SONY

XDCAM
Professional Disc System

Professional Disc™

XDCAM™ Family

www.sonybiz.net/xdcam

Time and money.
Two things you can't afford to waste.

We're living in a fast-paced world where time and money are scarce resources. Broadcasters and programme makers are under greater pressures than ever before. Increased competition means more channels chasing a fragmented audience that's offered almost limitless viewing choices. Capturing great-looking images from anywhere in the world and getting to them on air ahead of your rivals can be a matter of survival. Global viewing audiences want to be informed, entertained and enthralled. And in a media-saturated world they won't hang around if your competitors have got the best pictures first.

While viewers are expecting more, tight project budgets mean there's no latitude for making the wrong decisions and paying the price later on. Choosing the right format isn't just about raw performance and up-front hardware costs. It's about understanding the real price of every second on screen in terms of media lifecycles, facilities overheads and human resources.

In response to new opportunities and an increasingly competitive landscape, traditional broadcast workflows are changing fast. Tape-based production is being supplanted by network-oriented paradigms. From planning and acquisition to editing, playout and archive, broadcasters are embracing the benefits of, file-based production. News gatherers have led the way, but now the entire production community – from documentary makers to sports, drama and live events specialists – is following suit.

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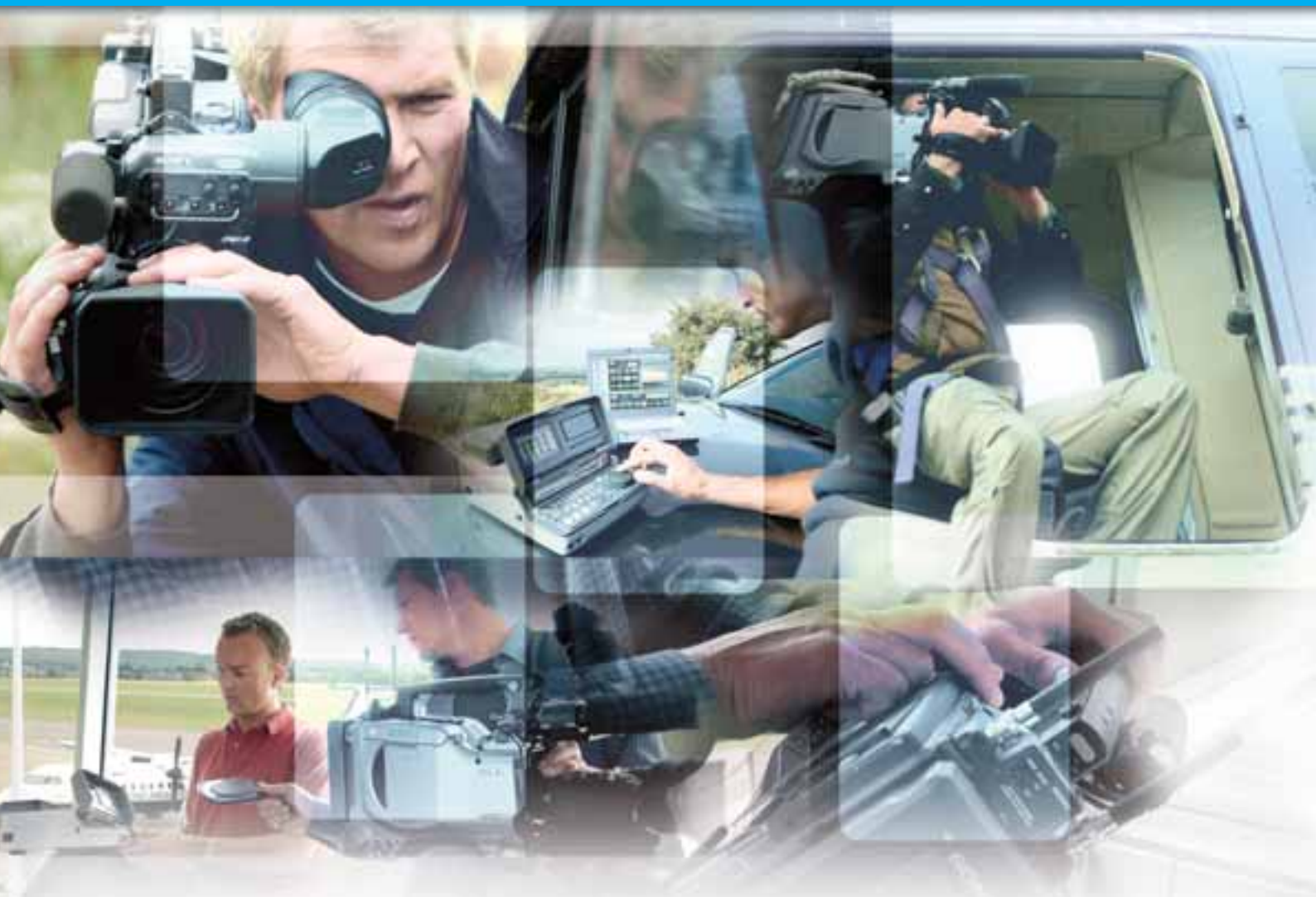

UNRIVALLED PERFORMANCE. ABSOLUTE RELIABILITY

At the heart of this rapid migration to network-oriented production is XDCAM. It's the world's first professional non-linear format that harnesses the power of open standards like MXF in a rugged package that teams superb performance and reliability with exceptionally attractive removable media costs.

For starters, XDCAM has been designed to shrug off the physical rigours of the harshest physical environments. Whether you're at the summit of a snow-capped mountain in sub-zero temperatures or driving across sand dunes in the mid-day desert heat, XDCAM performs unflinchingly.

Based on proven optical disc technology, XDCAM brings acquisition and production processes into one seamless workflow. Since you're shooting and editing with the same physical medium, pictures captured in the field with XDCAM can be instantly available in your non-linear editing environment. And because high-resolution content plus proxies and metadata are all stored on the same removable optical disc, XDCAM dovetails seamlessly with today's IT-oriented, network-centric news environments.

Just as importantly, XDCAM saves you time and money on every project compared with traditional tape-based production. Good for a minimum of 1,000 record/re-record cycles, the rugged optical disc cartridge stores up to 2 hours of broadcast-quality pictures – plus all your associated project files – while taking up less shelf space than a Betacam cassette. And since files can be imported faster than real-time from XDCAM into your non-linear news or production environment, there's no need to hang around ingesting hours worth of taped footage into your NLE before craft editing starts. Just think about it. The savings in facilities and operator costs alone can repay your investment in XDCAM within months… or even less.

XDCAM is much more than just a standalone production format. It's been conceived as part of a total environment that integrates content creation, storage and distribution in a single, seamless workflow. Leveraging support for MXF and open IT industry standards, XDCAM offers third party interoperability with hardware, applications and complete solutions from over thirty vendors.

Better still, XDCAM is ready for today's High Definition world. With XDCAM HD you can enjoy all the benefits of file-based, network-oriented acquisition and production – plus true HD picture quality to enhance the international commercial appeal and shelf-life of every project.

Broadcasters and programme makers in Europe alone are rapidly embracing the benefits of XDCAM to drive down costs, open up new creative possibilities and secure a formidable competitive edge for themselves. Isn't it time you joined them?

One format family. One vision. Infinite possibilities.

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New "Non-linear" Recording Medium – **The Professional Disc**

The Sony Professional Disc, PFD23 is a newly-developed, single-sided, optical disc that uses state-of-the-art blue-violet laser technology to enable extremely large-capacity recordings. The diameter of the disc is a mere 12 cm, equal to that of other optical media such as CDs or DVDs. Yet, despite its small size, the disc provides an amazing storage capacity of 23.3 GB – a feat made possible using a 405 nm blue-violet laser, an objective lens with a 0.85 numerical aperture (NA) and a specially developed recording layer.

Sony has taken great care in selecting the Professional Disc as the next-generation professional recording medium. The choice is based on Sony experience and technical expertise in developing and marketing a wide range of professional products that have effectively served users around the world for several decades.

Professional Disc™

Flexible Platform

The Professional Disc system is a very flexible platform on which an assortment of data in a variety of formats can reside. The use of optical disc technology eliminates the restrictions inherent in proprietary tape footprints and allows a variety of different video formats to be recorded as 'data files' and is therefore extremely flexible as to what can be recorded to it. In addition to video and audio streams, you can record a variety of metadata, such as date/time information and comments indicating the material content. Furthermore, computer files created on Microsoft Word, PhotoShop and other application software can also be stored on a Professional Disc media*.

*Up to 500 MB

Largest-Capacity Optical Disc

The superior disc capacity of the Professional Disc enables you to make high-quality yet long-duration recordings. Its 23.3 GB data capacity translates to a recording time of 45 to 85 minutes depending on the bit rate the camera operator chooses.

High Transfer Rate

The Professional Disc's data transfer rate is 72 Mb/s from a single optical head unit and 144 Mb/s on a dual head deck, providing stable recording and playback of high bit rate data such as a 50 Mb/s MPEG IMX stream.

Quick Random Access

The non-linear nature of the Professional Disc alone provides tremendous benefit when handling audio/video content. When a recording is played back from the disc, its physical location on the disc does not impact the time required to access it. Recordings can be accessed in a fraction of the equivalent time taken to access information on disc, making it much easier and faster to locate source material. This is the beauty of random access and all Sony XDCAM products are equipped with powerful features – delivering innovation to all your programming operations.

Highly Reliable, Durable and Re-usable Medium

Optical discs have a natural advantage since they suffer no mechanical contact during recording or playback, making the format ideal for continuous use and re-use. The Sony Professional Disc is also highly resistant to dust, shock and scratches, packaged in an extremely durable and dust-resistant cartridge. It is resistant to heat and humidity and is X-ray resistant – factors that make the Professional Disc ideal for use in harsh field environments and also allows for long media life and long-term storage.

