Full HD solid-state camcorder.

PMW-EX1R XDCAM EX Camcorder

SONY

www.sonybiz.net/xdcam
Full HD solid-state camcorder for superior HD Picture performance and more creative freedom.

PMW-EX1R Camcorder

The PMW-EX1R is the successor to the multiple award-winning EX1 and further extends the capabilities of the XDCAM EX family with great new features such as DVCAM recording, Cache Recording, Picture Inversion and a host of additional refinements. The EXTR is the ideal solution for customers such as broadcasters, independent videographers and film makers who need exceptional HD picture quality and state-of-the-art workflow from a compact and affordable handheld camcorder.

The XDCAM EX professional product range from Sony is designed to exploit the ultimate high performance of SxS memory cards. It combines a proven, non-linear XDCAM workflow with the only Full HD resolution sensor system available in a compact camcorder. This advanced imaging system consists of three 1/2-inch-type Exmor™ CMOS sensors, each with an effective pixel count of 1920x1080, to produce images in full HD resolution. In addition, there’s a purpose-built Fujinon Professional HD 14x zoom lens and a unique dual focus ring mechanism.

Supplied Wide-angle Fujinon 14x Zoom Lens
The PMW-EX1R is equipped with a high-quality, high-definition Fujinon 14x zoom lens specifically designed to offer optimum picture performance and unprecedented functionality. The lens offers a wide viewing angle of 5.8 mm (equivalent to 31.4 mm on a 35-mm lens), and many convenient features for diverse shooting situations.

Unique Focus Ring Mechanism
- Professional Manual Focus and Auto Focus
The lens adopts a unique focus ring mechanism, offering two types of Manual focus and Auto focus. The lens has two independent focus wheel mechanisms, which can be switched by sliding the focus ring back and forth.

Optical Image Stabiliser
Incorporated in the lens, this minimises the blurring effect caused by a shaking hand.

Expanded Focus
At the touch of a button, the centre of the screen on the LCD monitor and viewfinder of the PMW-EX1R can be magnified to about twice normal size, making it easier to confirm focus settings during manual focusing.

Selectable Peaking
The Peaking function of the PMW-EX1R can help operators to quickly and accurately adjust the camera’s focus by altering the way pictures are displayed on the LCD monitor and viewfinder. It can enhance the outline of the image which the camera focuses on most, and change its colour to make it stand out. Enhance levels can be selected from three levels, and the outline colour from four colours.

One-push Auto Iris
A One-push Auto Iris button on the lens of the PMW-EX1R, allows the user to go into Auto Iris mode only when the button is pushed.

Optical Image Stabiliser
Incorporated in the lens, this minimises the blurring effect caused by a shaking hand.

Cutting-edge Camera Technology
The PMW-EX1R is equipped with three 1/2-inch-type Exmor CMOS sensors, each with an effective pixel count of 1920 (H) x 1080 (V). This technology delivers superior picture performance with full HD resolution. Furthermore, this type of sensor allows the camcorder to provide an excellent sensitivity of F10, a remarkable signal-to-noise ratio of 54 dB, and a high horizontal resolution of 1000 TV lines.

Other benefits include greatly reduced power consumption and associated heat dissipation in the PMW-EX1R, qualities which made possible the unique use of 1/2-inch-type sensors on these compact camcorders. In addition, this type of sensor can capture images with a shallower depth of field, giving users more freedom of creative expression.

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AF Assist
The AF (Auto Focus) Assist function of the PMW-EX1R enables operators to manually change focus positions using the focus ring in AF mode. This means that AF reference focus positions can be shifted manually to a new position.

MF Assist
The MF (Manual Focus) Assist function of the PMW-EX1R helps to precisely focus on the target subject when shooting in MF mode. When MF Assist is enabled, auto focus is momentarily activated when the user stops adjusting the focus ring. The camera then finely focuses on the subject closest to the focal point of the lens at that time.

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Features

Creative Recording Modes and Settings

CINEAEDA

23.98P Native Recording
The compact PMW-EX1R offer a native 23.98P* recording capability. This makes these camcorders ideal for cinema production.

*In 1440 x 1080/23.98P (SP) mode, images are handled as 23.98P and recorded as 59.94i signals via 2-3 pull-down.

