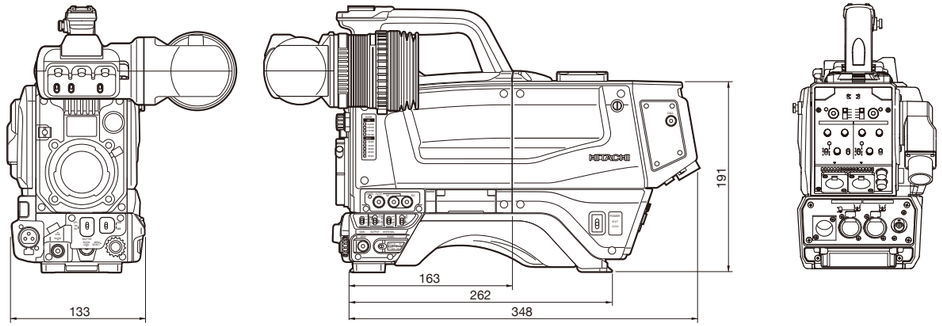
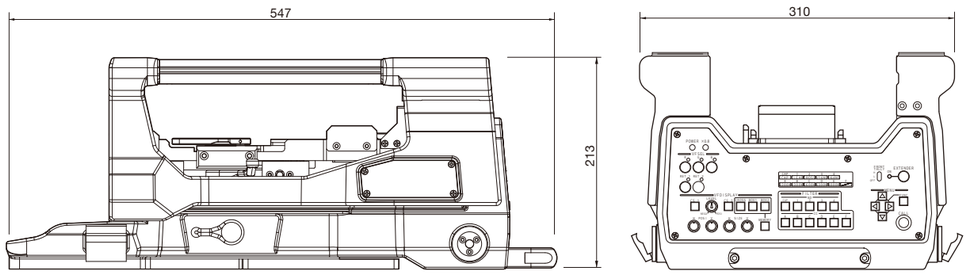
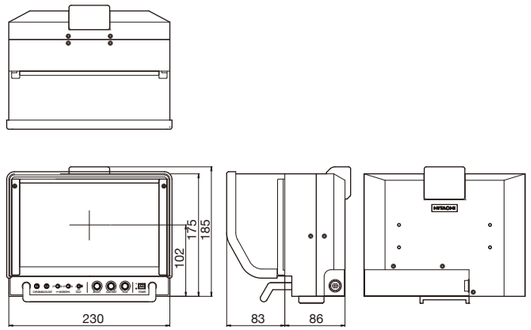
DIMENSIONS (SK-HD1000)



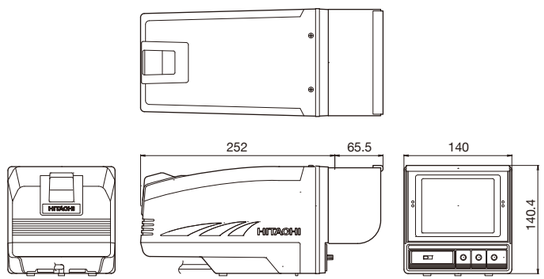
DIMENSIONS (SA-1000)



DIMENSIONS (VF-L9HD LCD Color Studio Viewfinder)



DIMENSIONS (VF-HD500 B&W CRT Studio Viewfinder)



⚠ CAUTION : To ensure safe operation, please read the instruction manual before using this product.

These Specifications are subject to change without notice.

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Hitachi Kokusai Electric

HITACHI

Multi-Format Digital HDTV Production Camera
SK-HD1000



The ultra-efficient SK-HD1000 is a member of Hitachi's "Green Products" Global initiative.



SK-HD1000 with VF-402



CA-HF1000 Rear Panel

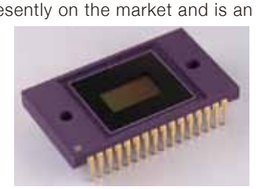
- Advanced Ergonomics Design
- New low center of gravity chassis
- Optimized for on-shoulder production
- Lightweight, ideal for portable use

Hitachi SK-HD1000 Multi-application HDTV Studio and Field Production Camera

The SK-HD1000 is Hitachi's third generation HDTV camera that embodies the latest advanced digital signal processing patents and world-renowned Hitachi technology. It is a high performance, Multi-Standard HDTV studio and field production camera system that satisfies various TV Systems worldwide. One camera system that is now used with 50Hz or 60Hz AC line power regions of the world having both analog and digital signals that comply to the respective countries' TV Systems. As a standard feature, the SK-HD1000 is a multi-format output camera system since it is able to output dual formats (SD and HD) at the same time. Optionally available is the ability to perform as a switchable cross-converting HD camera that outputs 1080i or 720p HDTV signal formats and SD at the same time.
The lightweight (4.4Kg (9.6lbs) : Camera head) 2-piece, dockable design gives it unique attributes which provide efficient and cost-effective adaptation to various TV program production demands. It' s circuits" miniaturization yield not only the smallest most flexible Hitachi HDTV camera to date but, one the "greenest" and most power efficient (16W camera head power consumption) ones on the market.

High-performance starts with advanced sensors

Hitachi has achieved an incredibly quiet HDTV image which is the foundation for its high performance and excellent picture quality. With the use of NEW 2.3 million pixels, micro-lens array, 1080i CCDs, the SK-HD1000 surpasses the performance of all prior models. These new sensors enable the SK-HD1000 to achieve outstanding resolution, dynamic range response, sensitivity and ultra-low vertical smear characteristics. A high horizontal resolution performance of 1100TVL (Luminance channel) is the pinnacle of picture sharpness from any camera presently on the market and is an attribute to the claim of having the most transparent signal processing path of any Hitachi digital camera manufactured to date. The camera head is also available with native megapixel 720P CCDs (SK-HD1000-S4 version) with exceptional low noise and ultra-low vertical smear characteristics.



