SONY

X-OCN

WHITE PAPER – V3.0 (JULY 2026)

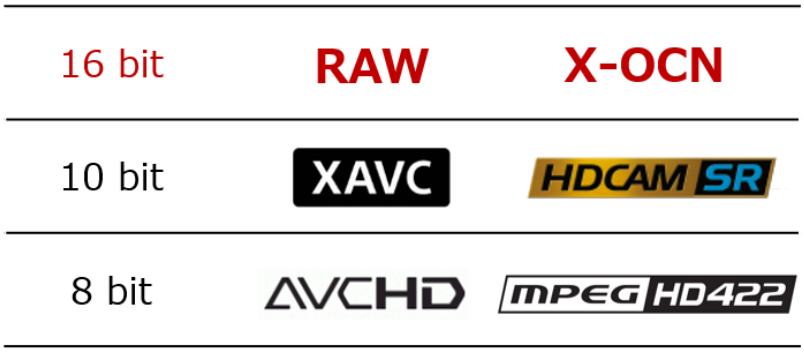
CONTENTS

INTRODUCTION

Since 2000, Sony has been working on developing Digital Motion Picture Camera System s for cinema industry under the “CineAtla” line over more than 20 years. Starting with the first CineAlta camera, F900, many models have been introduced to the market until now.

We introduced a lot of key technologies such as 24p, RGB444 system, Super35mm image sensor, 4K resolution in F55, and 8K resolution in F65. These models have been contributing to the high-end content creation market such as feature film, TV drama and commercials.
In 2017, we launched the latest cinema camera VENICE equipped with 36x24mm Full-Frame CMOS image sensor.

At the same time as the development of these cinema cameras, we have introduced video formats such as HDCAM and HDCAM-SR, providing YPbPr422 and RGB444 capability.
And then, we evolved RAW format which is native signal data from CMOS sensor before the process of generating video signals.



In 2016, Sony has released new recording format **X-OCN (eXtended tonal range Original Camera Negative)** – that is Sony’s original compressed RAW format.

This format further enhances the compression efficiency of Sony RAW, which delivers visually loss-less image quality.

X-OCN offers uncompromising image capture performance with the power of 16 bits, at low data rates. It processes camera original image data by utilizing a unique algorithm from Sony.

KEY ADVANTAGE OF X-OCN

- Exceptional quality with the power of 16 bits
- Smaller files, Longer recording times
- Greater decision-making flexibility in post-production
- Stable image quality with robust encoding
- Easy to work with full third-party support

Exceptional quality with the power of 16 bits

By combining superlative 16-bit precision with surprisingly moderate bit rates, X-OCN opens up powerful new production possibilities. X-OCN produces file sizes much smaller than typical camera RAW, but unlike conventional codecs, X-OCN offers 16-bit scene linear encoding. So, you get the ultimate in tonal expression, longer recording times, faster file transfers and more economical post-production.

Supported by Sony VENICE 2 (natively), BURANO (natively), VENICE and PMW-F55/F5 cameras (in combination with AXS-R7 recorder), the X-OCN format is a game changer achieving up to 8K resolution and High Dynamic Range while maintaining reasonable bitrates.

In this way, X-OCN is ideal for the most advanced workflows, including ACES, Rec.2020, SMPTE ST2084, the extended color space of Sony's S-Gamut3 color and High Dynamic Range tone mapping.

VENICE 2 and BURANO build upon X-OCN's proven success by offering internal 16-bit X-OCN recording without need for an external recorder, dramatically shrinking the form factor while still offering the full dynamic range and color reproduction of the sensor.

In 2026, the new C1 and C2 modes are added offering easier handling with even smaller file sizes. With the introduction of ultra compact FX5 camera, 16-bit X-OCN expands the range of options available to a broader group of users.

Far exceeding 10 and 12-bit formats, 16-bit X-OCN records 65,536 tonal gradations per color component, or over 280 trillion individual shades of color. This is the ultimate in grayscale expression, creating an enormous palette for extreme subtleties in grading and far greater flexibility for colorists and editors alike.

Smaller files, Longer recording times

X-OCN combines the quality and versatility of RAW with the easy playback and smaller files of traditional codecs. You get longer recording times, faster file transfers and more cost-effective postproduction.

In most cases such as Feature Film, TV Drama or Commercial, Sony would recommend **X-OCN ST** which provides best balance between picture quality and file transfer time / storage size.

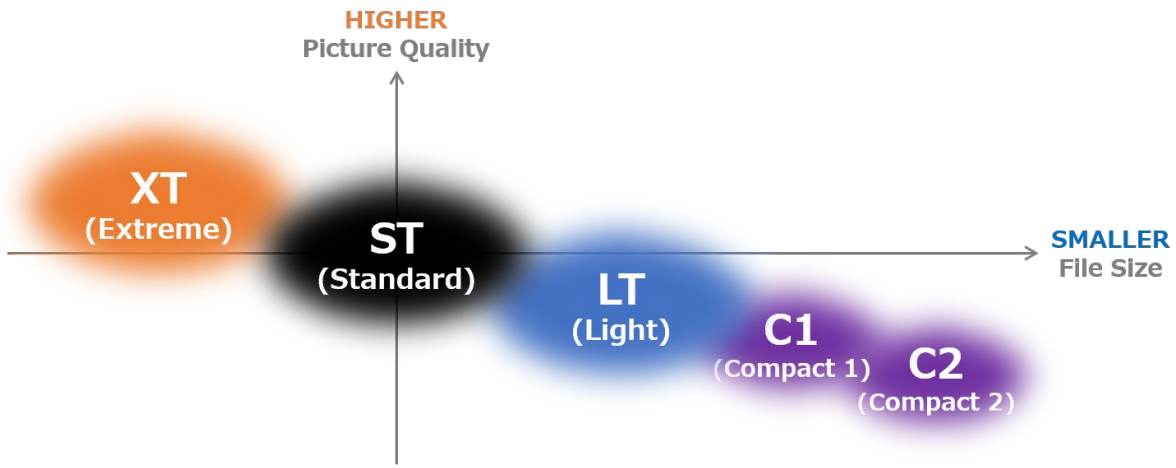
For special cases such as visual effects work or contents creation for giant screen, **X-OCN XT** is ideal as it captures the highest quality imagery.

For Mid-Low budget cinema (including TV Drama), Documentary or productions requiring long recording time, **X-OCN LT** is a good option as it provides smaller file size than X-OCN ST.

For a wide range of low-budget applications such as Web Advertising, Promotion Video or Independent Film, where even more compact file size or longer recording time is required, **X-OCN C1** or **X-OCN C2** is the ideal choice – while preserving the benefit of 16-bit scene linear.

Mode	Major Applications*	Description
X-OCN XT (Extreme)	• Giant Screen • Visual Effects • Feature Film	• Even higher picture quality than X-OCN ST, exceeding Sony RAW quality
X-OCN ST (Standard)	• Feature Film • Episodic Television • Commercials • Documentary	• Best balance between picture quality and file transfer time / storage size, providing best efficiency in post-production • Equivalent quality to Sony RAW, even with 30% smaller file size
X-OCN LT (Light)	• Indy Feature • Episodic Television • Commercials • Documentary • Live Events	• Smaller file size than X-OCN ST (with 60% smaller than Sony RAW), benefiting from smaller storage requirements and faster download times
X-OCN C1 (Compact 1)	• Web Advertising • Promotion Video • Independent Film	• Similar level of bitrate to XAVC-I / XAVC S-I, while retaining X-OCN post flexibility • 25% smaller file size than X-OCN LT
X-OCN C2 (Compact 2)	• Web Advertising • Promotion Video • Independent Film	• Suitable for High Frame Rate shooting • Even 20% smaller file size than X-OCN C1, while preserving the advantage of 16-bit scene linear imagery

*Actual examples, not meaning each mode is appropriate only for these applications

