

Dolby® Digital Plus

Frequently Asked Questions



For current and emerging broadcast formats, Dolby Digital Plus defines the broadcast surround experience.

What is Dolby Digital Plus?

Dolby® Digital Plus is a next-generation audio codec that includes Dolby Digital while offering extended capabilities for evolving content delivery systems. Dolby Digital Plus is scalable—the bit rate can be configured for the available broadcast system while delivering compelling stereo or multichannel (up to 7.1 channels) surround sound. Dolby Digital Plus maintains backward compatibility with the millions of home theater systems through a conversion process found at the heart of every Dolby Digital Plus decoder (a set-top box, or STB, for example) that converts Dolby Digital Plus into the highest quality Dolby Digital bitstream possible.

Dolby Digital Plus is ideal for cable, IPTV, satellite, and terrestrial TV and is the perfect complement for H.264 video. It can easily be implemented in STBs, TVs, and game consoles. Dolby Digital Plus is available on HD DVD and Blu-ray Disc™ players and in the newest A/V receivers.

What were the design philosophies in developing Dolby Digital Plus for broadcast applications? What are the key distinguishing points of Dolby Digital Plus?

Recognizing the need for more efficient codecs, the video industry developed the video codec H.264, and Dolby developed Dolby Digital Plus. Together,

they can address the need to carry entertainment audio/video programs in bandwidth-sensitive environments such as broadcast. Given the demand for enhanced-quality offerings such as high-definition video with multichannel surround sound, these new, more efficient codecs are a must-have technology for broadcasters to roll out new services.

In broadcast environments, Dolby Digital Plus was designed to provide improved bit-rate efficiency for delivery of mono, stereo, and multichannel audio and bandwidth-critical applications including cable, IPTV, satellite (DBS), and terrestrial broadcasts. Dolby Digital Plus features a new bitstream structure to enable discrete 5.1 or 7.1 content and multiple independent programs within a single bitstream as well as extensions for high-bit-rate modes.

Dolby Digital Plus is designed to anticipate new applications and requirements for next-generation content delivery. Dolby Digital Plus retains the same metadata functionality used by DVD producers and broadcasters to ensure a consistent-quality audio experience for all listening environments. New extensions support advanced applications such as the mixing of Dolby Digital Plus streams to support services for the visually and hearing impaired.

Dolby Digital Plus can scale up to 3 Mb and more for use in applications where more bandwidth is available such as on HD DVD and Blu-ray Disc and for use in VOD services.

What are the advantages of Dolby Digital Plus to the broadcast community?

Dolby Digital Plus complements the move in the video world to the higher efficiency H.264 video codec by allowing the efficient delivery of high-quality stereo and multichannel audio content (up to 7.1 channels of audio and beyond). It does this while retaining full compatibility with the millions of A/V receivers that incorporate Dolby Digital. Dolby Digital Plus is a robust offering that can be tailored to meet the operator's needs, scaling easily from limited-bandwidth systems to higher bandwidth systems such as VOD to provide audio similar to that of HD DVD and Blu-ray Disc.

What are the applications for Dolby Digital Plus?

Dolby Digital Plus is ideal for digital broadcast delivery formats—including cable, IPTV, satellite, and terrestrial TV—and can be easily implemented in set-top boxes and TVs. Dolby Digital Plus has been adopted by the world's leading suppliers of H.264 set-top box ICs and system-on-a-chip (SoC) devices and is also applicable for HD

DVD and Blu-ray Disc players and discs, next-generation A/V receivers, game consoles, and software.

Does Dolby Digital Plus support commentary tracks in broadcast or audio description services for the visually impaired?

Dolby Digital Plus will have the capability of mixing two streams, controlled by the content producer. The consumer can switch between the mixed and normal versions by using the audio options button on the remote control or other mechanisms specific to a broadcast system.

Do set-top boxes always have a Dolby Digital Plus to Dolby Digital conversion feature?

Yes. Approved Dolby Digital Plus decoder implementations are mandated to always include the Dolby Digital Plus to Dolby Digital conversion process. If the set-top box is connected to the A/V receiver via S/PDIF, the signal will be converted to Dolby Digital.

HDMI™ hardware that complies with v.1.0 and later of the HDMI specification can support the transmission of Dolby Digital Plus. The HDMI transmitter must support a digital audio interface clock rate of 192 kHz, and the firmware on the transmitter must be capable of identifying Dolby Digital Plus decoding ability in the receiving device (A/V receiver). In order to achieve this, it must support version C of the CEA-861 specification.

What is the full range of data rates for Dolby Digital Plus?

Dolby Digital Plus can scale from 32 kbps to 6 Mbps. An example of a data-rate range for 5.1-channel Dolby Digital Plus for broadcast would be 192–256 kbps.

What is the maximum channel capacity of Dolby Digital Plus?

Dolby Digital Plus can support up to 14 discrete channels of audio in a variety of configurations.

What type of connector will be required on my set-top box to deliver 7.1 channels of Dolby Digital Plus? Is there a specific connection standard?

A high-bandwidth digital interface will be required to support delivery of all content encoded in Dolby Digital Plus. Dolby Digital Plus signals decoded to PCM can also be transported via HDMI connections. Dolby will develop support protocols for other interfaces as required.

Does Dolby Digital Plus support metadata functionality such as dialogue normalization and dynamic range control?

All of Dolby's broadcast formats (Dolby E, Dolby Digital, Dolby Digital Plus) support metadata. And only Dolby formats guarantee the uninterrupted metadata path throughout the broadcast chain. Dolby Digital metadata functionality is included in Dolby Digital Plus. Metadata is a fundamental part of the design philosophy behind Dolby Digital and Dolby Digital Plus. In addition, advanced metadata to support new applications such as stream mixing is defined within the Dolby Digital Plus standard.

How does Dolby Digital Plus achieve improved coding efficiency?

Dolby has developed a variety of innovative new bandwidth-saving compression tools such as transient noise preprocessing, adaptive hybrid transform processing, and enhanced channel coupling, plus a bandwidth extension technology called Dolby

SPX (Spectral Extension). For more information, view *Introduction to Dolby Digital Plus, an Enhancement to Dolby Digital Coding System*. The paper can be found in the Dolby Technical Library at www.dolby.com/resources/tech_library/ (under Technologies, select Dolby Digital Plus).

What chipsets contain Dolby Digital Plus?

Dolby Digital Plus has been adopted and designed into the latest audio/video chipsets from the top four SoC providers, as well as many other implementations and cores. To find a current list of IC implementations for Dolby Digital Plus for broadcast products, visit www.dolby.com/ddpluschips.

Do I need a new license agreement with Dolby to be a Dolby Digital Plus hardware licensee?

Yes. Consistent with all new Dolby hardware technologies, a new license is required to develop hardware products incorporating Dolby Digital Plus. For most cases, the basic royalty rate for Dolby Digital Plus in set-top boxes is the same as the basic royalty rate for Dolby Digital, so typically there is no additional cost to introduce the next-generation technology. Furthermore, a Dolby Digital Plus license includes Dolby Digital functionality at no additional cost if Dolby Digital is used for backward compatibility only. An initial fee may apply depending on the other licenses that the company holds with Dolby.

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Dolby Laboratories, Inc.

100 Potrero Avenue, San Francisco, CA 94103-4813 USA T 415-558-0200 F 415-863-1373
Wootton Bassett, Wiltshire SN4 8QJ England T 44-1793-842100 F 44-1793-842101

dolby.com