



System Camera and Switcher Product Lineup

Building systems that meet the needs of businesses as well as

Panasonic Live and Pro

Studio Camera System



Studio Camera System

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4K/HD Studio Camera System



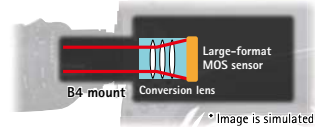
4K Studio Handy Camera

AK-UC3000GJ (Tajimi connector model)
AK-UC3000GSJ (LEMO connector model)

Equipped with a large-format 4K sensor, this camera produces highly expressive 4K video with rich gradation in addition to supporting simultaneous HD/SD.

New-generation 4K video

Applying built-in conversion lens, 2/3-type lens can be used with this 4K large-format camera without an adapter and achieves excellent image quality. The new imaging system makes maximum use of incident light to achieve a wide dynamic range.



*Image is simulated.

UHD and HD/SD output supported*1

The AK-UC3000 camera system handles UHD as well as HD/SD output simultaneously*1. You can select the video output based on usage. (See below chart for the supported video format.)

List of supported formats

UHD (3G-SDI x 4)	3840 x 2160/59.94p, 50p, 29.97p, 25p, 23.98p, 29.97PsF, 25PsF, 23.98PsF
HD (3G-SDI)	1080/59.94p, 50p, 59.94i, 50i, 23.98p over 59.94i, 29.97PsF, 25PsF, 23.98PsF, 720/59.94p, 50p
SD	480/59.94i, 576/50i

*1: AK-UC500 Camera Control Unit (CCU) outputs UHD/HD/SD video.

HDR



HD Studio Handy Camera

AK-HC5000GJ (Tajimi connector model)
AK-HC5000GSJ (LEMO connector model)

AK-HC5000 HD Studio Handy Camera allows for 1080p 4x high-speed shooting for vivid imaging of exciting moments in sports and events.

1080p 4x high-speed shooting included as standard function*1

The AK-HC5000 camera system has a high-speed shooting function that adds rich expressions to video content production.



*Image is simulated.

Newly developed 2/3-type MOS sensor

High-image-quality video production is realized with the newly developed 2/3-type MOS sensor. (See below chart for the supported video format.)

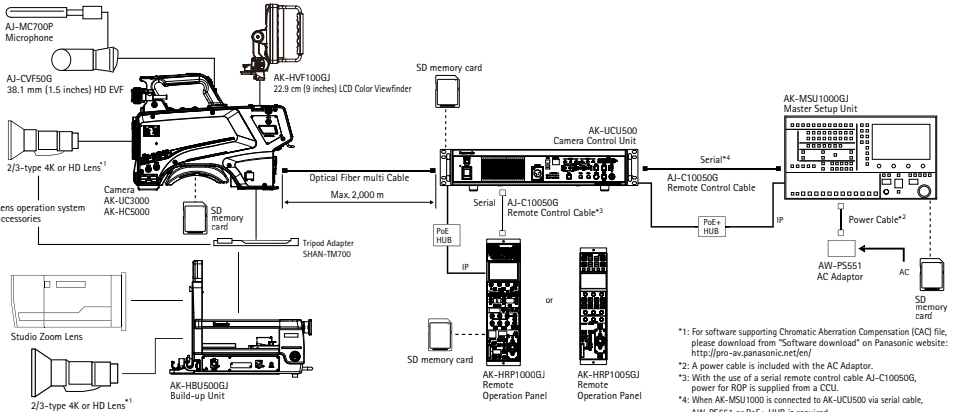
List of supported formats*2

HD (3G-SDI)	1080/59.94p, 50p, 59.94i, 50i, 23.98p over 59.94i, 29.97PsF, 25PsF, 23.98PsF, 720/59.94p, 50p
High Speed (3G-SDI x 4)	1080/239.76p, 200p, 239.76i, 200i
SD	480/59.94i, 576/50i

*1: To obtain the 1/4 slow effect, a device to separately record 1080/239.76p, 200p is necessary.

*2: AK-UC500 Camera Control Unit (CCU) outputs 4x HD/HD/SD video.

System Configuration



High-quality video and excellent operability

With the AK-UCU500 Camera Control Unit (CCU), uncompressed long-distance transmission of 4K/HD video signals via optical fiber is supported. The AK-HRP1000GJ/1005GJ Remote Operation Panel (ROP) is equipped with a color LCD display that provides excellent visibility. In combination, these devices achieve high-quality video and excellent operability. In cases where power is supplied by the CCU, it is possible to transmit at a long distance of up to approx. 2,000 m between the camera and the CCU. The distance can be extended up to 10,000 m*1 by providing an external power supply to the camera and using a general-purpose optical fiber transmission device. Between the CCU and the ROP, in addition to a dedicated serial line, IP connection via LAN cable is also supported.

High sensitivity and low noise

The AK-UC3000 is equipped with a large-format 4K MOS sensor. Two shooting modes can be selected. In High Sense Mode, it is possible to obtain an S/N ratio of 60 dB or higher while also achieving F10 high sensitivity. The result is low-noise and high-image-quality video. The AK-HC5000 is equipped with a 2/3-type 3MOS sensor, and it also has two shooting modes to choose from. In High Sense Mode, it achieves F10 59.94p and F11 50p high sensitivity and low noise with an S/N ratio of 60 dB or higher.

Chromatic Aberration Compensation (CAC)

This exclusive technology sets up a conversation between lens and camera which allows for a highly sophisticated algorithm to be deployed that will automatically compensate the registration error that is caused mainly by lens chromatic aberration, and minimize the circumjacent blur*2.

Images showing CAC (Chromatic Aberration Compensation) function effect



Rear Panel



Skew reduction realized through high-speed scans

Making unstinting use of knowhow accumulated via Panasonic's ENG cameras, the skewing characteristic of MOS sensors has been reduced by reading out the MOS sensor signal at high speed.

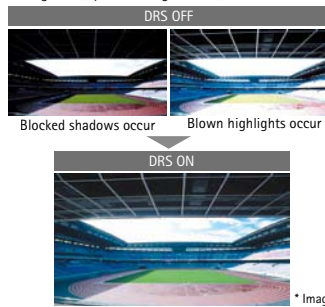
Skew reduction images



Dynamic Range Stretch (DRS) function*3

The DRS function automatically suppresses blocked shadows and blown highlights. When dark and bright areas are mixed in the same scene, such as when looking outside from indoors, DRS can maintain a high level of gradation expression in dark, bright, and intermediate tones, thereby minimizing blocked shadows, blown highlights, and washed out colors. This makes it possible to obtain visually wide dynamic range video in real time.

Images showing DRS (Dynamic Range Stretch) effect



Selectable gamma curves

In addition to the Film Rec Gamma functions (V-REC, F-REC) supporting digital film production, you can select the Filmlike 1/2/3 modes.

HDR (High Dynamic Range) compatibility HDR

This mode provides rich gradation to render contrast, color and shadow in dark image areas that could not previously be reproduced due to blackout, thus resulting in more realistic image display. It is also possible to configure a system supporting simultaneous HDR/SDR in order to handle production environments with both.

Shockless gain

It is possible to smoothly transition the image changes that occur when gain is changed. In addition, with the 0.1 dB step master gain adjustment function, you can fine tune the adjustments to match the scene being shot.

Diverse color correction functions

In addition to the EBU or NTSC preset color correction matrix, you can fine tune the hue and saturation of individual colors with 12-axis color correction and the linear matrix. Sensitive color expression is also possible using the separate Skin Tone Detail Correction function for skin tone adjustment.

*1: Adverse conditions, additional patching and longer runs will require repeater devices.

*2: For software supporting Chromatic Aberration Compensation (CAC) file,

please download from "Software download" on Panasonic website(<http://pro-av.panasonic.net/en/>)

*3: For the AK-UC3000GJ/UC3000GSJ, only when in HD mode.

Skin Tone Detail Correction

Tones down wrinkles and dull areas to beautifully shot natural skin textures. Colors for correction can be chosen from the entire hue phase (360°) even for colors other than skin tones, and three types of correction can be individually applied. There is also a function to select color and directly adjust it.

Images showing Skin Tone Detail Correction effect



* Image is simulated.

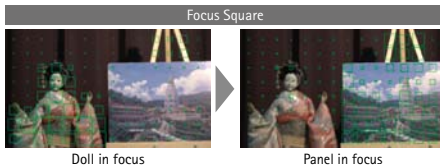
Servo control ND/CC filters

The cameras are equipped with filters for a variety of shooting environments.

[ND filters] CAP, Through, 1/4, 1/16, 1/64
[CC filters] Cross, 3200 K, 4300 K, 6300 K, Diffusion

Focus assist functions

Quick and accurate focusing is supported with focus assist functions such as Focus Bar (indicates focus level), Focus-in-Red (uses color to indicate areas in focus), MAG (magnifies central portion), and Square (shows focus status of screen as a whole). Lenses with auto focus and focus assist capabilities are also supported*1.



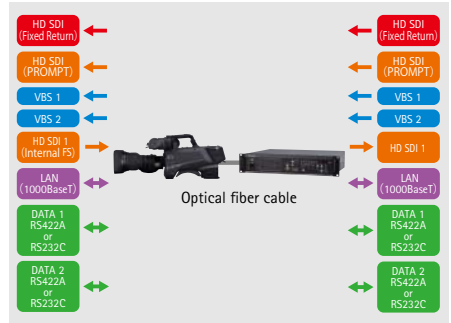
Camera standalone output formats

For camera head output (HD SDI 1/HD SDI 2), it is possible to select 1080p, 1080i, and 720p.

Extensive video and data transmission (TRUNK) functions

Since video and data can be transmitted between the camera and a Camera Control Unit (CCU) using optical fiber cable alone, system expansion to match operation conditions is possible.

- HD SDI (CCU→camera) two lines, VBS (CCU→camera) two lines: Can be used for monitoring with prompter, fixed return or camera (studio floor monitor), etc.
- HD SDI (camera→CCU) one line*2: This line can be used to transmit an additional video signal of a handheld or remote camera to the studio. Since the camera video input is equipped with a frame synchronizer, asynchronous video signals can also be used.
- LAN (1000BaseT)*2 one line: To be used to control external devices and remote cameras by IP protocol. Transmission of streaming video is also supported.
- DATA (RS422A or RS232C) two lines: Can be used to transfer lens and pedestal position data in a virtual system.



Detailed settings and functions optimized for operability

- Transmission of up to 10,000 m possible using single fiber*3.
- It is possible to save camera settings, such as video adjustments, on an SD memory card. Firmware version upgrades are also supported.
- Support for IP streaming and IP control.
- The NewTek Software "NewTek AutoLink for Panasonic PTZ"*4, which is available on the Internet, allows Panasonic professional cameras equipped with IP streaming to be automatically detected from NewTek TriCaster® and IP series Video Mix Engine on the network, enabling direct use of IP streaming from the cameras with these NewTek products.
- DC12 V 2.5 A and 1.0 A output as a standard feature. This can be used as a power source for large lenses, prompters, and sub-monitors.

Intercom connection

With two independent intercom lines, in addition to Intercom 1 and Intercom 2 switching, an Intercom 1 and 2 mix mode has been added and can be selected to observe the situation.

New slanted-line design improves mobility and operability

The functional layout achieves both ease of use and high-performance. The low-profile body design enhances visibility to the right side of the camera, along with the low center of which improves operability. The shoulder pad can be moved in a 24 mm (15/16 inches) range so you can increase shooting stability by adjusting the forward/backward balance when lens weight changes.



*1: For the compatible lenses, please contact the manufacturer.
*2: Cannot be utilized when the camera system is UHD(4K) and HD high-speed mode is used.
*3: Adverse conditions, additional patching and longer runs will require repeater devices.
*4: For more details, please visit the following website
(http://pro-av.panasonic.net/en/products/newtek_autolink/)



Camera Control Unit (CCU)

AK-UCU500PJ/AK-UCU500EJ (Tajimi connector model)

AK-UCU500PSJ/AK-UCU500ESJ (LEMO connector model)

The CCU supports both 4K and HD formats by just changing the camera head. It enables a high-quality, long-distance optical fiber transmission camera system to be configured with less cost.

- Optical fiber transmission of uncompressed video signals over a distance of approx. 2,000 m between camera and CCU*1.
- The compact, lightweight unit measures 2U in height and is rack-mountable.
- Supported formats
 UHD (3G-SDI x 4)** : 3840 x 2160/59.94p, 50p, 29.97p, 25p, 23.98p, 29.97PsF, 25PsF, 23.98PsF
 HD (3G-SDI) : 1080/59.94p, 50p, 59.94i, 50i, 23.98p over 59.94i, 29.97PsF, 25PsF, 23.98PsF, 720/59.94p, 50p
 HD High Speed (3G-SDI x 4)** : 1080/239.76p, 200p, 239.76i, 200i
 SD : 480/59.94i, 576/50i
- Supports IP streaming (100 Base-T).
- SD memory card can be used for saving user files and updating firmware versions.
- Input/output
 SDI OUT x 7, SDI OUT (PM) x 1, VBS x 1, etc.
 *4K MODE** : SDI OUT x 4 (4K), SDI OUT x 3, SDI OUT (PM) x 1, VBS x 1, VBS (PM) x 1
 *HS MODE** : SDI OUT x 4 (HS), SDI OUT x 3, SDI OUT (PM) x 1, VBS x 1, VBS (PM) x 1
 RET Input (SDI): 4ch, VBS: 1ch) etc.
 LAN-TRUNK (100/1000BASE-T)
 PROMPT Input (SDI : 1ch, ANALOG : 2ch)

Rear Panel



Rear Panel



AK-HRP1000GJ



AK-HRP1005GJ

Remote Operation Panel (ROP)

AK-HRP1000GJ

AK-HRP1005GJ

Expand operation scope with two size options: a full operation panel and a simplified panel. These compact operation panels also support PoE** and IP control.

- Two models: 1/4 rack size (AK-HRP1000GJ) and 1/5 rack size (AK-HRP1005GJ).
- LCD panels with enhanced visibility.
 AK-HRP1000GJ: 8.9 cm (3.5 inches) (VGA)
 AK-HRP1005GJ: 8.1 cm (3.2 inches) (VGA)
- Camera serial control and IP control (RJ45 LAN cable) are possible.
- Supports PoE**, which can supply power via LAN cable (CAT5e or faster).
- Functions for studio camera scene file registration and retrieval.
- Equipped with SD memory card slot for saving user files, scene file and updating firmware versions.

Rear Panel

AK-HRP1000GJ



AK-HRP1005GJ



Master Setup Unit (MSU)

AK-MSU1000GJ **NEW**

Controls up to 99 CCU units via IP

- IP and serial connections supported.
 IP connection: Up to 99 units
 Serial connection: Up to six units
- 7-inch Touch Panel LCD
 Video monitoring function
- HD SDI Input (Monitoring) (1080i)
- Power DC12 V(DC10 V - DC17 V) or PoE+ (via PoE+ Hub)

*1: When power is supplied from CCU.

**2: When Connected with AK-UC3000 4K Studio Handy Camera.

**3: When Connected with AK-HCS000 HD Studio Handy Camera.

*4: Abbreviation of Power over Ethernet.

4K/HD Studio Camera System



22.9 cm (9 inches) LCD Color Viewfinder

AK-HVF100GJ

Equipped with newly designed tilt mechanism and extensive functions such as focus assist and external video input.

- High-resolution 22.9 cm (9 inches) color LCD panel displays full HD 1920 x 1080 pixels
- Focus assist functions (Focus-in-Red, Focus Bar*)
- Detail depends on zoom ratio**
- External HD-SDI (3G SDI) input
- External DC input (+12 V DC)
- Four assignable function buttons
- Contrast, brightness, and peaking are adjustable
- Pan, tilt, and lift structure used

Rear Panel



Lift structure image



Build-up Unit

AK-HBU500GJ

Enables use of large studio-use lens.

- Smooth camera mounting/removal possible
- Precise optical axis (horizontal/vertical) adjustment structure
- Rear control panel equivalent to that of a large camera
- DC OUT 12V 7.5 A (XLR4-pin)/DC OUT 1.5 A (4-pin)

Side Panel



Rear control panel



Other accessories



AJ-CVF50G
38.1 mm (1.5 inches) HD EVF



AJ-HVF21KG
50.8 mm (2 inches) HD EVF
59.94 Hz/50 Hz Switchable
Not available in some areas.



