

SONY
make.believe

FDR-AX1

Digital 4K Video Camera Recorder



HANDYCAM®

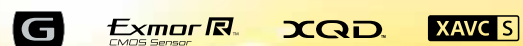
The Power of Imaging **BE MOVED**

4K
*3,840 x 2,160 pixels

Your Story. In 4K detail.

Digital 4K Video Camera Recorder **FDR-AX1**

Tell your story in four times the resolution of Full HD with the 4K camera that's made for everyone. Shoot with the breathtaking quality of XAVC-S 4K/60p and capture professional audio with XLR mic inputs. Even take direct, manual control with zoom, focus and iris rings, plus 7 assignable buttons. The groundbreaking power of 4K is ready to capture your imagination—experience it with Sony. Let the revolution begin.

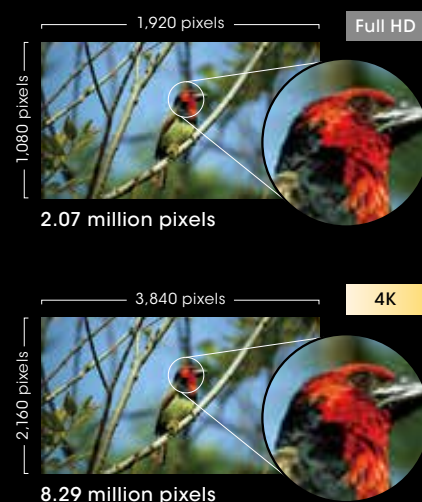
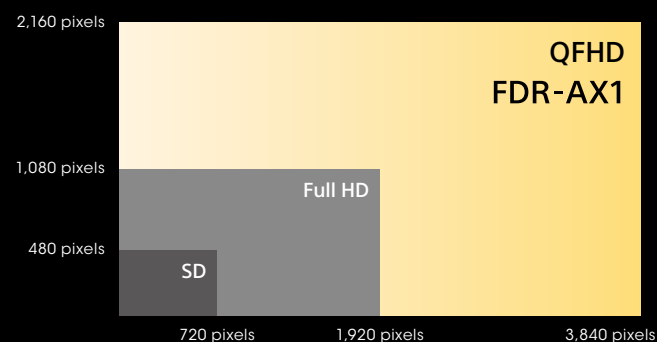


4K images will open your eyes to a new era of excitement

Experience the new dimension of definition with four times the image quality of Full HD

While camcorders typically support SD (720x480) to Full HD (1920x1080) formats the new FDR-AX1 Handycam® camcorder supports 4K (3840x2160).

This is literally four times the resolution of Full HD (1920x1080). With this superior format the FDR-AX1 captures incredible detail, bringing you more realistic, vibrant, true-to-life video.

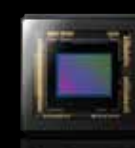


Unleashing the technologies behind 4K image innovation



G
High-performance
G Lens

The G Lens advances the Sony heritage of image processing innovation by redefining what an aspheric lens and special low-dispersion glass can faithfully reproduce together. The G Lens is specially tuned to capture qualities of definition and color that put this groundbreaking Handycam camcorder in a class of its own. In addition, the high-quality G lens offers a broad focal range from wide-angle to 20x optical zoom (30-600mm, 35mm equivalent), enabling an amazing range of video expression.



Exmor R
CMOS Sensor
Exmor R® CMOS sensor
delivers multifaceted
4K support

Sony's unique Exmor R® CMOS sensor is essential to the stunning image quality that the FDR-AX1 achieves. Its back-illuminated structure featuring wiring layers on the back of the photodiode (light receiving element) dramatically boosting low-light sensitivity for shooting more lifelike images even in dim lighting. Sony's cutting-edge technology also makes the FDR-AX1 nimble at reading massive 4K data at 60 fps.