Premier user of 16-bit analog-to-digital conversion

Hitachi cameras were the first on the market to recognize and implement 16-bit analog-to-digital conversion. The SK-HD1000 takes full advantage of the increased dynamic range output of the NEW imagers by using 3 (Red, Green, Blue channel) 16-bit analog-to-digital converters. These high speed ADCs are the bridge between the serial output of the CCDs and the advanced Hitachi processor. They assure that every nuance of the image captured and, converted to electrical energy by the sensors is interpreted in the digital domain resulting in faithful image reproduction.

Hitachi's advanced digital signal processing

Each essential part of the Hitachi SK-HD1000 camera system has its own DSP processor. Different DSP ICs are used independently for the HDTV camera head processing, the transmission system and the Camera Control Unit (CCU) processing. The new, power-efficient Digital Signal Processor LSI' s are designed under the 65nm rule with dynamic processing capability in excess of 30-bits per pixel, per RGB channel. Hitachi' s DSP processors are designed for and, can adopt to progressive readout HDTV sensors. The processing dynamic headroom of the SK-HD1000 in theory (14-bit), allow for signals in excess of 85dB to be faithfully reproduced. Additional digital encoding at the camera head and CCU provides low interference and high signal integrity for both digital and analog outputs.
An outstanding overall signal-to-noise ratio specification of 60dB is achieved by use of our own low-noise circuit technology. The standard sensitivity is rated at F10 with 2000 lx.
Even at high gain, clear images are obtained with little noise.

Setup memory and adjustment transfer card

A small plug-in setup card (SD card) stores the user setup and Scene File information. The adjustment data can then be recalled and used for future scenes and productions thereby assuring the exact video "look" and characteristics as the original Scene File and adjustment settings. A single camera's setup data can also be transferred to quickly adjust a group of cameras to be used in a production.
Access to setup card data and transfer is also available from the SU-1000 master setup panel.



Digital signal transmission via Hybrid Fiber Optical Cable

The SK-HD1000 camera system utilizes industry standard Hybrid Fiber-optic cable connectors made of high-strength stainless steel to insure durability and reliable performance under the most demanding TV Studio and Field production circumstances. All command audio and video signals to and from the camera are digitally transmitted hence, totally immune to EMI/ RFI interference. Camera power and cable condition supervision are also performed when using the Hybrid Fiber-Optic Cable (HFOC). Full Auxiliary (up to 4 analog or digital, HD or SD) video return and individual Teleprompter facilities are also available with the SK-HD1000 transmission system. The maximum HFOC length with applied camera power and fully operational facilities is 1,000 meters* (3,280 feet*) .

Unique to cameras in the SK-HD1000' s price range are optical power meters at the camera head (via engineering menu) and on the front of the CU-HD1000 camera control unit. These meters indicate the optical condition of both the receive and, transmit signals independently to accurately depict the proximity to the "digital cliff", maximum cable distance or provide basic HFOC diagnostics in the field.

*HFOC distance with applied CCU power differs depending on the system configuration. It is dependant on the type of lens used, viewfinder, studio Adaptor, teleprompter and other accessories that may be connected and thereby consuming power otherwise available for the camera head.





Superb High Definition picture reproduction & enhancement tools

Luminance response tools

Selectable gamma tables

In addition to normal gamma point and balance adjustments, the SK-HD1000 offers a multi-point gamma table that provides the user with exposure control over just the darkest points in the image. It enables adjustment of the initial gamma gain to optimize the reproduction of dark scene components. Hitachi' s DSPs assure that no additional noise components are introduced in the image even with the most aggressive Gamma Table settings. Additionally, this function does not change any of the other parameters of the video signal thus maintaining overall exposure, detail, color reproduction and composition.



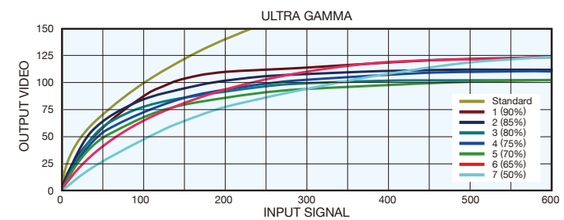
Standard Gamma



High Gamma Table ON (Simulated image)

Ultra Gamma

It dramaticarlly increases the exposure latitude of the camera in shooting condictions where lighting and scenery vary widery in intensity. Seven different ultra-gamma responses are preprogrammed to suit just about every possible adverse shooting condition.



Black stretch

The SK-HD1000' s Black stretch function allows for better reproduction of dark or underexposed areas by evenly raising the luminance response without changing the pedestal or white clip/ knee settings. It is especially useful in high contrast image venues, outdoors or sports production.

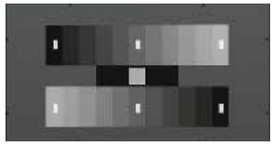
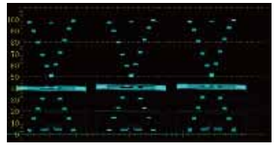
Linear and auto-knee

Like the peak video level control function of the white clip; the linear knee function is made up of the actual knee (level compression) point and its slope which improve overexposed portions of the picture by compressing the video past a certain point. These points are user adjustable.
The auto knee provides the perception of a wider dynamic range by dynamically compressing (varying knee and slope) the video level in accordance to the strength of its over-exposure.

Lens optimization

Gray-Scale automatic setup

The SK-HD1000 offers the Gray-Scale Automatic Setup function to optimize the optical parameters that could negatively affect the image you are trying to capture and faithfully reproduce. The Gain, Gamma, and Flare are the video signal functions that vary from lens to lens.