AG-CVF15G
87.6 mm (3.45 inches) Color HD EVF
Open two ways for LCD monitor viewing



AG-CVF10G
87.6 mm (3.45 inches) Color HD EVF
Open one way for LCD monitor viewing



AK-HVF70G
17.8 cm (7 inches) LCD Color Viewfinder



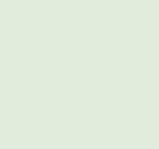
AJ-MC700P
Microphone Kit (monaural)



SHAN-TM700
Tripod Adapter



AW-PS551
AC Adapter



AJ-C10050G
Remote Control Cable
(50 m / 164 feet)

*1: When connected to AK-UC3000 or AK-HC5000.

4K/HD Studio Camera System Specifications & Dimensions

As of April, 2017

Studio Camera System

AK-UC3000GJ/UC3000GSJ/AK-HC5000GJ/HC5000GSJ

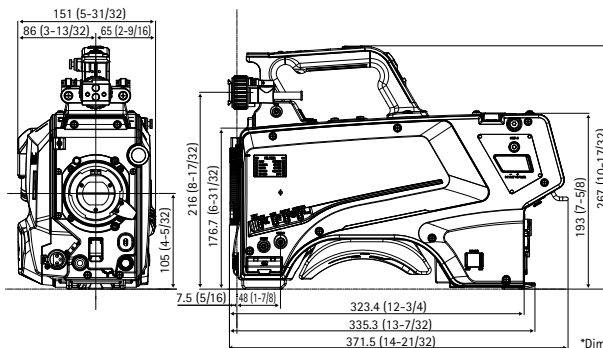
Power Supply	DC 12 V (when using an external power supply) AC 240 V, 50 Hz/60 Hz (when AK-UCU500P/AK-UCU500PS/ AK-UCU500E/AK-UCU500ES is connected)	<HD SDI1> terminal	BNC x 1 HD (3G/1.5G): 0.8 V [p-p], 75 Ω
Power Consumption	119 W (maximum, when connecting to an external 12 V and including supply to an externally connected devices) 360 W (maximum, when AK-UCU500P/AK-UCU500PS/ AK-UCU500E/AK-UCU500ES is connected and including supply to an externally connected devices)	<HD SDI2> terminal	BNC x 1 HD (3G/1.5G): 0.8 V [p-p], 75 Ω
Operating Temperature	-10 °C to 45 °C (14 °F to 113 °F) (Preheating required under a temperature 0 °C (32 °F) or below)	<AUX> terminal	BNC x 1 Functions as <HD TRUNK> terminal/<PROMPTER2> terminal by switching the setting in the menu <HD TRUNK>: HD (1.5G) <PROMPTER2>: VBS signal 1 V [p-p], 75 Ω
Storage Temperature	-20 °C to 60 °C (-4 °F to 140 °F)	<G/L IN/PROMPTER OUT> terminal	BNC x 1 <G/L IN>: Tri-level SYNC or BB (black burst) <PROMPTER OUT>: VBS signal 1 V [p-p], 75 Ω Functions as <G/L IN> when standalone, and as <PROMPTER OUT> when AK-UCU500P/AK-UCU500PS/ AK-UCU500E/AK-UCU500ES is connected
Operating Humidity	85% or less (relative humidity)	<MIC 1> terminal	XLR x 1, 3-pin <LINE>/<MIC>/<+48 V> switchable For <MIC>, <FRONT>/<REAR> switchable <LINE>: 0 dBu, +4 dBu menu selection available <MIC>: -60 dBu, -40 dBu, or -20 dBu menu can be selected
Weight	Approx. 4.4 kg (9.70 lbs.) (body only, excluding the accessories)	<MIC 2> terminal	XLR x 1, 3-pin <LINE>/<MIC>/<+48V> switchable <LINE>: 0 dBu, +4 dBu menu selection available <MIC>: -60 dBu, -40 dBu, or -20 dBu menu can be selected
Dimensions (W x H x D)	Body only 151 mm x 267 mm x 371.5 mm (5-31/32 inches x 10-17/32 inches x 14-21/32 inches) (excluding protrusions)	<MIC> terminal (front)	XLR x 1, 3-pin Switchable with <MIC 1> terminal
Pickup Device	AK-UC3000: 11 million pixels, CMOS x 1 AK-HC5000: 2/3-type, 2.2 million pixels, MOS x 3	<INTERCOM1> terminal	XLR x 1, 5-pin
Optical Filter	CC: 3200 K, 4300 K, 6300 K, Cross, Diffusion ND: CAP, Clear, 1/4, 1/16, 1/64	<INTERCOM2> terminal	XLR x 1, 5-pin
Lens mount	2/3-type bayonet	<EARPHONE> terminal	Stereo mini jack x 1, 3-pin
Sensitivity	Two shooting modes AK-UC3000: [HIGH SENS]: F10 (59.94 Hz)/F11 (50 Hz) [NORMAL]: F6 (59.94 Hz)/F7 (50 Hz) 2000 lx, 3200 K, when white reflectivity is 89.9% AK-HC5000: [HIGH SENS]: F11 (59.94 Hz)/F12 (50 Hz) [NORMAL]: F8 (59.94 Hz)/F9 (50 Hz) 2000 lx, 3200 K, when white reflectivity is 89.9%	<OPT FIBER> terminal	Optical composite connector x 1
	AK-UC3000: 4K: 1800 TV lines or above (center, AK-UCU500P/ AK-UCU500PS/AK-UCU500E/AK-UCU500ES output) HD: 1000 TV lines or above (center) AK-HC5000: 1000 TV lines or above (center)	<LENS> terminal	12-pin x 1
Horizontal Resolution	AK-UC3000: 4K: 1800 TV lines or above (center, AK-UCU500P/ AK-UCU500PS/AK-UCU500E/AK-UCU500ES output) HD: 1000 TV lines or above (center) AK-HC5000: 1000 TV lines or above (center)	<VF> terminal	20-pin x 1
S/N	60 dB or above	<VF> terminal (rear)	29-pin x 1
Horizontal Modulation	50% or above (27.5 MHz)	<DC IN> terminal	XLR x 1, 4-pin, DC 12 V
Gain switching	AK-UC3000: [NORMAL]: -6, -3, 0, 3, 6, 9, 12, 15, 18, 21, 24, 27, 30, 33, 36 [HIGH SENS]: -6, -3, 0, 3, 6, 9, 12, 15, 18, 21, 24, 27, 30, 33, 36 AK-HC5000: [NORMAL]: -3, 0, 3, 6, 9, 12, 15, 18, 21, 24, 27, 30, 33, 36 [HIGH SENS]: -6, -3, 0, 3, 6, 9, 12, 15, 18, 21, 24, 27, 30, 33, 36	<DC OUT 12 V 1 A> terminal	4-pin x 1
	AK-UC3000: [59.94i]/[59.94p] mode: 1/100, 1/120, 1/125, 1/250, 1/500, 1/1000, 1/1500, 1/2000 •[29.97p] mode: 1/48, 1/50, 1/60, 1/96, 1/100, 1/120, 1/125, 1/250, 1/500, 1/1000, 1/1500, 1/2000 •[23.98p] mode: 1/48, 1/50, 1/60, 1/96, 1/100, 1/120, 1/125, 1/250, 1/500, 1/1000, 1/1500, 1/2000 •[50i]/[50p] mode: 1/60, 1/100, 1/125, 1/250, 1/500, 1/1000, 1/1500, 1/2000 •[25p] mode: 1/48, 1/50, 1/60, 1/96, 1/100, 1/125, 1/250, 1/500, 1/1000, 1/1500, 1/2000	<RET CTRL> terminal	6-pin x 1
Shutter speed	AK-UC3000: [59.94i]/[59.94p] mode: 1/100, 1/120, 1/125, 1/250, 1/500, 1/1000, 1/1500, 1/2000 •[29.97p] mode: 1/48, 1/50, 1/60, 1/96, 1/100, 1/120, 1/125, 1/250, 1/500, 1/1000, 1/1500, 1/2000 •[23.98p] mode: 1/48, 1/50, 1/60, 1/96, 1/100, 1/120, 1/125, 1/250, 1/500, 1/1000, 1/1500, 1/2000 •[50i]/[50p] mode: 1/60, 1/100, 1/125, 1/250, 1/500, 1/1000, 1/1500, 1/2000 •[25p] mode: 1/48, 1/50, 1/60, 1/96, 1/100, 1/125, 1/250, 1/500, 1/1000, 1/1500, 1/2000	<EXT I/O> terminal	20-pin x 1, DC 12 V, 0.5 A
		<REMOTE> terminal	10-pin x 1
		<TRUNK> terminal	12-pin x 1
		<DC OUT 12 V 2.5 A> terminal	2-pin x 1
		<LAN> terminal	RJ-45 x 1
		<USB2.0> terminal (host)	Type A connector, DC 5 V, 0.5 A
		Build-up terminal	20-pin x 1

Remote Camera System

Dimensions

Unit: mm(inches)

AK-UC3000GJ/UC3000GSJ/AK-HC5000GJ/HC5000GSJ



*Dimensions above are for the AK-UC3000.

Live Switcher

4K/HD Studio Camera System Specifications & Dimensions

AK-UCU500P/UCU500E/UCU500PS/UCU500ESJ

Power Supply	AK-UCU500P/AK-UCU500PS: 100 V - 120 V AC, 50 Hz/60 Hz AK-UCU500E/AK-UCU500ES: 100 V - 240 V AC, 50 Hz/60 Hz
Power Consumption	500 W (Without camera connected: 70 W)
Capacity for Supplying Power to a Camera	240 V AC (tolerance: 5%), 1.46 A, 50 Hz/60 Hz
Operating Temperature	0°C to 40°C (32°F to 104°F)
Humidity	10% to 90% (no condensation)
Weight	Approx. 8.8 kg (19.4 lb)
Dimensions (W x H x D)	424 mm x 88 mm x 401 mm (16-5/8 inches x 3-7/16 inches x 15-13/16 inches) (excluding protrusions)
Video Output	3G/HD/SD-SDI: 7 lines (embedded audio is supported only for HD signals) HD/SD-SDI: 1 line (shared with picture monitor output**); embedded audio is supported only for HD signals) Analog composite: 2 lines (1 line shared with picture monitor output**)
HD TRUNK Output	HD-SDI: 1 line (cannot be used in UHD/HS mode)
Return Input	3G-/HD-/SD-SDI: 4 lines (RET1 input has active-through output) Analog composite: 1 line
Prompter Input	HD-SDI: 1 line (with active-through output) Analog composite: 2 lines (through output of 1 and input of 2 share the connector**) It is not terminated when the unit is turned OFF. No through output.
Reference Input	BB (black burst) / tri-level**2: 1 line (automatic termination, connect to upper connector; BB signal and tri-level signal automatically recognized, with loop-through output)
Microphone Output	0 dBm/600 Ω, 2 lines (XLR, 3-pin, male)
Communication	Intercom input/output (ENG / PROD, 0 dBm, 600 Ω (4 W) / 1 V [p-p], 200 Ω (RTS), 4 W / RTS / CLRCOM) : 2 lines** PGM input (0 dBm/600 Ω) : 2 lines Tally input (red, green, yellow) : 1 input each
AUX	WFM control 6-bit (open collector output, terminal shared with camera microphone gain setting*) Camera microphone gain setting input 5-bit (photo-coupler input, terminal shared with WFM control*) Down-conversion system setting input 2-bit (photo-coupler input)
TRUNK	RS-422 / RS-232C 2 lines**1
FRONT ROP	RS-422 1 line, 16 V DC output (only one of this and REAR ROP can be selected at one time via the menu or the [ROP FRONT/REAR] selection switch on the front panel)
REAR ROP	RS-422 1 line, 16 V DC output (only one of this and FRONT ROP can be selected at one time via the menu or the [ROP FRONT/REAR] selection switch on the front panel)
MSU	RS-422 1 line, GPI for control
LAN TRUNK	LAN connection with camera side via an optical cable** 1 line, 100BASE-T, 1000BASE-T
LAN	Personal computer connection for distribution via the Web** 1 line, 10BASE-T, 100BASE-TX (use a crossover cable when connecting directly with a personal computer)

AK-HRP1000GJ/HRP1005GJ

	AK-HRP1000GJ	AK-HRP1005GJ
Power Supply	12 V DC (Power supply from camera: 10 V - 16 V DC) 42 V - 57 V DC (PoE power supply)	0.51 A (Power supply from camera: 10 V - 16 V DC) 0.15 A (PoE power supply)
Power Consumption	0.44 A (Power supply from camera: 10 V - 16 V DC) 0.11 A (PoE power supply)	0.44 A (Power supply from camera: 10 V - 16 V DC) 0.11 A (PoE power supply)
Operating Temperature	0°C to 40°C (32°F to 104°F)	
Humidity	90% or less	
Storage Temperature	-20°C to 60°C (-4°F to 140°F)	
Weight	Approx. 1.7 kg (3.75 lb)	Approx. 1.5 kg (3.31 lb)
Dimensions (W x H x D)	102 mm x 385 mm x 113 mm (4 inches x 15-3/16 inches x 4-7/16 inches)	82 mm x 355 mm x 124.4 mm (3-1/4 inches x 14 inches x 4-7/8 inches)
Camera/CCU Control	Control signals (camera, CCU control) Power supply 16 V DC (when CCU connected)**, 12 V DC (when camera connected)**	
Maximum Cable Length	When camera connected: 20 m (65.7 ft) When CCU connected: 50 m (164 ft)	

AK-MSU1000GJ

Power Supply	12 V DC (DC input range: 10 V - 16 V DC) 42 V - 57 V DC (PoE+ power supply)
Power Consumption	1.6 A (Power supply: 12 V DC) 0.6 A (PoE+ power supply)
Operating Temperature	0°C to 40°C (-4°F to 140°F)
Humidity	90% or less
Storage Temperature	-20°C to 60°C (-4°F to 140°F)
Weight	Approx. 4.0 kg (8.82 lb)
Dimensions (W x H x D)	482 mm x 222 mm x 81.5 mm (18-31/32 inches x 8-3/4 inches x 3-7/32 inches) (including mounting brackets and dial heights)
Adjustment Functions	Scene file, ND filter, CC filter, Color temperature (COLOR TEMP), Master gain (MASTER GAIN), Shutter (SHUTTER), Master pedestal (MPED), Iris (IRIS), Camera selection
CCU Control	RS422 or IP
Maximum Cable Length	When CCU connected: 50 m (164 ft)

AK-HVF100GJ

Power Supply	DC 12 V (supplied from camera or XLR)
Power Consumption	18 W
Operating Temperature	0 °C to 45 °C (32 °F to 113 °F)
Operating Humidity	10% - 85% (no condensation)
Storage Temperature	-20 °C to 60 °C (-4 °F to 140 °F)
Weight	Approx. 2.6 kg (5.73 lbs.) (not including hood) / Approx. 3.0 kg (6.61 lbs.) (including hood)
Dimensions (W x H x D)	340 mm x 234 mm x 193 mm (13-13/32 inches x 9-7/32 inches x 7-5/8 inches) (not including hood) 340 mm x 234 mm x 231 mm (13-13/32 inches x 9-7/32 inches x 9-1/8 inches) (including hood)
Display Panel	9.0 inches
Number of Pixels	1920 x 1080 (FHD)
Display Color	Approx. 16.77 million colors
Operation	<POWER> switch, <MENU> button, <SELECT> dial button, <F1>/<F2>/<F3>/<F4> buttons, <BRIGHT> knob, <CONTRAST> knob, <PEAKING> knob, <INPUT> switch
Connector	Camera I/F connector (D-sub 29 pins x 1) SDI IN connector (BNC x 1) DC IN connector (XLR 4 pins x 1)
Supported Signal Format	CAM: 1080/59.94i, 1080/50i SDI: 1080/59.94p, 1080/50p, 1080/59.94i, 1080/50i, 720/59.94p, 720/50p

AK-HBU500GJ

Power Supply	12 V DC (when external power is supplied) 240 V AC 50 Hz/60 Hz (when AK-UCL500 is connected)
Power Consumption	70 W (when external power is supplied) 165 W (when AK-UCL500 is connected)
Operating Temperature	-10°C to 45°C (14°F to 113°F)
Operating Humidity Range	85% or less (relative humidity)
Storage Temperature	-20°C to 60°C (-4°F to 140°F)
Weight	Approx. 12.8 kg (28.22 lb) (unit only)
Dimensions (W x H x D)	300 mm x 417 mm x 510 mm (16-7/16 inches x 20-1/16 inches x 11-13/16 inches)
Camera Number Display	1 to 15 (depending on system settings)
LENS I/F Connector	36-pin x 1
CAMERA I/F Connector	20-pin x 1
[DC IN] Connector	XLR x 1, 4-pin, 12 V DC
[DC OUT 12V 1.5A] Connector	4-pin x 1
[DC OUT 12V 7.5A] Connector	XLR x 1, 4-pin

*1: Depending on the setting, only one of them can be selected at one time.

