

SONY®

High Definition Video System

Digital **HDVS**®



Sony Multi-format Video Camera System

HDC-900/HDC-950/HDCU-900

Big Pictures for Global Coverage





For over a decade, Sony has been pioneering the development of high definition video equipment. Today, its High Definition Video System (HDVS®) includes cameras, switchers, routers, VTRs and camcorders. This range of products now has a significant addition, as Sony proudly introduces an innovative all-digital production system — the HDC-900 studio camera, the HDC-950 companion portable camera, and the HDCU-900 camera control unit. The worldwide movement towards the introduction of advanced digital video broadcast services requires the origination of program material with very high video and audio quality. DTV in the USA encompasses both HDTV and SDTV, DVB in Europe presently is SDTV but there is growing interest in HDTV. Sony has very carefully considered this movement in designing its new-generation HD cameras, and has developed a true multi-purpose camera system that is compatible with the various international formats that will be used in these enhanced services. The HDC-900/950 family has been designed to deliver a variety of choices of HDTV and SDTV to meet these multiple global digital origination formats. In particular, the growing interest in progressive scan origination has been made a central design focus of this important new camera family.

There are several important design criteria required in a new HD camera to ensure that it not only provides the features required for these new services, but also has compatibility with existing broadcast environments:

- True multi-standard operation, from 1080/24P to analog composite
- Similar in operation to current color video cameras
- Easy to integrate into conventional systems
- As cost-effective in daily use as current equipment

These design requirements are completely met in HDC-900 and HDC-950 cameras:

- Operational controls and connectors are located in similar positions to those on current Sony HDC and BVP Series cameras, so operators accustomed to these models immediately find the HDC-900/950 familiar and easy to use
- Existing Sony MSUs, CNUs and RCPs can be used with the HDC-900/950. Current menu control systems and auto set-up functions are also compatible
- Capital cost is not significantly greater than Sony standard definition camera equipment

Common Image Format Operation

A seminal new global digital HD standard was born in 1999 – the culmination of more than fifteen years of international collaboration within the ITU. The global agreement that was reached – on all parameters relating to the still image being a singular set of numbers – represents a giant step forward for HD program origination and International Programme Exchange. This is now called the widescreen 16:9 digital HD 1920 x 1080 Common Image Format standard. The only remaining variables within this worldwide standard are the field and frame rates that recognize the long-established regional differences of 50 and 60 Hz, and the new recognition of the singular global 24P progressive format. Sony proudly introduces the new HDC-900/950 camera family as the first worldwide HD camera system conforming to this new ITU-R 709-3 Recommendation for High Definition Production and International Programme Exchange. It captures all imagery according to the now internationally standardized 16:9 Widescreen 1920 x 1080 sampling structure. It can be switched to originate this format at 24P, 25P, or 30P progressive scan frame rates, or at the established 50i and 60i interlaced field rate. One camera system can be employed anywhere in the world – a major step forward in professional equipment evolution and one that will introduce valuable manufacturing economics of scale in the future.

1080/24P has become a significant new origination format for HDTV, DVB, DVD and CineAlta™ productions – constituting an important new and cost-effective alternative to motion picture film origination for prime time television program and commercial production. Naturally, the Sony HDC-900/950 system supports this format to provide high definition material for these program distribution channels. However, the HDC-900/950 system also provides signals in many other formats for maximum versatility. In addition to facilitating HD capture according to different picture capture rates, the cameras also can be configured to supply a multiplicity of digital production scanning formats. Thus, the HDC-900 and HDC-950 embody sophisticated digital down-conversion options within their camera control unit – the HDCU-900 – that deliver a variety of choices in other production formats in addition to the selected primary 1920(H) x 1080(V) HD output.

