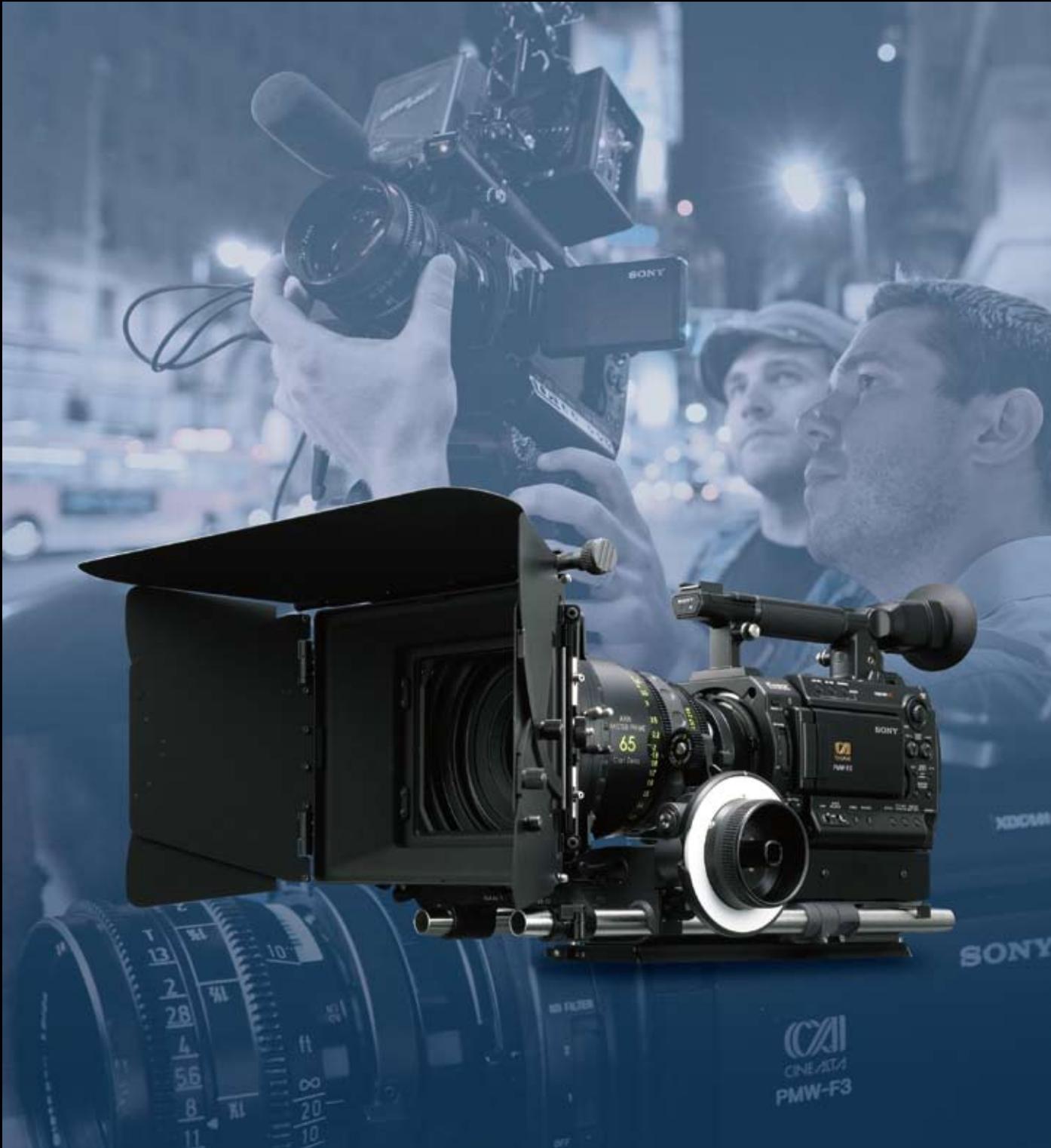


# PMW-F3L PMW-F3K

Solid-state Memory Camcorder

**SONY**  
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**CINEALTA**  
CINEALTA™

**XDCM EX**

**SXS**

**Exmor™**  
Super35 CMOS

# Sony Opens Up New Era of Super 35mm Digital Production

In the year 2000, Sony introduced the HDW-F900 CineAlta HDCAM camcorder, the first-ever 1080/24p recording camcorder for feature films, TV dramas and cinematography production. It became the foundation for a decade of development of Super 35mm digital motion picture cameras such as the F35 and SRW-9000PL.