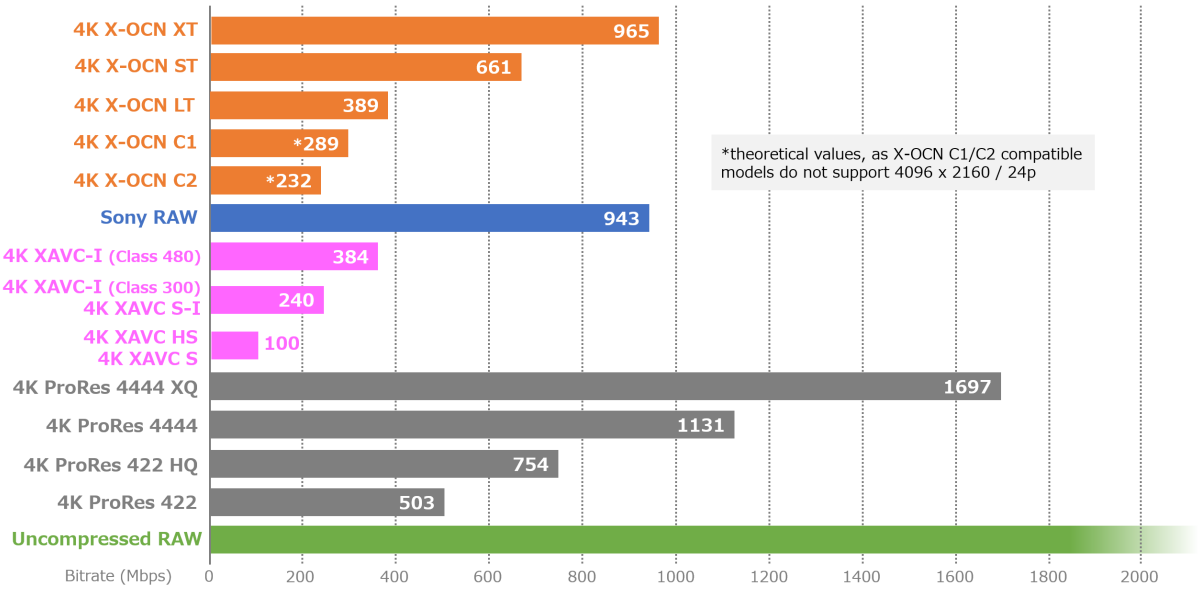


The following bar charts show how the bitrate of X-OCN (Sony's original compressed RAW) is compared to other formats at 4K/24p and 8K/24p.

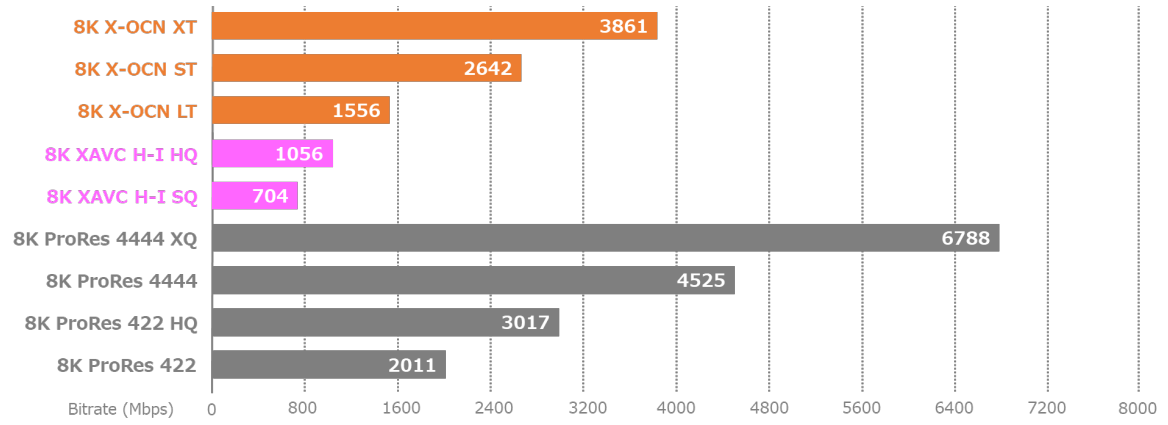
When it comes to 4K X-OCN LT (389Mbps), it can offer stunning RAW quality with 16-bit scene linear at almost equivalent bitrate to 4K XAVC Class480 (384Mbps) and even at lower bitrate than 4K ProRes 422 (503Mbps).

As for 4K X-OCN C1 (289Mbps) and 4K X-OCN C2 (232Mbps), those use a bitrate level comparable to that of 4K XAVC-I (Class 300) / 4K XAVC S-I (240Mbps).

Bitrate Comparison at 4096 x 2160 / 24p



Bitrate Comparison at 8192 x 4320 / 24p



Greater decision-making flexibility in post-production

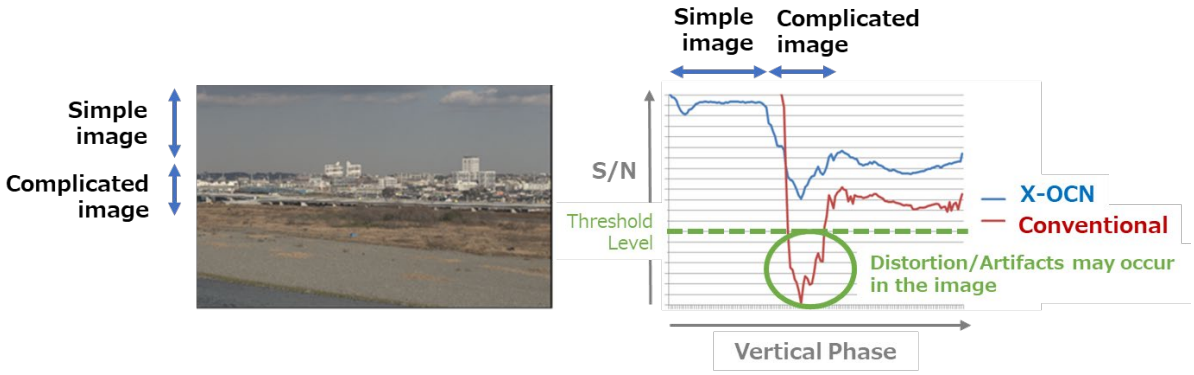
Instead of “baking in” your settings for Exposure Index, color space, LUTs, gamma, log and others, X-OCN captures these parameters as monitoring settings.

This process is completely non-destructive, delivering the full potential of the original sensor data into post-production but with the added advantage of efficient file sizes.

As a result, your colorist and editor are empowered with far greater decision-making flexibility than is possible with conventional video.

Stable image quality with robust encoding

X-OCN adopts an encoding algorithm which allows to secure uniform picture quality within each frame. It contributes to minimizing risks on any distortion or artifacts in the image, that may be caused by a limitation of conventional encoding.



- **Over threshold level :** No negative effect visually in the image
- **Under threshold level :** Distortion/Artifacts may occur in the image

In addition, X-OCN uses CBR (Constant Bit Rate) encoding, where the output remains constant regardless of the complexity of the image. It provides consistent picture quality between all frames.

These robust encoding technologies ensure stable image quality, that is crucial especially in high-end content creation including feature film.

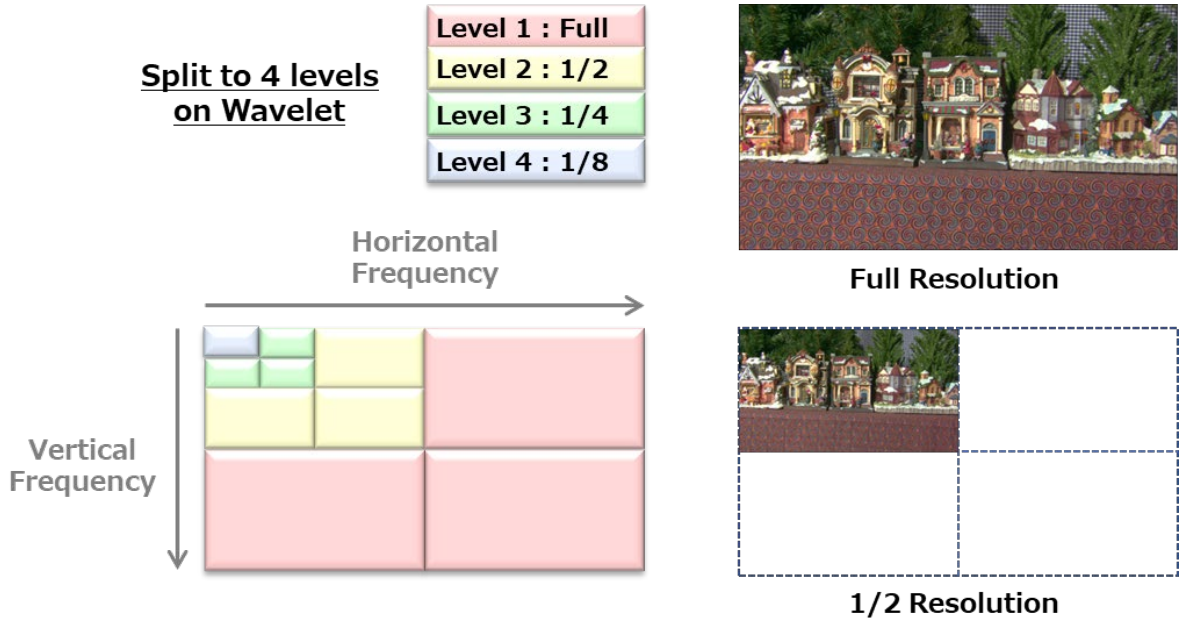
Easy to work with full third-party support

X-OCN is as easy to work with as Sony RAW, with files that playback in real-time on most laptop computers. You get a choice of tools for viewing, editing, grading and file management.