No.1 image sensor manufacturer for digital cameras and video recorders. *Based on Sony research-April 2012 to March 2013 (50% market share)



**Professional
image
processor**

An extraordinary image processor, identical to those in professional-grade 4K camcorders, rapidly processes signals transmitted from the CMOS sensor and finalizes images. In processing the vast 4K data in real time at 60 fps, it achieves four times the resolution of the HD format. Moreover, this processor not only features high-performance noise reduction for more realistic images and image quality adjustment functions for greater freedom of expression; it is also specially tuned for the FDR-AX1 to deliver image processing performance that accelerates the evolution of camcorders.

Advancing to the next world of 4K (3840 x 2160) video recording



4K/60p recording far surpasses Full HD⁶

The FDR-AX1 is the first 4K (3840 x 2160 pixels) resolution Handycam consumer camcorder and features blazingly fast image processor identical to those included in Sony models for professional use. Because the camera can record 4K/60 fps (59.94 Hz) movies at its full resolution, even images shot while panning or when subjects were moving look extraordinarily smooth, sharp and true to life in playback.

High-quality 50 Mbps HD recording XAVC S

High quality XAVC-S can be recorded to 150mbps. Additionally, there is also an option to record very high quality Full HD at 50mbps with the FDR-AX1.

XAVC-S consumer-use 4K/HD recording format

Based on the XAVC 4K/HD format suited for professional use, the FDR-AX1 records 4K/HD movies in the XAVC-S format, developed for consumer use. To extend the hours of 4K video capture capacity, XAVC-S employs the Long GOP codec of H.264/AVC for video file compression. Moreover, the MP4 container format simplifies the handling of 4K videos.⁷

Next generation XQD memory card



The FDR-AX1 adopts the next-generation XQD memory card that supports fast 4K/HD writing/reading and makes high bit-rate⁸ recording possible. Data can be transferred to a PC rapidly using a XQD reader/writer via USB 3.0 connection.



Two XQD media slots

The FDR-AX1 features two XQD media slots and uses XQD media card for smooth, high-speed reading and writing of 4K video. A relay recording⁹ feature makes it possible to lengthen recording by automatically switching between two or more media.

Details of compatible formats

Codec	Wrapper	Sampling	Bit-rate	Recording Pixels
XAVC-S	mp4	4:2:0	150 Mbps	4K (3840 x 2160) 60p ² /50p
			100 Mbps	4K (3840 x 2160) 30p ³ /25p/24p ⁴
			60 Mbps	4K (3840 x 2160) 30p ³ /25p/24p ⁴
AVCHD ¹	m2ts	4:2:0	50 Mbps	HD (1920 x 1080)
			Max. 28 Mbps	HD (1920 x 1080)

¹ AVCHD compatibility scheduled for introduction in the middle of 2014.
² 59.94Hz ³ 29.97Hz ⁴ 23.38Hz

Witnessing a new world view with 4K on TV



Viewing on 4K TVs via single HDMI cable

4K¹⁰ videos recorded on the FDR-AX1 can be played on a 4K monitor with a single HDMI cable (bundled with the camcorder). A 4K monitor supports up to 4K/30p. By simply changing the menu HDMI output settings

to 1920x1080 video can also be played back on standard Full HDTVs.⁶

Connecting for 4K/60p playback on 4K LED TVs BRAVIA

To extend 4K¹⁰ BRAVIA LED TV compatibility, the FDR-AX1 has an original function to transmit 4K/60P¹¹ 8-bit 4:2:0 signals using a single HDMI cable. In this way, you

can view clear, smooth video of fast-moving sports and other subjects at 60p on 4K BRAVIA LED TVs.

Connection to TV



TRILUMINOS™ Color.

A breathtaking way to relive your fondest memories.

The FDR-AX1 supports Sony's TRILUMINOS Color, allowing you to view photos and movies in rich, natural colors on any TV equipped with a TRILUMINOS Display. The expanded color gamut lets you immerse yourself in those unforgettably colorful moments, from the complex shades in a shimmering blue sky to the natural tones of a rosy complexion.



