

SONY

HDC Series HDC-2000 Series, HDC-P1, HDC-4300
HD System Camera



Sony HD Cameras – Setting a New Benchmark of Performance and Creativity

Over the years, Sony has established a powerful lineup of solution for HD studio operations, with its HDC Series cameras along with a wide range of accessories to enhance your creative options.

Sony's flagship model, the HDC-2000 Series, has been accepted as a worldwide standard with its excellent picture quality realized by cutting-edge technologies.

For even higher levels of creativity, Sony offers the HDC-4300 super-motion camera with 4K capability and a Point-of-View (POV)-style HD camera, the HDC-P1. In addition to various camera head choices, these systems also boast various options such as a stunning 7-inch OLED viewfinder and a large lens adaptor that enables rapid attachment without fine adjustment. Also, the intelligent transmission interface unit HDFA-200 brings simple 3D multi-camera system operation. As all options are compatible with the HDC Series, you can build your own camera system to meet your precise needs.

With their innovative high performance, advanced operability, and field-proven high reliability, the HDC Series is a stunning acquisition tool for a broad range of HD production applications.



HDC-2000 Series Multi-format HD Camera System



HDC-2500

The HDC-2000 Series*¹ has been accepted as a worldwide standard with its excellent picture quality realized by cutting-edge technologies, including high-performance 2/3-inch CCD image sensors and a digital signal processor (DSP) with a 16-bit A/D converter.

In addition, the HDC-2000 Series incorporates a 3-Gbps high bit-rate fiber transmission system as standard which enables double-speed acquisition for exquisite picture-quality slow motion.

Together with these cameras, Sony offers two types of camera control unit for the HDC-2000 Series. Also, exchangeable outside panels are provided for flexible operation through fiber, triax, or wireless infrastructures.

*¹ Please refer to the table below to see the supported formats for each camera head.

Studio Camera



HDC-2000

Optical-fiber interface
1080/50i, 1080/59.94i
1080/23.98p, 1080/24p, 1080/25p, 1080/29.97p
1080/50p, 1080/59.94p, 720/50p, 720/59.94p
1080/100i*², 1080/119.88i*²,
720/100p*², 720/119.88p*²

Portable Cameras



HDC-2500

Optical-fiber interface
1080/50i, 1080/59.94i
1080/23.98p, 1080/24p, 1080/25p, 1080/29.97p
1080/50p, 1080/59.94p, 720/50p, 720/59.94p
1080/100i*², 1080/119.88i*²,
720/100p*², 720/119.88p*²



HDC-2400

Optical-fiber interface
1080/50i, 1080/59.94i
720/50p, 720/59.94p
1080/23.98p*³, 1080/24p*³, 1080/25p*³,
1080/29.97p*³, 1080/50p*⁴, 1080/59.94p*⁴,
1080/100i*⁵, 1080/119.88i*⁵,
720/100p*⁵, 720/119.88p*⁵



HDC-2570

Progressive digital triax interface
1080/50i, 1080/59.94i
720/50p, 720/59.94p
1080/50p*⁴, 1080/59.94p*⁴

*² Double-speed acquisition format for slow-motion *³ Optional HZC-PSF20 software is required. *⁴ Optional HZC-PRV20 software is required. *⁵ Optional HZC-DFR20 software is required.

HDC-2000 Series Cutting-edge Technologies

Highly Acclaimed Progressive CCD

Based on Sony's HAD sensor technology and the latest on-chip lens structure, this 2/3-inch type 2.2-megapixel*¹ full-HD progressive CCD offers high sensitivity of F11 (at 1080/50i) or F10 (at 1080/59.94i) at 2,000 lx, and a superior signal-to-noise ratio of -60 dB even without digital noise suppression.

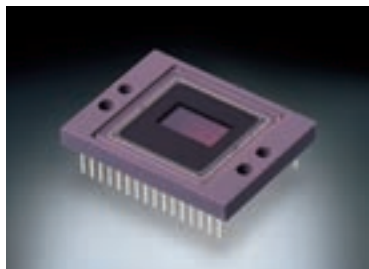
In addition, a wide variety of capturing formats are available, including 1080/50i, 1080/59.94i, 1080/23.98p, 1080/24p, 1080/25p, and 1080/29.97p.

What's more, this CCD can capture top-quality 1080/50p or 1080/59.94p images – a capability that also delivers the highest quality 720/50p or 720/59.94p image acquisition.

Double-speed acquisition for excellent slow-motion picture quality is available in 1080/100i*², 1080/119.88i*², 720/100p*², and 720/119.88p*² modes.

*¹ Actual picture area.

*² Optional HZC-DFR20 software is required for the HDC-2400 and HDC-2570.



Servo-controlled ND and CC Filters*³

HDC-2000, HDC-2500, and HDC-2570 cameras are equipped with dual optical filter wheels for ND (Neutral Density) and CC (Color Correction) which can be remotely controlled by any remote control panel (RCP) or master setup unit (MSU), as well as directly controlled by the camera head.

*³ The HDC-2400 is equipped with a single optical filter wheel for ND.

State-of-the-art DSP LSI with 16-bit A/D Conversion

The DSP LSI developed for the HDC-2000 Series supports 1080/50p and 1080/59.94p progressive formats, and 16-bit resolution, making full use of the high-clarity images captured by the CCD. Additionally, high-resolution A/D conversion allows faithful reproduction of gradation in mid-to-dark-tone areas of the picture. White balance, white shading, and flare are digitally corrected, allowing for stable image correction. Moreover, the new version of the Auto Lens Aberration Compensation 2 (ALAC2) function is incorporated to optimize lens performance, providing stunning picture quality by highly improved horizontal and vertical compensation.

3-Gbps Optical Fiber Transmission

HDC-2000, HDC-2400, and HDC-2500 cameras offer a 3-Gbps transmission capability as standard. This high-performance feature enables you to shoot in various capturing formats.

Each camera comes equipped with a SMPTE-standard optical fiber interface for connecting its associated HDCU-2000 or HDCU-2500 Camera Control Unit.

In addition to achieving exceptional quality, these cameras can transmit all-digital bi-directional video and audio signals, a control line, and a prompter line over extremely long distances – up to 4,000 meters (13,123 feet)*⁴ with the HDCU-2000, and 2,000 meters (6,562 feet)*⁴ with the HDCU-2500.

*⁴ When supplying power to the camera via optical fiber cable, maximum cable length depends on camera system configuration, lens type, the size of the optical fiber cable, and the number of cable connectors.

Network TRUNK*⁵

The Network TRUNK function (LAN port) allows for data transmission between the camera and the CCU at up to 1 Gbps, which supports new system configurations being used with various IP-based products.

*⁵ Optional HKC-FB20 and HKC-CN20 side panels are required for the HDC-2570.

Compact and Lightweight Camera Body

HDC-2400, HDC-2500, and HDC-2570 cameras incorporate carbon fiber reinforced plastic (CFRP) in their outside panel. With a strong and lightweight body, these cameras are highly mobile and can be operated even in the toughest shooting conditions.

The HDC Series provides stable handling, owing to its low center of gravity. You can easily adjust the shoulder pad into a well-balanced position without needing to use a screwdriver. Also, a wide viewable area beneath the handle provides you with a broad field of view, ideal for handheld camera operation. HDC-2000 studio cameras also offer great ergonomic design to increase ease of use.

Noise Suppression Function

The HDC-2000 Series has a Noise Suppression function which reduces the high-frequency noise elements in video signals by using Sony's advanced digital signal processing technology.

Two Types of Focus Assist Functions

The Viewfinder Detail function adds dedicated image-enhancing edge signals directly to the viewfinder, helping you to recognize a focusing point.

The Focus Assist Indicator displays an indicator for adjustment at the bottom (or another selected position) of the viewfinder frame. This is helpful especially when shooting with a wide-viewing angle.



HDC-2000

HDC-2000 Series Flexibility

Easy Transmission Change

The transmission system can be easily changed between fiber, triax, and wireless transmission by replacing parts assembled in the outside panels*1. In addition, since all replacement connectors are located in the outside panels, camera balance is maintained.

*1 The optional HKC-CN20 is required to attach an outside panel.

HKC-FB20 : Optical Fiber Transmission Adaptor

HKC-TR27 : Digital Triax Transmission Adaptor

HKC-WL20 : Wireless Module Adaptor

Upgrade Software to Expand Creativity

An upgrade path is provided from the basic model HDC-2400 to the full-featured flagship model HDC-2500. You can select the configuration with the following optional software including special versions that operate for a limited time period, according to your needs*2.

*2 To upgrade from the HDC-2400 to the HDC-2500, an optional HKC-DF20 Dual Optical Filter Unit is required.

HZC-PSF20 : Support Software for PsF format

HZC-PSF20M : Support Software for PsF format (30-day limited period)

HZC-PSF20W : Support Software for PsF format (7-day limited period)

HZC-PRV20 : 50p/59.94p Software

HZC-PRV20M : 50p/59.94p Software (30-day limited period)

HZC-PRV20W : 50p/59.94p Software (7-day limited period)

HZC-DFR20 : Double-speed Capturing Software for Slow Motion

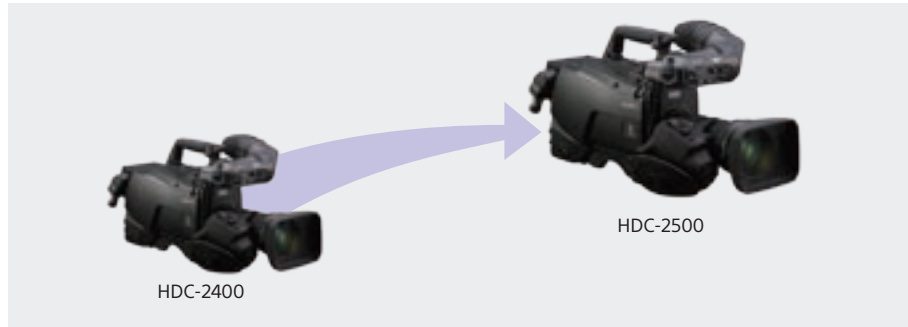
HZC-DFR20M : Double-speed Capturing Software for Slow Motion
(30-day limited period)

HZC-DFR20W : Double-speed Capturing Software for Slow Motion
(7-day limited period)

HZC-UG444 : User Gamma-compatible Software

HZC-UG444M : User Gamma-compatible Software (30-day limited period)

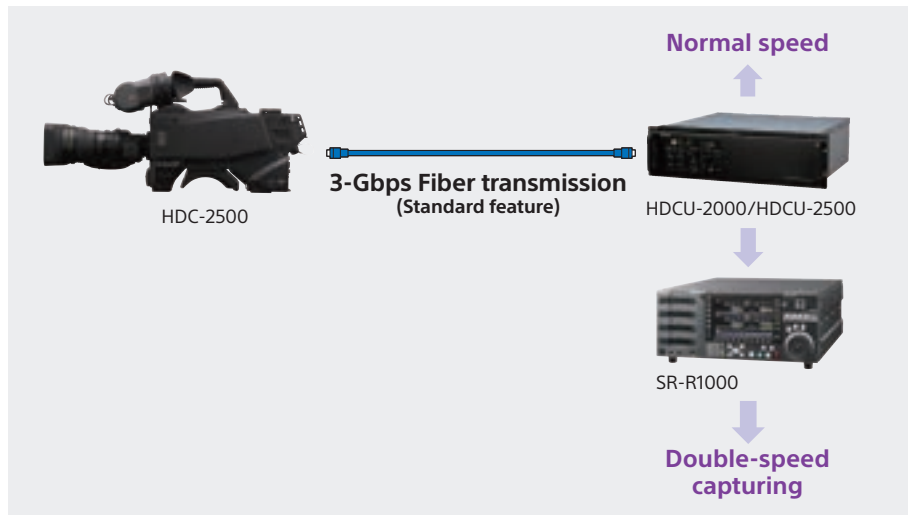
HZC-UG444W : User Gamma-compatible Software (7-day limited period)



Double-speed Acquisition for Slow Motion*3

With a 3-Gbps wideband transmission capability, the HDC-2000 Series offers a double-speed acquisition function in 1080/100i, 1080/119.88i, 720/100p, or 720/119.88p mode. This transmits a high-quality image to the HDCU-2000 or HDCU-2500 Camera Control Unit (CCU) using an optical hybrid cable. In addition, normal-speed image acquisition by 1080/50i, 1080/59.94i, 720/50p, or 720/59.94p can also be output in parallel, with double-speed acquisition from the CCU. This means there is no need to set up an additional camera just for double-speed shooting.

*3 Optional HZC-DFR20 software is required for the HDC-2400 and HDC-2570.



HDC-2000 Series Versatile System Components

HDTX-200 HD Digital Triax Adaptor (Camera-side) HDFX-200 HD Digital Triax Adaptor (HDCU-side)

HDTX-200 and HDFX-200 HD Digital Triax Adaptors are available to convert optical fiber transmission to widely used triax transmission. The HDTX-200 adaptor is used with the HDC-2000, HDC-2400, or HDC-2500 camera*¹ to convert its camera output to triax, while the HDFX-200 adaptor is used with the HDCU-2000 or HDCU-2500 camera control unit to receive triax signals from the camera.

These triax-based systems enable high-quality images to be transmitted from the camera over a long distance – up to 1,400 meters (4,593 feet)*² with a \varnothing 14.5 mm triax cable or 1,000 meters (3,281 feet)*² with a \varnothing 13.2 mm triax cable.

*¹ The HDC-2570 does not require the HDTX-200 unit because it is equipped with a triax output as standard.

*² When supplying power to the camera via an optical fiber cable and/or a triax cable, maximum cable length varies with the camera system configuration, lens type, viewfinder type, and the size of the optical fiber cable.

