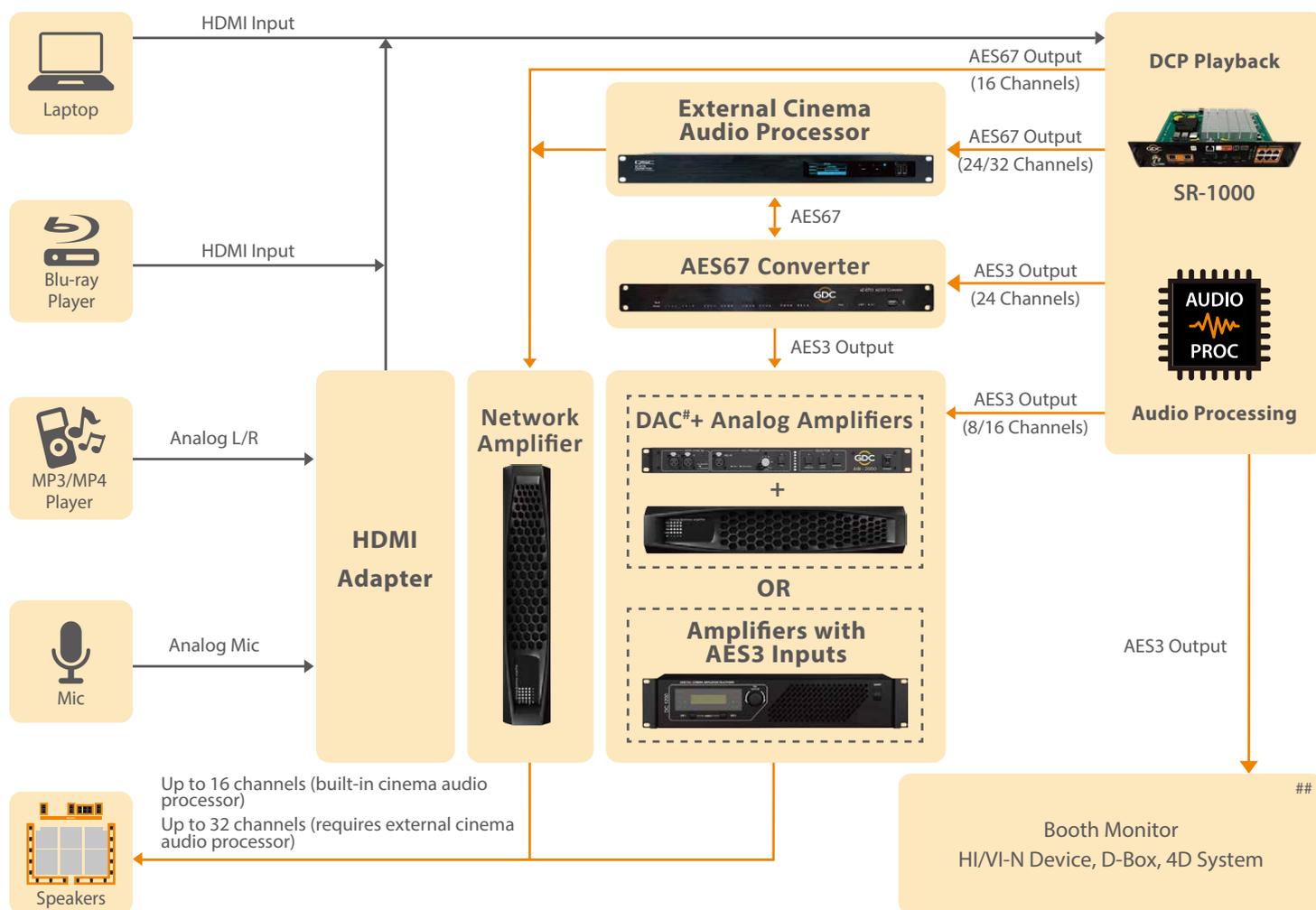
- Compact, perfect for any setup
- Cost-effective
- Expandable to accommodate future needs



SR-1000 IMB and Optional Audio Interface Box to Interface with External Audio Equipment*



Solution for SR-1000 IMB with Digital or Analog Amplifiers*



*The actual system configuration may vary depending on specific application requirements. The specifications of the audio interface boxes may vary. Please contact GDC for further details.

