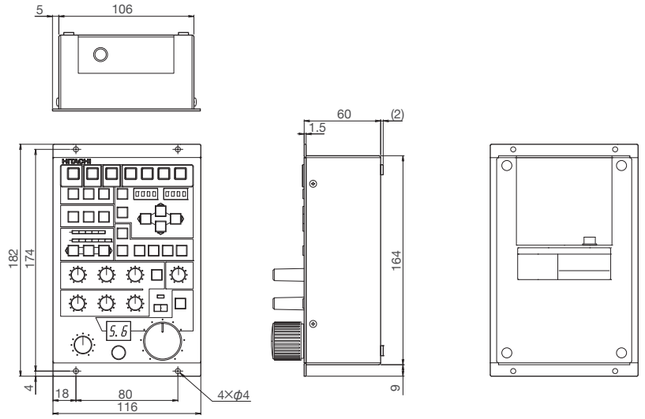
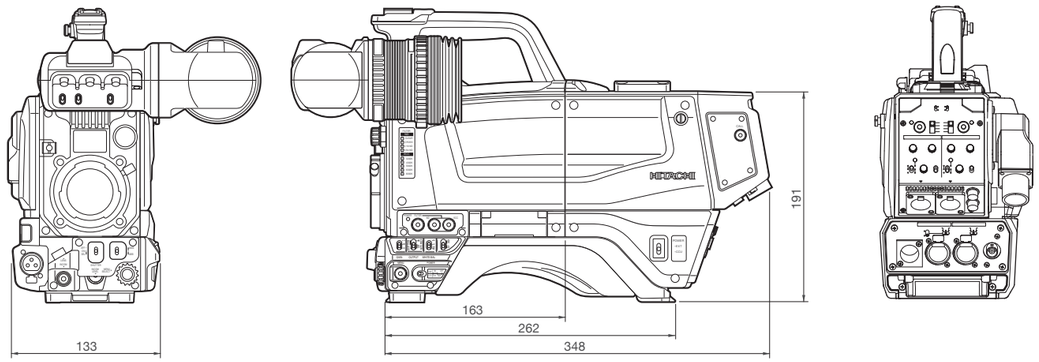
RU-1000VR Remote Control Unit

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.

These Specifications are subject to change without notice.

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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

Professional HD Camera System

Z-HD5000

Premier user of 16-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) 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 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 (16-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-HD500 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 dependent 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.

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 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
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	8.5kg, 19.1lbs.
Power consumption	210W approx. (AC operation, including Z-HD5000, VF-402 and AUX POWER OUT 100VA)

CU-HD500 Camera Control Unit

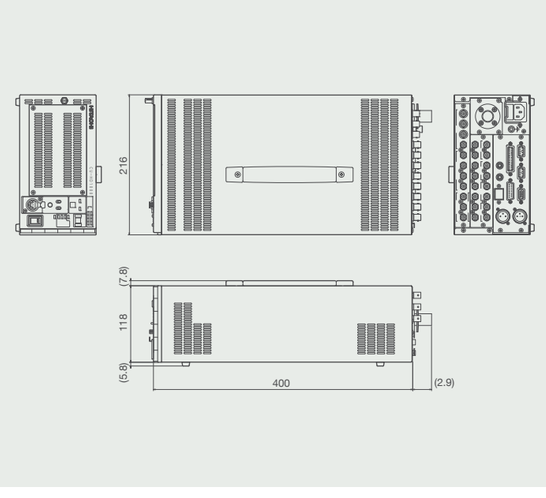
Genlock	1x BNC, B-BST 0.45Vp-p/75Ω (loop through) HDTV tri-level sync 0.60Vp-p/75Ω (loop through)
Digital Return 1/2	1x BNC, HD SDI or SD SDI
Prompt	1x BNC, VS or VBS 1.0Vp-p/75Ω (loop through)
Intercom (Headset)	5-pin XLR, -60dBm
Communication	1xD-sub 25-pin,Incom,Tally
Intercom	0dBm / 600Ω at 4Wire, 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 (R/G Tally)	1x D-sub 9-pin 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 Z-HD5000, 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.