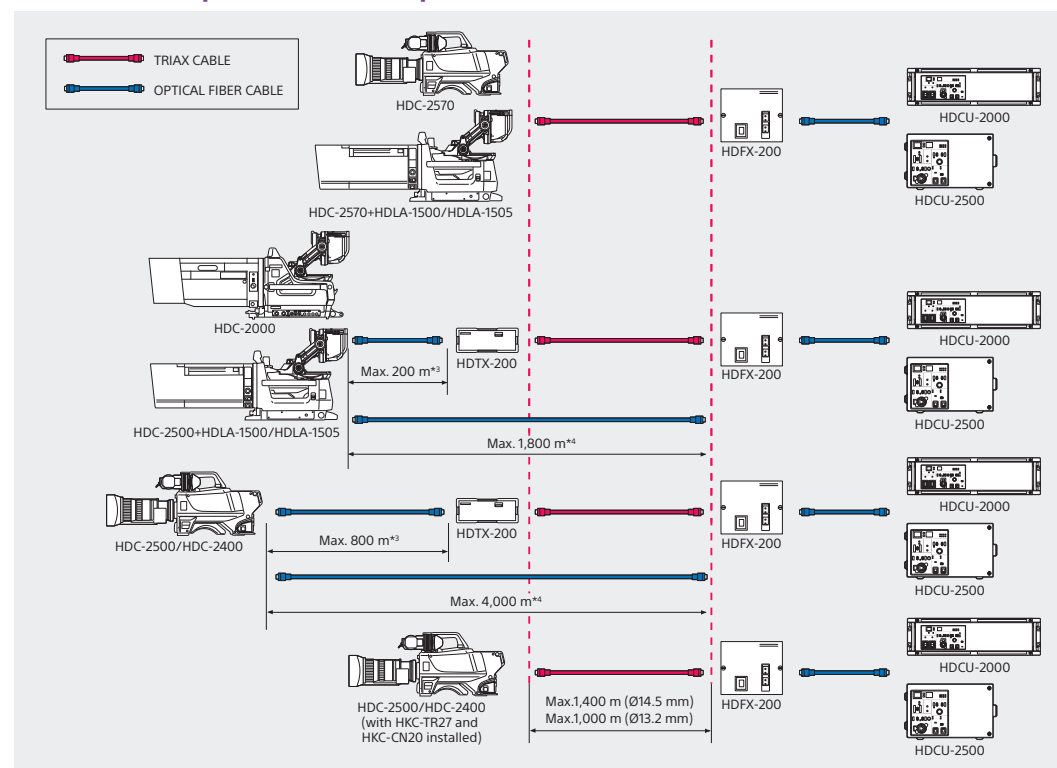


HDTX-200



HDFX-200

Triax and Optical Fiber Operation



*³ The maximum cable length varies with the camera system configuration, lens type, and viewfinder type.

*⁴ The maximum cable length varies with the camera system configuration, lens type, and viewfinder type. Maximum length is achieved when the HDCU-2000 is connected.

HDC-2000 Series Versatile System Components

HDCE-200 Camera Extension Adaptor for Third-party Products

This camera extension adaptor realizes long-distance transmission. The HDCE-200 is designed for connecting a camera to a camera control unit (CCU) and converting the link format between them from BNC to optical fiber. This unit also integrates with third-party products through its coax mode connection. It supports long-distance HD production with a single mode fiber cable, installing HKC-SM27 into the HDCE-200 for camera-side and HAFX-200 for the CCU side and connecting the system elements together.

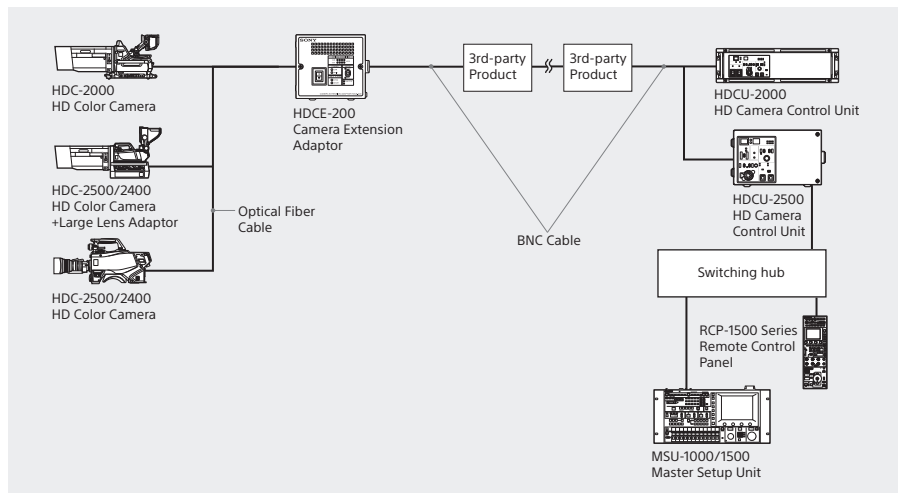


HDCE-200



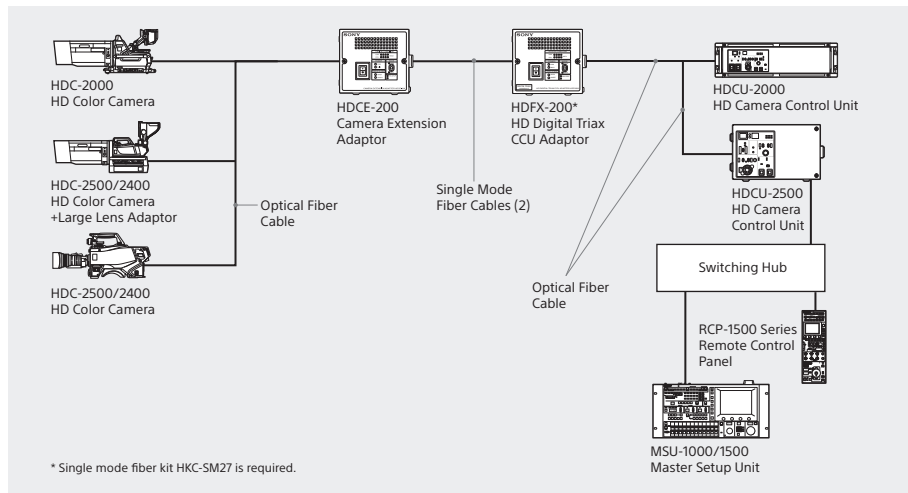
HKC-SM27

(1) Coax mode with third-party products

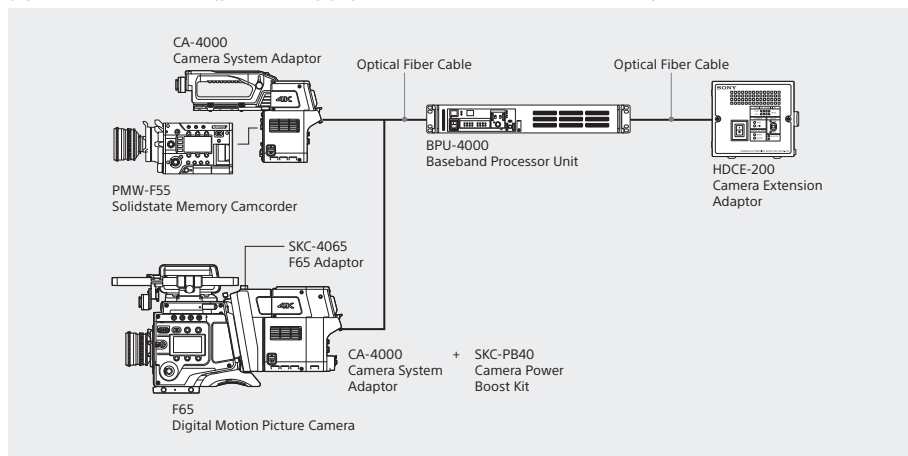


In addition, the HDCE-200 can be used by connecting the BPU-4000 Baseband Processor Unit and, in this configuration, it supplies power to the CA-4000 Camera System Adaptor in Extension mode.

(2) Single mode fiber transmission for the HDC Series



(3) Extension mode (power supply to the camera from the BPU)



HDC-2000 Series Creative Versatility

Multi-matrix Function

The Multi-matrix function of the HDC Series allows color adjustments to be applied over a user-specified color range. The color spectrum is divided into 16 areas of adjustment, where the hue and/or saturation of each area can be modified.



Multi-matrix OFF



Multi-matrix ON

Simulated images

Natural Skin-tone Detail Function

The Natural Skin-tone Detail function lets you control the tone of human skin by making certain areas smooth while keeping specific areas sharp. This function is particularly effective in maintaining eyebrows when human skin tone is touched up.



Natural Skin-tone Detail OFF



Natural Skin-tone Detail ON

Simulated images

Adaptive-matrix Function

This enables ideal color conversion for shooting even under excessively strong ambient lighting conditions such as live shooting under bright monochromatic blue light. These conditions would typically cause a conventional matrix function to exceed the color conversion range.

Knee Saturation Function

Traditionally, shooting very bright portions of an object (such as key light conditions from a person's forehead) can reduce color saturation and change the hue in highlight areas. HDC-2000 Series cameras adopt a Knee Saturation function, in which the "washed-out" effect caused by saturation and hue change is reduced to a minimum. This function provides far more natural color reproduction in highlighted areas.



Knee Saturation OFF



Knee Saturation ON

Simulated images

Digital Extender Function

Digital Extender function expands the size of the image by a factor of two in the center of the image sensor's captured image. This function works without decrease in sensitivity, such as an F-number drop, which typically occurs when using conventional optical extender functions.

HDC-2000 Series Creative Versatility

Low-key Saturation Function

With conventional cameras, low light areas can be subject to a reduction in saturation. This results in under-saturated colors in those areas. The Low-key Saturation function on the HDC-2000 Series eliminates this problem by optimizing the amplification of color saturation in low light areas, providing more natural color reproduction.



Low-key Saturation OFF



Low-key Saturation ON

Selectable Gamma Table

The selectable gamma table provided with this camera series allows you to create a specific look for a picture by selecting from a choice of fixed gamma patterns.

Variable Black Gamma Function

This feature helps bring out details from the dark areas of an image without affecting mid-tones.



Standard Video Gamma



Variable Black Gamma ON

Simulated images

HyperGamma

HyperGamma is a set of transfer functions designed to provide powerful contrast. These functions are simply accessed via the setup menu, and you can select one of the four types of curves according to your needs and conditions. For example, you can select to enhance natural reproduction in low-key areas, to achieve greater flexibility in wide dynamic scenes.

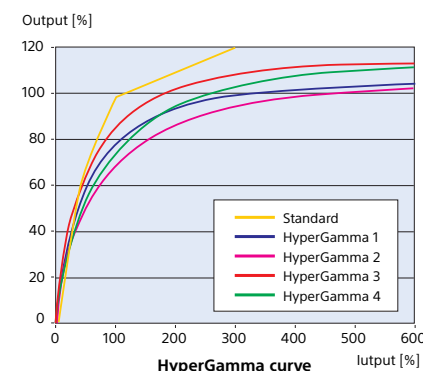


Low Light Condition



High Contrast Scene

Simulated images



User Gamma*1

User Gamma is another useful gamma feature, which allows for the creation of customized gamma curves. You can edit gamma curves using the CVP File Editor*2 gamma creation software running on a Microsoft Windows PC, and then quickly load them onto HDC-2000 Series cameras via a USB memory stick or an MSU/RCP using Memory Stick™ Duo. The software has an easy-to-use GUI that allows the gamma curve to be visually edited simply by plotting the x and y values of each point of the curve.

*1 Optional HZC-UG444 software is required for the HDC-2400 and HDC-2570. An optional HKC-FB20 side panel is also required for the HDC-2570.

*2 Available via Sony's download site.

HDC-2000 Series Versatile System Components

HDC-2000 Series cameras are compatible with a variety of new and legacy peripherals including camera control units, remote controllers, command network units, and master setup units. This gives you flexibility to configure a system according to your needs both in the studio and out in the field. Optional HDTX-200 and HAFX-200 Digital Triax Adaptors are available for HDC-2000, HDC-2400, and HDC-2500 optical fiber-based cameras to enable triax-based operation.

HDCU-2000 Full-rack-size Camera Control Unit HDCU-2500 Half-rack-size Camera Control Unit

You can configure the HDC-2000 Series with two types of camera control unit – the full-rack-size HDCU-2000, and half-rack-size HDCU-2500. The optical fiber transmission system used in these units maintains the camera's high picture quality across cable runs of up to 4,000 meters (13,123 feet)*¹ with the HDCU-2000, and up to 2,000 meters (6,562 feet)*¹ with the HDCU-2500. Both models are equipped with a range of built-in interfaces such as 3G-SDI/HD-SDI/SD-SDI outputs, 3G-SDI/HD-SDI/SD-SDI/analog composite return inputs, and a down-converted analog composite monitor output. In addition, a variety of output interfaces are offered via optional boards, which can be installed in six slots on the HDCU-2000 and two slots on the HDCU-2500. Furthermore, the LAN interface (10BASE-T/100BASE-TX) that is built into both CCUs allows you to control the camera over a network.

Both the HDCU-2000 and HDCU-2500 CCU are equipped with menu buttons and indicators that show the status of optical transmission on the front panel, providing greater operability.

*¹ When supplying power to the camera via an optical fiber cable, maximum cable length varies with camera system configuration, lens type, viewfinder type, the size of the optical fiber cable, and the number of cable connectors.