For additional simplicity, X-OCN uses the same industry-standard OP1a MXF wrapper as Sony RAW, XAVC, SR and MPEG2 formats. Picture, Sound and Metadata are contained within one file wrapper for easy file management.

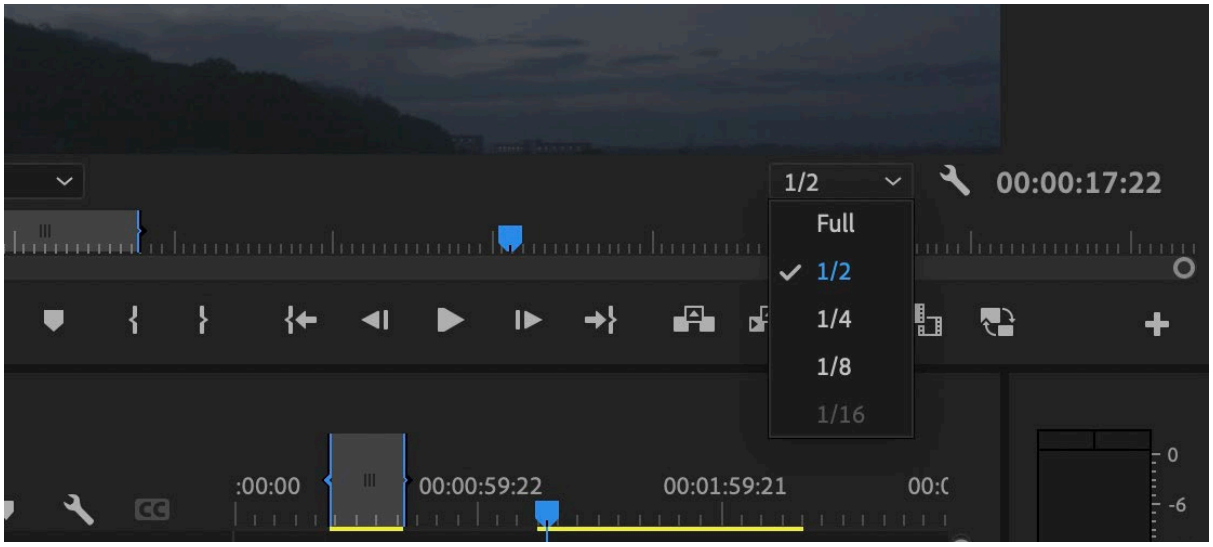
As another benefit, X-OCN adopts a wavelet transform as part of the image compression – that allows to offer great flexibility in viewing performance.

Even if a less powerful laptop computer needs to be used, you can still playback X-OCN clips smoothly in real-time by selecting 1/2 or 1/4 resolution (or even less if supported) on application software – thanks to hierarchical decoding capability.

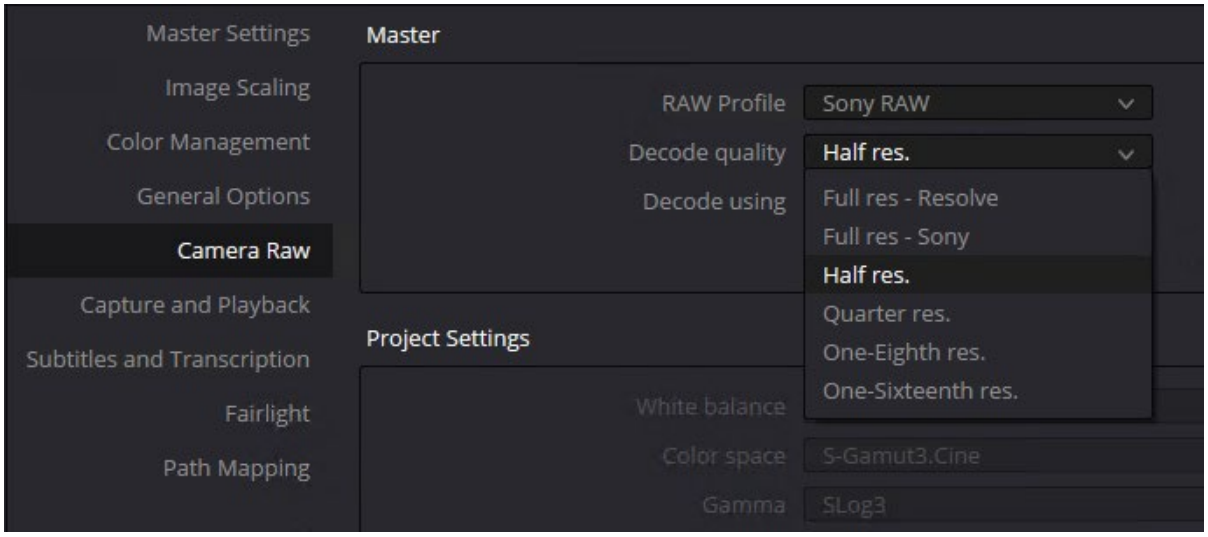


These are examples of decode setting for playback, which are available for Sony X-OCN clips on major third-party application software :

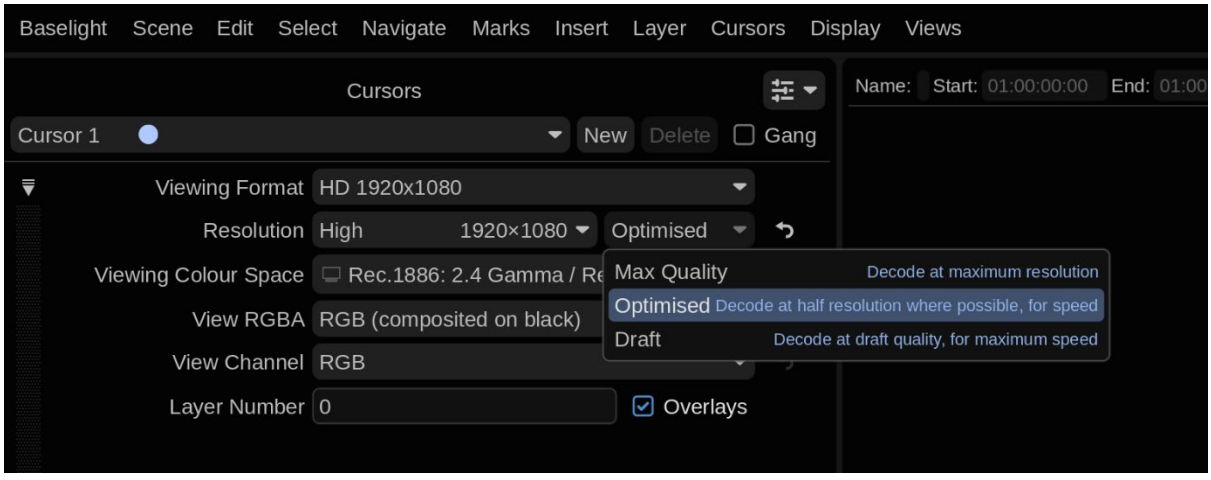
Adobe Premiere Pro :



Blackmagic DaVinci Resolve :



Filmlight Baselight :



X-OCN SPECIFICATIONS (VENICE 2 / BURANO / FX5)

- Recording Bitrate
- Recording Time
- FPS in Memory Card

Recording Bitrate

VENICE 2 23.98/24.0p Recording format in V2.0

VENICE 2 with 8K image sensor (Mbps)

Format	Profile	8.6K 3:2	8.6K 17:9	8.2K 2.39:1	8.2K 17:9	8.1K 16:9	7.6K 16:9	5.8K 6:5	5.8K 4:3	5.8K 17:9	5.5K 2.39:1	5.4K 16:9
X-OCN	X-OCN XT	5,345	4,233	3,079	3,861	4,233	3,861	3,040	2,676	1,919	1,446	1,919
	X-OCN ST	3,658	2,897	2,107	2,642	2,897	2,642	2,080	1,832	1,313	990	1,313
	X-OCN LT	2,155	1,706	1,241	1,556	1,706	1,556	1,225	1,079	773	583	773

