Multi-Format Digital HDTV Production Camera

SK-HD1000

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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The ultra-efficient SK-HD1000 is a member of Hitachi’s “Green Products” Global initiative.

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 country’s 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 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. Its circuits’ miniaturization yield not only the smallest most flexible Hitachi HDTV camera to date but; one, the “greenest” and most 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 Hitachi’ s technology 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 14-bit analog-to-digital conversion

Hitachi cameras were the first on the market to recognize and implement 14-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 14-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 "DSPs" are designed under the 65nm rule with dynamic processing capability in excess of 50-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 65dB 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. This standard sensitivity is rated at F10 with 2000lx. 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 ensure 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 Interferences. 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 (his engineering manu) and on the front of the CU-HD1000 camera control unit. These meters indicate the optical condition of both the receive and transmit signal independently to accurately depict the proximity to the “digital cliff”, maximum cable distance or provide basic HFCO diagnostics in the field.

*HFOC distance with applied CCU power differs depending on the system configuration.

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 compression.

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, compressed portions of the picture by compressing the video past a certain point. These points are user adjustable.

Linear knee and its slope...
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**Hitachi’s advanced digital signal processing**
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**Setup memory and adjustment transfer card**
A small plug-in setup card (SD card) stores the 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.

**Superb High Definition picture reproduction & enhancement tools**

**Luminance response tools**

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- **Black stretch**
  Hitachi’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 images (e.g. at the “digital cliff”, maximum cable distance or provide basic HFCC diagnostics in the field).

- **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 function provides the perception of a wider dynamic range by dynamically compressing (laying knee and slope) the video level in accordance to the strength of its over-exposure.
Color reproduction excellence

- **Skin-tone masking** provide the user wide latitude in subject image color functions thereby adding an additional color-correction (Triple-masking) of Skin tones without affecting other colors in the scene. This functions can take on the functions of VF Detail on/off, marker-1 or marker-2 FAW to the CS-1 switch via the operation menu. The CA-CS switch can be stored in the Scene files and its status can be displayed on the viewfinder markers & 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.  
| J-LOOK 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 available 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 320 & 54(720SP) camera head versions with colour temperature filters for 3200K, 4300K, 5600K & 8000K.

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 various 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.

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 lenses’ modulation shading characteristics to optimize the X1 and XG 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 8-axis linear matrix provides overall color control thereby providing the user with excellent and precise color rendition control.
  - **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 detail** The Skin-tone detail functions allow a flash 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.

- **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”.

- **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.

- **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.

- **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. Some of these adjustments are; H/V detail, crisp, level dependence, knee detail, limiter, source, frequency and balance.

- **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.

- **Quick 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.

- **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 graduations of 3200K, 4300K, 5600K, 6300K and 8000K. Only ECC 5600K only in the 32 & 54(720SP) 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 viewfinder and the monitor or 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, JVY 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.

- **Versatile CCD drive functions**

- **Versatile color reproduction excellence**

- **Easy of use characteristics & functions**

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

- **Comprehensive cameraperson operation panel** In studio production with SK-HD2000 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 prompted 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 teleprompter out, and 1 HD-SDI switchable as Monitor or VF and RET video output via BNC connectors. The MIC-1 channel is switchable with BNC output, 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 head. All the microphone input provides phantom power supplies and accept mic or line levels. These IO's satisfy a wide variety of production requirements and are provided as well as most broadcast-grade cameras.
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 XD 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 secondary combinations of colors. The 6-axis linear matrix provides overall color control thereby providing the user with excellent and precise color rendition control.

**Skin-tone masking**

The Skin-tone masking function provides the user with ability to target the color saturation level in highly color-saturated portions of the picture such as the petals in flowers. This function allows the user to maintain the color saturation level in highly color-saturated portions of the picture such as the petals in flowers.

**Chroma Saturation**

In addition to the extensive colorimetry controls offered in the SK-HD1000, the overall color saturation can be varied to achieve what is referred to as “dramatic” or artistic “effects”.

**Automatic optical saturation correction**

SK-HD1000, the overall color saturation can be varied to achieve the impression of more youthful TV personalities.

