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XDCAM HD422 Family

PDW-F800/PDW-700
XDCAM HD422 Camcorder

PDW-F1600/PDW-HD1500
XDCAM HD422 Recording Deck

PDW-HR1/MK1
XDCAM HD422 Hybrid Field Recorder

PDW-U2/PDW-U1
XDCAM Drive Unit

XDCAM HD MPEG HD422 CINEALTA Professional Disc DL Professional Disc XL-QD

Setting a New Benchmark: XDCAM HD422 Takes the Lead in File-based Production

Since its introduction in 2003, Sony's XDCAM™ Series has been embraced around the world for its file-based recording capability utilizing high-capacity and reliable Professional Disc™ media. Within this series, top-of-the-line XDCAM HD422 products were introduced in 2008; today, they represent an ever-expanding range that delivers a brilliant image resolution of 1920 x 1080 and eight-channel 24-bit uncompressed audio. With fast file-based operation and outstanding picture quality, XDCAM HD422 products are ideal for applications such as news gathering, when speed is a key concern, and invaluable when a high-quality impression is crucial, for example in the production of TV dramas, documentaries, and mainstream entertainment programs. In 2010, file-based operation was further enhanced with SxS Pro and SxS-1 memory media, while file interoperability was also maintained.

XDCAM HD422 Series

PDW-F800
PDW-700
Professional Disc Camcorder

PDW-HR1/MK1
XDCAM HD422
Hybrid Field Recorder

PDW-F1600
PDW-HD1500
Recording Deck

XDCAM Archive

PMW-500
SxS Memory Camcorder

PDW-U2
PDW-U1
Drive Unit

XDS-PD2000
XDS-PD1000
XDS-1000
Professional Media Station

PDJ-A640
PDJ-C1080
Cart

PFD50DLA/PFD23A
Professional Disc

PFD128QLW
Professional Disc Write Once

Acquisition → Ingest → Edit → Playout → Archive

XDCAM HD422 - At the Top of the XDCAM Series

Sony is proud to introduce the XDCAM HD422 lineup as its top-of-the-line products in the XDCAM Series. These powerful tools provide stunning, high-quality recording in both image and audio, as well as versatile operation enabled by a range of interfaces.

HD 1920 x 1080 and 1280 x 720 Recording Using the MPEG HD422 Codec

XDCAM HD422 products record and play back high-definition video with 1920 x 1080 and 1280 x 720 resolutions using MPEG HD422 compression, which employs MPEG-2 4:2:2P@HL compression technology. Data rates of up to 50 Mbps are used for recording, providing the highest picture quality in the XDCAM Series while keeping data size as low as possible for easy transfer and transmission. Moreover, the MPEG HD422 codec is based on industry-standard MPEG compression, offering high compatibility with many other devices such as nonlinear editing systems.

Wide Choice of Video Formats: Interlace and Progressive

XDCAM HD422 products offer a wide choice of video formats for different frame rates and scanning modes. They include 59.94i, 50i, 29.97p, 25p, and 23.98p*1 in a resolution of 1920 x 1080, and 59.94p and 50p in 1280 x 720.

*1: The PDW-700 requires the CBKZ-FC02 key. The PDW-HD1500 requires the PDBK-F1500 hardware key.

A Variety of Selectable Recording Modes and Video Formats

In addition to high-quality MPEG HD422 50-Mbps mode, the XDCAM HD422 lineup can record and play back videos at different bit rates and in a variety of video formats. In terms of the common system frequency, clips recorded in different formats can be recorded on a single disc*1.

*1: When playing back across clips recorded in different recording formats, video and audio playback may stop and then restart at the point where formats change.