Automatic vertical modulation shading adjustment

The SK-HD1000 assures that with any lens used, an even, chroma response will be attained by the automatic vertical modulation shading correction function. At the simple push of a button, this function provides separate memory of lens' modulation shading characteristics to optimize the X1 and X2 lens extender positions.



Color reproduction excellence

Triple-masking

The triple-masking function includes the 12-vector, linear matrix and, Skin-tone masking provide the user wide latitude in subject image color control. The 12-vector color corrector provides independent control of the hue and saturation for six primary and six secondary combinations of colors. The 6-axis linear matrix provides overall color control thereby providing the user with excellent and precise color rendition control.

Preset Masking

The preset masking function reproduce various image color such as STANDARD(Hitachi stanard)/ITU-709/SMPTE240M/SMPTE-WIDE/NTSC/EBU.

Skin-tone masking

The Skin-tone masking function provides "fine Painting" (hue and saturation) of Skin tones without affecting other colors in the scene. This functions additional and independently from the linear and 12-vector-masking functions thereby adding an additional color-correction (Triple-masking) Channel to the overall image color control.


Skin tone masking OFF


Skin tone masking ON (Simulated image)

Chroma Saturation

In addition to the extensive colorimetry controls offered in the SK-HD1000, the overall color saturation can be varied to achieve "dramatic" or artistic "effects" .


Original Image


Color corrected (Simulated image)

Knee Saturation

The Knee Saturation function dynamically restores color saturation to scene highlights above the Knee point. Color-saturated highlights lost in overexposed scenes are now visible. This function provides excellent results in ; for example when imaging : high-contrast, sunny outdoor scenes, fireworks, concerts, theatre stage lighting, and colored night scenes.


Knee Saturation OFF


Knee Saturation ON (Simulated image)

Lens Files

The SK-HD1000 can store 8 lens files which include various lens correction data such as vertical moduration shading.This lens correction data can also be stored in a card (SD card), where it can be recalled when necessary.

Picture sharpness enhancement

Absolute detail control

Hitachi provides 3 major detail controls designed to precisely place, control and shape the picture sharpness characteristics of the SK-HD1000.

Master Detail items

Master Detail items are available to adjust varied parameters of the detail signal to taste or to achieve a desired "look" in your productions. Some of these adjustments are ; H/V detail, crisp, level dependence, knee detail, limiter, source, frequency and balance.

Skin-tone Detail

The Skin-tone Detail functions allow a flesh color-based softening of the image to achieve the impression of more youthful TV personalities. 2 individual memories exist as well as a function to automatically detect the hue, saturation and luminance of the Skin-tone to be affected. This function is not limited to Skin-tones only ; it can increase or decrease the sharpness of any pair of colors in the image.


Skin-tone Detail OFF


Skin-tone Detail ON (Simulated image)

High-chroma detail

The High-chroma detail adjustments allow precise control of the detail level in highly color-saturated portions of the picture such as the petals of a rose or a colorful fabric.


High-chroma detail OFF


High-chroma detail ON (Simulated image)

Optical and image capture functions

Versatile CCD drive functions

Four modes of shutter operation are provided in the SK-HD1000 camera system :

Five PRESET electronic shutter speeds. For stopping action or fast
- moving objects in the image.
  LOCK SCAN to image non-synchronous displays without flicker.
- Automatic Electronic Shutter (AES) maintains the video level when the
- maximum F-stop shooting condition is reached.
  Charge Controlled Frame (CC FRM) offers improved vertical resolution.
- Very useful in capturing highly detailed static images.

Motorized and remotely controlled optical filters

In traditional photography, ND filters are used for depth of field control. Four optical ND filters are provided as standard on a motorized, remotely controlled filter wheel. These are: Clear, 4-point Cross, 1/16ND, 1/64ND. A second remotely controlled optical wheel is available in the S2 & S4(720P) camera head versions with colour temperature filters for 3200K, 4300K, 6300K & 8000K

Focus Assist

Three different visual aids are available to support The camera operator in fInding the right focus in the viewfinder. The Area Marker detects edges inside area, while a focus indicator shows the actual detail level by a horizontal line. A Focus Indicator Gauge can further be set to lock the maximum achieved level for a few seconds.

Quick focus + Precision Focus (Auto Focus)

The Quick Focus function automatically opens the iris then sets the video level with the electronic shutter. The resulting shallow depth of focus, allows the cameraman to set the exact focus with ease.
Lenses with Precision Focus(Auto Focus) technology are supported equally.

ECC(Electronic Color Compensation)

Due to the wide gain characteristics of the SK-HD1000, the ECC function compensates for color temperature electronically by providing preset gains to equal color temperature gradations of 3200K, 4300K, 5600K, 6300K and 8000K.Only ECC 5600K only in the S2 & S4(720P) camera head versions.The ECC can be controlled by the remote control panel and the base station like an optical filter. The setting can be stored in the Scene files and its status can be displayed on the view finder and the monitor output.

Full auto mode

The AES and automatic iris maintain the video level even with rapidly changing light intensity. These functions are accessed via the menu system or the shutter buttons provided on the RU-1200VR/JY and SU-1000 remote control panels.Full-time Auto White balance (FAW) corrects in real-time for color temperature variations due to changing types of lighting conditions on the scene object.

Ease of use characteristics & functions

Programmable soft-switches (CS-1, CA-CS)

The cameraperson can assign Zebra, marker, VF Detail, Quick Focus or FAW to the CS-1 switch via the operation menu. The CA-CS switch can take on the functions of VF Detail on/off, marker-1 or marker-2 on/off.