VENICE 2 with 6K image sensor (Mbps)

Format	Profile	6K 3:2	6K 1.85:1	6K 17:9	6K 2.39:1	5.7K 16:9	4K 6:5	4K 4:3	4K 4:3 SV	4K 17:9	4K 17:9 SV	4K 2.39:1	3.8K 16:9	3.8K 16:9 SV
X-OCN	X-OCN XT	2,631	2,143	2,091	1,665	2,091	1,525	1,342	1,342	965	965	770	965	965
	X-OCN ST	1,800	1,467	1,431	1,140	1,431	1,044	919	919	661	661	527	661	661
	X-OCN LT	1,061	864	843	671	843	615	541	541	389	389	310	389	389

VENICE 2 60p Recording format in V2.0

VENICE 2 with 8K image sensor (Mbps)

Format	Profile	8.6K 3:2	8.6K 17:9	8.2K 2.39:1	8.2K 17:9	8.1K 16:9	7.6K 16:9	5.8K 6:5	5.8K 4:3	5.8K 17:9	5.5K 2.39:1	5.4K 16:9
X-OCN	X-OCN XT	-	-	-	-	-	-	-	6,691	4,796	3,616	4,796
	X-OCN ST	-	-	5,268	6,606	-	6,606	-	4,579	3,282	2,474	3,282
	X-OCN LT	-	-	3,102	3,891	-	3,891	-	2,697	1,934	1,458	1,934

VENICE 2 with 6K image sensor (Mbps)

Format	Profile	6K 3:2	6K 1.85:1	6K 17:9	6K 2.39:1	5.7K 16:9	4K 6:5	4K 4:3	4K 4:3 SV	4K 17:9	4K 17:9 SV	4K 2.39:1	3.8K 16:9	3.8K 16:9 SV
X-OCN	X-OCN XT	6,577	5,357	5,227	4,163	5,227	3,813	3,355	-	2,413	-	1,924	2,413	-
	X-OCN ST	4,500	3,667	3,577	2,850	3,577	2,610	2,296	-	1,652	-	1,317	1,652	-
	X-OCN LT	2,651	2,160	2,108	1,678	2,108	1,537	1,353	-	973	-	776	973	-

BURANO Recording Bitrate (23.98p/24.00p) (Mbps)

Format	Profile	FF 8.6K 16:9	FF 8.6K 17:9	FFc 6K 16:9	FFc 6K 17:9	S35 5.8K 16:9	S35 5.8K 17:9	S35c 4K 17:9
X-OCN	X-OCN LT	1,812	1,699	894	838	813	762	385

BURANO Recording Bitrate (59.94p) (Mbps)

Format	Profile	FF 8.6K 16:9	FF 8.6K 17:9	FFc 6K 16:9	FFc 6K 17:9	S35 5.8K 16:9	S35 5.8K 17:9	S35c 4K 17:9
X-OCN	X-OCN LT	-	-	2,235	2,094	2,032	1,905	962

FX5 Recording Bitrate (23.98p/24.00p) (Mbps)

Format	Profile	FF 5K 3:2	FF 5K 17:9	FF 5K 16:9	FFc 3.8K 16:9
X-OCN	X-OCN LT	721	609	571	362
	X-OCN C1	537	453	425	270
	X-OCN C2	429	363	340	216

FX5 Recording Bitrate (59.94p) (Mbps)

Format	Profile	FF 5K 3:2	FF 5K 17:9	FF 5K 16:9	FFc 3.8K 16:9
X-OCN	X-OCN LT	1,801	1,521	1,427	904
	X-OCN C1	1,341	1,132	1,062	674
	X-OCN C2	1,072	905	849	539

Recording Time

VENICE 2 with 8K image sensor (by AXS-1TS66, 1TB memory)

Imager mode	Project FPS	X-OCN XT	X-OCN ST	X-OCN LT
5.4K 16:9	23/24	65 min	95 min	160 min
	25	62	91	154
	29	52	76	128
	50	31	45	77
	59	26	38	64
5.8K 17:9	23/24	65	95	160
	25	62	91	154
	29	52	76	128
	47	32	47	80
	50	31	45	77
	59	26	38	64
5.5K 2.39:1	23/24	86	126	212
	25	82	121	204
	29	69	100	170
	47	43	63	106
	50	41	60	102
	59	34	50	85
5.8K 6:5	23/24	41	60	102
	25	39	57	98
	29	33	48	81
	47	20	30	51
5.8K 4:3	23/24	46	68	115
	25	44	65	111
	29	37	54	92
	47	23	34	57
	50	22	32	55
	59	18	27	46

Imager mode	Project FPS	X-OCN XT	X-OCN ST	X-OCN LT
7.6K 16:9	23/24	32	47	80
	25	31	45	77
	29	25	37	64
	50	–	22	38
	59	–	18	32
8.1K 16:9	23/24	29	43	73
	25	28	41	70
	29	23	34	58
8.2K 17:9	23/24	32	47	80
	25	31	45	77
	29	25	37	64
	47	–	23	40
	50	–	22	38
	59	–	18	32
8.2K 2.39:1	23/24	40	59	100
	25	39	57	96
	29	32	47	80
	47	20	29	50
	50	19	28	48
	59	–	23	40
8.6K 17:9	23/24	29	43	73
	25	28	41	70
	29	23	34	58
	47	–	21	36
8.6K 3:2	23/24	23	34	58
	25	22	32	55
	29	18	27	46

VENICE 2 with 6K image sensor (by AXS-1TS66, 1TB memory)

Imager mode	Project FPS	X-OCN XT	X-OCN ST	X-OCN LT
3.8K 16:9	23/24	129 min	188 min	316 min
	25	124	180	304
	29	103	150	254
	50	62	90	153
	59	51	75	127
4K 2.39:1	23/24	161	235	395
	25	155	225	380
	29	129	188	317
	47	81	118	199
	50	77	113	191
	59	64	94	159
4K 17:9	23/24	129	188	316
	25	124	180	304
	29	103	150	254
	47	64	94	159
	50	62	90	153
	59	51	75	127
4K 4.3	23/24	93	135	229
	25	89	130	220
	29	74	108	183
	47	46	68	115
	50	44	65	110
	59	37	54	92
4K 6.5	23/24	81	119	201
	25	78	114	193
	29	65	95	161
	47	41	59	101
	50	39	57	97
	59	32	47	81
5.7K 16:9	23/24	59	87	147
	25	57	83	141
	29	47	69	118
	50	28	42	71
	59	23	35	59

Imager mode	Project FPS	X-OCN XT	X-OCN ST	X-OCN LT
6K 2.39:1	23/24	75	109	185
	25	72	105	177
	29	60	87	148
	47	37	54	92
	50	36	52	89
	59	30	43	74
6K 17:9	23/24	59	87	147
	25	57	83	141
	29	47	69	118
	47	29	43	74
	50	28	42	71
	59	23	35	59
6K 1.85:1	23/24	58	85	144
	25	56	81	138
	29	46	68	115
	47	29	42	72
	50	28	40	69
	59	23	34	57
6K 3:2	23/24	47	69	117
	25	45	66	112
	29	38	55	94
	47	23	34	58
	50	22	33	56
	59	19	27	47

*Recording one clip. When several clips are recorded, time should be shorter than the chart.

BURANO (by Sony CFexpress Type B VPG400, 960GB memory)

Imager Scan Mode	Frequency	X-OCN LT
FF 8.6K 17:9	23	74 min
	24	74
	25	71
	29	59
	50	-
	59	-
FF 8.6K 16:9	23	69
	24	-
	25	66
	29	55
	50	-
	59	-

Imager Scan Mode	Frequency	X-OCN LT
FFc 6K 17:9	23	150
	24	150
	25	144
	29	120
	50	72
	59	60
FFc 6K 16:9	23	140
	24	-
	25	135
	29	112
	50	67
	59	56

Imager Scan Mode	Frequency	X-OCN LT
S35 5.8K 17:9	23	165
	24	164
	25	158
	29	132
	50	79
	59	66
S35 5.8K 16:9	23	154
	24	-
	25	148
	29	124
	50	74
	59	62

Imager Scan Mode	Frequency	X-OCN LT
S35c 4K 17:9	23	323
	24	323
	25	310
	29	259
	50	156
	59	130

- The recording and playback times are for a continuous recording as a single clip.
- The actual times may be shorter, depending on the number of clips recorded.
- The recording/playback time may vary due to usage conditions and memory characteristics.

