

## HDW-650P

Three 2/3-inch Power HAD CCD sensors HDCAM camcorder



### Overview

HDCAM has become the format of choice around the world for high quality HD programming across a wide range of production genres. Since launch over 43,000 HDCAM camcorders and VTRs have been purchased, and year-by-year Sony has continued to strengthen the line-up to offer new creative opportunities to the user.

For 2008, Sony has added a new camcorder to the HDCAM family, the HDW-650P.

The HDW-650P incorporates the latest developments in acquisition technology to capture breathtaking HD images. It can record pictures in 1080/50i and 59.94i interlace mode, as well as in 1080/25P where a natural 'film look' is required.

The camcorder features three newly developed 2/3-inch type Power HAD FX CCDs, a 14-bit A/D converter, and a state-of-the-art DSP LSI signal processing. This provides extremely wide tonal reproduction, as well as a high sensitivity of F12 at 50 Hz. A signal-to-noise ratio of up to 59dB is realised using a newly developed noise-suppression function.

The HDW-650P is equipped with many useful features as standard - including a 3.5-inch colour LCD screen located on the inside panel - all packaged into a well-balanced, reliable chassis.

Other benefits include two HD-SDI outputs, a down-converted SD output, selectable gamma characteristics (HyperGamma), interval recording, picture cache recording, and a slow shutter function - all provided as standard. Addition of an optional colour or monochrome viewfinder and an optional ECM series microphone completes the feature set.

## **Superb High Definition pictures**

The HDW-650P acquires pictures in 1080-line resolution, providing an unforgettable High Definition viewing experience for your audience.

## **Increased marketability of your programmes**

HDCAM has achieved an enviable reputation for quality, and programmes shot in HDCAM are accepted by many of the world's most prestigious broadcasters. Shooting in HDCAM opens up new opportunities for international co-production and distribution.

## **Peace of mind for High Definition post production**

Over 43,000 HDCAM VTRs and camcorders are in use worldwide, and the number of post houses equipped with HDCAM grows every day. You can relax in the knowledge that there is an HDCAM facility close by to add the finishing touches to your project.

## **Easy integration with Standard Definition**

Today more and more programme makers are shooting HDCAM, with many of them using existing SD suites for post production. This approach provides many advantages. These include the lower cost associated with SD post production, and the benefit of retaining an exceptionally high quality HDCAM original recording for future distribution opportunities. And even when downconverted to SD, pictures from HDCAM camcorders will look noticeably better than those originated in SD.

## **Differentiation in a crowded market**

HDCAM camcorders have built an unrivalled reputation for the production of the very best in quality programming, helping establish HDCAM as the preferred High Definition format worldwide. In today's multi-channel world, shooting with the HDW-650P ensures that your pictures stand out to grab the attention of your viewers.

### **Ease-of-use for minimum re-training**

The latest in a long line of digital camcorders from Sony, the HDW-650P retains the ergonomic design and familiar operation for which Sony camcorders have become renowned. With the HDW-650P, you avoid expensive operational retraining and can generate great pictures from day one.

## Features

### **Choice of HD Recording Formats, including both interlaced and progressive**

The HDW-650P offers a choice of video formats for both frame rates and scanning mode. Acquisition of pictures at a resolution of 1920 x 1080 in 50i, 59.94i and 25P is provided.

### **Three 2/3-inch HD Power HAD FX CCDs**

The HDW-650P is equipped with three 2/3-inch type 2.2-megapixel HD CCDs, which are also used in Sony's class leading HDC-1500 HD Camera.

Based on Sony's Power HAD FX sensor technology and the latest on-chip lens structure, the HDW-650P offers a high sensitivity of F11 at 59.94 Hz or F12 at 50 Hz.

### **Superb Signal-to-noise Ratio**

A signal-to-noise ratio of 59dB can be achieved by activating the Noise Suppression (NS) mode of the HDW-650P, which helps to reduce the high-frequency noise elements of video signals using Sony's advanced digital processing technology.

## **14-bit A/D Conversion**

The HDW-650P incorporates high-performance 14-bit A/D conversion so that images captured by the high-performance CCDs can be processed with maximum precision.

This high-resolution A/D conversion allows mid- to dark-tone areas of the picture to be faithfully reproduced. Thanks to the 14-bit A/D converter, pre-knee signal compression in highlighted areas can be eliminated, and the camera can clearly reproduce a high-luminance subject at a 600% dynamic range\*.