Viewfinder options

Three viewfinder options are offered with the SK-HD1000 camera system. Black & White CRT-type viewfinders are manufactured for ENG (2-inch) and OB (5-inch). These are of high-brightness and contrast making them ideal for easy visibility in field production.
A 9-inch color TFT-LCD screen viewfinder is offered for critical viewing such as encountered in studio productions.



The SK-HD1000 incorporates heavy duty mounts for both the ENG and Studio viewfinders.

Viewfinder markers & functions

The SK-HD 1000 provides an excellent gamut of thoughtful viewfinder markers and functions to aid the cameraman in providing outstanding results during a TV program production.
All VF parameters can be stored in 4 dedicated memories which can catalog preferences for different camerapersons, programs, shooting condition or event period.
Programmable functions include; color/mono, detail, crisp, safety zone, 2 movable markers, center cross-hair, 2 movable effects boxes, variable aspect ratio side panels, side panel contrast/ bright, 2-mode zebra and variable line display level polarity.

Viewfinder status displays

Iris F-stop, Lens Externder position, Shutter speed, Optical and ECC filter in use, and Gain setting are all displayed or defeated via menu selection. Menu selection also includes the over-level or between range-type zebra are also provided.

Comprehensive cameraperson operation panel

In Studio and Field production, the SK-HD1000 provides the camera-person with a wide array of controls for intercom audio, program audio, aux video switching controls, script lamp connector, dual-tally and call functions that are the norm in high-end broadcast cameras. These functions along with available 100W of teleprompter monitor power and dedicated prompter SD signal make the SK-HD1000 a logical choice for sophisticated productions.




Camera head inputs & outputs

The camera head provides 2 buffered HD-SDI, 1 SD analog teleprom-pter out, and 1 HD-SDI switchable as Monitor or VF and RET video output via BNC connectors. The MIC-1 channel is switchable with balanced XLR input connector located at the front of the camera (shotgun mic) or at the rear of the CA-HF1000. All the microphone input provides phantom power supplies and accept mic or line levels. These IOs satisfy a wide variety of production requirements and are provided as with most broadcast-grade cameras.

ACCESSORIES

SA-1000 Studio Adaptor

With consideration to our customers and advancements in production workflows that require hand-held cameras to be used with large lenses in studio or field HD productions, Hitachi offers the SA-1000 studio Adaptor.
The SA-1000 serves primarily as a mechanical lens supporter and it also offers these important features.

- The ability to use “Hanger-type” box lenses and “Bayonet-type” hand-held portable lenses without removing the camera from the SA-1000.
- Functions routinely required by the cameraperson in Studio and Field production are brought out from the camera menu system and grouped in the SA-1000’s rear operation panel for easy access.

Hitachi’s efforts at providing an advanced level of studio camera features with this Studio Adaptor include a “Cable-less” and “tool-less” camera interface which increases the systems’ reliability and Hitachi retains the flexibility of having 2 choices for viewfinders when using the SK-HD1000 in this configuration.



SA-1000 Rear Panel



LM-B1000/SA-1000
(for Large Box Lens)



Additional lens mounting options for the SA-1000

LM-C1000/SA-1000
(for Canon Small Box Lens)



LM-F1000/SA-1000
(for Fujinon Small Box Lens)



LM-P1000/SA-1000
(for Portable Lens)



Dockable : One camera body to suit multiple configurations.

- Hybrid Fiber-optic cable Adaptor
- Triax cable Adaptor
- P2 Solid-State HDTV recorder
- Wireless Adaptor



Wireless Adaptor HDTV dockable recorder Fiber cable Adaptor Triax cable Adaptor

Flexible Choice of Camera Control Units

Three models of Camera Control Units are offered for the SK-HD1000 camera system. The CU-HD1000,TU-HD1000 and the CU-HD500 CCUs serve applications for Studio and Field production.
The CU-HD1000/TU-HD1000 offer the ability of 50/60Hz line power switching. They are compliant with RoHS directives* and as a standard function, the ability to output 1080i or 720p. Its reduced size (half-rack width/ 3RU’ s high), weight (7kg approx.) and improved power consumption make it ideal for OB applications**. CU-HD1000 also includes a unique optical power meter that indicates the status of the HFOC.
The CU-HD500 is (88mm) high and, of 2-RU EIA 19-inch rack width. And have HD/SD-SDI
Both CCUs are of easy-to-maintain modular design; employ the same control panels, data cables and peripherals. Other common CCU features include;

- Simultaneous HDTV/ SDTV, digital and analog video outputs
- 3 clean HD-SDI and SD-SDI outputs
- Analog RGB or Y, B-Y, R-Y component outputs
- 4 auxiliary returns
- Dedicated teleprompter channel
- ARIB-type color bar output
- 2 channel balanced analog Mic audio outputs or embedded HD-SDI digital audio,
- Genlock with composite or tri-level sync
- 2-tally (Red/Green) system.
- 2-channel, 2W/4W intercom system.
- RS-232C remote control
- TRUNK (RS-422) option

*RoHS stands for the “restriction on the use of certain hazardous substances in electrical and electronic equipment”. It is a European Directive aiming to control the use of certain hazardous substances in the production of new electrical and Electronic equipment (EEE).
** (See detailed specifications on the last page of this brochure)

CU-HD1000

Unique Optical Power Meter





CU-HD1000 Rear Panel

TU-HD1000/CX-HD1000 Digital Triax System

Hitachi's Digital Triaxial cable transmission system addresses two application requirements posed by our customers worldwide.
It is the next best, completely digital, signal transport compared to that using fiber-optic cable. No other HDTV triaxial cable transmission system comes close.
Second, in applications where traditional triax is already in use, substantial savings in the cabling infrastructure can be realized by employing Hitachi HDTV Digital Triax cameras.
Hitachi's patented Digital Triax System consists of the camera head triax adaptor and the corresponding TU-HD1000 camera control unit.
The main advantages and characteristics are:

