# PMW-400
## Solid-State Memory Camcorder

**SONY**

The PMW-400K (2/3-inch HD lens package) and the PMW-400L have now joined the XDCAM™ HD422 family, equipped with three 2/3-inch-type Full-HD Exmor™ CMOS sensors that provide high picture quality and an extremely high S/N ratio. These camcorders support MPEG HD422™, MPEG HD™, MPEG IMX™, DVCAM™, and also XAVC™*1 in the HD domain for future expansion of the broadcasting workflow. Two SxS™ card slots provide a wide range of AV and IT interfaces including two HD/SD-SDI, HDMI, i.LINK™, and composite outputs. The PMW-400 Series also supports wireless operation using an optional adapter, the CBK-WA101. This enables easy and quick clip data transmission to broadcast stations using cloud services, saving the time and transportation cost of shot clip delivery.

*1 Requires firmware upgrade, planned in 2014. 4K not supported.

# Features

## High Picture Quality
The PMW-400 Series incorporate three 2/3-inch-type Full-HD Exmor CMOS sensors (1920 x 1080) to achieve high resolution, high sensitivity (F12 at 60 Hz / F13 at 50 Hz), low noise (60 dB), and a wide dynamic range to give more freedom of expression for creative shooting.

## Three-dimensional Noise Reducer
In addition to existing noise reduction features, the PMW-400 Series also includes a three-dimensional noise reducer. This not only detects vertical and horizontal direction in a frame picture but also noise components in a time axis, utilizing correlation characteristics between video frames. Using this feature, the S/N ratio is improved to 60 dB which is the highest level of noise reduction in a 2/3-inch-type Full-HD shoulder camcorder.

## Selectable Format and Bit Rates
The PMW-400 Series provide a wide variety of codec operation points. Users can record Full-HD video (1920 x 1080) at up to 50 Mbps using MPEG HD422 as well as MPEG HD at 35 Mbps*2 / 25 Mbps, MPEG IMX at 50 Mbps, and DVCAM at 25 Mbps in an MXF file, as standard supported formats. These camcorders also incorporate XAVC*3 in the HD domain at a 100-Mbps data rate, enabling the creation of rich content with 10-bit quality.

*2 Requires firmware upgrade, planned in October, 2013.
*3 Requires firmware upgrade, planned in 2014. 4K not supported.

## 3.5-inch Color LCD Viewfinder
With a large, easy-to-read 3.5-inch QHD color LCD viewfinder as a standard accessory, the PMW-400 Series offer outstanding resolution of 960 × 540 pixels, strongly supporting critical focus control during HD shooting. The viewfinder cover can be flipped up to enhance visibility when the camera is set on a tripod.

## Various Conveniences via a Wireless Adapter
The PMW-400 Series are designed to support wireless operation using an optional wireless adapter, the CBK-WA101*4. Using this adapter, the user can stream out pictures to a mobile tablet, enabling crews to check shooting images live in the field. After shooting, proxy files created on the CBK-WA101 can be immediately transmitted to the broadcasting station. The adapter also provides remote control of the PMW-400 with mobile application software.

*4 Requires firmware upgrade, planned in October, 2013.

## Enhanced Flash Band Reducer
Incorporating a newly developed algorithm, the PMW-400 Series detects and processes flash banding inside its hardware before recording begins*5. This provides greater flexibility in reducing flash banding across different shooting environments. This feature can be disabled from the menu if the users wants to use Content Browser for flash band reduction after shooting. The user is free to choose when to reduce the flash band, either before or after shooting according to varying circumstances.

*5 Requires firmware upgrade, planned in October, 2013

## Variety of Interfaces
The PMW-400 Series offers two lines of SDI output connection enabling, for example, the director and camera operator to concurrently check shot content via two separate monitors. Also, for monitoring purposes these camcorders can be connected via HDMI to professional displays as well as domestic-use TVs with an HDMI connector. The i.LINK connector can be used for HDV when SP 1440 (FAT) mode is selected, and for DV when DVCAM (FAT) mode is selected, for both input and output signal flows.