Now Sony introduces a new member of its CineAlta camcorder line-up: the affordable PMW-F3 Super 35mm camcorder. It inherits DNA from the F35, which has been used for years in high-end digital cinematography, as well as most of the features and file-based workflow capabilities of PMW-EX1R and EX3 XDCAM EX™ solid-state memory camcorders.

The PMW-F3 is equipped with the newly developed Exmor™ Super35 CMOS image sensor, PL lens mount, and SxS® memory card for 1920 x 1080 full-HD recording. Sony offers two affordable models of the PMW-F3: one is without a lens, the PMW-F3L; the other includes three PL lenses (35/50/85 mm, T2.0), the PMW-F3K.

The PMW-F3 features future expandability, including RGB 4:4:4 baseband output with S-LOG gamma for external recording which means it can be used in an HDCAM-SR™ workflow. It also offers a 3D-LINK option, which allows two camcorders to be controlled simultaneously for stereoscopic 3D shooting.

Sony believes that - for many content creators - the PMW-F3 breaks entry barriers to digital cinematography and opens up a new era of Super 35mm digital production. This camera is suitable in all kinds of creative production such as independent film-making, cinematography, music videos, documentaries and many other productions, and delivers mobility, flexibility, and cost efficiency.



## KEY FEATURES



### 1. Exmor™ Super35 CMOS Image Sensor

The PMW-F3 is equipped with a newly developed Exmor Super35 CMOS image sensor which offers creative shallow depth of field, similar to that of a film camera. This sensor has an extremely high sensitivity of T11 (ISO800)\* with a very low noise level (an S/N ratio of 63 dB). This is a significant advantage especially when shooting in low-light conditions or at night using only ambient light.

\* Measured at 1080/59.94i.

**Exmor™**  
Super35 CMOS

### 2. PL Lens Mount

The PMW-F3 employs a PL lens mount that is standard for film cameras, allowing use of a virtually unlimited number of prime and zoom lenses for 35mm film cameras. This greatly broadens the choice of lenses for a wider spectrum of creative expression.

A PL lens mount adapter comes with the camera as standard. The PMW-F3 supports the Cooke/i Technology protocol, which enables the camcorder to communicate with the lens to obtain lens metadata such as focus and iris position. The ARRI LDS interface will be supported too. This improves post-production workflow as lens metadata can be recorded onto SxS card and brought into the post-production process.

### 3. Affordable PL Lens Kit Model

There are two models of the PMW-F3. One is the lens-less PMW-F3L and the other is an affordable and "ready-to-use" solution, ideal for entry-level users, the PMW-F3K with three fixed focal length PL lenses (35/50/85 mm, T2.0).

### 4. XDCAM EX Workflow

The recording format and recording media are identical to the existing PMW-EX1R and PMW-EX3, and proven, high-speed, intuitive XDCAM EX workflow can be used with high reliability. This workflow offers seamless integration with leading nonlinear editing software.

**XDCAM EX**

### 5. Small and Lightweight, With Low Power Consumption

The PMW-F3 has a small, compact body with a very modest footprint, and weighs just 2.4 kg (5 lb 4 oz). It offers mobility, flexibility, and cost efficiency. In addition, the camcorder's power consumption is only 24 W, and about three hours' recording can be achieved with only one BP-U60 battery.

### 6. HD-SDI Dual Link Output

The PMW-F3 has an HD-SDI Dual Link output connector which offers 4:2:2 1080 50/59.94p uncompressed signal output as standard. By using external recording devices such as HDCAM-SR recorders, users can achieve x 2.5 natural slow-motion playback in 1080/24p mode.