FX5 (by Sony CFexpress Type A VPG400, 960GB memory)

Project Frame Rate	Imager Mode	X-OCN		
		LT	C1	C2
59.94	FF 5K 3:2	69 min	93	116
	FF 5K 17:9	88	117	146
	FF 5K 16:9	82	110	137
	FFc 3.8K 16:9	137	183	227
50	FF 5K 3:2	83	112	139
	FF 5K 17:9	105	141	175
	FF 5K 16:9	99	132	164
	FFc 3.8K 16:9	165	219	272

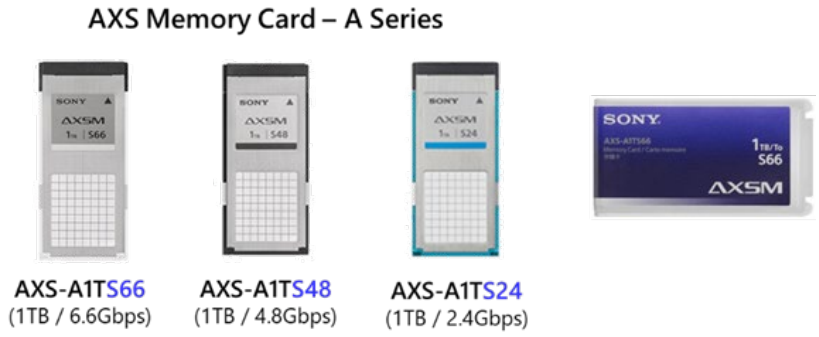
Project Frame Rate	Imager Mode	X-OCN		
		LT	C1	C2
29.97	FF 5K 3:2	139	186	232
	FF 5K 17:9	175	234	291
	FF 5K 16:9	164	220	273
	FFc 3.8K 16:9	274	364	451
25	FF 5K 3:2	167	223	278
	FF 5K 17:9	210	280	348
	FF 5K 16:9	197	263	327
	FFc 3.8K 16:9	328	436	540

Project Frame Rate	Imager Mode	X-OCN		
		LT	C1	C2
23.98	FF 5K 3:2	174	232	289
	FF 5K 17:9	218	292	363
	FF 5K 16:9	205	274	341
	FFc 3.8K 16:9	341	454	562
24	FF 5K 3:2	174	232	289
	FF 5K 17:9	218	292	363
	FF 5K 16:9	205	274	341
	FFc 3.8K 16:9	341	454	562

- The recording/playback time is for a continuous recording as a single clip.
- The actual time may be shorter, depending on the number of clips recorded.
- The time may vary due to usage conditions and memory characteristics.

FPS in Memory Card

VENICE 2



AXS Memory Card – A Series have 3 types. The maximum of shooting frame rate varies depending on the speed performance of AXS Memory Card.

VENICE 2 with 8K image sensor
Supporting format and FPS in AXS memory

Recording Format	Imager Mode	Shooting Framer S24/S48/S66 AXS Memory Card Support														
		24	25	30	48	50	60	66	72	75	88	90	96	100	110	120
X-OCN XT	8.6K 3:2	S66	S66	S66												
	8.6K 17:9 8.1K 16:9	S48/S66	S48/S66	S66												
	8.2K 17:9 7.6K 16:9	S48/S66	S48/S66	S48/S66												
	8.2K 2.39:1	S48/S66	S48/S66	S48/S66	S66	S66										
	5.8K 6:5	S48/S66	S48/S66	S48/S66	S66											
	5.8K 4:3	S48/S66	S48/S66	S48/S66	S66	S66	S66									
	5.8K 17:9 5.4K 16:9	S24/S48/S66	S24/S48/S66	S24/S48/S66	S48/S66	S48/S66	S48/S66	S66	S66	S66						
	5.5K 2.39:1	S24/S48/S66	S24/S48/S66	S24/S48/S66	S48/S66	S48/S66	S48/S66	S48/S66	S48/S66	S48/S66	S66	S66	S66	S66	S66	

Recording Format	Imager Mode	Shooting Framer S24/S48/S66 AXS Memory Card Support														
		24	25	30	48	50	60	66	72	75	88	90	96	100	110	120
X-OCN ST	8.6K 3:2	S48/S66	S48/S66	S48/S66												
	8.6K 17:9 8.1K 16:9	S48/S66	S48/S66	S48/S66	S66											
	8.2K 17:9 7.6K 16:9	S48/S66	S48/S66	S48/S66	S66	S66	S66									
	8.2K 2.39:1	S24/S48/S66	S24/S48/S66	S48/S66	S48/S66	S48/S66	S66	S66	S66							
	5.8K 6:5	S24/S48/S66	S24/S48/S66	S48/S66	S48/S66											
	5.8K 4:3	S24/S48/S66	S24/S48/S66	S24/S48/S66	S48/S66	S48/S66	S48/S66									
	5.8K 17:9 5.4K 16:9	S24/S48/S66	S24/S48/S66	S24/S48/S66	S48/S66	S48/S66	S48/S66	S48/S66	S48/S66	S48/S66	S66	S66				
	5.5K 2.39:1	S24/S48/S66	S24/S48/S66	S24/S48/S66	S24/S48/S66	S24/S48/S66	S48/S66	S48/S66	S48/S66	S48/S66	S48/S66	S48/S66	S48/S66	S48/S66	S48/S66	S66

Recording Format	Imager Mode	Shooting Framer S24/S48/S66 AXS Memory Card Support														
		24	25	30	48	50	60	66	72	75	88	90	96	100	110	120
X-OCN LT	8.6K 3:2	S24/S48/S66	S24/S48/S66	S48/S66												
	8.6K 17:9 8.1K 16:9	S24/S48/S66	S24/S48/S66	S24/S48/S66	S48/S66											
	8.2K 17:9 7.6K 16:9	S24/S48/S66	S24/S48/S66	S24/S48/S66	S48/S66	S48/S66	S48/S66									
	8.2K 2.39:1	S24/S48/S66	S24/S48/S66	S24/S48/S66	S24/S48/S66	S48/S66	S48/S66	S48/S66	S48/S66							
	5.8K 6:5	S24/S48/S66	S24/S48/S66	S24/S48/S66	S24/S48/S66											
	5.8K 4:3	S24/S48/S66	S24/S48/S66	S24/S48/S66	S24/S48/S66	S24/S48/S66										
	5.8K 17:9 5.4K 16:9	S24/S48/S66	S24/S48/S66	S24/S48/S66	S24/S48/S66	S24/S48/S66	S24/S48/S66	S24/S48/S66	S24/S48/S66	S24/S48/S66	S48/S66	S48/S66				
	5.5K 2.39:1	S24/S48/S66	S24/S48/S66	S24/S48/S66	S24/S48/S66	S24/S48/S66	S24/S48/S66	S24/S48/S66	S24/S48/S66	S24/S48/S66	S24/S48/S66	S24/S48/S66	S24/S48/S66	S24/S48/S66	S48/S66	S48/S66

VENICE 2 with 6K image sensor
Supporting format and FPS in AXS memory

Recording Format	Imager Mode	Shooting Framer S24/S48/S66 AXS Memory Card Support														
		24	25	30	48	50	60	66	72	75	88	90	96	100	110	120
X-OCN XT	6K 3:2	S48/S66	S48/S66	S48/S66	S66	S66	S66									
	6K 1.85:1	S24/S48/S66	S24/S48/S66	S48/S66	S48/S66	S48/S66	S66	S66	S66							
	6K 17:9 5.7K 16:9	S24/S48/S66	S24/S48/S66	S48/S66	S48/S66	S48/S66	S66	S66	S66							
	6K 2.39:1	S24/S48/S66	S24/S48/S66	S24/S48/S66	S48/S66	S48/S66	S48/S66	S48/S66	S66	S66	S66	S66				
	4K 6:5	S24/S48/S66	S24/S48/S66	S24/S48/S66	S48/S66	S48/S66	S48/S66	S48/S66	S48/S66							
	4K 4:3 Surround View	S24/S48/S66	S24/S48/S66	S24/S48/S66												
	4K 4:3	S24/S48/S66	S24/S48/S66	S24/S48/S66	S48/S66	S48/S66	S48/S66	S48/S66	S48/S66	S48/S66						
	4K 17:9 Surround View 3.8K 16:9 Surround View	S24/S48/S66	S24/S48/S66	S24/S48/S66	S24/S48/S66											
	4K 17:9 3.8K 16:9	S24/S48/S66	S24/S48/S66	S24/S48/S66	S24/S48/S66	S24/S48/S66	S24/S48/S66	S48/S66	S48/S66	S48/S66	S48/S66	S48/S66	S48/S66	S48/S66	S48/S66	
	4K 2.39:1	S24/S48/S66	S24/S48/S66	S24/S48/S66	S24/S48/S66	S24/S48/S66	S24/S48/S66	S24/S48/S66	S24/S48/S66	S24/S48/S66	S48/S66	S48/S66	S48/S66	S48/S66	S48/S66	S48/S66