#Digital AES3 to Analog converter, up to 32 channels

##Depends on the specific system configuration

SR-1000 Standalone IMB™

Technical Specifications

System Interfaces	2 x Gigabit Ethernet - (1GbE/RJ-45)
	1 x eSATA 6 Gbps
	2 x USB 3.0 (A-Type Female)
	1 x BNC (video sync input)
	1 x HDMI® 2.0 (alternative content input)
	2 x 3G-SDI (alternative content input) ¹
	8 x GPI (2 x RJ-45)
	8 x GPO (2 x RJ-45)
Audio Output	AES3 - 24-bit, up to 24-channel, 48 KHz (2/3 ¹ x RJ-45)
	AES67 ¹ - 24-bit, up to 32-channel, 48 KHz
Audio Processing	Up to 32-channel DTS:X for IAB decoder
	Up to 15-channel 1/3 octave Graphic EQ and independent bass/treble control (non-LFE channels)
	Parameter EQ for LFE channel (Subwoofer)
	Global delay for all channels and independent audio delay (500ms) for individual channel
DCP Playback	DCI-compliant
	JPEG 2000 ² - <u>Standard</u>
	2K - 24, 25, 30, 48, 50, 60 (2D)
	2K - 24, 25, 30 (3D)
	<u>Option with upgrade³</u>
	HFR option: 2K - 120 (2D); 48, 50, 60 (3D) 4K option: 4K - 24, 25, 30 (2D)
Video Processing Features	MPEG-2 SD/HD
	SMPTE and Interop Digital Cinema Packages (DCP) at bit rates up to 500 Mbps ¹ ; IAB; DTS:X
	Color-space conversion – supports YCbCr709, Rec.709, XYZ ¹ ; YCxCz
	Deinterlacing
	Scaler to support 2K & 4K projectors
Control	Web-based graphical user interface
	Cinema Automation - CA2.0
	Automatic playlist programming - CA2.0
	API for control from third-party TMS and NOC systems
Security	NexGuard® forensic watermarking
	FIPS 140-2 (Level 3 security certified)
Third-party Integration Options	Third-party TMS
	Third-party 4D systems
Subtitles	Subtitle overlay
	Projector Cinecanvas™ support
Power Consumption	Less than 75 W
Storage Options	CineCache 2TB/4TB
	Redundant local hot-swappable storage (up to 32TB) with CineCache 2TB/4TB
	Ultra Storage - CA2.0 Centralized Storage Server with on-board CineCache 2TB/4TB per screen
Closed Captioning Device	Support SMPTE430-10
Physical & Environmental	Dimensions (WxHxD) – 320 x 63.7 x 240 mm
	Weight – 1.4 kg
	Operating temperature – 0°C to 40° (32°F to 104°F)
	Operating humidity – 20% to 90%, non-condensing
	Maximum operating altitude – 10,000 ft. (3,000m) above sea level ⁴

¹ Depending on the SR-1000 option chosen

² Check with GDC on specific frame rate & resolution support

³ Paid license required

⁴ Depending on the specifications of the hard disk

Built-in Cinema Audio Processor

Technical Specifications

Audio Source

DCP source	5.1/7.1 surround sound channels and up to 32-channel DTS:X immersive audio supporting IAB
HDMI input	8-channel PCM
Microphone input (via AIB-2000/2800/3000 or HDMI adapter)	Microphone level input with switchable +48V phantom power, adjustable gain and selectable HPF (+48V phantom power and selectable HPF available only on AIB-2000 or AIB-3000)
Non-sync input (via AIB-2000/2800/3000 or HDMI adapter)	Stereo line level inputs
Analog balanced 7.1 input (via AIB-2000/2800)	8-channel analog line level inputs
SPDIF input (via AIB-2800)	1x optical fiber, 1x coaxial input

Audio Output

Digital audio output	Up to 24-channel AES3, up to 32-channel AES67, LCR Monitor, HI/VI-N, LTC (sync for 4D systems) and DBOX motion signal
Analog audio output (via AIB or DAC series)	8/12/16/24/32-channel balanced analog line level outputs

Audio Processing

DSP Processing (5.1/7.1/15.1)	32-bit full floating point DSP processing
Graphic EQ for 7/15 channels (non-LFE channels)	1/3 octave graphic EQ (27 bands) Band gain: -6 dB to 6 dB in 0.1 dB step
Bass/Treble for 7/15 channels (non-LFE channels)	Bass level: -6 dB to 6 dB in 0.1 dB step Treble level: -12 dB to 12 dB in 0.1 dB step Treble corner frequency: 1K/2K/3K/4K Hz
LFE/Bass management parametric EQ	Center frequency: 20 Hz to 120 Hz in 1 Hz step Bandwidth (Q): 0.5 to 10 in 0.1 step Gain: -12~6 dB in 0.1 dB step
LFE low pass filter	Default / SMPTE
Crossover (for 5.1/7.1 only)	Mode: 2-way
Crossover/Bass management filter	Filter type: Butterworth, Linkwitz-Riley Filter slope: -12, -24, -36, -48 dB/octave
Limiter	Speaker type: passive / active/ external processor
Global delay for all channels	-400~400ms
Audio delay for individual channel	0~500ms
Volume control (main fader) for all channels	-90 dB~10 dB (fader 0~10)
Mute (fade in/out) duration configuration	0.2 to 5.0 second in 0.1 step
Channel gain for individual channel	-22 dB~8 dB in 0.1dB step
PCM channel assignment	Yes
Signal generator	100 Hz, 1K Hz, 10K Hz, PinkNoise, sweep
Audio input level meter	16 channels
Backup and restore	Audio configuration presets (equalization (EQ), crossover, channel delay, global delay and gain)

Control

Control	Web-based graphical user interface Cinema Automation CA2.0 Automatic playlist programming CA2.0 API for control from third-party TMS and NOC systems
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Performance

Analog audio output (via AIB or DAC series)	>105 dB
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