- Hitachi's patented, fully digital, bi-directional signal transmission system
- Employs no RF modulation or modems
- Little to no signal degradation.
- Capitalizes on reduced costs and flexibility of triaxial copper cable.
- Includes 1080i/ 720p cross-converter for HD-SDI outputs
- Built in, high-performance SDTV up/ down converters
- Similar IO's as the CU-HD1000



CX-HD1000 Triax adaptor



TU-HD1000 Triax base station

ACCESSORIES

SU-1000 Setup Control Unit

The SU-1000 Setup Control Unit is used for the adjustment of camera parameters in a multi-camera production environment.
This unit provides full control of the SK-HD1000 camera systems. Utilizing a new wide touch screen LCD panel that expands control functions. It is connected directly to each CCU in parallel fashion via serial data cable with a distance of up to 100 meters. 12 cameras can be directly controlled from the SU-1000. Camera control can be extended from 12 cameras up to 48 cameras(option).

The compact and lightweight SU-1000 features Color LCD indicators in the display section to easily identify and access the provided control parameters. The unit is sufficiently small and lightweight enough to be used in space deprived locations such as encountered on a broadcast OB Van.

SU-1000



The SU-1000 has these primary functions:
- Selection of a single camera or groups of cameras to be controlled.
- On/Off control of all functions.
- Control of all variable data adjustments including Iris & Master black.
- Selection of storage and operation data files.
- Transfer of files and data between cameras or groups of cameras.
- Adjustment and file data (write/ read) from SD memory card
- Video output selection including external video switcher control (source or sink).
- Ethernet connectivity and cabling



VR Remote Control Unit RU-1200JY/VR&RU-1500JY

- The RU-1200JY/VR Remote Control Unit is a new design of remote operation panels for the Hitachi SK-HD1000. Painstaking attention has been paid to making the most commonly used controls and functions directly and instantaneously accessible to the video control engineer.
  It is an ideal production tool that enhances any HD studio or field production.
  The RU-1200JY and RU-1200VR are completely identical in their functions except the iris and master black adjustments, for which the “JY-type” uses a joystick type control while the “VR-type” uses rotary knobs.
- The RU-1500JY has all the functionality of the RU-1200JY, but with touchscreen panel operation and Ethernet connectivity and cabling.

RU-1200VR



RU-1200JY



RU-1500JY



Studio and Field Production Viewfinders

The SK-HD1000 camera system offers two choices for Studio or Field production viewfinders. Model VF-L9HD is a color 9-inch TFT-LCD screen designed for critical color viewing of the image. The LCD screen offers a wide viewing angle and fast transient response time for a lag-less, crisp image similar to a CRT-type screen. It is most suitable where precise composition and color evaluation of the image are required. The VF-HD 500 model is a monochrome 5-inch CRT-type unit that is more suited for Sports and OB applications where high-brightness and contrast are required. Both our Studio and Field production viewfinders can be out-fitted with alternate mounts thereby decreasing the overall system cost.