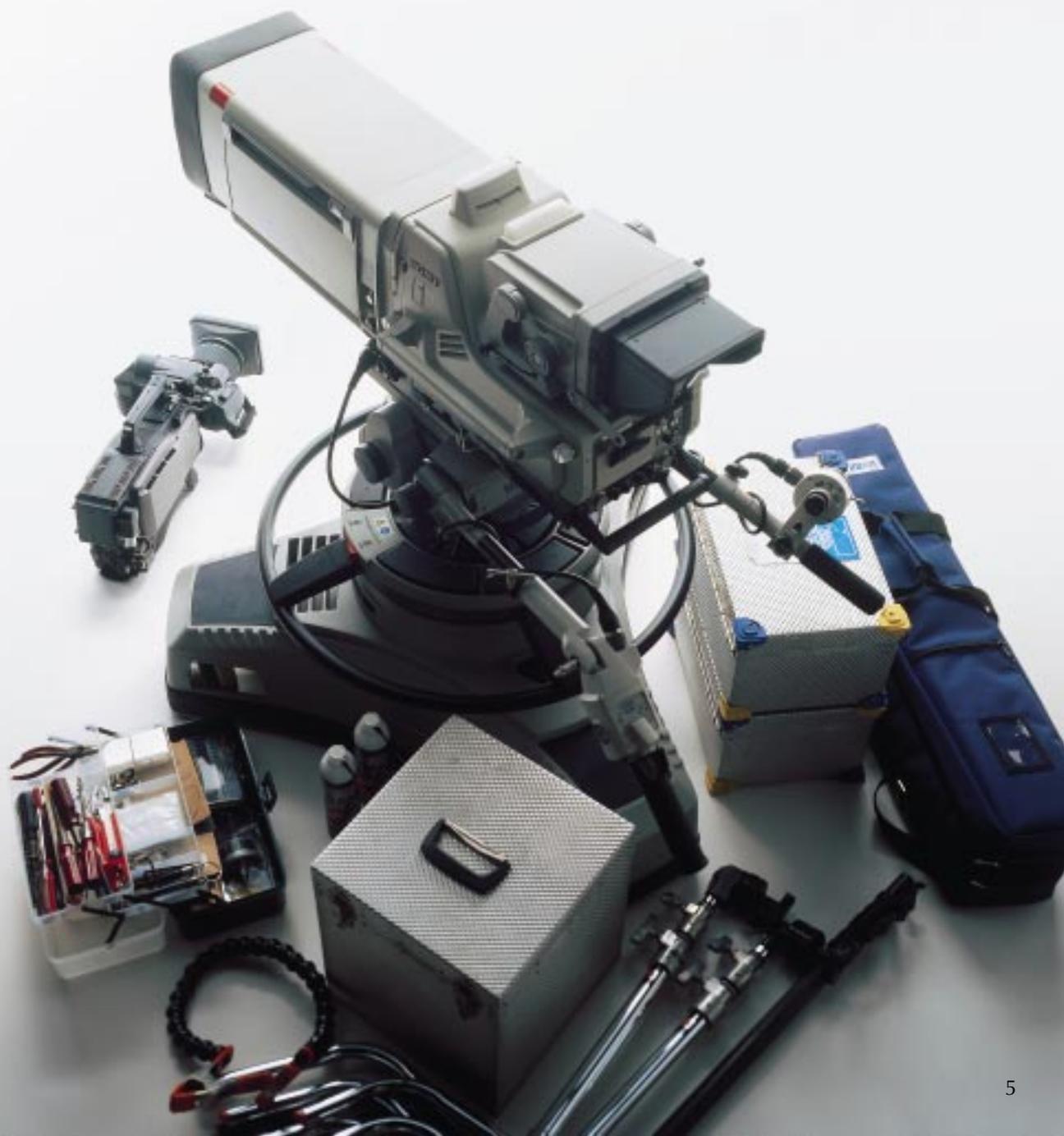
For the USA the HDCU-900 can include a board option that digitally converts a 1920(H) x 540(V) at 60P origination to the alternate 1280(H) x 720(V) at 60P desired by some major US broadcasters.

Standard definition signals are also available, 480/60i and 480/30P pictures for widescreen or 4:3 SDTV, or for 4:3 NTSC broadcasting, and 576/50i and 576/25P pictures for DVB and PAL-based systems. Whatever the format, the camera signal is available via HD-SDI and SDI outputs, so

there is no quality loss as the signal is transferred from the HDCU-900 control unit.

With its multi-format signal interfaces, the HDC-900/950 system is equally suitable for HD production, cinematic 24P shooting, and broadcasting on the worldwide SDTV, NTSC and PAL formats.

A distinct advantage of this camera is that the down-conversion of the "super-sampled" HD origination produces standard definition 480 and 576-line SDTV/PAL/NTSC signals having technical performances that are superior to those were they originated in their native formats (their horizontal and vertical MTFs are higher and the associated scanning aliasing are less).

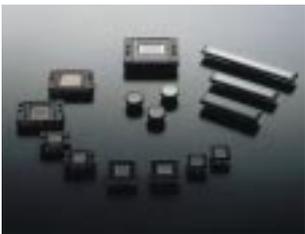


New Technologies

Improvements in Digital Signal Processing (DSP), a newly developed 2.2-million pixel CCD and 12-bit A/D conversion are at the heart of the HDC-900/950 camera system. 12-bit A/D conversion improves gradation analysis by a factor of four compared to 10-bit conversion, significantly improving control over picture tonal reproduction, and accuracy of color reproduction. A 600% dynamic range in combination with the 12-bit A/D and the superior DSP processing ensure superb processing of overexposed picture information and the handling of specular highlights. Some of the important new technologies used in the HDC-900/950 system are described below.



Exclusive HAD Sensor Technology



A new design of CCD has been developed for the HDC-900 and HDC-950. Based on Sony HAD sensor technology and using the on-chip lens structure of the latest Power HAD™ sensors, this CCD is

based on the 1920 x 1080 CIF (Common Image Format) and is switchable between progressive mode and interlace mode readout. With its light collecting capability dramatically improved, this 2/3-type 2.2 million-pixel FIT CCD offers an industry-leading sensitivity of f10 at 2,000 lux. It has a limiting horizontal resolution of 1000 TVL/ph, a signal-to-noise ratio of 54 dB (unweighted over 30 MHz) and the outstandingly low vertical smear level of -135 dB (typical).



12-bit A/D Conversion and ADSP (Advanced Digital Signal Processing)

The combination of 12-bit A/D conversion and the new 2.2-million sensor CCD provides excellent color rendition and overall picture quality.