High-quality Uncompressed Audio Recording

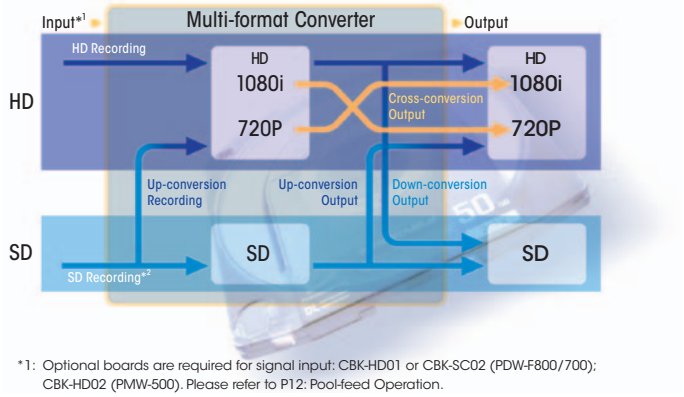
In addition to HD video recording, eight-channel high-quality audio is an equally significant feature in the XDCAM HD422 system. The PDW-F1600/HD1500 has eight audio channels (HD-SDI), while the PDW-F800/700 camcorder has four audio channels. Both can record 24-bit, 48 kHz uncompressed audio on each channel.

Up/down- and Cross-conversion Capability

XDCAM HD422 products come equipped with powerful up/down- and cross-conversion systems, which provide great operational flexibility. Conversions can be done via HD-SDI input*1/output, SD-SDI input*2/output and composite input*2/output.

*1: The PDW-F800/700 requires an optional CBK-HD01 board.
*2: The PDW-F800/700 requires an optional CBK-SC02 board.
*1 *2: The PMW-500 requires an optional CBK-HD02 board.

XDCAM HD422 Format Conversion Capability on PDW-F800/700/F1600/HD1500, and HR1



*1: Optional boards are required for signal input: CBK-HD01 or CBK-SC02 (PDW-F800/700); CBK-HD02 (PMW-500). Please refer to P12: Pool-feed Operation.
*2: Optional hardware keys are required: CBKZ-MD01 (PDW-700); PDBK-S1500 or PDBK-F1500 (PDW-HD1500); CBK-MD01 (PMW-500).
*1 *2: The PMW-500 can record the cross-converted or HD up-converted signal after it is processed at input stage. Yet, there is no cross-conversion nor HD up-conversion at output stage. The SD down-conversion is provided at output stage.

XDCAM HD 422 Recording/Playback Specifications

Mode (Codec)	Number of Pixels	Bit Rate (Mbps)	Audio Bits	Audio Channels	Y/C Sampling	Frame Frequency	Recording Time (Unit: Minutes)		
							PFD23A 23.3 GB	PFD50DLA 50 GB	SxS-1*8 64 GB
MPEG HD422 (MPEG-2 4:2:2P@HL)	1920 x 1080	50	24	8*3	4:2:2	59.94i, 50i, 29.97p, 25p, 23.98p*4	Approx. 43	Approx. 95	Approx. 120
	1280 x 720					59.94p, 50p, 29.97p*6, 25p*6, 23.98p (Pull-down)*7			
MPEG HD (MPEG-2 MP@HL)	1920 x 1080*6	35	16	4	4:2:0	59.94i, 50i, 29.97p, 25p, 23.98p*4	-	-	Approx. 200
	1440 x 1080			2*2*5			more than 65	more than 145	Approx. 180
		25		4			more than 68	more than 150	-
				2*2*5			Approx. 85	Approx. 190	Approx. 280
		18*2*5		4			Approx. 90	Approx. 200	-
				2			more than 112	more than 248	-
	1280 x 720	35	16	4		59.94p, 50p, 29.97p*6, 25p*6, 23.98p (Pull-down)	more than 122	more than 265	-
		25*5					more than 65	more than 145	Approx. 180
							Approx. 85	Approx. 190	-
MPEG IMX*1 (MPEG-2 4:2:2P@ML)	720 x 480 (NTSC) 720 x 576 (PAL)	50	24	4	4:2:2	59.94i, 50i, 29.97p*6, 25p*6	Approx. 45	Approx. 100	Approx. 120
			16	8*3					
		40*5	24	4			Approx. 55	Approx. 120	-
			16	8*3					-
		30*5	24	4			Approx. 68	Approx. 150	-
			16	8*3					-
DVCAM*1	720 x 480 (NTSC) 720 x 576 (PAL)	25	16	4	4:1:1 (NTSC) 4:2:0 (PAL)	59.94i, 50i, 29.97p*6, 25p*6	Approx. 85	Approx. 185	Approx. 220

*1: Optional hardware keys are required: CBKZ-MD01 (PDW-700); PDBK-S1500 or PDBK-F1500 (PDW-HD1500); CBK-MD01 (PMW-500).
*2: For the PDW-700/F800, playback is only available.
*3: Up to four-channel with the PDW-F800/700 and PMW-500.
*4: Optional hardware keys are required: CBKZ-FC02 (PDW-700); PDBK-F1500 (PDW-HD1500).
*5: Only in the PDW-700/F800 (not available in the PMW-500).
*6: Only in the PMW-500 (not available in the PDW-700/F800).
*7: Pull-down recording is only in the PDW-700/F800. The PMW-500 has 23.98p recording.
*8: The PMW-500 has two recording modes (UDF and FAT), and recording times may vary.

