

Panasonic
ideas for life

4/2011

Multi-format Camera
AK-HC3500

*Powerful multi-format digital camera with a new
IT-3CCD delivering 1080i native resolution*



High image quality, easy operation and outstanding reliability from a new generation HD multi-format camera



The AK-HC3500 is the zenith of advanced camera design. In addition to a unique 2/3 type IT-3CCD and spatial offset processing technologies, it offers a newly-developed 14-bit A/D converter and 38-bit Digital Signal Processing LSI for exceptional image quality. To satisfy the demands of shooting in the field, it also features an ergonomic design for easier, more comfortable use. Add to this outstanding performance, and you have the ideal studio and field multi-format camera for the high definition era.

Two types of HD formats, 1080/59.94i and 1080/50i, can be switched.

The AK-HC3500's multi-format capability makes it perfect for demanding broadcasts and program production at home and abroad.

Compatible formats

HD

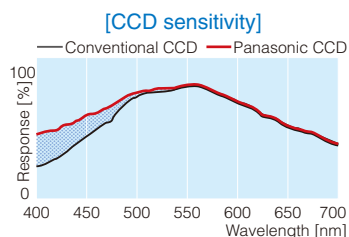
1080/59.94i, 1080/50i

Panasonic's unique high sensitivity, low smear 2/3 type 2.2-megapixel IT-3CCD.

Panasonic CCD sensor technology and the improved on-chip lens performance offers a high sensitivity of F10 (1080/59.94i) /F11 (1080/50i) at 2 000 lx, a low smear level and an excellent signal to noise ratio of 60 dB.

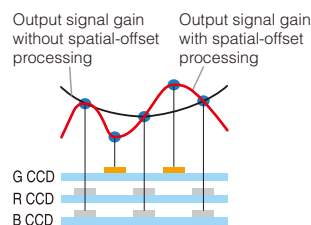


CCD/prism assembly

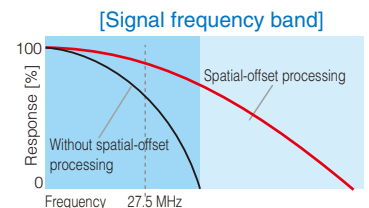


Blue channel sensitivity has been improved approximately 3 dB to achieve a better response ratio. Even deep-blue colors can be reproduced with vivid chrominance and significantly reduced noise.

Panasonic's single-channel transfer system and spatial-offset processing technologies improve signal modulation depth and reduce moire.



With spatial-offset processing, green samples are offset, allowing motion in the object to be more faithfully reproduced.



With spatial-offset processing, the depth of modulation of high-frequency signals is greatly improved.

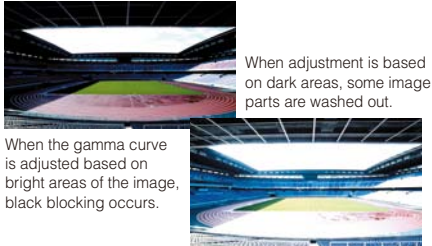
14-bit A/D converter and latest 38-bit Digital Signal Processing (DSP) provide clear, sharp images from dark to bright areas.

A/D conversion is 14-bit compared to conventional 12-bit. There's also a newly-developed 38-bit Digital Signal Processing (DSP) and Panasonic's original real-time gamma correction to enable high quality images with Dynamic Range Stretch (DRS) and other high-performance functions.

Dynamic Range Stretch (DRS) Function

DRS helps assure high image quality when shooting extremely contrasty scenes. It's also effective when shooting standard scenes because it avoids aliasing (knee artifacts) which can be unattractive for on-screen talent.

Before correction



After correction



Clear, sharp reproduction of both bright and dark areas.

Cine Gamma Curve

Thanks to its cine gamma curve, the AK-HC3500 can produce pictures with the same kind of tonal beauty, natural gradation, and rich colors you get with film recordings.



