RU-1000VR Remote Control Unit

Dimensions	"VR" Knob version : 116 (W) x 182 (D) x 60 (H) mm
Mass	0.6Kg. 1.2lbs.
Power input	+12VDC
Operational temperature	0°C to 40°C, 32°F to 104°F
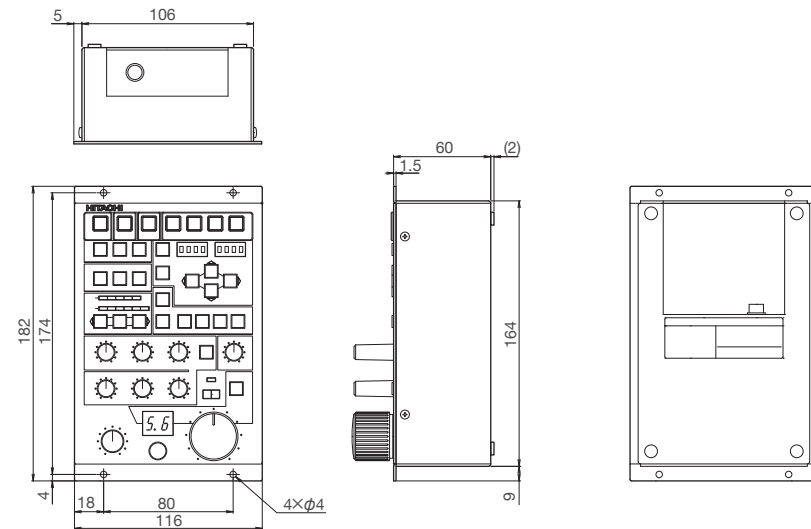
DIMENSIONS (Z-HD5000)
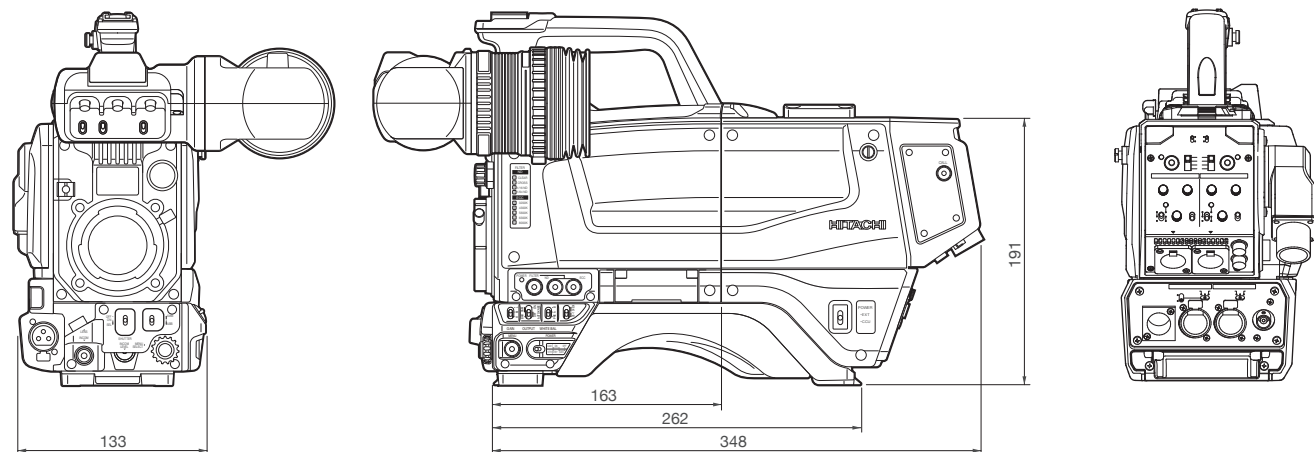
⚠️ **CAUTION :** To ensure safe operation, please read the instruction manual before using this product.

Hitachi Kokusai Electric

HITACHI
Inspire the Next

Professional HDTV Camera System
Z-HD5000

Introducing the newest member of the prestigious Z-camera family of economical HDTV cameras.

Hitachi Z-HD5000 Multi-application HDTV Studio and Field Production Camera

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 Z-HD5000 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 Z-HD5000 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 Z-HD5000 in theory (14-bit), allow for signals in excess of 58dB 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 58dB 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.

Digital signal transmission via Hybrid Fiber Optical Cable

The Z-HD5000 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 Z-HD5000 transmission system. The maximum HFOC length with applied camera power and fully operational facilities is ,3000 meters* (9,840 feet*).

Unique to cameras in the Z-HD5000' s price range are optical power meters at the camera head (via engineering menu) and on the front of the CU-HD5000 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

Black stretch
The Z-HD5000'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.