HDCU-2000

- Eight SDI outputs, including four 3G-SDI outputs
- Up to twelve additional 3G-SDI/HD-SDI outputs (with three optional HKCU-2007 boards)
- Four sets of 3G-SDI/HD-SDI/SD-SDI and analog composite return video inputs
- Two-channel teleprompter inputs
- Built-in LAN interface (10BASE-T/100BASE-TX)
- Two-channel data trunk lines (RS-422A or RS-232C) for easy data transmission
- AES/EBU digital audio output
- Two-channel microphone outputs (two XLR connectors)
- High power supply allowing HDC-2000 Series cameras or HDC-2400/HDC-2500 with HDLA-1500/ HDLA-1505/HDLA-1507 operation



HDCU-2000



HDCU-2000 Rear Panel

HDC-2000 Series Versatile System Components

HDCU-2500

- High power supply allowing HDC-2000 Series cameras to operate with the HDLA-1500/HDLA-1505/HDLA-1507
- Seven SDI outputs, including three 3G-SDI outputs
- Up to four additional 3G-SDI/HD-SDI outputs (with optional HKCU-2007 boards)
- Three 3G-SDI/HD-SDI/SD-SDI or analog composite return video inputs
- One-channel teleprompter input
- Built-in LAN interface (10BASE-T/100BASE-TX)
- Two-channel data trunk line (RS-422A/RS-232C) for easy data transmission
- Two-channel microphone outputs (two XLR connectors)



HDCU-2500



HDCU-2500 Rear Panel

HKC-T1500 CCD Block Extension Adaptor

The HKC-T1500 CCD Block Extension Adaptor is a unique accessory for HDC-2400, HDC-2500, and HDC-2570 portable cameras. It allows the CCD block to be extended from the camera body by up to 12.5 m (up to 50 m with an optional cable). More creative camera shooting angles can be achieved, along with the freedom to place the imaging assembly in areas where a full-size camera would be restricted. The HKC-T1500 adaptor expands the spectrum of HD camera applications to areas such as snorkel lenses, helicopter gimbal mounts, and mini jibs.



The HKC-T1500 connected to the HDC-2500.

Interface Expansion Options

Three types of interface expansion option are available for both CCUs: the HKCU-1001, HKCU-1003, and HKCU-2007.

- The HKCU-2007 3G-SDI/HD-SDI Output Expansion Unit provides four 3G-SDI or HD-SDI outputs
- The HKCU-1003 Multi Interface Unit consists of three types of interface board and provides:
 - Two analog NTSC or PAL VBS signal outputs, a PIX output, and a WFM output (Board A)
 - A frame reference input, output to lock 2-3 pull-down sequence, a PIX output, and a WFM output (Board B)
 - Analog NTSC or PAL VBS and analog component R/G/B or Y/R-Y/B-Y outputs (Board C)
- The HKCU-1001 SD Analog Interface Unit provides two analog NTSC or PAL VBS signal outputs, a PIX (picture monitor) output, and a WFM (waveform monitor) output



HKCU-2007 3G-SDI/HD-SDI Output Expansion Unit

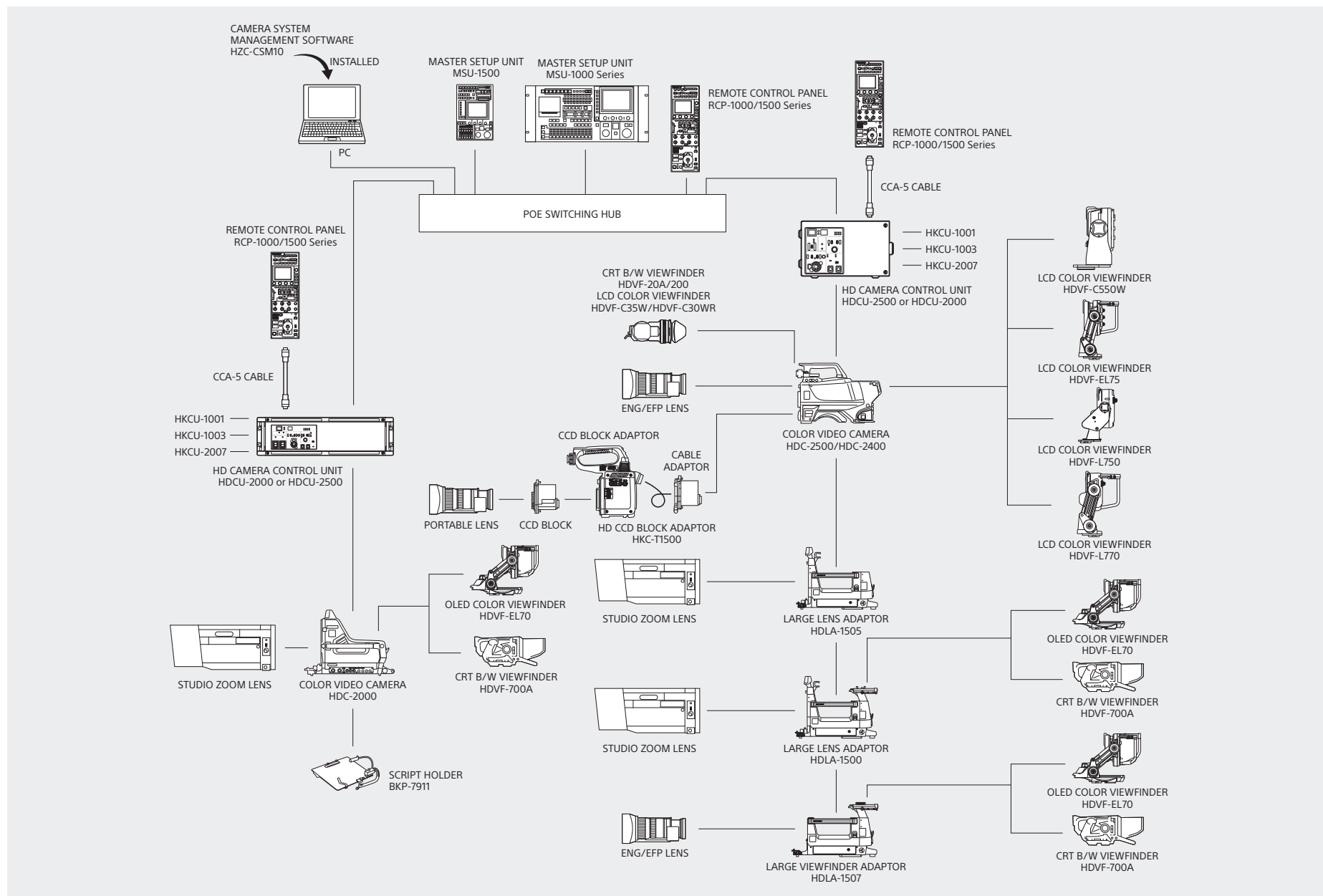


HKCU-1003 Multi Interface Unit

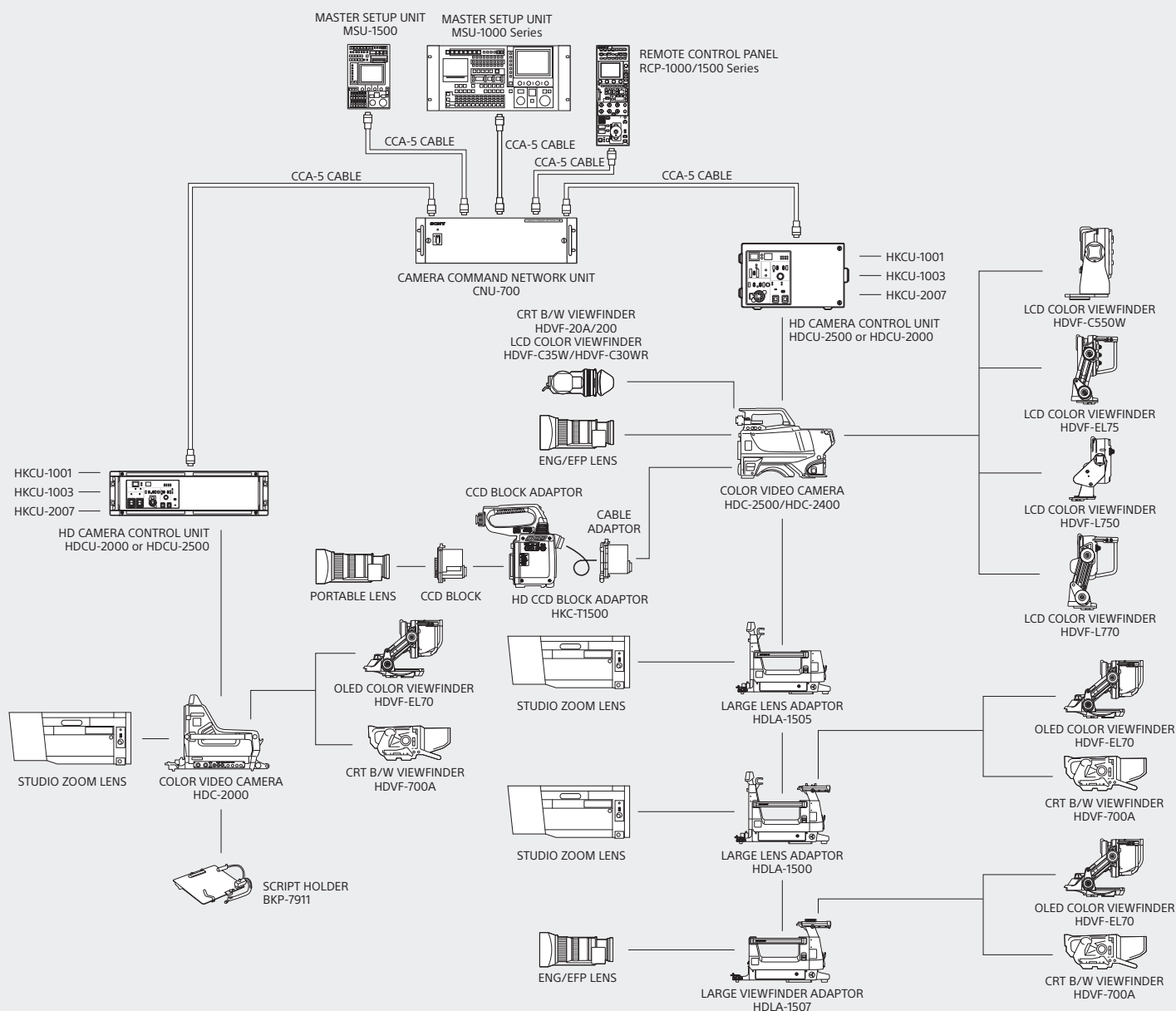


HKCU-1001 SD Analog Interface Unit

HDC-2000 Series System Configuration with LAN Connection



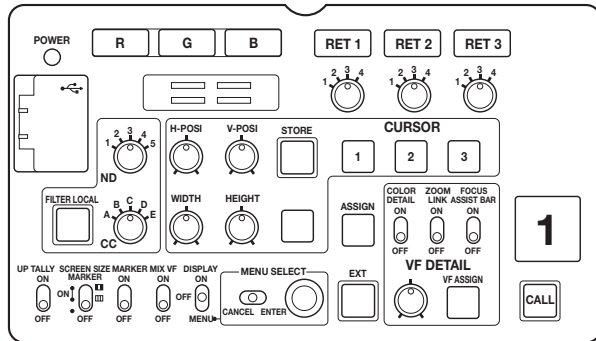
HDC-2000 Series System Configuration with Camera Network Unit Connection



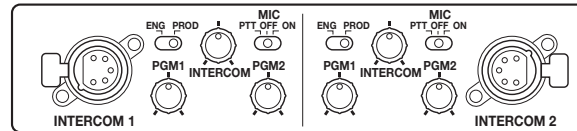
HDC-2000 Series Control/Intercom Panels and Connectors

HDC-2000

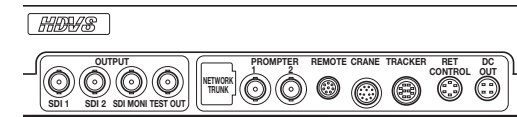
Control Panel



Intercom Panel (for 60 Hz countries)

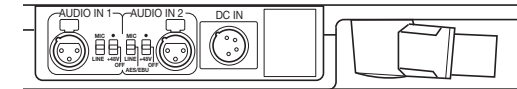
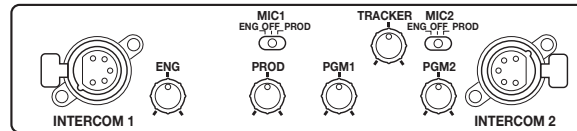


Connectors



Inside Panel

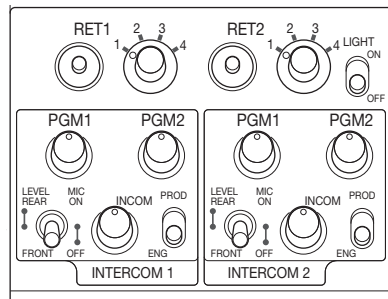
Intercom Panel (for 50 Hz countries)



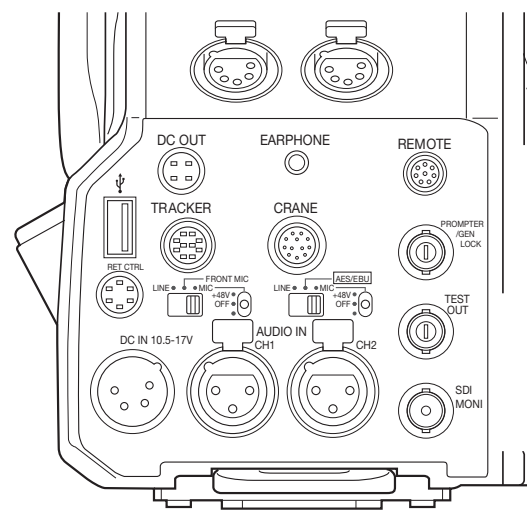
Outside Panel

HDC-2400/HDC-2500/HDC-2570

Control/Intercom Panel (for 60 Hz countries)



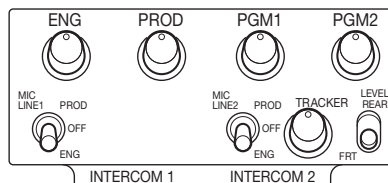
Connectors



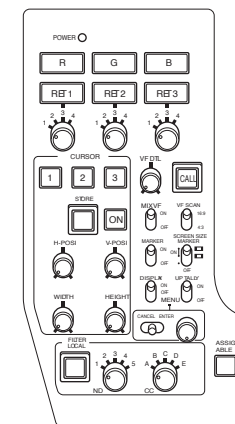
DC OUT Connector



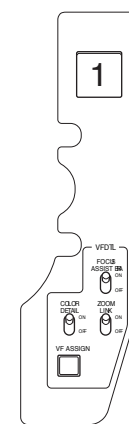
Control/Intercom Panel (for 50 Hz countries)



Control Panel (Left)



Control Panel (Right)



HDC-4300 Super Motion Camera with 4K Capability



Simulated image

HDC-4300 Super Motion Camera with 4K Capability

Since the launch of the BVP-3000 high-speed capturing camera in 1984, Sony has been continuously developing cameras that provide high-quality slow-motion image shooting, primarily used for sports coverage. There is strong demand for a slow-motion camera system – one that offers even greater performance, as well as 4K/HD compatibility. The HDC-4300 has stunning picture quality with its three superb 2/3-inch 4K imagers, state-of-the-art features, and broad range of functions.