Color Correction

The 12-vector variable masking circuit allows precise and independent hue and saturation adjustment of individual colors.



* Color correction restricted to the red colors.

Skin Tone Detail Correction

Separately defocusing two skin tones helps tone down wrinkles and dull areas to produce beautiful, naturally textured results when shooting people. And since defocusing is possible throughout the entire hue phase (360 °), defocusing can also be applied for colors other than skin tones.



Beautiful results with fewer wrinkles and other blemishes

Enhanced DTL Signal Processing

Enhanced DTL signal processing ensures superb picture quality with minimal noise in horizontal and vertical directions, as well as in the image's dark and brightly lit areas.



Sharp, high-quality images

Tow Color Correction Matrix

EBU or NTSC preset color correction matrix can be selected.

• Photos are approximate image.

Easy-to-use, high-performance camera head

Designed for easy operation and expandability

The AK-HC3500 incorporates Panasonic's extensive broadcast camera design know-how to provide even easier operation. Convenient features include a backlight on the rear operation panel for improved operation in dark settings and an SD Memory Card slot for easy storage of user settings. A movable optical connector is also provided to reduce stress on the optical cable.

Variable internal diameter lens mount for easy use with a build-up unit

When mounting onto an optional build-up unit, a mechanism enlarges the internal diameter of the lens mount. Because the lens and camera can be separately mounted onto or removed from the build-up unit, previously troublesome lens removal is eliminated for faster, more convenient operation.

Movable optical cable connector

Connection to a camera control unit (CCU) is with SMPTE standard optical fiber cable. Transmission of high quality images and different types of signals is possible even when the camera and CCU are separated by a distance of up to about 2.0 km. Operation convenience is further assured by the movable connector.



Connector for non-North American countries.



Servocontrol ND/CC Filters

The following ND/CC motor driven double optical filters are available for shooting in any lighting conditions.

- [CC filters]
3 200 K, 4 300 K,
6 300 K, Cross, Diffusion
- [ND filters]
Cap, 100 %, 25 %, 6.3 %, 1.6 %

Menu Switch

JOG Dial Button



Back Light for Rear Operation

HD-SDI Output

Two RS422/RS232C Data Trunk Lines

Camera/RET/VF HD-SDI Output

AUX connector

Either standard RET-Y input or PROMPT2 output can be selected.

PROMPT/GL

SD Memory Card slot

Using an SD Memory Card enables storage and retrieval of various camera settings such as user viewfinder indications. Camera settings stored on an SD Memory Card can also be retrieved.

* SD Memory Cards are sold separately. (Panasonic cards with a capacity of 2GB or lower are recommended. SDHC Memory Cards are not compatible.)

● The photo is North American model

Ergonomic design for easy handling

In response to customer requests, we have made numerous improvements over prior models. These include optimal weight balance, boosted efficiency when used with a build-up unit, and a low center of gravity for more comfortable handling. Thanks to this advanced design, the AK-HC3500 helps to reduce user fatigue while assuring exceptional efficiency both in the studio and at outdoor venues.



In addition to the low center of gravity of the camera itself, the AK-HC3500 features slip-resistant shoulder pads adjustable up to 24 mm front and back. These design innovations help reduce fatigue during shoulder-mount use while assuring stable shooting.



The handle's end is shaped to enable easy carrying.



Lowering the height of the camera has moved the viewfinder closer to the camera's optical axis, thereby reducing the azimuth difference for improved operating convenience.

for studio and field applications

Fast, easy mounting onto a build-up unit

With cable-free mounting onto an optional build-up unit and minimal difference between the viewfinder's and the camera's optical axes, the AK-HC3500 provides the high maneuverability required for shooting.



Just slide the camera in the build-up unit to complete mounting.

Mounting an LCD viewfinder is also easy.



Even with an LCD viewfinder mounted on the camera, the camera can be mounted onto the build-up unit just by sliding it in.