Ultra-Gamma
A new and useful function implemented in the Z-HD5000 is the Ultra-Gamma function. It dramatically increases the exposure latitude of the camera in shooting conditions where lighting and scenery vary widely in intensity. Seven different ultra-gamma responses are pre-programmed to suit just about every possible adverse shooting condition.

Color reproduction excellence

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 Z-HD5000, 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)

ULTRA GAMMA

Chart axes: OUTPUT VIDEO (0, 25, 50, 75, 100, 125, 150) vs INPUT SIGNAL (0, 100, 200, 300, 400, 500, 600)

Legend:
- Standard
- 1 (90%)
- 2 (85%)
- 3 (80%)
- 4 (75%)
- 5 (70%)
- 6 (65%)
- 7 (50%)
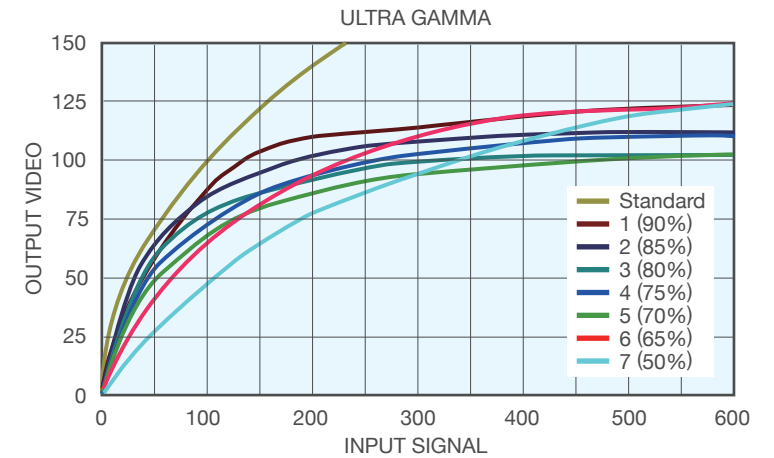
Picture sharpness enhancement

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)

Flexible Choice of Camera Control Units

Two models of Camera Control Units are offered for the Z-HD5000 camera system. The CU-HD1000 and the CU-HD500 CCUs both serve applications for Studio and Field production.

The CU-HD1000 offers the ability of 50/60Hz line power switching, it is compliant with RoHS/ WEEE directives* and as a standard function, the ability to output 1080i (50/59.94) or 720p (50/59.94) (CU-HD1000). Its reduced size (half-rack width/ 3RU' s high), weight (7Kg approx.) and improved power consumption make it ideal for OB applications**. It also includes a unique optical power meter that indicates the status of the HFOC.

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

- Dual HD TV format outputs. Switchable between 1080i (50/59.94) and 720p (50/59.94). (CU-HD1000)
- 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. (CU-HD1000)
- 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.

*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

CU-HD500

CU-HD500 Rear Panel

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 Z-HD5000 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.

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

Remote Control Unit

- The RU-1000VR / RU-1200JY / RU-1500JY Remote Control Unit is a new design of remote operation panels for the Hitachi Z-HD5000. 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-1500JY has all the functionality of the RU-1200JY, but with touchscreen panel operation and Ethernet connectivity and cabling.

RU-1200JY

RU-1500JY

RU-1000VR

Studio and Field Production Viewfinders

The Z-HD5000 camera system offers two choices for Studio or Field production viewfinders. Model VF-L90HD 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.

VF-L90HD Viewfinder/AT-951

VF-HD500 Viewfinder/AT-550

System configuration chart

Microphone adaptor
MH-1000 (for long Mic)
MH-402 (for short Mic)