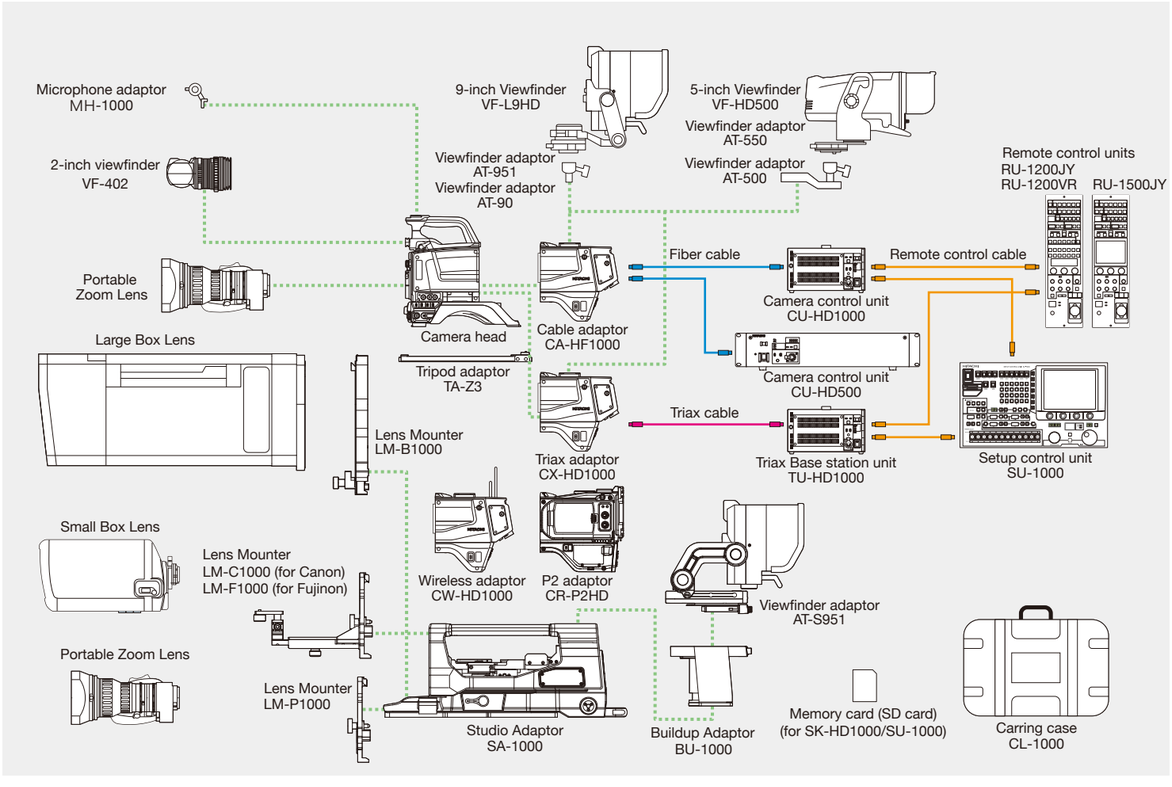
VF-L9HD Viewfinder/AT-951



VF-HD500 Viewfinder/AT-550



System configuration chart



SPECIFICATIONS

SK-HD1000 Camera Head

	SK-HD1000	SK-HD1000-S2	SK-HD1000-S4
Imaging Device	(3X - RGB) 2/3-inch, 16:9, 2.3 M Pixel Super-Advanced, micro-lens IT-CCD		(3X - RGB) 2/3-inch, 16:9, 1.0 M Pixel Super-Advanced, micro-lens IT-CCD
Effective pixels	1,920 (H) X 1,080 (V)		1,296 (H) X 726 (V)
Optical system	F1.4 prism.		
Optical Filters	1X motorized filter wheel w/4 filter positions 1: Clear, 2: Cross, 3:1/16ND, 4:1/64ND ECC (Electronic Color Corrector) with 5 settings (3200K, 4300K, 5600K, 6300K, 8000K) Option (3200K, 4300K, 5600K, 7500K, F.AWB (Full time AWB)	2X motorized filter wheel w/5 filter positions ND CAP, 1:CLEAR, 2:1/4ND, 3:1/16ND, 4:1/64ND CC A:CROSS, B:3200k, C:4300K, D:6300K, E:8000K ECC (Electronic Color Corrector) 5600K	
Sensitivity	F10 @2000lx, 3200K, 89.9% reflectance		
Signal to Noise Ratio	60dB (typical)		58dB (typical)
Horizontal resolution	1100 TV Lines (at center)		700 TV Lines (at center)
Depth of modulation	60% (typical) (800TV Lines at center, 27.5 MHz, 1080i)		50% typical 27.5MHz (720p) (530TVL at center, 27.5 MHz)
Registration	Overall 0.01% (excluding lens limitations)		
Lens mount	B4 bayonet-type		
Gain selection	L (low) -3, 0dB M (medium) 0, +3, +6, +9, +12, +15, +18, +21dB H (high) +3, +6, +9, +12, +15, +18, +21, +24dB		
Electronic Shutter	1/100, 1/250, 1/500, 1/1000, 1/2000(1080/59.94i), AES, CC Frame 1/60, 1/250, 1/500, 1/1000, 1/2000)1080/50i)		
Power consumption	Camera head 16 W Head only (without VF, lens)		
Dimensions	133 (W) x 191 (H) x 262 (D) mm		
Mass	2.2kg, 4.8lbs. Camera head		
Operating temperature	-10ºC to +45ºC, 14ºF to 113ºF		
Camera head	1X BNC HD-SDI VF out (Character ON/OFF) or HD-SDI RET out		
Input & Output	4-pin Multi connector for remote control panel 20-pin Multi VF connector, 12-pin Multi LENS connector 3-pin XLR MIC-1 connector, SD Memory Card Slot		

CA-HF1000 Fiber Camera Adaptor

CCU connector	1X-type HFOC female connector (LEMO/Tajimi Type)
	SMPTE-304M-type
Video transmission system	Fully digital, bi-directional, 10-bit, 4 : 2 : 2 sampling,
	SMPTE-274M
Intercom	2X channel, 5-pin each XLR, channel selection,
	MIC on/off, volume
Program audio	2X, PGM audio level controls w/ Chnl1 & Chnl2 intercom mix
Teleprompter power output	1X 5-pin, 230VAC, 60W~100W, external prompter Tally drive out
	(depending on configuration accessories)
Microphones	Chnl1 & 2 Line or MIC level select (MENU),
	with phantom power on/off
Return/ Aux switcher	2-channel, 4-input remote AUX/VF video select connector
	(RET control)
Video Inputs & Outputs	2X HD-SDI out, 1X SD analog teleprompter out switchable
	with, 1X Genlock in (Tri-level)
Other I/O	1X 29-pin (for SA-1000 cable-less interface)
	1X 5-pin script lamp +12VDC (1.0A max)
	1X 5-pin VF AUX return
	(for use in cranes or extended Head/VF configurations)
	1X 4-pin XLR, 12VDC, power input
Mass	2.2kg, 4.8lbs.

CX-HD1000 Triax Camera Adaptor

CCU connector	1X-Triax connector
Video transmission system	Fully digital, bi-directional, 10-bit, 4 : 2 : 2 sampling,
	SMPTE-274M
Intercom	2X channel, 5-pin each XLR, channel selection,
	MIC on/off, volume
Program audio	2X, PGM audio level controls w/ Chnl1 & Chnl2 intercom mix
Teleprompter power output	1X 5-pin, 230VAC, 60W~100W, external prompter Tally drive out
	(depending on configuration accessories)
Microphones	Chnl1 & 2 Line or MIC level select (MENU),
	with phantom power on/off
Return/ Aux switcher	2-channel, 4-input remote AUX/VF video select connector
	(RET control)
Video Inputs & Outputs	2X HD-SDI out (1x HD/SD-SDI Cam/Ret, SD-SDI PPT switchable)
	1X SD analog out (VBS/PPT), Genlock (Tri-level sync) switchable
Other I/O	1X 29-pin (for SA-1000 cable-less interface)
	1X 5-pin script lamp +12VDC (1.0A max)
	1X 5-pin VF AUX return
	(for use in cranes or extended Head/VF configurations)
	1X 4-pin XLR, 12VDC, power input
Mass	2.6kg

VF-402 B&W CRT ENG Viewfinder

TV System	50 or 60Hz 1080i or 720p
Construction	Metal die-cast chassis and mount
CRT	2-inch B&W 16:9 CRT with removable Diopter (CRT Focus ring)
User-comfort	VF angle rotation, X-Y mechanical movement, anti-fog lens,
	rubber eyecup
Resolution	650TVL
Functions	Bright, Contrast, Peaking, knobs VR front-facing
Internal Tally	Red/ Green, Front-facing high brightness LEDs
Tally controls	Tally OFF, NORMAL, HIGH
Mass	0.76kg, 1.7lbs
Power Consumption	5W (approx.)