Build-up Unit AK-HBU3500



- Large studio lenses can be mounted.
- Smooth, fast camera mounting is possible.
- Innovative design minimizes camera and viewfinder azimuth difference and lowers the center of gravity.

Adjustment functions	AC output reset, VF ON/OFF, Up tally ON/OFF, Marker ON/OFF, Cursor setting, Cursor memory 1, Cursor memory 2, 4:3 marker, ND filter selection, Local, CC filter selection, Menu ON/OFF, Menu jog, RET A switch, RET B switch, User, VF DTL, Monitor output selection, H-POSI, V-POSI, WIDTH, HEIGHT
Power supply	AC 220 V (when connecting Camera)
Power consumption	Approx. 20 W
Operating temperature	0 °C to 40 °C (32 °F to 104 °F)
Storage temperature	-20 °C to 60 °C (-4 °F to 140 °F)
Dimensions (WxHxD)	300 mm x 417 mm x 570 mm (11-13/16" x 16-1/2" x 22-1/2")
Weight	Approx. 14.5 kg (32.0 lb)

Viewfinder



2 type HD EVF
AJ-HVF21KG



8 type LCD Color Viewfinder

AK-HVF931A

- Controllers are easily accessible with one hand.
- Pan angle: 90 °
- 1080i, 720p switchable
- Aspect ratio 16:9/4:3 switchable

	AJ-HVF21KG	AK-HVF931A
External adjustment controls	Brightness, Contrast, Peaking	Brightness, Contrast, Peaking
Power supply	DC12 V (supplied from camera)	DC12 V (supplied from camera)
Power consumption	Approx. 3.8 W	Approx. 18 W
Operating temperature	0 °C to 40 °C (32 °F to 104 °F)	0 °C to 40 °C (32 °F to 104 °F)
Dimensions (WxHxD)	240 mm x 80 mm x 206 mm (9-1/2" x 3-3/16" x 8-1/8")	275 mm x 209 mm x 230 mm (10-13/16" x 8-1/4" x 9-1/16")
Weight	Approx. 0.75 kg (1.7 lb)	Approx. 2.8 kg (6.1 lb)

Versatile system components

To meet system requirements, a wide range of convenient peripheral equipment is available, including a camera control unit (CCU), a master setup unit (MSU) and remote operation panels (ROP).

Camera Control Unit AK-HCU3550

The half-rack size Camera Control Unit AK-HCU3550 uses the optical fiber transmission system for maintaining superb picture quality between the camera and CCU even from long distances.



HD and SD format simultaneous operation enabled

As a standard feature, the unit incorporates not only HD video signal outputs but SD video signal outputs (SDI and analogue composite).

Width equivalent to a half-rack unit

If a tub is installed when the unit is to be mounted in a rack, two units whose width would be equivalent to 3U rack units can be installed side by side so that the rackspace can be utilized fully.

Bar ID display

Characters can be displayed on the color bar signals so as to identify the output source of the images, and then output.

Utility power supply

The power supply capability is large enough to enable 200 VA to be taken out from the utility power supply of the buildup unit. (The power supplied varies depending on the length of the optical fiber cable.)

DC power drive

The unit can also be driven using a DC power supply (DC 12V). (When the camera is driven by a DC power supply)



(Rear view)

Prompter

Two prompter inputs are provided as a standard feature. (One input when dual sync is used)

Data trunk function

Two RS-422 and two RS-232C circuits are provided as a standard feature. They obviate the need for the cables used with virtual control, pan-tilt head and lens control, etc.