Slow & Quick Motion Function
Commonly known by filmmakers as over-cranking and under-cranking – this enables users to create unique ‘looks’ as well as slow- and fast-motion special effects.

Image capture can be at frame rates selectable from 1 fps (frame per second) to 60 fps in 720P mode, and from 1 fps to 30 fps in 1080P mode, in 1 fps increments.

Example of slow motion mechanism

For example, when viewed at 23.98P, images captured at 60 fps appear two and a half times slower than normal. Conversely, images captured at 4 fps appear six times faster than normal.

Interval Recording Function
An Interval Recording function records one frame at pre-determined intervals. This is convenient for shooting over long periods of time, and also when creating special effects with extremely rapid motion.

Frame Recording Function
Frame Recording is unique to the PMW-EX1R – a function that is especially useful for clay animation shooting. Using this function, images for pre-determined frames are recorded every time the record button is pressed.

Shutter Angle Settings
As well as traditional electronic shutter speed controls, adjustable in fractions of a second, the PMW-EX1R also offers shutter angle control, which is familiar to filmmakers.

DVCAM Recording
A newly added feature in the PMW-EX1R – SD recording in DVCAM mode – offers those currently using SD systems a smooth migration path to HD production. By introducing the PMW-EX1R as a DVCAM acquisition camcorder, the conventional ingest process to non-linear systems becomes dramatically more efficient. Once the requirement is migrated to HD delivery, the PMW-EX1R can continue to be deployed for HD acquisition.

Picture Profile Feature
This allows camera operators to easily call up customised picture-tonal settings to suit particular shooting conditions, rather than having to re-adjust the camera each time, giving users greater operational efficiency. Up to six different pictures – tonal settings such as the parameters of matrix, colour correction, detail, one of eight gamma curves, and knee – can be saved on SxS memory card. These settings are displayed on the LCD monitor at the touch of a button.

Shot Transition Function
With a simple push of a button, this enables smooth, precise and repeatable automatic scene transitions. The operator can program the duration and select from three transition profiles: Linear, Soft Stop, and Soft Transition.

ATW & Hold
The ATW (Auto Tracing White Balance) function automatically adjusts the camera’s colour temperatures according to changes in the lighting conditions. This function is useful when recording outside for long periods, and the lighting changes gradually over time. The PMW-EX1R also has an ATW Hold function, which allows the operator to hold auto tracing at a desired colour balance via an assignable switch.

IR Remote Control On Rear
Situated on the rear of the handle, this allows the user to control the PMW-EX1R with a remote commander both from the front and rear of the camcorder.

Additional Aspect Markers For Cinema Operation
Several new aspect markers such as 1.66:1, 1.85:1, 2.35:1, and 2.4:1 are added for more convenient cinema operation.

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The PMW-EX1R is equipped with a large, easy-to-view, colour LCD with a high resolution of 1920 x 480 pixels. This screen can be flexibly rotated for accessible viewing from any shooting angle. The ease of focusing and adjustability offered by this high-resolution panel, adjustability, enable it to be used as a viewfinder or camera assistant operator panel. It can also be used to instantly review recorded footage, access the camera’s set-up menus, view thumbnails, and display status indications.

### Rotary Grip
The hand grip of PMW-EX1R can rotate approximately 120 degrees, which allows operators to flexibly adjust the angle of the grip. This gives greater control and comfort when holding the camera in any shooting position. The grip for the PMW-EX1R has a new, enhanced shape that better fits the user’s hand.

### 0.54-inch Colour LCD Viewfinder
The PMW-EX1R comes equipped with a new colour LCD viewfinder, which displays high-resolution colour pictures of approximately 1,226,000 pixels in a wide-screen aspect ratio of 16:9, to simplify focusing. Operators can switch between Colour and Monochrome Display modes, according to their preference.

### One-push Auto Iris
A One-push Auto Iris button on the lens of the PMW-EX1R, allows the user to go into Auto Iris mode only when the button is pushed.

### Built-in Stereo Microphone and Two-channel Audio Input
The PMW-EX1R has a built-in stereo microphone and two XLR audio-input connectors for connecting professional microphones or feeding an external audio source. These allow high-quality, two-channel 16-bit, 48-kHz linear PCM uncompressed audio to be recorded.