VF-L9HD LCD Color Studio Viewfinder

TV System	50/60Hz, 1080i/ 720p auto-switching
Construction	Metal chassis and mount
	9-inch, color TFT-LCD, 800 (H) x 450 (V),
Display	6500°K with removable hood
Camera mounts	2X, AT-90/ AT-950
Functions	Chroma, Backlight, Marker-1/2 On/Off, Bright,
	Contrast, Peaking, knobs VR front-facing, Power ON/OFF
Internal Tally	Red/ Green, Front-facing high brightness LEDs
Tally controls	Tally OFF, NORMAL, HIGH
Mass	1.8kg, 4lbs
Power consumption	18W (approx.)

VF-HD500 B&W CRT Studio Viewfinder

TV System	50 or 60Hz, 1080i or 720p	Functions	Bright, Contrast, Peaking, knobs VR front-facing
Construction	High-impact plastic	Internal Tally	Red/ Green, Front-facing high brightness lamp
CRT	5-inch B&W 4 : 3 CRT with removable hood	Tally controls	Tally ON/OFF
Camera mounts	2X, AT-500/ AT-550	Mass	1.8kg, 4lbs
Resolution	750TVL	Power consumption	15W (approx.)

CU-HD1000 Camera Control Unit

Genlock	BNC, B-BST 0.45Vp-p/75ohm (loop through)
	HDTV tri-level sync 0.60Vp-p/75 Q (loop through)
Digital Return 1/2/3/4	BNC, HD SDI or SD SDI
Analog Return 1/2	BNC, VS or VBS 1.0Vp-p/75ohm (loop through)
Prompt	BNC, VS or VBS 1.0Vp-p/75ohm (loop through)
Intercom (Headset)	5-pin XLR, -60dBm
Communication	
Intercom	0dBm , 600Ω/ 4Wire
PGM	0dBu or -15dBu ,200Ω at 2Wire 0dBm/ 600Ω
R/G TALLY	DC or contact supply
REMOTE 1	1.5Vp-p or RS-232C (Switchable)
REMOTE 2	1.5V p-p
Output signals	
ENCR	3x BNC, VBS 1.0Vp-p/75 Ω
R-Y or R	1x BNC, NTSC : 0.7Vp-p, PAL : 0.525Vp-p/ 75Ω
	VS 1.0Vp-p/ 75Ω (Selectable)
Y or G	1x BNC, VS 1.0Vp-p/ 75Ω
	1x BNC, VS 1.0Vp-p/ 75Ω (Selectable)
B-Y or B	1x BNC, NTSC : 0.7Vp-p, PAL : 0.525Vp-p/ 75Ω
	VS 1.0Vp-p/ 75Ω (Selectable)
Digital Out	3x BNC, HD-SDI (Embedded audio available)
	3x BNC, HD-SDI or SD-SDI selectable (Embedded audio available)
	HD-SDI or SD-SDI selectable PIX (Embedded audio available)
PIX (R,G,B,ENCR)	1x BNC, VS or VBS 1.0Vp-p/ 75Ω
WFM OUT (R,G,B,ENCR)	1x BNC, VS or VBS 1.0Vp-p/ 75Ω
MIC OUT 1	1x XLR, 3-pin, 0dBm/ 600Ω
MIC OUT 2	1x XLR, 3-pin, 0dBm/ 600Ω
Intercom (headset)	1x XLR, 5-pin, 0dBu Max +15dB
Remote 1	1x 4-pin, 1.5Vp-p or 1x D-sub, 9-pin RS-232C (Switchable)
Remote 2	1x 4-pin, 1.5Vp-p
Communication	1x D-sub 25-pin
Intercom	0dBm , 600Ω with 4-Wire, 0dBu or -15dBu, 200Ω with 2-Wires
TALLY OUT	1x D-sub 9-pin
R/G Tally	Contact or Voltage selectable
WFM control	1x D-sub 15-pin WFM 0-7, 0/5V,
Power supply voltage	CU-HD1000J AC100V @ 50/60Hz
	CU-HD1000U AC117V @ 60Hz
	CU-HD1000E AC230V @ 50Hz
HFOC maximum cable distance	3,000 meters* (9,840 feet*) with CCU power
Operating temperature	0°C to 40°C, 32°F to 104°F
Mass	7kg, 15.4lbs.
Power consumption	210W approx. (AC operation, including SK-HD1000,
	VF-402 and AUX POWER OUT 100VA)

