

SONY®



CX1
CINEALTA™

HDCAM SR™

SRW-1

HD Portable Digital Video Recorder

SRPC-1

HD Video Processor

www.sonybiz.net/hdcamsr





RGB FIELD PRODUCTION

CineAlta™ products are Sony's response and commitment to the ITU 709 global standard, specifically intended for international high-definition (HD) programme origination. Globally, HD programming is becoming far more mainstream and the HDCAM™ format has become a very popular format supporting it. This popularity has escalated the demand for even greater picture quality and storage capacity to support extremely high-integrity digital production and multi-channel audio mastering. Responding to these demands, Sony introduced a new state-of-the-art format that provides a platform with greater storage capacity, higher data-transfer rates and more audio channels than current HDCAM models. This format is HDCAM-SR™.



The Sony SRW-1 HD Portable Digital Video Recorder and SRPC-1 HD Video Processor in combination form a full-bandwidth 4:4:4 (RGB) portable VTR system that adopts this HDCAM-SR format. It offers virtually lossless 1080-line high-definition recordings at multiple frame rates on HDCAM-SR tape media and greatly enhances shooting operations in field production applications due to its stunning picture quality and portable size.



The SRW-1/SRPC-1 portable VTR system connects via a dual-link HD-SDI interface to create a convenient, portable full-bandwidth 4:4:4 (RGB) image-capturing system. The SRW-1 can be configured with not only 4:4:4 cameras, but also the HDW-F900R HDCAM camcorder via a single HD-SDI link to record 4:2:2 component images. The SRPC-1 processor unit, specially designed for the SRW-1, provides a variety of video-processing functions and houses an array of input and output connectors, including HD/SD signals, 12 channels of digital audio and 4 channels of analogue audio. Its processing functions include the easy handling of 2-3 pull-down insertions, down conversion and RGB 4:4:4 to Y/Cb/Cr 4:2:2 colour-space conversion. Furthermore, with the addition of the optional HKSR-102 board, the SRW-1/SRPC-1 provides a powerful new feature called SR Motion™, which includes various distinctive recording modes such as Select FPS, Interval Frame and Slow Shutter.



Offering unprecedented HD image quality, excellent operability and powerful interfacing capabilities, the SRW-1/SRPC-1 is an ideal HD portable VTR system for movie-making, commercial production and high-end television production applications.



FEATURES AND BENEFITS



HIGH-QUALITY HD FIELD RECORDING

Connecting to a 4:2:2 or 4:4:4 camera, the SRW-1/SRPC-1 creates the highest-quality and most faithful portable HD image-capturing system ever seen. With full-bandwidth HD RGB 4:4:4 and top-quality 4:2:2 Y/Cb/Cr 10-bit recording capabilities, achieved by the new HDCAM-SR format, the SRW-1/SRPC-1 offers unprecedented picture quality – meeting the needs of even the most demanding customers in movie-making, commercial production and high-end television production industries, as well as the requirements of digital-content mastering. In addition, the SRW-1/SRPC-1 offers up to 12 channels of 24-bit audio at 48 kHz.

DOUBLE-SPEED RECORDING

The SRW-1/SRPC-1 is equipped with a unique double-speed recording capability, which doubles the drum rotation and tape speed and thus achieves an amazing data transfer rate of 880 Mbps (standard quality is 440 Mbps)*. This extremely high-speed data transfer rate provides three selectable recording modes for different purposes. The high-quality mode** is used to record highest-quality RGB 4:4:4 HD images. This is the ideal mode for applications where the highest possible picture quality is a top priority. The 1080/60P recording mode is used to achieve a slow-motion effect when playing back recordings in 1080/30P format. The 2CH video recording mode enhances flexibility and creative versatility. This mode allows the SRW-1/SRPC-1 to record the images of two cameras simultaneously – making it possible for users to shoot two different scenes simultaneously or achieve 3D stereo shooting.

* Recording time will be half that of the standard recording mode.

