

# HDCAM SR One-piece Camcorder.

SRW-9000 HDCAM SR Camcorder

**SONY**



**CINEALTA™**

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**HDCAM SR™**

# Quality Meets Mobility, SRW-9000 HDCAM-SR Camcorder.

SRW-9000 HDCAM-SR Camcorder

In 2000, Sony laid the groundwork for a new era of digital image-making in the motion picture industry with the introduction of its HDW-F900 – the first model in Sony's "24P-capable" CineAlta™ lineup. Since then, the HDW-F900 – and its successor model, the HDW-F900R – have been satisfying the demand for high-level picture quality and creative versatility in primetime TV production, commercial production, and movie-making.

Now, Sony has taken an evolutionary step with the next-generation 24P camcorder, the SRW-9000 HDCAM-SR™ camcorder. This inherits many of the excellent qualities of the HDW-F900/F900R, plus it offers incredible operational mobility – even in harsh shooting environments – thanks to its one-piece body, and outstanding picture performance from the HDCAM-SR recording format.



In standard configuration, the SRW-9000 is capable of top-quality 4:2:2 Y/Cb/Cr 10-bit recording at 1080/23.98p, 24p, 25p and 29.97p, and at 1080/50i and 59.94i. In addition, the SRW-9000 can record 1080/50p and 59.94p signals, and 4:2:2 720/50p and 59.94p\* signals, making it ideal for DTV programming and transmission applications. For users who require further creative performance, a variety of option cards can be added, allowing the benefits of full-bandwidth 1080 RGB 4:4:4 capturing, SR Motion™ variable frame rate capturing and recording, S-Log Gamma, and additional signal inputs and outputs.

Providing improved operational flexibility and cost benefits, the SRW-9000 is the perfect choice for anyone in the broadcasting industry seeking HDCAM-SR picture quality and a high level of creative freedom. Both now and into the future, the SRW-9000 will help ignite a passion for stunning visual productions in digital cinema, commercial programs, TV dramas, and documentaries.

\* Requires future software upgrade.

## Self-contained One-piece Camcorder With Versatile Operability

As well as being a top-end camcorder, the SRW-9000 is extremely versatile. With its rugged yet compact one-piece design, it is suitable for many kinds of shooting application, such as documentaries, where high reliability and mobility are essential.

In addition, the SRW-9000 comes equipped with a B4 lens-mount system, allowing the camcorder to use



widely used 2/3-inch HD lenses.

Furthermore, an on-board battery, the BP-GL95A can be attached to provide power. With its self-contained recording media (based on the HDCAM-SR format) and compact one-piece design, the SRW-9000 delivers powerful mobility and comfortable shooting – both indoors and outside.

## HDCAM-SR Format Recording Creating Visually Lossless Images: The MPEG-4 SSiP Simple Studio Profile



The HDCAM-SR recording format – MPEG-4 SSiP Simple Studio Profile – is Sony's well-proven technology which has been widely used in high-end content creation, such as film making, and primetime TV drama.

In addition, the HDCAM-SR format has been chosen as the preferred programme delivery format by many broadcasters worldwide. In order to achieve maximum compression efficiency, the HDCAM-SR format uses intra-frame compression for progressive images and intra-field compression for

interlaced images with amazingly high data rates of 440 Mbps as standard and a double-data rate of 880 Mbps.

System Format		Frame Rate	Recording Mode	Option
Signal Format				
1080	4:2:2	59.94/50p	Double-data-rate (880 Mbps)	-
		30 / 29.97 / 25 / 24 / 23.98PsF / 59.94 / 50i	Standard (440 Mbps)	-
	4:4:4 HQ	30 / 29.97 / 25 / 24 / 23.98PsF / 59.94 / 50i	Double-data-rate (880 Mbps)	HKSR-9003
		30 / 29.97 / 25 / 24 / 23.98PsF / 59.94 / 50i	Standard (440 Mbps)	HKSR-9003
720*	4:2:2	59.94/50p	Standard (440 Mbps)	-

\*Planned to be available in 2010

Furthermore, higher quality recordings, such as 1080/50p, 59.94p, and RGB 4:4:4 recording, can be achieved.