CU-HD500 Camera Control Unit

Genlock	BNC, B-BST 0.45Vp-p/75ohm (loop through)
	HDTV tri-level sync 0.60Vp-p/75 Q (loop through)
Digital Return 1/2	BNC, HD SDI or SD SDI
Prompt	BNC, VS or VBS 1.0Vp-p/75ohm (loop through)
Intercom (Headset)	5-pin XLR, -60dBm
Communication	1x D-sub 25-pin
Intercom	0dBm, 600Ω/ 4Wire, 0dBu or -15dBu, 200Ω with 2-wires
PGM	0dBm, 600Ω
R/G TALLY	Contact or DC supply
Digital Out	2x BNC, HD-SDI (Embedded audio available)
	4x BNC, HD-SDI or SD-SDI selectable (Embedded audio available)
	HD-SDI or SD-SDI selectable PIX (Embedded audio available)
MIC OUT 1	1x XLR, 3-pin, 0dBm/ 600Ω
MIC OUT 2	1x XLR, 3-pin, 0dBm/ 600Ω
Intercom (headset)	1x XLR, 5-pin, 0dBu Max +15dB
Remote 1	1x 4-pin, 1.5Vp-p
Remote 2	1x 4-pin, 1.5Vp-p
MIC REMOTE	1x D-sub 15-pin MIC1.2 GAIN
TALLY OUT	1x D-sub 9-pin
(R/G Tally)	Contact 24V DC. 10mA
WFM control	1x D-sub 15-pin WFM 0-7, 0/5V
Power supply voltage	CU-HD500J AC100V @ 50/60Hz
	CU-HD500U AC117V @ 60Hz
	CU-HD500E AC230V @ 50Hz
HFOC maximum cable distance	3,000 meters* (9,840 feet*) with CCU power
Operating temperature	0°C to 40°C, 32°F to 104°F
Mass	9kg, 15.4lbs
Power consumption	300W approx. (AC operation, including SK-HD1000,
	VF-402 and AUX POWER OUT 100VA)

TU-HD1000 Triax base station

Genlock	BNC, B-BST 0.45Vp-p/75ohm (loop through)
	HDTV tri-level sync 0.60Vp-p/75 Q (loop through)
Digital Return 1/2/3/4	BNC, HD SDI or SD SDI
Analog Return 1/2	BNC, VS or VBS 1.0Vp-p/75ohm (loop through)
Prompt	BNC, VS or VBS 1.0Vp-p/75ohm (loop through)
Intercom (Headset)	5-pin XLR, -60dBm
Communication	
Intercom	0dBm , 600Ω/ 4Wire
PGM	0dBu or -15dBu ,200Ω at 2Wire 0dBm/ 600Ω
R/G TALLY	DC or contact supply
REMOTE 1	1.5Vp-p or RS-232C (Switchable)
REMOTE 2	1.5V p-p
Output signals	
ENCR	3x BNC, VBS 1.0Vp-p/75 Ω
R-Y or R	1x BNC, NTSC : 0.7Vp-p, PAL : 0.525Vp-p/ 75Ω
	VS 1.0Vp-p/ 75Ω (Selectable)
Y or G	1x BNC, VS 1.0Vp-p/ 75Ω
	1x BNC, VS 1.0Vp-p/ 75Ω (Selectable)
B-Y or B	1x BNC, NTSC : 0.7Vp-p, PAL : 0.525Vp-p/ 75Ω
	VS 1.0Vp-p/ 75Ω (Selectable)
Digital Out	3x BNC, HD-SDI (Embedded audio available)
	3x BNC, HD-SDI or SD-SDI selectable (Embedded audio available)
	HD-SDI or SD-SDI selectable PIX (Embedded audio available)
PIX (R,G,B,ENCR)	1x BNC, VS or VBS 1.0Vp-p/ 75Ω
WFM OUT (R,G,B,ENCR)	1x BNC, VS or VBS 1.0Vp-p/ 75Ω
MIC OUT 1	1x XLR, 3-pin, 0dBm/ 600Ω
MIC OUT 2	1x XLR, 3-pin, 0dBm/ 600Ω
Intercom (headset)	1x XLR, 5-pin, 0dBu Max +15dB
Remote 1	1x 4-pin, 1.5Vp-p or 1x D-sub, 9-pin RS-232C (Switchable)
Remote 2	1x 4-pin, 1.5Vp-p
Communication	1x D-sub 25-pin
Intercom	0dBm , 600Ω with 4-Wire, 0dBu or -15dBu, 200Ω with 2-Wires
TALLY OUT	1x D-sub 9-pin
R/G Tally	Contact or Voltage selectable
WFM control	1x D-sub 15-pin WFM 0-7, 0/5V,
Power supply voltage	TU-HD1000J AC100V @ 50/60Hz
	TU-HD1000U AC117V @ 60Hz
	TU-HD1000E AC230V @ 50Hz
Operating temperature	0°C to 40°C, 32°F to 104°F
Mass	7.9kg
Power consumption	210W approx. (AC operation, including SK-HD1000,
	VF-402 and AUX POWER OUT 100VA)

RU-1200VR/JY Operation Control Panel

Dimensions	"VR" Knob version : 102 (W) x 340 (D) x 55 (H) mm
	"JY" Joystick version : 102 (W) x 370 (D) x 55 (H) mm
Mass	1.5kg, 3.3lbs
Power input	+12VDC
Operational temperature	0°C to 40°C, 32°F to 104°F

RU-1500JY Operation Control Panel

Dimensions	102 (W) x 370 (D) x 56.2 (H) mm
Mass	1.3kg
Power input	+12VDC
Operational temperature	0°C to 40°C, 32°F to 104°F
Interface	RJ-45 connector, 4-pin connector

SU-1000 Setup Control Unit

Input signal	VE (Video Engineer) Switch input : Contact closure
Dimensions	385 (W) x 255 (D) x 65 (H) mm
Power input	100/117/220/240VAC, 50/60Hz, auto-sensing
Mass	4.1kg, 9lbs
Operational temperature	0°C to 40°C, 32°F to 104°F
Power consumption	Approx. 33VA
Interface	RJ-45 connector, 4-pin connector