** The content recorded by the high-quality mode cannot be played back by the SRW-5000/5500 VTR.

MULTI-FRAME-RATE 1080 HD RECORDING AND PLAYBACK

The SRW-1/SRPC-1 supports both multi-frame-rate recording and playback using 1920 (H) x 1080 (V) active pixels as specified by the industry-standard ITU Common Image Format (CIF). This fulfills a wide range of needs such as digital cinematography, commercial and high-end television programme productions. The following range of both progressive and interlaced frame rates can either be recorded or played back:

- Progressive: 23.98PsF, 24PsF, 25PsF, 29.97PsF, 50P, 59.94P
- Interlace: 50i, 59.94i

720P RECORDING AND PLAYBACK

In standard configuration, the SRW-1 also records in 4:2:2 720/59.94P/50P format. As with the 1080 format, users still have up to 12 channels of 24-bit audio available when operating in 720P format.

LONG RECORDING TIME

The SRW-1/SRPC-1 is capable of recording up to 50 minutes at 1080/23.98P and up to 40 minutes at 1080/59.94i or 720/59.94P on a single S-sized HDCAM-SR cassette. For even longer recording time, two SRW-1/SRPC-1 units can be cascaded to double the recording capacity.

OPERATIONAL AND CREATIVE VERSATILITIES

RS-422 INTERFACE FOR SERVER CONNECTION

The industry-standard RS-422 Sony 9-pin interface allows editors to control the SRW-1/SRPC-1 remotely. Connecting to the server via a HD-SDI dual-link connection, the SRW-1/SRPC-1 acts as an on-line feeder, smoothly transferring the recorded material to the subsequent post-production operation.

DETACHABLE CONTROL PANEL

A detachable control panel provides operators with a comfortable VTR operating environment. When the control panel is detached, the supplied extension cable allows operators to control the SRW-1/SRPC-1 remotely.



BUILT-IN TELE-FILE READ/WRITE CAPABILITY

The SRW-1/SRPC-1 has a built-in Tele-File read/write capability. Because this VTR accommodates a wide range of recording formats, the Tele-File feature – which allows auxiliary information to be stored on a tape label containing an IC chip – is utilised to verify the proper format. Tele-File labels come as a standard feature on all HDCAM-SR tapes.

SR MOTION

The SRW-1/SRPC-1 offers a variety of recording features that deliver impressive motion effects and allow users to be more creative when shooting.

Sony SR Motion feature is a collection of three of these powerful functionalities – namely Select FPS, Interval Frame and Slow Shutter – each of which leverages the advanced processing of the SRW-1/SRPC-1 and the internal memory of the optional HKSR-102 board to create exceptional-looking images.

Yet what makes this SR Motion feature so useful, is that users can see the results immediately on the set without the use of any converters or nonlinear editing systems. It is a powerful tool for creating highly novel, expressive and spectacular images with less effort and minimal equipment.

SELECT FPS

The Select FPS recording function of the SRW-1/SRPC-1, which is commonly known as “over-crank” and “under-crank”, allows users to create very smooth and elegant slow and quick-motion images. When used with a compatible camera, the SRW-1/SRPC-1 and optional HKSR-101 optical interface board provide 1 to 60 fps (frames per second) recording for 4:2:2 signals or 1 to 30 fps recording for RGB 4:4:4 signals, in increments of 1 fps. For example, when viewed at 23.98P, images captured at one fps will appear 24 times faster than normal. Conversely, images captured at 60 fps will appear 2.5 times slower than normal.

INTERVAL FRAME

The Interval Frame function intermittently records signals onto a tape at intervals predetermined by the user. To achieve this, the SRW-1/SRPC-1 holds all the frames captured by the camera in an on-board buffer memory and then records only those frames that occur at each interval. This mode, commonly known as “time-lapse” recording, provides extremely fast-motion effects. The SRW-1/SRPC-1 can change interval time seamlessly even as they record.