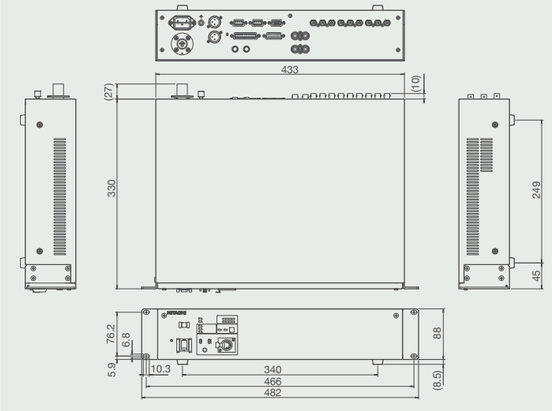
SU-1000 Setup Control Unit

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

DIMENSIONS (CU-HD1000)



DIMENSIONS (CU-HD500)



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

9-inch viewfinder VF-L90HD

Construction	1080i/720p field frequency 59.94/50Hz
Number of pixels	1280(H) x 768(V) normal scan (16:9)
Color temperature	6500K
Input Signals	Analog 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)

7-inch Viewfinder HDF-700H

Picture Resolution	800 (H) x 480 (V)
Input Signals	Analog Y/Pb/Pr
Internal tally	Red/Green
Dimensions	195 (W) x 153 (H) x 50 (D)mm
Mass	1.0kg, 2.2lbs approx.

Fiber Camera Adaptor CA-HF1000 / CA-HF1000E

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 5-pin script lamp +12VDC (1.0A max) 1x 6-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-inch Viewfinder VF-402 (59.94Hz) / VF-402E (50Hz)

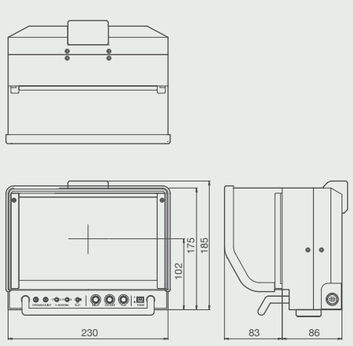
Construction	Metal Die-cast chassis & mount 2-inch BW 16:9 CRT Diopter (CRT Focus Ring) VF angle rotation X-Y mechanical movement
Resolution	650 TV lines
Functions	BRIGHT, CONTRAST, PEAKING knob VR (front facing)
Internal tally	Red/Green
Tally switch	Tally switch OFF NORMAL HIGH

B&W CRT Viewfinder VF-HD500 (59.94Hz) / VF-HD500E (50Hz)

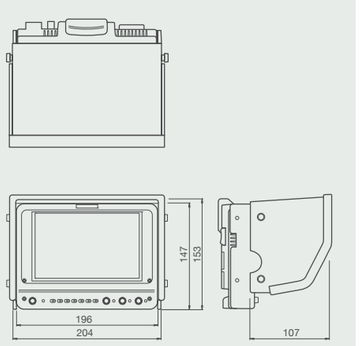
Construction	High-impact plastic
CRT	5-inch B&W 4 : 3 CRT with removable hood
Resolution	750TVL
Functions	Bright, Contrast, Peaking, knobs VR front-facing
Internal Tally	Red/ Green, Front-facing high brightness lamp
Tally controls	Tally On/ Off
Mass	1.8kg, 4lbs
Power consumption	15W (approx.)

DIMENSIONS

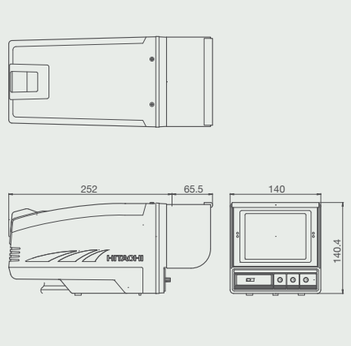
VF-L90HD LCD Color Studio Viewfinder



HDF-700H LCD Color Studio Viewfinder



VF-HD500 B&W CRT Studio Viewfinder



Superb High Definition picture reproduction & enhancement tools

Real-time Lens Aberration Correction (RLAC)

Modern HDTV lenses can still produce certain optical distortions. One of these called “Lateral chromatic aberration” can be reduced in certain model of lenses when used with the Z -HD5000 camera system. The Hitachi function is called RLAC meaning “Real-time-lens-aberration-correction” and it dynamically corrects the image using the correction data provided by the digital interface between the lens and camera.