### Rotatable Zoom Switch and Record Start/Stop Button
To facilitate zoom control and recording operation during low-angle shooting, an additional zoom switch and record start/stop button are located on the carrying handle. In addition, the PMW-EX1R has a new zoom transition menu which ensures smooth transitions - the user simply selects “Soft” to enable the on-handle zoom to start and stop more smoothly.

### On-handle Zoom Switch and Record Start/Stop Button
The PMW-EX1R has a wide range of interfaces optimised for a variety of operational needs, wide interoperability, and flexible workflow. These include an HD-SDI output and in E-to-E mode. 10 bits of 4:2:2 signal can be output from the connector. For versatile usage, there is also a down-converted SD-SDI output, LINK (HDV) input/output, and analogue composite/component output.

### One-push S&Q Switch
For the PMW-EX1R, a new S&Q (Slow & Quick Motion) button has been added to the inside panel. It allows the user to switch quickly between Normal mode and S&Q mode. In S&Q mode, a blue LED on the button lights up.

### Four Assignable Buttons
Frequently used functions can be programmed to four assignable buttons allowing operators to make rapid changes when working in the field.

### Other Features
- Built-in ND filter wheel: OFF: Clear, 1: 1/8ND, 2: 1/64ND
- Selectable gain: -3, 0, 3, 6, 9, 12, 18 dB
- High-speed picture search: x4, x15
- Freeze Mix function
- Skin-tone detail control
- Low-key saturation

### HD-SDI and Other Versatile Interfaces
The PMW-EX1R has a standard HDMI connector (Type A) allows the use of a consumer display or professional monitor equipped with an HDMI input. Non-compressed video and two channels of audio can be output.

### HDMI Output
- HDMI connector (Type A)
- 1080p, 10-bit, YUV 4:4:4
- 1080i, 8-bit, YUV 4:2:2
- 720p, 10-bit, YUV 4:2:2
- 720p, 8-bit, YUV 4:2:2
- 1080p, 8-bit, YUV 4:2:2
- 1080i, 10-bit, YUV 4:2:2
- 1080i, 10-bit, YUV 4:4:4
- 720p, 10-bit, YUV 4:4:4
- 720p, 10-bit, YUV 4:2:2
- 720p, 8-bit, YUV 4:2:2
- 720p, 8-bit, YUV 4:4:4
**General**

- **Mass:** 2.4 kg (5 lb 4 oz) (body), 2.8 kg (6 lb 2 oz) (with lens hood, large eye cup, BP-U30 battery, one SxS PRO memory card)
- **Dimension (W x H x D):** 179 x 199 x 308 mm (7 1/8 x 7 7/8 x 12 1/4 inches) without projection
- **Power requirements:** DC 12 V
- **Power consumption:** Approx. 12.5 W (while recording, EVF On, LCD monitor Off)
- **Storage temperature:** -20 °C to +60 °C (4 °F to +140 °F)
- **Battery operating time:** Approx. 240 min with BP-U90 battery
- **Battery operating time:** Approx. 120 min with BP-U30 battery

**Camera Section**

- **Recording format (Video):** MPEG-2 Long GOP, MPEG-2 MP@HL

**Audio:** Linear PCM (2ch, 16-bit, 48-kHz)

- **HD HQ mode:** VBR, maximum bit rate: 35 Mb/s, MPEG-2 MP@HL
- **HD SP mode:** CBR, 25 Mb/s, MPEG-2 MP@H-14
- **HDV (1080i) / DVCAM stream input/output:** S400

**Inputs/Outputs**

- **Audio input:** XLR-type 3-pin (female) (x2), line/mic/mic +48 V selectable
- **Audio output:** Phono jack (CH-1, CH-2) via A/V multi connector
- **Component output:** Mini D-connector (x1) via A/V multi connector
- **DC input:** DC jack

**Monitoring**

- **Viewfinder:** 0.45 inch color LCD, approx. 921,000 effective pixels, 640 (horizontal) x 3 (RGB) x 480 (vertical), 16:9, hybrid type

