SONY

XAVC
Workflow Guide

XAVC

Version 2 : February 2015

Contents

About this guide

This XAVC Workflow Guide offers up-to-date information on how to work with XAVC, in its various forms, from recording on a camcorder, through review on a recording deck, clip management, editing and archive.

XAVC compliant products and applications will change over time, as Sony and partner providers improve their offerings. This Guide (Version 3 : February 2015) is therefore correct to the date of publication.

For the latest on XAVC products and solutions, and the most up-to-date version of this Workflow Guide check on the www.pro.sony.eu/xavc web site.

Guide limitations

This Guide offers some general advice on the use of XAVC related products and applications, and should be taken as a guide on how to get started using XAVC as a production format. However you should not feel limited to the advice given in this Guide.

If you find new, and more efficient methods of working with XAVC that save time and speed up the production process, you should feel free to use these methods.

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Benefits of the XAVC format

XAVC

XAVC is an open format based on the best of current codec standards, and can be licensed to third party companies that want to make products in support of XAVC. This innovative format gives maximum flexibility and creative possibilities for videographers, programme and movie makers not only during the capture, recording and production phase, but also in post-production, editing, and archive.

XAVC technology is based on industry standard MPEG-4 AVC/H.264 compression. Furthermore XAVC used the highest quality implementation of these standards, allowing broadcaster and movie makers to realise exceptional performance compression technology in a practical format.

XAVC offers a practical and real format for broadcasters and videographers wanting higher quality recordings with smaller file sizes and fast production cycles to on-air, through to high end movie makers wanting the best image quality and highest image resolutions possible with practical workable file sizes and reasonable post-production turn-around times.

XAVC image resolutions

The XAVC format has been designed to support all current popular AV media resolutions, including 4K, QFHD*, 2K, HD and SD as a proxy. This represents all the popular resolutions used by videographers and movie makers to produce high quality material in a variety of scenarios.

*QFHD otherwise known as Quad Full HD, Ultra HD, UltraHD or UHDTV. See Appendix.

XAVC colour depths and dynamic range

The XAVC format enables videographers to future proof their work. It supports 8, 10, and 12 bit colour depths, providing maximum dynamic range for colour correction and grading.

XAVC frame rates

HD and 2K XAVC material can be recorded up to 180 frames per second. QFHD and 4K XAVC material can be recorded up to 60 frames per second. This allows high-performance of monitoring and greater choice and creativity in post-production.

XAVC sample structures

The choice of 4:2:2, and 4:2:0 sample structures are available in XAVC. This enhances the colour grading process, increases creative control and flexibility, and reduces the post-production budget. The creation and application of special effects, credits or channel identity take less time with superior result with 4:2:2 colour sampling.

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XAVC frame structures

XAVC is a practical codec technology that supports both Intra-Frame and Long GOP recording. This provides the media community with a choice depending on the type of material being recorded, the expected market and the type of post-production used.

The practical nature of XAVC

XAVC is a practical implementation of internationally accepted codec designs. It offers real solutions that can be used in real programme and movie making.

This includes camcorders, media, media readers, recorders, file management applications, editors, colour correction and grading software, and archiving solutions.

XAVC chipset

One important aspect of XAVC is the design of a new chipset that could be used in a range of practical products. The real challenge is to produce small portable products such as camcorders and portable recorders that provide the exceptional qualities offered by XAVC, but still maintaining low power consumption for practical recording times on reasonably cost effective batteries.

XAVC offers the possibility of producing products that can record
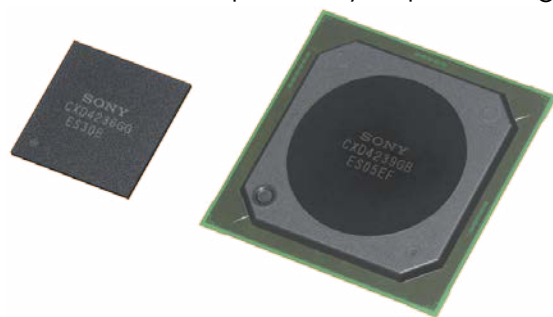
in XAVC while still maintaining reasonable recording times on both the media and with conventional batteries. The XAVC chipset offers the best combination of high quality video recordings beyond HD, and product designs with all the practical features videographers and cinematographers are seeking.

XAVC and XAVC S

XAVC S has been designed as a partner compression codec to XAVC with a more tightly compressed video signal. It is designed to support 4K video signals with a resolution of 3840x2160 pixels and an aspect ratio of 16:9 only. 4K televisions for home use will be restricted to this resolution. (XAVC also supports full 4K resolution of 4096x2160 and 17:9 aspect ratio.)

XAVC S is restricted to 8 bit samples, a 4:2:0 sample structure and 150Mbps data rate. It also has some limitations in non-linear editing.

XAVC utilises AVC as a professional codec for the highest quality video compression, and professional post-production workflows. XAVC S is intended as a more economic and simpler consumer codec, that is more appropriate to simpler editing and internet streaming applications.

XAVC/XAVC S file wrappers & folder structure

XAVC uses the MXF (Material eXchange Format) file wrapper in both 4K and HD files, and the MP4 file wrapper for its proxy files. These are the preferred file wrappers for professional digital video and audio material.

XAVC S uses the MP4 file wrapper defined by MPEG-4 Part 14 for its 4K, HD and proxy files. This wrapper allows direct streaming over the internet.

XAVC and XAVC S is recorded to media with a conventional file structure that is easy to navigate through from any conventional

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computer. The recording device can be connected directly to the computer where it appears as an external drive, or the media can be removed and either inserted into the computer directly or connected via a media reader or media adaptor where is also appears as an external drive.

XAVC summary

This table summarises the scope of XAVC. Products may not have settings for all these modes so it is worth checking the specifications of each XAVC compliant product to see if it offers the version of XAVC your production requires.

XAVC type	Resolution	Frame rates*	Colour	Dynamic range	AVC level	Compression type	Bit rate (max)	Compression method	File wrapper
XAVC 4K Intra	4096x2160	23p 24p 25p 30p 50p 60p	4:2:2	10 bits	5.1, 5.2	Intra Frame	600Mbps	VBR/CBG	MXF
XAVC QFHD Intra	3840x2160	23p 25p 30p 50p 60p	4:2:2	10 bits	5.1, 5.2	Intra Frame	600Mbps	VBR/CBG	MXF
XAVC QFHD Long GOP	3840x2160	23p 25p 30p 50p 60p**	4:2:0	8 bits	5.1, 5.2	Long GOP	150Mbps**	VBR	MXF
XAVC S QFHD	3840x2160	23p 25p 30p 50p, 60p	4:2:0	8 bits	5.1, 5.2	Long GOP	150Mbps***	VBR	MP4
XAVC 2K Intra	2048x1080	23p 24p 25p 30p 50p 60p	4:2:2	10 bits	4.2, 5	Intra Frame	222Mbps	VBG/CBG	MXF
XAVC HD1080 Intra	1920x1080	23p 25p 29p 50i 50p 60i 60p	4:2:2	10 bits	4.1, 5	Intra Frame	223Mbps	CBG	MXF
XAVC HD1080 Long GOP	1920x1080	23p 25p 29p 50i 50p 60i 60p	4:2:2	10 bits	4.1, 4.2	Long GOP	50Mbps	VBR	MXF
XAVC HDthin	1440x1080	23p 25p 29p 50i 60i	4:2:0	10 bits	4	Intra Frame	54Mbps	CBG	MXF
XAVC HD720 Intra	1280x720	50p 60p	4:2:2	10 bits	4.1	Intra Frame	112Mbps	CBG	MXF
XAVC HD720 Long GOP	1280x720	50p 60p	4:2:2	10 bits	4.1	Long GOP	50Mbps	VBR	MXF
XAVC S HD	1920x1080	23p 25p 30p 50p, 60p	4:2:0	8 bits	5.1, 5.2	Long GOP	50Mbps	VBR	MP4

Notes

*Some frame rates are shortened to make the table smaller. 23p = 23.98p, 30p = 29.97p, 60i = 59.94i, 60p = 59.94p.

** XAVC QFHD runs at 100Mbps for 23p, 25p, and 30p, and at 150Mbps for 50p and 60p.

*** XAVC S QFHD runs at 60Mbps or 100Mbps for 23p, 25p, and 30p, and at 150Mbps for 50p and 60p.

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XAVC products

Sony offer a number of products in support of XAVC and XAVC S. This list is correct at the time of publication February 2015.

XAVC & XAVC S products

XAVC products include camcorders, decks, drives and media adaptors. The first XAVC product were the PMW-F5 and PMW-F55 introduced at the end of 2012. These two modular camcorders were designed for high-end broadcast and digital cinematography production, with a firm bias towards 4K production.