*2: The BB (black burst) signal and tri-level sync signal of the reference input are recognized automatically.

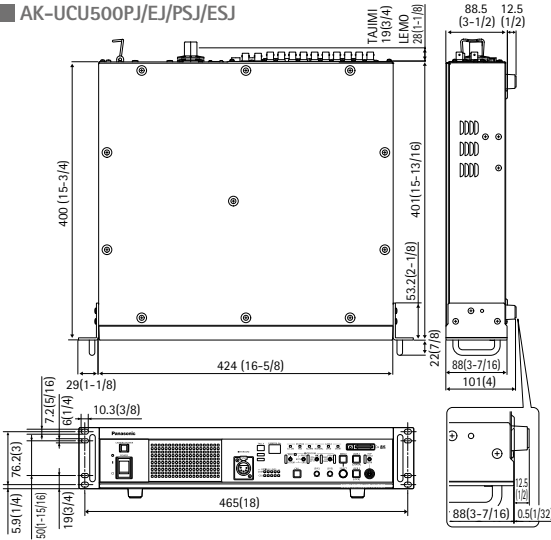
*3: IP video cannot be transmitted when [CCU MODE] is set to [2160/23.98p], [2160/23.98p5f], [1080/23.98p], or [1080/23.98p5f].

*4: Can be provided from CCU

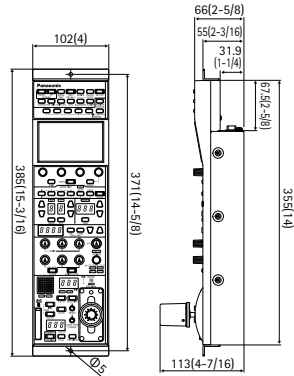
Dimensions

Unit: mm(inches)

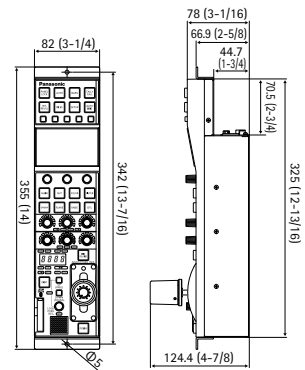
■ AK-UCU500PJ/EJ/PSJ/ESJ



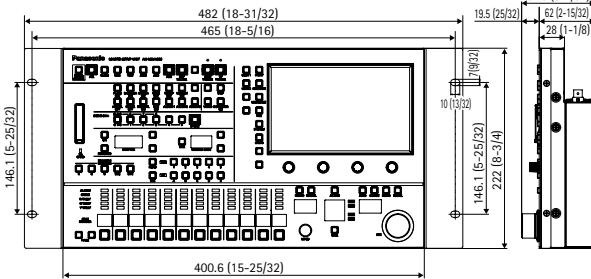
■ AK-HRP1000GJ



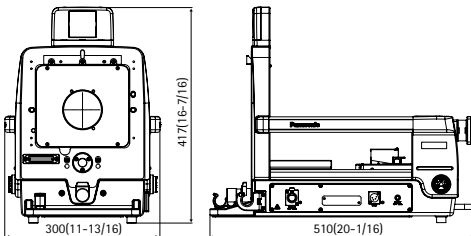
■ AK-HRP1005GJ



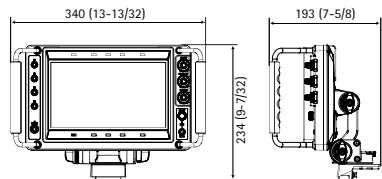
■ AK-MSU1000GJ



■ AK-HBU500GJ



■ AK-HVF100GJ



Studio Camera System



Studio Handy Camera

AK-HC3800G (Tajimi connector model)

AK-HC3800GS (LEMO connector model)

A Studio and EFP Camera System for Broadcast Use That Delivers High-End Image Quality and Enables Long-Distance Optical Fiber Transmission at Low Cost.

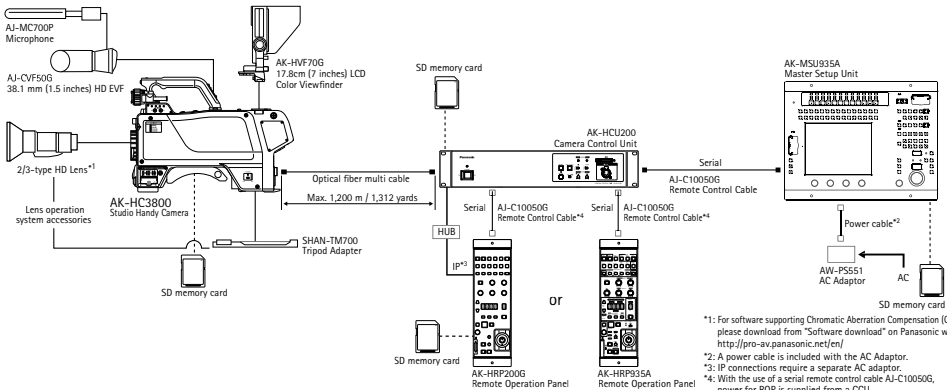
- The 2/3 type 2.2 megapixel 3CCD enables the standard sensitivity of F12 (2,000 lx/50 Hz) and F11 (2,000 lx/59.94 Hz) which is one of the highest sensitivity in this range of cameras.
- High-Performance DSP Provides 16 bit A/D, 38 bit Processing.
- For HD, supporting 1080/59.94i, 1080/50i, 1080/23.98p(over59.94i), 25p(over50i) and 1080/29.97p(over59.94i) video format are supported as standard. In addition, 720/59.94p, 720/50p and 1080/23.98PsF video format can also be supported when selected on CCU.
- Chromatic Aberration Compensation (CAC).
*When a CAC-compatible lens is used.
- Digital Extender (2x). This function expands the image by 2x in the digital signal processing circuit, allowing powerful shooting even with a low-magnification lens.
- 12-axis color correction, linear matrix, and other color correction functions.
- Skin Tone Detail Correction separately reduces the sharpness of two types of color gamut to help tone down wrinkles and dull areas for more beautiful, natural textures. The function can be applied to the entire hue phase (360°), enabling the sharpness of all colors, not just skin tones, to be reduced.
- Selectable gamma curves are included in the DSP circuit. The Film Rec mode produces film tone.

- Scan reverse function is featured.
- The Dynamic Range Stretch (DRS) function automatically suppresses blocked shadows and blown highlights. A gamma curve and knee slope are applied to match the contrast of each pixel and corrected in real time to maintain excellent gradation for each shade even when a single scene contains dark, bright and intermediate shades.
- ND filter: Clear, 1/4, 1/16, 1/64
- Selectable EBU or NTSC preset matrix.
- Connect the camera to a CCU using multi-mode optical fiber cable to enable high resolution video and multiple signals to be transmitted between the camera and the CCU up to a distance of approximately 1,200 m.
- A lens file function (for up to 32 files) to save flare and shading values.
- Camera settings, such as VF settings, can be saved on an SD memory card. SD memory cards can also be used for firmware upgrades.
- Various information, including the color temperature setting, is displayed in the viewfinder.

Rear Panel



System Configuration and Interface





Camera Control Unit (CCU)

AK-HCU200P/HCU200E (Tajimi connector model)

AK-HCU200PS/HCU200ES (LEMO connector model)

Allows a High-Quality, Uncompressed, Long-Distance Optical Fiber Transmission Camera System to Be Configured at Low Cost

- High-Definition, Long-Distance, Optical Digital Transmission. The cable between the camera and the CCU can be extended up to approximately 1,200 m.
- The AK-HCU200 is 59.94 Hz/50 Hz switchable, and supports 1080/59.94i, 1080/50i, 1080/29.97PsF,*1 1080/25PsF,*1 1080/23.98PsF,*1 720/59.94p, and 720/50p HD Multi-formats.
- Two SDI channels and one VBS channel are provided for RET input, and prompter input (analog video signal input) is included as standard.
- Four SDI OUT lines are provided (two support PM output). In addition to HD video signal output, SD downconverted video signal output (SDI, analog composite) comes as standard.
- Multiple AK-HRP200G Remote Operation Panels and up to 19 AK-HCU200 Camera Control Units can be routed through a hub with IP connection.
- The AK-HRP935A Remote Operation Panel or AK-MSU935A Master Setup Unit can also be used for serial remote control of the AK-HCU200 Camera Control Unit.*2
- Setting Up CCU with a PC.
- The camera number and other text can be superimposed onto the color bar output signal.
- The SD memory card slot allows CCU setting data to be saved on an SD memory card.
- The 2U height of this compact, lightweight unit allows 2U rack mounting.

Rear Panel



AK-HC3800G/AK-HC3800GS/AK-HC3500A Common Options

AJ-CVF50G **NEW**
38.1 mm (1.5 inches) HD EVF

AJ-MC700P
Microphone Kit (monaural)

AJ-HVF21KG
50.8 mm (2 inches) HD EVF
59.94 Hz/50 Hz Switchable
Not available in some areas.

AJ-C10050G
Remote Control Cable
(50 m / 164 feet)

AK-HVF100GJ
22.9 cm (9 inch) LCD Color Viewfinder
*External power supply is required when connected to AK-HC3800G/GS/HC3500A.

AW-PS551
AC adaptor

SHAN-TM700
Tripod Adaptor

Remote Operation Panel (ROP)

AK-HRP200G

A Compact Operation Panel for Serial Connection and for Controlling up to 19 Cameras with IP Connection



- The AK-HRP200G supports both serial (1:1) and IP connection.*3 IP connection enables up to 19 cameras to be controlled by a single Remote Operation Panel.
- Five connection modes are provided: CCU Serial, CCU IP, Remote Camera Serial, Remote Camera IP and Camera Recorder IP.
- The menu can be displayed on a monitor connected to the Camera Control Unit, so detailed camera settings can be made by operating the Remote Operation Panel.
- The joystick control lever enables fine manual iris/pedestal operation.
- Scene files and user files can be saved on an SD memory card.
- The unit is compact, with a width of 92 mm and a 6U height for easy rack mounting.

Rear Panel



17.8 cm (7 inch) LCD Color Viewfinder

AK-HVF70G

Can also be used with the AK-HC3500AP/AES/AE.

Light Weight, Low Power Consumption, and High Resolution Plus Focus Assist Functions

- The compact, lightweight viewfinder weighs only about 1.6 kg (3.5 lb) (excluding hood, hood weights approx. 200 g (0.44 lb)). Thanks to the LCD panel, the power consumption is only 10W.
- This high-resolution, 17.8 cm (7 inches) color LCD panel displays 1024 pixel x 600 pixel (WSVGA) images. Its wide viewing angle extends to 130 degrees vertically and 160 degrees horizontally (contrast >10:1). Displays approximately 16,200,000 colors.
- The Focus-in-Red function emphasizes the image parts that are in focus by marking their edges in red, and the Pixel-to-Pixel function displays an enlarged image without resizing.



*1: The 1080/29.97PsF, 1080/25PsF and 1080/23.98PsF formats must be selected at the camera. *2: Only functions that are supported by the CCU can be controlled by the AK-MSU935A or AK-HRP935A. *3: External power supply (DC 12 V) required when LAN cable is used. Power is supplied by the Camera Control Unit in serial connection.

Studio Camera System Specifications & Dimensions

AK-HC3800G/HC3800GS

Power Supply	12 V DC (during external power supply operation) 190 V DC (when CCU is connected)
Power Consumption	25 W (during external power supply operation, camera only) 53 W (maximum power during external power supply operation when maximum power supplied for each output connector while all accessories are connected) 60 W (maximum power when CCU is connected and maximum power supplied for each output connector while all accessories are connected)
Operating Temperature	-10 °C to 45 °C (14°F to 113°F) Preheating required at temperatures below 0°C (32°F)
Storage Temperature	-20 °C to 60 °C (-4°F to 140°F)
Operating Humidity	10 % to 85 % (no condensation)
Weight	Approx. 3.7 kg (approx. 8.16 lb)
Dimensions (W x H x D)	135 mm x 260 mm x 367.5 mm (5-5/16 inches x 10-1/4 inches x 14-7/16 inches) excluding protrusions
Pickup Device	2/3 type 2.2 million pixel IT, CCD x 3
System	GBR pickup system
Color Separation Optical system	f/1.4 prism
Optical Filter	ND: Clear, 1/4, 1/16, 1/64
Lens Mount	Bayonet type
Output standard	SMPTE 292M
Sensitivity	F11 (59.94 Hz) F12 (50 Hz)
Horizontal Resolution	1100 TV lines
S/N	60 dB or higher
Output Format	1080/59.94i, 1080/50i, 1080/23.98p(over59.94i), 25p(over50i), 1080/29.97p(over59.94i), 720/59.94p*, 720/50p*, 1080/23.98PsF*
Horizontal Frequency	33.716 kHz, 1125 line frame (59.94 Hz) 28.125 kHz, 1125 line frame (50 Hz)
Vertical Frequency	59.94 Hz or 50 Hz, interlace
MIC Input	-60 dBu to 4 dBu (XLR 3-pin female x 2) Gain selected by camera menu
Intercom	XLR 5-pin female x 1 Input: -60 dBu to -20 dBu Output: 100 mW max.
HD-SDI Output	BNC x 2 (HD-SDI 1/HD-SDI 2) HD signal = 0.8 V [p-p], 75 Ω The HD-SDI 2 signal output can be added to the regular images using the camera menu item setting and switched to the VF or RET image output.
Prompter Output	BNC x 1, VBS signal = 1.0 V [p-p], 75 Ω
DC OUT	12 V, MAX. 1A
RET CONTROL Terminal	Round 6 pin x 1
VF	Round 20 pin x 1, D-Sub 29 pin x 1
Power Switching	CCU, OFF, EXT
USER 1/2/3	Functions specified by menu items can be assigned to the switch.
RET A/B Selection	For selecting the return signal
RET/PTT Switching	RET, PPT
Output Selection ^{*2}	CAM, BAR, TEST
White Balance Mode ^{*2}	A, B, preset
Shutter Speed Selection ^{*2}	59.94 Hz: 1/48 (23.98p), 1/60 (23.98p, 29.97p), 1/100, 1/120, 1/125, 1/250, 1/500, 1/1000, 1/1500, 1/2000 50 Hz: 1/50 (25p), 1/60, 1/100, 1/125, 1/250, 1/500, 1/1000, 1/1500, 1/2000
Intercom	MIC ON/OFF, receiving level, or PGM level
MIC Setting	MIC power, MIC gain, MIC1 selection

*1: The 720/59.94p, 720/50p and 1080/23.98PsF formats must be selected at the CCU.
*2: When the CCU is connected, the selection functions cannot be used. Control is performed from the ROP.