Video output	HD-SDI/SD-SDI x 4 lines** (shared by picture monitor output 1 line**) / Analogue composite x 2 lines (shared by picture monitor output 1 line**)
WFM output	Analogue composite x 1 line
Return input	HD-SDI/SD-SDI x 4 lines
Prompter input	Analogue composite x 2 lines**
Reference input	Black burst/tri-level x 2 lines (loop-through x 1 line)**3*
Sync output	Analogue sync, HD (± 0.3 V[P-P]) / SD (1 V[P-P]) (with 75 Ω termination) x 1 line**
Mic output	0 dBm/600 Ω x 2 lines
Communication	Intercom input/output (0 dBm, 600 Ω , 2W/RTS/4W**) x 2 lines (ENG/PROD) / PGM input (0 dBm/600 Ω) x 2 lines / Tally input (Red, Green) x 1 line each
WFM CONT	For WFM control (open collector output)
AUX	For setting down-conversion system (photo-coupler input) / For tally, alarm (open collector output)
TRUNK	RS-422/RS-232C x 2 lines**
ROP I/F	RS-422 x 1 line, 12 V output
MSU I/F	RS-422 x 1 line, GPI for control
LAN	For use with PC connections x 1 line (10Base-T, 100Base-TX)
AC input voltage	100 V to 120 V ± 5 %, 50/60 Hz (AK-HCU3550P) / 220 V to 240 V ± 5 %, 50/60 Hz (AK-HCU3550EA)
DC input voltage	12 V ± 10 %
Power consumption	37 W (excluding power supply), 340 W (include power supply)
Power supply capacity	AC220 V ± 5 %, 1.2 A, 50/60 Hz
Operating temperature	0 $^{\circ}$ C to 40 $^{\circ}$ C (32 $^{\circ}$ F to 104 $^{\circ}$ F)
Humidity	10 % to 90 % (no condensation)
Dimensions (WxHxD)	200 x 120 x 455 mm (7-7/8 " x 4-3/4 " x 17-15/16 ") excluding protrusions
Weight	Approx. 9 kg (19.8 lb)

1* Embedded audio is supported only for HD signal output.

2* Prompter input 2 and reference input 2 share the same connector so only one of these inputs can be selected at one time.

3* The black burst signal and tri-level sync signal of reference input 1 are recognized automatically.

4* Depending on the setting, only one of these outputs can be selected at one time.

Master Setup Unit AK-MSU935

The MSU (with a large LCD control panel) can adjust the camera's entire parameters; serves up to 12 camera systems.



(Rear view)

- Master control of precise camera settings for the entire camera system (up to 12 camera systems)
- Large scale (6.3 type) LCD display
- SD memory card slot for storing/recalling three user references, eight scene files, and sixteen lens files

Adjustment functions	Camera selection, MODE ON/OFF (5600 K, flare OFF, black gamma ON, gamma OFF, knee OFF, white clip OFF, HD matrix ON, PM character display, HDTV detail OFF, SDTV detail OFF, HDTV skin tone detail ON, SDTV skin tone detail ON), Control item selection (UNDO, black shading selection, white shading selection, R/G/B shading, matrix control, FUNC, system, pedestal control, gain control, gamma control, flare control, white clip control, HD detail control, SDTV detail), ALL, Reference, Camera video output selection, Automatic adjustment (white balance, black balance, setup), Monitor selection (P-M, WFM), Scene files, SHUTTER, Gain selection, Filter selection (HEAD, ND filter, CC filter), CALL, Auto iris, Lens file storage, Lens file call, Iris active, Master pedestal storage, Master pedestal file call, Iris, Master pedestal
Power supply	DC12 V
Power consumption	Approx. 15 W
Operating temperature	0 °C to 40 °C (32 °F to 104 °F)
Storage temperature	-20 °C to 60 °C (-4 °F to 140 °F)
Dimensions (WxHxD)	340 mm x 75 mm x 264 mm (13-3/8 " x 2-15/16 " x 10-3/8 ")
Weight	Approx. 3.25 Kg (7.17 lb)

Remote Operation Panel AK-HRP931

The 1/3 rack size remote operation panel can easily adjust camera parameters.