Since then the range has extended to include high-end 4K and 2K digital cinematography, through broadcast 4K and HD production, HD videography, industrial and consumer applications.

With the introduction of XAVC S a new range of cost effective products now offer the benefits and qualityof XAVC in a simpler format.

The media used to record XAVC material on the PMW-F5 and PMW-F55 was the new high performance SxS PRO+ series of media cards.

Now XAVC and XAVC S can be recorded to a wide range of media including the new high performance XQD media, SD media and Memory Stick Pro Duo. The exact type used depends of the product and the format selected.

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PMW-F55 >   PMW-F5 >

PMW-F55 & PMW-F5 camcorders

These two camcorders were the first camcorders produced in support of XAVC. Both of these camcorders are primarily intended for high-end digital cinematographic production with full resolution 4K Super 35mm CMOS sensor capable of Full 4K (4096x2160) resolution, and 14 stops of dynamic range.

Summary

Lens mount	FZ with PL mount adaptor provided
Sensor	4K (4096x2160) Super 35mm Exmor CMOS
Dynamic range	14 stops
Media	SxS

XAVC compatibility (see table on page 5)

XAVC type
XAVC 4K Intra
XAVC QFHD Intra
XAVC 2K Intra
XAVC HD1080 Intra
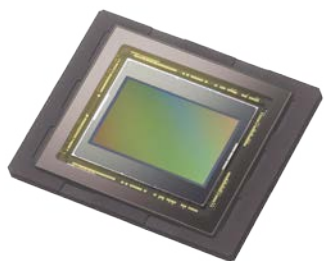
PMW-F55 & PMW-F5 supplementary information

Differences

The PMW-F55 and PMW-F5 differ in some repects. Some of these differences impact the XAVC capabilities of these camcorders.

1. The PMW-F55 includes a unique frame capture image sensor that eliminates rolling shutter and jello effects characteristic of CMOS sensors, even with a fully open shutter. This sensor also has a far larger colour space compared with the sensor used in the PMW-F5 providing richer colour in XAVC recordings.

2. The PMW-F55 is capable of XAVC 4K and QFHD recording to internal SxS Pro+ media. The PMW-F5 is only capable of XAVC HD and 2K recording to its internal SxS media.

3. Both camcorders are capable of slow/quick recording :-

PMW-F55 : 2K XAVC, 1-150 progressive frames per second.
        : 4K/QFHD XAVC, 1-50 progressive frames per second.

PMW-F5   : 2K XAVC, 1-100 progressive frames per second.

PMW-F55 live configuration

The PMW-F55 can be configured as a live 4K camera with a B4 lens mount adaptor and a fibre output adaptor.

Shooting RAW

Both the PMW-F55 and PMW-F5 can shoot and record 4K RAW material. RAW is an uncompressed signal containing all the iinformation from the sensor, and represents the highest quality recording capable from these camcorders, with the largest amount of data. RAW is not coded and should not be confused with XAVC. RAW recordings can only be recorded when the AXS-R5 dockable recorder is attached to the back of the camcorder, and recording are made to AXSM media.

The PMW-F55 can record simultaneous RAW and XAVC 4K, with the RAW recording to AXSM media in the AXS-R5 recorder, and the XAVC recording to SxS Pro+ media in the camcorder.

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Products

PXW-FS7 >   PXW-FS7K >

PXW-FS7

Whether you're producing documentaries, music videos or corporate productions, the shoulder-mounting PXW-FS7 combines legendary Sony picture quality with immense creative flexibility and class-leading ergonomics.

Optimised for single-user shooting, the PXW-FS7 is light and easy to handle with a sealed die-cast magnesium chassis for robust usability in dusty or humid environments.

The Super35 "Exmor" CMOS sensor delivers stunning 4K images with 422 10-bit sampling at up to 600 Mbit/s, with support for recording formats including XAVC Intra & Long GOP, MPEG-2 HD 422 and Apple ProRes 422*. Sony's versatile Alpha E Mount System offers near-limitless artistic options plus the benefits of Silent Focus Technology and Electrical Iris Control.

*XDCA-FS7 is required. Apple ProRes 422 will be supported via Firmware Update early 2015

Summary

Lens mount	Alpha E mount
Sensor	4K (4096x2160) Super 35mm Exmor CMOS
Dynamic range	14 stops
Media	XQD

XAVC compatibility (see table on page 5)

XAVC type
XAVC QFHD Intra
XAVC QFHD Long GOP
XAVC HD1080 Intra

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PXW-FS7 supplementary information

RAW recording with PXW-FS7

The XDCA-FS7 Extension Unit allows the PXW-FS7 camcorder to output a QFHD RAW signal. This can be recorded to AXSM media using an AXS-R5 recorder and HXR-IFR5 adaptor.

The PXW-FS7 can record HD XAVC and QFHD RAW simultaneously. The XAVC recording becomes a proxy to th RAW recording.

PMW-400 camcorder

The ubiquitous camcorder for newsgathering and field-based production, this fully featured workhorse benefits from a mutli-codec design that includes DVCAM, MPEG2 and XAVC recording providing the ultimate in choice for production crews.

Two versions of the camcorder are available, the PMW-400L and the PMW-400K, both fitted with highly sensitive triple 2/3-inch type Exmor CMOS sensors and an industry standard B4 lens mount. The PMW-400K includes a powerful 16x optical zoom lens.

With firmware version 1.30, the PMW-400 will support XAVC Intra 10 bit HD 4:2:2 MXF recordings as a free firmware upgrade. XAVC Long GOP recording is supported with version 1.4.

The PMW-400 can also operate in a wireless production workflow. (See page 58 for more information on wireless workflows in Sony camcorders.)

Summary

Lens mount	B4
Sensor	Triple 2/3" Full HD (1920x1080) Exmor CMOS
Sensitivity	f13 Full HD at 50i 2000lx , 89,9% reflectance
Media	SxS

XAVC compatibility (see table on page 5)

XAVC type
XAVC HD1080 Intra
XAVC HD1080 Long GOP
XAVC HD720 Intra

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PMW-300 camcorder

Compact but uncompromising, this feature-packed semi-shoulder mounting camcorder delivers superb low-light performance thanks to three 1/2-inch type Exmor CMOS Full HD sensors.

The PMW-300 includes an EX lens mount and an interchangeable lens. It is available in two versions, the PMW-300K1 with a x14 (5.8-81.2mm) zoom lens and the PMW-300K2 with a x16 (5.8-93mm) zoom lens.

With firmware version 1.20, the PMW-300 will support XAVC Intra 10 bit HD 4:2:2 MXS recordings as a free firmware upgrade, and XAVC Long GOP recording.

The PMW-300 can also operate in a wireless production workflow. (See page 58 for more information on wireless workflows in Sony camcorders.)

Summary

Lens mount	EX (Lens provided. See text).
Sensor	Triple 1/2" Full HD (1920x1080) Exmor CMOS
Sensitivity	f11 (typical) Full HD at 59.94i
Media	SxS

XAVC compatibility (see table on page 5)

XAVC type
XAVC HD1080 Intra
XAVC HD1080 Long GOP
XAVC HDthin
XAVC HD720 Intra
XAVC HD720 Long GOP

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PXW-X160 & PXW-X180 camcorder

Both the PXW-X160 and PXW-X180 include triple 1/3" Full HD high sensitivity sensors for a high quality high definition image. The fixed 25x zoom lens offers versatile worry-free operation in a wide variety of shooting scenarios.

Both camcorders, are very similar in design and look identical. However the PXW-X180 also include a built-in wireless adaptor, enabling proxy material to be recorded on an SDHC card and pushed to the cloud or ftp server. You can find out more about wireless production workflows with Sony camcorders on page 58.

Both camcorders can record high defintion both in the new high quality XAVC format as well as the more traditional MPEG HD422 format. They can also record standard definition DVCAM to ensure compatibility in almost any production environment.

Summary

Lens mount	Fixed G series x25 3.7-92.5mm (26-650 equiv.) zoom lens
Sensor	Triple 1/3" Full HD (1920x1080) Exmor CMOS
Sensitivity	f10 (typical) Full HD at 50i
Media	SxS

XAVC compatibility (see table on page 5)

XAVC type
XAVC HD1080 Intra
XAVC HD1080 Long GOP
XAVC HD720 Intra
XAVC HD720 Long GOP

SONY

PXW-Z100 camcorder

The PXW-Z100 is the first of a new range of high performance professional compact camcorders capable of recording high frame rate 4K material.

The camcorder includes a single high resolution sensor and a fixed 20x zoom lens for versatile worry-free 4K shooting in a wide variety of scenarios.