The powerful ADSP circuitry enables camera set-up parameters to be adjusted over a wide range. Menus are used to select the required parameters, such as gain, gamma, flare, pedestal and detail, and adjustments made from a central Master Set-up Unit (MSU) Parameter settings can be transferred to other cameras in a system for perfect picture matching.

Further developments in Sony LSI technology have reduced power consumption by 75%* compared to conventional gate array LSIs.

*Sony measurement.

Ergonomic Body Design

For over two decades, Sony has been designing and manufacturing broadcast video cameras and camcorders. In creating these designs, great importance has always been given to achieving control layouts based on the practical, operational requirements of the user. The control layout of the HDC-900 therefore naturally follows that of other HDC and BVP Series cameras. For example, the V/F adjustment and controls for the intercom system, V/F return selection, lens filter selection, etc. are all located in similar positions to previous models, so that operators with experience of Sony cameras can operate this new model intuitively. The HDC-950 portable model features a body that is so compact and lightweight that it opens up new and exciting possibilities in location camera work. Newly developed ADSP LSIs drastically reduces its power consumption, which helps comfortable and stable operation of entire system. Ingenious design with a low optical axis and superb weight distribution means that the camera can be carried comfortably on the shoulder without causing fatigue. Tripod operation is just as easy, and the HDC-950 has all its controls and connectors located in similar positions to those on Sony BVP cameras. Even with a viewfinder, microphone and a standard ENG lens, the total weight of the HDC-950 is only around 7 kg (about 16 pounds).

Optical Filter Wheels

Independent ND and CC optical filters are provided on both the HDC-900 and HDC-950. The filter drives provided for both 900 and 950 are exactly the same, so that common operation is enabled between the hard camera and the portable type when the filter settings are adjusted remotely on a RCP, MSU or RM-B150 Remote Control Unit.

Electronic Shutter

The electronically operated shutter provides speeds of 1/100, 1/250, 1/500/, 1/1,000, and 1/2,000 of a second (1080/60i mode).

Clear Scan and ECS (Extended Clear Scan)

The well-proven Clear Scan and ECS functions eliminate banding effects when shooting monitor displays by allowing the shutter speed to be adjusted so that it exactly matches the various scanning frequencies that are in use. The clear scan shutter speed range is 60.1 to 4300 Hz (1080/60i mode). The ECS function is especially effective under the frequency of 60 Hz.