Professional Disc Media (PFD23) Specifications

Storage capacity	**23.3 GB**
Laser wavelength	**405 nm** (blue-violet)
Data transfer (writing) rate	**72 Mb/s** (per optical head)
Disc diameter	**120 mm** (4 5/8 inches)
Cartridge dimensions (W x H x D)	**129 x 131 x 9 mm** (5 ⅛ x 5 ¼ x ⅜ inches)
Mass	**90 g** (3 oz)
Recording format	**Phase change recording**

The XDCAM Workflow Innovation

Sony XDCAM Series of products offer a variety of unique functions that have been made possible through the use of optical discs. These functions open up stunning innovations in each area of the production workflow, whether you use the products individually or as part of an integrated XDCAM system.

Instant Random Access and Thumbnail-Based Search of Material

With all Sony XDCAM products, video and audio signals are recorded as one clip file each time a recording is started and stopped. During playback, quick cue-up to the next or previous clip is possible simply by pressing the 'Next' or 'Previous' button, as performed on a CD or DVD player.

Furthermore, thumbnails are automatically generated for each clip, as a visual reference to cue-up material in a random fashion. Simply press the thumbnail button and the XDCAM camcorders or decks instantly generate and display these thumbnails on either their LCD displays* or a connected monitor. You can easily cue up the desired scene by guiding the cursor to the corresponding thumbnail and confirming your selection with the appropriate button. The recording associated with that thumbnail is then instantly brought up to the full screen size and material can be played, paused, fast-forwarded or scrubbed. This feature proves extremely useful when footage must be reviewed on the camcorder, or when users are searching for material during editing.

Thumbnail-based searches were only available in non-linear systems after digitising the source to the editor's hard drive, whereas Sony XDCAM products offer this capability straight from the optical disc.

*Available only on the PDW-510P/530P/V1/R1 model.

Thumbnail display on camcorder LCD display

IT-friendly System – Network Convenience

In the Sony XDCAM Series of products, recordings are made as data files in the MXF (Material eXchange Format) file format. This allows material to be handled with great flexibility in an IT-based environment – easily available for copying, transferring, sharing and archiving. This file-based recording system also allows material to be viewed directly on a PC linked to the XDCAM units via an i.LINK* (File Access Mode**) connection – just as a PC reads files on an external drive.

The XDCAM camcorders and decks come equipped with IT-friendly, computer-based interfaces. These includes the i.LINK interface supporting DV IN/OUT and file access mode and 1000Base-T or 100Base-TX Ethernet interfaces. Together with the devices' MXF file transfer capability, this makes integrating XDCAM products into a network a quick, straightforward task.

*i.LINK is a Sony trademark used only to designate that a product is equipped with an IEEE 1394 connector. Some products with an i.LINK connector may not 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.

**For connection with third party products using this mode, please contact your nearest Sony office.

XDCAM displayed as a removable storage device (i.LINK (File Access Mode))

XDCAM units connected via a network

The Ultimate in Acquisition Convenience

Sony XDCAM camcorders take full advantage of the new optical media. Recordings on optical discs are automatically made on the empty area of a disc, relieving camera operators' concerns about accidentally overwriting other confirmed 'takes'. Furthermore, because acquisition is an ongoing process of shooting and reviewing, this eliminates the burden of searching for the correct position to start the next recording, meaning the camera is always ready for the next shot.

Operators can also review their latest take immediately, with a simple press of the 'Return (RET)' button. If a take is not good, it can be easily deleted from the disc before moving onto the retake. This way, you not only save disc space, but you can also prepare a disc that contains only your OK takes, boosting the efficiency of subsequent editing processes.

Scene Selection

XDCAM decks and camcorders are equipped with a powerful "Scene Selection" function, which allows cut editing* to be accomplished only within the camcorder or deck itself. Since editing is performed using just one camcorder or deck, rough 'on-site' editing is easily achieved, with the compactness and convenience required in the field.

Two key elements make this possible - the XDCAM system's random access capability and its function to playout clips in the order designated by the operator. With an XDCAM camcorder or deck, operators can select only the necessary clips and place them on a storyboard. As required, clips can be rearranged or inserted into the storyboard sequence. In addition, deck models offer the additional ability to trim clips. The results of the storyboarding are saved as an XDCAM EDL (called "Clip List"), which can be written back to the original disc to stay with the material. This disc can then be played back according to the Clip List, on the same or different XDCAM unit, so that only the selected portions are played out in the desired order.

The material clips that were not selected for the "Clip List" still remain on the original disc, but are ignored when an XDCAM unit plays back the disc according to the Clip List**.

The Scene Selection feature presents dramatic improvements to conventional workflows, such as when transferring material to a non-linear editor and/or server, or when searching for material and/or edit points in linear editing systems.

When GUI-based operation is preferred, Scene Selection can also be performed on a PC running the PDZ-1 proxy browsing software*** supplied with all XDCAM products, providing a visually comfortable working environment.

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

** Up to 99 Clip Lists can be saved.

*** See page 20 for details.

Scene Selection on a built-in LCD display

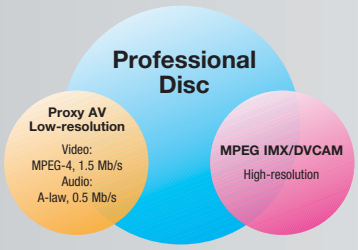
Scene Selection on a PC running supplied PDZ-1 software

Proxy AV Data – Opening Up New Possibilities for Network-based Collaboration

What is Proxy AV Data?

Another stunning benefit of these XDCAM products is their use of Proxy AV Data – a technique that effectively streamlines the entire production process in many different ways. In brief, Proxy AV Data is a low-resolution, MPEG-4 based version of the full-resolution MPEG IMX/DVCAM stream with a bit rate of 2.0 Mb/s (video: 1.5 Mb/s, audio: 0.5 Mb/s). When a recording is made, a Proxy AV stream that is time code synchronised with the full-resolution stream, is also recorded automatically on the disc. The Proxy AV Data, which is smaller in size, is easier to work with and can be transferred over common networks at much greater speeds.

The following are just a few of the many ways that Proxy AV Data can improve current workflows.



1. Remote Content Browsing

One convenient use for Proxy AV Data is content browsing from remote locations. The MPEG-4 Proxy AV Data can be replayed on standard PCs running the MXF Proxy Viewer or PDZ-1 software supplied with all XDCAM products. Since XDCAM camcorders* and decks allow the transfer of this Proxy AV Data through their LAN ports, the Proxy AV Data of material shot in the field can be uploaded to a designated server for remote viewing from the studio. This capability allows journalists in the studio, for example, to start writing scripts before the disc even arrives.

*XDCAM camcorders require an optional Ethernet (100Base-TX) Adaptor (CBK-NC01).

2. Extremely Fast Logging

Because Proxy AV Data is much smaller than high-resolution video and audio, it allows extremely fast transfer of material from XDCAM devices. With the supplied PDZ-1 software or non-linear editors* compatible with XDCAM products, data transfer occurs at amazing speeds. Once data is copied to the hard drive of the PC running the PDZ-1 software, all logging decisions can be made by referring to the Proxy AV Data residing on the hard drive, rather than from the original media in a linear fashion, which would be the case with a typical tape-based logging system. While typical logging systems tie up the playback device during the entire process, logging directly from the PC's hard drive means that the XDCAM deck can be used for other tasks during the logging process.

*For compatible third-party products, please contact your nearest Sony office.

3. Proxy Editing

Proxy AV Data copied to the hard drive of the PC running the supplied PDZ-1 software or other non-linear editors* compatible with XDCAM products can be placed on the timelines of these systems. This is a similar process to conventional VTR off-line editing, but without the need to create 'off-line' dubs prior to the edit. Once Proxy Editing is complete, the resultant Proxy EDL can be exported in other EDL formats such as BVE-9100, Newsbase XML and ALE (Avid Log Exchange), in addition to the XDCAM's Clip List, for subsequent on-line editing. Furthermore, when used with compatible non-linear editors*, the editor can automatically ingest the necessary high-resolution material from XDCAM devices according to the Proxy EDL. After this, operators can continue high-resolution editing on the editor for final retouches. These innovative workflows greatly reduce overall editing lead times.

*For compatible third-party products, please contact your nearest Sony office.

4. Immediate Streaming File Creation

Proxy AV Data also makes it possible to immediately and easily create streaming files directly on a compact PC running the supplied PDZ-1 software. The PDZ-1 software can generate streaming files in the popular ASF format, which can be replayed on Microsoft® Windows® Media Player, using the Proxy EDL and corresponding Proxy AV Data. With the PDZ-1 software, the Proxy clips in the MPEG-4 format placed on the PDZ-1's timeline can be converted to the ASF format and they can be compiled into one file. The created ASF files can be effectively used for many different purposes such as streaming to web, daily rushes of shooting on location, client approvals and more.

5. Archive Management System Using Proxy AV Data

The use of Proxy AV Data also brings a great number of benefits when establishing an archive system. The Professional Disc media itself is highly suitable for archiving material due to its robustness, long media life of up to 50 years based on Sony accelerated testing and slim, small size. In addition, the Proxy AV Data — mirrored data of the original high-resolution data — can be effectively used as catalogue pictures to search for and retrieve the desired archive material.

By transferring all Proxy AV Data of the discs stored in the archive system to one PC running the supplied PDZ-1 software, a cost-effective, easy to maintain archive management system can be established. Using the functions of the PDZ-1 software, operators can register detailed information associated with each recording such as clip descriptions, disc (reel) numbers and other important notes. This gives users the convenience of searching for archive material by browsing the Proxy AV Data, or by using the 'Search' function of the PDZ-1 software to locate desired clips using the registered text information as key words. Convenient archiving is just another benefit of using the XDCAM equipment and its Proxy Data.

High-resolution File Transfer Over a Network

Another stunning feature that innovates current workflows is the capability to transfer high-resolution material over a standard network. Clips recorded on Professional Disc media can be sent and received over a standard network through a LAN port on the decks or camcorders*, allowing seamless exchange of material among any networked devices installed all over the world.

The transfer can be performed by a simple FTP operation using Microsoft Internet Explorer or common FTP client software. The supplied PDZ-1 software can also be used to perform file transfer very easily. For advanced operation, the Partial FTP Transfer function allows only the clips selected in a Clip List to be transferred over the network.

This network capability makes it possible to send footage from the field to the studio immediately after the shoot, or easily share material among production staff at multiple locations, without the lead time of delivering tapes or replying on costly satellite transmissions.