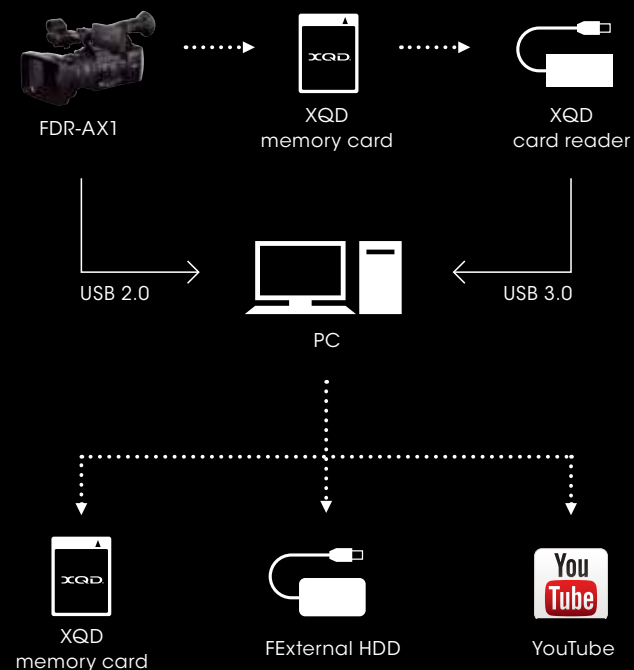
Saving 4K video data



Saving spectacular 4K video content to a PC



In order to save 4K video data to a PC, there are two ways to connect a PC to the FDR-AX1: either by using a USB cable, or by inserting a XQD memory card in a XQD reader/writer. Data can be downloaded to the PC, then managed and played¹² with PlayMemories™ Home and other compatible players. You can also save the data to other media types, such as an external HDD from a PC.¹³ The video can be edited with XAVC S-compatible non-linear editing software.¹⁴ 4K video content can be shared by uploading it to YouTube.¹⁵



Fine-tuning crystal-clear sound with great control and precision



Professional-class audio XLR terminal

In addition to a high-performance internal microphone, the AX1 features two external XLR jacks for connecting external microphones that can also be used to record superior-quality balanced audio synchronized to the video. You can also mix audio from recordings made using the internal microphone and externally connected microphones, respectively.



3 ND filters

The AX1 features three ND filters for adjusting the amount of light entering the image sensor from the lens. There are four filter settings: Off (Clear), 1/4 filter, 1/16 filter and 1/64 filter. These filter settings give users the ability to adjust to light conditions, while maintaining desired shutter angle

and aperture even on bright and sunny days.

Independent zoom, focus and iris rings

Independent zoom, focus and iris rings enable fast zooming, swift focusing and easy focus adjustment.