## HDCAM-SR Camcorder – Delivering Proven Picture Quality

The SRW-9000 is an HDCAM-SR one-piece camcorder that delivers full HD resolution images and employs 2/3 inch CCD imagers – the same CCD that is used on Sony's F23 with proven picture quality.

Combining this CCD with a high-precision 14-bit A/D converter and digital signal processing, the camcorder is able to capture and reproduce stunning-quality 1080/60p and 1080/50p images. With Sony's sophisticated capabilities in image-capturing technology, the SRW-9000 achieves an enhanced dynamic range with a remarkable signal-to-noise ratio of 55 dB.



**Shooting Example of SR Motion**  
The camcorder can create an intentional blur image in a quick motion.

## SR Motion Variable Frame Rate Image Capturing

By adding the HKSR-9002\* Picture Cache Board, the SRW-9000 is capable of recording images at a variable frame rate from 1 fps to 60 fps in 4:2:2 mode. And by combining the HKSR-9002\* with the HKSR-9003, it can perform the same function even in 4:4:4 mode.

\*Planned to be available in the first half of 2010.

## Full-bandwidth RGB 4:4:4 Digital Image Capturing

With the addition of the optional HKSR-9003 RGB 4:4:4 Processing Board, the SRW-9000 offers full-bandwidth digital 4:4:4 high-definition Red, Green, and Blue signal processing and output capabilities. This camcorder also delivers 4:4:4 High Quality (HQ) mode and 4:4:4 Standard Quality (SQ) mode, enabling 880 Mbps 4:4:4 RGB recording and 440 Mbps 4:4:4 RGB recording respectively for highly demanding picture productions. And to capture the huge dynamic range of more than 12 stops, the SRW-9000 has S-Log Gamma with the same optional boards.

Signal Format	Recording Frame Rate	Option	Slow Motion/Quick Motion		
			Slow Motion	Quick Motion	
1080	4:2:2	1 to 60 fps, 1 frame increments	HKSR-9002	23.98 / 24PsF:	0.40x to 24x
				25PsF:	0.42x to 25x
				29.97PsF:	0.50x to 30x
				50p:	0.83x to 50x
1080	4:4:4 HQ	1 to 60 fps, 1 frame increments	HKSR-9002 and HKSR-9003	23.98 / 24PsF:	0.40x to 24x
				25PsF:	0.50x to 25x
				29.97PsF:	0.50x to 30x
				59.94p:	1.0x to 60x
1080	4:4:4 HQ	1 to 30 fps, 1 frame increments	HKSR-9002 and HKSR-9003	23.98 / 24PsF:	0.80x to 24x
				25PsF:	0.83x to 25x
				29.97PsF:	1.0x to 30x
				59.94p:	1.0x to 60x

Slow Motion/Quick Motion playback speed is approximate.

## Features



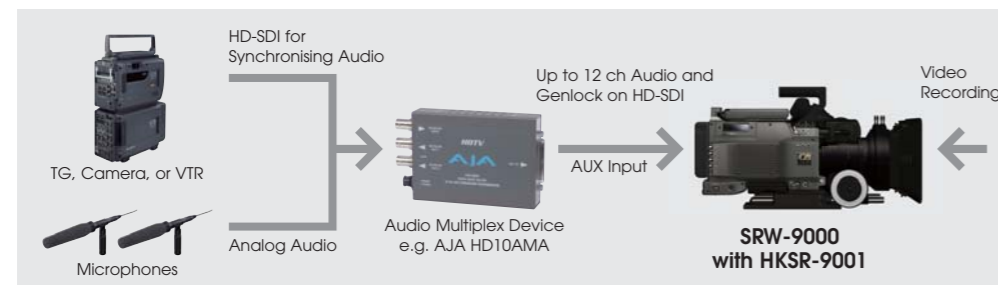
### I/O Expandability

When using the HKSR-9001 HD-SDI Expansion Board, users gain additional dual-link HD-SDI outputs and an AUX input port.