The file-based transfer provides another great benefit: it enables operators to dub material without any generation loss. File operations such as Partial Transfer and Disc Copy can also be performed via the i.LINK (File Access Mode) interface, with the same benefit of no generation loss.

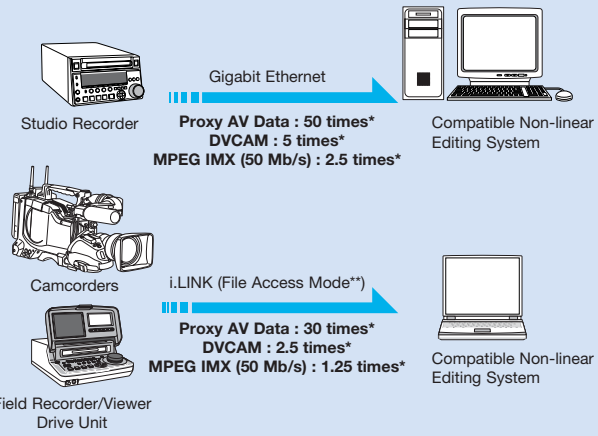
*XDCAM camcorders require an optional Ethernet (100Base-TX) Adaptor (CBK-NC01).

High-Speed Data Transfer – the Foundation of Workflow Innovation

A large part of the appeal of these Sony XDCAM products is their high-speed data transfer capability, allowing you to transfer data to other equipment at speeds several data rates faster than real time. This is possible because XDCAM products provide a range of high-speed interfaces and because, by nature, the Professional Disc offers the flexibility to read data at different speeds.

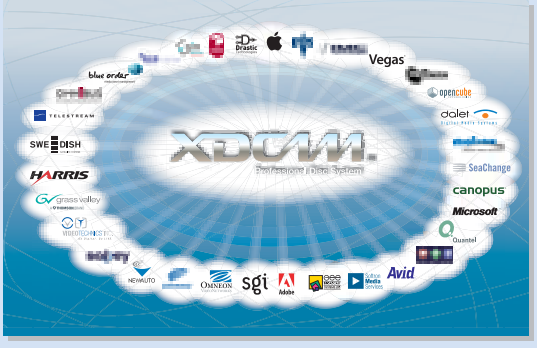
For low-resolution Proxy AV Data, a maximum transfer speed of an amazing 50 times* faster than real time is achieved, while for high-resolution (MPEG IMX and DVCAM) material, the maximum transfer speed is at 5-times* speed for DVCAM signals and 2.5-times* speed for MPEG IMX signals.

* These are the approximate figures when using the PDW-1500 deck to transfer data over Gibabit Ethernet. The actual transfer rates may vary.



* Data transfer rates are approximate. The actual data transfer rates may vary depending on the non-linear editing system used.

** For connection with third party products using this mode, please contact your nearest Sony office.



Detailed interoperability between XDCAM and products from other companies can be found in the XDCAM Interoperability Guide.

Features and Benefits of the XDCAM Professional Disc Systems

Outstanding Picture Quality of MPEG IMX/DVCAM Format Recording

Sony XDCAM products offer the capability to record* and play back both MPEG IMX and DVCAM streams**. Users have the flexibility to select from these formats according to their picture-quality needs, or to match their editing-format requirements.

The DVCAM format uses 8-bit digital component recording with a 5:1 compression ratio and a sampling rate of 4:1:1 (for NTSC)/4:2:0 (for PAL). The MPEG IMX format uses 8-bit digital component recording with MPEG-2 4:2:2P@ML compression at 50, 40, 30 Mb/s, enabling users to choose the picture quality and recording time according to their needs.

The XDCAM Series of products provide approximately 85 minutes of DVCAM recording time and 68, 55 and 45 minutes of MPEG IMX recording at 30, 40 and 50 Mb/s, respectively. MPEG IMX recording is the ideal choice when you need higher picture quality, while DVCAM recording offers the benefit of a longer recording time.

* Recording on the PDW-V1 is available only through the Ethernet or i.LINK (file access mode) interface.

** The PDW-510P camcorder is capable of DVCAM recording only.

Recording/Playback Time

MPEG IMX	DVCAM
68 min. at 30 Mb/s 55 min. at 40 Mb/s 45 min. at 50 Mb/s	85 min.

Flexible Metadata Recording

XDCAM products are also capable of recording a variety of metadata, which provides a huge advantage when searching for data in subsequent processes. The following are examples of metadata types that Sony XDCAM Series of products can handle and record.

DISC METADATA/CLIP METADATA

From acquisition to editing and onto the archiving process, a great amount of information is associated with the recordings. For example, production dates, creator names, camera setup parameters, copyright notes and memorandums are just a few. With the XDCAM products, such information can be saved together with the AV material on the same disc and be effectively used to improve the entire workflow chain. Using the supplied PDZ-1 software allows a variety of data to be added either on a “Disc” or “Individual Clip” basis in different forms such as “Disc Title”, “Clip Title”, “Disc ID Number”, “Comments” or “Clip Status (to indicate OK/NG status)”.

Furthermore, the PDZ-1 software has a powerful ‘Search’ function to easily locate desired clips by using the registered metadata as text-based keywords, providing enhanced efficiency in searching material, determining edit points or retrieving archive materials.

ESSENCEMARK™ RECORDING

The EssenceMark used in Sony XDCAM products is also a very useful form of metadata and provide a most effective way of searching for recordings via thumbnail pictures. EssenceMark can be set during the shoot either manually or automatically. Thumbnails representing the EssenceMark positions are generated each time the EssenceMark is set, proving invaluable when searching for required scenes in subsequent reviewing and editing processes.

■ **Manual Marking**

Each time the ‘return’ button on the camcorder lens or the ‘Shot Mark’ button on the deck is pressed, an EssenceMark is set. After the shoot, operators can quickly cue to that point simply by selecting its thumbnail from a list displayed on the LCD screen of the playback device or a video monitor connected to it. When the PDZ-1 software is used, operators can define EssenceMark names using desired keywords and easily set these as user-defined EssenceMark.

■ **Automatic Marking**

XDCAM camcorders can also automatically set an EssenceMark when particular events are sensed by, or occur within, the camcorder. For example, the camcorder can be set up to record EssenceMark when the audio level overshoots, or when there is an abrupt change in video luminance levels. Since several different types of EssenceMark can exist on the disc, Sony XDCAM Series of products offer an easy way of searching through them by type.

OTHERS

All XDCAM products are also capable of recording UMID/Extended UMID (Unique Material IDentifier) which consists of globally unique number or a material number. Another unique feature that XDCAM products provide is the capability to record any type of computer file format such as Word, Excel, JPEG or WAV onto the Professional Disc media, which allows operators to record all files associated with the footage onto a single disc.

Seamless Integration into Current VTR-Based Systems

In order to achieve seamless integration into current tape-based systems, a great deal of thought has been put into the development of Sony XDCAM products. A range of conventional AV interfaces including SDI, analogue composite, analogue/digital audio I/Os and RS-422A 9-pin remote interface allows easy connectivity to current equipment, including a wide variety of VTRs, linear and non-linear editors and audio mixers. In addition, XDCAM products offer network-based interoperability with other Sony network-capable equipment, such as the MPEG IMX e-VTR, establishing a highly effective and advanced system. And, because operability is another key concern when investing in new equipment, Sony has paid special attention to this too, allowing operation that is best suited to optical media while retaining the feel of conventional VTR-based products.

Easy and Low-cost Maintenance

From the outset, the Sony XDCAM Series of products have been designed using the best concurrent engineering practices, answering maintenance issues before they even arise. Moving parts have been minimised, as have the number of parts requiring periodic replacement. This results in a drastic reduction in maintenance labour and promotes more efficient use of your equipment.

Sony XDCAM products* are also compatible with Sony remote maintenance and monitoring software – an SNMP-compliant application that can monitor and log the hardware's status in real time via an Ethernet network. If a malfunction is detected, this system can immediately identify the problem, allowing you to take corrective action. Not only is the system reactive, it proactively monitors your systems and identifies maintenance needs in a timely manner too.

* XDCAM camcorders require an optional Ethernet (100Base-TX) Adaptor (CBK-NC01).

Sony MMStation™ SNMP-compliant Remote Monitoring and Maintenance Software

High Durability and Reliability

In harsh working environments, it is of critical importance that hardware is tolerant to shock and vibration during important shoots. Sony's accumulated knowledge about the tough criteria for such environments, together with years of experience meeting these criteria, contribute greatly to the high reliability of Sony XDCAM products.

The Sony XDCAM camcorders use rubber dampers to hold the disc drive block in place thereby minimising the effect of any shock or vibration. In addition, a powerful tracking system, based on the best Sony servo technologies, reduces the chance of the optical head recording off track. In the event a shock exceeds the servo's capacity, causing the head to be positioned incorrectly, a buffer memory is available to help prevent off-track recordings. The buffer serves in such a way that recording to the disc will not occur until the optical head returns to its correct position. After the head is properly positioned, the buffered information is recorded to the disc, thereby helping to prevent interruptions in the recording. A substantial amount of buffering has been built into the camcorder to accommodate large off-track errors.

In addition, in the event of an abnormal recording, powerful ECC (Error Correction Code) and sophisticated concealment techniques are available on all machines so that discs can be played back appropriately.

PBZD-E1500 software

PBZD-E1500 software allows the PDW-1500 deck to be used for traditional broadcast insert and assemble editing. This can be very useful when integrating XDCAM into a linear editing environment or when selectively archiving tape based material to professional disc.

XDCAM Camcorders

Sony XDCAM camcorders have been designed with special consideration for heavy-duty field acquisition, providing excellent picture quality, operability and reliability inherited from the Sony BETACAM™ family of acquisition products. In addition to these impressive capabilities, Sony XDCAM camcorders also provide numerous innovative features that take full advantage of the benefits of non-linear disc media. These unique features offer a completely new style of field operation, adding flexibility and efficiency to those operations where quick programme completion is a top priority. The PDW-530P features MPEG IMX/DVCAM-switchable recording and two built-in optical filter wheels (ND and CC), while the PDW-510P features DVCAM recording and one built-in optical filter wheel.