The PXW-Z100 uses the new high speed but compact XQD media ensuring cost effective shooting even at high frame rate 4K resolutions.

The camcorder operates entirely in the new high quality XAVC format recording full 4K (4096x2160 pixels), QFHD (3840x2160pixels) and full HD in both Intra Frame and Long GOP recordings, offering a wide choise of resolutions, frame rates and recoding durations to the media.

Summary

Lens mount	Fixed x20 4.1-82mm (30-600mm equiv.) zoom lens
Sensor	18.9 Mpixel (8.8 Mpixel equiv.) 1/2.3" Exmor R CMOS
Media	XQD

XAVC compatibility (see table on page 5)

XAVC type
XAVC 4K Intra
XAVC QFHD Intra
XAVC QFHD Long GOP
XAVC HD1080 Intra
XAVC HD1080 Long GOP

PXW-X70 camcorder

The PXW-X70 unleashes exceptional creative power in an impressively compact and highly portable package.

A new benchmark in handheld camcorders, it's the first 4K-ready XDCAM ultra-compact camcorder with a choise of XAVC, AVCHD or DVCAM recording. The camcorder features a large 1" Exmor R CMOS sensor for good low-light sensitivity, creative control over depth of field, plus up to 24x Clear Image zoom with ultra-fast autofocus.

You'll see the difference with sensational picture quality and a host of workflow-friendly features, from GPS to Wi-Fi with NFC and live streaming. More information about wireless capability can be found on page 58.

Summary

Lens mount	Fixed x12 9.3-111.6mm (29-348mm equiv.) zoom lens
Sensor	1.0 type (13.2x8.8mm) Exmor R CMOS
Media	SD/SDHC/SDXC and Memory Stick Pro Duo

XAVC compatibility (see table on page 5)

XAVC type
XAVC HD1080 Long GOP
XAVC HD720 Long GOP

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FDR-AX1 camcorder

The FDR-AX1 consumer camcorder offer cost effective QFHD and HD recording to the new XAVC S fomat in a compact and versatile recording platform.

The camcorder includes a single high resolution sensor and a fixed 20x zoom lens for versatile worry-free QFHD and HD shooting in a wide variety of scenarios. It uses the new high speed but compact XQD media ensuring cost effective shooting even at high frame rate 4K resolutions.

Summary

Lens mount	Fixed x20 4.1-82mm (35.5-630mm equiv.) zoom lens
Sensor	18.9 Mpixel (8.8 Mpixel equiv.) 1/2.3" Exmor R CMOS
Media	XQD

XAVC compatibility (see table on page 5)

XAVC type
XAVC S QFHD
XAVC S HD

FDR-AX100 camcorder

The FDR-AX100 is a very compact QFHD Handycam camcorder with a choice of either conventional AVC-HD or the new high quality XAVC S format, retaining all the quality of larger camcorders in an eminently portable package. The camcorder will also shoot stills with high (5398x3352 pixel) resolution.

The camcorder is equipped with a fixed x12 optical zoom lens, with x24 Clear Image zoom and x160 digital zoom. The 1" sensor provides plenty of creative opportunities with shallow depth of field and QFDH (3840x2160pixel) resolution.

Summary

Lens mount	Fixed x12 9.3-111.6mm (29-348mm equiv.) zoom lens
Sensor	1.0 type (13.2x8.8mm) Exmor R CMOS
Media	SD/SDHC/SDXC and Memory Stick Pro Duo

XAVC compatibility (see table on page 5)

XAVC type
XAVC S QFHD
XAVC S HD

SONY

Products

FDR-AXP33

The recently introduced FDR-AXP33 palm-sized 4K Handycam camcorder, brings cost-effective 4K recording capability, with a host of other useful features in a comapct device.

The camcorder includes Optical SteadyShot, a 10x optical zoom lens with 15x Clear Image Zoom in 4K.

The camcorder also includes live streaming via Ustream, one touch remote control, and mulit-camera controls.

A projector is included in the front of the viewscreen so that recorded material can be reviewed in the field or hotel room.

The FDR-AXP33 can record HD in AVCHD, MP4 and XAVC S formats. It can also record QFHD 4K to XAVC S format

Summary

Lens mount	Fixed x10 (3.8-38mm) Zeiss Vario Sonnar T zoom lens
Sensor	1/2.3" (7.76mm) 8.29Mpixel Exmor R CMOS
Media	SD/SDHC/SDXC and Memory Stick Pro Duo

XAVC compatibility (see table on page 5)

XAVC type
XAVC S QFHD
XAVC S HD

SONY

Alpha A7S digital still camera

The ILCE-7S, commonly known as the Alpha 7S or simply as the A7S, has already revolutionised digital stills camera design with its high quality stills shooting and video capabilities. The sensor has been specifically designed to shoot both stills images HD and QFHD video in very low light conditions.

HD video can be recorded internally in the new high quality XAVC S format. QFHD is output from the camera on an HDMI connector for reocrding on an external recorder.

The Alpha E mount provides almost limitless creative choices of lenses that can be used on the camera.

Summary

Lens mount	Alpha E (full frame)
Sensor	12.2Mpixel Full Frame (36x24mm) Exmor CMOS
Sensitivity	Native ISO 100-102,400 expanded to 50-409,600
Media	SD/SDHC/SDXC and Memory Stick Pro Duo

XAVC compatibility (see table on page 5)

XAVC type
XAVC S HD

SONY

Alpha A7S supplementary information

Selecting lenses for the A7S

The Alpha A7S is equipped with an Alpha E mount for its lenses. Note that most E mount cameras have either APS-C or Super 35mm sensors. The A7S has a full frame sensor. Therefore care should be taken in selecting lenses for this camera. If an E mount lens designed for APS-C or Super 35mm cameras is used on the A7S the image may suffer from vignetting. Only E mount lenses specifically designed for full frame sensors should be used on the PXW-FS7.

Alpha A7S

Sony, and third party suppliers, produce adaptors to allow other lens types to be mounted to the A7S. However only adaptors capable of operating with a full frame sensor should be used. Of the Sony LA-EA range of adaptors, only the LA-EA3 and LA-EA4 should be used. The LA-EA1 and LA-EA2 are designed for APS-C or Super 35mm sensors.

NEX-FS700

4K video recording on the A7S

Although the A7S is capable of 4K (QFHD) operation, internal recording to the camera's own SD or Memory Stick media extends to HD resolution only. A 4K signal is available through the HDMI connector and can be recorded on any suitable external recorder.

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Products

DSC-RX100 III digital still camera

The DSC-RX100 III is a compact digital still camera with XAVC S, AVDHD and MP4 video capability.

The camera includes a large 1" sensor providing real creative control over depth of field, and the lens is a 3x zoom lens with a range that covers most general photographic needs.

The SVGA OLED viewfinder provides clear monitoring even in dull conditions and ideal review of recorded photographs and movies.

The camera includes a neutral density filter, and also includes Program, Aperture Priority, Shutter-Speed Priority and Manual modes normally found on professional still cameras, for complete creative control over stills photography.

Summary

Lens mount	Fixed 3x optical (24-70mm) zoom lens
Sensor	20.1Mpixel 1.0 type (13.2x8.8mm) Exmor R CMOS
Media	SD/SDHC/SDXC and Memory Stick Pro Duo

XAVC compatibility (see table on page 5)

XAVC type
XAVC S HD

SONY

DSC-RX10 with v2 firmware

The DSC-RX10 is a fully capable compact SLR digital stills camera with a fixed Carl Zeiss Vario-Sonar T 8.3x zoom lens and a 1" sensor providing a good image and plenty of creative control.

The BIONZ X processing engine provide fast image processing allowing pictures to be taken quickly in succession.

The DSC-RX10 can shoot AVCHD video at a selection of frame rates. Version 2 firmware adds XAVC S video capability.

Summary

Lens mount	Fixed 8.3x (8.8-73.3mm) zoom lens
Sensor	20.2Mpixel 1" Type (13.2x8.8mm) Exmor R CMOS
Media	SD/SDHC/SDXC and Memory Stick Pro Duo

XAVC compatibility (see table on page 5)

XAVC type
XAVC S HD

SONY

HDR-PJ410

The HDR-PJ410 is new for 2015. This super compact camcorder will record high definition video to both the AVCHD and XAVC S formats for high quality images in a highly portable device.

The camcorder includes Optical SteadyShot with Intelligent Active Mode for easy shooting in almost any scenario.

The HDR-PJ410 includes a built-in projector. This allows recorded material to be displayed in the field, or hotel room without a television or monitor.