* When IP connection, 1080/29.97sF, 1080/50PsF, 720/59.94p, and 720/50p format are used, you may need to update AK-HC3800 firmware. For details, see the Panasonic website. <http://pro-av.panasonic.net/>

AK-HCU200P/E/PS/ES

Power Supply	100 V to 240 V AC, 50Hz/60 Hz
Power Consumption	170 W (Without CAMERA connected: 32 W)
Capacity for Supplying Power to a Camera	190 V DC, 0.6 A
Operating Temperature	0 °C to 40 °C (32 °F to 104 °F)
Operating Humidity	10 % to 90 % (no condensation)
Weight	Approx. 6.6 kg (approx. 14.6 lb)
Dimensions (W x H x D)	424 mm x 88 mm x 400 mm (16-11/16 inches x 3-7/16 inches x 15-3/4 inches) Excluding protrusions
Video Output	HD-SDI/SD-SDI: 4 lines (2 lines shared with picture monitor output*) Analog composite: 1 line (1 line shared with picture monitor output*)
Output Format	1080/59.94i, 1080/50i, 1080/29.97PsF**, 1080/25PsF**, 1080/23.98PsF**, 720/59.94p, 720/50p
Return Input	HD-SDI/SD-SDI: 2 lines (switched depending on the setting) VBS: 1 line
Prompter Input	1 line, Analog composite
Reference Input	1 line (1 loop-through line) Black burst/tri-level ^{†5}
Microphone Output	2 lines (XLR, 3-pin, male), 0 dBm/600 Ω
Intercom	XLR, 5-pin, female Input: -55 dBu to -10 dBu Output: 100 mW (max.)
COMMUNICATION	Intercom input/output: 2 lines (1/2*) (0 dBm, 600 Ω, RTS/4W*) PGM: 1 line, input (0 dBm/600 Ω) Tally input: Red, Green, 1 input each
ROP interface	RS-422, 1 line, 12 V output
MSU interface	RS-422, 1 line, GPI for control
LAN port	1 line (8-pin, RJ45)

*3: Depending on the setting, only one of them can be selected at one time.

*4: The 1080/29.97PsF, 1080/25PsF and 1080/23.98PsF formats must be selected at the camera.

*5: The black burst signal and tri-level sync signal of the reference input are recognized automatically.

AK-HRP200G

Power Supply	12 V DC
Power Consumption	4.2 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)
Operating Humidity	90 % or less
Weight	Approx. 1.3 kg (approx. 2.87 lb)
Dimensions (W x H x D)	92 mm x 308 mm x 55 mm (3-5/8 inches x 12-1/8 inches x 2-3/16 inches) excluding protrusions
CCU Control	<ul style="list-style-type: none"> Control signals (camera, CCU control) Power supply (12 V DC)^{*6} Tally control signal
PREVIEW control	Contact output
Maximum cable length	50 m (164 ft)

*6: Can be provided from CCU or AC adaptor

AK-HVF70G

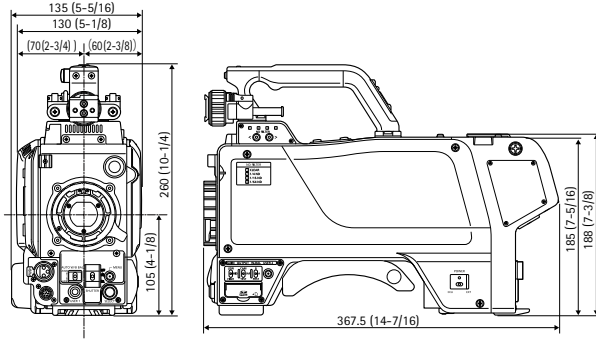
Power Supply	DC 12 V (supplied by the camera)
Power Consumption	10 W
Operating Temperature	0 °C to 45 °C (32 °F to 113 °F)
Storage Temperature	-20 °C to 60 °C (-4 °F to 140 °F)
Operating Humidity	10% to 85% (no condensation)
Weight	Approx. 1.6 kg (approx. 3.53 lb) (without hood) 243.5 mm x 212 mm x 172 mm (9-19/32 inches x 8-11/32 inches x 6-25/32 inches) (with hood attached) 243.5 mm x 212 mm x 85 mm (9-19/32 inches x 8-11/32 inches x 3-11/32 inches) (without hood)
Dimensions (W x H x D)	
Panel Size	177.8 mm (7.0 inches)
Number of Pixels	1024 pixel x 600 pixel (WSVGA)
Display Colors	Approx. 16,200,000 colors
Operation Panel	POWER switch x 1, MENU button x 1 SELECT dial x 1, Function buttons x 3 Picture adjusting knobs x 3 ([BRIGHT], [CONTRAST], [PEAKING])
Connectors	Camera I/F connector (D-Sub 29-pin x 1)

Weight and dimensions are approximate.
Specifications are subject to change without notice.

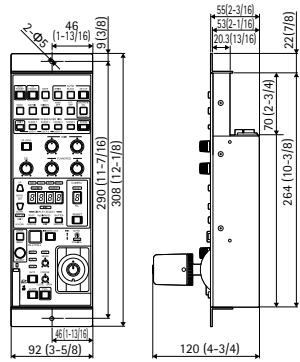
Dimensions

Unit: mm(inches)

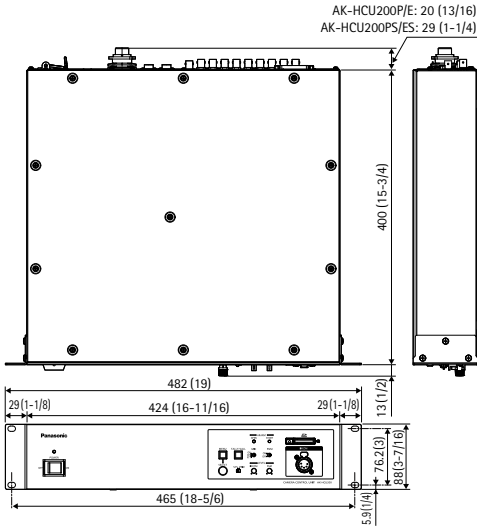
■ AK-HC3800G/HC3800GS



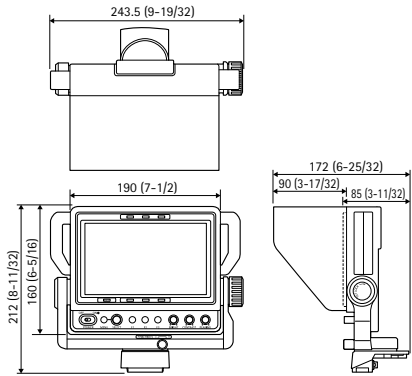
■ AK-HRP200G



■ AK-HCU200P/E/PS/ES



■ AK-HVF70G



Studio Camera System



Studio Handy Camera

AK-HC3500AP / AK-HC3500AES (LEMO connector model)

AK-HC3500AE (Tajimi connector model)

*This model is not available in some areas.

High Performance HD Camera System with Optical Fiber Transmission Capability

• The 2/3 type 2.2-megapixel 3CCD enables standard sensitivity of F11 (2,000 lx/50 Hz), F10 (2,000 lx/59.94 Hz), which is one of the highest levels in this camera range.

• Supports the HD formats of 1080/59.94i, 1080/50i, 1080/29.97p (over 59.94i), 1080/23.98p (over 59.94i)*, and 1080/25p (over 50i).

*The AK-HCU355A enables conversion to 1080/23.98p (over 47.96i).

• High-Performance DSP Provides 16 bit A/D, 38 bit Processing.

• The Dynamic Range Stretch (DRS) function automatically suppresses blocked shadows and blown highlights. A gamma curve and knee slope are applied to match the contrast of each pixel and corrected in real time to maintain excellent gradation for each shade even when a single scene contains dark, bright and intermediate shades.

• Selectable gamma curves are included in the DSP circuit. Five modes including the Film Rec mode which produces film tone, Video Rec mode and Film-like 1/2/3.

• The 12-axis color correction function allows precise and independent hue and saturation adjustment of individual colors.

• The EBU or NTSC preset color correction matrix can be selected.

• Skin Tone Detail Correction separately reduces the sharpness of two types of color gamut to help tone down wrinkles and dull areas for more beautiful, natural textures. The function can be applied to the entire hue phase (360°), enabling the sharpness of all colors, not just skin tones, to be reduced.

• 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.

• When mounting onto an optional Build-up Unit, a mechanism enlarges the internal diameter of the lens mount.

• Internal motor driven filters for shooting in variable lighting conditions and color temperatures.

[CC filter] 3200K, 4300K, 6300K, Cross, Diffusion

[ND filter] CAP, Through, 1/4, 1/16, 1/64

• Connect the camera to a CCU using multi-mode optical fiber cable to enable high resolution video and multiple signals to be transmitted uncompressed between the camera and the CCU up to a distance of approximately 2,000 m. Operating convenience is further assured by the movable connector.

• Two lines of data trunk are provided (select between RS-422 and RS-232C) to support virtual systems, etc.

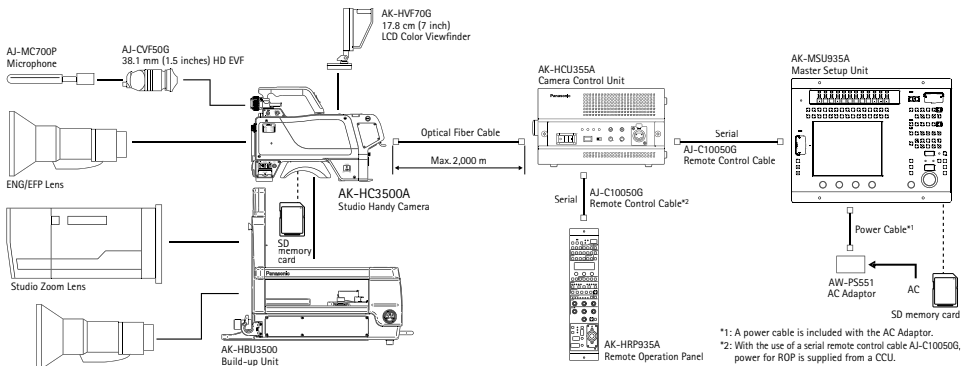
• A lens file function (for up to 32 files) to save flare and shading values.

• Using an SD Memory Card enables storage and retrieval of various camera settings, such as user viewfinder indications.

Rear Panel



System Configuration and Interface





Camera Control Unit (CCU)

AK-HCU355AP/AK-HCU355AES (LEMO connector model)
AK-HCU355AE (Tajimi connector model*)

*This model is not available in some areas.

Portable Half-rack Size, High-Quality Optical Fiber Transmission, and Camera Power Supply.

- The AK-HC3500A can be connected to a Camera Control Unit (CCU) via an optical fiber cable. High-quality images and signals can be transmitted even when the cable length between the camera and the CCU is up to about 2,000 m. Operating convenience is further assured by the movable connector.
- Standard video output: HD-SDI, SD-SDI, SD composite.
- With a tub, two units of the CCU can be mounted together in a 3U rack size.
- Text display of BAR ID, output source for color bar images, etc.
- Two prompter inputs are provided as a standard feature. (One input when dual sync is used.)
- Four HD/SD-SDI return inputs are provided.
- DC (12V) power drive. (When the camera is driven by a DC power supply.)
- The large power supply enables 200 VA to be taken from the utility power supply of the Build-up Unit. (The power supplied varies depending on the length of the optical fiber cable.)
- Two lines of data trunk are provided (selectable from RS-422/ RS-232C). No cables required to control virtual system, pan/tilt camera head, or lens.

Rear Panel



Build-up Unit

AK-HBU3500

*This model is not available in some areas.

Supports Large, High-Power Lenses



Master Setup Unit (MSU)

AK-MSU935A

Can also be used with the AK-HC3800G/GS*1.

With a large LCD control panel, the MSU can adjust all of the camera's parameters, serving up to 12 camera systems.

- Master control of precise camera settings for the entire camera system (up to 12 camera systems)
- Switch between external monitor and waveform monitor.
- Large-scale (16-cm/6.3-inch) LCD display
- SD Memory Card slot for storing/retrieving three user references, eight scene files, and sixteen lens files.

Rear Panel



* Optional AC adaptor is required.

Remote Operation Panel (ROP)

AK-HRP935A

Can also be used with the AK-HC3800G/GS*1.

The 1/4 rack size Remote Operation Panel can easily adjust camera parameters.

- Full control of camera settings
- 1/4 rack size Remote Operation Panel



Rear Panel



*1: Serial connection only.

Studio Camera System Specifications & Dimensions

AK-HC3500AP/AES/AE

Power Supply	DC 12 V (during external power supply operation) AC 220 V (when CCU is connected)
Power Consumption	AK-HC3500AP: 32W (during external power supply operation) 34W (when CCU is connected) AK-HC3500AE/AK-HC3500AES: 28W (during external power supply operation) 70W (when CCU is connected)
Operating Temperature	-10 °C to 45 °C (14 °F to 113 °F) Preheating required at temperatures below 0°C (32°F)
Operating Humidity	Less than 85 %
Storage Temperature	-20 °C to 60 °C (-4°F to 140°F)
Weight	Approx. 4.7 kg (approx. 10.36 lb)
Dimensions (W x H x D)	135 mm x 260 mm x 360 mm (5-5/16 inches x 10-1/4 inches x 14-3/16 inches) excluding protrusions
Pickup Device	2/3 type 2.2 million pixel IT, CCD x 3
System	GBR Pickup System
Color Separation Optical system	f/1.4 prism
CC Filter	3200 K, 4300 K, 6300 K, Cross, Diffusion
ND Filter	CAP, Through, 1/4, 1/16, 1/64
Lens mount	Bayonet mount
Sensitivity	59.94 Hz F10 (2000 lx, 3200 K, 89.9 %)
	50 Hz F11 (2000 lx, 3200 K, 89.9 %)
S/N	60 dB (typ) (Y: 30 MHz)
Horizontal modulation	More than 50 % (27.5 MHz)
Output Format	1080/59.94, 1080/50i, 1080/29.97p (over 59.94i), 1080/25p (over 50i), 1080/23.98p (over 59.94i)
HD-SDI Output	HD signal = 0.8 V [p-p], 75 Ω (BNC) The HD-SDI 2 signal output can be added to the regular images using the camera menu item setting and switched to the VF or RET image output. Embedded audio supported (MUTE when RET Video output)
PROMPT Output GENLOCK Input	VBS signal = 1 V [p-p], 75 Ω (BNC) Tri-level SYNC/BB (BNC x 1) The PROMPT output and the GENLOCK input are changed with the switch.
AUX Output	Prompt2 Output: VBS Signal = 1 V [p-p], 75 Ω (BNC) (When there is Prompt2 input in CCU)
MIC Input	-60 dBu to 4 dBu (XLR 3-pin female x 2) Gain selected by camera menu
Intercom	Input: -60 dBu to -10 dBu Output: 100 mW max. (XLR 5-pin, female x 2) (The mix of PGM1 and PGM2 is individually controlled)
DC OUT	12 V, MAX. 1 A

AK-HBU3500

Power Supply	AC 220 V, 50Hz/60 Hz (Supplied from the Studio Handy Camera)
Power Consumption	20 W (main unit only) 200W (with large lens, viewfinder and maximum load condition of AC outlet)
Operating Temperature	-10 °C to 45 °C (14 °F to 113 °F)
Operating Humidity	Less than 85 %
Weight	Approx. 14.5 kg (Approx. 32.0 lb)
Dimensions (W x H x D)	300 mm x 417 mm x 510 mm (11-13/16 inches x 16-7/16 inches x 20-1/16 inches)
Adjustment Functions	H-POSI, V-POSI, WIDTH, HEIGHT, 4:3 brightness adjustment level
Switch Functions	AC output reset, Viewfinder power, UV tally ON/OFF, Center maker, Cursor memory 1, Cursor memory 2, 4:3 marker, ND filter selection, Local, CC filter selection, Menu ON/OFF, Menu JOG, Return A switch, Return B switch, User, Viewfinder detail, Monitor output selection, P in P function ON/OFF, P in P position selection (functions not available with the AK-HC3500A)

*This model is not available in some areas.