Powerful Nonlinear Recording - Professional Disc Media

PFD128QLW

PFD50DLA

PFD23A

Media characteristics are critical to video production workflow. Sony's Professional Disc media are highly reliable yet cost effective, and specifically developed with utmost consideration for professional recording applications.

- PFD50DLA 50 GB disc and PFD23A 23 GB disc PFD128QLW*1 128 GB disc (Write Once)
- Split-second random access
- No need to cue up when starting recording
- Long recording times: in MPEG HD422, up to 95 minutes (50 Mbps) with the PFD50DLA, up to 240 minutes (50 Mbps) with the PFD128QLW*2
- Outstanding archival life
- No mechanical contact between disc and optical pickup - achieving high durability for rewriting
- Phase change recording - effective against erosion caused by ultraviolet rays
- Robust against any degradation caused by ultraviolet rays or ambient storage conditions
- Packaged in an extremely durable, dust-resistant and Easy-to-handle cartridge

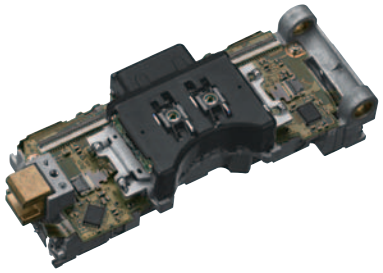
Professional Disc Specifications

	PFD128QLW	PFD50DLA	PFD23A
Dimension	5 1/8 x 5 1/4 x 3/8 inches (129 x 131 x 9 mm)		
Weight	3 oz (90 g)		
Media type	Write Once	Rewritable	
Capacity*3	128 GB	50 GB	23.3 GB
Transfer rate*4 (with a single pickup)	max.144 Mbps	max. 86 Mbps	
Read cycles	more than 1,000,000		
Rewrite cycles	1*5	more than 1,000	
Recording format	Phase-change recording		
Estimated archival life*6	50 years		

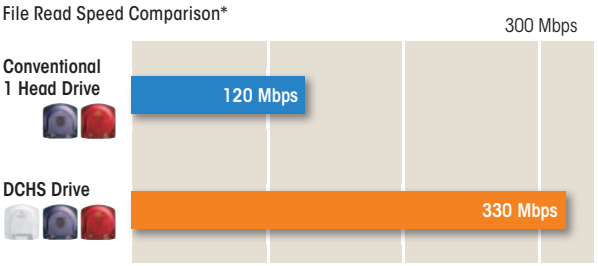
*1: The PFD128QLW can only be used with the PDW-U2 and XDCAM Station Series (XDS-1000/PD1000/PD2000).
*2: Recordable time may vary according to the total number of recorded files, and recording conditions.
*3: A portion of the user data area will be used for data management. This total user area may vary.
*4: Transfer rate varies according to product and recording format.
*5: Additional recording is supported prior to finalizing the disc.
*6: Estimated from Sony's accelerated test.

Dual-channel Head System (DCHS) Drive

The PDW-U2 and XDCAM Station Series (XDS-1000/PD1000/PD2000) adopt the Dual-channel Head System (DCHS) for their Professional Disc drive. The DCHS drive is equipped with two optics on one head. This realizes higher transfer speeds in a more compact size and with lower power consumption compared with a drive with two optical heads.



High transfer speeds give a significant boost to ingest, edit, and archive workflows.



* Drive performance.

SxS Memory Cards Combine High Transfer Speeds and High Reliability

The PMW-500, XDCAM Station Series, and PDW-HR1/MK1 all accept the SxS memory card. These products can handle the same files as current Professional Disc products and XDCAM EX products.
Both SxS PRO™ and SxS-1™*1 memory cards use the PCI Express interface to achieve an extremely high data-transfer speed of 1.2 Gbps via SBS-64G1A/32G1A and 800 Mbps via the other SxS memory cards.
These cards can resist considerable shock (1500 G) and vibration (15 G). Also, a unique Salvage function serves to restore content damaged by power loss or memory disconnection during recording*2.