HDC-4300
Lens and viewfinder are optional.

Sony's cutting-edge technology enables the HDC-4300 to capture 1920 x 1080 high-definition images at an amazing frame rate, eight times*¹ above the normal frame rate (1080/479.52p, 1080/400p, 720/479.52p or 720/400p).

The HDC-4300 has another huge advantage – its 4K capability, achieved by installing optional SZC-4001 software. The HDC-4300 delivers superb 4K images thanks to its three 2/3-inch 4K imagers with Sony's latest designed optical system, supporting ITU-R BT.2020*² and providing a wide color gamut. The HDC-4300 is released as a high-performance model, and is the first in the HDC Series to offer both an HD and a 4K capability. With all these attractive features, the Sony HDC-4300 is the optimum solution to deliver true-to-life sports entertainment.

*¹ SZC-4002 software option increases standard 3x HD super slow motion to 4x, 6x and 8x HD super slow motion.

*² ITU-R BT.2020 is the specification of video format defined by ITU-R. The HDC-4300 does not cover it in full.



HDC-4300 Super Motion Camera with 4K Capability

Features

(1) High-frame-rate HD capture for 8x super slow motion (with optional software, SZC-4002 for BPU-4000)

The HDC-4300's real 4K imagers capture at four times the resolution of HD. In HD shooting, this can be used to achieve extreme high-speed image capture at a maximum of 479.52/400 fps with the optional software upgrade. Capture rates of 59.94/50, 119.88/100 and 179.82/150 fps are available as standard. The full digital process is applied to each frame even at high-frame rates in the BPU-4000, producing the same quality in the images as one at the normal speed. Both the high-speed image and the normal-speed image can be adjusted by individual paint parameters. Captured images can be recorded to the PWS-4400 4K/HD multi-port AV storage unit for super slow motion replay*1.

*1 Some third party manufacturer servers may also be used. For 8x slow motion replay, the PWS-4400 system requires software upgrade V1.4.

(2) Superb 4K capability (with optional software, SZC-4001 for HDC-4300)

The HDC-4300 has the function of capturing 4K images. For the HDC-4300, Sony has brought together its leading-edge technologies and deep experience to design and build the world's first three 2/3-inch 4K imagers with ultra-precision alignment technology used to mount the chips to a newly developed prism. This new optical system supports the wide color gamut of ITU-R BT.2020*2, enabling more precise color reproduction in live broadcasts.

*2 ITU-R BT.2020 is the specification of video format defined by ITU-R. The HDC-4300 does not cover it in full.

(3) Direct installation of B4-mount lenses for 4K/HD shooting

Thanks to the 2/3-inch camera mount, the HDC-4300 works directly with B4 lenses. The B4-mount supports both HD and 4K lenses, allowing you to use B4-mount high power large lenses to capture sports scenes with the same depth of field as the HDC Series cameras.



(4) 4K/HD multiple operation

The HDC-4300 has inherited flexible configuration capabilities from field-proven HDC Series cameras, and can add the most appropriate functions efficiently. Examples include its 4K capability and high-frame-rate capturing function for 8x slow motion, according to usage or workflow, with the installation of optional software. In combination with the existing HDC Series camera systems, which are widely accepted in broadcast stations and productions worldwide, you can achieve multi-source operation of 4K and HD without any major modifications. This provides assurance of a smooth and easy migration from HD to 4K live production.

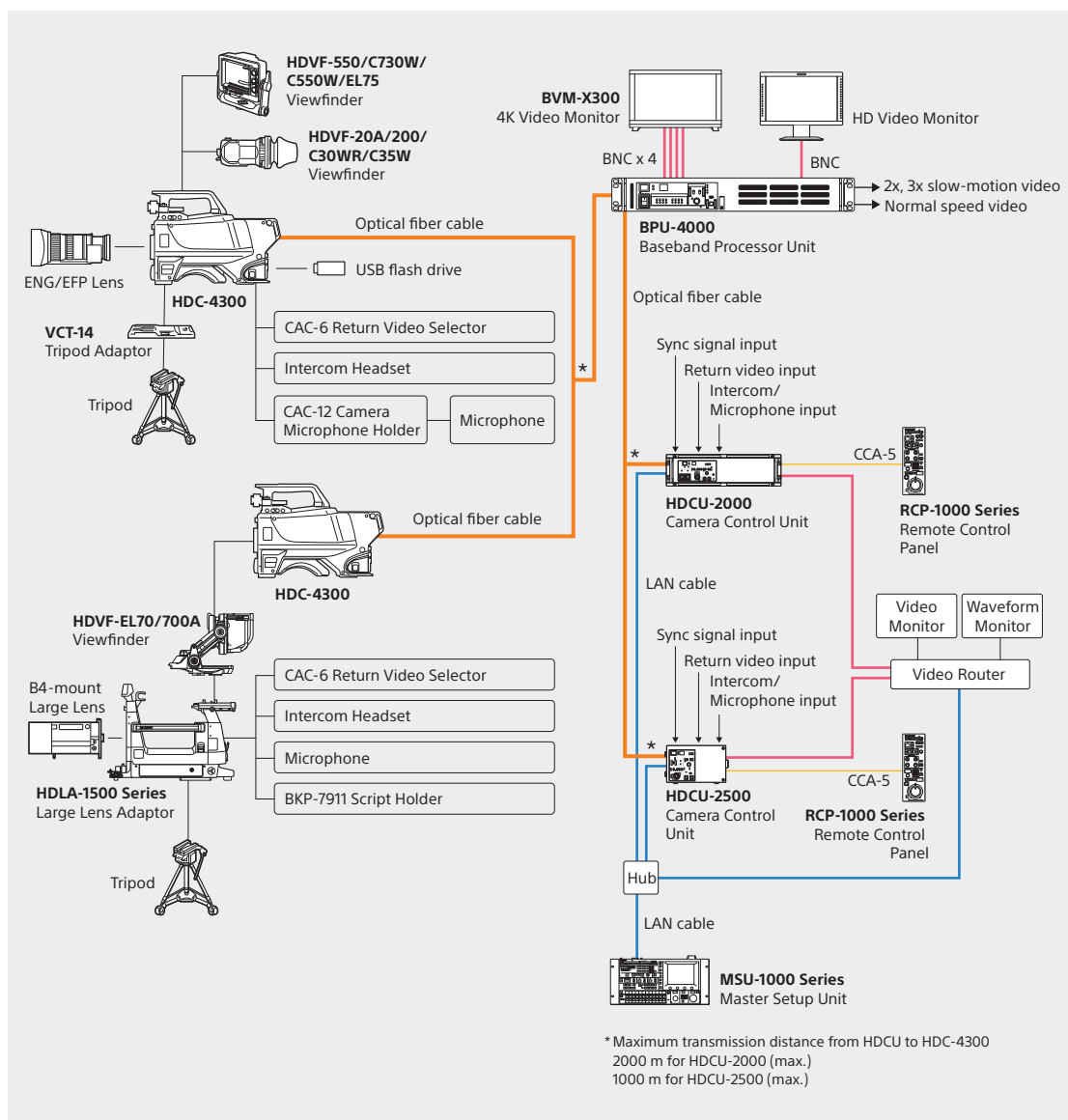
(5) Advanced 4K live camera system

The 4K live camera system based on the HDC-4300 is built in combination with the BPU-4000 baseband processor unit and the HDCU-2000 or HDCU-2500 camera control unit. This system has particular appeal for sports live broadcasting.



1 HDC-4300 2 BPU-4000 3 HDCU-2000

System Configuration Example



HDC-P1 HD Multi-purpose Camera

The HDC-P1 is a highly compact Point-of-View (POV)-style HD multi-purpose camera based on sophisticated core technologies established through a long-time development of Sony's flagship HDC Series system cameras.

Sony offers the HDC-P1 as a small box-type POV camera with shooting flexibility from almost anywhere, and also high-quality full-HD pictures as a standalone camera or a system camera that enables seamless integration with pictures from full-size cameras.

The HDC-P1 also enhances the creative flexibility of live production. You can use it as a robotic camera in a studio automation system or compact 3D camera installed in a 3D camera system.



HDC-P1 HD Multi-purpose Camera

Features

Compact design with high picture quality

Packed in a highly slim and compact body of only about 86 mm (3 1/2 inches) wide and weighing around 1.7 kg (3 lb 12 oz, excluding a lens), the HDC-P1 is equipped with three superb 2/3-inch progressive CCDs and Sony-developed digital processing LSI to bring out high picture quality equivalent to that of reputable HDC Series cameras.

The HDC-P1 is ideal for use in space-limited areas such as camera crane jibs, helicopter camera mounts, and stereoscopic 3D camera rigs.

Dual optical servo filters

The HDC-P1 is equipped with Neutral Density (ND) and Color Correction (CC) optical servo filter units, which can be remotely controlled according to lighting condition changes from a remote control panel (RCP) or a master setup unit (MSU).

Master setup unit and remote control panel

You can use the MSU-1000/MSU-1500 Master Setup Unit (MSU) and RCP-1000 Series Remote Control Panel (RCP) developed for Sony's flagship HDC Series system cameras to adjust HDC-P1 camera parameters.

Multi-format operation

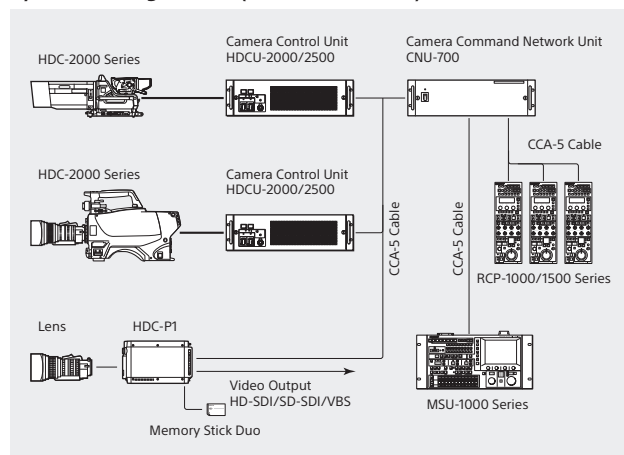
A wide range of capturing formats are supported, such as 1080/59.94i, 1080/50i, 1080/59.94p^{*1}, 1080/50p^{*1}, 720/59.94p, 720/50p, 1080/23.98PsF^{*2}, 24PsF^{*2}, 25PsF^{*2}, and 29.97PsF^{*2}.

^{*1} Optional HZC-PRVP1 software is required.

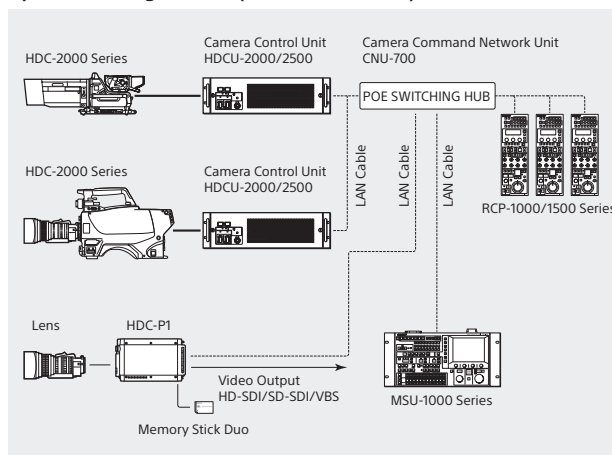
^{*2} Optional HZC-PSFP1 software is required.

System Example

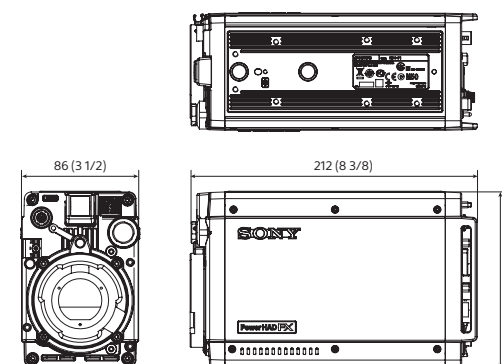
System Configuration (CNU Connection)



System Configuration (LAN connection)



Dimensions



Unit: mm (inches)

Versatile System Components

HDFA-200 HD Optical Fiber Adaptor Unit

The HDFA-200 is an optical fiber adaptor which employs sophisticated high bit-rate transmission technologies to realize stereoscopic 3D camera operation.

You can configure an unprecedentedly high-performance, highly compact 3D camera rig using the HDFA-200 combined with the POV-style HDC-P1 HD Multi-purpose Camera.

Alternatively, a simple system can be configured using the HDFA-200 with a single optical fiber cable.

The HDFA-200 can also transmit RGB 4:4:4 signals using an F35 Digital Cinematography Camera with a 35-mm-sized CCD sensor and PL lens mount.

With its sophisticated performance and functionality, the HDFA-200 is ideal for a broad range of applications such as 3D live production and TV program production with digital cinematography cameras.



Features

Optical fiber transmission

By employing high bit-rate digital optical fiber transmission technologies, signals can be transmitted from two cameras to a camera control unit (CCU) with a single optical fiber cable. Power*1 and genlock signals can also be supplied to the two cameras.

*1 Up to DC 13 A (14 V) power can be supplied. It depends on connected devices or the cable length.

Stereoscopic 3D multi-camera operation

The HDFA-200 provides a data transmission capability that includes two-channel audio input, intercom, and trunk data (a general-purpose control signal via a CCU and the HDFA-200). The adaptor unit lets you carry out 3D multi-camera system operation as simply as with a conventional camera system.

Beneficial single remote panel operation

Flexible 3D system camera operation is assured. You can control left-eye and right-eye cameras simultaneously or separately for individual adjustment.