### 7. RGB and S-LOG Output Option (CBK-RGB01)\*\*

The PMW-F3 delivers a scalable external recording solution. When the RGB and S-LOG output option is added, RGB 4:4:4 1080p 10-bit baseband signal output is available for external recording devices such as HDCAM-SR recorders. A LUT (Look Up Table) function is also provided for monitoring purposes when S-LOG gamma is selected. The same option includes 3G-SDI output functionality. It enables users to select HD-SDI Dual Link or 3G-SDI depending on the connecting devices.

**HDCAM SR™**

### 8. 3D-LINK Option (CBK-3DL01)\*\*

Another new feature of the PMW-F3 is the 3D-LINK option which is especially convenient for 3D stereoscopic shooting. Two PMW-F3 cameras can be controlled by one camera remote controller at the same time. The two cameras are connected with a special 10-pin cable that includes genlock, timecode in/out, and control line. Simultaneous control of the Iris and Focus functions of two cameras is extremely useful.

\*\* The CBK-RGB01 and the CBK-3DL01 are software key options which activate the optional features.

The CBK-RGB01 will be available in the middle of 2011, and the CBK-3DL01 in late 2011.



#### Eco-friendly Design

Sony employs its considerable technical capabilities and know-how in the design of energy-efficient and eco-friendly products. The PMW-F3 is a good example of this in the company's HD-domain camcorders. Designed to be environmentally friendly, the power consumption of the PMW-F3 is around 30% lower than conventional digital camcorders\* from Sony, and its energy-saving design results in lower CO<sub>2</sub> emissions.

\* As compared with Sony's HDW-F900R CineAlta 24P HDCAM camcorder.

## OTHER FEATURES



**PMW-F3K**  
(Supplied with 35 mm, 50 mm and 85 mm T2.0 lens)

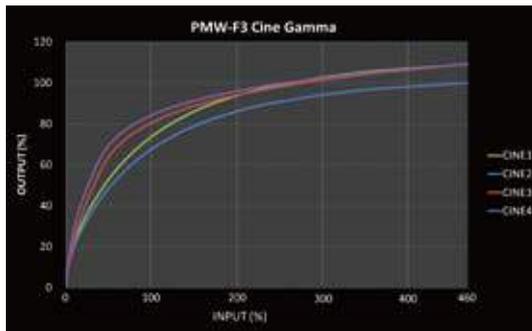
**PMW-F3L**  
(Supplied without lens)

### 1. Picture Profile

The Picture Profile feature of the PMW-F3 allows camera operators to easily call up customized picture-tonal settings to suit particular shooting conditions, rather than having to readjust the camera each time. This gives greater operational efficiency. Up to ten different pictures - including tonal settings such as matrix parameters, color correction, detail, one of eight gamma curves, and knee - can be saved on SxS memory card. These settings are displayed on the LCD panel at the touch of a button.

### 2. Selectable Gamma Curves

The PMW-F3 offers a wide variety of gamma curves to flexibly handle contrast and give a specific 'look' to an image. In addition to six types of standard gamma curve, there are four types of Hyper Gamma which are identical to those on CineAlta™ cameras. Operators can select the best-suited preset gamma curve, depending on scene requirements.



### 3. Built-in ND Filters

The PMW-F3 camcorder is equipped with built-in optical ND (Neutral Density) filters. These filters are selected via a built-in ND filter slide - Clear (Off), 1/8 ND (0.9), and 1/64 ND (1.8) - and conveniently enable operators to control light intensity without a matte box in small camera configuration.

### 4. Camera Remote Control

The PMW-F3 camcorder is equipped with a remote control interface. Various camera settings can be remotely controlled using an optional RM-B150 or RM-B750 Remote Control unit via an 8-pin remote connector.

### 5. Slow Shutter Function

The PMW-F3 offers a Slow Shutter function for capturing clear images in low-light environments. This allows the shutter speed to be extended to a maximum of eight frames. The function not only increases camera sensitivity but also produces a special blurring effect when shooting a moving object, for enhanced shooting creativity. The shutter speed is selectable between 2- and 8-frame periods.