XDCAM HD    Exmor FULL HD 3CMOS    XAVC    MPEG HD422    MPEG HD    MPEG IMX    DVCAM    SxS

# Specifications

| | PMW-400K | PMW-400L |
|---|---|---|
| **General** | | |
| Mass | Approx. 3.4 kg (body only without lens, VF, Mic) | |
| Dimensions *1 | 124 x 269 x 332 mm (5 x 10 5/8 x 13 1/8 inches) (excluding protrusions, body only) | |
| Power Requirements | DC 12 V | |
| Power Consumption | Approx. 26 W (with viewfinder, lens and microphone while recording) | |
| Operating Temperature | 0° C to 40° C (32° F to 104° F) | |
| Storage Temperature | -20° C to +60° C (-4° F to +140° F) | |
| Continuous Operating Time | Approx. 180 min with BP-L80S | |
| Recording Format (Video) | XAVC (future upgrade)<br>MPEG-2 Long GOP:<br>- HD 422 mode: CBR, 50 Mbps max., MPEG-2 422P@HL<br>- HQ mode: VBR, 35 Mbps max., MPEG-2 MP@HL<br>- SP mode: CBR, 25 Mbps, MPEG-2 MP@H-14<br>- SD mode : MPEG IMX, DVCAM | |
| Recording Format (Audio) | <UDF><br>- HD 422 50 mode: LPCM 24 bits, 48 kHz, 4 channels<br>- HD 420 HQ mode: LPCM 16 bits, 48 kHz, 4 channels<br>- SD MPEG IMX mode: LPCM 16/ 24 bits, 48 kHz, 4 channels<br>- SD DVCAM mode: LPCM 16 bits, 48 kHz, 4 channels<br><FAT><br>- HD mode: LPCM 16 bits, 48 kHz, 4 channels<br>- SD DVCAM mode: LPCM 16 bits, 48 kHz, 2 channels | |
| Recording/Playback Time (MPEG HD) | <UDF Mode><br>HD 422 50/ SD MPEG IMX Mode: *2<br>- Approx. 120 min with SBS-64G1A (64 GB) memory card<br>- Approx. 60 min with SBP-32/SBS-32G1A (32 GB) memory card<br>- Approx. 30 min with SBP-16 (16 GB) memory card<br>HD 420 HQ Mode:<br>- Approx. 180 min with SBS-64G1A (64 GB) memory card<br>- Approx. 90 min with SBP-32/SBS-32G1A (32 GB) memory card<br>- Approx. 45 min with SBP-16 (16 GB) memory card<br>SD DVCAM Mode: (option)<br>- Approx. 220 min with SBS-64G1A (64 GB) memory card<br>- Approx. 110 min with SBP-32/SBS-32G1A (32 GB) memory card<br>- Approx. 55 min with SBP-16 (16 GB) memory card<br><FAT Mode> *2<br>- HD HQ Mode:<br>- Approx. 200 min with SBS-64G1A (64 GB) memory card<br>- Approx. 100 min with SBP-32/SBS-32G1A (32 GB) memory card<br>- Approx. 50 min with SBP-16 (16 GB) memory card<br>HD SP Mode:<br>- Approx. 280 min with SBS-64G1A (64 GB) memory card<br>- Approx. 140 min with SBP-32/SBS-32G1A (32 GB) memory card<br>- Approx. 70 min with SBP-16 (16 GB) memory card<br>SD DVCAM Mode: (option)<br>- Approx. 260 min with SBS-64G1A (64 GB) memory card<br>- Approx. 130 min with SBP-32/SBS-32G1A (32 GB) memory card<br>- Approx. 65 min with SBP-16 (16 GB) memory card | |
| Recording Frame Rate | <UDF><br>HD 422 50 Mode: MPEG-2 422P@HL, 50 MBps/ CBR<br>- 1920 x 1080/59.94i, 50i, 29.97p, 25p, 23.98p<br>- 1280 x 720/59.94p, 50p, 29.97p, 25p, 23.98p<br>HD 420 HQ Mode: MPEG-2 MP@HL, 35 MBps/ VBR<br>- 1920 x 1080/59.94i, 50i, 29.97p, 25p, 23.98p, (Version Up)<br>- 1440 x 1080/59.94i, 50i, 29.97p, 25p, 23.98p,<br>- 1280 x 720/59.94p, 50p, 23.98p (2-3 pull down)<br>SD MPEG IMX Mode<br>- 720 x 486/ 59.94i, 29.97PsF<br>- 720 x 576/50i, 25PsF<br>SD DVCAM Mode<br>- 720 x 486/59.94i, 29.97PsF<br>- 720 x 576/50i, 25PsF<br><FAT><br>HD HQ 1920 Mode: MPEG-2 MP@HL, 35 Mbps/ VBR<br>- 1920 x 1080/59.94i, 50i, 29.97p, 25p, 23.98p<br>HD HQ 1440 Mode: MPEG-2 MP@HL, 35 Mbps/ VBR<br>- 1440 x 1080/59.94i, 50i, 29.97p, 25p, 23.98p<br>HD HQ 1280 Mode: MPEG-2 MP@HL, 35 Mbps/ VBR<br>- 1280 x 720/59.94p, 50p, 29.97p, 25p, 23.98p<br>HD SP 1440 Mode: MPEG-2 MP@H-14, 25 Mbps/ CBR<br>- 1440 x 1080/59.94i, 50i, 23.98p (2-3 pull down)<br>SD DVCAM Mode<br>- 720 x 486/59.94i, 29.97PsF<br>- 720 x 576/50i, 25PsF | |