**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.

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 target or to achieve a desired “look” in your productions. Some of these adjustments are: 
- High Detail, Crisp, level dependence, Knee detail, Limiter, source, frequency and balance.
- Skin-tone detail

- 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, theater stage lighting, and colored night scenes.

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Optical and image capture functions

**Versatile CCD drive functions**

Four modes of shutter operation are provided in the SK-HD1000 camera system:
- PRESET electronic shutter speeds. For stopping action or fast moving objects in the image.
- AUTO 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 52 & 54/52SP camera head versions with colour temperature filters for 3000K, 4000K, 5600K, and 8000K. Only ECC 5600K only in the 52 & 54/52SP 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 viewfinder 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 (FAWB) 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 on/marker 2 on/off.

**Viewfinder options**

Three viewfinder functions are offered with the SK-HD1000 camera system. A Black & White CRT-type viewfinder are manufactured for ENG 2-inch and CBM 3-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.

**Viewfinder markers & functions**

The SK-HD 1000 provides an excellent gamut of thoughtful viewfinder markers and functions to aid the cameraperson 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/ brightness, 2 mode zebra and variable line display level polarity.

**Camera head inputs & outputs**

The camera head provides 2 buffered HD-SDI, 1 SD analog telecine output, and 1 HD-SDI switchable as Monitor or VF and RET video output via BNC connectors. The MIC-1 channel is switchable with 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.
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.

Additional lens mounting options for the SA-1000

Dockable: One camera body to suit multiple configurations

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

Flexible Choice of Camera Control Units

Three models of Camera Control Units are offered for the SK-HD1000 cameras system. The CU-HD1000/TU-HD1000 and the CU-3300 CCUs serve applications for Studio and Field production.

The CU-HD1000/TU-HD1000 offer the ability of 50/60Hz line power switching. They have compliant with RoHS/ WEEE directives* and as a standard function, the ability to output 1080i or 720p. Its reduced size (half-rack width/3RU’s high), light weight (3kg 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-3300 is (98mm) high and, of 2-RU EIA 19-inch rack width. It offers additional IOs (input, outputs) to improve its flexibility and use in elaborate technical installations.

Both CCUs are of easy-to-maintain modular design; employ the same control panels, data cables and peripherals. Other common CCU features include:

- Unique Optical Power Meter
- 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
- ARRI-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

** (See detailed specifications on the last page of this brochure)

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
- Employing no RF modulation or modems
- Little if no signal degradation
- Capabilities on reduced costs and flexibility of triaxial copper cables
- Includes 1080/ 720p cross-converter for HD-SDI outputs
- Build in, high-performance SDTV up/down converters
- Similar I/O's as the CU-HD1000

Multi-Format Digital HDTV Production Camera

SK-HD1000

Dockable: One camera body to suit multiple configurations

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

HDTV dockable recorder Fiber cable Adaptor Triax cable Adaptor

TU-HD1000/CX-HD1000 Digital Triax System

CU-HD1000 Rear Panel

CX-HD1000 Triax adaptor

TU-HD1000 Triax base station

LM-B1000/SA-1000

LM-C1000/SA-1000

LM-F1000/SA-1000

LM-P1000/SA-1000

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- Similar I/O's as the CU-HD1000

*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 produc
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- 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.

Additional lens mounting options for the SA-1000

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

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

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-3300 CCUs serve applications for Studio and Field production. The CU-HD1000/TU-HD1000 offer the ability of 50/60Hz line power switching. They have compliant with RoHS/ WEEE directives* and as a standard function, the ability to output 1080i or 720p. Its reduced size (half-rack width/3RU’s high), weight (approx. 7kg) 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-3300 is (88mm) high and, of 2-RU EIA 19-inch rack width. It offers additional IOs (input, outputs) to improve its flexibility and use in elaborate technical installations.

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

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** (See detailed specifications on the last page of this brochure)

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 adapter and the corresponding TU-HD1000 camera control unit.