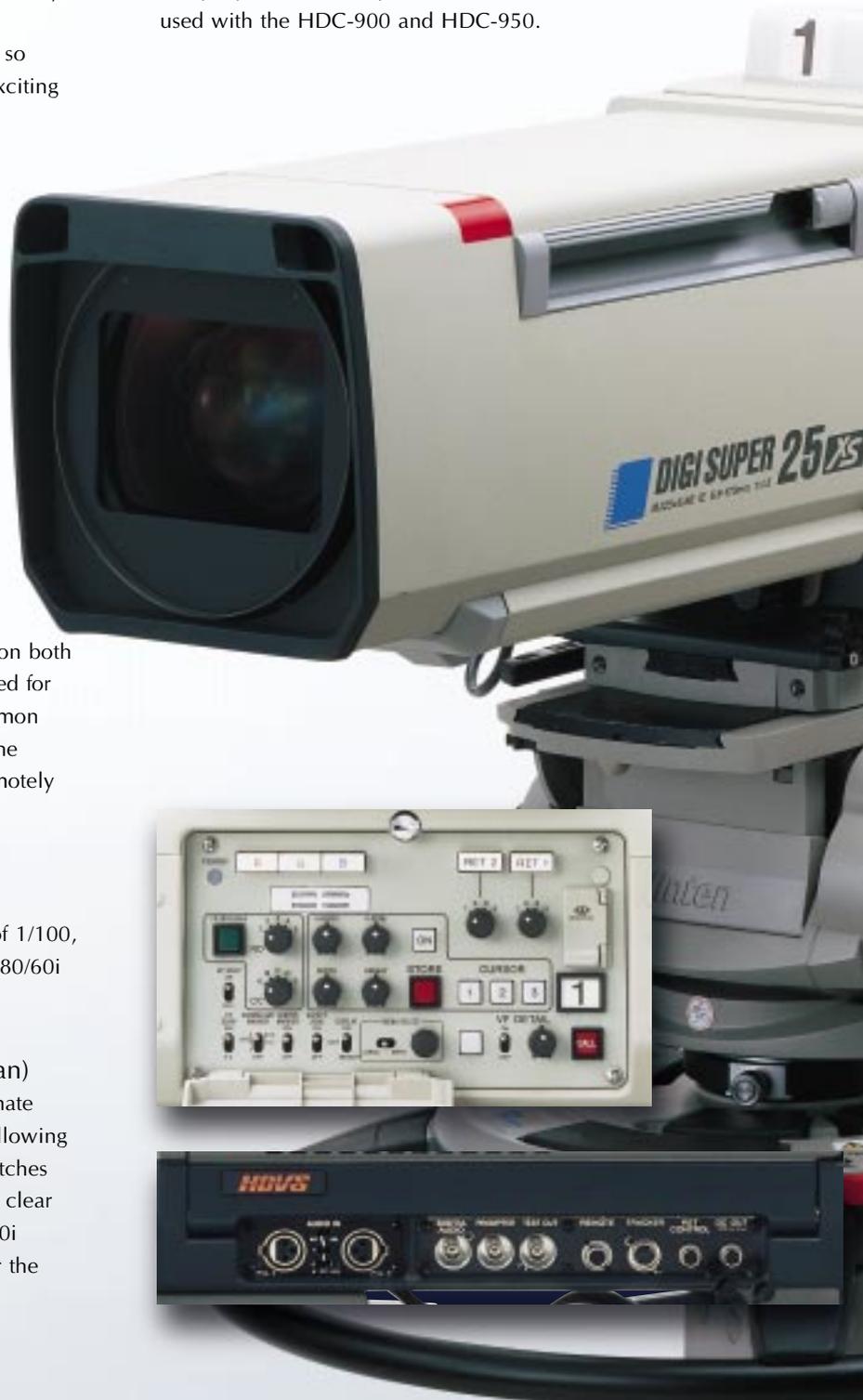
Super EVS

Super EVS (Enhanced Vertical-definition System) raises vertical picture resolution, while minimizing line flicker*. It is ideal for shooting of a stationary subject or still images – the method used for the “Claymation” process, for instance.

*The Super EVS functions when operated at Interlace mode.

Standard 2/3-type Lens Mount

Either an HD lens or a standard definition 2/3-type format lens can be mounted. This allows standard lenses that are in everyday use with Sony cameras and camcorders to be used with the HDC-900 and HDC-950.





Multiple Output Capability

The HDCU-900 CCU has four sets of HD SDI SMPTE-292M signal outputs and V/F return inputs, plus four sets of digitally down-converted SDI SMPTE-259M outputs and four digitally up-converted V/F return inputs. By adding an optional HKCU-901 SD Encoder Board, NTSC and PAL VBS signal outputs and V/F return inputs, and an analog component output are provided. An HKCU-902 HD Analog Interface Board provides HD analog outputs and inputs (as defined by

SMPTE-240M) while the HKCU-903 Frame Converter Board provides 3:2 pull-down to change the picture format between cinematic 24P and progressive 30 frame. The HKCU-904 Line Converter Board has the capability to convert 1080-line pictures into 720-line pictures, and provides four sets of HD-SDI outputs and V/F return inputs.

The chart shown on page 11 summarizes the output capability of the HDCU-900.



HDCU-900



HDCU-900 Rear Panel

HKCU-901 SD Encoder Unit



HKCU-902 HD Analog Interface Unit



HKCU-903 Frame Rate Converter Unit



HKCU-904 Line Converter Unit



High Definition Origination

HD Production Format	1080/60i	1080/50i	1080/30P	1080/25P	1080/24P	720/60P	
Camera Head Capture Format	1080/60i	1080/50i	1080/30P	1080/25P	1080/24P	1080/60i	540/60P
HDCU-900 Output Format							
HD-SDI (Reserved slot)	1080/60i	1080/50i**	1080/30P**	1080/25P**	1080/24P**	1080/60i	540/60P
Down-converted SDI (Removable slot)	480/60i**	576/50i**	480/30P**	576/25P**	480/60i**	480/60i	480/60i
HKCU-903 Frame Converter (Optional)	No	No	No	No	1080/60i**	No	No
HKCU-904 Line Converter (Optional)	No	No	No	No	No	720/60P	720/60P**
HKCU-901 SD Encoder (Optional)	NTSC**	PAL**	NTSC*	PAL*	No	No	No

* Monitoring quality only

** Entries printed in red are recommended choices

Standard Definition Production

Production Format	480/60i	480/30P	576/50i
Camera Head Capture Format	1080/60i	1080/30P	1080/50i
HDCU-900 Output Format			
HD-SDI (Reserved slot)	1080/60i**	1080/30P**	1080/50i**
Down-converted SDI (Removable slot)	480/60i**	480/30P**	576/50i**
HKCU-903 Frame Converter (Optional)			
HKCU-904 Line Converter (Optional)			
HKCU-901 SD Encoder (Optional)	NTSC**	NTSC*	PAL**

* Monitoring quality only

** Entries printed in red are recommended choices

Optical Fiber Digital Transmission

The cable connecting the HDCU-900 CCU to an HDC-900 or HDC-950 camera uses two single-mode optical fiber lines, two control lines, and two power lines to carry digitized video, audio, control signals and power to the camera. An extremely high-quality, all-digital bi-directional video and audio signal can be transmitted up to a distance of 3 km (1.86 miles)*. This cable and connector conforms to the SMPTE standard.

*When supplying power to the camera via the optical fiber cable, the maximum cable length varies with the camera system configuration, the size of the optical fiber cable and the number of cable connectors.

Safety Oriented Power Supply

As safety is a major design concept of every Sony design, the HDCU-900 continuously checks the camera cable for open or short circuits. An alarm is given if a fault is found and some appropriate precautionary actions taken, case by case. An additional safety feature is that a low voltage is initially supplied from the HDCU-900 optical fiber connector when the unit is switched on. Only when the system check has verified that an appropriate camera is connected is the normal operating voltage output.