Viewfinder output with multiple diagnostic/monitoring modes

The HDFA-200 has a viewfinder output, which offers several ways to display the output from the two connected cameras. You can choose from Split, Mix, and Difference modes, as well as a variety of other options designed to ease the process of rigging 3D camera pairs.

3D monitoring with a viewfinder

The viewfinder (VF) connector on the HDFA-200 can output just right-eye, left-eye, or both right- and left-eye signals. In both right- and left-eye signals mode, you can select split-, mix-, or Y difference-mode for adjustment of the 3D rig.

Features

Lens metadata linkage with MPE-200

The focal length of the lens, zoom position, and iris data are overlaid on an HD-SDI signal output from the CCU as metadata when using a lens supporting serial data transmission. This enables powerful operation for a 3D live production combined with the HDFA-200.

Remote operation of a 3D rig using a trunk data line

General-purpose control signals of up to 150 kbaud can be transmitted as trunk data. This enables RS232C or RS422 signals to be transmitted between a CCU and the HDFA-200, such as operation signals for a 3D rig.

H/V inverting function

The HDFA-200 is equipped with a function that compensates for picture inversion caused by a half-mirror rig such as replacement between right- and left-eye pictures, mirror reversed-picture of horizontal, vertical, or both horizontal and vertical direction. In addition, the amount of signal delay caused by picture inversion is automatically controlled.

Simple system integration with the HDC-P1

By adopting a universal synch cord adaptor, a CCA5 interface control cable is unnecessary for connecting the HDC-P1 HD multi-purpose camera. This makes the system easy to build.

Lightweight and compact

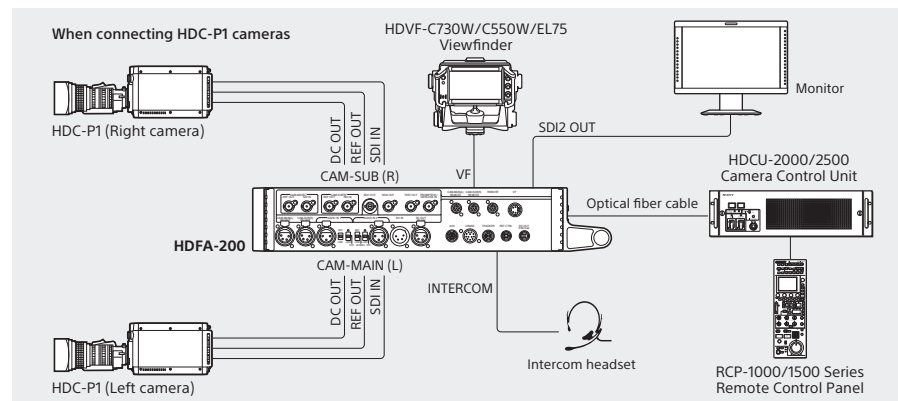
The HDFA-200 is designed to be very compact and lightweight for superior mobility in the field. It weighs approximately 3.8 kg (8 lb 6 oz). It's easily mounted to a 3D rig, a tripod adaptor, or a universal clamp due to its many general-purpose mounting screw holes.

Optical fiber transmission

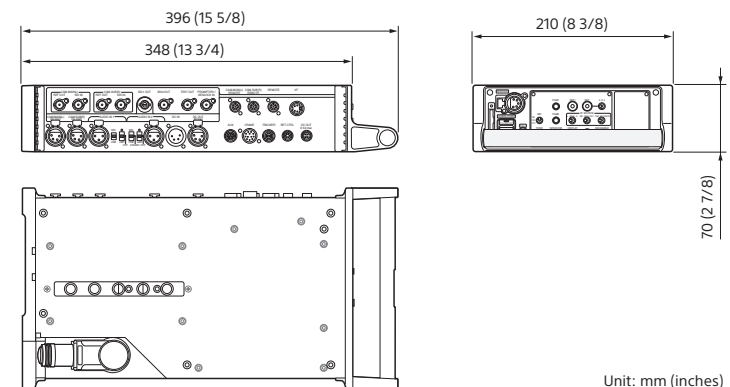
Offering a high bit-rate digital optical fiber transmission capability, the HDFA-200 can transmit two cameras' signals to a connected camera control unit, and supply power and genlock signals to the cameras as well with a single optical fiber.

System Example

Two cameras with a CCU



Dimensions



Versatile System Components

MSU-1000/MSU-1500 Master Setup Unit

The MSU-1000/MSU-1500 Master Setup Unit is a central control panel used for the adjustment of camera parameters in a multi-camera system. The MSU-1000/MSU-1500 unit is connected to each camera control unit in the system via the CNU-700 Command Network Unit or a switching hub.

- Central control of camera parameters for the entire camera system
- Picture and waveform monitor switching
- Precise picture adjustment
- Built-in 6.5-inch*1 LCD display for clear viewing of adjustment parameters during operation
- Memory stick slot for storing/recalling files
- Built-in LAN interface (10BASE-T/100BASE-TX)

*1 Viewable area measured diagonally.



MSU-1000

MSU-1500

RCP-1000/1500 Series Remote Control Panel

Five types of remote control panel are available: the RCP-1000, RCP-1001, RCP-1500, RCP-1501, and RCP-1530. A wide range of camera parameters can be controlled. The RCP-1500, RCP-1501, and RCP-1530 are equipped with various functions for fundamental camera operations, and offer a network interface capability, while the RCP-1000 and RCP-1001 are simple remote control panels that provide specific basic functions.



RCP-1000

RCP-1001

RCP-1500

RCP-1501

RCP-1530

CNU-700 Camera Command Network Unit

The CNU-700 allows communication between all the units in the system, and provides the ability to assign CCUs, MSUs, RCPs, and HDC-2000 Series camera heads. A RISC-based microprocessor system provides high-speed transfer of command signals to the HDCU-2000 and HDCU-2500 Camera Control Unit for rapid response and reliable control.

One CNU-700 unit can control six cameras, and can be expanded to control up to 12 cameras when fitted with an optional BKP-7930 Expansion Board. Several CNU-700 units can be connected to the camera control network in a large system. The CNU-700 supports RCP assignment and an S-BUS interface*1.

*1 An optional BKP-7933 S-BUS Interface Board is required.



CNU-700

HZC-CSM10 Camera System Management Software

The HZC-CSM10 is a Microsoft Windows-based Master Setup Unit (MSU) software application for controlling the camera system from a PC. It has similar features to a hardware-based MSU, offering camera control, optical level display, file management, remote control panel (RCP) assignment, and diagnosis. The HZC-CSM10 GUI controls any parameters of the system camera and enables visual setting lists. It acts as a software client to a master hardware MSU.

System requirements

Operating system: Windows 7 (with Service Pack 1 installed), Windows 8

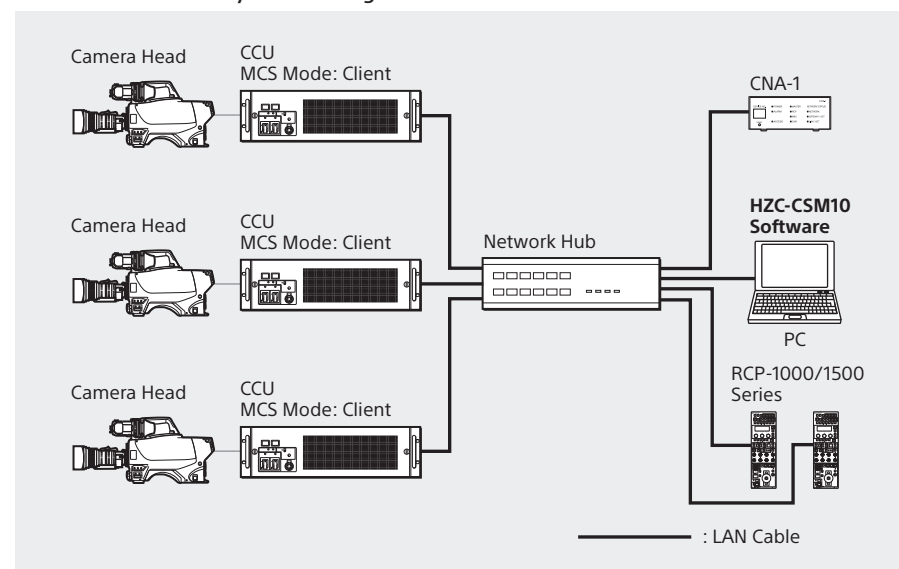
Professional: 32-/64-bit, Ultimate: 32-/64-bit
(The software cannot be installed on Windows Vista and Windows XP.)

CPU: 1 GHz or faster 32-bit (x86) or 64-bit (x64) processor

Memory: 2 GB or more

Hard disk: 50 MB or more of free space

HZC-CSM10 Camera System Management Software



Versatile System Components

CNA-1 Camera Control Network Adaptor

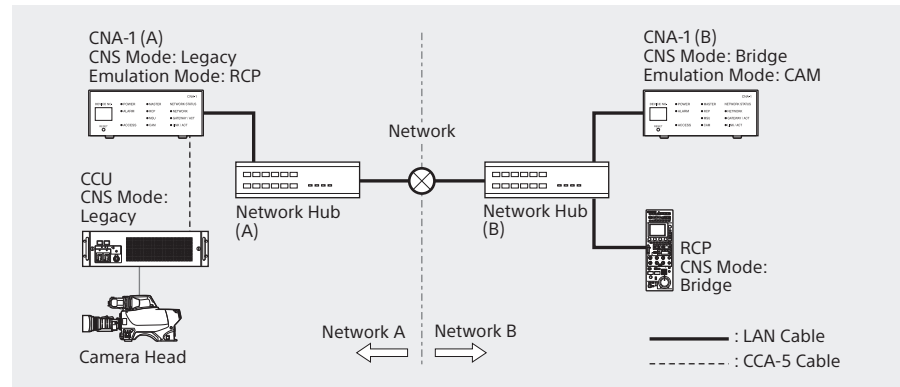
Using the CNA-1, third-party systems integrators and vendors can integrate a system much more easily. With its protocol-converting capability between Sony's protocol and the IP protocol, the CNA-1 enables Sony's system cameras to work with other manufacturers' products. An additional camera chain can be extended via the CNA-1. In addition, the CNA-1 can also be utilized as a "master" module with the HZC-CSM10 PC-based Master Control Unit (MSU) software without requiring a hardware MSU. You can make settings and control Sony's video cameras for studio or OB vehicle from a Windows PC. As well as operating each camera, other functions are enabled such as browsing the status of connected cameras, managing files, and more.



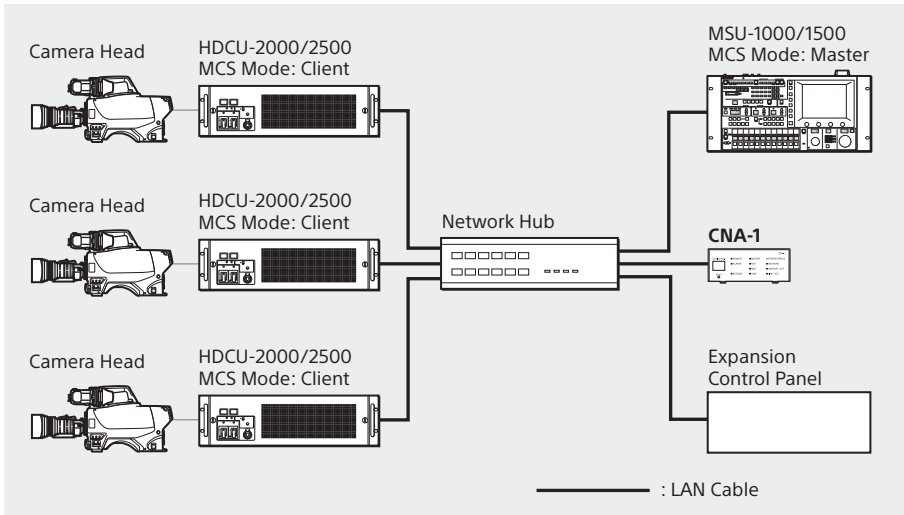
CNA-1

Even when some delays occur, due to the long-distance transmission infrastructure, communication is assured using two CNA-1 with its simple protocol.

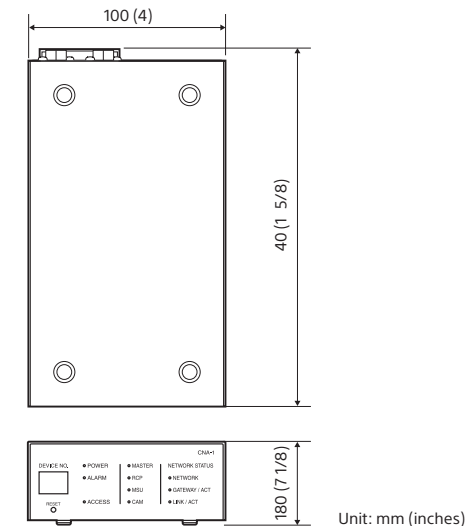
When controlling a camera with an RCP on a one-to-one basis.



System Example



Dimensions

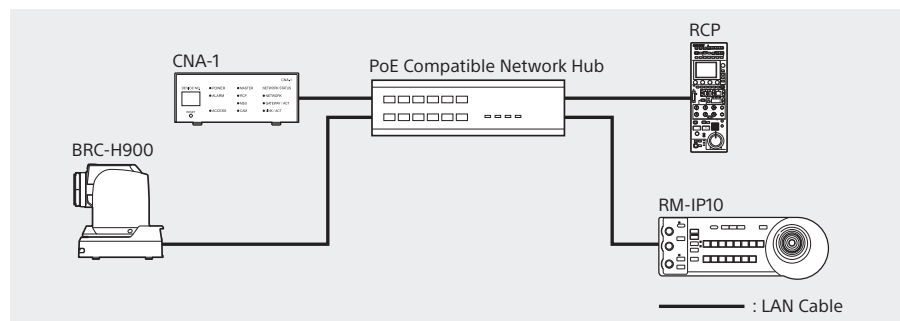


Unit: mm (inches)

You can select the following camera operating software to be installed to the CNA-1 according to your needs.