Summary

Lens mount	Fixed 30x (26.8-804mm) zoom lens
Sensor	1/5.8 type (3.1mm) Exmor R CMOS
Media	Micro SD/SDHC/SDXC and Memory Stick Micro

XAVC compatibility (see table on page 5)

XAVC type
XAVC S HD

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HDR-CX405

The HDR-CX405 is new for 2015. This super compact camcorder will record high definition video to both the AVCHD and XAVC S formats for high quality images in a highly portable device.

The camcorder includes Optical SteadyShot with Intelligent Active Mode for easy shooting in almost any scenario.

Summary

Lens mount	Fixed 30x (26.8-804mm) zoom lens
Sensor	1/5.8" (3.1mm) 1.71Mpixel (4:3) Exmor R CMOS
Media	Micro SD/SDHC/SDXC and Memory Stick Micro

XAVC compatibility (see table on page 5)

XAVC type
XAVC S HD

HDR-AS100V Action Cam

The Sony Action Cam range offer extreme versatility for sports and action shots, with its fixed no-fuss wide angle lens, simple setup, GPS capability, and easy wireless connectivity.

This version of the Action Cam range records Full HD to XAVC S at 50Mbps on Micro SDXC.

It will also record MP4 HD and other lower resolutions up to 240 frames per second to Micro Memory Stick and SD cards depending on the mode of operation. The slim design allows it to be worn during sport events or descretely fitted

Summary

Lens mount	Fixed lens. 170^0 FOV (120^0 FOV with SteadyShot)
Sensor	1/2.3" 13.5Mpixel (effective) Exmor R CMOS
Media	Micro SDXC

XAVC compatibility (see table on page 5)

XAVC type
XAVC S HD

SONY

FDR-X1000V Action Cam

New for 2015 this latest version of the Action Cam range records XAVC S in both QFHD and HD resolutions. This combines all the benefits of the previous AS100V Action Cam with full Ultra HD image resolution.

Summary

Lens mount	Fixed lens. 170^0 FOV (120^0 FOV with SteadyShot)
Sensor	1/2.3" 8.8Mpixel (effective) Exmor R CMOS
Media	Micro SDXC

XAVC compatibility (see table on page 5)

XAVC type
XAVC S QFHD
XAVC S HD

PDW-HD1550 recorder/player

The PDW-HD1550 is a versatile and compact professional recorder/player combining a control surface that is familiar to many broadcasters and post-production houses, with a feature set that fits well with the most contemporary media production environment.

The PDW-HD1550 is an improvement over the previous PDW-HD1500, working with highly cost effective and robust Professional Disc media in all of the existing professional XDCAM recording formats.

The PDW-HD1550 adds the ability to record XAVC Intra-Frame 10 bit 4:2:2 HD (1920x1080) recording at a variety of popular video frame rates. The deck provides a cost effective and secure archive system for high definition XAVC material onto reliable Professional Disc media.

Summary

Lens mount	-
Sensor	-
Dynamic range	-
Media	Professional Disc

XAVC compatibility (see table on page 5)

XAVC type
XAVC HD1080 Intra

SONY

PMW-1000

The PMW-1000 is a versatile and compact professional recorder/player combining a control surface that is familiar to many broadcasters and post-production houses, with a feature set that fits well with the most contemporary media production environment.

The PMW-1000 works with professional industry standard SxS media in all of the existing professional XDCAM and DVCAM recording formats.

The PDW-1000 includes the ability to record XAVC Intra-Frame 10 bit 4:2:2 HD (1920x1080) recording at a variety of popular video frame rates, providing an ingest path for any camcoder, like the PMW-F55 or PMW-F5.

Summary

Lens mount	FZ with PL mount adaptor provided
Sensor	4K (4096x2160) Super 35mm Exmor CMOS
Media	SxS

XAVC compatibility (see table on page 5)

XAVC type
XAVC HD1080 Intra
XAVC HD720 Intra

PWS-4400 A/V server

The PWS-4400 XAVC server records 4K and HD video and can be configured for up to four 4K recording channels. In addition to 4x 4K ports, the system has up to 6x HD ports**. The unit also provides 2TB internal storage as standard (and up to 8TB as an option) which provides around 5 hours storage @ 4K 50p/59.94p 600Mbps through the very efficient XAVC video format. In 4K workflow, the unit generates a 4K XAVC file that can be handled easily in non-linear editing systems (NLE) or a PWS-CD401 codec file providing a DNxHD* file for Avid users. The unit supports HFR (High Frame Rate) recording in HD 120i** with the HDC-2500 Series camera, HD 240p or 360p** with the PMW-F55 and 4K 120p** with the F65. Media supported includes HDD, Optical Disc Archive, SxS** and Professional Disc**. Version 1.2 also offers increased functionality, including Loop Record, EVS transfer and Avid Interplay.

* Option with Version 1.2.

** Requires Version1.1 or Version 1.2.

Summary

Lens mount	-
Sensor	-
Dynamic range	-
Media	None

XAVC compatibility (see table on page 5)

XAVC type
XAVC 4K
XAVC QFHD Intra
XAVC 2K
XAVC HD1080 Intra

SONY

SxS media

SxS media is a form of ExpressCard/34 media. It is available in a variety of different versions. The original version was SxS PRO. This provides 1.2Gbps read and write speeds, fast enough for all forms of XAVC HD and 2K, and MPEG2 HD recordings. SxS PRO will not guarantee to properly record XAVC 4K and QFHD material.

SxS 1 cards offer similar characteristics to SxS PRO but in a more cost effective design. This media is not as reliable as SxS PRO, and is only guaranteed to record MPEG2 HD recordings.

SxS PRO+ is the latest SxS media capable of recording at 1.5Gbps and playing back at 1.6Gbps. It is recommended for all forms of XAVC including 4K and QFHD.

The SBAC-USxx range of SxS card readers allow USB connection to a host computer for fast transfer of material from SxS media into a computer or server.

The latest version, the SBAC-US30 includes a high speed USB3 connection. It will also work with all present types of SxS media.

The SBAC-UT100 includes two SxS slots and connection for Thunderbolt 2 and USB 3.0.

Products

XQD media

XQD is a new compact media specifically designed for a new generation of compact hand-held 4K camcorders, and high frame rate digital stills cameras. There are three series of XQD cards, H series runs at 125MBps (1Gbps), N series also runs at 125MBps, and the S series which runs at two speeds, 168 MBps (1.34Gbps) and 180MBps (1.44Gbps). The H series XQD cards have been discontinued, and the N series are a direct replacement.

The MRW-E80 reader provides a USB3 connection into a host computer for moving recorded material from XQD media into a server or non-linear editor.

SONY

SD & SD Micro media

SD media is specified to work with some XAVC S products. However the fastest SD cards (SDXC) should always be used. SDXC Micro cards are used with the HDR-AS100V Action Cam and can also be used with other SD compliant products through the Sony SRAC-A1 SD Micro to SD adaptor.

Memory Stick

Memory Stick has similar characteristic and performance specifications to SD media and will work with some XAVC products in some modes of operation. However the fastest Memory Stick (Memory Stick PRO-HG Duo HXA Series) should always be used through a Memory Stick to SxS adaptor.

SxS media adaptors

There are three SxS media adaptors available for Memory Stick, SD cards, and XQD media. The MEAD-MS01 adaptor allows Memory Stick to be used in any equipment with an SxS slot, the MEAD-SD02 adaptor for SD cards, and the QDA-EX1 adaptor for XQD media.

File management & editing with XAVC

All the major non-linear editing software application vendors support XAVC to varying levels. It is important to ensure that the selected NLE supports the chosen XAVC mode. This guide will help you select applications to suit the camera or camcorder you are using, and the XAVC mode you are recording in your project.

SONY

File management with Sony Content Browser

Sony Content Browser is an all-in-one clip management application that can be used with the latest portfolio of Sony camcorders and decks, including those using NXCAM, XDCAM, XDCAM-EX and XAVC formats.

The latest version of Content Browser is version 2.3. This requires an XAVC licence available from Sony Creative Software. (One licence is provided with each XAVC product.) This version supports clip View, Copy, Move and Delete functions. Metadata can be browsed and edited. Content Browser also supports SxS formatting.

Content Browser V1.1 is still available as a free version, compatible with MPEG2, DVCAM and IMX codecs only. XAVC is not supported with this version.

There is also an optional version of Content Browser - **Content Browser Advanced Pack** licence 2.1. Advanced Pack is an optional pack that adds additional features with better organisation of the post-production process. If you have a Content Browser Advanced Pack licence, no additional XAVC licence is required.

Note : RAW Viewer is also able to read and decode XAVC files.