\*In 1080/50i and 59.94i mode.

## **3.5-inch\* LCD**

A large, easy-to-view, colour LCD screen on the HDW-650P camcorder's side panel enables operators to instantly review recorded footage - as well as access the camera's set-up menus, and view status indications such as the four channels of audio and the remaining time available from the tape and battery.

\*Viewable area measured diagonally.

## **New Audio Capability: Digital Wireless Microphone Receiver**

The HDW-650P is compatible with a range of microphones.

It is equipped with a slot to accommodate the DWR-S01D\* digital wireless microphone receiver, which provides two-channel audio with stable and secure transmission tolerant to interference.

The status of the digital wireless microphone system can be monitored through both the camcorder's viewfinder and the LCD display.

Shotgun-type microphones, such as the ECM-680S/678/674, are

also available as options.

\*The DWR-S01D will be available in spring 2009

## **Well-balanced Compact Body**

The ergonomic design of the HDW-650P provides optimum weight balance, allowing users to enjoy comfortable hand-held operation. Because its centre of gravity is located roughly at the centre point of the shoulder pad, operating the camera for long periods on the shoulder causes less strain on the supporting arm. The HDW-650P's light body weighs just 4.2 kg (9 lb 4 oz).

## **Down-conversion Capability**

The HDW-650P is equipped with a built-in down-conversion system as standard. Down-converted pictures can be output via SD-SDI for SD post production or monitoring.

## **Picture Cache Recording**

The HDW-650P offers a picture cache recording function that is especially useful.

Up to eight seconds of audio and video are buffered in the camcorder's memory before the Rec. start button is pressed (when in Standby mode).

This ensures that action up to eight seconds before the Rec. start button was pressed will still be captured. Cache recording works even before the tape is inserted into the drive - helping to prevent the loss of any unexpected, yet important events.

## **Slow Shutter\***

The shutter speed of the HDW-650P is selectable down to a 16-frame period (in 2-, 3-, 4-, 5-, 6-, 7-, 8-, and 16-frame periods).

During this frame period, electrical charges accumulate on the

CCDs, which dramatically increases sensitivity. This helps camera operators to shoot in extremely dark environments.

The Slow Shutter function also allows operators to use shutter speeds longer than the frame rate, for enhanced shooting creativity. For example, when shooting a moving object, to create intentional blurring of the image.

\*Requires a software upgrade, planned to be available in spring 2009.

### Other Features Provided as Standard

- Four types of HyperGamma characteristic as standard: HyperGamma 1, 2, 3, and 4. Operators can select the best-suited preset gamma curve depending on the scene being shot and their desired 'look' for the image.
- Supports AES/EBU Digital Audio input, in addition to microphone input, +48 V microphone input, and line input
- Trigger REC function (HD-SDI Remote Function: REC Command)

## Specifications

General	
Power Requirements	DC 12 V +5.0 V/-1.0 V
Power Consumption	Approx. 35 W (with 12 V DC supply, when recording, LCD monitor off)
	Approx. 9 lb 4 oz (without options) Approx. 5.9 kg (with VF, Mic, BCT-

Mass	40HD, BP-GL95) Approx. 4.2 kg (without options) Approx. 13 lb (with VF, Mic, BCT-40HD, BP-GL95)
Operating Temperature	32°F to 104°F 0°C to 40°C
Storage Temperature	-4°F to 140°F -20°C to +60°C
Operating Humidity	25% to 85% (relative humidity)
Continuous Operating Time	Approx. 120 min with BP-GL95 battery (When using an optional HDVF-20A and operating at the normal temperature of 25°C (77°F).)
Dimensions (W x H x D) *[1]	5 x 10 5/8 x 13 1/8 inches 124 x 269 x 332 mm

## Camera Section

Pickup Device	3-chip 2/3-inch type IT CCD
Effective Picture Elements	1920 x 1080 (H x V)
Optical System	F1.4 prism system