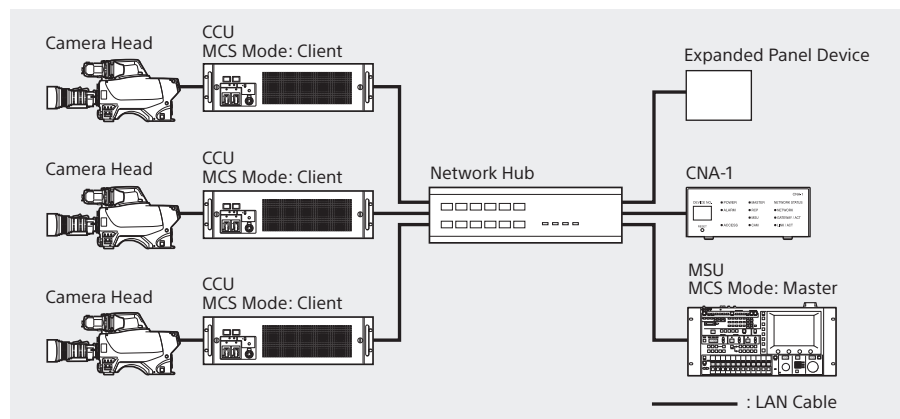
HZC-BRCN1

Controlling the BRC-H900 HD Color Video Camera remotely from the RCP or MSU by converting their protocols to the VISCA protocol for the BRC-H900 over IP.



HZC-MSCN1

Controlling multiple cameras from one CNA-1 by expanding the gateway function of the CNA-1.



HZC-RACN1

Changing the assignment of RCP from the control system. Each operator can set the assignment of the camera from the CNA-1 without changing command cable connections.

HDVF-EL70/75 OLED (Organic Light Emitting Diode) Viewfinder

The HDVF-EL70/75 is a sophisticated color viewfinder which uses a Sony-developed OLED (Organic Light Emitting Diode) display. This provides an unprecedented level of image performance such as high-resolution, high-contrast, and faithful color reproduction – especially for black. The OLED display also provides a wide color gamut, short response time, and wide viewing angle, which helps users to easily adjust the focus. Thanks to the OLED display's thin size, the HDVF-EL70/75 viewfinder is designed to be very compact, allowing for highly flexible viewing positions – from high to low and front to back.

Flexible Viewing Positions



Versatile System Components

HDLA-1500/HDLA-1505/HDLA-1507 – Maximizing Operability

To meet the demand for operations that combine a portable camera with a large lens, Sony has developed highly sophisticated HDLA-1500 and HDLA-1505 Large Lens Adaptors to maximize the operability of HDC-2400, HDC-2500, and HDC-2570 cameras.

Generally, setting up a portable camera to a large lens adaptor is a difficult task, especially fine-tuning the mechanical adjustments between each device. However, with the HDLA-1500 or HDLA-1505 Large Lens Adaptor, time-consuming adjustments and wiring are completely eliminated. Another convenient peripheral for the portable cameras, the HDLA-1507 Large Viewfinder Adaptor, is also available, enabling a large viewfinder to be used. And an upgraded control panel on the rear side of each adaptor provides improved operability.

Unique Interlocking Mechanism for Simple Operation

HDLA-1500, HDLA-1505, and HDLA-1507 adaptors do not require any cable wiring. Utilizing an unprecedented interlocking mechanism, this solution passes the power, video, and control signals on directly from the portable camera to the HDLA Series adaptor. This unique mechanism also allows the portable camera to be attached and detached without removing large lenses. Furthermore, a lens can be removed even when the camera is mounted on the HDLA-1500 or HDLA-1505 adaptor. The interlocking mechanism therefore allows for astonishingly quick and smooth setup.

Low-profile Design

The low-profile design significantly improves your view, while also minimizing the parallax between the optical axis of the camera head and viewfinder.



Docking 1

Open the rear cover of the HDLA Series adaptor. There is no need to detach the viewfinder.



Docking 2

Mount the portable camera and slide forward until you hear the locking click.



Docking 3

Close the rear cover.

Optional Accessories



MSU-1000
Master Setup Unit



MSU-1500
Master Setup Unit



HDLA-1500
Large Lens Adaptor
(for attachment of the
HDVF-EL70/700A)



HDLA-1505
Large Lens Adaptor
(for attachment of the HDVF-EL75/
C730W/550/C550W)



HDLA-1507
Large Viewfinder Adaptor
(for attachment of the
HDVF-EL70/700A)



RM-B170
Remote Control Unit



RCP-1000
Remote Control Panel



RCP-1001
Remote Control Panel



RCP-1500
Remote Control Panel



RCP-1501
Remote Control Panel



RCP-1530
Remote Control Panel



HDVF-20A
2.0-inch*1 CRT B/W Viewfinder



HDVF-200
2.0-inch*1 CRT B/W Viewfinder



HDVF-C35W
3.5-inch*1 LCD Color Viewfinder



HDVF-C30WR
2.7-inch*1 LCD Color Viewfinder



HDVF-EL70
7.4-inch*1 Color HD Viewfinder



HDVF-EL75
7.4-inch*1 Color HD Viewfinder



VFH-790
Outdoor Hood for
HDVF-EL70/EL75



HDVF-L750
7-inch*1 LCD Color Viewfinder



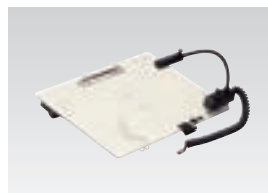
HDVF-L770
7-inch*1 LCD Color Viewfinder

*1 Viewable area measured diagonally

Optional Accessories



BKW-401
Viewfinder Rotation Bracket



BKP-7911
Script Holder



CAC-6
Return Video Selector



CAC-12
Mic Holder



VCT-14
Tripod Adaptor



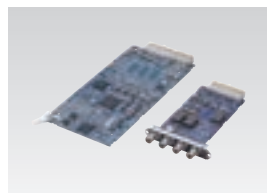
HKC-DF20
Dual-filter Unit for HDC-2400



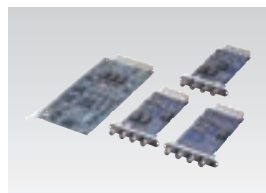
HKC-T1500
HD CCD Block Adaptor



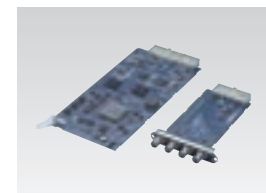
HKC-T3300
HD CCD Block Adaptor



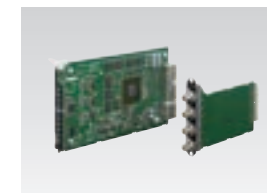
HKCU-1001
SD Analog Interface Unit
(for HDCU-2000/HDCU-2500)



HKCU-1003
Multi Interface Unit
(for HDCU-2000/HDCU-2500)



HKCU-1005
HD-SDI/SD-SDI Expansion Unit
(for HDCU-3300R)



HKCU-2007
3G-SDI/HD-SDI Expansion Unit
(for HDCU-2000/HDCU-2500)



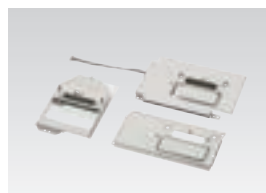
HKC-FB20
Optical Fiber Transmission
Adaptor



HKC-TR27
Digital Triax Transmission
Adaptor



HKC-WL20
Wireless Module Adaptor



HKC-CN20
Side Panel Attachment Kit



HDCU-2000
Full-rack-size
Camera Control Unit



HDCU-2500
Half-rack-size
Camera Control Unit



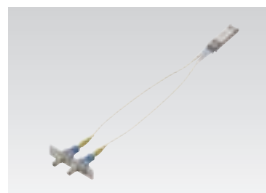
HDFX-200
Digital Triax CCU Adaptor



HDTX-200
Digital Triax Camera Adaptor



HDCE-200
Camera Extension Adaptor



HKC-SM27
Single Mode Fiber Kit



BPU-4000
Baseband Processor Unit

Combination List

| | Model name | Product name | HDC-2000 | HDC-2500 | HDC-2400 | HDC-2570 | HDC-4300 | HDC-P1 |
|----------------------------|--------------|---|----------|----------|----------|----------|----------|--------|
| Master Setup Unit | MSU-1000 | Master Setup Unit | YES | YES | YES | YES | YES | YES |
| | MSU-1500 | Master Setup Unit | YES | YES | YES | YES | YES | YES |
| Large Lens Adaptor | HDLA-1500 | Large Lens Adaptor | – | YES | YES | YES | YES | – |
| | HDLA-1505 | Large Lens Adaptor | – | YES | YES | YES | YES | – |
| | HDLA-1507 | Large Viewfinder Adaptor | – | YES | YES | YES | YES | – |
| Remote Control Panel | RM-B170 | Remote Control Unit | YES | YES | YES | YES | YES | YES |
| | RCP-1000 | Remote Control Panel | YES | YES | YES | YES | YES | YES |
| | RCP-1001 | Remote Control Panel | YES | YES | YES | YES | YES | YES |
| | RCP-1500 | Remote Control Panel | YES | YES | YES | YES | YES | YES |
| | RCP-1501 | Remote Control Panel | YES | YES | YES | YES | YES | YES |
| | RCP-1530 | Remote Control Panel | YES | YES | YES | YES | YES | YES |
| View finder & Outdoor Hood | HDVF-20A | 2.0-inch CRT B/W Viewfinder | – | YES | YES | YES | YES | – |
| | HDVF-200 | 2.0-inch CRT B/W Viewfinder | – | YES | YES | YES | YES | – |
| | HDVF-C35W | 3.5-inch LCD Color Viewfinder | – | YES | YES | YES | YES | – |
| | HDVF-C30WR | 2.7-inch LCD Color Viewfinder | – | YES | YES | YES | YES | – |
| | HDVF-EL70*1 | 7.4-inch Color HD Viewfinder | YES | – | – | – | – | – |
| | HDVF-EL75*1 | 7.4-inch Color HD Viewfinder | – | YES | YES | YES | YES | – |
| | HDVF-700A*2 | 7.0-inch CRT B/W Viewfinder | YES | – | – | – | – | – |
| | HDVF-C730W*2 | 6.3-inch LCD Color Viewfinder | – | YES | YES | YES | YES | – |
| | HDVF-550*3 | 5.0-inch CRT B/W | – | YES | YES | YES | YES | – |
| Accessory | HDVF-C550W*4 | 5-inch LCD Color Viewfinder | – | YES | YES | YES | YES | – |
| | HDCU-2000 | HD Camera Control Unit | YES | YES | YES | YES*5 | – | – |
| | HDCU-2500 | HD Camera Control Unit | YES | YES | YES | YES*5 | – | – |
| | HDFX-200 | Digital Triax CCU Adaptor | – | – | – | YES | – | – |
| | HDTX-200 | Digital Triax Camera Adaptor | YES | YES | YES | – | – | – |
| | HKC-T1500 | HD CCD Block Adaptor | – | YES | YES | YES | – | – |
| | HKC-T3300 | HD CCD Block Adaptor | – | – | – | – | – | – |
| | HKC-DF20 | ND/CC Dual Optical Filter Unit | Standard | Standard | YES | Standard | – | – |
| | HKC-FB20*6 | Optical Fiber Transmission Adaptor | – | Standard | Standard | YES | – | – |
| | HKC-TR27*6 | Digital Triax Transmission Adaptor | – | YES | YES | Standard | – | – |
| | HKC-WL20*6 | Wireless Module Adaptor | – | YES | YES | YES | – | – |
| | HKC-CN20 | Side Panel Attachment Kit | – | YES | YES | YES | – | – |
| | BKW-401 | Viewfinder Rotation Bracket | – | YES | YES | YES | YES | – |
| | BKP-7911 | Script Holder | YES | YES | YES | YES | YES | – |
| | CAC-6 | Return Video Selector | YES | YES | YES | YES | YES | – |
| | CAC-12 | Mic Holder | – | YES | YES | YES | YES | – |
| | VCT-14 | Tripod Adaptor | – | YES | YES | YES | YES | YES |
| Software | HZC-PSF20 | Support software for PsF format | Standard | Standard | YES | YES | – | – |
| | HZC-PRV20 | 50p/59.94p Software | Standard | Standard | YES | YES | – | – |
| | HZC-DFR20 | Double-speed capturing software for slow motion | Standard | Standard | YES | YES | – | – |
| | HZC-UG444 | User Gamma-compatible software | Standard | Standard | YES | YES | – | – |
| | HZC-PRVP1 | Support software for progressive format | – | – | – | – | – | YES |
| | HZC-PSFP1 | Support software for PsF format | – | – | – | – | – | YES |

| Model name | Product name | HDCU-2000 | HDCU-2500 |
|------------|------------------------------|-----------|-----------|
| HKCU-1001 | SD Analog Interface Unit | YES | YES |
| HKCU-1003 | Multi Interface Unit | YES | YES |
| HKCU-2007 | 3G-SDI/HD-SDI Expansion Unit | YES | YES |
| HKCU-1005 | HD-SDI/SD-SDI Expansion Unit | – | – |

*1 Outdoor Hood: VFH-790 (for HDVF-EL70/EL75), It can attach to HDLA-1500, 1507.

*2 Outdoor Hood: VFH-770 (for HDVF-730W/700A)

*3 Outdoor Hood: VFH-550 (for HDVF-550)

*4 Outdoor Hood: VFH-570 (for HDVF-C550W)

*5 An optional HDFX-200 is required.

*6 HKC-CN20 is necessary for connection.