Editing

SONY

Catalyst Browse

Catalyst Browse is a free of charge media assistant that lets you browse files from your Sony camera, deck, or card reader with detailed views of individual clips; see and edit media metadata; accurately view video using source color space, and apply color correction and color looks. Once you've selected the clips you need, you can copy them to a local hard drive or connected NAS, upload to Sony Media Cloud Services Ci, transcode to a variety of formats, as well as create, ingest, and export Sony Professional Disc clip lists.

The latest software version 1.1 add the follow new functions:

- Avid DNxHD® Read Support

- Apple ProRes Read Support (Mac Only)

- Vector Scope

- AVCHD 2GB chunk file support

- MPEG2 SD Support

- Contrast / Brightness Support

- Transcoding processing speed improvement

- SBAC-US30 support

Editing

SONY

CATALYST PREPARE

Catalyst Prepare

Catalyst Prepare is an optional cross-platform media preparation solution that reads Sony pro video formats as well as formats from other manufacturers, such as Canon and GoPro. It's the ultimate preproduction assistant that allows you to easily and intuitively browse storage devices, create and view clips, edit metadata, transcode to a wide variety of pro formats, load media onto production drives, and more. Catalyst Prepare features include source color space support, color correction and color looks, and storyboard creation.

IMPORT

Catalyst prepare allows the quickly view and import clips from the latest professional camcorders, including Sony, Canon, GoPro, and others. Find here all supported formats:

EXPORT

Transcode to a wide variety of formats, including AVCHD, XDCAM, MPEG-4 AVC, SStP, Sony RAW, AAC (.mp4), DPX, OpenEXR, ProRes (Mac only), DNxHD, or XAVC, with presets ranging from Internet- and tablet-focused delivery, to large-screen 4K displays. Include color adjustments if desired, and select output color space in the transcode process.

Take advantage of viewing your Rec. 709, S-Log1, S-Gamut/S-Log2, S-Gamut3/S-Log3, S-Gamut3.Cine/S-Log3, and Sony RAW sources in the full high dynamic range color space. Show safe areas and apply clip settings such as horizontal/vertical flip and anamorphic stretch.

For better organization and fluid post-production process- use the storyboard editor to sequence and edit a rough cut, then render the storyboard or export it to a variety of NLEs.

AUDIO

Catalyst Prepare supports files with up to 16 channels of audio.

Editing

SONY

XAVC 4K/HD and XAVC S with AVID

Avid Media Composer is the one of the most widely used NLE for professional film and video editing. With Avid Media Composer v6.5 onwards and Newscutter v10.5 onwards, videographers gain accelerated workflows, automated media management, and extending real-time production.

Avid uses DNxHD as a codec technology, engineered to create mastering-quality media at reduced file sizes, shattering the barriers to real-time productivity, whether using local storage or in real-time collaborative workflows.
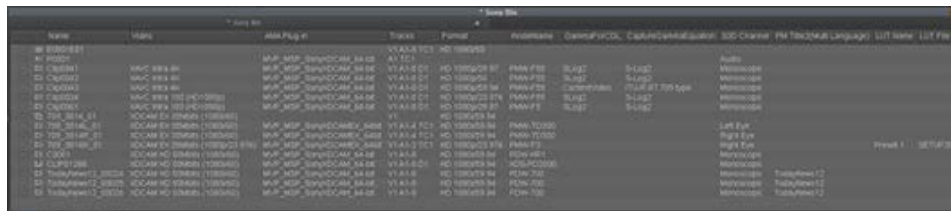
For faster and fluid workflow, Sony has created a special free of charge AMA plug-in for AVID (PDZK-MA2 V.3.4). This software for Microsoft Windows and MAC OS X operating systems provides support for XAVC and XDCAM / XDCAM HD files in Avid Media Composer, Symphony and NewsCutter products, allowing viewing and editing capability.

AMA : Avid Media Access

Supported XAVC modes

With this plug-in, the new version Avid Media Composer 7.0.4 supports:-

- Decode XAVC Intra 4K and HD
- Encode XAVC Intra 4K and HD
- Decode XAVC Long GOP 4K 4:2:0 8 bits and HD 4:2 :2 10 bits
- Encode XAVC Long GOP HD 4:2:2 10 bits

Editing

Notes:

XAVC S is not currently supported natively by Avid Media Composer. To import XAVC S flies into Avid for smooth editing, third-party software is required to convert XAVC S to DNxHD. This process is called "Transcoded editing". The original files are converted to another format to be compatible with editing system. This process may lower bitrates and quality of the original files.

PDZK-MA2 also supports the XDCAM EX format.

Avid Symphony has become an option of Media Composer from version 7.

Installation procedure and use

The process installing the AM plug-in and ingesting XAVC into Avid is as follow:

- Ensure that the Avid system is compatible with the chosen XAVC mode (see note below).
- Delete any previous version of the PDZK-MA2 plug-ins.
- Install the XAVC/XDCAM Plug-in for Avid (PDZK-MA2 V.3.4 as for February 2015).
- Choose Setting and click on AMA.
- Open AMA and enable AMA Volume Management.
- Select the File menu and choose Link to AMA Volume.
- Locate the footage from card (SxS, XQD or SD) in Finder window.
- Create and name the new Bin with the imported clips.

Version compatability

Specific plug-in versions are designed to support specific Avid products.

- PDZK-MA2 Version 3.4   : Media Composer v7.04/v8.2/v8.3 and Newscutter v11.0.4

- PDZK-MA2 Version 3.32 : Media Composer v7.0.4/v8.1/v8.2 and Newscutter v11.0.4

- PDZK-MA2 Version 2.4   : Media Composer 6.5.4 Symphony 6.5.4 and NewsCutter 10.5.4

To import XAVC files
- Select **File** > **AMA Link**.
- Select **Files of Type** as **Sony XAVC_XDCAM** (*.MXF or Folder).

To export XAVC files
- Select **File** > **AMA File Export**.
- Select **File type : XAVC**.
- Set directory and designate filename.
- Select **Format : XAVC**.
- Click on **Save**.

SONY

XAVC 4K/HD and XAVC S with ADOBE

At the date of publication (February 2015), Premiere Pro Creative Cloud is the latest version of Adobe's timeline-based video editing software application. It is part of the Adobe Creative Cloud suite of graphic design, publishing, video editing and web development programs. Premiere Pro CC is the redesigned successor to Adobe Premiere. The latest version includes expanded native format support and multicam operations with XAVC.

With Creative Cloud, it's easy for videographers working with 4K or HD in XAVC or XAVC-S to download the latest features and synchronize the settings and shortcuts to any editing workstation in the world. Adobe Premiere Pro CC leads the industry with native media support on both Mac OS and Windows systems.

Supported XAVC modes

The new version 8.2.0 of Adobe Premiere Pro CC natively supports:

- Decode XAVC Intra 4K and HD
- Encode XAVC Intra 4K and HD
- Decode XAVC Long GOP HD 4:2:2 10 bits
- Decode XAVC Long GOP QFHD 4:2:0 8 bits
- Decode XAVC S 4K and HD 4.2.0 8 bits (.MP4)

Implicates XDCAM Proxy workflow (re-linking proxy to hi-res file)

Editing

SONY

Notes:

Import and edit XAVC content is direct, without rewrapping or transcoding. The flexible structure of XAVC allows you to browse clips using the Media Browser and organize them using camera metadata. The videographer can edit directly from the SxS card via the camcorder, or a card reader, or use the Media Browser to transfer the content to hard disk for better performance.

Installation procedure and use

To ingest XAVC material into Adobe Premier Pro CC:-

- Ensure that the Premier Pro version is compatible with the chosen XAVC mode.
- Choose **Media Browser**.
- Locate the footage from the media card (SxS, XQD or SD).
- Either right-click on the clip and select **Import**, or select the clip or clips and go to **File Menu** and select **Import**.

To export XAVC material from Adobe Premier Pro CC:-

- Select **File** > **Export** > **Media**.
- Select **Format: MXF OP1a**.
- Select any XAVC Preset, i.e. **XAVC Intra** ...
- Enter an Output Name.
- Click on **Export**.

SONY

XAVC 4K/HD and XAVC S with Vegas Pro

Vegas Pro 13 is an integrated, affordable and forward-thinking production environment designed for a new generation of creative professionals.

Vegas Pro 13 is the world's first HD, 2K and 4K XAVC native editor. The latest version features built-in support for XAVC files, with the same drag and drop, no transcode simplicity that videographer have enjoyed with other popular formats. No expensive add-ons or plug-ins are required. For optimal performance with 2K and 4K XAVC content, use the new smart proxy HD workflow for full frame rate playback on a wide variety of hardware configurations, from compact laptops to advanced multi core workstations.

You can find out more about the Sony range of creative software application at this address http://www.sonycreativesoftware.com/, and more about Sony Vegas family of software applications at this address http://www.sonycreativesoftware.com/vegassoftware.