SLOW SHUTTER

In conjunction with the long exposure capturing function of the camera, the SRW-1/SRPC-1 with the optional HKSR-101 optical interface board can record images captured at shutter speeds longer than the recording frame rate, allowing users to capture images under very low-light conditions or create images with beautiful motion blurs.

INTERNAL FORMAT-CONVERSION CAPABILITY

In addition to RGB 4:4:4 to Y/Cb/Cr 4:2:2 conversion, the SRW-1/SRPC-1 possesses a wide variety of format-conversion (including 2-3 pull-down) capabilities ranging from HD to HD and HD to SD, offering solutions for high-quality material monitoring and work-tape creation.

SRW-1 Internal Format-Conversion Capability

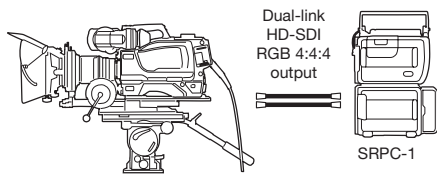
SYSTEM (HD-SDI IN/OUT)	HD MONITOR OUT	SD MONITOR OUT
1080/4:2:2	23.98PsF	23.98PsF 59.94i*
	25PsF	25PsF 625/50i
	29.97PsF	29.97PsF 525/59.94i
	50i	50i 625/50i
	59.94i	59.94i 525/59.94i
1080/4:2:2	50P	50i 625/50i
	59.94P	59.94i 525/59.94i
1080/4:4:4 SQ or HQ	23.98PsF	23.98PsF 59.94i*
	25PsF	25PsF 625/50i
	29.97PsF	29.97PsF 525/59.94i
	50i	50i 625/50i
	59.94i	59.94i 525/59.94i
720/4:2:2	59.94P	720/4:2:2 59.94P

HD-SDI Dual Link Alternative

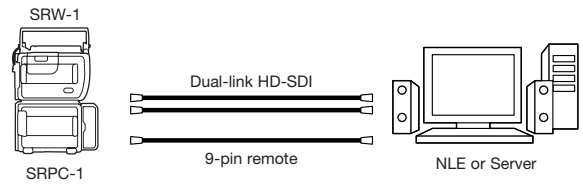
* 2:3 pull-down SQ: Standard Quality 440Mbps HQ: High Quality 880Mbps

SYSTEM CONFIGURATION

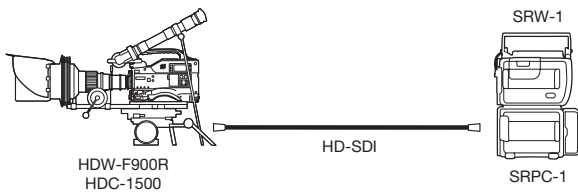
RGB 4:4:4 Recording (HD-SDI Dual-link)