*1: SxS-1 memory cards support fewer re-writes than SxS PRO memory cards. Notification is given when an SxS-1 memory card approaches its end of life.
*2: In some cases, images recorded just before an accident may not be restored (several seconds). No warranty is given on always achieving content restoration.

Data File Recording via User Data Folder

Professional Disc media formatted by XDCAM HD422 products*1 can be used for data storage. As well as XDCAM AV files, every type of PC file can be recorded onto the disc's User Data folder, allowing users to deliver and archive precious AV content with related materials.

*1: This capacity is up to 21.5 GB (PFD23A) or 46.4 GB (PFD50DLA). Discs formatted by XDCAM SD and XDCAM HD products do not support this capability but include 500 MB of general data area.

File Format for Content Exchange and Sharing: Material eXchange Format (MXF)

In Sony's XDCAM Series, recordings are made as data files in the industry-standard MXF (Material eXchange Format) file format, which is compliant with SMPTE 378M (OP-1a). This allows material to be handled with great flexibility in an IT-based environment - it is easily available for copying, transferring, sharing, and archiving.

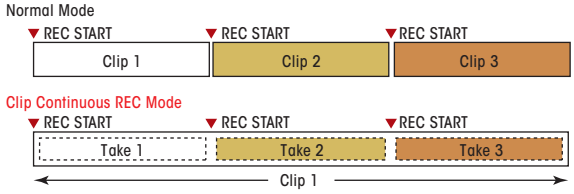
IT/Network Friendly

XDCAM HD422 Professional Disc camcorders and decks come equipped with IT-friendly, computer-based interfaces for transferring material. These include an i.LINK™*1 interface supporting File Access mode and an Ethernet interface. Equipped with a Direct FTP function, XDCAM HD422 camcorders and decks can transfer files via Ethernet without a PC.

*1: i.LINK is a Sony trademark used only to designate that a product is equipped with an IEEE 1394 connector. Not all products with an i.LINK connector may communicate with each other. Please refer to the documentation that comes with any device having an i.LINK connector for information on compatibility, operating conditions, and proper connection.

Selectable Modes of File Recording

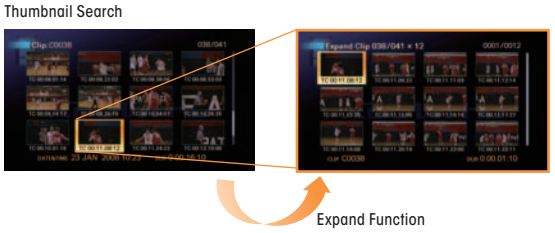
XDCAM HD422 products provide two types of file recording mode. In standard operation, one clip file is created each time recording is started and stopped. In the other mode, called Clip Continuous REC mode, one clip file can be created at the user's discretion. Although it is a single clip, Thumbnail Search operation and the Expand function are available just as if individual clips were created. Users can choose the most suitable mode depending on the type of application.



File-based Search Operation

The XDCAM HD422 Series comes with the following functions which further facilitate the search process:

■ Thumbnail Search operation and an Expand function, allowing users to search for materials using thumbnails as a visual reference.



■ Clip Filtering*1: can use Clipflag, Planning Metadata, and the AV format to sort desired clips.

*1: Clip Filtering is not available in the XDCAM Station. Sorting by metadata and format is not available in the PMW-500.

Local Language Support*1

A number of fonts for local languages can be used in Clip/Disc Properties. Supported languages include: Chinese, German, French, Korean, Spanish, Russian, Japanese, and more.

*1: The applicable language depends on the products. These languages are only available in the PDW-700/F800/HD1500/F1600.
Japanese and Korean are not available in the PMW-500.

EDL-based Editing - Scene Selection Function

The Scene Selection function allows simple cuts-only editing*1 to be performed within the camcorder or deck itself. The result of these edits can be saved as an XDCAM EDL (also called a Clip List), which can be written back to the original disc so as to stay with the material.

*1: The video and audio of a clip cannot be edited independently.