Supported XAVC modes

- The new version 13 Vegas Pro Edit natively supports:
- Decode XAVC Intra 4K and HD
- Encode XAVC Intra 4K and HD
- Decode XAVC S 4K and HD 4.2.0 8 bits (.MP4)
- Encode XAVC S 4K and HD 4.2.0 8 bits (.MP4*)

Implicates XDCAM Proxy workflow (re-linking proxy to hi-res file)

*Exported XAVC S file may not be able to playback on all XAVC S format camcorder.

Notes:

Live feeds can also be captured as XDCAM MXF files for editing in Vegas Pro 13, or archived for future use. The Sony MXF file format is roughly one-fourth the bit rate of other HD compression technologies such as Avid DNxHD® or Apple ProRes, making it more efficient for hard drive storage.

Editing

SONY

Installation procedure and use

To ingest XAVC and XAVC S material in Vegas Pro 13:-

- Ensure that the version of Vegas is compatible with the chosen XAVC mode
- Choose **Device Explorer** or locate the material on the media card (SxS, XQD or SD)
- Click **Import All New Clips** button, or if you want to import just a one specific clip, click the thumbnail to select it and then click the Import Selected **Clips** button. (Hold the **Ctrl** key while you click thumbnails to select multiple clips and import them in one operation.)
- The clips will appear in the **Project Media** window.
- Add (drag) the clips to the timeline.

Notes on fast editing with Vegas Pro

If editing native 4K clips is takes too long on your computer, you can use the new proxy feature in Vegas Pro 13. The lower-resolution files allow the fast editing without breaking your creative process, and then swap back to the original 4K file to render the final project when you have finished editing.

To create a proxy of a XAVC 4K clip:-

- Right-click the clip in the **Project Media** window.
- Choose **Create Video Proxy** from the menu.

During the editing process, you can preview the project as proxies in either Draft or Preview modes, or as 4K in either Good or Best modes.

To render the project out to the XAVC format:-

- Select **File > Render As....**
- In the Render As window:-
  - Designate an export folder and filename.
  - Click the **Sony XAVC/XAVC S (*.mxf, *.mp4)** expand arrow.
  - Select the template from the list.
    - Tick the **View all options** tick-box.
    - Tick the **Enable multichannel mapping** tick box.
    - Select **Channels** and tick **Master**, then click on **OK**.
    - Select **Sony XAVC 2K Intra 59.94p** for example.
    - Select **Customise Template**.
    - Select **8ch/24bit** on **Audio** tab and click on **OK**.
  - Click on **Render**.
  - Click on **Close**.

To render the project out to the XAVC S format:-

- Select **File > Render As....**
- In the Render As window:-
  - Designate an export folder and filename.
  - Click the **Sony XAVC/XAVC S (*.mxf, *.mp4)** expand arrow.
  - Select the template from the list.
  - Click on **Render**.
  - Click on **Close**.

SONY

XAVC 4K/HD and XAVC S with Final Cut Pro

Final Cut Pro is a non-linear video editing application developed by Apple. The most recent version, Final Cut Pro X 10.1 (FCP), runs on Intel-based Mac computers with OS X version 10.9 or later.

FCP has been updated for next-generation Mac Pro architecture, providing high performance when editing and monitoring 4K video, and working with complex graphics and effects. FCP's latest version smoothly edits multiple streams of 4K at full resolution. Enhanced playback architecture paired with the power of the new Mac Pro allows for multicam video edits with up to 16 simultaneous streams of 4K ProRes material. If you prefer to work directly with 4K camera formats, FCP natively supports XAVC.

FCP works with the ProRes codec. ProRes is a line of intermediate codecs, intended for use during video editing, and not for practical end-user viewing.

The previous version of FCP, version 7, is not compatible with XAVC or XAVC S. Only the latest version – Final Cut Pro 10.1 (Final Cut Pro X) adds general QuickTime support for XAVC.

Final Cut Pro 10.1.4 supports native MXF import and edit the Pro Video Format 2.0 software update, including XAVC Intra 4K/HD support.

For faster and fluid workflow, Sony has created a special plug-in (PDZK-LT2 V.1.2). This free-of-charge software for Mac provides support for XAVC and XDCAM / XDCAM HD files in FCP allowing viewing and editing capability.

Plug-in Version 1.1 Mac OS X (Mac OS X 10.8.3 or later; Mac OS X 10.7.5 or later; Mac OS X 10.6.8 or later)

Plug-in Version 1.2 Mac OS X (Mac OS X 10.9 or later (requires Final Cut Pro X 10.1 or later))

Supported XAVC modes

The new version Final Cut Pro X supports with plug-in:

- Decode XAVC Intra 4K and HD
- Decode XAVC S 4K and HD 4.2.0 8 bits (.MP4*)

* XAVC S files may not be imported directly from recording media

Implicates XDCAM Proxy workflow (re-linking proxy to hi-res file)

Content Browser 2 Support for Apple Final Cut Pro*** (Mac only)

- Import clips to FCP-X and FCP-7 with file conversion to QuickTime
- Export edited sequence to MXF / MP4 files from FCP-7

*** XDCAM (MXF) & XDCAM EX (MP4) clips only (XAVC / NXCAM not supported)

Editing

Installation procedure and use

To install the plug-in and ingest XAVC material into FCP:-

- Insure that the version of FCP supports the chosen XAVC mode.

- Install the XAVC/XDCAM plug-in for FCP (PDZK-LT2 V.1.2).

- Click the **Import** button on the left-hand side of Project.

- Locate the footage from card (SxS, XQD or SD) in Devices.

- Click on any of the clips and choose **Import Selected**.

- Confirm in the new window to:

    Copy files in Final Cut Events folder (to work with native XAVC files)

    … or create Optimized Media, which will convert the files into ProRes

    … and/or Create Proxy Media.
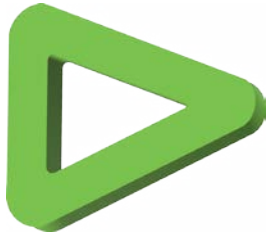
XAVC 4K/HD and XAVC S with EDIUS

EDIUS is a video editing software package currently developed by Grass Valley. EDIUS Pro 7.41 is a versatile real time editing software application for 4K, 3D, HD and SD. This is the finishing tool often used for broadcast news, news magazine content, and studio programs, as well as corporate, documentary, and 4K theatrical productions.

Low-resolution proxy editing mode enables EDIUS Pro 7.41 to work with older desktop and laptop systems. That means videographers do not need the latest and greatest system to edit with EDIUS Pro 7.41 and XAVC.

Supported XAVC modes

The latest version of EDIUS, version 7.41 supports all types of XAVC and XAVC S. EDIUS can export not only MXF files but also whole XAVC files and folders to media.

Note:

EDIUS works with HQX codec technology. HQX is a line of intermediate codecs, which are intended for use during video editing, and not for practical end-user viewing.

Installation procedure and use

To ingest XAVC into EDIUS 7:-

- Insure that the EDIUS version supports the chosen XAVC mode.
- Select the File menu, then Add Clip. (SourceBrowser is also useful to browse/add/import clips from media.)

To export XAVC clips from EDIUS 7:-

- Select **File** > **Export** > **Print to File**.
- Select **XAVC** and click on **Export**.
- Select **Destination**, enter **Clipname**, select **Format**, click on **OK**.

Editing

SONY

Notes on media & ingest paths

Adopting a safe backup and archive strategy

Recording media can always be removed from the XAVC camera or camcorder and connected to a computer via a media adaptor or media reader. However it is strongly advised never to perform edits on the original recorded material on the original recording media. Editing performance is likely to be severely affected, there is a risk that editing files may fill the media and cause the editor to stop or crash. There is also a strong likelihood that you will corrupt or alter the original recorded clips, which you may need to refer to in their original form later.

Most media used in XAVC products include a read-only switch. Switch the media to read-only mode before inserting it into the computer, media reader, or media adaptor. This will ensure the computer does not alter the original recording in any way.

Always copy the complete folder and file structure from the media to a new folder on the computer. Then copy this to at least one archive or backup device external from the editing computer.

Remove the media from the computer without deleting anything or reformatting the media.

Check that the recorded material is visible from the editor and all the recorded clips can be used on the editor's timeline.

When you are sure that the copied material is complete, you can switch the read-only switch on the media off, and reformat the media ready for the next shoot. Always reformat the media in the camera or camcorder, not in the computer. This will ensure that the media's format is entirely compliant with the camera or camcorder.

Finally never edit directly from any backups or archived material. If the working copy becomes corrupted or you need to start a project again, take another copy from the archive or backup and work from the copy.