PDW-510P
Camcorder (DVCAM recording)

PDW-530P
Camcorder (MPEG IMX / DVCAM recording)

* Lens, wireless microphone receiver and battery pack are optional.

Common Features on Both Camcorders

16:9/4:3 Switchable Power HAD™ EX CCDs

XDCAM camcorders incorporate three 16:9/4:3 switchable CCDs for their image capture device. Using the best of Sony CCD technology, these allow for outstanding picture quality with a high signal-to-noise ratio of 63 dB, low smear level of -140 dB (typical) and high sensitivity of F11.

12-bit A/D Conversion

XDCAM camcorders also incorporate a high-integrity 12-bit A/D converter, so that the high-quality images captured by the Power HAD EX CCDs are processed with great precision. In particular, this high bit resolution allows contrast to be reproduced precisely in mid-tone areas of the picture.

Advanced Digital Signal Processing

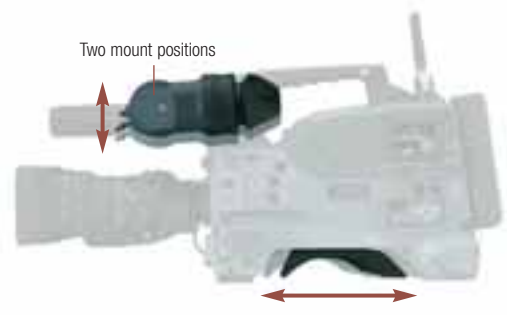
A key to quality in DSP cameras is how many bits are used in their non-linear processes, such as gamma correction. XDCAM camcorders use more than 30 bits, minimising round-off errors so the high quality of the CCDs is maintained. The DSP LSI of XDCAM camcorders also enables highly sophisticated image control such as Multi-Matrix function and Triple Skin-Tone Detail control.

Compact, Lightweight Body

XDCAM camcorders are designed to be very compact and lightweight, for a high level of mobility in the field. They weigh approximately 5.7 kg (12 lb 9 oz) including viewfinder, microphone, disc and BP-GL95 battery pack.

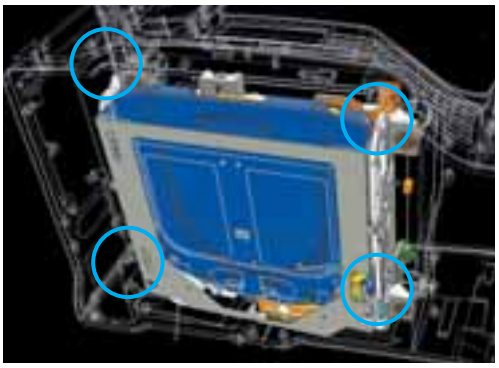
Rugged and Ergonomic Design

The design of these camcorders is based on years of Sony experience in camera ergonomics and provides a high level of mobility and balance. The shoulder pad position is adjustable and the viewfinder height can be selected from two positions, while rear panel connectors are located well away from the battery pack, making it easy to connect cables. Operators familiar with the comfort benefits of Sony BETACAM camcorders will immediately feel at home with XDCAM camcorders, which extend this comfort even further.



Shock- and Dust-Resistant Disc Drive

To minimise errors caused by shock or dust entering the disc drive, XDCAM camcorders have 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 helping to absorb the shock that would otherwise go into the disc drive.



Four Shock-Absorbing Dampers

2.5-inch* Type Colour LCD Screen

An easy-to-view colour LCD screen provided on the camcorder side panel enables advanced operations such as Thumbnail Search and Scene Selection. Status indications such as four-channel audio meters and disc and battery remaining time can also be displayed, as can camera set-up menus.

*Viewable area measured diagonally.

Extensive Range of Interfaces

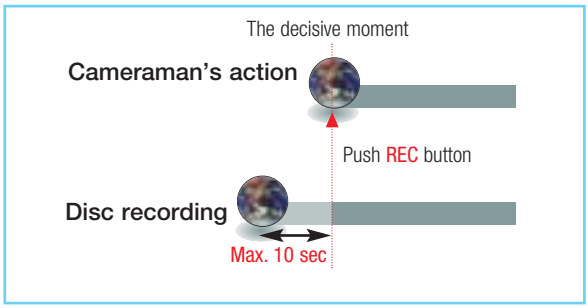
Sony XDCAM camcorders come equipped with a wide range of interfaces. In addition to an analogue composite output, they also offer the i.LINK interface that supports both DV IN/OUT and File Access Mode* protocols as standard. By adding the appropriate optional plug-in board, SDI output (CBK-SD01) and analogue composite input (CBK-SC01) also become available. The ability to install these boards within the camcorder chassis eliminates the need for an external camera adaptor unit, thus maintaining the compactness and balance of the camcorder.

Furthermore, by adding the optional CBK-NC01 Ethernet (100Base-TX) Adaptor, a network interface also becomes available.

*For connection with third party products using this mode, please contact your nearest Sony office.

Picture Cache Recording

Picture Cache Recording is a convenient function whereby up to 10 seconds of audio and video signals are buffered into memory before the Rec button is even pressed. This means that everything that happened 10 seconds before the Rec button was pressed, in Standby mode, will still be recorded to disc – a capability that can prevent the loss of unexpected but important events occurring before the operator even has the chance to press the Rec button.



Low-Light Shooting

Sony XDCAM camcorders offer two convenient features for shooting in low-light conditions which can be used either alone or together depending on the situation or operator preferences.

This slow shutter capability also makes it possible to intentionally blur images when shooting a moving object, increasing shooting creativity.

Slow Shutter allows you to use shutter speeds longer than the frame rate at 1/2 to 1/25 seconds (1 to 8 and 16 frame accumulation)

Turbo Gain allows the camera gain to be boosted up to +48 dB.

Flexible Image Controls

Sony XDCAM camcorders also provide highly advanced image control features that were once only available on high-end studio cameras. These allow images to be recorded to a disc with maximum quality and camera-work creativity.

- Multi-Matrix function
- TruEye™ processing
- Triple Skin-Tone Detail control
- Electronic soft focus
- Selectable gamma table
- Colour-temperature control

Film-like Shooting With Progressive Mode

XDCAM camcorders also provide progressive modes including 24P (optional CBK-FC01* required) to offer a film-like shutter effect. The combined use of this mode and preset film-like gamma settings enables operators to easily create film-like images.

- NTSC: 29.97P or optional 23.976P**
- PAL: 25P

* For NTSC only

** Recording to disc is in 59.94i via 2-3 pull-down.
Requires an optional pull-down(24P shooting) board(CBK-FC01).

High-Quality Audio Recordings

Sony XDCAM camcorders record high quality audio as specified by the recording format selected. These camcorders are also equipped with a range of audio interfaces: an analogue 5-pin XLR connector for stereo audio output, two 3-pin XLR connectors with selectable MIC/Line level input, and the front microphone input. The two 3-pin XLR connectors can also be switched to accept four channels of AES/EBU digital audio input, establishing a full digital ENG/EFP system using the Sony DMX-P01 Digital Portable Mixer.

- DVCAM recording: 4 channels, 16 bits, 48 kHz
- MPEG IMX recording: 4 channels, 16 bits, 48 kHz, or 4 channels, 24 bits, 48 kHz

Proxy AV Data Recording on Memory Card

By use of the optional CBK-PC01 Memory Card Adaptor, Proxy AV Data and metadata can be recorded on a Sony Memory Stick™ or SanDisk CompactFlash medium* simultaneously when recorded on a Professional Disc medium. Removing the media from the camcorder and inserting it into a PC allows users to immediately start browsing and editing these data without having to transfer. The small data size of the Proxy AV Data makes it possible to record a large volume of AV data on a single, very small card; for example, up to 65 minutes on a 1 GB card and up to 260 minutes on a 4 GB card.

* A memory card and its compatible memory card adaptor are required.

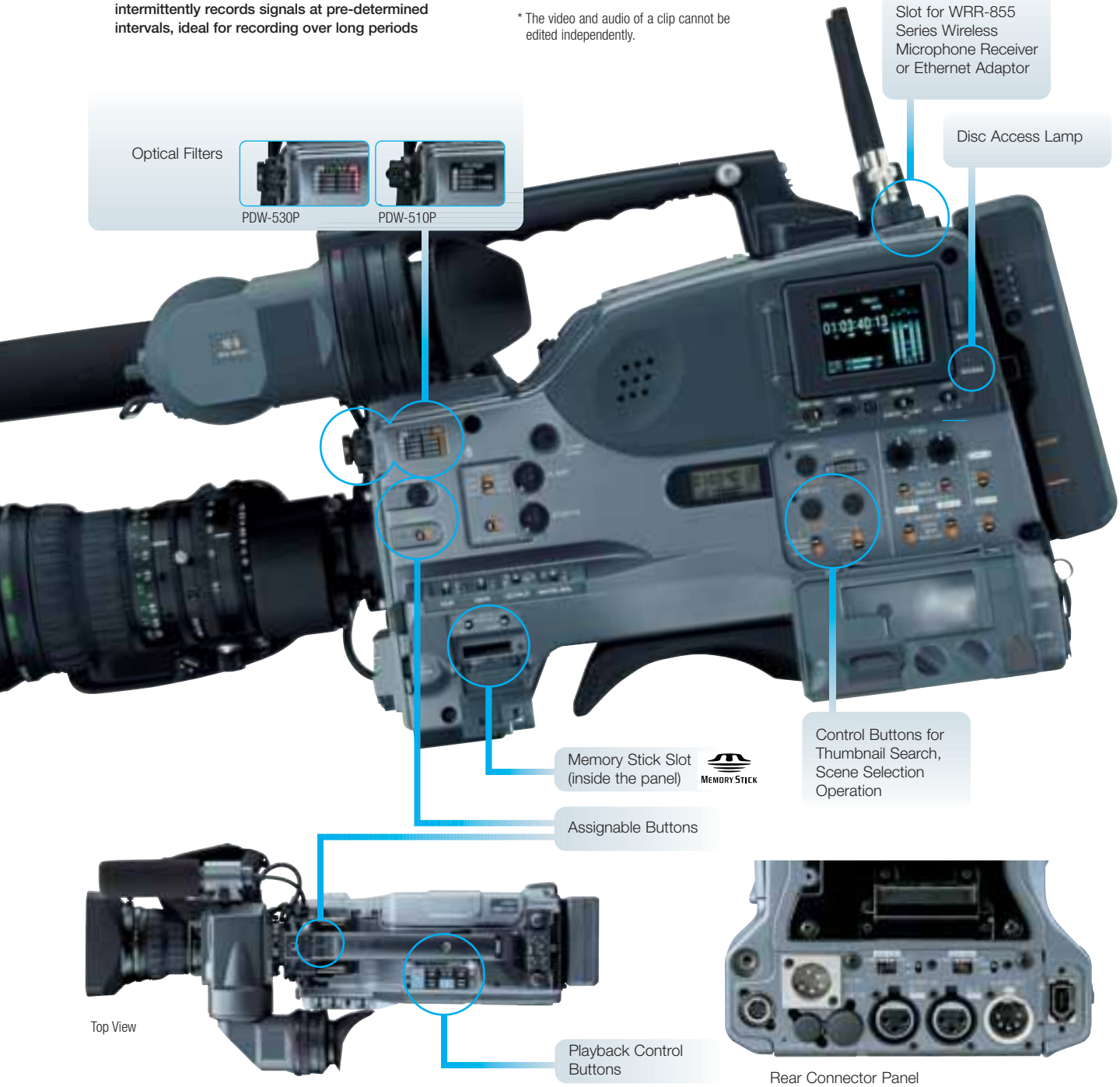
* Compatible Sony products are as follows. For other compatible products offered by SanDisk Corporation, please consult with your nearest Sony office.