Locking to External Reference Signals

The HDCU-900 can be locked to an external reference signal. Either a HD tri-level sync signal (according to SMPTE-240M), or an SD black burst signal can be used as the reference signal.

Memory Stick™

Sony **Memory Stick** technology provides a new function on both the HDC-900 and HDC-950.

Camera operators can store their personal preferences for a number of camera set-up parameters and V/F indicators in a personal Memory Stick. Whenever one of these memory devices is inserted into its slot on a HDC-900/950 camera, the operator's particular settings are instantly recalled. All the data stored in one or more Memory Sticks also can be registered and stored in a standard PC, so that each set of preferences can then be used to initialize individual or groups of cameras.



MSA-16A



HDC-900



HDC-950



System Components for Creative Control

The HDC-900/950 Camera and HDCU-900 CCU system is fully compatible with existing Sony command network systems and provides the same high level of creative control of camera functions.

The Master Set-up Units — MSU-700A and MSU-750

These MSUs provide a centralized technical control position in a multi-camera system. The MSU-700A is designed for use mounted with its control panel horizontal while the MSU-750 is designed for mounting vertically. They have been designed to allow comprehensive, wide ranging, technical supervision and alignment of a complex camera system from a single centralized panel. If it is desirable to extend this supervision to more than one control location (for example separate operational and engineering/maintenance control centers) then a number of MSU panels can form part of a large camera system. The MSU-700A and the MSU-750 are designed to work in conjunction with the Command Network Units CNU-700 and CNU-500. However, in a single-camera system, these MSUs can operate alone. They provide rapid, finger-tip access to all controls relating to the smooth functioning of an operational system, including:

- Technical alignment controls for the entire camera chain
- Picture and waveform monitor switching
- System configuration
- Control data filing
- Precise picture adjustment

Some of the important control functions that can be made from these MSUs are now described.



MSU-750



MSU-700A

Multi Matrix

This function enables a particular color in a scene to be selected and its hue and saturation changed.



Multi Matrix ON

Adaptive Highlight Control (Auto Knee mode)

The Sony ADSP system intelligently monitors the brightness of all areas of the picture and automatically adapts the knee point/slope for optimum reproduction at that particular scene location within the picture. A typical example is shooting an interior scene which includes a sunlit exterior seen through a window.



Auto Knee ON

Three-channel Skin Tone Detail Correction

Skin Tone Detail Correction controls the detail level of those objects in a scene with specific color tones. The HDC-900/950 allows detail to be set independently for each of three separate color ranges. These colors are not limited to skin tones, but can be set for any color. Detail may be increased or decreased relative to the normal level.



Skin Tone Detail ON

Knee Saturation Function

This function works similar to well-established Sony TruEye™ processor which is one of the most innovative features that Sony ADSP allows, then makes possible to reproduce very natural colors of high contrast scene content. When knee correction is individually applied to the RGB channels, it can lead to color distortion in highlight areas, for example skin tones can tend to look yellow. Knee Saturation processing automatically retains accurate color in these highlight areas to maintain the saturation in those picture areas compressed by the Knee function.



Knee Saturation ON

Low-key Saturation

The Knee Saturation function is also effective for low-key pictures, maintaining saturation to give color reproduction characteristics.

Selectable Gamma and Initial Gain

Several Pre-set Gamma curves and Initial Gain settings are provided to emulate standardized video gamma transfer characteristics.

These gamma tables are always accessible and interchangeable via camera set-up menu.



Standard Video Gamma



Variable Black Gamma Range ON

Variable Black Gamma Range

The Variable Black Gamma Range function helps to control shadow areas with precision. It can help to bring out details from the dark areas of the picture without affecting mid-tones and keeping the absolute black level unchanged. 12-bit A/D and the low noise CCD have extended the prowess of this important subjective picture control.

Black Stretch

Limits the Black Gamma function to picture luminance.

Level Dependent Detail

This function provides natural detail enhancement on extreme highlights by automatically limiting the amplitude of edge signals when they occur in high contrast signals.



Level Dependent Detail Control Function ON

Camera Command Network Units — CNU-500 and CNU-700

The CNU-700 and CNU-500 Camera Command Network Units form the technical “nerve center” of a star-shaped camera control network, providing communication between all the units in the system. A RISC-based microprocessor system provides high-speed transfer of command signals to the HDCU-900 CCU for rapid response.

The CNU-500 is for use in systems with up to six cameras and the CNU-700 is for use in larger systems. One CNU-700 can also control six cameras, but can be expanded to control up to 12 cameras when fitted with an optional expansion board. Several CNU-700 units can be connected to the camera control network in a large system.



CNU-700



CNU-500

Remote Control Panels — RCP-700 Series

The RCP-700 Series of Remote Control Panels consists of four types, providing a range of control from basic to full control of the operational adjustments of an HDC-900/950 camera. Each type of panel is available with either joystick or dial-type control.