Proxy Data

At the same time as recording high-resolution video and audio data, a low-resolution version of this AV data (called Proxy Data) is recorded on the same disc. Proxy Data is much smaller in size, can be transferred at an amazingly high speed, easily browsed and simply edited using the XDCAM Browser (or compatible editing software offered by many other industry-leading manufacturers).

Metadata

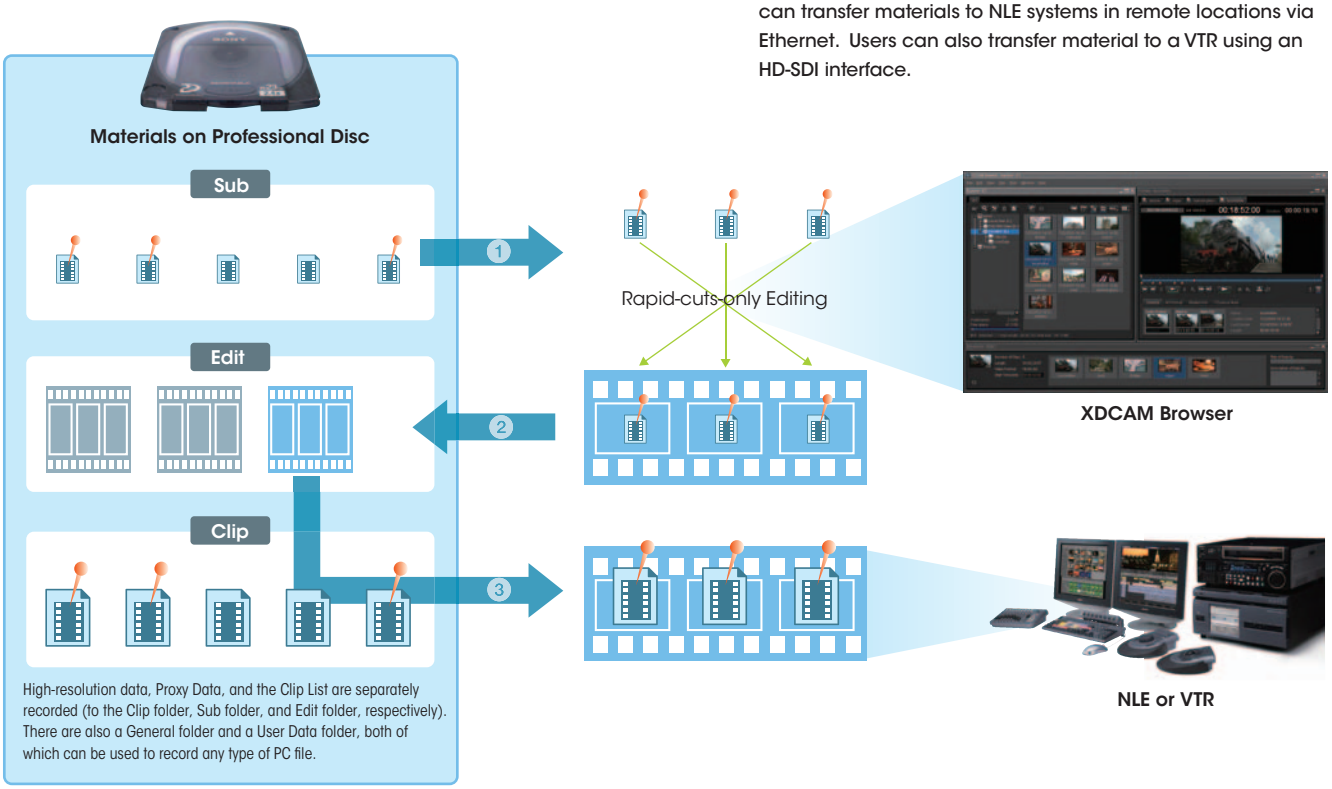
All XDCAM HD422 products are capable of recording a variety of metadata, which provides a huge advantage when searching for specific data after an initial recording has been made. Information such as production dates, creator names, and camera setup parameters can be saved together with the AV material. This makes it possible to organize and search through all recordings effectively. One particular metadata, called EssenceMark™ (Shot Mark), is a convenient reference that can be added to desired frames to make them easy to recall in subsequent editing processes. Clipflag is another convenient metadata which users can add to their desired clips as "OK", "NG" (No Good) or "KP" (Keep). This simplifies efficient clip management, enabling for example batch ingesting of OK clips or deletion of all NG clips.