Recording Format	Imager Mode	Shooting Framer S24/S48/S66 AXS Memory Card Support														
		24	25	30	48	50	60	66	72	75	88	90	96	100	110	120
X-OCN ST	6K 3:2	S24/S48/S66	S24/S48/S66	S24/S48/S66	S48/S66	S48/S66	S48/S66									
	6K 1.85:1	S24/S48/S66	S24/S48/S66	S24/S48/S66	S48/S66	S48/S66	S48/S66	S48/S66	S48/S66							
	6K 17:9 5.7K 16:9	S24/S48/S66	S24/S48/S66	S24/S48/S66	S48/S66	S48/S66	S48/S66	S48/S66	S48/S66							
	6K 2.39:1	S24/S48/S66	S24/S48/S66	S24/S48/S66	S24/S48/S66	S24/S48/S66	S48/S66	S48/S66	S48/S66	S48/S66	S48/S66	S48/S66				
	4K 6:5	S24/S48/S66	S24/S48/S66	S24/S48/S66	S24/S48/S66	S24/S48/S66	S48/S66	S48/S66	S48/S66							
	4K 4:3 Surround View	S24/S48/S66	S24/S48/S66	S24/S48/S66												
	4K 4:3	S24/S48/S66	S24/S48/S66	S24/S48/S66	S24/S48/S66	S24/S48/S66	S24/S48/S66	S48/S66	S48/S66	S48/S66						
	4K 17:9 Surround View 3.8K 16:9 Surround View	S24/S48/S66	S24/S48/S66	S24/S48/S66	S24/S48/S66											
	4K 17:9 3.8K 16:9	S24/S48/S66	S24/S48/S66	S24/S48/S66	S24/S48/S66	S24/S48/S66	S24/S48/S66	S24/S48/S66	S24/S48/S66	S24/S48/S66	S24/S48/S66	S24/S48/S66	S48/S66	S48/S66	S48/S66	
	4K 2.39:1	S24/S48/S66	S24/S48/S66	S24/S48/S66	S24/S48/S66	S24/S48/S66	S24/S48/S66	S24/S48/S66	S24/S48/S66	S24/S48/S66	S24/S48/S66	S24/S48/S66	S24/S48/S66	S24/S48/S66	S24/S48/S66	S48/S66

Recording Format	Imager Mode	Shooting Framer S24/S48/S66 AXS Memory Card Support														
		24	25	30	48	50	60	66	72	75	88	90	96	100	110	120
X-OCN LT	6K 3:2	S24/S48/S66	S24/S48/S66	S24/S48/S66	S24/S48/S66	S24/S48/S66	S48/S66									
	6K 1.85:1	S24/S48/S66	S24/S48/S66	S24/S48/S66	S24/S48/S66	S24/S48/S66	S24/S48/S66	S24/S48/S66	S48/S66							
	6K 17:9 5.7K 16:9	S24/S48/S66	S24/S48/S66	S24/S48/S66	S24/S48/S66	S24/S48/S66	S24/S48/S66	S24/S48/S66	S48/S66							
	6K 2.39:1	S24/S48/S66	S24/S48/S66	S24/S48/S66	S24/S48/S66	S24/S48/S66	S24/S48/S66	S24/S48/S66	S24/S48/S66	S24/S48/S66	S24/S48/S66	S48/S66				
	4K 6:5	S24/S48/S66	S24/S48/S66	S24/S48/S66	S24/S48/S66	S24/S48/S66	S24/S48/S66	S24/S48/S66	S24/S48/S66							
	4K 4:3 Surround View	S24/S48/S66	S24/S48/S66	S24/S48/S66												
	4K 4:3	S24/S48/S66	S24/S48/S66	S24/S48/S66	S24/S48/S66	S24/S48/S66	S24/S48/S66	S24/S48/S66	S24/S48/S66	S24/S48/S66						
	4K 17:9 Surround View 3.8K 16:9 Surround View	S24/S48/S66	S24/S48/S66	S24/S48/S66	S24/S48/S66											
	4K 17:9 3.8K 16:9	S24/S48/S66	S24/S48/S66	S24/S48/S66	S24/S48/S66	S24/S48/S66	S24/S48/S66	S24/S48/S66	S24/S48/S66	S24/S48/S66	S24/S48/S66	S24/S48/S66	S24/S48/S66	S24/S48/S66	S24/S48/S66	
	4K 2.39:1	S24/S48/S66	S24/S48/S66	S24/S48/S66	S24/S48/S66	S24/S48/S66	S24/S48/S66	S24/S48/S66	S24/S48/S66	S24/S48/S66	S24/S48/S66	S24/S48/S66	S24/S48/S66	S24/S48/S66	S24/S48/S66	S24/S48/S66

BURANO

CFexpress (Type B) Memory Card – CEB-G Series

CEB-G1920T
(1920GB / VPG400)

CEB-G960T
(960GB / VPG400)

On this camera, Sony CFexpress (Type B) VPG400 Memory Card is recommended to use – which allows a maximum of shooting frame rate at each imager scan mode.

Recommended Recording Media

The guaranteed operating conditions will vary depending on the Rec Format and Recording settings.
Yes: Operation supported
No: Normal operation not guaranteed

Recording format		CFexpress Type B (exFAT)		
		Non-VPG	VPG200	VPG400
X-OCN (LT)	8.6K 17:9	No	No	Yes
	8.6K 16:9	No	No	Yes
	6K 17:9	No	No	Yes
	6K 16:9	No	No	Yes
	5.8K 17:9	No	No	Yes
	5.8K 16:9	No	No	Yes
X-OCN (LT)	4K 17:9	No	No	Yes

Recording Format	Imager Scan Mode	Frame Rate
X-OCN LT	**FF 8.6K 17:9**	**1-30**
	FF 8.6K 16:9	
	FFc 6K 17:9	**1-60**
	FFc 6K 16:9	
	S35 5.8K 17:9	
	S35 5.8K 16:9	
	S35c 4K 17:9	**1-60, 100, 120**

FX5

CFexpress (Type A) Memory Card – CEA-G Series

CEA-G1920T
(1920GB / VPG400)

CEA-G960T
(960GB / VPG400)

On this camera, only CFexpress (Type A) VPG400 Memory Card is guaranteed to operate for X-OCN recording.

Codec	Imager Scan Mode	CFexpress Type A	
		VPG200	VPG400
X-OCN LT X-OCN C1 X-OCN C2	FF 5K 3:2	-	✓
	FF 5K 17:9	-	✓
	FF 5K 16:9	-	✓
	FFc 3.8K 16:9	-	✓