### 6. Interval Recording Function

The Interval Recording function intermittently 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.

### 7. HD-SDI and Other Versatile Interfaces

The PMW-F3 comes equipped with a wide range of interfaces optimized for a variety of operational needs, broad interoperability, and flexible workflow. These include an HD-SDI output and, in E-to-E mode, an uncompressed 4:2:2 10-bit signal can be output from the connector. For versatile usage, there is also a down-converted SD-SDI output, i.LINK (HDV/DV CAM), and analog composite/component output. In addition, the PMW-F3 has a timecode input/output and genlock input, allowing the camcorder to be used in a multi-camera system. Also, the PMW-F3 has an HD-SDI Dual-link output for 4:2:2 1080 50/59.94p as standard, and RGB 4:4:4 1080 24/25/30p output as an option.



### 8. Supplied Software for Powerful Content Management

The newly developed XDCAM Browser version 1.1 not only enables users to browse video clips shot by the PMW-F3 on their MS Windows and Macintosh computers, but also to register and edit metadata, and convert file formats.



## Exmor™ Super35 CMOS Image Sensor

The PMW-F3 is equipped with a Super 35mm CMOS image sensor which is equivalent to that of Super 35mm film and has been specifically developed for digital cinematography. Its positioning within the chassis is exactly the same as it would be within a 35mm film camera - ensuring exactly the same optical performance with the widest variety of 35mm cine lenses.

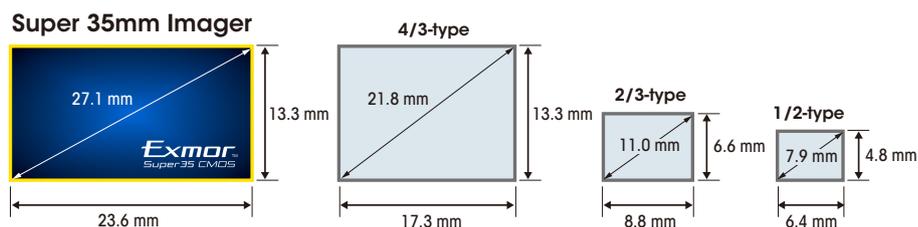
The actual size of each pixel on the image sensor is approximately four times larger than those typically found in DSLRs. These are the foundations that support the needs of professional shooters - greater sensitivity, exposure latitude, low noise, and motion smoothness. Also, because the large Super 35 mm sensor is employed, this camcorder offers shallower depth of field than DSLRs and other camcorders with a smaller size sensor yet with the same aperture value.

The output signal from this new CMOS image sensor is processed

in the newly developed high-quality camera signal processor inside the unit. By utilizing cutting-edge technology, this camcorder achieves very high sensitivity and an extremely low noise level. When video mode sensitivity is T11 (ISO800)\*, the S/N ratio is 63 dB. When the S-LOG mode dynamic range is 800%, the S/N ratio is 57 dB.

As the Exmor Super35 CMOS image sensor offers extremely high sensitivity, the ND filter is built-in for easy control of incoming light intensity. In addition, to minimize design size, ND filter glasses have an up/down slide mechanism.

\* Measured at 1080/59.94i.



## Three PL Lens Kits (35/50/85 mm, T2.0)

To make a camera operator's entry into the 35mm world as easy and economical as possible, the affordable PMW-F3K model comes as standard with three PL lenses. These have fixed focal lengths of 35 mm, 50 mm, and 85 mm with T2.0, and - as this type of lens doesn't support flange back adjustment - an adjustment mechanism is installed in the main body of the PMW-F3. These PL lenses meet the specifications both of traditional cinema lenses and of digital lenses.

- High resolution
- Well-controlled vignetting
- Low geometric distortion
- Minimized breathing
- Exit pupil position accommodates the characteristics of the image sensor
- Eight-blade iris diaphragm specification

This Super 35mm image sensor camcorder has a shallow depth of field. Its T2.0 lens achieves the same blur quality (bokeh) as a T0.8 lens with camcorders which have a 2/3-type image sensor typically used for broadcasting.