XDCAM Workflow: Rapid Cuts-only Editing and Partial Transfer

❶ Proxy Data can be downloaded at an amazingly high speed. Users can easily find required material by referring to metadata.

❷ Users can quickly make a storyboard using the XDCAM Browser. Storyboarding can now be performed in the field with just a mid-specification notebook computer, because Proxy Data is so light in size. Storyboard data (the Clip List) is recorded back to Professional Disc media.

❸ If required, only the parts necessary for the storyboard are transferred to the editing system. XDCAM HD422 products can transfer materials to NLE systems in remote locations via Ethernet. Users can also transfer material to a VTR using an HD-SDI interface.



XMPilot:
Workflow Empowered by XDCAM Metadata

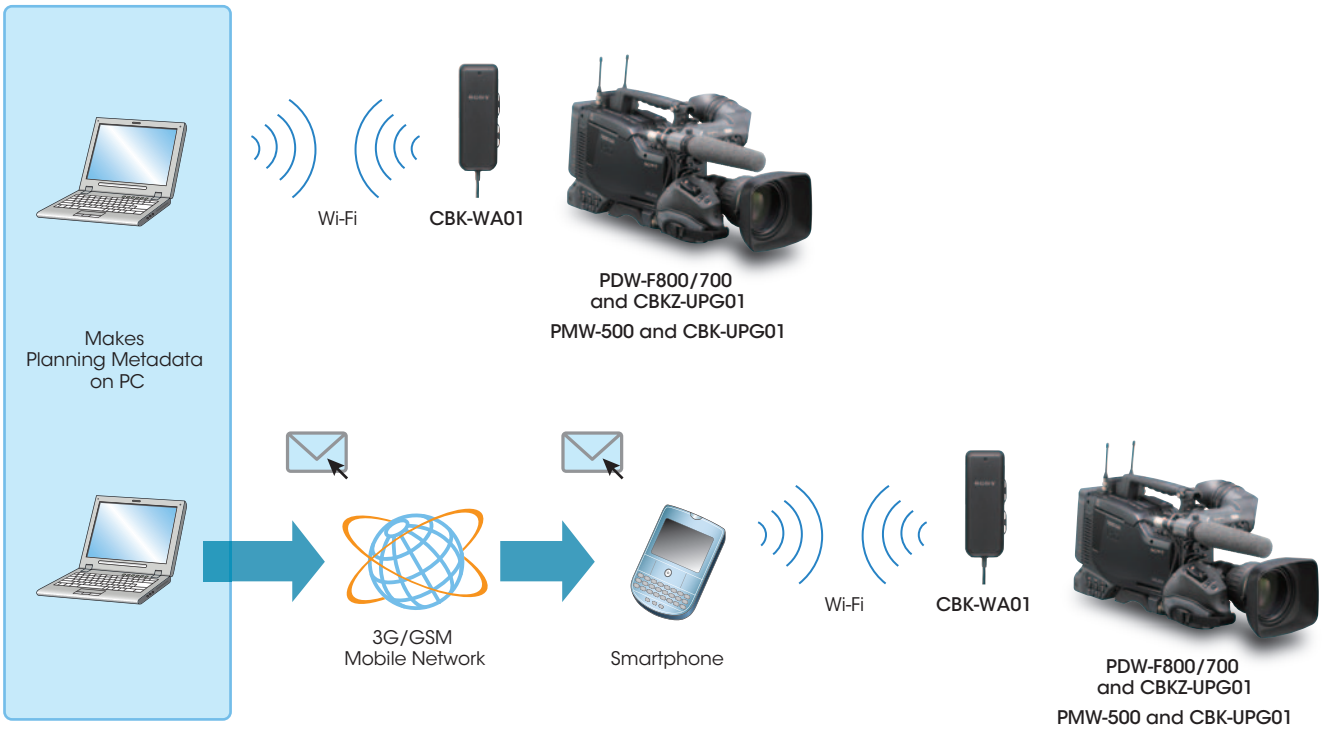
Before shooting starts, users can import the metadata that will be used. This type of metadata is named Planning Metadata, and it includes information about the clips to be shot. It diminishes the time and effort of inputting metadata at a location, thus achieving a smooth interface with post-production and archiving.