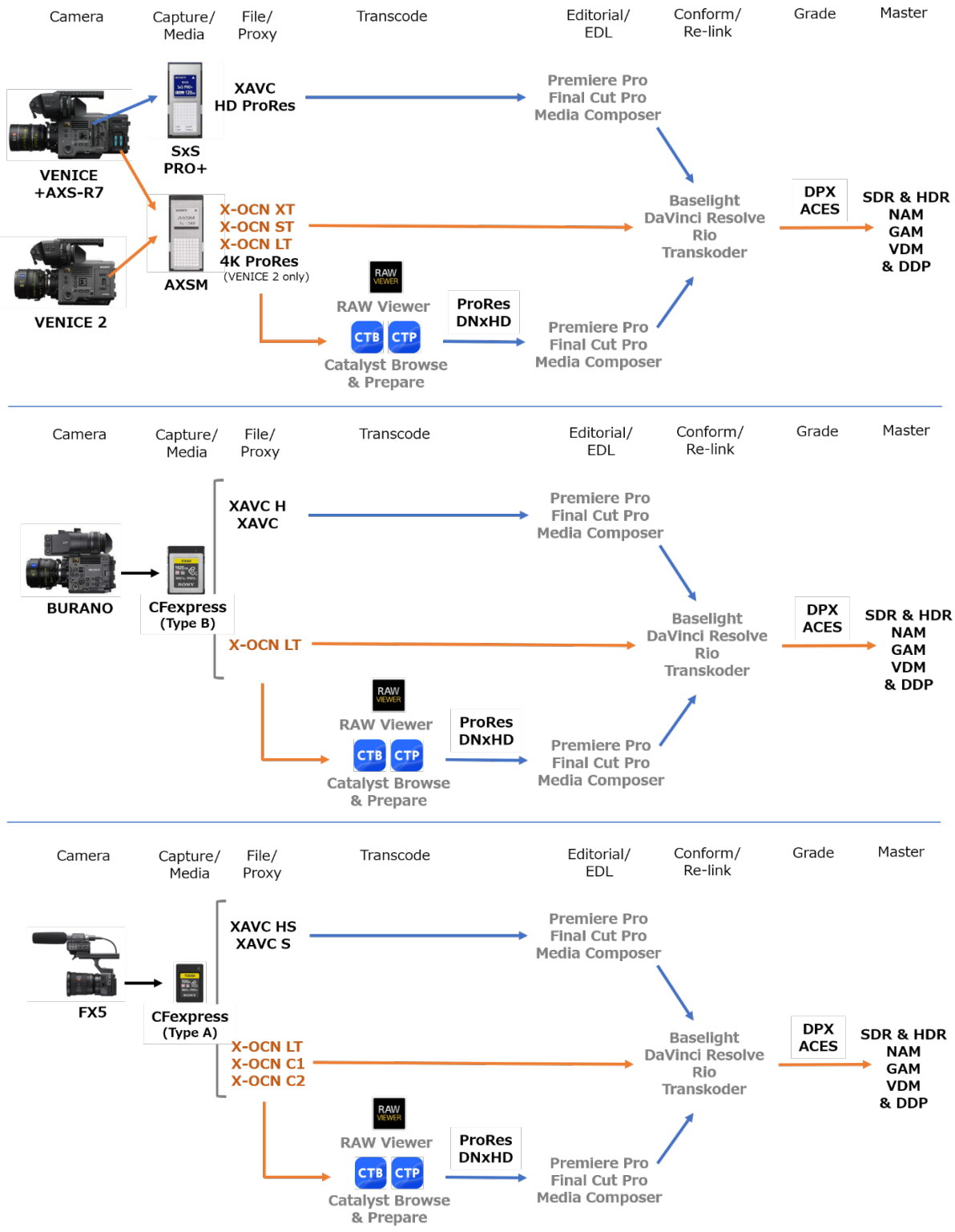
Support for Variable Frame Rate (Slow & Quick Motion) feature in X-OCN recording is currently under consideration for a future firmware update.

Project Frame Rate	Imager Scan Mode	X-OCN		
		LT	C1	C2
59.94 / 50 29.97 / 25 23.98 / 24	FF 5K 3:2	Fixed	Fixed	Fixed
	FF 5K 17:9	Fixed	Fixed	Fixed
	FF 5K 16:9	Fixed	Fixed	Fixed
	FFc 3.8K 16:9	Fixed	Fixed	Fixed

X-OCN WORKFLOW

- Workflow Overview (from Capture to Master)
- Sony RAW Viewer
- Sony RAW SDK
- Full Third-party Support
- Metadata

Workflow Overview (from Capture to Master)

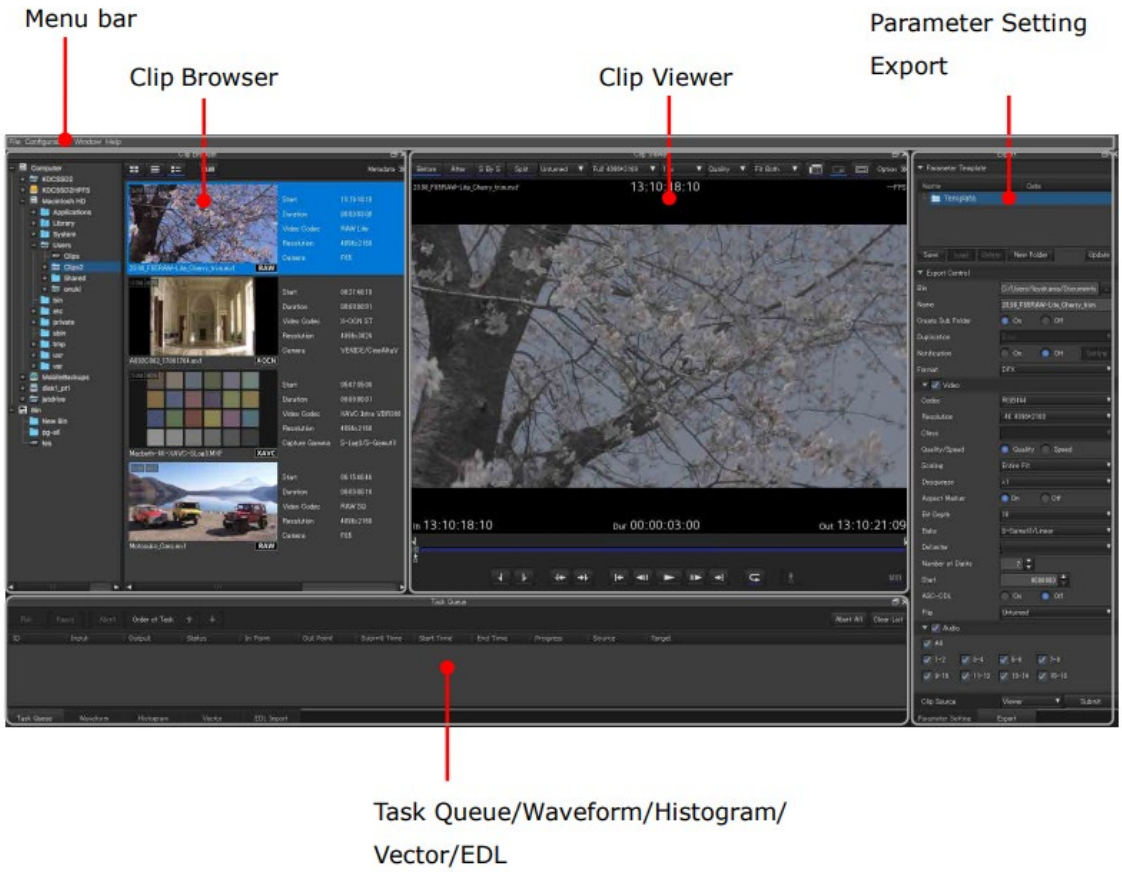


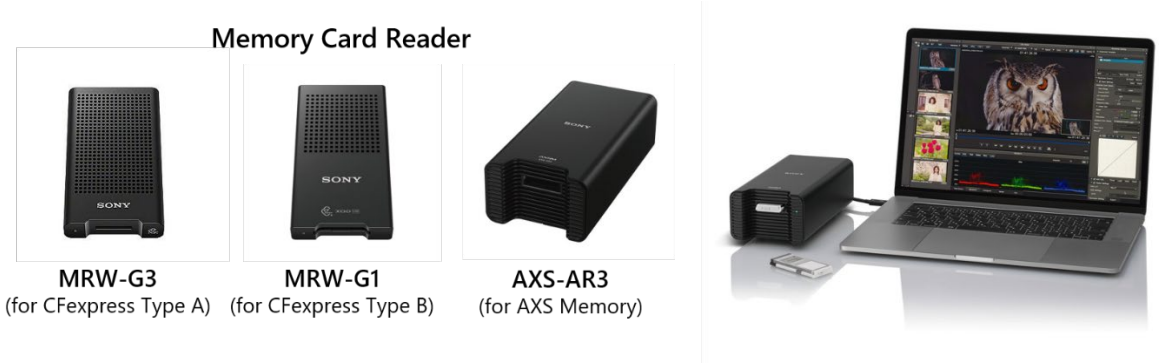
Sony RAW Viewer

RAW Viewer is free application software that allows you to view RAW, X-OCN and XAVC files recorded with Sony VENICE 2, VENICE, BURANO and other cameras as well as AXS-R7 recorder.

With its intuitive user interface, you can view and perform basic color grading on files transferred to your computer, or files stored on a memory card inserted to AXS-AR3 or other card reader.

In addition, you can also export RAW, X-OCN and XAVC files to DPX, OpenEXR, XAVC or ProRes (only for Mac) format to facilitate file based post-production workflow.





Sony RAW SDK

Sony offers a license program to support third-party development for X-OCN format. This program includes supply of technical documents and SDK.

Over 50 third-party companies already take part in this program to support X-OCN on their own products.

For more information, please contact : psg-biz-alliance-agrmnt@sony.com

Full Third-party Support

X-OCN is supported by leading non-linear editing software and color grading tools such as Adobe Premiere Pro, Avid Media Composer via nablet Sony RAW AMA plug-in, Blackmagic DaVinci Resolve, Colorfront OSD and Filmlight Baselight, to name a few.

For more details, please refer to another document :

X-OCN Supported Products by Alliance Partners

Metadata

X-OCN is a very easy and flexible format to work with Metadata that reflects the setup of the camera is recorded alongside the image information.