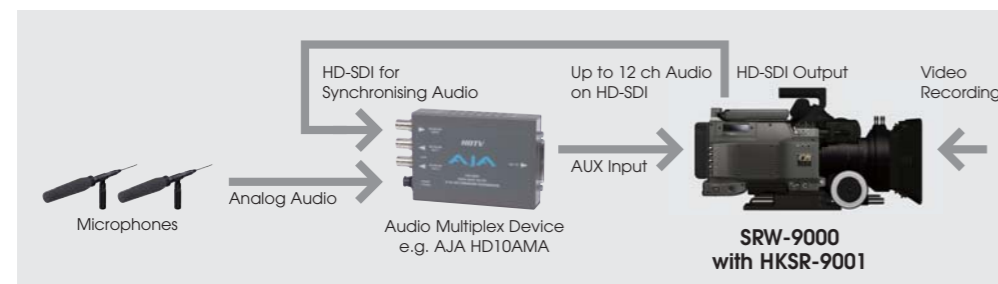
Using a greater bandwidth, the dual-link HD-SDI enables the camcorder to output 1080/4:2:2/50p

and 59.94p, and 1080/4:4:4, which cannot be achieved with a single HD-SDI output. The camcorder's RGB 4:4:4 output capability allows users to monitor materials in RGB full resolution, instantly on site.

The AUX input works as an HD-SDI audio input. This provides users with an outstanding audio multiplexing capability of up to 12 channels, in conjunction with third-party audio multiplexing devices.



a) Audio Multiplex With External HD-SDI Genlock



b) Audio Multiplex With HD-SDI Output



The fixing devices are not supplied

### Wide Choice of Viewfinders

The SRW-9000 accepts three types of viewfinder, including the HDVF-20A/200, HDVF-C35W, and HDVF-C30WR. The newly introduced HDVF-C30WR is especially suited for use with the SRW-9000, offering improved focus-assist functions, a colour brightness level indicator, and numerous other beneficial features.

Moreover with camera pre-installed LUTs (lookup tables) for S-Log Gamma, this viewfinder allows easy selection of the LUT function.



### Versatile Gamma Settings

#### S-Log Gamma

A feature of the optional HKSR-9003 RGB 4:4:4 Processing Board, S-Log Gamma captures the full dynamic range of the CCD. The setting is similar to the tonal response of a film negative, so that users can retain full flexibility in colour correction and a seamless workflow with post-production facilities geared toward log encoded material.

#### HyperGamma

HyperGamma is another powerful gamma feature. The user can select the best-suited preset gamma curve depending on the scene and their desired 'look' for the image.

The SRW-9000 inherits these powerful HyperGamma settings from Sony's CineAlta cameras and camcorders, which are widely used in cinema and drama productions. Additionally, the camcorder can use new settings that are tailored to the advanced characteristics of the SRW-9000.

#### Customisable Gamma

The SRW-9000 allows users to customise gamma curves with supplied CVPFileEditor™ software for Windows PCs and MAC. An easy GUI enables users to change the shape of the gamma curve, and then users can load the curve into the camera via Memory Stick PRO™ media.

### Other Features

- **High-precision 14-bit A/D Conversion**
- **Picture Cache Recording Capability**  
Everything captured for a maximum of three seconds before the REC button is pressed is recorded to HDCAM-SR tape when the camcorder is in stand-by mode.
- **Built-in Down Converter**
- **Wide Range of Accessories**  
The SRW-9000 is compatible with a wide range of accessories for the HDW-F900R, F23, SRW-1, and ARRI.