(Rear view)

- Full control of camera settings
- Joystick-type iris control
- 1/3 rack size remote operation panel

CCU control	Control signals (camera, CCU control) Power supply (DC12 V) Tally control signals
RCP control	Control signals (fader control) Power supply (DC12 V)
Power supply	DC12 V (supplied from CCU)
Power consumption	Approx. 6 W
Operating temperature	0 °C to 40 °C (32 °F to 104 °F)
Storage temperature	-20 °C to 60 °C (-4 °F to 140 °F)
Dimensions (WxHxD)	136 mm x 55 mm x 419 mm (5-3/8 " x 2-3/16 " x 16-1/2 ")
Weight	Approx. 2.3 kg (5 lb)

Remote Operation Panel AK-HRP935

The 1/4 rack size remote operation panel can easily adjust camera parameters.

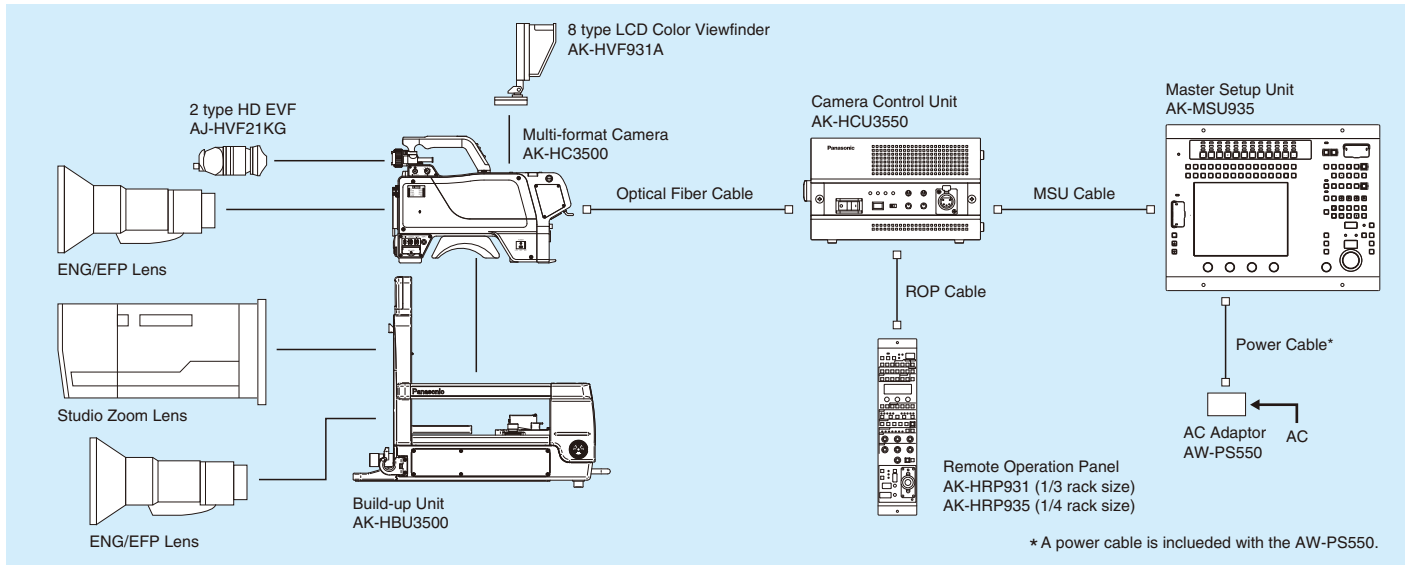


(Rear view)

- Full control of camera settings
- Joystick-type iris control
- 1/4 rack size remote operation panel

CCU control	Control signals (camera, CCU control) Power supply (DC12 V)
RCP control	Control signals (fader control) Power supply (DC12 V)
Power supply	DC12 V (supplied from CCU)
Power consumption	Approx. 6 W
Operating temperature	0 °C to +40 °C (32 °F to 104 °F)
Storage temperature	-20 °C to 60 °C (-4 °F to 140 °F)
Dimensions (WxHxD)	92 mm x 55 mm x 419 mm (3-5/8 " x 2-3/16 " x 16-1/2 ")
Weight	Approx. 1.8 kg (4 lb)