In post-production this metadata is automatically applied to the 16-bit linear recordings so that what you see in the edit or grading suite accurately reflects the way the camera was set. However, in post-production you can override the metadata settings for color temperature, Exposure Index and sharpness etc* to alter the way the data is processed.

This gives a tremendous degree of flexibility while retaining the exceptional quality of the 16-bit recording.

*The controls available depends on the software used

The following information is a list of metadata recorded as embedded in X-OCN MXF files, as well as recorded in XML files at the same time on the camera.

(Information on FX5 is planned to be updated around September 2026)

Table legend

Opt: Included if information is available on a lens attached to the camera (optional)

Yes: Defined

－: Not defined　　*These examples are based on clips shot on VENICE 2

Item	Notation example* in RAW Viewer	X-OCN MXF		X-OCN XML	
		VENICE 2	BURANO	VENICE 2	BURANO
Creation Date	2021-10-29 11:04:05	Yes	Yes	Yes	Yes
Last Update	2021-10-30 11:04:05	－	－	Yes	Yes
UMID	060A2B340101010501010D43130000000 70BF41D2F494EB7A16DD045A68CDF2E	Yes	Yes	Yes	Yes
Start	03:36:29:20	Yes	Yes	Yes	Yes
End	03:36:32:19	Yes	Yes	Yes	Yes
Duration	00:00:03:00	Yes	Yes	Yes	Yes
Poster Frame		－	－	－	－
Recording Mode		－	－	Yes	Yes
Drop Frame	NDF	Yes	Yes	Yes	Yes
Camera	VENICE/CineAltaV	Yes	Yes	Yes	Yes
Video Codec	X-OCN XT	Yes	Yes	Yes	Yes
Resolution	6048x4032	Yes	Yes	Yes	Yes
Aspect Ratio	3:2	Yes	Yes	Yes	Yes
Format FPS	23.98p	Yes	Yes	Yes	Yes
Capture FPS	23.98p	Yes	Yes	Yes	Yes
Pixel Aspect	1:1	－	－	Yes	Yes
Flip	normal	－	－	Yes	Yes
Embeded 3DLUT	SL3SG3Ctos709.cube	Yes	－	－	－
Number of Audio Channels	4	Yes	Yes	Yes	Yes
Audio Codec	LPCM	Yes	Yes	Yes	Yes
Audio Bit Depth	24	Yes	Yes	Yes	Yes
Audio Sampling Rate	48000	Yes	Yes	Yes	Yes
Auto Exposure Mode	ManualExposureMode	Yes	Yes	－	－
Exposure Index	500	Yes	Yes	Yes	Yes
Auto Focus Sensing Area Setting	ManualFocusMode	Yes	Yes	－	－
ND Filter Wheel	1/4	Yes	Yes	Yes	Yes
Image Sensor Dimension Effective Width	35925um	Yes	Yes	－	－
Image Sensor Dimension Effective Height	23950um	Yes	Yes	－	－
Image Sensor Readout Mode	ProgressiveFrame	Yes	Yes	Yes	Yes
Shutter Speed Angle	172.50deg	Yes	Yes	Yes	Yes
Shutter Speed Time	1/50sec	Yes	Yes	－	－
Camera Master Gain Adjustment	0.00dB	Yes	Yes	－	－
ISO Sensitivity	500	Yes	Yes	Yes	Yes
Electrical Extender Magnification	100%	Yes	Yes	－	－
Auto White Balance Mode	PresetWhiteBalanceSetup	Yes	Yes	－	－
White Balance	5500	Yes	Yes	Yes	Yes
Tint Correction	0.00000	Yes	Yes	－	－
Camera Master Black Level	3.0%	－	－	－	－
Capture Gamma Equation	scene-linear	Yes	Yes	Yes	Yes
Gamma for CDL	rec709	Yes	－	Yes	－
Color Primaries (Capture Color Primaries)		－	－	－	－
Camera Attributes	MPC-36289999999Version5.00	Yes	Yes	Yes	Yes
Effective Marker Aspect Ratio	6048:3202	Yes	Yes	Yes	Yes
User Frame Line 1	1920×1080+0+0	Yes	Yes	－	－
User Frame Line 2	1920×1080+0+0	Yes	－	－	－
Active Area Aspect Ratio	6048:4032	Yes	Yes	Yes	Yes
Pixel Aspect Ratio	1:1	Yes	Yes	Yes	Yes
Image Orientation	normal	Yes	Yes	－	－
Raw Black Code	512	Yes	Yes	Yes	Yes
Raw Gray Code	1504	Yes	Yes	Yes	Yes
Raw White Code	5472	Yes	Yes	Yes	Yes
Gamma for Look	s-log3-cine	Yes	Yes	Yes	Yes
Color for Look	s-gamut3-cine	Yes	Yes	Yes	Yes

Item	Notation example* in RAW Viewer	X-OCN MXF		X-OCN XML	
		VENICE 2	BURANO	VENICE 2	BURANO
Pre-CDL Transform	LUT:SL3SG3Ctos709.cube	Yes	Yes	Yes	Yes
Post-CDL Transform	none	Yes	–	Yes	–
Look Process Baked	false	Yes	Yes	Yes	Yes
Monitoring Characteristics	rec709	Yes	Yes	Yes	Yes
Monitoring Base Curve	rec709	Yes	Yes	Yes	Yes
Monitoring Color Primaries	rec709	Yes	Yes	Yes	Yes
Monitoring Coding Equations	rec709	Yes	Yes	Yes	Yes
Monitoring Descriptions	LUT:SL3SG3Ctos709.cube	Yes	Yes	Yes	Yes
Camera Tilt Angle	2.70000	Yes	–	–	–
Camera Roll Angle	1.30000	Yes	–	–	–
Focus Distance	2296mm	Opt	–	–	–
Aperture Value	3.14	Opt	–	–	–
Aperture Ring T Stop Position	2.8 + 3/10	Opt	–	–	–
Current Focal Length	0mm	Opt	–	–	–
Hyperfocal Distance	219224mm	Opt	–	–	–
Near Focus Distance	2273mm	Opt	–	–	–
Far Focus Distance	2319mm	Opt	–	–	–
Horizontal Field of View	27.9deg	Opt	–	–	–
Entrance Pupil Position	+51mm	Opt	–	–	–
Normalised Zoom Value	0.000	Opt	–	–	–
Lens Serial Number	xxxxxxxx	Opt	–	–	–
Iris F-Number	2.87	Opt	Opt	–	–
Iris T-Number	3.1	Opt	Opt	–	–
Iris Ring Position		Opt	Opt	–	–
Focus Position from Image Plane	2.296m	Opt	Opt	–	–
Focus Ring Position		Opt	Opt	–	–
Macro Setting	OFF	Opt	Opt	–	–
Lens Zoom 35mm Still Camera Equivalent	85mm	Opt	Opt	–	–
Lens Zoom Actual Focal Length	85mm	Opt	Opt	–	–
Zoom Ring Position		Opt	Opt	–	–
Anamorphic Lens Squeeze Ratio		Opt	Opt	–	–
Optical Extender Magnification	100%	Opt	Opt	–	–
Lens Attributes	xxxxxxxx	Opt	Opt	Opt	Opt
Cooke /i technology		Opt	–	–	–
Cooke /i2 technology		Opt	–	–	–
Cooke /i3 technology		Opt	–	–	–
Zeiss eXtended metadata		Opt	–	–	–
Description		–	–	–	–
Circle		–	–	–	–
Project		–	–	–	–
Director Name		–	–	–	–
Director of Photography Name		–	–	–	–
Production		–	–	–	–
Camera Index		–	–	Yes	Yes
Reel		–	–	Yes	Yes
Scene		–	–	–	–
Cut		–	–	–	–
Take		–	–	–	–
Shot		–	–	Yes	Yes
Mark In		–	–	–	–
Mark Out		–	–	–	–

CONCLUSION

X-OCN (Sony's original compressed RAW format) gives you all the benefits of a RAW workflow but without huge file sizes normally associated with uncompressed RAW. It takes everything that the sensor captures and uses a clever encoding process to store that information in a user friendly, compact, 16-bit MXF file.

The 16-bit scene linear files ensure that you are recording every nuance and every subtle texture that the camera can deliver, maximizing your grading and post-production possibilities. At the same time the compact file size delivers a fast and efficient workflow. Transfer times are faster and storage requirements significantly reduced compared to other uncompressed workflows.

X-OCN files are computer friendly, allowing for fast workflows even with modest post-production hardware.