Full Frame RLAC OFF RLAC ON

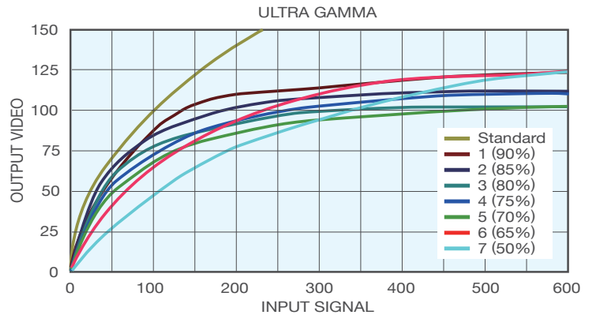
Luminance response tools

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

Triple-masking

The triple-masking function includes 12-vector, linear matrix and Skin tone masking providing users wide latitude in subject image color control. The 12-vector color corrector provides independent control of hue and saturation for six primary and six secondary combinations of colors. A 6-axis linear matrix provides overall color control for excellent, precise color rendition control. The Skin tone masking function provides “fine painting” (hue and saturation) of skin tones without affecting other colors in the scene.

Skin tone masking OFF

Skin tone masking ON (Simulated image)

Auto Chroma

Auto Chroma automatically reduces over-saturated colors in the image caused by extremely bright and colorful objects such as emergency vehicle lights or stage lighting L.E.D’s. Also has the effect of ‘legalizing’ the color gamut of a particular preset masking setting.

Chroma Saturation

Total chroma saturation allows control over the amount of color in the image. A purely black & white image can be also be achieved.

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)

Other Useful Production Camera Features

Prompter and floor monitor power

Enough AC Power available to drive 2x 24inch LCD monitors with either Hybrid Fiber Cable or Digital Triax CCUs.

Focus Assist

Focus Assist supports 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.

Gray-Scale automatic setup

The Z-HD5000 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.

ACCESSORIES

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 HD-SDI / SD-SDI digital outputs.
- VBS, Analog RGB or Y, B-Y, R-Y component outputs.(CU-HD1000)
- 4 auxiliary returns (CU-HD1000) / 2 auxiliary returns (CU-HD500)
- Dedicated teleprompter channel.
- ARIB-type color bar output.
- 2 channel balanced analog Mic audio outputs or embedded .
- 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.
- Selectable Hybrid fiber or Single mode fiber (CU-HD500)
  Single mode fiber up to 6km

*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

CU-HD1000 Front Panel


CU-HD1000 Rear Panel

CU-HD500

CU-HD500 Front Panel


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 is a compact remote operation panel designed for easy operation of standard camera functions. Iris and master black adjustments employ "VRtype" rotary knob controls and commonly used controls and functions are directly and instantaneously accessible to the video control engineer.

- The RU-1500JY is a high performance touchscreen remote operation panel designed for ease of use. Easily adjustable using the 3.5" LCD touchscreen panel and rotary encoders, plus custom switches to further support the professional user in designing a personal workflow . The RU-1500JY provides an integrated SD card slot for transferring user setup and Scene File information , and Ethernet connectivity for control over an IP network.

RU-1000VR

RU-1500JY

Studio and Field Production Viewfinders

The Z-HD5000 camera system offers three choices for Studio or Field production viewfinders. Model VF-L90HD is a color 9-inch TFT-LCD screen and Model HDF-700H is a color 7-inch TFT-LCD screen which are designed for critical color viewing of the image . TFT-LCD screens are 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


VDF-700H Viewfinder
/AT-750

VF-HD500 Viewfinder
/AT-550

System configuration chart