Specifications

HDC-2000/HDC-2500/HDC-2400/HDC-2570 Specifications

| | | HDC-2000 | HDC-2500 | HDC-2400 | HDC-2570 |
|--|----|---|--|---|--|
| General | | | | | |
| Power requirements | | AC 240 V, 1.7 A (max.), DC 180 V, 0.9 A (max.), DC 12 V, 10 A (max.) | AC 240 V, 1.4 A (max.), DC 180 V, 1.0 A (max.), DC 12 V, 7 A (max.) | AC 240 V, 1.4 A (max.), DC 180 V, 1.0 A (max.), DC 12 V, 7 A (max.) | DC 180 V, 1.1 A (max.), DC 12 V, 8.5 A (max.) |
| Operating temperature | | -20 °C to +45 °C (-4 °F to +113 °F) | | | |
| Storage temperature | | -20 °C to +60 °C (-4 °F to +140 °F) | | | |
| Mass | | 21 kg (46 lb 4.8 oz) | 4.5 kg (9 lb 15 oz) | | 5.1 kg (11 lb 3.9 oz) |
| Camera | | | | | |
| Pickup device | | 3-chip 2/3-inch type CCD | | | |
| Effective picture elements (H x V) | | 1920 x 1080 | | | |
| Signal format | | 1080/50i, 59.94i, 23.98p, 24p, 25p, 29.97p 1080/50p, 59.94p, 720/50p, 59.94p 1080/100i, 119.88i, 720/100p,119.88p | 1080/50i, 59.94i 720/50p, 59.94p | | |
| Spectrum system | | F1.4 prism | | | |
| Lens mount | | Sony hanger mount | Sony bayonet mount | | |
| Built-in filters | CC | A: CROSS, B: 3200K, C: 4300K, D: 6300K, E: 8000K | | Electrical (CC optical filters are available with optional HKC-DF20) | A: CROSS, B: 3200K, C: 4300K, D: 6300K, E: 8000K |
| | ND | 1: CLEAR, 2: 1/4ND, 3: 1/8ND, 4: 1/16ND, 5: 1/64ND | | 1: CLEAR, 2: 1/4ND, 3: 1/16ND, 4: 1/64ND, 5: CROSS | 1: CLEAR, 2: 1/4ND, 3: 1/8ND, 4: 1/16ND, 5: 1/64ND |
| Sensitivity (at 2000 lx, 3200K, 89.9% reflectance) | | F11 (at 1080/50i), F10 (at 1080/59.94i) | | | |
| Signal-to-noise ratio (1080i, typical) | | -60 dB/-64 dB (with NS max.) | | | |
| Horizontal resolution (1080i) | | 1,000 TV lines (at center) | | | |
| Shutter speed selection | | 1/60, 1/125, 1/250, 1/500, 1/1000, 1/2000 sec (50i) 1/100, 1/125, 1/250, 1/500, 1/1000, 1/2000 sec (59.94i) 1/32, 1/48, 1/96, 1/100, 1/125, 1/250, 1/500, 1/1000, 1/2000 sec (23.98p/24p) 1/33, 1/50, 1/100, 1/125, 1/250, 1/500, 1/1000, 1/2000 sec (25p) 1/40, 1/60, 1/100, 1/120, 1/125, 1/250, 1/500, 1/1000, 1/2000 sec (29.97p) 1/60, 1/125, 1/250, 1/500, 1/1000, 1/2000 sec (50p) 1/100, 1/125, 1/250, 1/500, 1/1000, 1/2000 sec (59.94p) | 1/60, 1/125, 1/250, 1/500, 1/1000, 1/2000 sec (50i) 1/100, 1/125, 1/250, 1/500, 1/1000, 1/2000 sec (59.94i) 1/60, 1/125, 1/250, 1/500, 1/1000, 1/2000 sec (50p) 1/100, 1/125, 1/250, 1/500, 1/1000, 1/2000 sec (59.94p) | | |
| Modulation depth (1080i, typical) | | Y: 50% at 27.5 MHz (800 TV lines with typical lens), Pb/Pr: 80% at 12 MHz | | | |
| Input/output connectors | | | | | |
| Audio input (CH1) | | XLR-3-pin (female) (x1), mic or line selectable | | | |
| Audio input (CH2) | | XLR-3-pin (female) (x1), AES/EBU, mic, or line selectable | | | |
| Mic 1 input | | – | XLR-3-pin (female) (x1) | | |
| Return control input | | 6-pin (x1) | | | |
| Prompter output/Genlock input/Return input | | – | BNC (x1), 1.0 Vp-p, 75 Ω | | |
| Prompter 1 | | BNC (x1), 1.0 Vp-p, 75 Ω | | – | |
| Prompter 2 | | BNC (x1), 1.0 Vp-p, 75 Ω | | – | |
| DC input | | XLR-4-pin (x1), DC 10.5 V to 17 V | | | |
| DC output | | 4-pin (x1), DC 10.5 V to 17 V, 1.5 A (max.) | 4-pin (x1), DC 10.5 V to 17 V, 0.5 A (max.), 2-pin (x1), DC 10.5 V to 17 V, 2.5 A (max.) | | |
| Test output | | BNC (x1), 1.0 Vp-p, 75 Ω | | | |
| SDI 1 output (with embedded audio) | | BNC (x1), 3G-SDI, HD-SDI | | | |
| SDI 2 output | | BNC (x1), HD-SDI | | – | |
| SDI-MONI | | BNC (x1), HD-SDI or SD-SDI selectable | | | |
| Earphone output | | – | Stereo mini jack (x1) | | |
| CCU | | Electro-optical connector (x1) | | – | |
| HDFX | | – | Triax connector (x1) | | |
| Tracker | | 10-pin (x1) | | | |
| Crane | | 12-pin (x1) | | | |
| Intercom 1 | | XLR-5-pin (female) (x1) | | | |
| Intercom 2 | | XLR-5-pin (female) (x1) | | | |
| Remote | | 8-pin (x1) | | | |
| Network trunk | | RJ-45 (x1) | | | |
| Lens | | 36-pin (x1) | 12-pin (x1) | | |
| Viewfinder | | D-sub 25-pin (x1) | | 20-pin (x1) | |
| Supplied accessories | | | | | |
| | | Operation manual (1), Angle adjustment brackets (2), Front cover (1), Number plates for side panel (2 sets), Number plates for up-tally lamp (1 set), Cable clamp (2) | | Operation manual (1), Cable clamp belt (1 set), Camera number label (1), Screws (+B3x8) (2) | |

* 1080/59.94p and 1080/50p signals can be output only from the HDC-2000/HDC-2500 camera head in a stand-alone configuration.

HDCU-2000/HDCU-2500 Specifications

| | HDCU-2000 | HDCU-2500 |
|--------------------------------|---|---|
| General | | |
| Power supply | AC 100 V, AC 120 V, or AC 220 to 240 V, 50/60 Hz | AC 100 V to 240 V, 50/60 Hz |
| Operating temperature | 5 °C to 40 °C (41 °F to 104 °F) | -10 °C to +40 °C (+14 °F to +104 °F) |
| Storage temperature | -20 °C to +60 °C (-4 °F to +140 °F) | |
| Mass | 17.5 kg (38 lb 9.3 oz) | 6.7 kg (14 lb 12 oz) |
| Input/output connectors | | |
| Camera | Optical fiber connector (x1), AC 240 V power supply | Optical fiber connector (x1), AC 180 V power supply |
| Intercom/Tally/PGM | D-sub 25-pin (x1) Intercom (PROD/ENG): 4W/RTS/CC, 0 dB, Tally (R, G, Y), PGM: 2 systems, 0/-20 dB | |
| RCP/CNU | 8-pin (x1) | |
| Trunk A | 12-pin (x1) | |
| Trunk line | D-sub 9-pin (female) (x1), RS-232C | - |
| LAN | RJ-45 (x1), 10 BASE-T, 100 BASE-TX | |
| Network trunk | RJ-45 (x1) | |
| I/O port | D-sub 15-pin (female) (x1) | - |
| Input connectors | | |
| Return input | [SDI RET IN] BNC (x4) 3G-SDI: SMPTE 424M/425M Level-B, 2.970 Gbps/2.967 Gbps HD-SDI: SMPTE 292M, 1.485 Gbps/1.4835 Gbps SD-SDI: SMPTE 259M, 270 Mbps [VBS RET IN] BNC (x4) analog signal, 1.0 V p-p, 75 Ω | BNC (x3) VBS: 1.0 Vp-p, 75 Ω 3G-SDI: SMPTE 424M/425M Level-B, 2.970 Gbps/2.967 Gbps HD-SDI: SMPTE 292M, 1.485 Gbps/1.4835 Gbps SD-SDI: SMPTE 259M, 270 Mbps |
| Reference input | BNC (x2), loop-through output HD: SMPTE-274M, tri-level sync, 0.6 Vp-p, 75 Ω SD: Black burst (NTSC: 0.286 Vp-p, 75 Ω/PAL: 0.3 Vp-p, 75 Ω) or NTSC 10F-BB | |
| Prompter input | BNC (x4), loop-through output (2-ch), analog signal, 1.0 Vp-p, 75 Ω | BNC (x2), loop-through output (2-ch), analog signal, 1.0 Vp-p, 75 Ω |
| Mic remote | D-sub 15-pin (x1) | |
| HD prompter input | BNC (x1) SMPTE 292M, 75 Ω, 1.485 Gbps/1.4835 Gbps | |
| Output connectors | | |
| Audio output (CH1, CH2) | XLR-3-pin (male) (x2), 0 dBu/-20 dBu/+4 dBu | |
| AES/EBU | BNC (x1) | - |
| Character output | BNC (x1), VBS, 1.0 Vp-p, 75 Ω, character ON/OFF selectable | - |
| Character/Sync output | - | BNC (x1), HD sync/SD sync/Character selectable HD sync: BTA S001A, tri-level sync, 0.6 Vp-p, 75 Ω SD sync: composite sync, 0.3 Vp-p, 75 Ω Character: VBS, 1.0 Vp-p, 75 Ω, character ON/OFF selectable |
| Sync output | BNC (x1), HD sync/SD sync selectable HD: BTA S001A, tri-level sync, 0.6 Vp-p, 75 Ω SD: composite sync, 0.3 Vp-p, 75 Ω | - |
| WF remote | D-sub 15-pin (female) (x1) | - |
| 3G-SDI/HD-SDI output | BNC (x2) 3G-SDI: SMPTE 424M/425M Level-B, 0.8 Vp-p, 75 Ω, 2.970 Gbps/2.967 Gbps HD-SDI: SMPTE 292M, 0.8 Vp-p, 75 Ω, 1.485 Gbps/1.4835 Gbps BNC (x2) 3G-SDI: SMPTE 424M/425M Level-B, 0.8 Vp-p, 75 Ω, 2.970 Gbps/2.967 Gbps HD-SDI: SMPTE 292M, 0.8 Vp-p, 75 Ω, 1.485 Gbps/1.4835 Gbps 3G-SDI/HD-SDI and character ON/OFF selectable | BNC (x2) 3G-SDI: SMPTE 424M/425M Level-B, 0.8 Vp-p, 75 Ω, 2.970 Gbps/2.967 Gbps HD-SDI: SMPTE 292M, 0.8 Vp-p, 75 Ω, 1.485 Gbps/1.4835 Gbps BNC (x1) 3G-SDI: SMPTE 424M/425M Level-B, 0.8 Vp-p, 75 Ω, 2.970 Gbps/2.967 Gbps HD-SDI: SMPTE 292M, 0.8 Vp-p, 75 Ω, 1.485 Gbps/1.4835 Gbps 3G-SDI/HD-SDI and character ON/OFF selectable |
| HD-SDI/SD-SDI output | BNC (x2) HD-SDI: SMPTE 292M, 0.8 Vp-p, 75 Ω, 1.485 Gbps/1.4835 Gbps SD-SDI: SMPTE 259M, 0.8 Vp-p, 75 Ω, 270 Mbps BNC (x2) HD-SDI: SMPTE 292M, 0.8 Vp-p, 75 Ω, 1.485 Gbps/1.4835 Gbps SD-SDI: SMPTE 259M, 0.8 Vp-p, 75 Ω, 270 Mbps HD-SDI/SD-SDI and character ON/OFF selectable | BNC (x2) HD-SDI: SMPTE 292M, 0.8 Vp-p, 75 Ω, 1.485 Gbps/1.4835 Gbps SD-SDI: SMPTE 259M, 0.8 Vp-p, 75 Ω, 270 Mbps BNC (x2) HD-SDI: SMPTE 292M, 0.8 Vp-p, 75 Ω, 1.485 Gbps/1.4835 Gbps SD-SDI: SMPTE 259M, 0.8 Vp-p, 75 Ω, 270 Mbps HD-SDI/SD-SDI and character ON/OFF selectable |
| HD trunk output | BNC (x1) BTA: SMPTE 292M, 0.8 Vp-p, 75 Ω, 1.485 Gbps/1.4835 Gbps (Available only when camera single link format is selected.) | |

Optional Input/Output Boards

| | |
|--|--|
| HKCU-1001 SD Analog Interface Unit | |
| VBS output | BNC (x2) |
| Analog composite monitor output | BNC: WF (x1), PIX (x1) |
| HKCU-1003 Multi Interface Unit | |
| VDA-A board: VBS I/F | |
| VBS output | BNC (x2) |
| Analog composite monitor output | BNC: WF (x1), PIX (x1) |
| VDA-B board: Frame rate I/F | |
| Frame reference input/output | BNC (x1, loop-through), full pull-down sequence lock |
| Analog composite monitor output | BNC: WF (x1), PIX (x1) |
| VDA-C board: Sub I/F | |
| VBS output | BNC (x1) |
| Analog component output | BNC (x3), R/G/B or Y/R-Y/B-Y selectable |
| HKCU-2007 3G/HD SDI Output Expansion Unit | |
| 3G-SDI/HD-SDI output | BNC (x2) 3G-SDI: SMPTE 424M/425M Level-B standard, 0.8 Vp-p, 75 Ω, 2.970 Gbps/2.967 Gbps HD-SDI: SMPTE 292M, 0.8 Vp-p, 75 Ω, 1.485 Gbps/1.4835 Gbps 3G-SDI/HD-SDI selectable BNC (x2) 3G-SDI: SMPTE 424M/425M Level-B standard, 0.8 Vp-p, 75 Ω, 2.970 Gbps/2.967 Gbps HD-SDI: SMPTE 292M, 0.8 Vp-p, 75 Ω, 1.485 Gbps/1.4835 Gbps 3G-SDI/HD-SDI selectable Character ON/OFF selectable (connectors 3/4) |

