DCI Requirements for Digital Cinema Packages

DCP Image Format

The images shall be compressed with JPEG2000 ACTIVE IMAGE ONLY per the DCI specification and shall have the following attributes:

4:4:4 12 bits per sample, X'Y'Z' color space, DCI-P3 Color gamut Image sizes:

- 2K scope: 2048 x 858
- 2K flat: 1998 x 1080
- 4K scope: 4096 x1716
- 4K flat: 3996 x 2160

DCP Audio Format

The audio files shall have the following attributes:

- Files must be in reels matching the image file reels
- The sampling clock rate shall be exactly 48,000.000 Hz or 48 KHz at exactly 24 fps
- Reference level shall be -20dbfs

DCP Format

The DCP files shall be wrapped using the MXF Interop for DCI. The DCP shall consist of the following types of files:

- Assetmap
- Vol Index
- Packing List (PKL)
- Composition Playlist (CPL)s
- MXF Wrapped image track file(s)
- MXF Wrapped audio track file(s)

The image and audio files shall be in sync.

Image files shall be wrapped from the JPEG2000 compressed image files or equivalent.

Audio files shall be wrapped for 5.1 sound with the following channel assignments:

- Channel 1—Left
- Channel 3—Center
- Channel 5—Left Surround
- Channel 2—Right
- Channel 4—LFE
- Channel 6—Right Surround

If two (2) channels of sound (Stereo—LtRt) are required, a separate CPL shall be used within the same DCP.

File Naming

The DCP file name must follow proper digital cinema naming convention.

Reference http://digitalcinemanamingconvention.com for more info.

Physical Media for Final DCP

The files shall be delivered on an external hard drive with an USB2 interface using EXT2 or EXT3 Linux file system.

Trailers shall be delivered on USB Thumb Drive.

For more information contact dcinsupport@fotokem.com

PLAYBACK

- JPEG2000 2K or 4K movie and preshow file playback at 2K resolution
  - 12 bit 444 (XYZ, RGB) on dual link HD-SDI
- MPEG2 MXF interop movie, pre-show and alternative content file playback
- JPEG2000 4K movie file playback at 4K resolution (option)
- 3D — JPEG2000 movies and 48p playback via Dual 10 bit 422 (YPbPr/YCxCz)

SECURITY

- TI's CineLink II Strong Link Encryption
- Thomson's NexGuard Forensic Watermarking
- Philips' CineFence Forensic Watermarking
- FIPS 140-2 Level 3 Security Certified

INTERFACE

- Gigabit Ethernet for file transfer
- Gigabit Ethernet for control & subtitling
- RS-422 serial control port
- USB 2.0
- External control of captioning cervices
  - WGBH & PCS (Option)

STORAGE

- Up to 4TB of RAID5 storage

AUDIO

- AES/EBU audio16 channels
  - Single DB-25 connector
- Balanced or unbalanced analog audio 8 channels (two options available)
  - Single DB-25 connector internal board
  - External digital audio (DB-25) to analog audio converter in a1RU rack mount chassis

GPIO

- 8 optically isolated inputs
- 8 open collector outputs

VIDEO OUTPUT

- Dual link HD-SDI with physical link encryption

OUTPUT RESOLUTION

- Dual link 2048 x 1080 24p 4:4:4 12 bit

- Two single links 2048 x 1080 24p 4:2:2 10 bit

POWER

- Dual-Redundant Power Supply
- 100–240VAC 50–60Hz (2 x 300W)

DIMENSIONS

- 3U Rack Unit
- 19" x 22" x 5.25" inch (48 x 56 x 13cm)

DCP File Sources Requirements

Preference sources:

Resolution: 2048px x 1080px; 2048px x 858px ;1998px x 1080px

Format: DPX sequence Apple ProRes HQ, TGA, TIFF see file naming and directory convention)

Color spaces: RGB, R'G'B', XYZ, X'Y'Z'

Information about the Gamma must be provided in case is different from REC709 Gamma

2.2

Other sources (HD):

Resolution: 1920px x 1080px (preferable), 1280px x 720px

Other resolutions: 1440px x 1080px, 1280px x 1080px

Format: TIFF sequence (preferable), TGA, MOV

Color spaces: RGB, R'G'B', YUV

HD masters: HDCAM, HDCAM-SR, HDV, AVCHD

Information about the Gamma must be provided in case is different from REC709 Gamma

2.2

The video should be 24 frames.