AK-HCU355AP/AES/AE

Power Supply	DC 12 V AC 100 V to 120 V, 50 Hz/60 Hz (AK-HCU355AP) AC 220 V to 240 V, 50 Hz/60 Hz (AK-HCU355AES/355AE)
Power Consumption	37 W (excluding power supply) 340 W (include power supply)
Capacity for Supplying Power to a Camera	AC 220V to 240 V, 1.2 A, 50 Hz/60 Hz (AK-HCU355AP) AC 220V to 240 V, 1.2 A, 50 Hz/60 Hz (AK-HCU355AES/355AE)
Operating Temperature	0 °C to 40 °C (32 °F to 104 °F)

Operating Humidity	10 % to 90 % (no condensation)
Weight	Approx. 9 kg (Approx. 19.8 lb)
Dimensions (W x H x D)	200mm x 120 mm x 445 mm (7-7/8 inches x 4-3/4 inches x 17-9/16 inches) excluding protrusions
Video Output	HD-SDI/SD-SDI x 4 lines*1 (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**2
Return Input	HD-SDI/SD-SDI x 4 lines
Prompter Input	Analogue composite x 2 lines**2
Reference Input	Black burst/tri-level x 2 lines (loop-through x 1 line)**2, **3
Sync Output	Analogue sync, HD (±0.3 V [p-p]) / SD (1 V [p-p]) (with 75 Ω termination) x 1 line**4
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**4
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: Cross cable)

AK-MSU935A

Power Supply	DC 12 V
Power Consumption	15 W
Operating Temperature	0 °C to 40 °C (32 °F to 104 °F)
Operating Humidity	Less than 80 %
Weight	Approx. 3.25 kg (Approx. 7.2 lb)
Dimensions (W x H x D)	340 mm x 75 mm x 264 mm (13-3/8 inches x 2-15/16 inches x 10-3/8 inches)
Switch Functions	Camera selection, MODE ON/OFF (5600 K, Flare OFF, Black Gamma OFF, Gamma OFF, Knee OFF, White clip OFF, HD matrix ON, PM character display, HDTV detail OFF, SDIV detail off, HDTV skin tone detail ON, SDIV skin tone detail ON), Control item selection (LUNDO, Black shading selection, White shading selection, R/G/B shading, Matrix control, FUNC, System, Pedestal control, Gain control, Gamma curve control, Flare control, Knee/White clip control, HD detail control, SDIV detail), ALL, Reference, Camera video output selection, Automatic adjustment (Auto white balance, Auto black balance, Auto setup), Monitor selection, Scene files, SHUTTER, Gain selection, Filter selection (HEAD, ND filter, CC filter), CALL, Auto iris, Iris active, Master pedestal storage, Master pedestal file call
Adjustment Functions	Iris, Master pedestal
CCU control	RS-422 compliant
Camera (CCU) connection	Control up to 12 cameras

- *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.
*5: Reference input 2 supports only dual sync tri-level sync signal input when the 23.98P5F format applies.

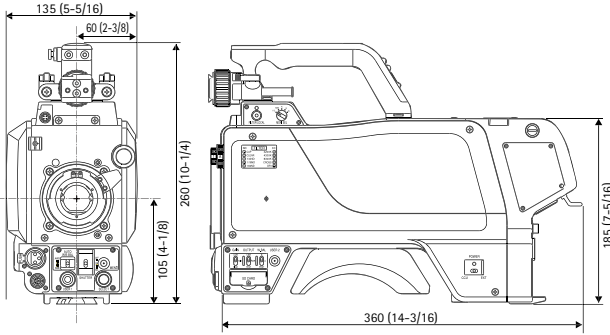
AK-HRP935A

Power Supply	DC 12 V (DC 10V to 17V) (supplied from CCU)
Power Consumption	Approx. 6 W
Operating Temperature	0 °C to 40 °C (32 °F to 104 °F)
Operating Humidity	Less than 80 %
Weight	Approx. 1.85 kg (Approx. 4.1 lb)
Dimensions (W x H x D)	92 mm x 419 mm x 55 mm (3-5/8 inches x 16-1/2 inches x 2-3/16 inches) excluding protrusions
CCU Control	Control signals (camera, CCU control)
Maximum Cable Length	RS-422 compliant 50 m (164 ft)

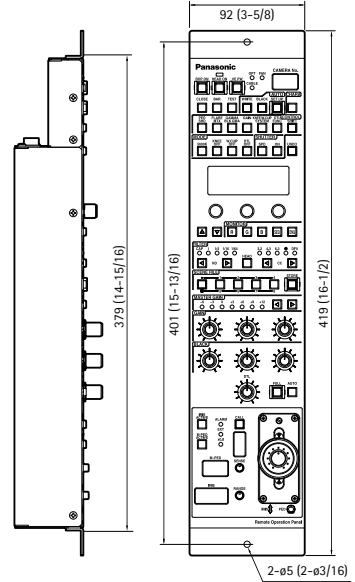
Dimensions

Unit: mm(inches)

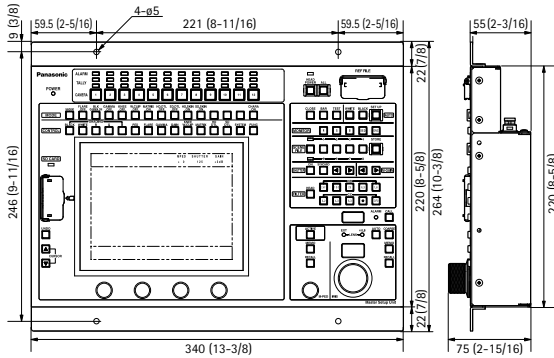
■ AK-HC3500AP/AES/AE



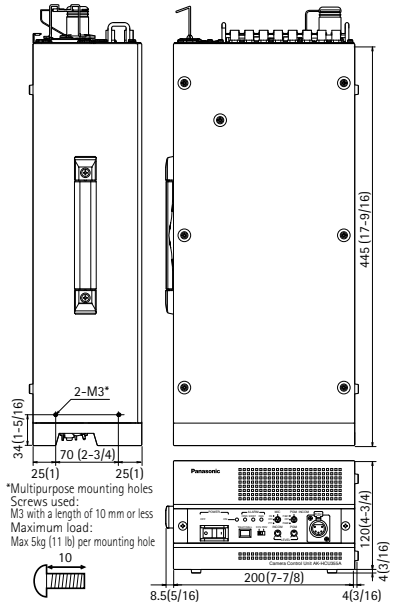
■ AK-HRP935A



■ AK-MSU935A

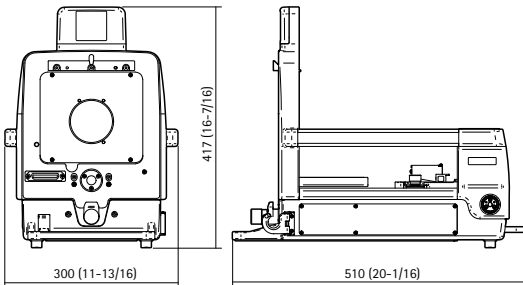


■ AK-HCU355AP/AES/AE



*Multipurpose mounting holes
Screws used:
M3 with a length of 10 mm or less
Maximum load:
Max 5kg (11 lb) per mounting hole

■ AK-HBU3500



Multi-Purpose Camera



11 million pixels

4K Multi Purpose Camera

AK-UB300GJ **NEW**

4K Multi Purpose Camera supporting simultaneous output in UHD and HD and equipped with a 2/3 type lens mount

- Two sensitivity modes can be selected (high sensitivity mode/standard mode).
- Equipped with cropping function for selecting up to three setting areas and capturing the desired locations.
- Equipped with a newly developed haze reduction function.
- Transmission with a single cable is possible when an existing output board (3G x 4) is replaced with a 12G or 3G TICO UHD output board.
- Equipped with 4K focus assist function and HD cropping marker.
- Compatible with HD-IP streaming output and IP control.
- Integration with Panasonic's AW series system cameras is possible.
- Equipped with flash band compensation function and scan reverse function.
- Equipped with a wide range of color correction functions (linear matrix, 12-axis color correction, skin color correction, etc.).
- Dynamic Range Stretch (DRS) automatically optimizes contrast.
- Equipped with intelligent automatic adjustment functions for white balance, gain, etc.
- Serial/IP control possible from AK-HRP200G/AK-HRP1000GJ/AK-HRP1005GJ Remote Operation Panels (ROP) and AW-RP50/AW-RP120G Remote Camera Controller.

* TALLY lights can only be controlled by IP control.

Option Boards



12G Output Board
AK-UHD12G **NEW**

Scheduled for release in June 2017

- Output: UHD 12G 2 outputs or UHD 3G x 4 1 output
HD 2 outputs



3G TICO UHD Output Board
AK-UTS03G **NEW**

Scheduled for release in October 2017

- Output: UHD 2 outputs (3G TICO)
HD 2 outputs

3G TICO & 12G to Quad 3G SDI Converter
AK-UGB01G **NEW**



Scheduled for release in October 2017

This unit converts the signal from 3G TICO UHD Output Board to 3G x 4. It also converts 12G SDI signal to 3G x 4.

- Input: 1 input (12G or 3G TICO)
1 output (3G x 4)
Quad Square / 2 Sample Interleave (Level A or B)

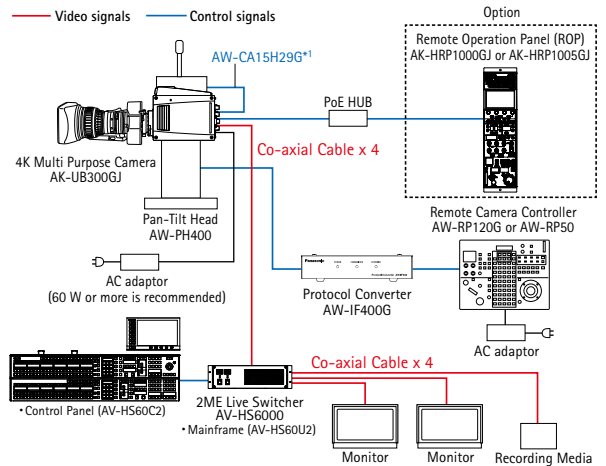
[Multi Purpose Camera Application Examples]

Application :

Sports Broadcasting



High speed and accurate camera operation for sports shooting

The AK-UB300GJ Multi-Purpose Camera for high-resolution and low-moire shooting and the AW-PH400 indoor pan-tilt head for high speed (90°/s) and accurate pan-tilt movement powerfully backs up skillful camerawork required for sports broadcasting.



*1: AW-CA15H29G is not required when a remote operation panel (ROP) is directly connected to AK-UB300GJ.
* Some functions are restricted when AW-PH400 Pan-Tilt Head is connected.

Pan-Tilt Head

Model No.	AW-PH400		AW-PH650
Appearance	 For indoor use		 For outdoor use
Power supply / Power consumption	AC 120 V (60 Hz), AC 220 to 240 V (50/60 Hz) / 145 W		AC 120 V (60 Hz), AC 220 to 240 V (50 Hz) / 120 W
Weight	Approx. 10.2 kg (Approx. 22.5 lb)		Pan-tilt Head: Approx. 19 kg (Approx. 41.9 lb) Housing: Approx. 18 kg (Approx. 39.7 lb) AC adaptor: Approx. 4.2 kg (Approx. 9.3 lb)
Dimensions (W x H x D) (pan-tilt head only, excluding protrusions)	315 mm x 534 mm x 188 mm (12-3/8 inches x 21 inches x 7-3/8 inches)		Pan-tilt Head: 237 mm x 511 mm x 213 mm (9-5/16 inches x 20-1/8 inches x 8-3/8 inches) Housing: 246 mm x 314 mm x 685 mm (9-11/16 inches x 12-3/8 inches x 26-15/16 inches) AC adaptor: 200 mm x 131 mm x 280 mm (7-7/8 inches x 5-3/16 inches x 11-1/16 inches)
Maximum load (including with a camera, a lens and a teleprompter)	Approx. 8 kg (Approx. 17.6 lb)		Approx. 10 kg (Approx. 22.0 lb)
Pan/tilt angle (maximum pan/tilt speed)	Pan	Approx. $\pm 200^\circ$ (90°/s)	Approx. $\pm 160^\circ$ (20°/s)
	Tilt	Approx. $\pm 150^\circ$ (90°/s)	Approx. 50° to Approx. -95° (20°/s)
Stop accuracy	under ± 30 arcseconds (0.008°)		under ± 5 arcminutes (0.08°)
Quietness	under NC30 (at 30°/s)		under NC40 (at 20°/s)
Maximum control distance (when using AW-RP120G/AW-RP50)	1500 m (when using the protocol converter AW-IF400G*)		1000 m
Interface RS232C	-		-
Maximum preset memories	50		50
Applicable lens	ENG lenses, MD lenses		ENG lenses, MD lenses
Tally light	Standard equipment (removable)		-
Teleprompter output	Standard equipment		-
Accessory	Camera cable (Approx. 0.6 m)		Multi cable (Approx. 10 m) Camera cable (Approx. 0.4 m) Camera housing
AC Adaptor/Power Cable	AC adaptor built in (power cable (2 m) included)		AC adaptor DC power cable (Approx. 30 m)

* When using AW-PH400 and AW-PH650 with AK-UB300GJ, please contact your regional dealer. * For more details, see Remote Camera System Optional Products on page 39.

2/3 type Lens



20x HD Zoom Lens AK-LZ20M85G

• Focal length: 8.5 mm-170 mm (F1.8-F2.7)
 • Weight: Approx. 1.41 kg (Approx. 3.1 lb)
 [excluding lens hood]
 Dimensions (W x H x D): 114 mm x 91 mm x 170 mm
 (4-1/2 inches x 3-19/32 inches x 6-11/16 inches)

Cable

Name	Model	Length	Remote Camera	Pan-Tilt Head	Controller	Note
Cable for Indoor Pan-tilt Head Connection	AW-CA15H29G	0.7 m	AK-UB300GJ AK-HC1800G* AK-HC1500G*	AW-PH360* AW-PH405* AW-PH400	AW-RP120G AW-RP50	Remote camera - Pan-Tilt Head connection*

*1: To connect the AW-HE870 with the AW-PH360/AW-PH405/AW-PH400/AW-PH650 pan-tilt head, or to connect the AK-HC1500G/AK-HC1800G with the AW-PH650 pan-tilt head, use the camera cable that comes with each pan-tilt Head.

☆ Limited Stock ★ Discontinued Products

4K / HD Integrated Camera

For indoor use



AW-UE70W



AW-UE70K



1/2.3-type MOS	20x optical zoom	Digital Zoom/i.Zoom	
DRS/DNR/HDR	OIS	PoE+	IP control
4K/HD image IP transmission	Up to 100 presets	Audio Input	
USB Video Class	MicroSD Card Recording		

Integrated pan-tilt 4K cameras able to output 4K video via HDMI, USB, and IP transmission

- In addition to HDMI, SDI and USB output, production quality 4K/full HD video output via IP transmission is supported.
- With the four-drive lens system, three zoom lenses and one focus lens are driven independently and simultaneously.
- With PoE+*, power can be supplied via LAN cable so installation costs can be reduced.
- Supports remote camera control using an IP control browser. It can be operated from not only a PC but also a MAC or mobile terminals.
- For SDI/HDMI output, 2160/29.97p (HDMI only), 2160/25p (HDMI only), 1080/59.94p, 29.97p, 59.94i, 29.97PsF, 1080/50p, 25p, 50i, 25PsF, 720/59.94p, and 50p image formats are supported.
- Optical (FHD, 4K)/4-axis Hybrid Image Stabilizer (FHD) for stable shooting.
- High Dynamic Range (HDR) mode corrects for halation and black defects.
- Shooting in low-light conditions is possible using Night Mode which supports automatic switching.
- In addition to a 20x optical zoom, the AW-UE70W/K series can zoom up to 30x (22x when in 4K mode) while maintaining high resolution thanks to Super Resolution technology.
- The Freeze During Preset function enables to freeze the video during preset playback.
- In addition, using an IP network, it is possible to externally control recording start/stop and transmit recorded files to an FTP server.

For indoor use



AW-HE130W



AW-HE130K

1/2.86-type 3MOS	20x optical zoom	Digital Zoom	
DRS/Hybrid DNR	OIS	PoE+	IP control
HD image IP transmission	Up to 100 presets	Audio Input	

Integrated pan-tilt full-HD cameras supporting IP transmission output of full HD images

- In addition to HD-SDI and HDMI output, IP transmission of full-HD video output and multi-streaming output are supported.
- Transmit IP video without a separate encoder reduces cost and simplifies installation.
- With PoE+*, power can be supplied via LAN cable so installation costs can be reduced.
- Supports remote camera control using an IP control browser. It can be operated from not only a PC but also a MAC or mobile terminals.
- Supports HD/SD multi-format including 1080/29.97p*, 25p*, and 23.98p*3.
- Equipped with 1/2.86-type full HD 3MOS sensors and DSP (Digital Signal Processor). Achieves high sensitivity, a high S/N ratio and high resolution through the use of advanced video processing.
- Optical Image Stabilization System (OIS) and 1.4x Digital Extender Zoom.
- Independent Color Correction Function with 12 Color Axes + 3 Skin Tone Axes and Color Temperature Adjustment Mode.
- Shoot clearer video with Hybrid Digital Noise Reduction (Hybrid DNR).
- Equipped with Night Mode for infrared shooting.
- The Freeze During Preset function enables to freeze the video during preset playback.