2-inch viewfinder
VF-402

Portable Zoom Lens

Camera head
Z-HD5000

Tripod adaptor
TA-Z3

Camera adaptor
CA-HF1000

9-inch Viewfinder
VF-L9HD

Viewfinder hood
HO-1900-R1

Viewfinder adaptor
AT-950/AT-951
Viewfinder adaptor
AT-90

5-inch Viewfinder
VF-HD500
Viewfinder adaptor
AT-550
Viewfinder adaptor
AT-500

Carring case
CL-1000

Remote control units
RU-1000VR/RU-1200JY/RU-1500JY

Fiber cable

Remote control cable

Camera control unit
CU-HD1000
Camera control unit
CU-HD1000

Camera control unit
CU-HD500

Setup control unit
SU-1000

SPECIFICATIONS

Z-HD5000 Camera Head

|	
Imaging Device	(3X - RGB) 2/3-inch, 16:9, 1M Pixel Super-Advanced, micro-lens IT-CCD
TV System	1,920(H) X 1,080(V) / 59.94i / 50i
Optical system	F1.4 prism
Optical Filters	1X manual filter wheel w/4 filter positions Clear, Cross, 1/16ND, 1/64ND
	ECC (Electronic Color Correction) with 5 settings (3200K, 4300K, 5600K, 6300K, 8000K)
Sensitivity	F10 @2000lx, 3200K, 89.9% reflectance
Signal to Noise Ratio	58dB
Horizontal resolution	>800 TVL (1080i)
Registration	Negligible (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 (59.94i)
	1/60, 1/250, 1/500, 1/1000, 1/2000 (50i), AES, CC Frame
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
Input & Output	1X BNC HD-SDI VF out (Character ON/OFF) or HD-SDI RET out
	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

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	0ºC to 40ºC, 32ºF to 104ºF
Power consumption	Approx. 33VA
Interface	RJ-45 connector, 4-pin connector

9-inch viewfinder VF-L90HD

Construction	1080i/720p field frequency= 50/59.94Hz
Number of pixels	1280(H) x 768(V) normal scan (16:9)
Color temperature	6500K
Input Signals	Analogue Y/Pb/Pr/SYNC
Functions	BRIGHT, CONTRAST, PEAKING knob VR power on/off, tally on/off, Marker on/off, (center marker, 4 : 3 marker, area marker)
Internal tally	Red/Green
Dimensions	230(W) x 185(H) x 86(D)
Mass	1.6kg, 3.5lbs
Attachment (Option)	AT-951(mass : 1.6kg, 3.5lbs AT-90 (mass : 0.7kg, 1.54lbs)
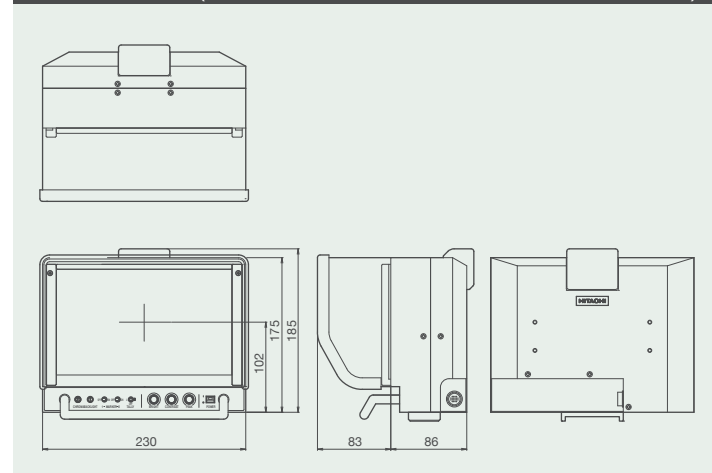
CA-HF1000 Fiber Camera Adaptor

|	
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 to 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 shared with Genlock in
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.

2-inchviewfinder VF- 402 (59.94Hz) / VF-402E (50Hz)

Construction	Metal Die-cast chassis & mount 2-inch BW 16:9 CRT Diopter (CRT Focus Ring) VF angle rotation X-Y mechanical movement
Resolution	650 TV lines
Functions	BRIGHT, CONTRAST, PEAKING knob VR (front facing)
Internal tally	Red/Green
Tally switch	Tally switch OFF NORMAL HIGH

VF-HD500 B&W CRT Studio Viewfinder

|	
TV System	50 or 60Hz, 1080i
Construction	High-impact plastic
CRT	5-inch B&W 4 : 3 CRT with removable hood
Camera mounts	2X, AT-500/ AT-550
Resolution	750TVL
Functions	Bright, Contrast, Peaking, knobs VR front-facing
Internal Tally	Red/ Green, Front-facing high brightness lamp
Tally controls	Tally On/ Off
Mass	1.8kg, 4lbs
Power consumption	15W (approx.)
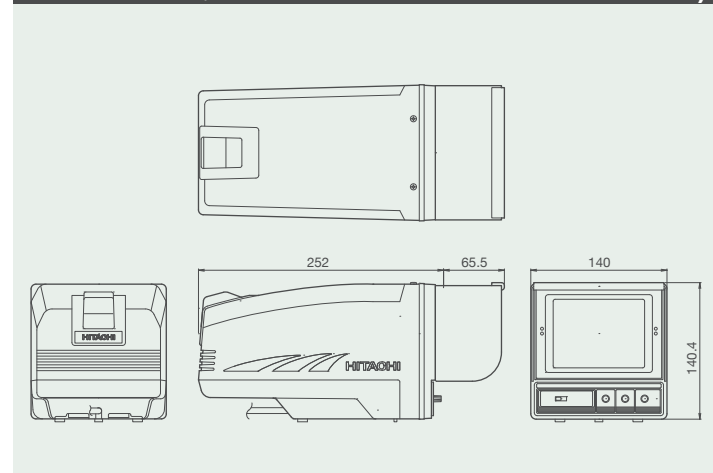
CU-HD1000-S8 Camera Control Unit