- Memory Stick: Sony Memory Stick Pro MSX-1GS, MSX-512S
- Memory Stick Adaptor: Sony Memory Stick PC Card Adaptor MSAC-PC4

Other Features

- Thumbnail Search operation
- Scene Selection operation for in-camera cut editing*
- Proxy AV Data recording
- Metadata recording: UMID, Extended UMID, EssenceMark
- A second LCD screen displays time code and remaining battery/disc capacity during power on and off
- Four assignable buttons, two on the camera handle and two on the inside panel, enable operators to assign frequently used functions
- Auto Tracing White Balance for automatic adjustments in camera colour temperature according to lighting changes
- Interval recording (automatic and manual) intermittently records signals at pre-determined intervals, ideal for recording over long periods
- Ability to write EDL (Clip List) back onto disc
- Memory Stick™ function for storage of camcorder setup files
- Slot to accommodate a Sony WRR-855 Series wireless microphone receiver
- Optional Ethernet (100Base-TX) Adaptor (CBK-NC01) for Ethernet connection
- Camera remote control via Sony RM-B150 and RM-B750 remote control units
- Intelligent lighting system synchronises strobe on/off to the Rec button
- i.LINK (DV Stream) output from MPEG IMX playback
- Supplied with the PDZ-1 Proxy Browsing Software and MXF Proxy Viewer

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



PDW-1500 STUDIO RECORDER (RECORDING AND PLAYBACK)
PDW-R1 FIELD RECORDER (RECORDING AND PLAYBACK)
PDW-V1 FIELD VIEWER (PLAYBACK AND FILE RECORDING)
PDW-D1 DRIVE UNIT (PLAYBACK AND FILE RECORDING)
PDJ-A640/C1080 CART

XDCAM Decks & Carts

The Sony XDCAM products offer two types of decks and a drive unit to meet the varying operational requirements both in the field and studio. Their functions have been carefully selected to increase production efficiency by exploiting the advantages of Professional Disc media.
The PDW-1500, PDW-R1 and PDW-V1 decks provide familiar VTR-like controls that minimise the learning curve needed to get up to speed, while the PDW-D1 drive unit places emphasis on compactness and cost-efficiency.

Both decks and the drive unit come supplied with the PDZ-1 Proxy Browsing Software as standard. This software is intended for browsing Proxy AV Data recorded by XDCAM products, for easy and quick cut editing, and for metadata registration on an intuitive GUI.

(For details, please refer to page 20.)

PDW-1500

PDW-R1

PDW-V1

PDW-1500 Studio Recorder

The PDW-1500 Studio Recorder is a half-rack size recorder suitable for both non-linear and linear editing environments. Despite its small size, this deck offers high-speed data transfer capability between compatible non-linear editing devices, creating a powerful editing system for video productions. Equipped with an RS-422A 9-pin interface, the PDW-1500 also fits well in linear editing systems as a feeder, bringing the added benefits of non-linear disc recoding into a linear editing environment.

- MPEG IMX/DVCAM recording
- Proxy AV Data recording
- High-speed file transfers: 50x for Proxy, 5x for DVCAM and 2.5x for MPEG IMX (at 50 Mb/s) files when using a Gigabit Ethernet connection
- Metadata recording
- Ability to write EDL (Clip List) back onto disc
- A variety of interfaces (*refer to the chart on page 19)
- RS-422A 9-pin remote interface
- Thumbnail Search operation
- Scene Selection operation
- Search speed (in colour):
  - JOG: ±1 times normal speed
  - Variable: ±2 times normal speed
  - Shuttle: ±35 times normal speed
- Insert editing of audio tracks of a single clip (Clip audio insert editing function)
- Gigabit Ethernet connectivity
- i.LINK (DV Stream) output from MPEG IMX playback
- The use of the optional RM-280 Editing Controller allows easy control of Thumbnail display and Scene Selection operations, as well as basic playback controls.
- Repeat playback function
- Equipped with two optical heads
- Dimensions (W x H x D):
  210 x 130 x 415 mm
  (8 3/8 x 5 1/8 x 16 3/8 inches)
- Mass: 7.4 kg (16 lb 5 oz)

PDW-R1 Field Recorder

The PDW-R1, the latest addition to the XDCAM family, is a highly mobile field recorder. Its compact design is very similar to the existing PDW-V1 model, but the PDW-R1 recorder additionally provides other functionalities such as MPEG IMX/DVCAM recording and a wider range of interfaces. Its extremely compact, lightweight body makes the PDW-R1 ideal for use in the field as a pool-feed recorder, backup recorder and compact recorder installed in an extremely confined space such as a car or helicopter. Furthermore, equipped with an RS-422A interface as well as other video and audio interfaces, this recorder can be used in both linear and non-linear editing systems.

- MPEG IMX/DVCAM recording
- Proxy AV Data recording
- High-speed file transfers: 30x for Proxy, 2.5x for DVCAM and 1.25 for MPEG IMX (50 Mb/s) files when using an i.LINK (File Access Mode) connection
- Metadata recording
- Ability to write EDL (Clip List) back onto disc
- A variety of interfaces (refer to the chart on page 19)
- RS-422A 9-pin remote interface
- Parallel recording function, which enables the deck's Rec start/stop to be synchronised with the Rec start/stop of the camcorder connected via the i.LINK interface
- 3.5-inch* colour LCD screen
- Thumbnail Search operation
- Scene Selection operation
- Search speed (in colour):
- JOG: 1 time normal speed
- Shuttle: ±20 times normal speed
- Compact and lightweight design
- AC, DC and battery-powered operation
- Ethernet connectivity (100Base-TX)
- i.LINK (DV Stream) output from MPEG IMX playback
- Repeat playback function
- Equipped with one optical head
- Dimensions (W x H x D):
  230 x 105 x 340 mm
  (9 1/8 x 4 1/4 x 12 inches)
- Mass: 4.7 kg (10 lb 6 oz)

*Viewable area measured diagonally.

PDW-V1 Field Viewer

The PDW-V1 Field Viewer is an extremely compact and lightweight unit, offered as an affordable solution for playing back Professional Discs as well as for AV and data file recording* through its Ethernet network interface or i.LINK (File Access Mode**) interface. It is ideal for field applications and for desktop viewing by journalists, producers and other production staff.

A unique feature of this model is its built-in 3.5-inch*** type colour LCD screen, allowing users to view recordings any time, anywhere without the need for an external video monitor. What's more, the PDW-V1 is equipped with an analogue RGB output capability, so users can view recordings on standard computer displays too. It also comes equipped with a built-in audio speaker.

The PDW-V1 can be AC or battery powered, a feature that proves convenient in the field. What's more, because it allows high-speed transfer of Proxy AV Data, it can also serve as a cost-effective editing solution. As with other XDCAM products, the PDW-V1 offers a Scene Selection capability, to which even greater user convenience is added with its colour LCD screen.

- MPEG IMX/DVCAM playback
- Recording of MPEG IMX/DVCAM files via Ethernet or i.LINK (File Access Mode**) interfaces*
- Proxy AV Data recording
- High-speed file transfers: 30x for Proxy, 2.5x for DVCAM and 1.25x for MPEG IMX (50 Mb/s) files when using an i.LINK (File Access Mode**) connection
- Metadata recording
- Ability to write EDL (Clip List) back onto disc
- Compact, lightweight design
- 3.5-inch*** type colour LCD screen
- Built-in audio speaker
- Thumbnail Search operation
- Scene Selection operation
- Analogue RGB output capability
- AC/battery-powered operation
- Network connectivity (100Base-TX)
- i.LINK (DV Stream) output from MPEG IMX playback
- Search speed (in colour):
  - JOG: ±1 times normal speed
  - Shuttle: ±20 times normal speed
- Repeat playback function
- Equipped with one optical head
- Dimensions (W x H x D): 210 x 90 x 320 mm
  (8 3/8 x 3 5/8 x 12 5/8 inches)
- Mass: 3.5 kg (7 lb 11oz)

* The PDW-V1 does not support synchronous video/audio input.

** For connection with third party products using this mode, please contact your nearest Sony office.

*** Viewable area measured diagonally.

PDW-D1

PDW-D1 Drive Unit

The PDW-D1*, a new addition to the XDCAM family, is an XDCAM disc drive unit specifically designed for use in non-linear editing systems. The drive unit supports the i.LINK interface supporting DV IN/OUT and File Access Mode** protocols, allowing connection with a variety of non-linear editing systems. Its highly compact and lightweight design allows installation in any working environment even on a busy journalist's desktop as well as awkward working areas in the field.