For indoor use



AW-HE2

1/4.37-type MOS	Ultrawide-Angle Lens	i.Zoom	DRS	IP control
HD image IP transmission	Up to 9 presets	Audio Input	USB Video Class	

Compact HD camera with built-in microphone and ultrawide-angle horizontal viewing and Intelligent Zoom

- Ultra-compact body with wide-angle lens, microphone and tally lamp.
- Ultrawide-angle 95° horizontal viewing and Intelligent Zoom.
- Supports remote camera control using an IP control browser.
- Digital pan/tilt, PinP (Picture in Picture) mode, preset memory.
- Video/Audio output and power supply via USB
- Dynamic Range Stretch (DRS) automatically optimizes contrast.

For indoor use



AW-HE40SW [SDI Model] **AW-HE40SK** [SDI Model]
AW-HE40HW [HDMI Model] **AW-HE40HK** [HDMI Model]

1/2.3-type MOS	30x optical zoom	Digital Zoom/i.Zoom
DRS/DNR/HDR	PoE+	IP control
HD image IP transmission	Up to 100 presets	Audio Input
USB Video Class	MicroSD Card Recording	

Integrated pan-tilt full-HD cameras with excellent operability and installation flexibility

- In addition to HD-SDI (AW-HE40SW/SK) and HDMI (AW-HE40HW/HK) output, IP transmission full HD video output and multi-streaming output are supported.
- With PoE+^{*1}, power can be supplied via LAN cable so installation costs can be reduced.
- Supports remote camera control using an IP control browser. It can be operated from not only a PC but also a MAC or mobile terminals.
- Supports 1080/59.94p (HDMI model only), 29.97p^{*2}, 59.94i, 29.97PsF, 1080/50p (HDMI model only), 25p^{*2}, 50i, 25PsF, 720/59.94p, and 50p video formats.
- High Dynamic Range (HDR) mode corrects for halation and black defects.
- Shooting in low-light conditions is possible using Night Mode, which supports automatic switching.
- With i.Zoom, the AW-HE40 series can zoom up to 40x while maintaining high resolution.
- The Freeze During Preset function enables to freeze the video during preset playback.
- In addition, using an IP network, it is possible to externally control recording start/stop and transmit recorded files to an FTP server.

For outdoor use

IP65



AW-HR140 **NEW**
 Scheduled for release in Summer 2017

1/2.86-type 3MOS	20x optical zoom	Digital zoom
DSP	D.I.S.S.	PoE++ ^{*4}
HD image IP transmission	Up to 100 presets	Audio Input

Outdoor integrated pan-tilt full HD camera with high sensitivity, high S/N ratio, and high resolution

- In addition to HD-SDI output, IP transmission full HD video output and multi-streaming output are supported.
- With PoE++^{*1*}, power can be supplied via LAN cable so installation costs can be reduced.
- Supports 1080/59.94p, 1080/50p, 1080/59.94i, 1080/50i, 1080/29.97p^{*2}, 1080/25p, 1080/23.98p^{*3}, 1080/29.97PsF, 1080/25PsF, 1080/23.98PsF, 720/59.94p, and 720/50p video formats.
- Equipped with 1/2.86-type full HD 3MOS sensors and DSP (Digital Signal Processor). Achieves high sensitivity, a high S/N ratio and high resolution through the use of advanced video processing.
- Dynamic Image Stabilizing System (D.I.S.S.) simultaneously reduces both large, slow swings and small, quick vibrations.
- Equipped with intelligent automatic adjustment functions for white balance, gain, etc.
- Equipped with a newly developed haze reduction function.
- Oval shape reduces air resistance and tough aerodynamic form resists adhering of snow and dirt.
- IP65 water and dust resistance, wipers as standard equipment, and salt-resistant paint support installation in severe environments.
- Shooting in low-light conditions supported using Night Mode.
- Freeze During Preset function enables freezing of the video during preset playback.

Option

Wireless remote control
AW-RM50G
 ("AA", "R6" or "LR6" battery x 2 are not included.)



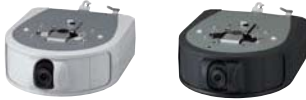
*For AW-UE70W/K, AW-HE130W/K, AW-HE40 series and AW-HE2

Direct Ceiling Mount Bracket
VV-Q105A



*For AW-UE70W/K, AW-HE130W/K, AW-HE40 series and AW-HEA10W/K

For indoor use



Control Assist Camera

AW-HEA10W AW-HEA10K

Wireless control from iPad*1 for pan, tilt and zoom of an 4K/HD Integrated Camera*2

- AW-HEA10W/K Control Assist Camera and 4K/HD Integrated Camera*2 used in combination.
- 95° wide-angle view is captured by the Control Assist Camera and displayed on an iPad*1.
- Tapping the desired area of the 95° wide-angle image displayed on the iPad*1 to turn the 4K/HD Integrated Camera*2 to capture the tapped position.
- Thus, controlling, panning, tilting and zooming the 4K/HD Integrated Camera*2 are simple and intuitive.
- Allows up to 9 presets.
- Allows up to 100 sets of Control Assist Camera and 4K/HD Integrated Camera can be connected to an iPad.
- With PoE support, power can be supplied via LAN cable.
- By changing the mounting surface, desktop and hanging installation are both supported.

[Basic system and operations]



4K PROFESSIONAL



360-degree Live Camera

AW-360B10 **NEW** (360-degree Live Camera Base Unit) AW-360C10 **NEW** (360-degree Live Camera Head)

Scheduled for release in August 2017 Scheduled for release in August 2017

360-degree uncompressed video 4K output (2:1 Equirectangular format)

- This system can stitch video from 4 cameras by itself without external equipment and output 360-degree video in 2:1 equirectangular format.
- Outputs natural images through "real-time active stitching capability" which detects an object at the seam, and adjusts stitching position constantly.
- By combinational AE / ATW of each cameras depending on shooting condition, it can adjust light and color totally.
- Outputs 4K/30p uncompressed high definition video with very low latency.
- Flexible operation thanks to easy installation and uninstallation at a shooting site.
- Capable of monitoring and configuration remotely with a PC via network. Control from iPad in Wi-Fi environment is also possible.
- We will offer high-reliability shooting for professional use such as prevention of unexpected cable removal.

*1: An iPad (sold separately) and a wireless AP (sold separately) are required. Please install the iPad application "PTZ Cntrl" (free). For details, please visit Panasonic AW-HEA10W/K website (http://pro-av.panasonic.net/en/sales_o/camera/aw-hea10/). *2: AW-UE70W/K, AW-HE130W/K, and AW-HE40 series only.

Detection of motion of subjects without need for sensors and automatic tracking, and recording in situations such as lectures using remote cameras*¹ by installing to a computer

Auto Tracking Software Key

AW-SF100G



- High-performance "motion detection" and high-accuracy "facial recognition"²⁾ are used. Highly precise automatic tracking with few breaks is possible regardless of where the person is facing, such as when a lecturer is writing on a blackboard.
- An easy-to-understand GUI is employed to enable intuitive setting tasks.
- IP-based software is employed with operation via IP connection, so cameras can be set up in a classroom and operated remotely.
- The software can be set for use as a web application too, enabling control via tablet or smartphone as well as PC.
- Install on a PC³⁾ and connect to a Panasonic remote camera.

*1: AW-UE70W/K, AW-HE130W/K, and AW-HE40 series only.

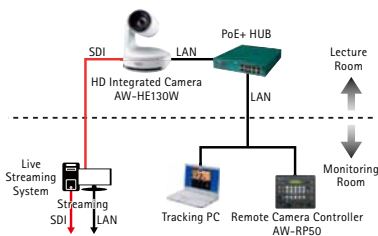
*2: The face recognition software of PUX Corporation is used for the face recognition function.

*3: This refers to the Standalone version. If the Web application version is to be used, the Auto Tracking Software is installed on an HTTP server and used from there.



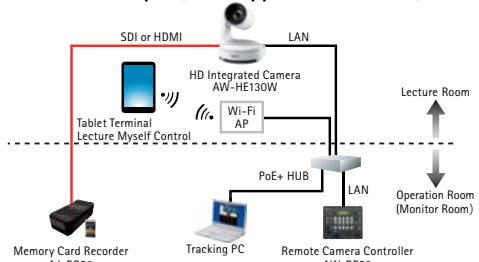
* Depending on the usage conditions, there may be errors in detection of tracked subjects or they may not be tracked properly. Please use this software in an environment in which corrections can be made by an operator. * There is a 30-day free trial available for Auto Tracking Software. Please purchase this "Auto Tracking Software Activation Key" after checking precautions and confirming that this will work in your environment during this free trial period. When purchasing optional software please refer to the Panasonic website <<http://pro-av.panasonic.net/>>"Software Download".

Connection Example (Standalone Version)



*Only AW-UE70W/K, AW-HE130W/K and AW-HE40 series supported PoE+.

Connection Example (WEB Application Version)



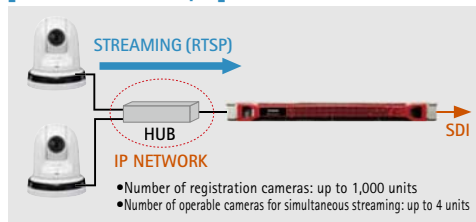
P2 Streaming Server

Remote camera video streaming via a network and SDI output; streaming receiver enables smooth operation on PC screen

- Equipped with original QoS to achieve stable streaming.
- GUI enables intuitive operation.
- Extensive input/output for flexible support.

* Remote Cameras do not support QoS.

[Connection Example]



Compact Camera Head Memory Card Portable Recorder

AG-UCK20GJ **NEW**

AG-UMR20 **NEW**

"New POVCAM" with a Compact, Lightweight, Free-Shooting Design and IP Network Linking Capability

- A compact, lightweight, free-style shooting system inheriting the features of the 1st-generation POVCAM.
- Network operation for IP control and IP streaming.
- Acquisition of high-quality FHD (1920 x 1080) 59.94p/50p/23.98p images and high-resolution 4K (UHD (3840 x 2160)) 29.97p/23.98p/25p* images is supported.
- Equipped with Double SD Memory Card Slots (SDXC supported) enabling Relay Recording with two SD memory cards. Extended recording is possible and can be used for backup recording.

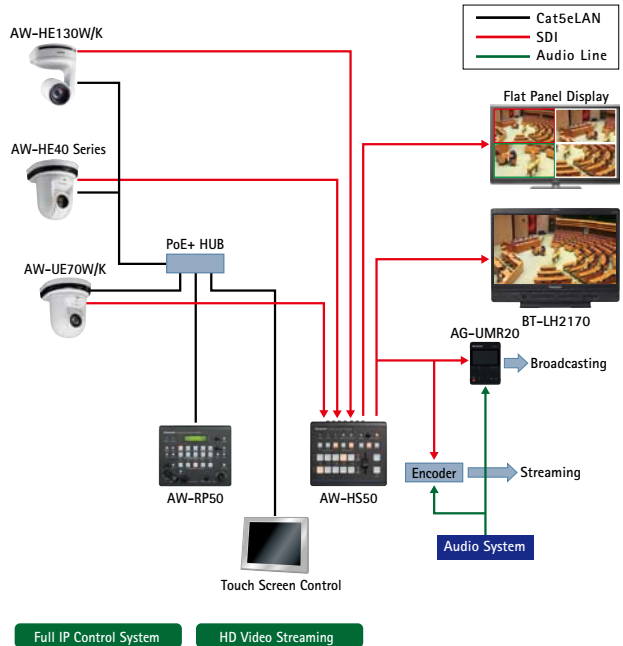
*4K acquisition is possible only when connected to the AG-UCK20GJ Compact Camera Head. 4K refers to UHD (3840 x 2160) resolution. The maximum resolution in 4K shooting mode via HDMI/SDI output is FHD (1920 x 1080) 59.94/50i.

4K / HD Integrated Camera Application Examples

Application 01: Parliament / Conference Room

Quick capture of speakers using extensive preset camera positions

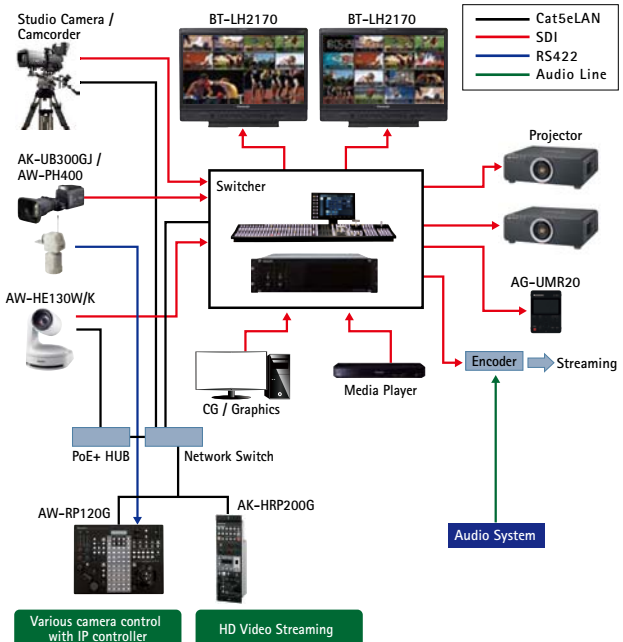
Efficient camera control is possible by defining 4K/HD Integrated Camera positions in advance. Combining this with touch panel screen controller enables quick camera work with only few shooting staff.



Application 02: HOW / Event

Sophisticated image production combining high-performance cameras and switchers

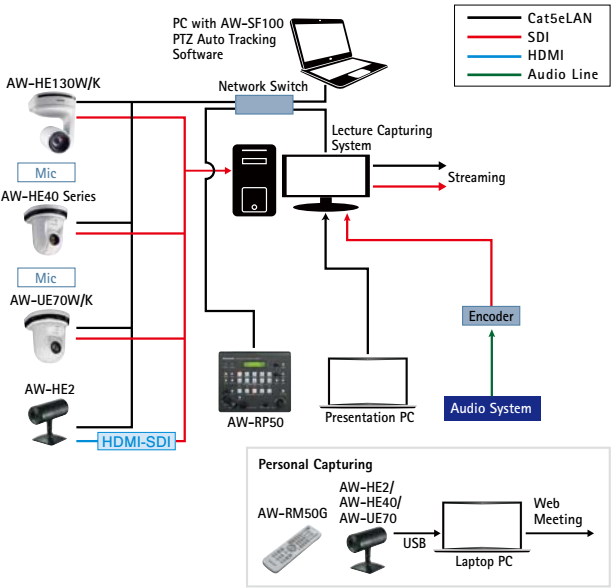
By installing the optimum camera for each scene, it is possible to capture all the scenes. Richly varied shooting is possible through the control of multiple types of cameras using the AW-RP120G and AK-HRP200G remote controllers.



Application 03: Lecture Capture

Flexible lecture recording and streaming with a Lecture Capturing System

Install the wide-angle AW-HE2 along with a high-image-quality HD Integrated Camera such as the AW-HE130 to capture the delicate nuances of the instructor as well as the overall atmosphere of the lecture room. With a flexible link to an IP-based lecture capturing system, it is possible to perform everything from recording to distribution.

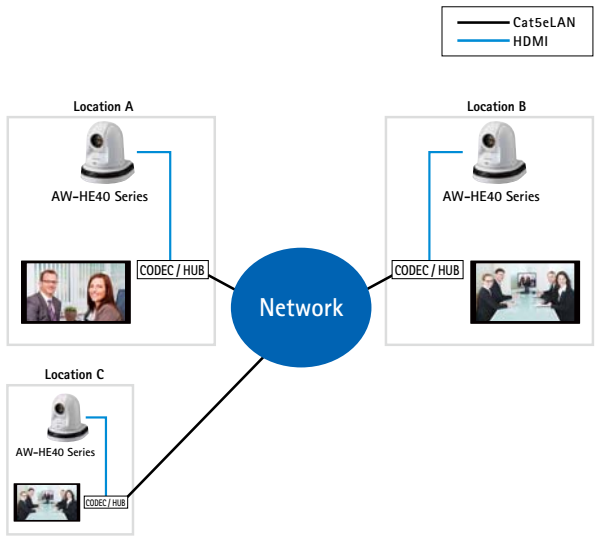


- High Quality Video With Lecture Capture
- Flexible System Design

Application 04: Telepresence

An extensive lineup of units that can be used as TV conferencing cameras

For TV conferencing cameras, customers can select from an extensive lineup that includes the compact and high-image-quality AW-HE40 HD Integrated Camera and the wide-angle AW-HE2 camera, which can capture all participants in the frame. Shoot video optimized for conference room size and meeting purpose.