Genlock		1x BNC, B-BST 0.45Vp-p/75Ω (loop through)
		HDTV tri-level sync 0.60Vp-p/75Ω (loop through)
Digital Return 1/2/3/4		4x BNC, HD SDI or SD SDI
Analog Return 1/2		2x BNC, VS or VBS 1.0Vp-p/75Ω (loop through)
Prompt		1x BNC, VS or VBS 1.0Vp-p/75Ω (loop through)
Intercom (Headset)		5-pin XLR, -60dBm
Communication		1x D-sub 25-pin,Incom,Tally
	Intercom	0dBm / 600Ωat 4Wire,0dbu or -15dbu/200Ωat 2Wire
	PGM	0dBm / 600Ω
	R/G TALLY	DC or contact supply
Output signals		
	ENCR	3x BNC, VBS 1.0Vp-p/75Ω
	R-Y or	1x BNC, NTSC : 0.7Vp-p, PAL : 0.525Vp-p/ 75Ω
	R	VS 1.0Vp-p/ 75Ω (Selectable)
	Y or	1x BNC, VS 1.0Vp-p/ 75Ω
	G	1x BNC, VS 1.0Vp-p/ 75Ω (Selectable)
	B-Y or	1x BNC, NTSC : 0.7Vp-p, PAL : 0.525Vp-p/ 75Ω
	B	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
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		0ºC to 40ºC, 32ºF to 104ºF
Mass		8.5kg, 19.1lbs.
Power consumption		210W approx. (AC operation, including SK-HD1000, VF-402 and AUX POWER OUT 100VA)
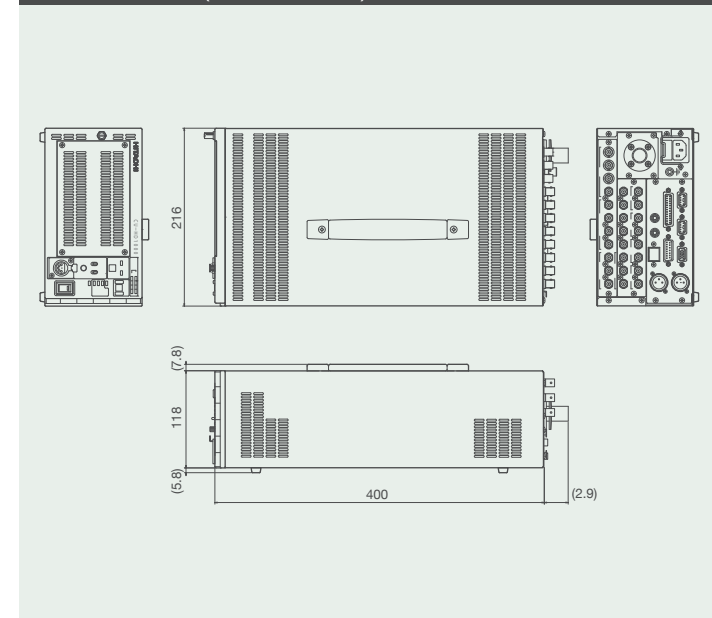
CU-HD500 Camera Control Unit

Genlock		1x BNC, B-BST 0.45Vp-p/75Ω (loop through)
		HDTV tri-level sync 0.60Vp-p/75Ω (loop through)
Digital Return 1/2		1x BNC, HD SDI or SD SDI
Prompt		1x BNC, VS or VBS 1.0Vp-p/75Ω (loop through)
Intercom (Headset)		5-pin XLR, -60dBm
Communication		1xD-sub 25-pin,Incom,Tally
	Intercom	0dBm / 600Ω at 4Wire,0dbu or -15dbu / 200Ω at 2Wire
	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		0ºC to 40ºC, 32ºF to 104ºF
Mass		9kg, 15.4lbs
Power consumption		300W approx. (AC operation, including SK-HD1000, VF-402 and AUX POWER OUT 100VA)

* The maximum length of the cable supplying power to the camera varies with the camera system configuration and with the type of optical fiber cable.

DIMENSIONS (VF-L9HD LCD Color Studio Viewfinder)

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

DIMENSIONS (CU-HD1000)

DIMENSIONS (CU-HD500)