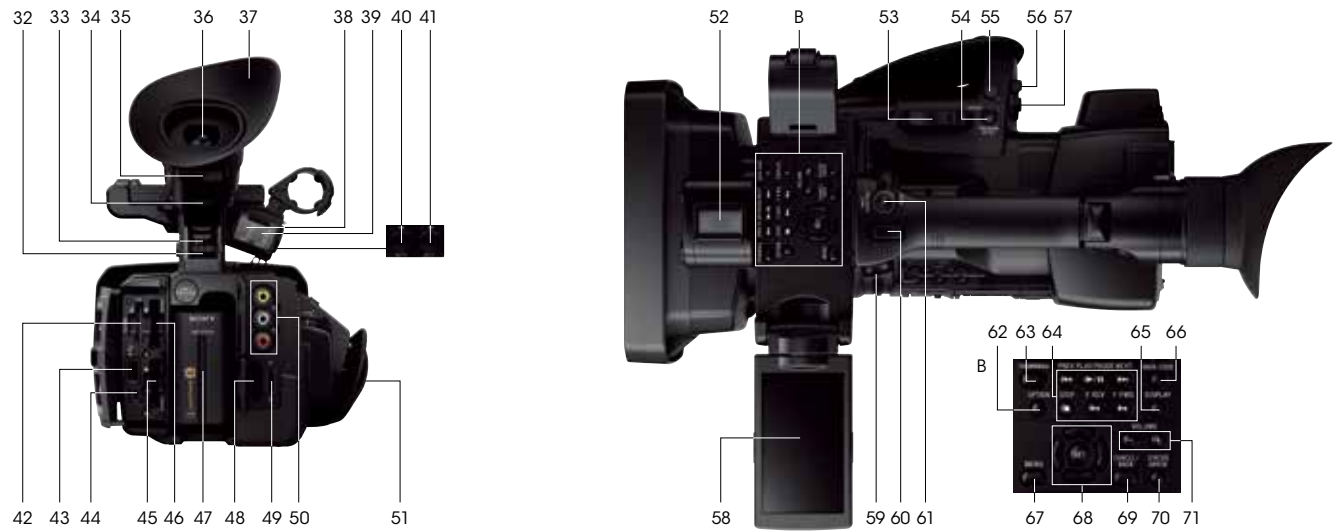
Paint functions

Six paint functions (white, offset white, gamma, detail, skin detail and matrix) can be combined and adjusted in the paint menu to create expressive movie styling and cinematic looks.

Details



- | | | | |
|------------------------------|--------------------------|---------------------------------|--|
| 1. Internal microphone | 9. GAIN button | 17. ND filter | 25. STATUS CHECK button |
| 2. Front recording lamp | 10. WHT BAL button | 18. IRIS button | 26. CH1 (INT MIC/INPUT1/INPUT2) switch |
| 3. Lens | 11. SHUTTER SPEED button | 19. GAIN switch | 27. AUTO/MAN (CH1) switch |
| 4. Lens hood with lens cover | 12. AUTO/MANUAL switch | 20. White balance memory switch | 28. AUDIO LEVEL (CH1) dial |
| 5. Handle zoom switch | 13. Lens cover lever | 21. (one push) button | 29. CH2 (INT MIC/INPUT1/INPUT2) switch |
| 6. (headphones) connector | 14. Focus ring | 22. jog dial | 30. AUTO/MAN (CH2) switch |
| 7. ASSIGN button | 15. Zoom ring | 23. MENU button | 31. AUDIO LEVEL (CH2) dial |
| 8. PUSH AUTO button | 16. Iris ring | 24. CANCEL/BACK button | |



- | | | | |
|--|--|-----------------------------|-----------------------------------|
| 32. Rear recording lamp | 43. USB HOST ² | 51. Grip belt | 62. OPTION button |
| 33. HEADPHONE MONITOR switch | 44. USB connector (mini) | 52. Accessory shoe | 63. THUMBNAIL button |
| 34. Viewfinder release lever | 45. XQD memory card B slot/
select button/access lamp | 53. Zoom lever | 64. Playback control buttons |
| 35. Viewfinder lens adjustment lever | 46. XQD memory card A slot/
select button/access lamp | 54. Focus Magnifier button | 65. DISPLAY button |
| 36. Viewfinder | 47. Battery pack | 55. Remote jack | 66. DATA CODE button ³ |
| 37. Large eyecup | 48. Utility SD slot | 56. Power switch | 67. Menu button |
| 38. Input2 switch | 49. HDMI OUT jack | 57. Record button | 68. ⬆/⬇/⬆/⬇/Exec button |
| 39. Input1 switch | 50. VIDEO OUT connector/
AUDIO OUT connectors | 58. LCD screen | 69. CANCEL/BACK button |
| 40. XLR terminal (Input2) | | 59. Hook for shoulder strap | 70. STATUS CHECK button |
| 41. XLR terminal (Input1) | | 60. Handle zoom lever | 71. VOLUME button |
| 42. Memory stick/SD card C slot ¹ | | 61. Handle Record button | |