Users can make a PC file of Planning Metadata, including clip names and EssenceMarks™, and import this file to camcorders via Ethernet, USB memory, or smartphones *1.

*1: Requires the optional CBK-WA01 adapter and CBKZ-UPG01 software key.

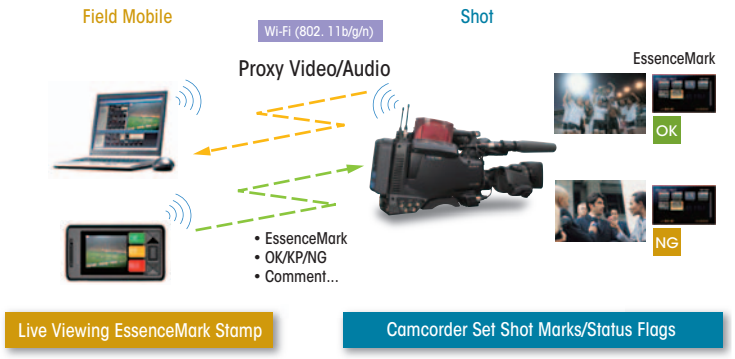
XMPilot™

Planning Metadata Upload Using CBK-WA01 Wi-Fi Adapter



Live Viewing and Logging

View live video on a PC or smartphone. Users can set the EssenceMark™ to OK, KP (Keep), or NG (No Good) during shooting.



Planning Metadata Add-in software
- Create Planning Metadata via Microsoft Outlook
- Transfers Planning Metadata directly to a camcorder via wi-fi
- Transfers Planning Metadata to smartphones or other devices on email

XDCAM Browser (support planned later in 2011)
- Create Planning Metadata
- Transfers Planning Metadata directly to a camcorder via wi-fi
- Live viewing with the ability to set the EssenceMark™ during shooting

XMPilot Toolkit (SDK) For XMPilot Application Developers

Sony supplies the XMPilot Toolkit for XMPilot application software development.
The XDCAM Toolkit covers the following functions:
- Metadata creation and transfer
- Mobile applications for smartphones
- Ingest software

For information about Sony's XMPilot Toolkit license contract, please contact:
xdcam_xmpilot_promo@jp.sony.com

XDCAM HD422 Camcorder

Multi-format
Production Camcorder
PDW-F800

EFP/ENG-oriented yet
Versatile Camcorder
PDW-700

PDW-F800 Features

1080/23.98p and SD Recording as Standard

CINEALTA

The PDW-F800 is a multi-format and versatile camcorder that is ideal for cinema and TV drama production as well as ENG applications.

Slow & Quick Motion Function

The PDW-F800 offers a powerful Slow & Quick Motion function that enables users to create elegant fast- and slow-motion footage - commonly known in film shooting as over- and under-cranking.

PDW-F800 Slow & Quick Motion

Format	Capturing	Slow & Quick Motion
1080/23.98p	1p to 48p in 1p increments	1/2x (slow) to 24x (quick)
1080/25p	1p to 50p in 1p increments	1/2x (slow) to 25x (quick)
1080/29.97p	1p to 59.94p in 1p increments	1/2x (slow) to 30x (quick)

The Slow & Quick Motion function is available in MPEG HD422 mode only. Audio recording is not supported with the Slow & Quick Motion function. The following features cannot function with Slow & Quick Motion:

1. Picture Cache Recording
2. Interval Recording
3. Disc Exchange Cache
4. Clip Continuous Recording
5. Live logging

User Gamma

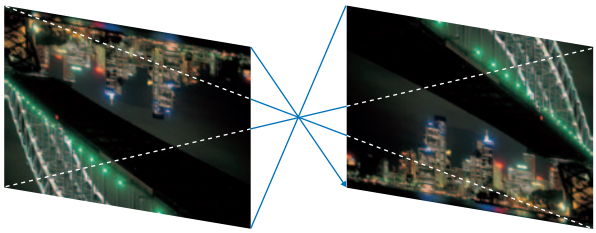
The PDW-F800 allows users to customize gamma curves with the supplied CvpFileEditor software for Windows PCs. An easy GUI enables users to change the shape of the gamma curve; they can then load this curve into the camcorder via Memory Stick™, Memory Stick PRO™, or Memory Stick PRO Duo™ media.