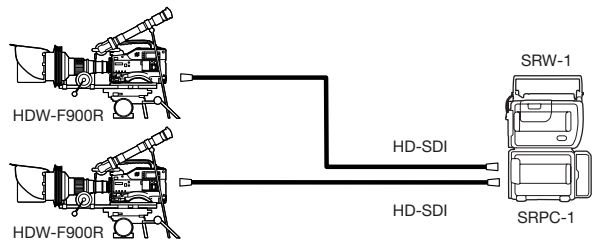
Source Feeding to NLE or Server



4:2:2 Recording



Two-camera Operation



DIMENSIONS



SRW-1/SRPC-1 Rear Panel

SPECIFICATIONS

General	
Power requirements	DC +12 V (DC +11 to +17 V)
Operating temperature	0 °C to +40 °C
Storage temperature	-20 °C to +60 °C
Humidity	25 % to 80 % (relative humidity)
Mass	8.5 kg (18 lb. 12 oz)
Dimensions (W x H x D)	279 x 399 x 139 mm (11 x 15 7/8 x 5 1/2 inches)
Recording format	HDCAM-SR
Recording/Playback time	Normal speed recording: 50 min. with BCT-40SR cassette (24P mode)
	Double speed recording: 25 min. with BCT-40SR cassette (24P mode)
Fast forward/rewind time	5 min.
Fast forward/rewind speed	±11 times
Search speed (Shuttle mode)	±11 times
Input/Output Signals	
HD serial V/A input	BNC x2, Serial Digital (1.485 Gbps), SMPTE-292M/ SMPTE-372M/BTA-S004/ITU-R.BT709
HD reference video input	BNC x 1, Tri Level Sync, 0.6 Vp-p, 75 Ω , sync negative
SD reference video input	BNC x 1, Black Burst, 0.286 Vp-p, 75 Ω , sync negative
Digital audio input	BNC x 2 (AES/EBU)
Analogue audio input	XLR-3pin x 4 (female)
Time code Input	BNC x 1, 0.5 to 18 Vp-p, 10 kΩ
HD serial V/A output	BNC x 2, serial digital (1.485 Gbps), SMPTE-292M/ SMPTE-372M/BTA-S004/ITU-R.BT709
HD serial V/A monitor output	BNC x 1 (with character out), D1 serial digital (270 Mbps), SMPTE-259M
SD serial V/A monitor output	BNC x 1 (with character out), D1 serial digital (270 Mbps), SMPTE-259M
Digital audio output (ch1 to ch12)	D-sub multi connector
Analogue audio monitor output	XLR-3pin x 2 (male)
Time-code output	BNC x 1, 1.0 Vp-p (75 kΩ), 2.2 Vp-p (10 kΩ)
Phones	Stereo mini jack x 2 -17 dBu
Remote input interface	D-sub 9-pin (female), Sony 9-pin remote
Digital video performance	
Sampling frequency	Y: 74.25 MHz, Cb/Cr: 37.125 MHz G: 74.25 MHz, B: 74.25 MHz, R: 74.25 MHz
Quantisation	10 bits/sample
Compression	MPEG-4 Studio Profile
Channel coding	S-NRZ
Error correction	Reed-Solomon code
Digital audio performance	
Sampling frequency	48 kHz (synchronised with video)
Quantisation	24 bits/sample
Wow & flutter	Below measurable level
Analogue audio performance (Playback with the SRW-5000 VTR)	
Sampling frequency	24 bits/sample
Frequency response	20 Hz to 20 kHz, +0.5 dB/-1.0 dB (reference level)
Dynamic range	More than 100 dB (1 kHz)
Distortion	Less than 0.05 % (at 1 kHz, reference level)
Crosstalk	Less than -80 dB (at 1 kHz, between any two channels)
Accessories	
Supplied accessories	Operational manual (1)
Optional accessories	HKSR-102, Picture Cache Board AC-DN10, AC Adaptor AC-DN2B, AC Adaptor BP-GL95, Info Li-Ion Battery BC-L70, Battery Charger BC-L500, Battery Charger BCT-6/33/40SR, HDCAM-SR Video Cassette Tapes BCT-HD12CL, Video Head Cleaning Cassette

OPTIONAL ACCESSORIES



HKSR-102
Picture Cache Board

AC-DN10
AC Adapter

AC-DN2B
AC Adaptor



BP-GL95
Info Li-Ion Battery

BC-L70
Battery Charger

BC-L500
Battery Charger



BCT-6/33/40SR
HDCAM-SR Video Cassette Tapes

BCT-HD12CL
Video Head Cleaning Cassette

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- Sony Financial Services: Innovative and flexible finance solutions designed to meet budgetary and financial requirements and constraints, enabling businesses to always have the most current technology.
- Sony Training Services: A range of off-the-shelf or customised training services from basic operation through to high-level technical maintenance.
- Sony Prime Support Services: Fully integrated and customised support for products and systems throughout their operational life, combining proactive and reactive technical services.

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Features and specifications are subject to change without notice.
All non-metric weights and measurements are approximate.
23.98P, 24P, 25P and 29.97P are used as generic names in this literature for the industry standard 23.98PsF, 24PsF, 25PsF and 29.97PsF (Progressive Segmented Frames), respectively.
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CA SRW-1/SRPC-1/GB-25/09/2006