SONY

PMW-F55, and PMW-F5

These camcorders use SxS media. XAVC 4K Intra-Frame and XAVC QFHD Intra-Frame recordings require SxS PRO+ media. XAVC 2K Intra-Frame and XAVC HD Intra-Frame recording can use SxS PRO+ or SxS PRO media up to 25p frame rate.

Material may be transferred to a server or NLE directly through the USB connector on the camcorders. Alternatively the SBAC-US20 SxS drive provides a USB connection to an NLE or server.

SONY
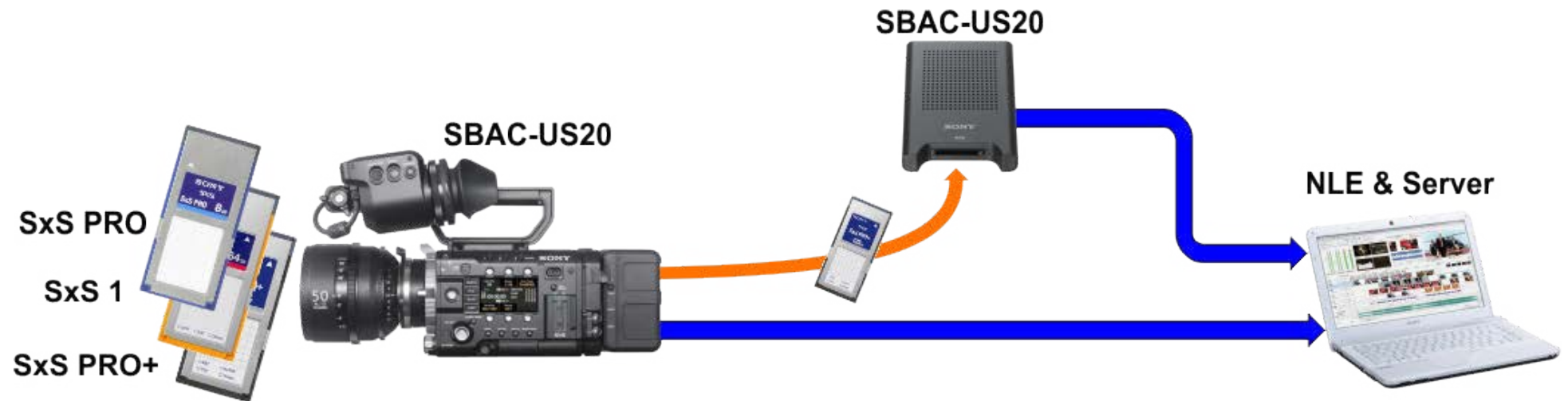
PMW-400, PMW-300 & PXW-X180

These camcorders use SxS media and record the high definition mode of XAVC Intra-Frame only. SxS PRO or SxS 1 media can be used in these camcorders. SxS PRO+ will work, but is considered over-specified.

Material may be transferred to a server or NLE directly through the USB connector on the camcorders. Alternatively the SBAC-US20 SxS drive provides a USB connection to an NLE or server.

The PMW-1000 recorder/player deck will play back XAVC HD Intra-Frame recordings from the PMW-400 and PMW-300 camcorders. This deck can also be used to record and edit XAVC HD material in a linear editing suite, and can also bridge between SxS media from these camcorders into a server or NLE.

The PDW-1550 will also record XAVC HD Intra-Frame to Professional Disc, and can be used as a bridge from SxS media to cost effective Professional Disc as an ultra-reliable archive.
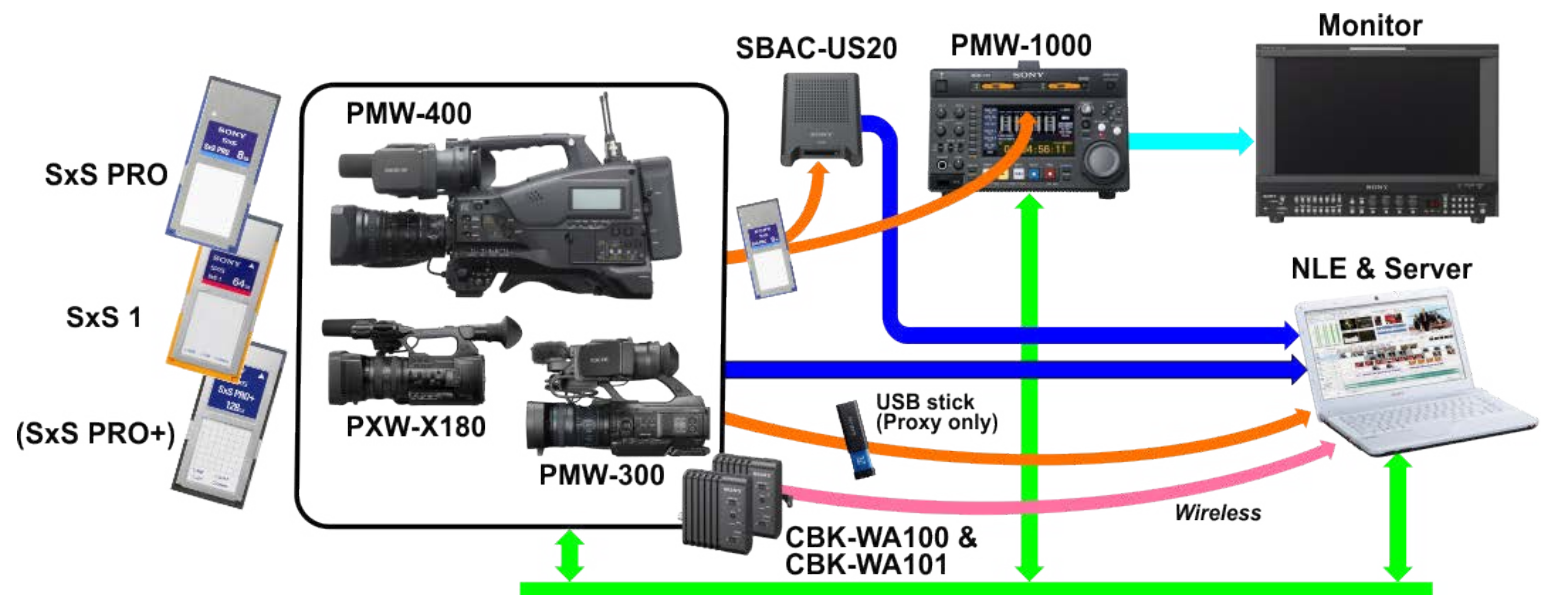
PXW-Z100 & FDR-AX1

These camcorders use XQD media. This is a compact but high performance media designed for a new generation of compact 4K camcorders.