| | PMW-400K | PMW-400L |
|---|---|---|
| **Lens** | | |
| Lens Mount | Sony 2/3-inch type bayonet mount | |
| Zoom Ratio | 16x (optical),<br>servo/manual (AF lens for PMW-400K) | |
| Focal Length | f = 8 mm to 128 mm (equivalent to 31.5 mm to 503 mm on 35 mm lens) | |
| Iris | F1.9 to F16 and Close, Auto/Manual selectable | |
| Focus | AF/MF/Full MF selectable | |
| Focus | 800 mm to ∞ (MACRO OFF) | |
| Focus | 50 mm to ∞ (MACRO ON, Wide) | |
| Focus | 732 mm to ∞ (MACRO ON, Tele) | |
| Filter Diameter | M82 mm, pitch 0.75 mm (on lens) | |
| **Input/Output** | | |
| Genlock Input | BNC (x1) | |
| Timecode Input | BNC (x1) | |
| Audio Input | XLR-type 3-pin (female) (x2), Line/Mic/Mic +48 V selectable | |
| Mic Input | XLR-type 5-pin | |
| SDI Output | BNC (x2), HD-SDI/SD-SDI selectable | |
| Video Output | BNC (x1) HD-Y or Analog composite | |
| Audio Output | XLR-type 5-pin | |
| Timecode Output | BNC (x1) | |
| Earphone Output | Stereo mini jack (x1) | |
| Speaker Output | Monaural | |
| DC Input | XLR-type 4-pin | |
| DC Output | 4-pin | |
| Lens | 12-pin | |
| Remote | 8-pin | |
| Light | 2-pin | |
| i.LINK | IEEE 1394, 6-pin (x1), HDV (HDV 1080i )/DVCAM stream input/output *3 , S400 | |
| USB | USB device B Type (x1), host A Type (x1) | |
| HDMI | A type (x1) | |
| **Camera Section** | | |
| Imager | 3-chip 2/3-type "Exmor" Full HD CMOS | |
| Effective Picture Elements | 1920 (H) x 1080 (V) | |
| Optical System | F1.4 prism system | |
| Built-in Optical Filters | 1: Clear, 2: 1/4ND, 3: 1/16ND, 4: 1/64ND | |
| Shutter Speed (Time) | 1/60 sec to 1/2,000 sec + ECS (Extended Clear Scan) | |
| Shutter Speed (Slow Shutter (SLS)) | 2, 3, 4, 5, 6, 7, 8, 16, 32, 64-frame accumulation | |
| Slow & Quick Motion Function | 720p: Frame rate selectable from 1 fps to 60 fps<br>1080p: Frame rate selectable from 1 fps to 30 fps | |
| Sensitivity (2000 lx, 89.9% reflectance) | F12 (typical) (1920 x 1080/59.94i mode)<br>F13 (typical) (1920 x 1080/50i mode) | |
| Minimum Illumination | 0.006 lx (typical) (1920 x 1080/59.94i mode, F1.9, +42 dB gain, with 64-frame accumulation) | 0.003 lx (typical) (1920 x 1080/59.94i mode, F1.4, +42 dB gain, with 64-frame accumulation) |
| White Balance | Preset (3200K), Memory A, Memory B/ATW | |
| Gain Selection | -3, 0, 3, 6, 9, 12, 18, 24, 30, 36, 42 dB | |
| S/N Ratio | 60 dB (Y) (typical) | |
| Horizontal Resolution | 1,000 TV lines or more (1920 x 1080i mode) | |
| **Viewfinder** | | |
| Viewfinder | 3.5-inch *4 type color LCD monitor: 960 (H) x 540 (V), Quarter HD Size | |
| **Other Equipment** | | |
| Built-in LCD Monitor | Black & White LCD (Audio level, TC, battery and media remaining capacity) | |
| Built-in Speaker | 1 | |
| **Supplied Accessories** | | |
| | Viewfinder (1)<br>Shoulder strap (1)<br>Stereo microphone (1)<br>Wind-screen (1)<br>Cold shoe kit (1)<br>Lens mount cap (1)<br>Flange back adjustment chart (1)<br>Auto focus lens (1)<br>Before Using this Unit (1)<br>CD-ROM:<br>Operating Instructions | Viewfinder (1)<br>Shoulder strap (1)<br>Stereo microphone (1)<br>Wind-screen (1)<br>Cold shoe kit (1)<br>Lens mount cap (1)<br>Flange back adjustment chart (1)<br>Before Using this Unit (1)<br>CD-ROM:<br>Operating instructions |

* The specifications are measured with supplied lens of PMW-400K.

*1: The values for dimensions are approximate.
*2: Recording/ Playback time may vary the according to the encoding or memory.
*3: HDV/ DV stream input/ output are available only in FAT mode. Depending on the connected products, it may not be recorded correctly.
*4: Viewable area measured diagonally.
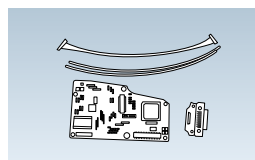
# Optional Accessories



**SxS Memory Card Series**



**MEAD-MS01/SD02 QDA-EX1**
Media Adapters for MS/SD Card and XQD



**CBK-WA100/101**
Wireless Adapter



**CBK-CE01**
50-pin Interface Unit and
Digital Extender Option



**CA-FB70/TX70**
System Camera Configuration Units

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