- High Quality Video Distribution
- Various System Design

4K / HD Integrated Camera Application Examples

Application 05:

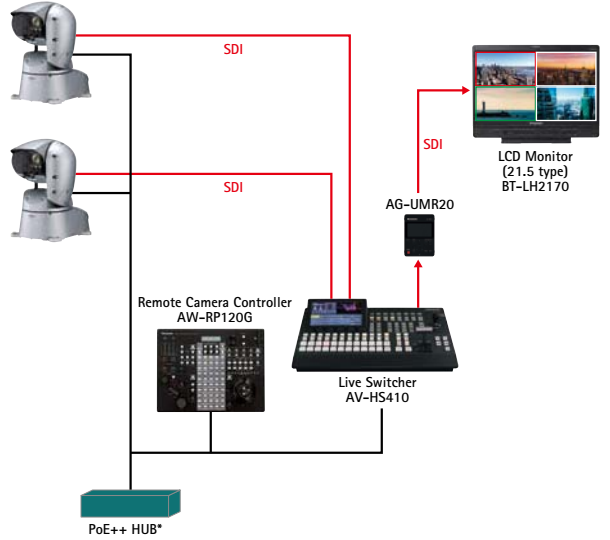
Information program (weather camera)

Produce vivid weather information programs with outdoor installation in severe environments

The high-sensitivity, high-S/N ratio, and high-resolution AW-HR140 Full-HD Outdoor Integrated Camera can be installed on the roof and operated with a controller inside the station. It will shoot low-vibration clear video in severe weather conditions. With water and dust resistance and wipers as standard equipment, it will provide reliable information even during tsunami and typhoon situations when shooting is difficult.



Full-HD Outdoor Integrated Camera
AW-HR140



Application 06:

4K Studio

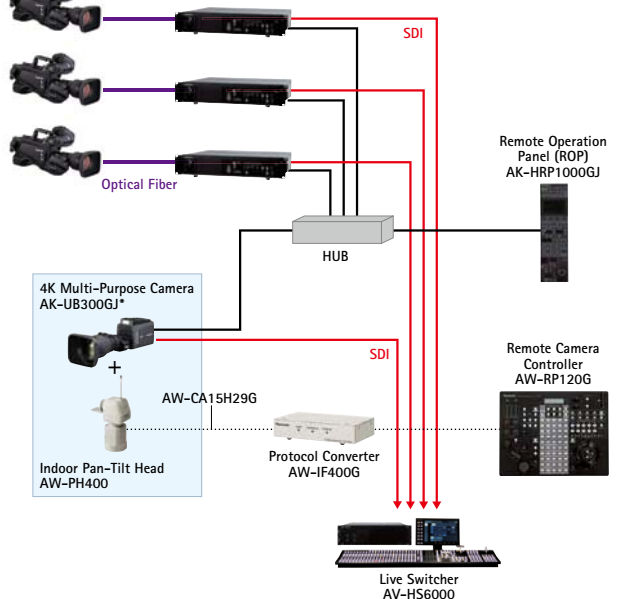
High-image-quality studio shooting with Studio Handy Cameras and Multi Purpose Cameras supporting 4K output

Utilize two types of 4K cameras for shooting situations such as music programs employing vivid lighting effects. By using an AK-UC3000GJ/GSJ 4K Studio Handy Camera along with an AK-UB300GJ 4K Multi Purpose Camera with a pan-tilt mount, it is possible to build a 4K studio setup that will also handle remote camera control.



4K Studio Handy Camera
AK-UC3000

Camera Control Unit (CCU)
AK-UCU500

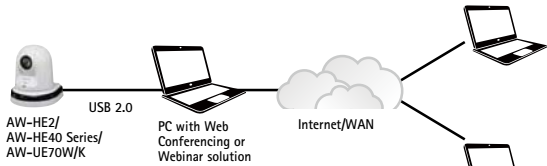
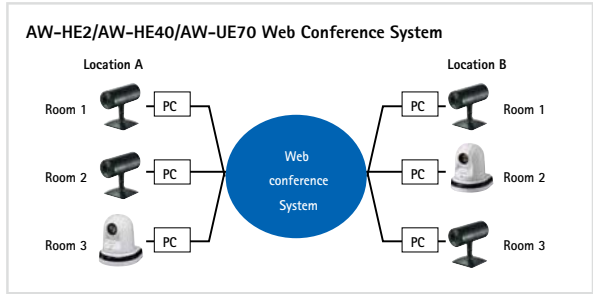


Application 07:

Web Conferencing & Webinars

USB functionality for web conferencing and web seminar with high quality video

The AW-HE2, AW-HE40, and AW-UE70 offer USB functionality using a standard USB Video Class driver to interface with most industry web conferencing and webinar software systems. This allows for a high quality 1080p video & audio via USB from a professional camera to interface with easy-to-use software web conferencing and webinar solutions.

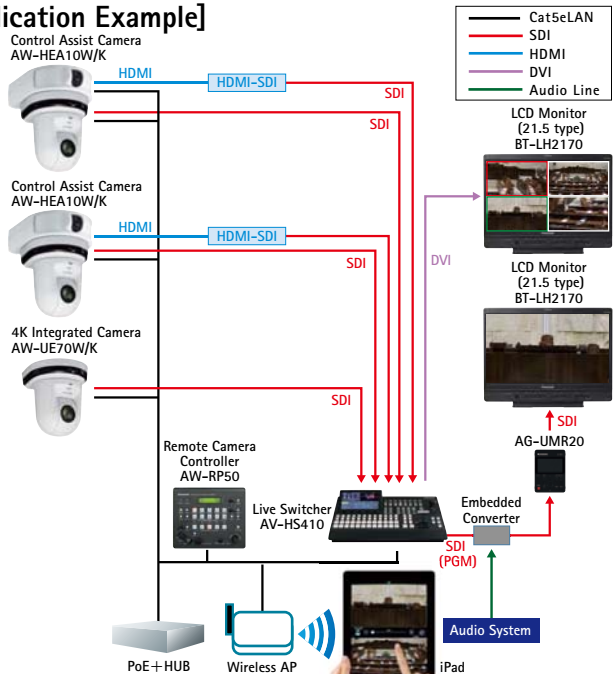
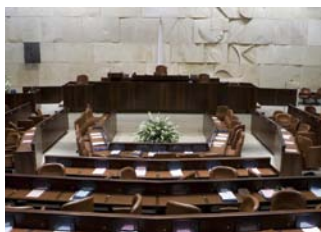


[Control Assist Camera Application Example]

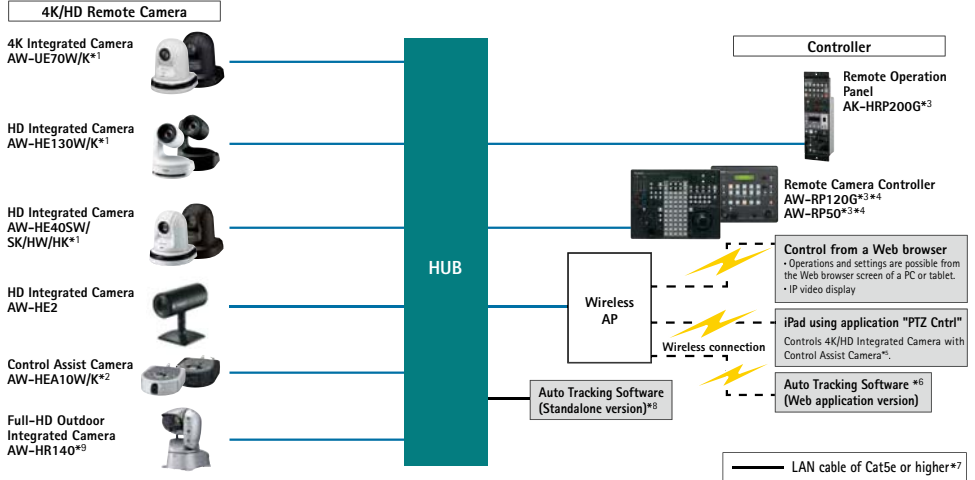
Application : Parliaments

When combined with a Control Assist Camera, there are even more uses for a 4K/HD Integrated Camera

Even the unexpected remarks of a participant without a preset position can be quickly handled with intuitive operations. In combination with wide-angle video with an overall view, it is possible to sensitively capture video suitable for constantly changing assembly sessions. Moreover, an iPad can be connected to multiple camera sets (sets of AW-HEA10 and 4K/HD integrated cameras), so a single operator can control multiple cameras by switching between them.



IP Connection Diagram



*1: When connected to a hub that supports PoE+, the provided AC adaptor is not required.

*2: When connected to a hub that supports PoE/PoE+, the provided AC adaptor is not required.

*3: AC adaptor AW-PS551 is required for AW-RP120G. Bundled AC adaptor is required for AW-RP50.

*4: The AW-HEA10W/K is not supported. Depending on the camera to be operated, this unit may require a software upgrade. For details, please contact the sales representative.

*5: An Apple iPad (sold separately) is required for use. The AW-HE2 is not supported.

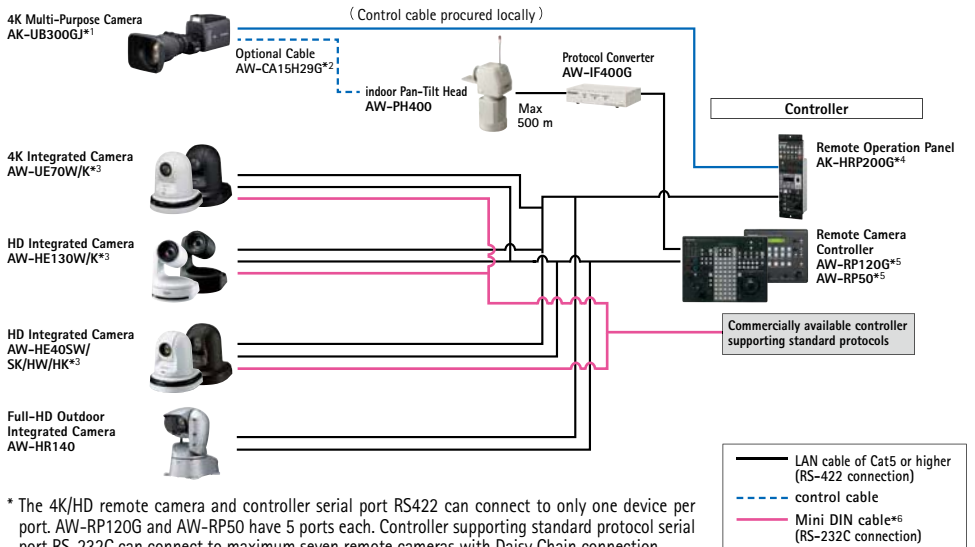
*6: An HTTP server with the auto tracking application installed is required. AW-UE70W/K, AW-HE130W/K, and AW-HE40 series only.

*7: When connecting AW-HE130W/K directly, please use a crossover cable. When connecting via a hub (switching hub), please use a straight cable.

*8: AW-UE70W/K, AW-HE130W/K, and AW-HE40 series only.

*9: AW-HR140 PoE++ conforms to IEEE802.3bt (Draft ver. 2.0).

Serial Connection Diagram



* The 4K/HD remote camera and controller serial port RS422 can connect to only one device per port. AW-RP120G and AW-RP50 have 5 ports each. Controller supporting standard protocol serial port RS-232C can connect to maximum seven remote cameras with Daisy Chain connection.

*1: For AK-UB300G, please prepare AC adaptors 12 V(DC) with more than 60 W.

*2: AW-CA15H29G is not required when a remote operation panel (ROP) is directly connected to AK-UB300G.

*3: Unit cannot be simultaneously controlled with an RS-422 connection and an RS-232C connection.

*4: When using a Remote Operation Panel (ROP), an additional AC adaptor or PoE hub may be required depending on the type of ROP.

*5: AC adaptor AW-PS551 is required for AW-RP120G. Bundled AC adaptor is required for AW-RP50.

*6: There are limitations on the connection methods and the functions that can be controlled. For details, please contact the sales representative.

Newly Developed 4K Optical System



The new 4K large format sensor can use 2/3 type lens without an adapter, and the conversion lens designed for large format sensor realizes the excellent video quality. Its new optical system makes maximum use of incident light to achieve the wide dynamic range.



(Images are simulated.)

UHD/HD Simultaneous Output

Supports simultaneous UHD/HD output, which enables to select the video output according to the application. Following formats are supported.

Supported formats

UHD	3840 x 2160/60p, 3840 x 2160/59.94p, 3840 x 2160/29.97p, 3840 x 2160/23.98p, 3840 x 2160/29.97PsF, 3840 x 2160/23.98PsF, 3840 x 2160/50p, 3840 x 2160/25p, 3840 x 2160/25PsF
UHD_CROP	1080/59.94p_CROP, 1080/59.94i_CROP, 1080/50p_CROP, 1080/50i_CROP
HD	1080/60p, 1080/59.94p, 1080/59.94i, 1080/29.97PsF, 1080/23.98PsF, 1080/23.98p, 1080/50p, 1080/50i, 1080/25PsF, 720/60p, 720/59.94p, 720/50p

Cropping Function

In addition to capturing the entire scene, up to three specified areas in the scene can be cropped and displayed. The area specified can be instantly switched using the controller.

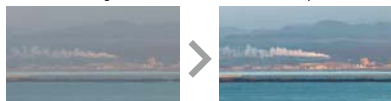


Select and output one of three areas

(Images are simulated.)

Haze Reduction Function

For installations in places where haze tends to occur, this function performs correction for a subject with low contrast to make the image clearer. Three settings can be selected for the compensation level.



(Images are simulated.)

Flash Band Compensation^{*1}

Using a high-precision flash band detection and compensation function for the camera signal processing LSI, enables elimination of the flash band phenomenon (light and dark areas appearing in the same frame) that occurs when a flash goes off during shooting.

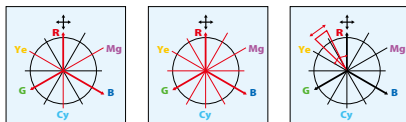
Images of flash band compensation



(Images are simulated.)

Wide Range of Color Correction Functions

Color saturation and hue can be finely adjusted individually by 12-axis color correction and linear matrix. Moreover, an independent skin color adjustment function (SKIN CORRECTION) enables fine color expression.



Linear matrix

12-axis color correction

Skin color correction

Dynamic Range Stretch (DRS) Function^{*1}

The DRS function automatically suppresses blocked shadows and blown highlights. When dark and bright areas are present in the same scene, such as when looking outside from indoors, DRS can maintain a high level of gradation expression in dark, bright, and intermediate tones. This minimizes blocked shadows, blown highlights, and washed out colors.

Intelligent Automatic Adjustment Function

-Auto Tracking White Balance Function

This function automatically adjusts the white balance as the color temperature gradually changes when shooting outdoors. Images can be automatically adjusted according to the subject or time of day.



Before correction After correction

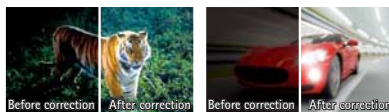
Before correction After correction

Before correction After correction

(Images are simulated.)

-Automatic Gain Control (AGC)

In addition to automatic iris control, continuous automatic variable gain control (-6 dB to 36 dB) is also possible. In addition to normal mode, modes with priority on movement (SPORTS mode) and image quality (SN mode) can also be selected.



Automatically controls variable gain in dark scenes

Movement is given priority for subjects in motion

(Images are simulated.)

IP Control from Remote Operation Panel

Serial control and IP control can be performed from the camera by connecting an AK-HRP200G or AK-HRP1000GJ/AK-HRP1005GJ Remote Operation Panel (ROP).