The main advantages and characteristics are:

- Hitachi’s patented, fully digital, bi-directional signal transmission system
- No RF modulation or modems
- No color degradation
- Capacities on reduced costs and flexibility of traditional copper cables
- Includes 1080i/ 720p cross-converter for HD-SDI outputs
- Build in, high-performance SDTV up/ down converters
- Similar IO’s as the CU-HD1000

Multi-Format Digital HDTV Production Camera

SK-HD1000

ACCESSORIES

Multi-Format Digital HDTV Production Camera
**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-HD500 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 outfitted with alternate mounts thereby decreasing the overall system cost.

**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 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 bias and data between cameras or groups of cameras.
- Adjustment and file data (meta/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.

**System configuration chart**

The RU-1500JY has all the functionality of the RU-1200JY, but with touchscreen panel operation and Ethernet connectivity and cabling.
**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-HD500 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 outfitted with alternate mounts thereby decreasing the overall system cost.

**System configuration chart**

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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.

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- The RU-1500JY has all the functionality of the RU-1200JY, but with touchscreen panel operation and Ethernet connectivity and cabling.
### SPECIFICATIONS

#### SK-HD1000 Camera Head
- **Image Sensor**
  - 1/2.8" Super Advanced, micro lens IT-CCD

- **Effective pixels**
  - 1,920(H) X 1,080(V), 1,296(H) X 726(V)

- **Horizontal resolution**
  - 650TVL

- **Sensitivity**
  - F10 @2000lx, 3200K, 89.9% reflectance

- **Optical Filters**
  - Super-Advanced, micro-lens IT-CCD

- **Gain selection**
  - H (high) +3, +6, +9, +12, +15, +18, +21, +24dB

- **Registration**
  - Overall 0.01% (excluding lens limitations).

- **Power consumption**
  - 5W (approx)

- **Dimensions**
  - 2.2Kg, 4.8lbs.

#### CA-HF1000 Fiber Camera Adaptor
- **Electrical Interface**
  - 3x BNC, HD-SDI (Embedded audio available)

- **Input signals**
  - 3x BNC, NTSC : 0.7Vp-p, PAL : 0.525Vp-p/ 75Ω

- **Output signals**
  - 2x BNC, NTSC : 0.7Vp-p, PAL : 0.525Vp-p/ 75Ω

- **Signal black reference**
  - DC or contact supply

- **Supply voltage**
  - 0dBu or -15dBu ,200Ω at 2Wire

- **Power consumption**
  - 18W (approx)

- **Communications**
  - 1.5Vp-p or RS-232C (Switchable)

- **Dimensions**
  - 1.8Kg, 4.0lbs.

#### CU-HD1000 Camera Control Unit
- **Input/Output**
  - 1x XLR, 5-pin, 0dBu Max +15dB

- **Audio**
  - 1x XLR, 5-pin, 0dBu Max +15dB

- **AES**
  - 1x D-sub 15-pin  WFM 0-7, 0/5V,

- **Dimensions**
  - 216 (W) x 181 (D) x 90 (H) mm

#### RU-1200VR/JY Operation Control Panel
- **Input/Output**
  - 2X 4-pin XLR, 12VDC, power input.

- **Audio**
  - 1X 5-pin, 230VAC, 60W~100W, external prompter Tally drive out.

- **Dimensions**
  - 385 (W) x 255 (D) x 65 (H) mm

#### SU-1000 Setup Control Unit
- **Input/Output**
  - 1X 8-pin XLR, 5-pin, -60dBm

- **Audio**
  - 1X 5-pin XLR, -60dBm

- **Dimensions**
  - 385 (W) x 255 (D) x 65 (H) mm

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**Multi-Format Digital HDTV Production Camera**

**CU-HD1000 Camera Control Unit**

**SU-1000 Setup Control Unit**

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**CA-HF1000 Fiber Camera Adaptor**

**SK-HD1000 Camera Head**

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**CX-HD1000 Triax Camera Adaptor**

**VF-402 B&W CRT ENG Viewfinder**

**VF-LS4D LCD Color Studio Viewfinder**

**VF-HD500 B&W CRT Studio Viewfinder**

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**Dimensions:**

**CU-HD1000**

**SU-1000**
**SK-HD1000 Camera Head**

- **Input & Output**
  - Camera head: 2X HD-SDI out, 1X SD analog teleprompter out switchable
  - AUX POWER OUT 100VA