## Lens Interface & Mount

The PMW-F3 is supplied with a PL mount adapter to provide immediate compatibility with the widest range of 35mm cine lenses. There are hot-shoe electric interfaces for Cooke/i Technology and ARRI LDS on the PL mount adapter. This makes it possible to improve the workflow by bringing iris, focus, and other lens metadata into the post-production process. Sony plans to introduce a zoom lens\*\* which are directly mounted to the PMW-F3 original FZ mount (please ask your local Sony office for details). This newly developed type of power zoom lens will expand the operational flexibility of the PMW-F3 so it can be used for almost any application.

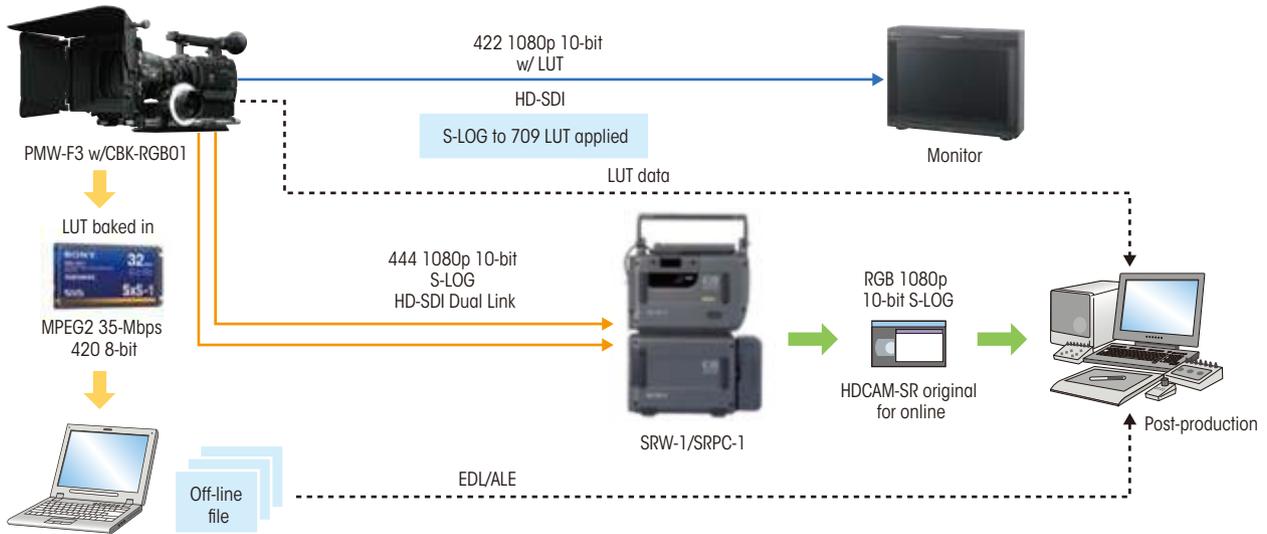
\*\* Availability of an optical zoom lens is expected in late 2011..



## RGB and S-LOG Workflow

The RGB and S-LOG output option (CBK-RGB01) makes it possible to output an RGB 4:4:4 1080p 10-bit signal over an HD-SDI Dual Link. Moreover by using same option, the Dual Link A output can be switched to 3G-SDI. 3G-SDI output reduces wiring between the camera and external recording and monitoring devices. This RGB output can be recorded with an external recording device such as the SRW-1 HDCAM-SR™ portable recorder. This feature allows users to capture higher picture quality especially for VFX including color grading, compositing and chroma key operation. This option also offers S-LOG gamma output which enables users to capture in an extremely wide dynamic