¹ AVCHD recording is planned to be updated in middle of 2014
² Function using this terminal is planned to be updated in middle of 2014
³ DATA CODE button will be active together with the AVCHD update planned in middle of 2014

Accessories

Shooting



Electret Condenser Microphone
ECM-MS2



Electret Condenser Microphone
ECM-680S



Remote Control Tripod
VCT-VP100



PL Filter
VF-72CPAM



Strap Shoulder Belt
BLT-110



Battery Light
HVL-LE1



Wide Conversion Lens
VCL-HG0872X

Battery



Accessory Kit
ACCKIT-D20



Rechargeable Battery
NP-F970



AC Adaptor/
Charger for L Series
AC-VQ1051D*

* Charge only

Others



Soft Carrying Case
LCS-VCC



XQD
XQD Memory Card
QD-N64



XQD
XQD Express Card
Adapter
QDA-EX1



XQD Card Reader
MRW-E80

Free bundle



4K/HD XAVCS Compatible Video
Editing Software
Vegas Pro 12 Edit



XQD
XQD Memory Card
N series 32GB

Specifications

Imaging Sensor	
Imaging Sensor	1 / 2.3" back-illuminated Exmor R® CMOS Sensor
Pixel Gross	Approx. 18900K pixels
Effective Picture Resolution (movie)	Approx. 8300K pixels
Color Filter System	RGB primary color filters
Recording	
Microphones, Max input level	120dB SPL
Media Type	XQD Memory Card x 2
Video Format	XAVC S format MPEG4-AVC/H.264
Video Mode (Resolution) 1	4K: 3840×2160 60P (150 Mbps), 3840×2160 30P (100 Mbps) 3840×2160 30P (60 Mbps), 3840×2160 24P (100 Mbps) 3840×2160 24P (60 Mbps), 3840×2160 50P (150 Mbps) 3840×2160 25P (100 Mbps), 3840×2160 25P (60 Mbps) HD: 1920×1080 60P (50 Mbps), 1920×1080 30P (50 Mbps) 1920×1080 24P (50 Mbps), 1920×1080 50P (50 Mbps) 1920×1080 25P (50 Mbps)
Video Actual (Pixel)	Approx. 8300K pixels
Video Signal	UHDTV HDTV
Audio Format	Linear PCM 2ch (48kHz/16bit)
Microphone / Speaker	Built-in Stereo Microphone Monaural Speaker
Mic Level Control	Yes (2steps)
Wind Position	Yes (Off/On)
Optics / Lens	
Lens Type	G™ Lens
Lens Stabilization	Optical SteadyShot™ image stabilization
Aperture	F1.6 - F3.4
Optical Zoom	20x
Focal Length (35mm equivalent) (Movie Mode)	f=4.1 - 82.0mm f=31.5 - 630mm
Filter Diameter	72mm
Minimum Focus Distance	Approx. 13/32inch (Wide), Approx. 31 1/2inch (Tele) Approx. 1cm (Wide), Approx. 80cm (Tele)
Aperture Blade	6 blades
ND Filter	OFF, 1/4, 1/16, 1/64
Focus Ring	Yes
Zoom Ring	Yes
Iris Ring	Yes
Viewfinder	
Type	0.45type
VF Backlight	Yes
VF Power Mode	Yes
LCD Display	
LCD Type	3.5" Xtra Fine LCD™ 3D display (1,229K) Wide (16:9)
Angle Adjustment	Opening Angle: max. 180 deg., Turning Angle: max. 270 deg.
LCD Backlight	Yes (Menu)
Coverage	100%
Marker	Yes
Focus Control	
Focus System	Contrast AF
AF Modes	Auto/Manual (Ring)
Focus Area	Full range Focus
Push Auto Focus	Yes
Manual Focus Assist	Magnified display for precise manual focus Peaking Display

