ALEXA DNxHD

The ALEXA system has expanded to become a family of the most popular digital cinematography cameras on the market. Besides exceptional image quality, there are various other features that have contributed to the great success of these cameras, among them the ability to record QuickTime/ProRes clips directly onto SxS PRO cards. This in-camera feature greatly simplifies working with ALEXA, allowing camera crews to be more focused on their jobs. While ProRes is supported by most postproduction applications, ARRI has striven for even better integration into a wider range of workflows. Continuing the development that recently brought about anamorphic de-squeeze and 120 fps recording, ARRI now introduces in-camera 16:9 MXF/DNxHD recording onto SxS PRO cards. ALEXA MXF/DNxHD files are natively supported by the Avid family of non-linear editing systems.

The DNxHD capability is available through an online purchase of a license key at http://alshop.arri.de. Each license key is coded to a particular camera and can be enabled by copying the license to an SD card and loading it into the camera. License features can also be disabled, allowing rental facilities to control, which cameras are sent out with DNxHD recording.

The DNxHD recording functionality enables the large number of Avid-based production facilities to draw greater profit from shooting with ARRI ALEXAs. It removes the necessity of transcoding the camera material for editing, which speeds up the process and effectively saves time and money during post.

Main Features

Shoot Avid DNxHD encoded MXF clips with ALEXA

- DNxHD 145 (8 bit 4:2:2) and DNxHD 220x (10 bit 4:2:2)
- 4:2:2 available in both Regular and High Speed Mode
- A DNxHD 10 bit 4:4:4 codec will be provided as a free update later
- Same naming convention as ProRes clips
- Same exposure latitude, sensitivity and colorimetry as ProRes recording
- Camera metadata embedded in XML clips
- Camera metadata provided in clip summary Avid Log Exchange (ALE) file

Edit Avid DNxHD encoded MXF clips from ALEXA

- Material can be edited in Media Composer 5.5 and 6.0
- Free AMA plug-in for ARRI MXF/DNxHD (Mac and Windows 32/64 bit)
- No transcoding required

Resource locations

- License key available for purchase online at http://alshop.arri.de
- ARRI AMA plug-in available for free at www.arri.com/alexa/downloads
- DNxHD white paper at www.arri.com/alexa/downloads

Notes

The DNxHD function requires SUP 6.0 for ALEXA and ALEXA Plus, and SUP 6.1 for ALEXA M and ALEXA Studio. The values on DNxHD 145 and DNxHD 220x denote the bit rate [Mbit/s] at 29.97 fps. As the supported project frame rates are 23.976, 24, 25, and 29.97 fps, the correct notation for these codecs would actually be Avid DNxHD 115/120/145 and DNxHD 175x/185x/220x.

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Advantages of MXF/DNxHD Recording

1. MXF files are an open industry standard

The Avid DNxHD codec source can be licensed free of charge, the codec is compliant to SMPTE VC-3, and MXF files are an open industry standard. Being a fully open format guarantees that MXF/DNxHD material will be accessible for any MXF-aware application. This makes the codec also a very good choice for archiving HD material.

2. An acquisition and archiving format of choice

Applications in the Avid editing environment usually employ the OP-Atom format for MXF files. For acquisition and archiving, however, major broadcasting corporations around the globe rely on MXF files in the OP1a format. Audio and video is always kept together and no data is lost if recording or data transfer is interrupted for any reason. ALEXA cameras deliver the DNxHD material in OP1a MXF files straight onto the recording media. This creates a good potential in terms of cost-savings.

3. Metadata is fully accessible

The MXF file container also holds all camera metadata. This data is automatically provided in the editor's bins in an Avid Media Composer and can be accessed with any basic text editor from an Avid Log Exchange (ALE) file that is also stored on the recording media and provides an overview of all recorded takes.

4. Platform-independent

Whether the material is edited on a Mac or a Windows system, the DNxHD codec can be read and written natively. ProRes material can also be accessed through a QuickTime AMA plug-in, but ProRes files cannot be created from a Windows machine. On these systems, ProRes material needs to be transcoded to e.g. DNxHD when effects or sequences are rendered to disc, causing a slower output.

The ARRI AMA Plugin

ARRI provides a free Avid Media Access (AMA) plug-in for the Mac version and the 32 and 64 bit Windows version of Media Composer 5.5 and 6.0. The plug-in is used to link the camera material into the editors bin(s) without creating a copy on the Avid storage. This gives the editor immediate and direct access to all clips just as if they were stored in the Avid Media Files folder. Depending on the project, the material could be edited right then and there. Typically, the material will be consolidated to provide OP-Atom MXF files on the Avid Media Files folder. This is essentially a copying process since no transcoding is involved. The original image quality is fully retained. Note that ALEXA uses high quality intraframe codecs, which result in bigger files than material encoded using a lower quality interframe long-GOP codec.

ALEXA DNxHD Recording – Technical Data

Requirements	ALEXA or ALEXA Plus SUP 6.0 or higher (02/ 2012) ALEXA Studio or ALEXA M SUP 6.1 or higher (04/2012)	
Mode Switch	Instant switch between Apple ProRes and Avid DNxHD	
Image Size	1920 x 1080 (16:9)	
Frame Rates	0.75 – 60 fps in DNxHD 145, DNxHD 220x (later DNxHD 444) 60 – 120 fps in DNxHD 145, DNxHD 220x (High Speed Mode)	
Processing	16 bit linear internal image processing, Regular Speed and High Speed image debayering algorithm	
Audio	2 Channels, 24bit, 48kHz	
Codec	**MXF/DNxHD 220x**	**MXF/DNxHD 145**
Data Rate (Mbit/s)	175 at 24 fps 185 at 25 fps 220 at 29.97 fps	115 at 24 fps 120 at 25 fps 145 at 29.97 fps
Bit Depth	10	8
Color Coding	4:2:2 YCbCr	4:2:2 YCbCr
Recording Time on 64 GB card	49 min at 24 fps 47 min at 25 fps 34 min at 29.97 fps 19 min at 60 fps 9 min at 120 fps	74 min at 24 fps 71 min at 25 fps 59 min at 29.97 fps 29 min at 60 fps 14 min at 120 fps
Application	High quality television applications requiring color correction.	Basic television applications if images do not require adjustments in postproduction.

Notes: All technical data based on Software Update Packet (SUP) 6.0.

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