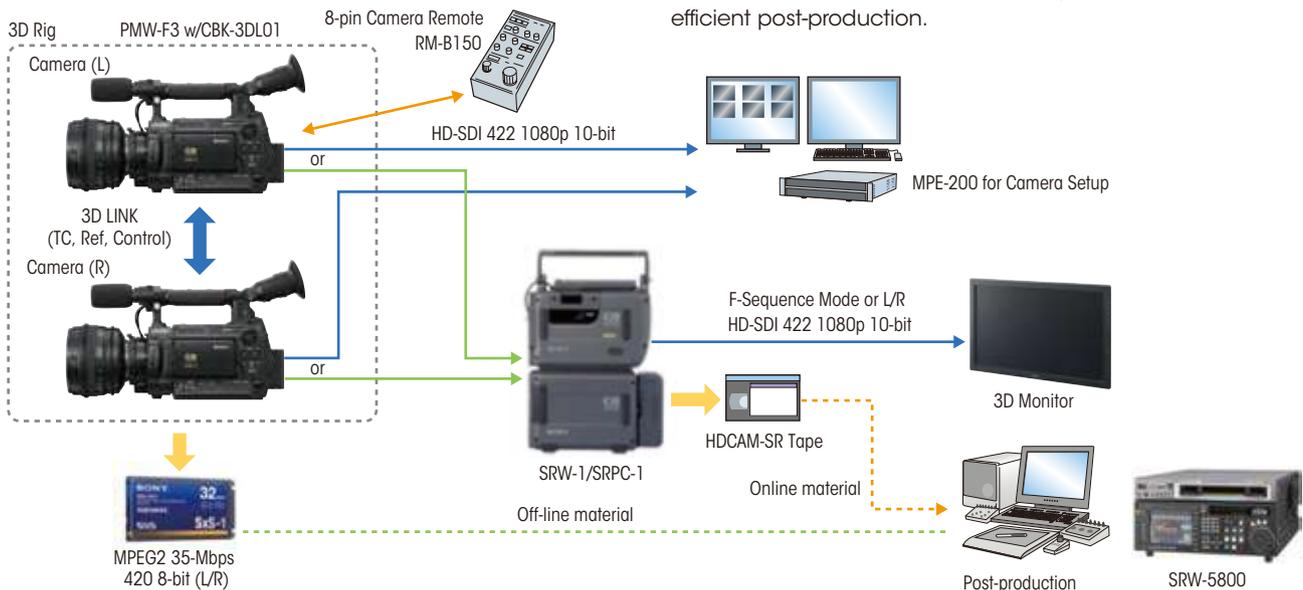
range of 800% with an S/N ratio of 57 dB. The advantage of S-LOG is the reproduction of both shadow details and highlight, contributing to "film-look" images. The PMW-F3 has four viewing LUTs for monitoring purposes when S-LOG output is activated. For example, if the user selects S-LOG to R709 conversion LUT as the viewing LUT, R709-converted images are available in HD-SDI output, and the result is checked without color grading in the field. At the same time, LUT-applied images can be recorded on SxS card and can be used as off-line material for making EDL/ALE files. RGB output can be recorded on HDCAM-SR tapes and used as on-line material. By using both HDCAM-SR tapes and SxS cards, the PMW-F3 enables efficient post-production workflow.



## Stereoscopic 3D Shooting System

The 3D-LINK option (CBK-3DL01) enables users to operate two PMW-F3 cameras at the same time via one camera remote controller. Two PMW-F3 cameras can be connected with a dedicated 10-pin cable which carries a reference signal, timecode and control. Since two

cameras are locked with a genlock signal, it's easy to achieve 3D shooting without time-consuming adjustment, and the images captured by the two cameras are completely synchronized. In addition, by using the HD-SDI output signal for an HDCAM-SR recorder, both off-line material on SxS card and on-line material on HDCAM-SR tapes can be used for efficient post-production.