### SRW-9000 Signal Output Format

System Format		Dual-link HD-SDI (HKSR-9001)	HD-SDI Monitor	TEST (VBS)	
Signal Format	Frame Rate				
1080	4:2:2	23.98PsF	1080/4:2:2/23.98PsF*1	1080/4:2:2/23.98PsF	525/59.94i
		24PsF	1080/4:2:2/24PsF*1	1080/4:2:2/24PsF	625/50i
		25PsF	1080/4:2:2/25PsF*1	1080/4:2:2/25PsF	625/50i
		29.97PsF	1080/4:2:2/29.97PsF*1	1080/4:2:2/29.97PsF	525/59.94i
		50i	1080/4:2:2/50i*1	1080/4:2:2/50i	625/50i
		59.94i	1080/4:2:2/59.94i*1	1080/4:2:2/59.94i	525/59.94i
	4:4:4SQ/HQ*2	50p	1080/4:2:2/50p	1080/4:2:2/50i	625/50i
		59.94p	1080/4:2:2/59.94p	1080/4:2:2/59.94i	525/59.94i
		23.98PsF	1080/4:4:4/23.98PsF	1080/4:2:2/23.98PsF	525/59.94i
		24PsF	1080/4:4:4/24PsF	1080/4:2:2/24PsF	625/50i
		25PsF	1080/4:4:4/25PsF	1080/4:2:2/25PsF	625/50i
		29.97PsF	1080/4:4:4/29.97PsF	1080/4:2:2/29.97PsF	525/59.94i
4:4:4	50i	1080/4:4:4/50i	1080/4:2:2/50i	625/50i	
	59.94i	1080/4:4:4/59.94i	1080/4:2:2/59.94i	525/59.94i	

\*1: Single-link. HD-SDI Output A and B output the same signal.

\*2: Requires optional HKSR-9003 board.

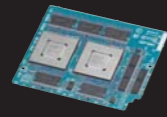
## Operational Accessories



**HKSR-9001**  
HD-SDI Expansion Board



**HKSR-9002\*1**  
Picture Cache Board



**HKSR-9003**  
RGB4:4:4 Processor Board



**AP-1**  
Assistant Panel



**BCT-6SR/33SR/40SR**  
HDCAM-SR Videocassette Tapes



**HDVF-C30WR**  
HD Electronic Viewfinder



**HDVF-C35W**  
3.5-inch\*2 LCD Colour Viewfinder



**HDVF-20A/200**  
2.0-inch\*2 CRT Viewfinder  
(Photo shows HDVF-20A)



**BP-GL95A**  
Lithium-ion Battery Pack



**BC-L160**  
Battery Charger



**BC-L70**  
Battery Charger



**AC-DN10/DN2B**  
AC Adaptor  
(Photo shows AC-DN10)



**RM-B750**  
Remote Control Unit



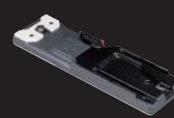
**RM-B150**  
Remote Control Unit



**WRR-861B/862B\*3**  
Wireless Microphone Receiver  
(Photo shows WRR-862B)



**ECM-678/674**  
Shotgun-type Electret Condenser Microphone  
(Photo shows ECM-678)



**VCT-14**  
Tripod Adaptor



**CAC-12**  
Mic Holder



**LUMA Series**  
Professional LCD Monitor



**TRIMASTER Series**  
Professional Master Monitor

## Optional Accessories From Other Manufacturers

### ARRI



**BP-8**  
Bridge Plate



**MB-20**  
Matte Box

### AJA



**HD10AMA**  
HD/SD 4-CH Analogue

### Carl Zeiss



**DIGIPRIME Lenses**



**DIGIZOOM Lenses**



**SHARPMAX**

### Canon



**HD-EC Prime Lenses**  
FJs Series



**HD-EC Zoom Lens**  
HJ21x7.5B KLL-SC



**HD-EC Zoom Lens**  
HJ11x4.7B KLL-SC



**HD-EC Zoom Lens**  
HJ8x5.5 KLL-SC

### Fujinon



**HD CINE SUPER**  
ZOOM/ Prime Lenses



**HD CINE COMPACT**  
C Lens  
HAc 13x4.5



**HD CINE COMPACT**  
C Lens  
HAc 15x7.3



**HD CINE COMPACT**  
C Lens  
HAc 18x7.6

\*1: Planned to be available in the first half of 2010. \*2: Viewable area measured diagonally. \*3: Requires optional mounting bracket (A-8278-057-B)

For details, please contact each manufacturer.