**Lens**

- **Zoom ratio:** 14x (optical), servo/manual
- **Focus length:** 5.8 mm to 81.2 mm (equivalent to 31.4 mm to 439 mm on 35 mm lens)
- **Iris:** F1.9 to F16 and Close, auto/manual selectable
- **Image stabilizer:** ON/OFF selectable, shift lens
- **Filter diameter:** 77 mm, pitch 0.75 mm (on lens)

**Camera Section**

- **Imaging device:** 3-chip, 1/3 inch type Exmor Full HD CMOS
- **Effective picture elements:** 1920 (H) x 1080 (V)
- **Optical system:** F1.8 prism system
- **Built-in optical filters:** Off/On, 1: RND. 2: 1/4ND
- **Sensitivity (2000 lx, 39.9% reflectance):** F10 (typical) (1920 x 1080/59.94i mode)
- **S/N ratio:** 54 dB (Y) (typical)
- **Horizontal resolution:** 1080p

**Power requirements:**

- **Minimum illumination:** 0.14 lx (typical) (1920 x 1080/59.94 mode, F1.9, +18 dB gain, with 64-frame accumulation)
- **Shutter speed:** 1/60 sec to 1/2,000 sec = ECS
- **Slow Shutter (SLS):** 2, 3, 4, 5, 6, 7, 8, 16, 32, and 64-frame accumulation

**Power consumption:**

- **Approx. 12.5 W (while recording, EVF On, LCD monitor Off)**

**White balance**:

- **Preset (3,200 K), Memory A, Memory B/ATW**

**Recording time**:

- **Approx. 240 min with BP-U60 battery**
- **Approx. 120 min with BP-U30 battery**

**Power requirements**:

- **DC input:** DC jack

**Recording/Playback**

- **HQ Mode:**
  - Approx. 100 min with SBP-32 (32 GB) memory card**
  - Approx. 50 min with SBP-16 (16 GB) memory card
  - Approx. 25 min with SBP-8 (8 GB) memory card
- **SP/SD Mode:**
  - Approx. 140 min with SBP-32 (32 GB) memory card**
  - Approx. 70 min with SBP-16 (16 GB) memory card
  - Approx. 35 min with SBP-8 (8 GB) memory card

**S/N ratio**:

- **54 dB (Y) (typical)**

**White balance**:

- **Preset (3,200 K), Memory A, Memory B/ATW**

**Gain**:

- **-3, 0, 3, 6, 9, 12, 18, 24 dB, AGC**

**Inputs/Outputs**

- **Audio input:** XLR-type 3-pin (female) (x2), line/mic/mic +48 V selectable
- **Composite output:** Phono jack (CH) via A/V multi connector, PAL or NTSC
- **Audio output:** Phono jack (CH-1, CH-2) via A/V multi connector
- **Component output:** HDMI (x1) via A/V multi connector
- **SDI output:** BNC (x1), HD-SDI/SD-SDI selectable
- **LINK:** IEEE 1394, 6-pin (x1), HDV (HDV 1080i) / DVCAM stream input/output, 5400
- **USB:** USB device, Mini-B (x1)
- **Headphone output:** Stereo mini-jack (x1)
- **Speaker output:** Monaural
- **DC input:** DC jack
- **Sens remote:** 1.0 pin
- **HDMI output:** A Type (x1)

**Viewfinder**:

- **0.45 inch color LCD, approx. 921,000 effective pixels, 640 (horizontal) x 3 (RGB) x 480 (vertical), 16:9, hybrid type**

**Built-in Microphone**

- **Omni-directional stereo electret condenser microphone.**

**Media**

- **Type:** ExpressCard/34 slot (x2)

**Supplied Accessories**

- **Lens hood (1), Large eye cup (1), Remote commander unit (1), USB cable (1), A/V connecting cable (1), Component video cable (1), Shoulder strap (1), Operation Manual (1), XDCAM EX Clip Browsing software (1), SxS device driver software (1), BP-U30 battery (1), BC-U1 charger (1), SBP-16 memory card (1)**

*The specifications are measured with supplied lens. When recording in HQ (35 Mbps) mode, actual recording times may vary according to the bit rate adopted during VBR encoding. Viewable area measured diagonally.*