Lens Mount	2/3-inch 48 bayonet mount
Built-in Filters	A: Cross, B: 3200K, C: 4300K, D: 6300K 1: Clear, 2: 1/4 ND, 3: 1/16 ND, 4: 1/64 ND
Sensitivity (2,000 lx, 89.9% reflectance)	F11 (59.94i), F12 (50i) (typical)
Minimum Illumination	0.08 lx (F1.4 lens, +42 dB gain, 32-frame accumulation)
Smear Level	-135 dB (typical)
Video S/N Ratio	64 dB (Noise suppressor max.) 54 dB (Noise suppressor off)
Modulation Depth	45% or more (at 27.5 MHz)
Registration	0.02% or less (excluding distortion due to lens)
Geometric Distortion	None identified (excluding distortion due to lens)
Horizontal Resolution	1,000 TV Lines
Shutter Speed	1/60, 1/125, 1/250, 1/500, 1/1000, 1/2000 sec (50i) 1/33, 1/50, 1/60, 1/100, 1/250, 1/500, 1/1000, 1/2000 sec (25PsF) 1/100, 1/125, 1/250, 1/500, 1/1000,



	1/2000 sec (59.94i)
Clear Scan	60 Hz to 4300 Hz (59.94i) 50 Hz to 4700 Hz (50i) 25 Hz to 2300 Hz (25PsF)
Programmable Gain	-6 dB/-3 dB/0 dB/3 dB/6 dB/9 dB/12 dB/18 dB/24 dB/30 dB/36 dB/42 dB
LCD Panel	Pixel resolution: 250,880 pixels 3.5 inches
<b>VTR Section</b>	
Recording Format	HDCAM 59.94i/50i/25PsF
Tape Speed	Approx. 96.7 mm/s (59.94i) Approx. 80.7 mm/s (50i/25PsF)
Recording/Playback Time	48 min (50i/25PsF) with BC-40HD 40 min (59.94i) with BC-40HD Approx. 5 min with BCT-40HD
Recommended Tapes	HDCAM cassette (S) BCT-6HD/12HD/22HD/32HD/40HD
Sampling Frequency	Y: 74.176 MHz (59.94i), 74.25 MHz (50i), Pb/Pr: 37.088 MHz (59.94i), 37.125 MHz (50i)
	10 bits/sample (8 bits sample for

Quantization	compression processing)
Channel Coding	S-NRZI PR-IV
Compression	Coefficient recording system
Error Correction	Reed-Solomon code
Error Concealment	Adaptive three dimensional

## Input/Output

Genlock Input	BNC (x1), 1.0 Vp-p, 75 Ω, unbalanced
Timecode Input	BNC (x1), 0.5 V to 18 Vp-p, 10 kΩ
Audio Input (CH1/CH2)	XLR-type 3-pin (female) (x2), -60 dBu/+4 dBu/AES/EBU (0 dBu = 0.775 Vrms)
Mic Input	XLR-type 5-pin (female) (x1), -50 dBu (LPF ON)
Test Output	BNC (x1), VBS/Y (component): 1.0 Vp-p, 75 Ω, unbalanced
HD-SDI Output	BNC (x1), 0.8 Vp-p, unbalanced
HD/SD-SDI Output	BNC (x1), 0.8 Vp-p, unbalanced
AUDIO Output	XLR-type 5-pin (male) (x1), 0 dBm

TC Output	BNC (x1), 1.0 Vp-p, 75 $\Omega$
Earphone Output	Mini jack (x2), 8 $\Omega$ , $-\infty$ dBs to -18 dBs variable
DC Input	XLR-type 4-pin (male) (x1), DC 11 V to 17 V
DC Output	4-pin (x1), DC 11 V to 17 V, Max. 0.5 A
Lens	12-pin (x1), DC 11 V to 17 V, Max. 0.7 A
Remote	8-pin (x1)
Light	2-pin (x1)

## Supplied Accessories

Shoulder strap (1)
Supplied Accessories
Operation manual CD-ROM (1)
Operation manual (1)

## Notes

Note	*[1] The values for dimensions are approximate.
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## Related products



### **DWR-S02D**

Digital wireless receiver



### **ECM-678**

Shotgun Electret condenser microphone



### **ECM-674**

Affordable shotgun Electret condenser microphone



### **ECM-673**

Short Shotgun Electret Condenser Microphone.



### **UWP-D11**

UWP-D bodypack wireless microphone package



### **UWP-D12**

UWP-D handheld wireless microphone package



### **UWP-D16**

UWP-D bodypack and XLR plug-on wireless microphone package



### **MDR-7510**

Studio professional headphones



### **ECM-VG1**

Shotgun Electret condenser microphone



### **MDR-7506**

Stereo professional headphones



### **HDVF-EL20**

OLED 0.7-inch colour HD viewfinder



### **HDVF-EL30**

OLED 0.7-inch colour Full HD viewfinder with 3.5-inch sub-LCD

## Gallery