It is unlikely that a standard PC, Mac or laptop will include an XQD slot. Therefore either an MRWE-80 reader can be used to connect the XQD card to the computer via the USB port, or a QDA-EX1 adaptor can be used to connect the XQD card to the computer via an Express card slot.
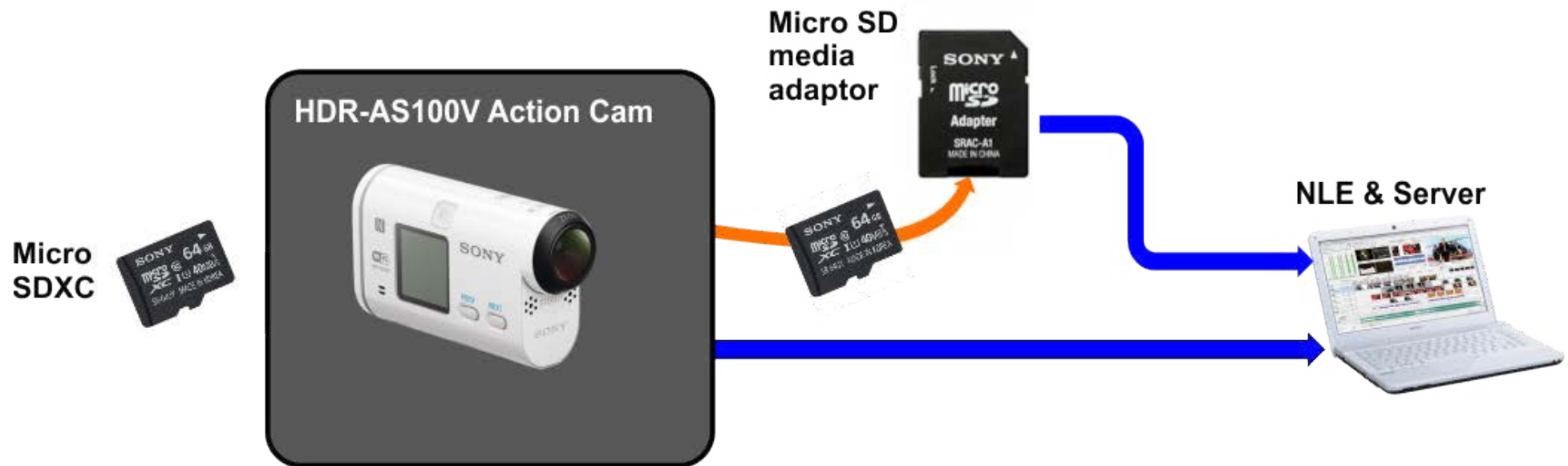
SONY
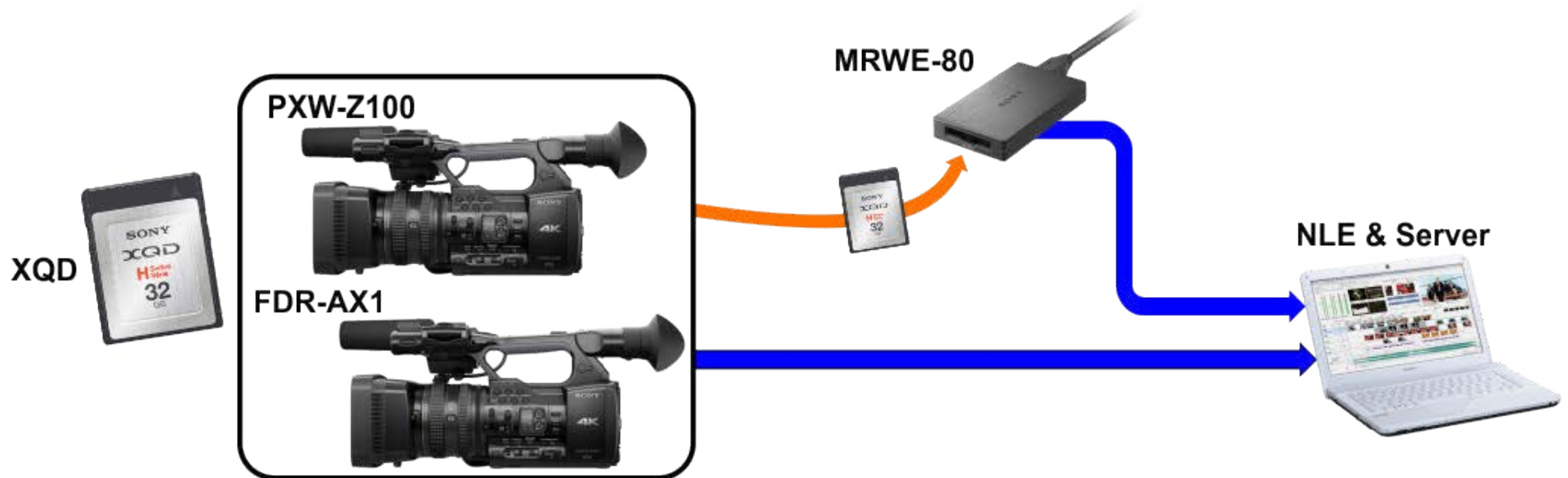
FDR-AX100 & Alpha A7S

Both the FDR-AX100 and Alpha A7S accept SDXC media. The camera/camcorder can be connected directly to the computer via a USB cable. The SD media can also be removed from the camera/camcorder and either plugged into the computer directly, or fitted to the computer via the SD media adaptor.

SONY
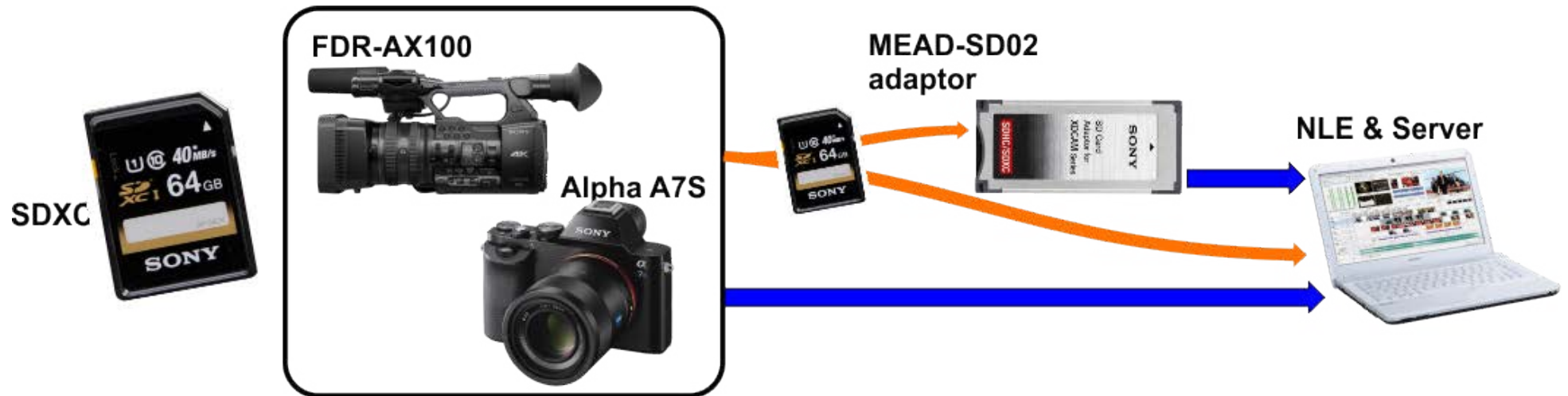
HDR-AS100V Action Cam

The HDR-AS100V Action Cam can accept both Micro Memory Stick or Micro SD media. However XAVC S recording requires specific Micro SDXC media. The SRAC-A1 Micro SD adaptor can be used to fit a Micro SD card to the SD media slot in a computer.

SONY

Appendix
How the technology works

Introduction to 4K

Several 4K resolutions exist in the fields of digital television and digital cinematography, all based on resolutions of about 4000 horizontal pixels.

The DCI (Digital Cinema Initiatives) 4K standard, sometimes referred to as True 4K or Full 4K, has a resolution 4096x2160 and 17:9 aspect ratio, and is utilised by all Sony hi-end digital cinematography products. This standard is exactly four times the resolution of the 2K (2048x1080, 17:9). (The aspect ratio 17:9 is approximate as 4096÷17×9≠2160. The exact ratio is 256:135.)

The QFHD standard, sometimes referred to as Quad HD, Ultra HD, UltraHD or UHDTV has been proposed by the Consumer Electronics Association. It has a resolution of 3840x2160, and a 16:9 aspect ratio. This is exactly four times the 1920x1080 high definition standard. QFHD has exactly square pixels, i.e. 3840÷16×9=2160. QFHD is intended for consumer televisions, and live broadcast television, live sports coverage etc.

Both 4K and QFHD offer exceptional reproduction of fine detail. Even if the final material is down-converted from 4K or QFHD to 2K or HD, after post-production and editing, fine quality is maintained and the final image has more detail compared to the same scene shot and produced entirely in 2K or HD.

4K workflows are considered the future, certainly for the digital cinematography and also for the professional market. QFHD is considered the next step for professional live television and for consumer use. The XAVC and XAVC S file formats offer real practical solutions for 4K productions in both True 4K and QFHD productions.

SONY

Wireless workflows with Sony camcorders

Many Sony camcorders are equiped with wireless capability.

Depending on the camcorder this can provide remote setup, live logging of shots, live review of recordings, and wireless transfer of material from the camcorder to an external device.

The PMW-400 is the first professional shoulder-mounted camcorder to include a special connector specifically for a multi-features wireless module. This module, the CBK-WA101, fits directly into this connector and provides multiple ports for dongles and media.

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References

XAVC workflow site

This is the online companion to the XAVC Workflow Guide and is the place where its latest version will always be hosted, along with a host of additional information, including White Papers, links to free e-training resources on XAVC and more.

http://pro.sony.eu/xavc

XAVC resource site

The Strategic Alliance XAVC team works closely with third-party manufacturers and service providers to evangelise and implement the XAVC format in all video and audio products. The objective of the website is to provide general information on XAVC to customers and anyone interested in XAVC technology and products. It is also the first point of contact for XAVC format licensing.

http://www.xavc-info.org/

Manufacturers and service providers who plan on XAVC format implementation are encouraged to view this website. The latest list of all (69) companies who support XAVC, and work with the Sony Strategic Alliance XAVC team, can be found here:-

http://www.xavc-info.org/xavc/share/data/XAVC_Format_Supporters.pdf

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For the latest on XAVC products and solutions, and the most up-to-date version of this Workflow Guide check on the http://www.pro.sony.eu/xavc web site.