- **Dimensions**
  - 385 (W) x 255 (D) x 65 (H) mm

- **Power Consumption**
  - Approx. 33VA

- **Operational Temperature**
  - 0°C to 40°C, 32°F to 104°F

**TU-HD1000 Triax base station**

- **Input & Output**
  - Communication: 1x D-sub 25-pin, 1x 4-pin, 1.5Vp-p
  - Video Inputs & Outputs: 3x BNC, VBS 1.0Vp-p/75 Ω

- **Dimensions**
  - 7°C to 40°C, 46°F to 104°F

**SU-1000**

- **Dimensions**
  - 385 65

**CA-HF1000 Fiber Camera Adaptor**

- **Video Transmission**
  - 1X motorized filter wheel w/4 filter positions.

- **Operational Temperature**
  - 0°C to 40°C, 32°F to 104°F

**VF-402 B&W CRT ENG Viewfinder**

- **Video Inputs & Outputs**
  - 14-pin XLR, -60dBm

**VF-L9HD LCD Color Studio Viewfinder**

- **Video Inputs & Outputs**
  - 1x XLR, 3-pin, 0dBm/ 600Ω

**VF-HD500 B&W CRT Studio Viewfinder**

- **Video Inputs & Outputs**
  - 1x XLR, 3-pin, 0dBm/ 600Ω

**SU-1000 Setup Control Unit**

- **Dimensions**
  - 656 (W) x 137 (H) x 137 (D) mm

**CU-HD1000 Camera Control Unit**

- **Communication**
  - 1x 4-pin, 1.5Vp-p

**RU-1200VR/JY Operation Control Panel**

- **Dimensions**
  - 641 (W) x 216 (H) x 57 (D) mm

**Dimensions**

- **VF-402**
  - 216118 (7.8)(5.8) 400 (2.9)

- **VF-L9HD**
  - 385 (W) x 255 (D) x 65 (H) mm

- **VF-HD500**
  - 385 (W) x 255 (D) x 65 (H) mm

**SK-HD1000 Camera Adaptor**

- **Video Transmission**
  - Super-Advanced, micro-lens IT-CCD.

- **Power Consumption**
  - 15W (approx)

**CA-HF1000 Fiber Camera Adaptor**

- **Video Transmission**
  - ND  CAP, 1:CLEAR, 2:1/4ND, 3:1/16ND

**VF-402 B&W CRT ENG Viewfinder**

- **Video Inputs & Outputs**
  - 1x BNC, NTSC : 0.7Vp-p, PAL : 0.525Vp-p/ 75Ω

**VF-L9HD LCD Color Studio Viewfinder**

- **Video Inputs & Outputs**
  - 1x BNC, NTSC : 0.7Vp-p, PAL : 0.525Vp-p/ 75Ω

**VF-HD500 B&W CRT Studio Viewfinder**

- **Video Inputs & Outputs**
  - 1x BNC, NTSC : 0.7Vp-p, PAL : 0.525Vp-p/ 75Ω

**VF-402**

- **Video Inputs & Outputs**
  - 1x BNC, NTSC : 0.7Vp-p, PAL : 0.525Vp-p/ 75Ω

**VF-L9HD**

- **Video Inputs & Outputs**
  - 1x BNC, NTSC : 0.7Vp-p, PAL : 0.525Vp-p/ 75Ω

**VF-HD500**

- **Video Inputs & Outputs**
  - 1x BNC, NTSC : 0.7Vp-p, PAL : 0.525Vp-p/ 75Ω

**CU-HD1000 Camera Control Unit**

- **Communication**
  - 1x 4-pin, 1.5Vp-p

**SU-1000 Setup Control Unit**

- **Dimensions**
  - 656 (W) x 137 (H) x 137 (D) mm

**SU-1000**

- **Dimensions**
  - 656 (W) x 137 (H) x 137 (D) mm
Multi-Format Digital HDTV Production Camera
SK-HD1000

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

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