RCP-720



RCP-721

Viewfinder Options

Multi-format LCD HD Color Viewfinders — HDVF-C700W and HDVF-C750W

The viewfinders developed for the HDC-900 and HDC-950 cameras are of a new, innovative design that is based on a 6-type TFT color LCD panel providing a resolution of 960 pixels horizontally x 540 pixels vertically. These viewfinders feature very low power consumption and, as they are very compact, their panning and tilting angles are greater than those of CRT-based viewfinders.

The HDVF-C700W is for use with the HDC-900 camera and the HDVF-C750W for use with the HDC-950 portable camera.

*The liquid crystal display fitted to this unit is manufactured with high precision technology, giving a functioning pixel ratio of at least 99.99 %. Thus a very small proportion of pixels (at most 0.01 %) may be "stuck", constantly on or constantly off. In addition, over a long period of use, because of the physical characteristics of the liquid crystal display, such "stuck" pixels may appear spontaneously. These problems have been kept to absolute minimum, but are an unavoidable characteristic of liquid crystal technology.



HDVF-C700W



HDVF-C750W

CRT-based Viewfinders — HDVF-700A and HDVF-20A

The monochrome CRT-based viewfinders HDVF-700A (7-type) and HDVF-20A (2-type) can also be used with the HDC-900/950.



HDVF-700A



HDVF-20A

Other options



CA-905L and BKP-9057,
Large Lens Adapter and 7-type
Viewfinder Saddle for HDC-950



BKP-7911,
Script Holder



BKP-7912,
Script Holder



CAC-6,
Return Video Selector



CAC-12,
Mic Holder



RM-B150,
Hand-held Remote Control Unit



RCP-700,
Remote Control Panel
(Joystick control)



RCP-701,
Remote Control Panel
(Dial control)



VCT-14,
Tripod Adapter



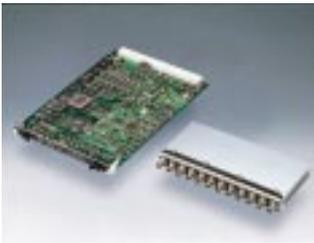
Viewfinder Eye-piece for HDVF-20A
A-8314-798-A
(High performance, with soft cushion)



Viewfinder Eye-piece for HDVF-20A
A-8262-537-A (High magnification)
A-8262-538-A (Low magnification)
A-8267-737-A (Standard magnification with special
compensation for aberrations)



BKW-401,
Viewfinder Rotation Bracket
for HDVF-20A



HKCU-901,
SD Encoder Unit for HDCU-900



HKCU-902,
HD Analog Interface Unit
for HDCU-900



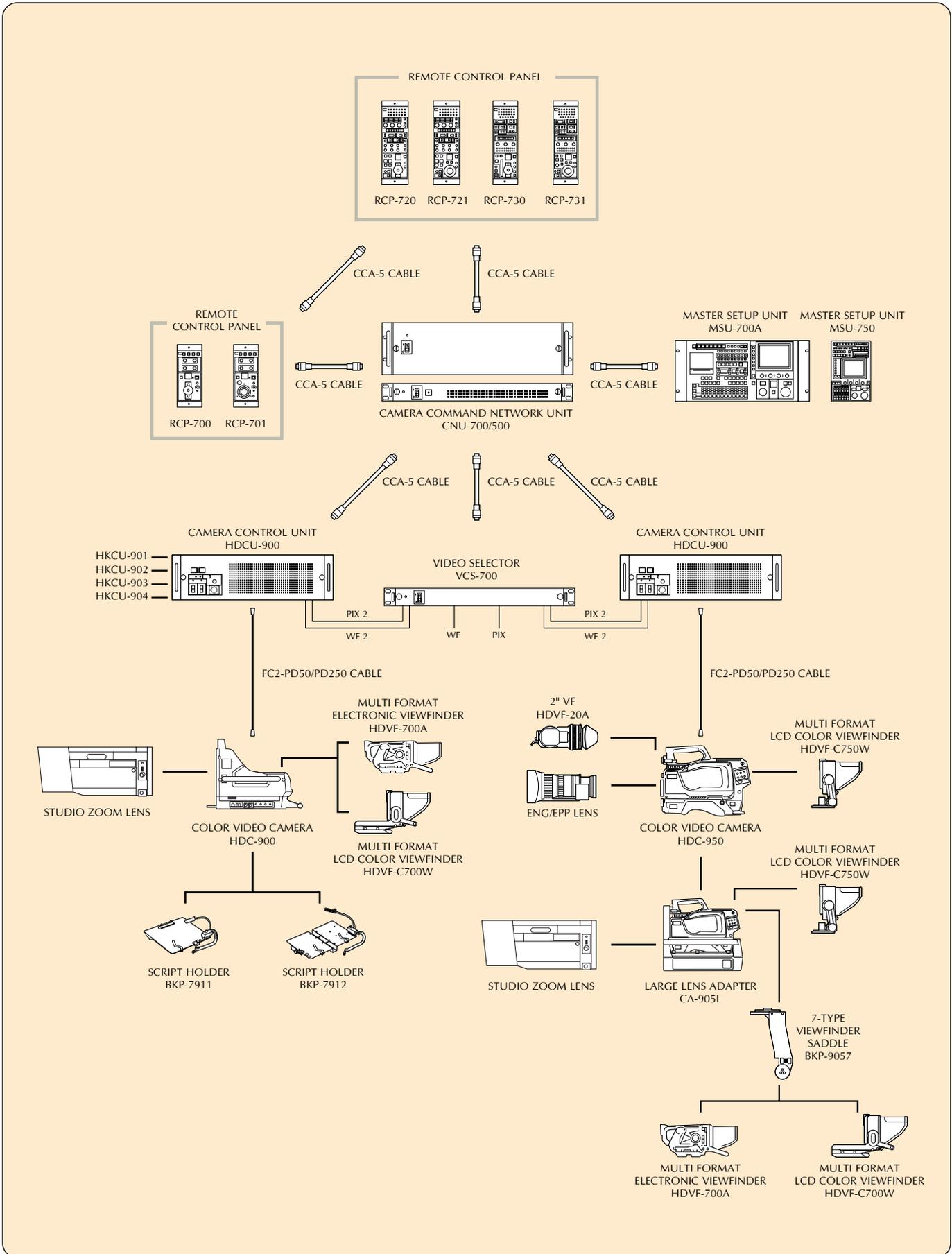
HKCU-903,
Frame Rate Converter Unit
for HDCU-900