## Optional Accessories for PMW-F3



**SBP-32/16**  
SxS PRO Memory Card



**SBS-32G1A/64G1A**  
SxS Memory Card



**MEAD-MS01**  
Media Adaptor



**MEAD-SD01**  
Media Adaptor



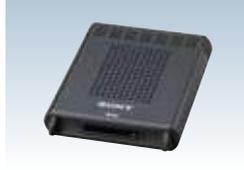
**PHU-120R**  
Professional Harddisk Unit



**PXU-MS240**  
Mobile Storage Unit



**PXU-HC240**  
HDD Cartridge (for PXU-MS240)



**SBAC-US10**  
SxS Memory Card USB Reader/Writer



**BP-U60**  
Lithium-ion Battery Pack (56 Wh)



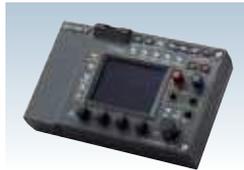
**BC-U1**  
Battery Charger (for BP-U30/U60)



**BC-U2**  
Battery Charger



**RM-B150**  
Remote Control Unit



**RM-B750**  
Remote Control Unit



**AC-DN10**  
AC Adaptor



**BC-L70**  
Two-channel Simultaneous Charger



**CBK-RGB01\***  
RGB and S-LOG Output Option



**CBK-3DL01\*\***  
3D-LINK Option

\* Availability of the CBK-RGB01 is expected in the middle of 2011.  
\*\* Availability of the CBK-3DL01 is expected in late 2011.

## Optional PL Lenses from Other Manufacturers

### Carl Zeiss



Master Prime Lenses



Ultra Prime Lenses



Compact Prime Lenses



Light Weight Zoom LWZ-2

### Cooke



S4/i Prime Lenses



5/i Prime Lenses



Panchro/i Series



S4/i CXX Wide Angle Zoom

### Angenieux



Optimo DP 16-42 mm



Optimo DP 30-80 mm



Optimo 24-290 mm



Optimo 17-80 mm

### Fujinon



HK3.1x14.5



HK4.7x18



HK7.5x24



HK5.3x75

# Recording Format

HD/SD	REC mode	Recording Resolution	Frame Rate						Audio Format	Recording Time (w/ 64GB SxS-1)	
			NTSC mode			PAL mode					
			59.94p	59.94i	29.97p	23.98p	50p	50i			25p
HD	HQ 35 Mbps (VBR)	1920x1080	-	x	x	x	-	x	x	Linear PCM 16 bit/48 kHz 2 CH	Approx. 200 min
		1440x1080	-	x	x	x	-	x	x		
		1280x720	x	-	x	x	x	-	x		
SD	SP 25 Mbps (CBR)	1440x1080	-	x	-	x (59.94i REC)	-	-	-	Linear PCM 16 bit/48 kHz 2 CH	Approx. 280 min
		720x480	-	x	x (29.97PsF)	-	-	-	-		
		720x576	-	-	-	-	-	-	x (25PsF)		

## Output/ Input Combination List

HD/SD	Recording Format	SDI/HDMI/i.LINK I/O Select	i.LINK output	SDI output	HDMI output	Video output	i.LINK input	
HD	HQ 1920/ HQ 1440/ HQ 1280	HD SDI	-	HD	-	HD-Y	-	
		SD SDI	-	SD	-	Composite	-	
		HD HDMI	-	-	HD	-	HD-Y	-
		SD HDMI P	-	-	SD Progressive	-	-	-
		SD HDMI i	-	-	SD Interlace	-	Composite	-
		SD HDMI i & DVCAM	DVCAM	-	SD Interlace	-	Composite	DVCAM (Display Only)
	SP 1440	HD SDI	-	HD	-	-	HD-Y	-
		SD SDI	-	SD	-	-	Composite	-
		HD HDMI & HDV	HDV	-	HD	-	HD-Y	HDV
		SD HDMI P & HDV	HDV	-	SD Progressive	-	-	HDV
		SD HDMI i & HDV	HDV	-	SD Interlace	-	Composite	HDV
		SD HDMI i & DVCAM	DVCAM	-	SD Interlace	-	Composite	DVCAM (Display Only)
SD	DVCAM	HD SDI	-	-	-	-	-	
		SD SDI	-	SD	-	Composite	-	
		HD HDMI & HDV	-	-	-	-	-	-
		SD HDMI P & HDV	-	-	-	-	-	-
		SD HDMI i & HDV	-	-	-	-	-	-
		SD HDMI i & DVCAM	DVCAM	-	SD I	-	Composite	DVCAM (Display Only)