The PDW-D1 provides a smart, yet cost-effective option for editing tasks.

- i.LINK interface supports both DV IN/OUT and File Access Mode protocols
- High-resolution AV file (MPEG IMX/DVCAM) recording via i.LINK (File Access Mode) interface
- DVCAM playback and recording via i.LINK (DV IN/OUT) interface
- Proxy AV Data recording
- i.LINK (DV stream) output from MPEG IMX recordings
- Metadata recording
- Ability to write EDL (Clip List) back onto disc
- High-speed file transfers : 30x for Proxy, 2.5x for DVCAM and 1.25x for MPEG IMX (50 Mb/s) files when using an i.LINK (File Access Mode**) connection
- Equipped with one optical head
- AC/battery-powered operation (battery-connection requires the optional BKP-L551 adaptor.)
- Highly compact and lightweight
- Dimensions (W x H x D): 182 x 257 x 78 mm (7 ¼ x 10 ⅛ x 3 ⅛ inches)
- Mass: 3.0 kg (6 lb 9 oz)

PDJ-A640

PDJ-C1080

PDJ-A640 Cart
PDJ-C1080 Cart

The PDJ-C1080 and new PDJ-A640 are automated robotic cart systems ideal for multi-disc ingesting, archiving and on-air playout applications. The smaller PDJ-C1080 accommodates up to four PDW-1500 units and up to 80 discs, while the larger PDJ-A640 accommodates up to four PDW-1500 units and up to 640 discs. The PDJ-A640 also accommodates PDW-F70 XDCAM HD decks in any combination with PDW-1500 units.

These cart systems are equipped with a standard VCC control protocol, allowing easy integration into existing systems. The total storage capacities are 1.8 Terabytes when using 80 discs and 15 Terabytes using 640 discs. PDJ-CS10 Cart Interface Software is available to interface with MXF-compliant systems such as editors and servers.

With the XDCAM's file-based operations and metadata capability, as well as the reliability, long life and small physical size of the Professional Disc media, these cart systems provide significant operational benefits, greater reliability, reduced operational costs and space-saving benefits compared to tape-based systems.

- Ideal for multi-disc ingesting, archiving and on-air playout applications
- Equipped with VCC protocol (RS-422 or RS-232C)
- Equipped with a barcode reader unit
- Optional PDJ-CS10 Application Software to interface with MXF-compliant systems such as editors and servers
- High reliability and low-cost maintenance

	PDJ-A640	PDJ-C1080
Max. number of decks installed and compatible model	4 PDW-1500 and PDW-F70, in any combination	4 PDW-1500
Max. number of discs	640	80
Total storage capacity and approximate recording time	15 Terabytes 480 hours (MPEG IMX 50 Mb/s) 906 hours (DVCAM)	1.8 Terabytes 60 hours (MPEG IMX 50 Mb/s) 113 hours (DVCAM)

Inputs/Outputs

		PDW-1500	PDW-R1	PDW-V1	PDW-D1
Outputs	SDI	●	●	●	—
	Analogue composite	●	●	●	—
	Digital audio	●	●	—	—
	Analogue audio	●	●**	—	—
	Audio monitor	●	●**	●	—
	Headphone	●	●	●	—
	Analogue RGB	—	—	●	—
	Time code	●	●	—	—
Inputs	SDI	●	●	—	—
	Analogue composite	●	●	—	—
	Digital audio	●	●	—	—
	Analogue audio	●	●	—	—
	Time code	●	●	—	—
Others	Remote (RS-422A)	●	●	—	—
	Ethernet	1000Base-T	100Base-TX	100Base-TX	—
	i.LINK (DV IN/OUT)	●	●	●***	●
	i.LINK (File Access Mode*)	●	●	●	●

*For connection with third party products using this mode, please contact your nearest Sony office.
**Analogue audio output and audio monitor output share the same connector. ***DV OUT only

Front Panels and Input/Output Connectors

PDW-1500
Studio Recorder

PDW-R1
Field Recorder

PDW-D1
Drive unit

PDW-V1
Field Viewer

PDZ-1 Proxy Browsing Software – An Extremely Powerful Partner with the XDCAM System

The PDZ-1 Proxy Browsing Software that is supplied with all XDCAM products is a highly convenient tool to easily browse recorded footage and even perform simple cuts-only editing right on your PC. This software also provides a variety of convenient tools for disc operation such as entire or partial disc copy (dubbing) and transfer between two XDCAM devices. It runs on a Windows-based PC and supports two types of interfaces: i.LINK (File Access Mode) and Ethernet.

The XDCAM products can transfer Proxy Data to a PC running the PDZ-1 software at an extremely high speed. The software then enables simple and quick cut editing of this Proxy Data and once the editing is complete, the edit results can be saved as a "Clip List" (or "XDCAM EDL") and written back to the original disc, allowing the disc to be played back according to the EDL. The Clip List also allows you to instantly generate a popular ASF file, which can be played back according to the EDL on Windows Media Player – a powerful feature that can streamline production workflows.

The PDZ-1 software also includes a variety of convenient functions such as "clip search by metadata", "EDL export in various formats" and "high-resolution file transfer according to a Clip List".

The MXF Proxy Viewer – application software specifically used to play back Proxy Data on a PC – is also supplied with all XDCAM products.

System requirements

Windows 2000 (SP4 or later), Windows XP Professional (SP1 or later), Pentium® III Processor 1 GHz or b higher, Minimum 512 MB of RAM, Internet Explorer (SP1 or later), DirectX 8.1b or higher

- Supported interfaces: i.LINK (File Access Mode) and Ethernet
- High-speed ingestion of Proxy Data from the XDCAM devices
- Browsing of Proxy Data recorded by the XDCAM systems (including those recorded by the HD version of the XDCAM system).
- Imports Proxy Data and metadata from a memory card
- Simple and quick cuts-only editing (storyboard)* with the following functions:
  - Preview a result of the storyboard on the PC
  - Save the results as a Clip List (XDCAM EDL)
  - Convert the Proxy Data on the storyboard to an ASF file for replay on Windows Media Player
  - Export the Clip List in BVE-9100, Newsbase™ XML and ALE (Avid Log Exchange) formats
  - Transfer high-resolution clips according to the Clip List
- Disc copy – entire disc (all clips) or only selected clips
- Registration of metadata such as "title", "creator", or "comments" for a disc or clip
- Setting of "EssenceMark" for instant cue-up to desired scenes. Names for EssenceMark can also be easily assigned.
- Supports a live logging function that allows operators to browse and storyboard Proxy Data and add EssenceMark and other metadata on a PC while the camcorder or PDW-1500 deck is still recording**
- Clip search function using the registered metadata as a keyword
- Print function allows metadata such as thumbnails, creation date and comments to be printed out in an easy-to-see storyboard view

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

** Possible when connecting the XDCAM products and the PC via an Ethernet interface.

PDZ-VX10: XDCAM Viewer Software

PDZ-VX10 XDCAM Viewer is a tool that enables you to play back and check the video and audio material in MXF files. In addition to playback of proxy AV data, it supports playback of the material at its original screen quality.

So, after a shoot you can upload the MXF files to your server or PC and quickly browse and quality check the material in High Definition on your desktop.

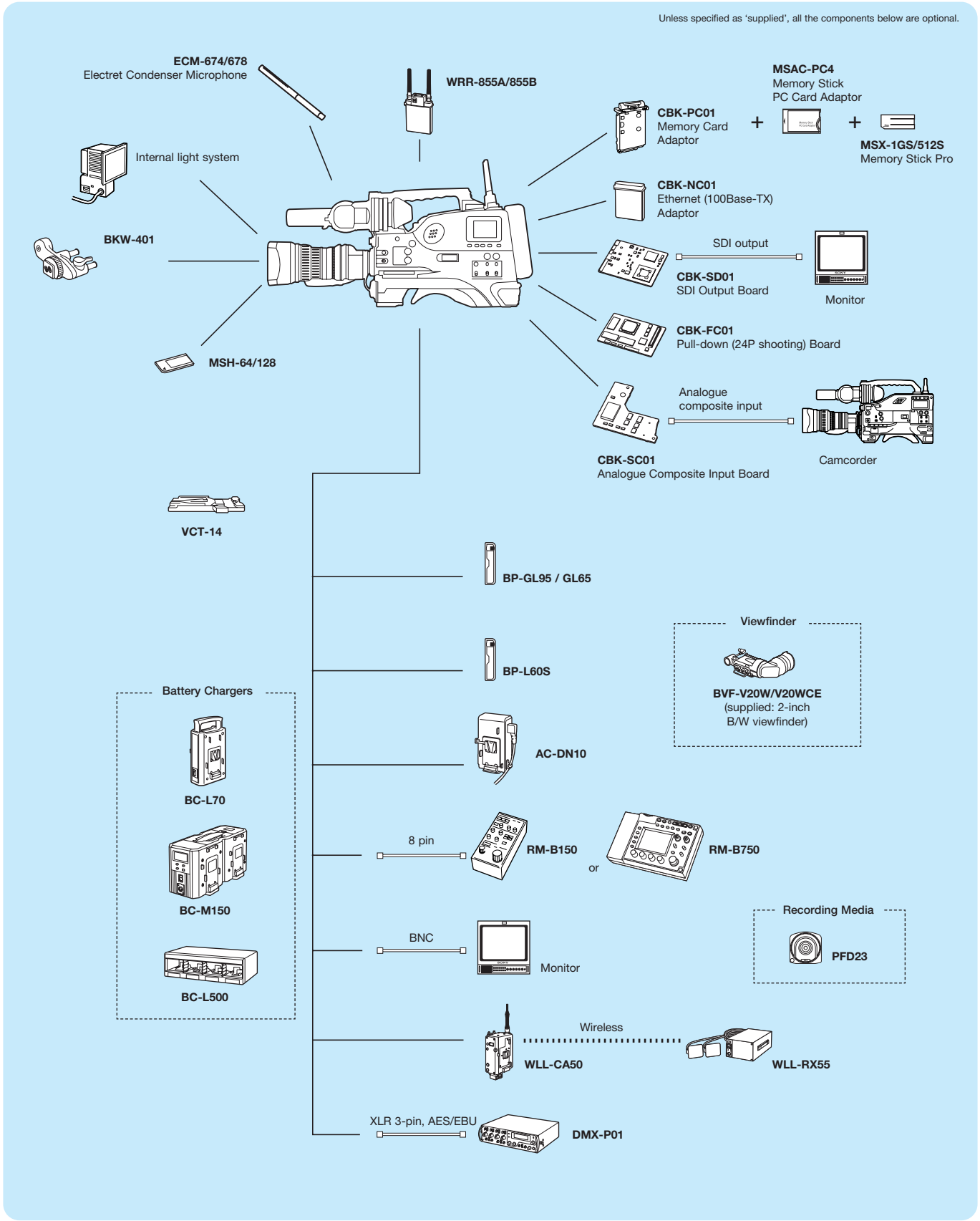
[To download software you must be registered with sonybiz.net and logged in.]