HKCU-904,
Line Converter Unit
for HDCU-900

FC2-PD50/250,
Optical Fiber Cable (50m/250m)

System Configuration



HDC-900 and HDC-950 Specifications

	HDC-900	HDC-950
Pickup device	3-CCD 2/3-type 16:9 FIT	
Picture elements	2.2 million pixels	
Spectrum system	F1.4 prism system	
Color correction filter-A	Cross	
Color correction filter-B	3200 K	
Color correction filter-C	4300 K	
Color correction filter-D	6300 K	
Color correction filter-E	8000 K	
Neutral density filter-1	Clear	
Neutral density filter-2	1/4 ND	
Neutral density filter-3	1/8 ND	
Neutral density filter-4	1/16 ND	
Neutral density filter-5	1/64 ND	
Servo filter control	Yes	Yes
Sensitivity	f 10 at 2000 lux (3200 K, 89.9% reflectance)	
Minimum illumination	10 lux (F 1.4, +12 dB gain up)	
Signal to noise ratio	54 dB (typical)	
Horizontal resolution	1000 TV lines	
Dynamic range (1080/60i mode)	600%	
Registration	Within 0.02% (all zones, without lens)	
Shutter speed selection (1080/60i mode)	1/100, 1/125, 1/250, 1/500, 1/1000, 1/2000 (sec)	
Gain selection	-3, 0, +3, +6, +12 dB	
Clear Scan selection (1080/60i mode)	60.1 to 4300 Hz	
Extended Clear Scan (1080/60i mode)	30.3 to 58.3 Hz	
Modulation depth	45% or more horizontally (800 TV lines at center, 27.5 MHz, with typical lens)	
Smear level	-135 dB (typical)	
Frequency response	Within ± 0.5 dB, 10 to 25 MHz Within ± 1.0 dB, 25 to 30 MHz	
Lens mount	Sony hanger mount	Sony bayonet mount
Mass (approx.)	20 kg (44 lb. 9 oz, without VF and lens)	5.1 kg (11 lb. 11 oz, without VF and lens)
Dimensions (W x H x D, approx.)	368 x 381 x 442 mm	133 x 276 x 360 mm
Operating temperature	-20 °C to +45 °C (-4 °F to +113 °F)	
Storage temperature	-20 °C to +50 °C (-4 °F to +122 °F)	
Input connectors	Audio in: XLR-3-31 type (Female x2), selectable phantom +48 V, line DC in: XLR 4-pin type (Male x1) Return control: 6-pin Digital audio in: BNC type	Front Mic in: XLR-3-31 type (Female x1) Audio in: XLR-3-31 type (Female x2), phantom +48 V, 600 Ω, balanced Reference in: BNC type, 1.0 Vp-p, 75 Ω Return control: 6-pin DC in: XLR 4-pin type (Male x1) Digital audio in: BNC type
Output connectors	Test out: BNC type, 1.0 Vp-p, 75 Ω Prompter out: BNC type, 1.0 Vp-p, 75 Ω HD SDI out: BNC type Viewfinder connector: D-sub 25-pin DC out: 4-pin, 5 W/ 12 V DC AC utility out: Max.200 VA	Test out: BNC type, 1.0 Vp-p 75 Ω HD SDI out: BNC type DC out: 4-pin, 10.5 to 17 V, Max. 200 mA Earphone: Minijack, 8 Ω
Input/output connectors	CCU: Optical fiber connector Lens: 36-pin Tracker: 20-pin Remote: 8-pin (for RCP-700 Series) Memory Stick slot (x1) Intercom: XLR 5-pin, (Female x2) VTR out: CCZ type, 26-pin	CCU: Optical fiber connector Lens: 12-pin Viewfinder connector: 20-pin Remote: 8-pin (for RCP-700 Series) External command: 8-pin, RS-232C Tracker: 20-pin External I/O: 20-pin (for CA-905L) Memory Stick slot (x1) VTR out: CCZ-type, 26-pin Intercom XLR 5-pin, (Female x2) Genlock/Prompter out: BNC type, 1.0 Vp-p, 75 Ω
Supplied accessories	Operation manual (1) Front cover (1) Number plate: For up tally (1) For side panel (2) For rear panel (1) Belt for cable clamp (2) Angle adjustment fitting (2)	Operation manual (1)