HKC-T1500

| | |
|-------------------------------------|---|
| General | |
| Power requirements for camera input | DC 13.5 V to DC 17.0 V |
| Operating temperature | -20 °C to +45 °C (-4 °F to +113 °F) |
| Operating humidity | 10% to 90% (no condensation) |
| Mass | Cable adaptor: approx. 0.5 kg (1 lb 1.6 oz) CCD block adaptor: approx. 1.9 kg (4 lb 3 oz) (with CCD block) |
| CCD block adaptor I/F | |
| Camera cable | 55-pin multicore cable connector (male) (x1) |
| Mic input | XLR-3-pin (female) (x1) |
| Lens | 12-pin (x1) |
| Viewfinder | 20-pin (x1) |
| Intercom | XLR-5-pin (female) (x1) |
| Cable adaptor I/F | |
| Camera cable | 55-pin multicore cable connector (female) (x1) |
| Mic output | XLR-3-pin (male) (x1) |
| Viewfinder | 20-pin (x1) |
| Intercom | XLR-5-pin (male) (x1) |

Specifications

HDC-4300/BPU-4000 Specifications

| | HDC-4300 |
|--------------------------------|---|
| General | |
| Power requirements | AC 240 V, 1.4 A (max.), DC 180 V, 1.0 A (max.), DC 12 V, 7 A (max.) |
| Operating temperature | -20°C to +45°C (-4°F to +113°F) |
| Storage temperature | -20°C to +60°C (-4°F to +140°F) |
| Mass | Approx. 5.0 kg (11 lb 0.37 oz) (unit only) |
| Camera section | |
| Pickup device | 3-chip 2/3-inch type CMOS |
| Spectrum system | F1.4 prism |
| Built-in filters | ND: 1: CLEAR, 2: 1/4ND, 3: 1/8ND, 4: 1/16ND, 5: 1/64ND CC: A: CROSS, B: 3200K, C: 4300K, D: 6300K |
| Sensitivity | F8.0 (2000 lx, 89.9% reflection) |
| Signal-to-noise ratio | -62 dB (HD/59.94i) |
| Horizontal resolution | 2000 TV lines (at center) in 4K, 5% or higher modulation |
| Input/output connectors | |
| BPU | Optical/electrical multi-connector (1) |
| Audio input (CH1, CH2) | XLR-type 3-pin, female (1 each) For MIC: -60 dBu (can be set to a value up to -20 dBu using the menu or from the HDCU2000/2500), balanced For LINE: 0 dBu, balanced |
| Mic input | XLR-type 3-pin, female (x1) |
| Return control | 6-pin (x1) |
| Prompter/Genlock | BNC (x1), 1 Vp-p, 75 Ω |
| Prompter 2 | BNC (x1), 1 Vp-p, 75 Ω |
| DC input | XLR-type 4-pin (x1), DC 10.5 V to 17 V |
| DC output | 4-pin (x1), DC 10.5 V to 17 V, 0.5 A (max.) 2-pin (x1), DC 10.5 V to 17 V, 2.5 A (max.) (Limitations may apply, depending on the load and input conditions.) |
| Test out | BNC (x1) |
| SDI (1, 2) | BNC (1 each) |
| SDI Monitor | BNC (x1) |
| Earphone | Stereo mini jack (x1) |
| Tracker | 10-pin (x1) |
| Crane | 12-pin (x1) |
| Intercom (1, 2) | XLR-type 5-pin, female (1 each) |
| Remote | 8-pin (x1) |
| Network trunk | RJ-45 8-pin (x1) |
| Lens | 12-pin (x1) |
| Viewfinder | 20-pin (x1) |
| USB | USB 2.0, Type A, 4-pin (x1) |
| Supplied accessories | |
| | Operation manual (1), Cable clamp belt (1set), Number plates (1set), Screws (+B3x8) (2) |

| | BPU-4000 |
|--------------------------------|--|
| General | |
| Power requirements | AC 100 V to AC 240 V, 50/60 Hz |
| Operating temperature | 5°C to 40°C (41°F to 104°F) |
| Storage temperature | -20°C to +60°C (-4°F to +140°F) |
| Mass | Approx. 6.8 kg (15 lb) |
| Dimension (W x H x D) | 424 x 66 x 395 mm (16 3/4 x 2 5/8 x15 5/8 inches) excluding protrusions |
| Input/output connectors | |
| Camera | Optical fiber (x1) |
| CCU | Optical fiber (x1) |
| Remote | 8-pin multi-connector (x1) |
| LAN | 8-pin (x1) |
| SDI input | BNC (x2) 3G-SDI: SMPTE ST424/425 Level-B, 2.970 Gbps/2.967 Gbps HD-SDI: SMPTE ST292, 0.8 Vp-p, 75 Ω, 1.485 Gbps/1.4835 Gbps |
| Reference input | BNC (x1) HD: SMPTE ST274, tri-level sync, 0.6 Vp-p, 75 Ω SD: Black burst (NTSC: 0.286 Vp-p, 75 Ω, PAL: 0.3 Vp-p, 75 Ω) |
| 3G/HD-SDI output | BNC (x18) 3G-SDI: SMPTE ST424/425 Level-A/B, 0.8 Vp-p, 75 Ω, 2.970 Gbps/2.967 Gbps HD-SDI: SMPTE ST292, 0.8 Vp-p, 75 Ω, 1.485 Gbps/1.4835 Gbps, 3G-SDI/HD-SDI selectable |
| HD-SDI output | BNC (x2) SMPTE ST292, 0.8 Vp-p, 75 Ω, 1.485 Gbps/1.4835 Gbps |
| Reference output | BNC (x1) HD: SMPTE ST274, tri-level sync, 0.6 Vp-p, 75 Ω SD: Composite sync, 0.3 Vp-p, 75 Ω HD sync/SD sync selectable |
| Supplied accessories | |
| | Number plates (1 set), Operation Guide (1), Operation Manual (CD-ROM) (1) |

HDC-P1/HDFA-200 Specifications

| | HDC-P1 |
|---|---|
| General | |
| Power requirements | DC 10.5 V to 17 V, 24 W (excluding peripherals) |
| Operating temperature | -20°C to +45°C (-4°F to +113°F) |
| Storage temperature | -20°C to +60°C (-4°F to +140°F) |
| Mass | 1.7 kg (3 lb 12 oz) |
| Camera section | |
| Pickup device | 3-chip 2/3-inch type CCD |
| Effective picture elements (H x V) | 1920 x 1080 |
| Signal format | 1080/50i, 1080/59.94i, 720/50p, 720/59.94p (1080/23.98p, 1080/24p, 1080/25p, 1080/29.97p, 50/59.94p: option) |
| Spectrum system | F1.4 prism |
| Lens mount | Sony bayonet mount |
| Built-in filters | CC: A: CROSS, B: 3200K, C: 4300K, D: 6300K ND: 1: CLEAR, 2: 1/4ND, 3: 1/16ND, 4: 1/64ND |
| Sensitivity (at 2000 lx, 3200K, 89.9% reflectance) | F10 (at 1080/59.94i, 720/49.94p), F11 (at 1080/50i, 720/50p) |
| Signal-to-noise ratio | HD output: Typical 55 dB (NS Max. 62 dB) SD output: Typical 65 dB (59.94 Hz) Typical 63 dB (50.00 Hz) |
| Horizontal resolution | 1,000 TV lines (at center) |
| Shutter speed | 1/100, 1/125, 1/250, 1/500, 1/1000, 1/2000 s (1080/59.94i) 1/60, 1/125, 1/250, 1/500, 1/1000, 1/2000 s (1080/50i) |
| Modulation depth | Y: 45% at 27.5 MHz (800 TV lines with typical lens), Pb/Pr: 80% of 12 MHz |
| Inputs/Outputs | |
| Genlock input | BNC (x1) HD: SMPTE 274M, tri-level sync, 0.6 Vp-p, 75 Ω SD: Black burst (NTSC: 0.286 Vp-p, 75 Ω/PAL: 0.3 Vp-p, 75 Ω) |
| SDI 1 output | BNC (x1) Can be switched between HD-SDI and SD-SDI |
| SDI 2 output | BNC (x1) Can be switched between HD-SDI and SD-SDI |
| VBS output | BNC (x1) |
| EXT I/O | D-sub 15-pin (female) (x1) |
| Remote | 8-pin (x1) |
| Lens | 12-pin (x1) |
| LAN | RJ-45 (x1), 10BASE-T, 100BASE-TX |
| Supplied accessories | |
| | Operation manual (1), Number plates for up-tally lamp (1set) |
| Optional Accessories | |
| | Tripod Adaptor (VCT-14) Remote Control Unit (RM-B170) Remote Control Panel (RM-B750) Master Setup Unit (MSU-900/MSU-1000 series) Remote Control Unit (RCP-700/RCP-920/RCP-1000 series) |

| | HDFA-200 |
|---------------------------------------|---|
| General | |
| Power requirements | AC 240 V, 1.2 A (max.), DC 180 V, 1.1 A (max.), DC 12 V, 10 A (max.) |
| Operating temperature | -20°C to +45°C (-4°F to +113°F) |
| Mass (the main unit only) | 3.8 kg (8 lb 6 oz) |
| Input/output connectors | |
| CCU Optical/electrical | multi-connector (x1) |
| SDI input | CAM-MAIN (L): BNC (x1), CAM-SUB (R): BNC (x1) |
| REF output | CAM-MAIN (L): BNC (x1), CAM-SUB (R): BNC (x1) |
| SDI OUT | SDI 1: BNC (x1), SDI 2: BNC (x1) |
| TEST output | BNC (x1) |
| Prompter 1/Genlock in | BNC (x1), 1 Vp-p, 75 Ω |
| Viewfinder | 20-pin (x1) |
| Audio in 1, Audio in 2 | XLR-type connector 3-pin, female (x1 each) For MIC: -60 dBu (variable up to -20 dBu by menu or HDCU-1000/1500 operation), balanced For LINE: 0 dBu, balanced |
| Intercom | XLR-type 5-pin, female (x1) |
| DC input | XLR-type 4-pin (x1), DC 10.5 V to 17 V |
| CAM-MAIN (L) DC output | XLR-type 4-pin, female (x1), DC 10.5 V to 17 V |
| CAM-SUB (R) DC output | XLR-type 4-pin, female (x1), DC 10.5 V to 17 V |
| DC output (4 A max) | XLR-type 4-pin, female (x1), DC 10.5 V to 17 V |
| DC output (0.5 A max) | 4-pin (x1), DC 10.5 V to 17 V |
| Remote (L, R) | CAM-MAIN (L): 8-pin (x1), CAM-SUB (R): 8-pin (x1) |
| Remote | 8-pin (x1) |
| AUX | 12-pin (x1) |
| RET CTRL | 6-pin (x1) |
| Tracker | 10-pin (x1) |
| Crane | 12-pin (x1) |
| Compatible devices | |
| 3D multi-camera | HDC-P1 |
| | HDC-1500R, HDC-1400R, HDC-2400, HDC-2500 |
| | HDC-1500, HDC-2400, HDC-2500 |
| Camera control unit | HDCU-1000*1, HDCU-1500*2, HDCU-2000, HDCU-2500 |
| RGB 4:4:4 transmission (2D) camera | F35 |
| Master Setup Unit | MSU-1000, MSU-1500 |
| Remote Control Panel | RCP-1500, RCP-1501, RCP-1530 |
| Supplied accessories | |
| | Operation manual (1), Cable clamp belt (1) |
| Optional accessories | |
| | HD Electronic Viewfinder HDVF-C550W (5-inch, color), HDVF-C730W (6.5-inch, color), HDVF-EL75 (7.4-inch, color) "Memory Stick Duo", "Memory Stick PRO Duo" |

*1 An HKCU-HB10 3G Fiber Transmission Unit is required.

*2 An HKCU-HB15 3G Fiber Transmission Unit is required.

MSU-1000/MSU-1500 Specifications

| | MSU-1000 | MSU-1500 |
|------------------------|--|--|
| General | | |
| Power requirements | AC 100 V to 240 V, 50/60 Hz | |
| Current consumption | 0.35 A | |
| Operating temperature | 5°C to 40°C (41°F to 104°F) | |
| Maximum cable length | 200 m (656 feet) | |
| Mass | 4.6 kg (10 lb 2.3 oz) | 3.6 kg (7 lb 15 oz) |
| Dimensions (W x H x D) | 482 x 67 x 222 mm (19 x 2 3/4 x 8 3/4 inches) | 204 x 354 x 67 mm (8 1/8 x 14 x 2 3/4 inches) |
| Inputs/outputs | | |
| Remote | CCU/CNU: 8-pin (x1) AUX: 8-pin (x1) | |
| I/O port | 50-pin (x1) | |
| LAN | RJ-45 (x1) | |
| AC input | 3-pin (x1) | |
| DC input | 4-pin (x1) | |

HDLA-1500/HDLA-1505/HDLA-1507 Specifications

| | HDLA-1500 | HDLA-1505 | HDLA-1507 |
|------------------------|---|-----------------------|------------------------|
| General | | | |
| Power requirement | AC 240 V (max. 1.2 A) / DC 180 V (max. 0.65 A), DC 12 V (max. 9 A) | | |
| Operating temperature | -20°C to +45°C (-4°F to +113°F) | | |
| Storage temperature | -20°C to +60°C (-4°F to +140°F) | | |
| Mass | 18.5 kg (40 lb 13 oz) | 17.1 kg (37 lb 11 oz) | 15.5 kg (34 lb 2.7 oz) |
| Input/output connector | | | |
| Lens | 36-pin (x1) | | — |
| DC input | XLR-4-pin (male) (x1), DC 10.5 to 17 V | | |
| DC output | 4-pin (x1), DC 10.5 to 17 V, max 1.5 A | | |
| | XLR-4-pin (female) (x1), DC 10.5 to 17 V, max 5.0 A | | |
| Viewfinder | D-sub 25-pin (x1) | — | D-sub 25-pin (x1) |

SONY

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Production of some of the peripherals and
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For advice on choosing devices, please contact your Sony dealer or
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