Proxy Browsing Software PDZ-1

Print Function

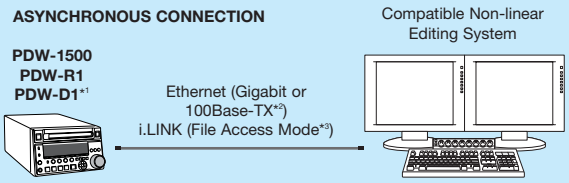
MXF Proxy Viewer

System Diagrams

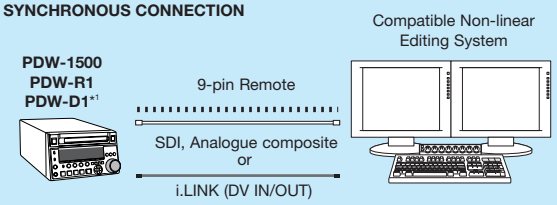


NON-LINEAR EDITING

ASYNCHRONOUS CONNECTION

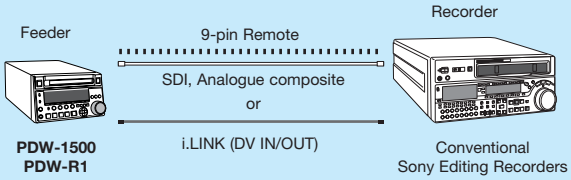


SYNCHRONOUS CONNECTION



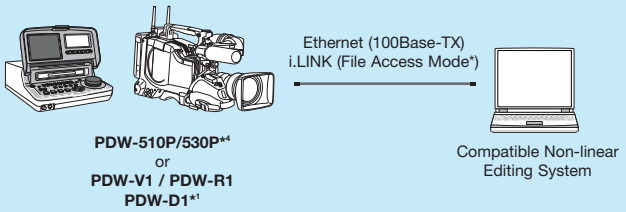
LINEAR EDITING

DISC-TO-TAPE EDITING

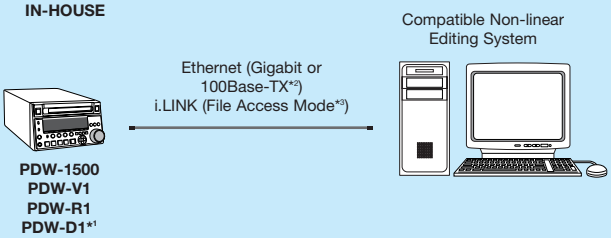


PROXY (LOW-RESOLUTION) EDITING

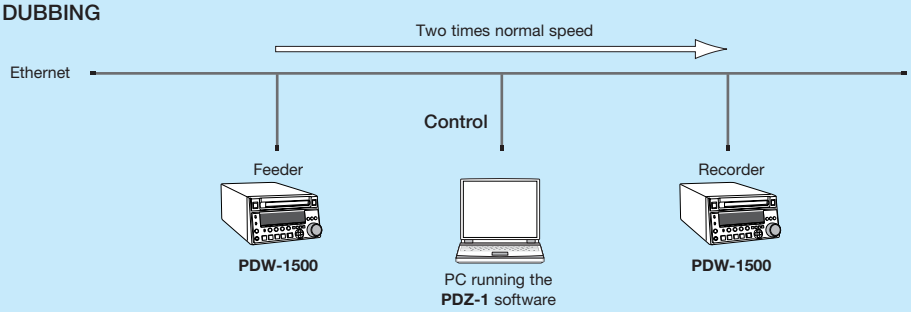
IN THE FIELD



IN-HOUSE



HIGH-SPEED DUBBING



*1 The PDW-D1 supports i.LINK (DV IN/OUT and File Access Mode) only.

*2 Ethernet interface depends on the XDCAM deck used.

*3 For connection with third party products using this mode, please contact your nearest Sony office.

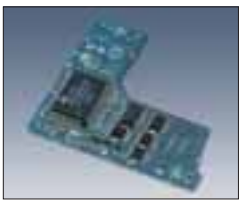
*4 Ethernet interface on the PDW-510P/530P is optional.

Optional Accessories

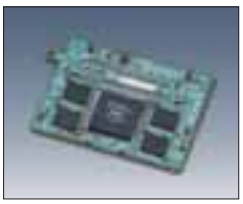
For PDW-510P/530P Camcorders

PFD23
Professional Disc

CBK-SD01
SDI Output Board



CBK-SC01
Analogue Composite Input Board

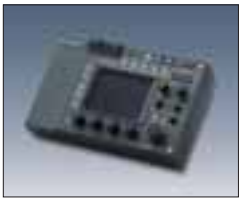


CBK-FC01
Pull-down(24P shooting) Board
(For PDW-530/510 NTSC models)

CBK-NC01
Ethernet (100Base-TX) Adaptor

BKW-401
Viewfinder Rotation Bracket

RM-B150
Remote Control Unit



RM-B750
Remote Control Unit

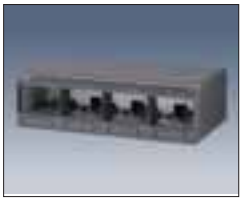
AC-DN10
AC Adaptor

BP-GL95/GL65
Lithium-ion Battery Pack

BP-L60S
Lithium-ion Battery Pack

BC-L70
Battery Charger

BC-M150
Battery Charger



BC-L500
Battery Charger

WLL-RX55
Wireless Camera Receiver

WLL-CA50
Wireless Camera Transmitter

VCT-14
Tripod Adaptor

MSH-64/128
Memory Stick

CCFD-3L
i.LINK Cable
(4-pin to 6-pin with lock)

CCF-3L
i.LINK Cable
(6-pin to 6-pin with lock)

CBK-PC01
Memory Card Adaptor

* A memory card and its compatible memory card adaptor are required.
* Compatible Sony products are as follows. For other compatible products offered by SanDisk Corporation, please consult with your nearest Sony office.
- Memory Stick: Sony Memory Stick Pro MSX-1GS, MSX-512S
- Memory Stick Adaptor: Sony Memory Stick PC Card Adaptor MSAC-PC4

WRR-855A/855B
Wireless Microphone Receiver
(Slot-in type)

WRR-862A/862B
Wireless Microphone Receiver

DMX-P01
Portable Audio Mixer

ECM-674/678
Shotgun-type Electret Condenser Microphone

LC-777
Carrying Case

1-547-541-12 Fog-proof filter
A-6282-537-A Viewfinder eye-piece (High magnification)
A-6282-538-A Viewfinder eye-piece (Low magnification)
A-8267-737-A Viewfinder eye-piece (Standard magnification with special compensation for aberrations)

A-8314-798-A Viewfinder eye-piece (High performance, x3)
X-3608-271-1 Standard viewfinder lens
A-8278-057-A Mounting bracket for WRR-862A/862B

For PDW-R1/V1/D1/1500 Decks

PFD23
Professional Disc

VMC-IL4615B/
IL4635B
i.LINK Cable
(4-pin to 6-pin, 1.5 m/3.5 m)

VMC-IL6615B/
IL6635B
i.LINK Cable
(6-pin to 6-pin, 1.5 m/3.5 m)

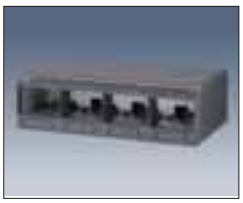
RM-280
Editing Controller (PDW-1500/R1)

RCC-5G
Remote Control Cable (5 m)
(PDW-1500/R1)

BP-GL95/GL65
Lithium-ion Battery Pack
(PDW-R1/V1/D1)

BC-L70
Battery Charger
(PDW-R1/V1/D1)

BC-M150
Battery Charger
(PDW-R1/V1/D1)



BC-L500
Battery Charger
(PDW-R1/V1/D1)

BKP-L551
Battery Adaptor
(PDW-D1)

PBZD-E1500
Software (PDW-1500)