HDCU-900 Specifications

General	
Power supply	AC 100/110-120/220/240 V, 50 Hz/60 Hz
Current consumption	5 A (at 100 V AC, entire system active)
Operating temperature	+5 °C to +40 °C (+41 °F to +104 °F)
Storage temperature	-20 °C to +60 °C (-4 °F to +140 °F)
Dimensions (Approx. W x H x D)	424 x 133 x 460 mm (16 3/4 x 5 1/4 x 18 1/8 inches)
Mass (Approx.)	20 kg (44 lb. 1 oz)
HD input/outputs	
HD SDI output	BNC type (x3), SMPTE-292M, 1080/50i, 60i, 30P, 25P, 24P
HD monitor output	BNC type (x1), SMPTE-292M, 1080/50i, 60i, 30P, 25P, 24P
HD SDI return input	BNC type (x4), SMPTE-292M, 1080/50i, 60i, 30P, 25P, 24P
SD outputs	
SD SDI output	BNC type (x4), SMPTE-259M, Serial digital component, 480/576-lines
SD monitor output	BNC type, WF (x1), PIX (x1), Analog R/G/B, 480/576-lines
Sync	
Reference input	BNC type (x1, with loop-through), HD tri-level sync or SD Black Burst
Sync output	BNC type (x1), HD tri-level sync or SD Sync
Intercom/Tally/PGM	
Intercom PD & ENG	D-sub 25-pin (x1), 4W/RTS/CC selectable
PGM1/PGM2	0/-20 dBu selectable
R-Tally/G-Tally	24 V power in/make contact
Audio	
MIC1/MIC2 output	XLR-3-31 type (Female x2), 0/-20 dBu selectable
Digital audio output	BNC type (x1), AES/EBU format, 20-bit/48 kHz
Prompter	
Prompter in	BNC type (x1, with loop-through), Analog, NTSC/PAL/HD-Y
Others	
RCP/MSU/CNU interface	8-pin (x1), Sony Camera Command Network Protocol (for entire camera system control)
WF mode	4-pin, Stair step (for SD composite Waveform monitor)
WF control	D-sub 15-pin (x1), GPI (for SDI component WF control)
System expansion I/O	D-sub 15-pin (x2), GPI (for system control with external GPI interface)
Trunk line	D-sub 9-pin, RS-232C, (remote line for CHU equipment)
Camera	
Optical fiber cable interface	SMPTE-304M based optical fiber connector (x1), 1.5 Gb/s optical fiber digital transmission, SMPTE-292M, AC 240 V

Optional input/output board for HDCU-900

HKCU-901 SD Encoder Unit	
SD inputs/outputs	
VBS output	BNC type (x2), NTSC/PAL
VBS return input	BNC type (x4), NTSC/PAL
Analog component output	BNC type (x3 for 1 set), Y/R-Y/B-Y or R/G/B selectable
Monitor output	BNC type, WF (x1), PIX (x1), G/B/R/Encoder
Sync	
Sync output	BNC type (x1), Black Burst, NTSC/PAL
HKCU-902 HD Analog Interface Unit	
HD input/outputs	
Analog HD output	BNC type (x2 sets), SMPTE-240M, Y/Pb/Pr or G/B/R selectable
Analog HD return input	BNC type (x4), SMPTE-240M, HD-Y
Analog HD PIX output	BNC type (x1), SMPTE-240M, G/B/R/Y
Sync	
HD sync output	BNC type (x1), SMPTE-240M, HD Tri-level sync
HKCU-903 Frame Rate Converter Unit	
HD input/output	
HD SDI output	BNC type (x4 including 1 monitor output), SMPTE-292M, 1080/50i, 60i, 30p, 25p, 24p
HD SDI return input	BNC type (x4), SMPTE-292M, 1080/50i, 60i, 30P, 25P, 24P
Sync	
HD sync output	BNC type (x2), Frame rate converted sync
Frame reference input	BNC type (x1 with loop-through), full pull-down sequence lock
HKCU-904 Line Converter Unit	
HD input/output	
HD SDI return input	BNC type (x4), 720P
HD SDI output	BNC type (x4), 720P
Sync	
HD sync output	BNC type (x2), Line converted sync

HDVF-C700W and HDVF-C750W Viewfinders

Picture elements	960 (H) x 3 (RGB) x 540 (V) pixels
Screen diagonal	6-type/132 (H) x 75 (V) mm
Horizontal resolution	540 TV lines
Luminance	300 nit
Color temperature	6,500 K
Power requirements	10.5 to 17 V DC
Operating temperature	0 °C to +45 °C (-4 °F to + 104 °F)
Storage temperature	-20 °C to +60 °C (-4 °F to + 140 °F)
Indicators	R Tally, G Tally, BATT, !
Connector	HDVF-C700W: D-sub 25-pin HDVF-C750W: Circular 20-pin

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24P is used as a generic name in this literature, describing the Sony 24PsF method.
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