Product Configuration

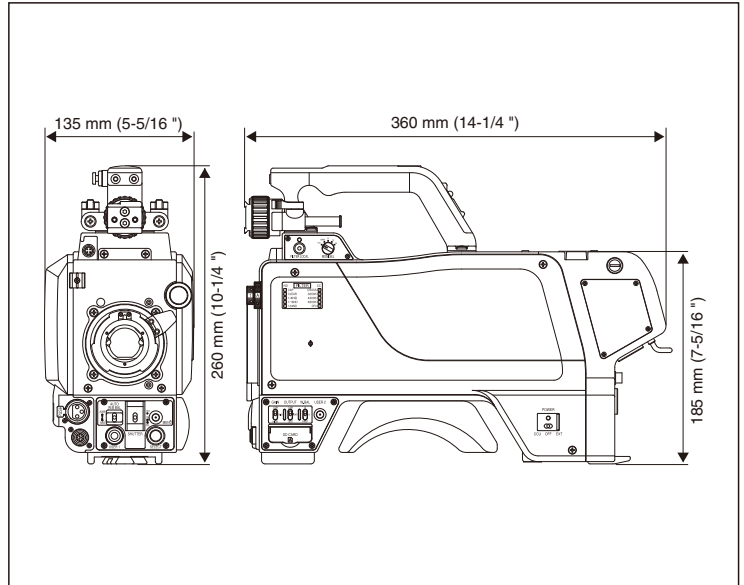


Specifications

CCD	2/3 type 2.2-megapixels IT-3CCD	
Image sensing method	GBR Image sensing method	
Total number of pixels	2 010 (H) x 1 120 (V)	
Effective number of pixels	1 920 (H) x 1 080 (V)	
Optical prism	F1.4 Prism	
Optical filter	CC	3 200 K, 4 300 K, 6 300 K, Cross, Diffusion
	ND	Cap, 100 %, 25 %, 6.3 %, 1.6 %
Lens mount	2/3 type Bayonet mount	
Sensitivity	F10 (1080/59.94i)/F11 (1080/50i) at 2 000 lx, 3 200 K, 89.9 % white	
S/N	60 dB (typ)(1080/59.94i) 60 dB (typ)(1080/50i)	
M.T.F	50 % (typ)(27.5 MHz)	
Storage temperature	-20 °C to 60 °C (-4 °F to 140 °F)	
Operating temperature	-10 °C to 45 °C (14 °F to 113 °F) * The camera must be turned on at least 30 minutes prior to use in ambient temperatures of -10 °C to 0 °C (14 °F to 32 °F).	
Power consumption	Approx. 28 W (DC12 V/camera head only)	
Dimensions (WxHxD)	135 mm x 260 mm x 360 mm (5-5/16" x 10-1/4" x 14-1/4")	
Weight	Approx. 4.7 kg (10.4 lb)	
HD SDI output	HD signal: 0.8 Vp-p 75 Ω (BNC)	
Monitor output 1*	HD signal: 0.8 Vp-p 75 Ω (BNC)	
PROMPT output	VBS signal: 1 Vp-p 75 Ω (BNC x 2)	
GENLOCK input	Tri-level SYNC/Black Burst (BNC x 1)	
AUX output	RET-Y input or PROMPT2 output are selectable.	
Microphone input 2*	-20 dBm/-30 dBm/-40 dBm/-50 dBm/-60 dBm (XLR 3pin x 2)	
INCOM 3*	0 dBm/600 Ω (XLR 4pin x 2)	

1* HD signal can be selected by the monitor output selection switch. 2* Gain is selected by the gain switch. 3* Mixing is controlled separately for PGM1 and PGM2.

Dimensions



Please refer to the latest Information, etc. at panasonic web site.



<http://pro-av.panasonic.net/>

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JQA-0443



Factories of Systems Business Group have received ISO14001:2004-the Environmental Management System certification. (Except for 3rd party's peripherals.)