PDZ-VX10
Viewer Software

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Specifications

XDCAM Camcorders

General		PDW-510P (DVCAM)	PDW-530P (DVCAM / MPEG IMX)
Mass		Approx. 4.1 kg (9 lb), 5.8kg (with VF, Mic, Disc, BP-GL95 battery) (12 lb 12 oz)	
Power requirements		DC 12 V +5.0 V/-1.0 V	
Power consumption		Approx. 32 W (while recording, with viewfinder, colour LCD off)	
Operating temperature		-5 to 40 °C (+23 to +104 °F)	
Storage temperature		-20 to +60 °C (-4 to+140 °F)	
Humidity		10 to 90% (relative humidity)	
Continuous operating time		Approx. 120 min. w/BP-GL95 battery	
Recording Format			
	Video	DVCAM (25 Mb/s)	MPEG IMX (50/40/30 Mb/s), DVCAM (25 Mb/s)
	Proxy Video	MPEG-4	
	Audio	DVCAM: 4 ch/16 bits/48 kHz	MPEG IMX: 4 ch/16 bits/48 kHz, 4 ch/24 bits/48 kHz DVCAM: 4 ch/16 bits/48 kHz
	Proxy Audio	A-law (4ch, 8 bits, 8 kHz)	
Recording/Playback time	MPEG IMX	—	50 Mb/s: 45 min., 40 Mb/s: 55 min., 30 Mb/s: 68 min.
	DVCAM	85 min.	
Signal inputs			
Genlock video		BNC x1, 1.0 Vp-p, 75 Ω	
Time code input		BNC x1, 0.5 to 18 Vp-p, 10 kΩ	
Audio input		XLR-3-31 x2, line / mic / mic+48V / AES/EBU selectable	
Mic input		XLR-3-31 x1	
Signal outputs			
Video output		BNC x1, 1.0 Vp-p, 75 Ω	
Video test output		BNC x1, 1.0 Vp-p, 75 Ω	
Time code output		BNC x1, 1.0 Vp-p, 75 Ω	
Earphone		Mini-jack x2 (front: monaural, rear: stereo/monaural)	
Audio output (CH-1/CH-2)		XLR-5-pin male (stereo)	
Other inputs/outputs			
Lens		12-pin	
Remote		8-pin	
Light		2-pin, DC 12 V, max. 50 W	
DC intput		XLR-4-pin	
DC output		4-pin (for wireless microphone receiver), DC 12 V (MAX 0.2A)	
Camcorder adapter		40-pin	
i.LINK		IEEE 1394, DV IN/OUT or File Access Mode*, 6-pin x1	
Audio performance			
Frequency response		20 Hz to 20 kHz, +0.5 dB/-1.0 dB	
Dynamic range		More than 85 dB	
Distortion		Less than 0.08% (at 1 kHz, reference level)	
Crosstalk		Less than -70 dB (at 1 kHz, reference level)	
Wow & flutter		Below measurable limit	
Head room		20 dB (ex-factory setting)	
Camera section			
Pickup device		3-chip 2/3-inch type 16:9 widescreen Power HAD EX CCD	
Total picture elements		1038(H) x 1188(V)	
Effective picture elements		980(H) x 582(V)	
Optical system		F1.4 prism	
Built-in optical filters		1 : 3200K, 2 : 5600K+1/8ND, 3 : 5600K, 4 : 5600K + 1/64ND	1: Clear, 2: 1/4ND, 3: 1/16ND, 4: 1/64ND A: CROSS, B: 3200K, C: 4300K, D: 6300K
Shutter speed		1/60, 1/125, 1/250, 1/500, 1/1000, 1/2000 (s)	
Slow Shutter		1/2 to 1/25 (s) (1 to 8 and 16 frame accumulation)	
Lens mount		2/3" 48 bayonet mount	
Sensitivity (2000 lx, 89.9% reflectance)		F11 (typical)	
Minimum illumination		Approx. 0.13 lx (F1.4 lens, +48 dB turbo gain, shutter off), approx. 0.008 lx (with 16-frame accumulation)	
Gain selection		-3, 0, 3, 6, 9, 12, 18, 24, 30, 36, 42, 48 dB	
Smear level		-140 dB (typical)	
S/N ratio		63 dB (typical)	
Vertical resolution		480 TV Lines/530 TV Lines(EVS)	
Registration		0.05% (all zones, w/o lens)	
Geometric distortion		Below measurable level (w/o lens)	
Modulation depth at 5 MHz		70%(16:9, typical)/55%(4:3, typical)	
Viewfinder			
CRT		2.0-inch type monochrome	
Controls		BRIGHT, CONTRAST, PEAKING controls, TALLY, ZEBRA, DISPLAY switches	
Horizontal resolution		450 TV lines (16:9)	
Microphone		Ultra-directional (detachable)	
Built-in LCD monitor			
		2.5-inch type colour LCD monitor	
Supplied accessories			
Operation manual (x1) – PDZ-1 proxy browsing software (x1) – MXF proxy viewer software (x1) – Viewfinder (x1) – Lens cap (x1) – Shoulder belt (x1) – Monaural microphone (x1)			

* For connection with third-party products using this mode, please contact your nearest Sony office

XDCAM Decks

General		PDW-1500	PDW-R1	PDW-V1	PDW-D1
Power requirements		AC 100 to 240 V, 50/60 Hz	AC 100 to 240 V, 50/60 Hz, DC (with battery)		
Power consumption		75 W	37 W	45 W	22 W
Operating temperature		+5 to 40°C (+42 to +104°F)	0 to 40°C (+32 to +104°F)		
Storage temperature		-20 to +60°C (-4 to +140°F)			
Humidity		20 to 90% (relative humidity)			
Mass		7.4 kg (16 lb 5 oz)	4.7kg (10 lb 6 oz)	3.5 kg (7 lb 11 oz)	3.0 kg (6 lb 9 oz)
Dimensions (W x H x D)		210 x 130 x 415 mm (8 3/8 x 5 1/8 x 16 3/8 inches)	230 x 105 x 340 mm (9 1/8 x 4 1/4 x 12 inches)	210 x 90 x 320 mm (8 3/8 x 3 5/8 x 12 5/8 inches)	78 x 182 x 257 mm (3 1/8 x 7 1/4 x 10 1/8 inches)
Recording/playback format	Video	MPEG IMX (50/40/30 Mb/s), DVCAM (25 Mb/s)			
	Proxy Video	MPEG-4			
	Audio	MPEG IMX: 8 ch/16 bit/48 kHz or 4 ch/24 bit/48 kHz DVCAM: 4 ch/16 bit/48 kHz			
	Proxy Audio	A-law (8/4 ch, 8 bit, 8 kHz)			
Recording/playback time	MPEG IMX	50 Mb/s: 45 min., 40 Mb/s: 55 min., 30 Mb/s: 68 min.			
	DVCAM	85 min.			
Search speed (in colour)	Jog mode	±1 times normal playback speed	±1 times normal playback speed		—
	Variable mode	±2 times normal playback speed	—		—
	Shuttle mode	±35 times normal playback speed	±20 times normal playback speed		—
Signal inputs					
Analogue reference input		BNC x2 (including loop through), 0.286 Vp-p, 75 Ω, sync negative	BNC x1, 0.286 Vp-p, 75 Ω, sync negative	—	—
Analogue composite input		BNC x2 (including loop through), 1.0 Vp-p, 75 Ω, sync negative	BNC x1, 1.0 Vp-p, 75 Ω, sync negative	—	—
SDI input		BNC x1, SMPTE 259M, (ITU-R BT656-3), 270 Mb/s		—	—
Analogue audio input		XLR x2 (channel selectable), +4/0/-3/-6 dBu (selectable from menu), 10 kΩ, balanced		—	—
Digital audio input		AES/EBU, BNC x2, 4 channels		—	—
Time code input		BNC x1		—	—
Signal outputs					
Analogue composite video output		BNC x2 (including one character out), 1.0 Vp-p, 75 Ω, sync negative		BNC x1 (character out), 1.0 Vp-p, 75 Ω, sync negative	—
SDI output		BNC x2 (including one character out),SMPTE 259M (ITU-R BT656-3), 270 Mb/s	BNC x1 (character out), SMPTE 259M (ITU-R BT656-3), 270 Mb/s		—
Video monitor output		—		D-sub 15-pin x1, analogue RGB	—
Built-in display		—	D-sub 15-pin x1, analogue RGB		—
Analogue audio output		XLR x2 (ch. selectable), +4/0/-3/-6 dBu (selectable from menu), 600 Ω load, low impedance, balanced		—	—
Audio monitor output		RCA x1 (L, R, Mix), -11 dBu, 47 kΩ, unbalanced	—	RCA x2 (L/R), -11 dBu, 47 kΩ, unbalanced	—
Digital audio output		BNC x2, 4 channels		—	—
Headphone output		JM-60 Stereo phone jack x1, -∞ to -13 dBu, 8 Ω, unbalanced			—
Built-in audio speaker		—	x1, monaural		—
Time code output		BNC x1		—	—
DC output		—	Round shape 4-pin, 12 V	—	—
Other inputs/outputs					
i.LINK*		IEEE 1394, DV IN/OUT or File Access Mode***, 6-pin x 1		IEEE 1394, DV OUT** or File Access Mode***, 6-pin x 1	IEEE 1394, DV IN/OUT or File Access Mode***, 6-pin x 1
Ethernet*		1000Base-T (RJ-45 x1)	100Base-TX (RJ-45 x1)		—
RS-422A		D-sub 9-pin x1 (VTR protocol)		—	—
Video performance					
Sampling frequency		Y: 13.5 MHz, R-Y/B-Y: 6.75 MHz			
Quantization		10 bits/sample			
Error correction		Reed Solomon Code			
Analogue composite input to analogue composite output		Bandwidth: 30 Hz to 4.5 MHz +0.5/-1.5 dB (NTSC) 25 Hz to 5.5 MHz +0.5/-1.5 dB (PAL) S/N ratio: 53 dB or more Differential gain: 2% or less Differential phase: 2° or less Y/C delay: 20 ns or less K-factor (2T pulse): 2% or less		—	—
Processor adjustment range					
Video level		±3 dB	– Ω to ±3 dB	±3 dB	—
Chroma level		±3 dB	– Ω to ±3 dB	±3 dB	—
Set up/black level		±30 IRE/±210 mV			—
Chroma phase/hue		±30°			—
System sync phase		±3 µs		—	—
System SC phase		±200 ns		—	—
Audio Performance					
Frequency response		20 Hz to 20 kHz +0.5/-1.0 dB (0 dB at 1 kHz)		—	—
Dynamic range		More than 90 dB		—	—
Distortion		Less than 0.05% (at 1kHz)		—	—
Head room		20/18/16/12 dB (selectable from menu)		—	—
Supplied Accessories					
		Operation manual (x1) PDZ-1 proxy browsing software (x1) MXF proxy viewer software (x1)		Operation manual (x1) PDZ-1 proxy browsing software (x1) MXF proxy viewer software (x1) Shoulder belt (x1)	Operation manual (x1) PDZ-1 proxy browsing software (x1) MXF proxy viewer (x1) Setup utility software (x1)****

* Note about Ethernet and i.LINK (File Access Mode): All XDCAM products allow asynchronous recording of MPEG IMX/DVCAM files through their Ethernet or i.LINK (File Access Mode) interfaces Asynchronous recording is possible only when XDCAM units are connected with a PC.

** The PDW-V1 does not support synchronous DVCAM recording through i.LINK interface.

*** For connection with third party products using this mode, please contact your nearest Sony office.

****This setup utility software is used to setup the PDW-D1 and runs only on a Windows-based PC (not compatible with Macintosh OS).

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