Exposure System	
Metering Modes	Multi-segment
Exposure Compensation	AE level / AE Speed (Menu)
Noise Reduction	Yes
White Balance Mode	Auto / One push / Outdoor / Indoor / Color temp
WB Shift	Yes
Minimum Illumination ¹	60P : 4 lux (1/30 Shutter Speed) 50P : 3 lux (1/25 Shutter Speed)
Auto Iris Control	F1.6 - F11.0
Manual Iris Control	F1.6 - F11.0
Push Auto Iris	Yes
Manual Exposure Assist	Zebra Pattern Display

Interface	
Memory Card Slot	XQD x2 (for XAVC S) Memory Stick PRO Duo™, Memory Stick PRO-HG Duo™ and SD/SDHC/SDXC compatible x1 (for AVCHD) SD/SDHC/SDXC x1 (Utility SD slot)
STD Output	Composite Video Out (AV CABLE (sold separately))
HD Output	HDMI Out (supplied)
4K Output	HDMI Out (supplied)
USB Port (s)	mini-B / USB2.0 Hi-speed / mass-storage-Type A / USB2.0 Hi-speed /Host
Headphone Jack	Stereo Minijack
Line Input (Analog Audio)	XLR
Microphone Input	XLR
DC IN	Yes
Remote Terminal	Remote terminal
HDMI Terminal	Yes
Accessory Shoe	Yes

Weights and Measurements	
Dimensions (Approx.)(WxHxD including supplied battery) ^{2, 3}	Approx. 7 7/16 inch x 7 19/32inch x 14 1/4 inch Approx. 189mm (W) x 193mm (H) x 362mm (D)
Weight (Approx) (Main unit only)	Approx. 86.1oz Approx. 2440g
Weight (Approx.) (Total) ⁴	Approx. 97.7oz (NP-F970) Approx. 2770g (NP-F970)

Power	
Battery Type	NP-F970
Power Consumption (in Viewfinder Operation) ^{1, 5}	4K : 14.2W (30P, 60Mbps) HD : 15.4W (60P, 50Mbps)
Power Consumption (in LCD Operation) ^{1, 5}	4K : 14.5W (30P, 60Mbps) HD : 15.7W (60P, 50Mbps)
Power Requirements	7.2V (battery pack); 12.4V (AC Adaptor)

In the box	
Supplied Accessories	Rechargeable Battery Pack (NP-F970) AC adaptor (AC-NB12A) Battery Charger (AC-VL1) HDMI Cable USB Cable Operating Guide Large eyecup Lens hood A/V connecting cable XQD Card License CD-ROM

XAVC S Movie Expected Recording Time		
	XAVC S 3840×2160 60P (150Mbps)	XAVC S 1920×1080 60P (50Mbps)
32GB XQD Memory Card	25min	70min
64GB XQD Memory Card	50min	150min

1. 60P:59,94P, 30P:29,97P, 24P:23,98P 2. including the projecting parts 3. including lens hood 4. including a battery pack, a media and a lens hood 5. Recording mode and media are default settings. 6. 1920 x 1080 pixels 7. Playback of data in all modes is not guaranteed when using MP4 playback devices and software. 8. XQD media card N-series, S-Series and later types recommended. 9. Video and sound may be cut temporary in the relay recording process. 10. 3840 x 2160 pixels 11. 59.94 Hz 12. 4K video playback depends on PC performance 13. Please use NTFS, exFAT or HFS+ 14. Please refer to non-linear editing software specifications regarding XAVC S compatibility 15. Please refer to YouTube specifications regarding 4K video compatibility.

Environmental Information

Halogenated flame retardants are not used in certain printed wiring boards. Recycled paper is used for the carton.

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Screen displays are simulated.

Simulated effects are used to illustrate some functions