Specifications of audio:

 All audio files should be in some non-compressed format - /wav/ with following

specifications:

- sampling frequency - 48kHz

- resolution - 24bit integer

Files can be mono or 5.1 depending on the content. It is very important music and effects

tracks /and files/ to be kept stereophonic.

Undesired sources:

Resolution: 720px x 576px (SD)

Format: TIFF sequence (preferable), TGA, AVI, MOV, MPEG

Color spaces: RGB, R'G'B', YUV

Digital Cinema Initiatives

DCI SYSTEM REQUIREMENTS AND SPECIFICATIONS FOR DIGITAL CINEMA

DCI Specification, Version 1.2 with Errata as of 30 August 2012 Incorporated

Digital Cinema Initiatives, LLC (DCI) has adopted a revised Version 1.2 of its Digital Cinema System Specification with errata as of 30 August 2012 incorporated.

The new *DCI Specification, Version 1.2 with Errata as of 30 August 2012 Incorporated,* dated 10 October 2012, incorporates the 96 erratum previously released for Version 1.2 of the DCI Specification that was dated 7 March 2008. With the integration of these errata into the body of the Specification, readers will now be able to use the Specification without having to cross-reference to these 96 errata.

Future errata will modify the *DCI Specification, Version 1.2 with Errata as of 30 August 2012 Incorporated.*

Click here for:
Digital Cinema System Specification Version 1.2 with Errata as of 30 August 2012 Incorporated, dated 10 October 2012 (PDF)

Click here for:
Digital Cinema Object-Based Audio Addendum, dated September 9, 2013 (PDF)

Click here for:
DCI Stereoscopic Digital Cinema Addendum, Version 1.0, dated July 11, 2007 (PDF)

ERRATA TO DCI DIGITAL CINEMA SYSTEM SPECIFICATION VERSION 1.2 WITH ERRATA AS OF 30 AUGUST 2012 INCORPORATED

Errata items continue to be evaluated and will be posted after agreement by the DCI membership that the specific erratum needs to modify the DCI Digital Cinema System Specification, Version 1.2 With Errata As Of 30 August 2012 Incorporated. Suggested Erratum issues may be emailed to dci.info@dcimovies.com. Please include "Errata" in the subject line.

DCI SPECIFICATION ERRATA LISTING -- 21 AUGUST 2013

Click here for [Errata_1-2_2013-0821.pdf]

	ERRATA TO DCI DIGITAL CINEMA SYSTEM SPECIFICATION VERSION 1.2 WITH ERRATA AS OF 30 AUGUST 2012 INCORPORATED		
Erratum	**Spec. 1.2 with Errata Incorporated Page No.**	**Section(s) Affected**	**Description**
1	26	Section 3.3.3	Section 3.3.3 is replaced in its entirety with the following: **3.3.3. Channel Labeling and Channel Routing** Channel labeling indicates where an audio channel is to be reproduced in an auditorium. Channel routing is the process of using these labels to direct each audio channel to the Media Block output that corresponds to the intended loudspeaker or device. *The playback device is required to perform channel routing.* *The channel labels and schema in SMPTE ST 429-2 "D-Cinema Packaging-DCP Operational Constraints" shall be utilized.*
2	100	Section 9.4.3.5	The following sentence is added to the end of item #5 (*i.e.*, below "b. Audio - Process..."): *The SM shall prevent playout of encrypted content for which the image and sound integrity pack metadata is not present per the requirements of Section 5.3.2.1.*

See more on:

http://www.dcimovies.com/specification/index.html