General	
Dimension (W x H x D)	148 x 211 x 330 mm (5 7/8 x 8 3/8 x 13 inches) (without handle and protruding parts)
Mass	Approx. 6.5 kg (14 lb 5 oz)
Power requirements	DC 12 V +5.0 V/-1.0 V
Power consumption	Approx. 57 W (while recording, w/o options, power save mode)
Operating temperature	0°C to 40°C (32°F to 104°F)
Storage temperature	-20°C to +60°C (-4°F to +140°F)
Humidity	10% to 90% (relative humidity)
Continuous operating time	Approx. 80 min w/BP-GL95A battery
Recording format	<b>Video:</b> HDCAM-SR 440 Mbps, HDCAM-SR 880 Mbps <b>Colour Space:</b> 4:2:2, 4:4:4SQ, 4:4:4HQ (w/HKSR-9003) <b>Audio:</b> 12 ch/24 bit/48 kHz
Recording/Playback time	<b>HDCAM-SR 440 Mbps:</b> 4:2:2, 4:4:4SQ: 40 min (30p), 50 min (24p) <b>HDCAM-SR 880 Mbps:</b> 4:4:4HQ: 20 min (30p), 25 min (24p), 4:2:2, 4:4:4SQ: 20min (60p), 24 min (50p)
Recommended tape	BCT-6SR, BCT-33SR, BCT-40SR
Inputs/Outputs	
Genlock In	BNC (x1), 1.0 Vp-p, 75 Ω
TC In	BNC (x1), 0.5 to 18 Vp-p, 10 Ω
Audio In	CH-1/CH-2: XLR-type 3-pin (female) (x2), Line/Mic/Mic +48 V selectable
AUX In	BNC (x1) w/HKSR-9001), SMPTE 292M (12 channel embedded audio)
Test out	BNC (x1), (switchable), HD Y/ SD composite (character On/Off)
HD-SDI Monitor	BNC (x2), HD-SDI SMPTE 292M (w/embedded audio) (character On/Off)
HD-SDI Out (Dual Link)	BNC (x2), (w/HKSR-9001 option) HD-SDI OUT LinkA/B HD-SDI: SMPTE 292M (w/embedded audio) HD-SDI Dual Link: SMPTE 372M (w/embedded audio)
TC Out	BNC (x1), 1.8 Vp-p, 1 kΩ
Earphone	Mini-jack (x1), (stereo)
DC In	XLR-type 4-pin (male) (x1), 11 to 17 V
DC Out	4-pin (x1), (for wireless microphone receiver), 11 to 17 V DC (MAX 0.5 A)
Lens	12-pin (x1)
Remote	8-pin (x1)
EXT IO	5-pin (x1), camera control (RS-232C)
CTRL (Cam)	(x1), for assistant panel (AP-1)
Memory Stick	(x2), for camera setup files, VTR maintenance

Audio Performance	
Frequency response	20 Hz to 20 kHz, +0.5 dB/-1.0 dB
Dynamic range	More than 100 dB
Distortion	Less than 0.05% (at 1 kHz, reference level)
Crosstalk	Less than -80 dB (at 1 kHz, reference level)
Headroom	20 dB
Camera Section	
Pickup device	3-chip 2/3-inch type Progressive CCD
Effective picture elements	1920 (H) x 1080 (V)
Optical system	F1.4 prism
Built-in optical filters	A: 3200K, B: 4300K, C: 5600K, D: 6300K, E: ND0.3 (1/2ND) 1: Clear, 2: ND0.6 (1/4ND), 3: ND1.2 (1/16ND), 4: ND1.8 (1/64ND), 5: CAP
Shutter speed	Angle 360.0° - 4.3° Continuous Mode (ECS)
SR Motion variable frame rate	(w/HKSR-9002*) Selectable from 1 to 60 frame/sec as recording frame rate
Lens mount	Special made rugged 2/3-inch type Sony bayonet mount (B4)
Sensitivity (2000 lx, 89.9% reflectance)	23.98/24/29.97Psf:T11 ISO580
Gain selection	-6, -3, 0, 3, 6, 9, 12 dB
Smear level	-135 dB (typical)
S/N ratio	55 dB
Horizontal resolution	1,000 TV lines (at center of screen) 5% or higher modulation
Registration	Within 0.02% (all zones, without lens)
Viewfinder	
	Option
Supplied Accessories	
	Operation manual (1), Lens mount cap (1), RiserPlate (1), V Plate, Handle, CP, CP cable (LM)

\*Planned to be available in the first half of 2010.

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