Focus Assist Function

A Focus Assist Indicator is a helpful tool for manual focus adjustments. A bar graph indicator is displayed at the bottom or in other positions of the viewfinder frame, enabling users to make more accurate and fine focus adjustments.

Image Inverter Function

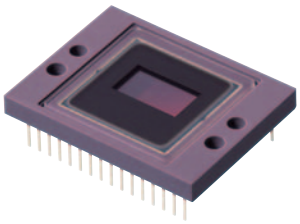
The Image Inverter function allows the use of a variety of image-inverting lenses, anamorphic lens adaptors, and cinema lenses with 2/3-inch adaptors.



PDW-F800 and PDW-700 Common Features

2/3-inch-type Three HD Power HAD FX CCDs

The PDW-F800/700 is equipped with three 2/3-inch type 2.2-megapixel full HD progressive CCDs, which are also used in the well-proven HDC-1500 Sony Multi-format HD Camera. Based on Sony's Power HAD™ FX sensor technology and the latest on-chip lens structure, this CCD offers a high sensitivity of F11 at 59.94 Hz (F12 at 50 Hz) and an excellent signal-to-noise ratio of 59 dB in Noise Suppression (NS) mode, which helps to reduce the high-frequency noise elements of video signals using Sony's advanced digital processing technology.



14-bit A/D Conversion

The PDW-F800/700 incorporates a high-performance 14-bit A/D converter that enables images captured by the high-performance CCDs to be processed with maximum precision. In particular, this high-resolution A/D conversion allows the gradation in mid-to-dark-tone areas of the picture to be faithfully reproduced. Thanks to the 14-bit A/D converter, pre-knee signal compression in highlighted areas can be eliminated, and the camera can clearly reproduce a high-luminance subject at a 600% dynamic range.

State-of-the-art DSP LSI

The newly developed DSP (Digital Signal Processing) LSI is the heart of the image-processing device of the PDW-F800/700 camcorder. In conjunction with the 14-bit A/D converter, it reproduces images captured by the CCD at maximum quality. In addition, on its large-scale logic circuits, this DSP comes with a variety of image-correction capabilities, some of which used to be on analog circuits, allowing for stable image correction. Moreover, a newly incorporated function - Automatic Lens Aberration Compensation*1 - can optimize lens performance to provide stunning picture quality.

*1: Works only with applicable lenses. Please contact lens manufacturers for details.

Supported Recording Formats - HD/SD and Interlace/Progressive

One of the big appeals of the PDW-F800/700 is its highly flexible multi-format recording capability. Users can select a recording format from HD (MPEG HD422 and MPEG HD) and SD (MPEG IMX™ *1 and DVCAM™ *1), in a variety of frame frequencies (as shown in the table on page 4).

*1: The PDW-700 requires an optional CBKZ-MD01 key.

High-quality 24-bit Audio Recording

The PDW-F800/700 records uncompressed four-channel, 24-bit audio (MPEG HD422 mode). It is also equipped with a range of audio interfaces.

Well-balanced Compact Body

The PDW-F800/700 is designed to be very compact and ergonomically well balanced, providing a high level of mobility and comfort in various shooting situations. It weighs only 6.0 kg (13 lb 4 oz) including the HDVF-20A viewfinder, the ECM-680S microphone, the PFD50DLA disc and the BP-GL95A battery pack.

Shock- and Dust-resistant Disc Drive

To minimize errors caused by shock or dust entering the disc drive, the PDW-F800/700 has several unique ways of providing operational resistance to such factors. The disc drive entrance is concealed by two lids, helping to prevent any dust from entering the drive. In addition, four rubber dampers are used to hold the disc drive block in place and to absorb shocks that would otherwise go into the disc drive.

Viewfinders*1

Two types of optional viewfinder are available for users: HDVF-20A and HDVF-200 2.0-inch*2 monochrome viewfinders and HDVF-C30WR 2.7-inch*2 and HDVF-C35W 3.5-inch*2 color viewfinders.

*1: No viewfinder is supplied with the PDW-F800/700.
*2: Viewable area measured diagonally.

HDVF-C30WR

HDVF-C35W

HDVF-20A

HDVF-200