## Specifications

General		
Dimension (W x H x D)	151 x 189 x 210 mm (6 x 7 1/2 x 8 3/8 inches) (PMW-F3L w/o projection)	
Mass	2.4 kg (5 lb 4 oz) (Camera only)	
Power Requirements	DC 12 V (10.5 V to 17.0 V)	
Power Consumption	Approx. 24.0 W (Typical) (REC mode, HD-SDI Dual Link On, EVF On, LCD Monitor Off)	
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 Hours (w/BP-U60)	Approx. 130 Min (HD-SDI Dual Link On) Approx. 170 Min (HD-SDI Dual Link Off)	
Lens (PMW-F3K)		
Focal Length	35 mm	
Aperture Value	T2.0 to Close	
Minimum Shooting Distance	0.35 m	
Filter Diameter	95 mm	
Camera		
Image Sensor	Type	Super 35mm Equivalent Single Chip CMOS
	Size	23.6 mm (H) x 13.3 mm (V), 27.1 mm (Diagonal)
	Total pixel count	3.5 M
	Effective pixel count	3.4 M
Built-in Filter	OFF: Clear, 1: 1/8 ND, 2: 1/64 ND	
Sensitivity (2000 lx, 89.9% reflective)	T11 (Typical) at 1080/59.94i	
ISO sensitivity	ISO400/27 <sup>o</sup> equivalent (at 1080p, Video Gamma mode) ISO800/30 <sup>o</sup> equivalent (at 1080p, S-LOG Gamma mode)	
S/N ratio	63 dB (Typical) at 1080/59.94i	
Lens Mount	PL mount (w/supplied lens mount adapter), FZ mount (w/o lens mount adapter)	
Shutter Speed	1/32 - 1/2000 sec	
Slow Shutter	2, 3, 4, 5, 6, 7, 8 frame accumulation	
Slow & Quick	720p	1 - 60 fps selectable (17-60 fps when HD-SDI Dual Link is active)
	1080p	1 - 30 fps selectable (17-30 fps when HD-SDI Dual Link is active)
White Balance	Preset, Memory A, Memory B/ATW	
Gain	-3, 0, 3, 6, 9, 12, 18 dB, AGC	
Gamma Curve	Standard Gamma x6, CINE Gamma x4 S-LOG Gamma (with CBK-RGB01 option)	
Input/Output		
HD/SD SDI OUT	BNC (x1) (HD-SDI/SD-SDI switchable)	
HD-SDI Dual Link OUT	BNC (x2) 4:2:2 1080 50/59.94p 10-bit 4:4:4 1080 23.98/25/29.97PsF 10-bit (w/CBK-RGB01 option)	
VIDEO OUT	BNC (x1) (HD-Y signal or Composite signal)	
HDMI OUT	HDMI connector (Type A) (x1)	
i.LINK IN/OUT	IEEE1394 S400 4-pin Connector (x1)	
AUDIO IN	XLR Type 3-pin (female) (x2), LINE/MIC/MIC+48 V selectable	
AUDIO OUT	RCA (x2)	
GENLOCK IN	BNC (x1)	
TC IN/OUT	BNC (x1)	
DC IN	XLR type 4-pin (male) (x1)	
REMOTE	8-pin (x1)	
USB	Mini TypeB connector (x1)	
PHONES	Stereo Mini Jack (x1)	
Display		
View Finder	0.45 inch, Aspect Ratio 16:9	
LCD Monitor	3.5 inch, Aspect ratio 16:9, Hybrid (semi-transmissive) type	
Audio		
Built-in Speaker	Monoral	
Media Slot		
Type	ExpressCard/34 (x2)	
Interface	ExpressCard Compliant	
Supplied Accessories		
PL lens mount adapter, Stereo MIC, Windscreen, IR remote, Shoulder Strap, CD-ROM (XDCAM Browser, SxS device driver software, PDF version operation manual), Operational Manual, Warranty card, PL lens kit (PMW-F3K only)		

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