Scan Reverse Shooting

Image can be displayed reversed vertically or horizontally by setting this mode.

Linkage with NewTek AutoLink for Panasonic PTZ Software

"NewTek AutoLink for Panasonic PTZ"^{**2}, can be downloaded from the website to allow Panasonic professional cameras equipped with IP streaming to be automatically detected on the network from a NewTek TriCaster[®] or IP series Video Mix Engine produced by NewTek, Inc., enabling direct use of IP streaming from cameras.

*1: Cannot be utilized when the camera system is in UHD or UHD CROP mode.

*2: For details, see the Panasonic website. (http://pro-av.panasonic.net/en/products/newtek_autolink/).

4K Integrated Camera Main Features

A four-drive lens system for high-image-quality zooming in 4K shooting



With the four-drive lens system, three zoom lenses and one focus lens are driven independently and simultaneously. Since the four groups of lenses can be driven separately, we were able to efficiently minimize the size and drive range of each lens and thereby achieve a smaller body and a zoom mechanism with high magnification and high image quality. Despite its compact size, the AW-UE70W/K has a high-resolution 20x optical zoom and a high-performance iA 22x zoom (4K mode).



(Images are simulated.)

Four types of output connectors. 4K output via HDMI, USB and LAN.



On the back of the unit, there are four types of output connectors which are HDMI, SDI, USB and LAN. 4K video output can be done not only via HDMI, but also via USB and LAN.

Output format list



Output	Resolution
HDMI	2160/29.97p, 2160/25p, 1080/59.94p, 1080/50p, 1080/59.94i, 1080/50i, 1080/29.97PsF, 1080/25PsF, 1080/29.97p, 1080/25p, 720/59.94p, 720/50p
SDI	1080/59.94p, 1080/50p, 1080/59.94i, 1080/50i, 1080/29.97PsF, 1080/25PsF, 1080/29.97p, 1080/25p, 720/59.94p, 720/50p
USB	2160/5p, 1080/30p, 1080/25p, 1080/15p, 1080/12.5p, 1080/5p, 720/30p, 720/25p, 720/15p, 720/12.5p, 720/5p, 360/30p, 360/25p, 360/15p, 360/12.5p, 360/5p
LAN	For details, please see "List of Supported Multi-Streaming Outputs".

Full HD Video Output Via IP Transmission*



In addition to HDMI, SDI and USB output, production quality 4K/full HD video output via IP transmission is supported. For 4K video output via IP transmission, there can be one channel of IP video output of up to 30 frames/second. At full HD image quality, IP video output up to 60 frames/second is possible. One camera delivers up to four channels*1 of IP streaming video (H.264), and simultaneous transmission to as many as 14 devices is supported**2, so that flexible system setup is possible to meet various application needs.

List of Supported Multi-Streaming Outputs (When priority mode "IP" or "IP (4K)" is selected)

Settings	H.264				JPEG		
	CH1	CH2*7	CH3*8	CH4*4	CH1	CH2	CH3
Resolution	IP selected	1920x1080 1280x720*3 640x360*5	1280x720 640x360 320x180	-	1920x1080*4 1280x720*3 640x360*5 320x180	-	-
	IP (4K) selected	3840x2160	-	-	640x360 320x180	-	-
Frame rate	IP selected	59.94 Hz	60/30/15/5 fps	30/15/5 fps	30/15/5 fps	-	-
		50 Hz	50/25/12.5/5 fps	25/12.5/5 fps	25/12.5/5 fps	-	-
	IP (4K) selected	59.94 Hz	30/15/5 fps	-	-	15/5 fps	-
		50 Hz	25/12.5/5 fps	-	-	12.5/5fps	-
Bit rate	Up to 50 Mbps at 4K or up to 24 Mbps otherwise						
Voice transmission	Yes (AAC48 KHz)						
PoE+	Yes						

* Depending on the output mode, certain restrictions apply.

4K / HD Integrated Camera Main Features

Full HD video output via IP transmission
(Not included in AW-HE2)

In addition to 3G-SDI and HDMI output, production quality full HD video output via IP transmission is supported with the AW-HE130W/K. The camera delivers up to four channels of IP streaming video (H.264), with a maximum quality level of 1080/60p at 24 Mbps*1. Simultaneous transmission up to 14 devices is also supported**2. Flexible system setup is possible to meet various application needs.

List of Supported Multi-Streaming Outputs (AW-HE40 series : When IP output priority is selected*)

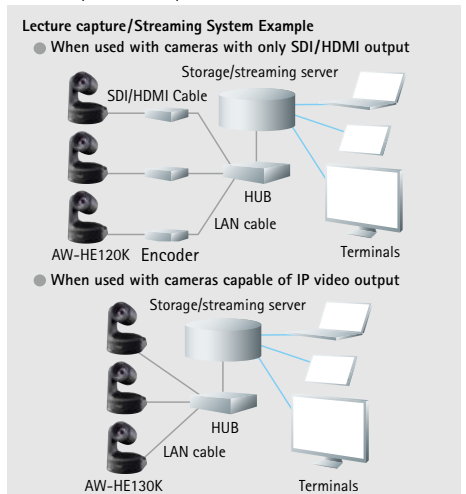
Settings	H.264			JPEG
	CH1	CH2*7	CH3*7/CH4*8	CH1/CH2/CH3
AW-HE130W/K AW-HR140 Resolution	1920x1080 1280x720	1280x720 640x360 320x180 160x90	1280x720 640x360 320x180 160x90	1920x1080 1280x720*7 640x360 320x180 160x90
AW-HE40 serie Resolution	1920x1080 1280x720*7 640x360*9	1280x720 640x360 320x180	1280x720 640x360 320x180	1920x1080*8 1280x720*7 640x360 320x180*7
AW-HE130W/K AW-HR140 Frame rate	59.94 Hz	60 fps 15 fps 5 fps	30 fps 15 fps 5 fps	30 fps/15 fps/ 10 fps/6 fps/ 5 fps/3 fps/ 2 fps/1 fps
	50 Hz	50 fps 12.5 fps 5 fps	25 fps 12.5 fps 5 fps	25 fps/12.5 fps/ 10 fps/5 fps/ 2 fps/1 fps
AW-HE40 serie Frame rate	59.94 Hz	60 fps/30 fps/ 15 fps/5 fps	30 fps 15 fps 5 fps	30 fps 15 fps 5 fps
	50 Hz	50 fps/25 fps/ 12.5 fps/5 fps	25 fps 12.5 fps 5 fps	25 fps 12.5 fps 5 fps
Bit rate	Up to 24 Mbps			
Voice transmission	Yes (AAC48 kHz)			
PoE+	Yes*10			

* Depending on the output mode, certain restrictions apply.

Transmit IP video without a separate encoder reduces cost and simplifies installation

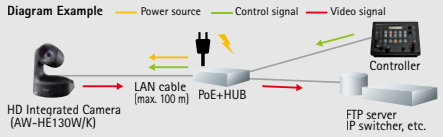
(Not included in AW-HE2)

There is no need for the separate encoder normally required when streaming video and audio via IP. Systems can be built with exceptional cost/performance benefits.



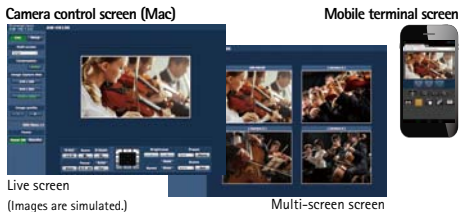
Supporting PoE+*11 for lower installation cost (Not included in AW-HE2)

By connecting to network devices that support the PoE+ standard (PoE++ for the AW-HR140)*11, power can be supplied via LAN cable (Cat5e). Since it is not necessary to install a power supply or even a local A.C. outlet, installation costs can be significantly reduced. Just as a PoE+ compliant 4K/HD Integrated Camera, it can accept power supply via PoE+HUB.



IP control with image monitoring using PC, Mac and mobile terminals

Using an IP browser, such as Internet Explorer or Safari, it is possible to set up and control the camera from a remote location. This feature simplifies the management of cameras around a campus, or across a worldwide enterprise network. IP video monitoring and remote camera control can also be performed from a PC/Mac or mobile terminals such as an iPhone, iPad or Android devices. (The AW-HE2 does not support mobile terminals.)



Optical Image Stabilizer and Digital Extender for capturing clear images at any distance.

• **Optical Image Stabilization System (OIS)**
(AW-UE70W/K, AW-HE130W/K and AW-HR140 only)
Automatically minimizes the effect of small vibrations from the surface where the camera is mounted, whether this is caused by the opening and closing of doors, nearby speakers, or other disturbances.

• **High-performance zoom lens/digital extender zoom**
(Not included in AW-HE2)
Optical zoom, digital zoom, and digital extender zoom are included. (The AW-HE2 has only digital zoom.) Digital extender zoom adopted for AW-UE70W/K, AW-HE130W/K, AW-HR140 and AW-HE40 series. AW-UE70W/K can quickly apply the 1.4, 2.0, 4.0, 6.0 or 8.0x digital extender zoom and for AW-HE130W/K, AW-HR140 and AW-HE40 series, 1.4x digital extender zoom.



Dynamic Image Stabilizing System (D.I.S.S.) reduces image vibration

(AW-HR140 only)

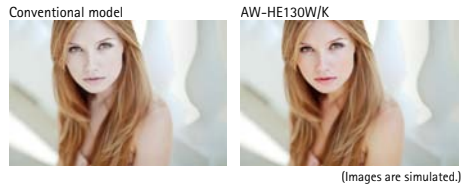
The newly developed Dynamic Image Stabilizing System (D.I.S.S.) simultaneously reduces both large, slow swings and small, quick vibrations to achieve highly stable images even in natural environments and installation locations where vibration tends to occur.



(Images are simulated.)

Advanced color adjustment capabilities for precision imaging

• **Independent Color Correction Function with 12 Color Axes + 3 Skin Tone Axes** (AW-HE130W/K and AW-HR140 only)
In addition to the conventional 12 axes, three additional axes have been added for the skin tone area. This makes it possible to reproduce skin tones with greater precision.



• **Color Temperature Adjustment Mode**
(Not included in AW-HE2)

In addition to the usual white balance modes, a new variable Color Temperature-based function has been added. This makes it easier to make the precise camera adjustments required for different lighting conditions.

*1: 1920 x 1080 60 fps output is 1ch display only. For 2ch or more, display is max. 30 fps. Also, JPEG output is up to 3ch. *2: Depends on your network environment. *3: Output is possible when HDR is off. *4: Output is possible when HDR is off and other than 60p is selected. *5: Output is possible when HDR is on. *6: Only one Android device can be connected to one camera. *7: Setting is possible when HDR is off with AW-HE40 series. *8: Setting is possible when HDR is set to off and frame rate is other than 60 fps (or 50 fps) with AW-HE40 series. *9: Setting is not possible when HDR is off with AW-HE40 series. *10: AW-HR140 does not support PoE+. *11: Abbreviation for Power over Ethernet Plus. AW-UE70W/K, AW-HE130W/K and AW-HE40 series conform to IEEE802.3at. AW-HR140 conforms to IEEE802.3bt (Draft ver. 2.0).

Dynamic Range Stretch (DRS) (Not included in AW-HE2) / Hybrid Digital Noise Reduction (Hybrid DNR) (AW-HE130W/K and AW-HR140 only)

Black defects, halation and washed-out colors are minimized for video images with a visually broad dynamic range (DRS). In addition, with Hybrid Digital Noise Reduction (Hybrid DNR), two types of noise reduction, 2D and 3D, are used together to enable clear video capture under a wide range of lighting conditions, with minimal after-image blurring or image degradation.

(Images are simulated.)



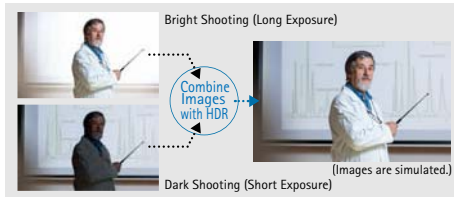
Without Noise Reduction
Some noise appear when gain control is turned up

3D Noise Reduction Alone
Afterimage and some loss of resolution appear

The Hybrid (2D/3D) Noise Reduction
Clearer images in difficult conditions

Equipped with High Dynamic Range (HDR) mode (AW-UE70W/K and AW-HE40 series only)

In addition to conventional Dynamic Range Stretch (DRS) and Digital Noise Reduction (DNR), the AW-UE70W/K and AW-HE40 series are equipped with High Dynamic Range (HDR) mode. When shooting and synthesizing two images with differing exposure times, the AW-UE70W/K and AW-HE40 series can create video with high visibility that corrects for halation and black defects even under backlit conditions.



Equipped with Night Mode for infrared shooting (Not included in AW-HE2)

The 4K/HD Integrated Cameras can deliver high-quality monochrome video in total darkness, when the camera's Night Mode is used in conjunction with an optional IR illuminator.



(Images are simulated.)

Still image displayed during preset movement supports one-camera operations (Not included in AW-HE2)

The new Freeze During Preset function may be enabled to freeze the video during preset playback. The immediately preceding still image is output during preset movement so that the swiveling movement is not displayed, making operations possible with one camera.

With Freeze During Preset function ON



Audio input function*1

The AW-UE70W/K, AW-HE130W/K, AW-HR140 and AW-HE40 series also support audio input, embedding, and encoding. The input from the camera's switchable mic/line input can be combined with the HD-SDI, HDMI, and streaming outputs for mixing, recording or transmission. The AW-HE2 has a built-in microphone.

Video/Audio Output with USB (AW-UE70W/K, AW-HE40 series and AW-HE2 only)

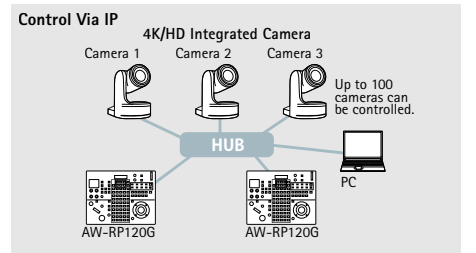
USB Video Class 1.0 and USB Audio Class 1.0 are supported. This enables video and audio output via USB so the cameras can be used as high-image-quality Web cameras for Web conferencing, distance learning, and other applications utilizing communication software.

Excellent quietness (Not included in AW-HR140)

Thanks to its fan-less design and advanced pan-tilt mechanism, the 4K/HD Integrated Cameras are very quiet and greatly reducing audio noise during video capture.

Flexible IP Control Architecture Simplifies System Design and Operation*2

Up to 100 4K/HD Integrated Cameras can be controlled by IP connection from an AW-RP120G/RP50 remote camera controller via a hub (switching hub). In addition, a single 4K/HD Integrated Camera can be controlled by up to five AW-RP120G/RP50 units by IP connection.

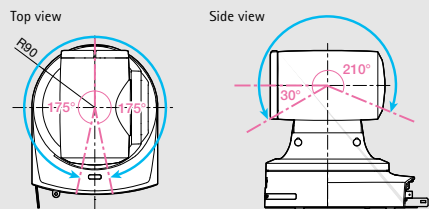


Exceptional Pan-Tilt mechanism performance for smooth moves during video capture.

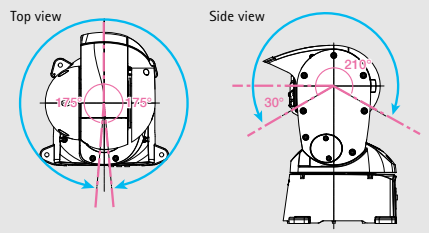
(Not included in AW-HE2)

Shooting across a wide range*³, the AW-HE130W/K and AW-HR140 can capture video with a pan range of $\pm 175^\circ$ and a tilt range of -30° to 210° (pan-tilt maximum speed of $60^\circ/\text{s}$ and minimum of $0.08^\circ/\text{s}$), and the AW-UE70W/K and AW-HE40 series have a pan range of $\pm 175^\circ$ and a tilt range of -30° to 90° (pan-tilt maximum speed of $90^\circ/\text{s}$). In addition to the high- and low-speed operation and excellent remote control response, the noise level during operation is very low, at NC35 or less.*⁴

AW-HE130W/K Example



AW-HR140 Example



Simple connection and installation enable a flexible camera layout

(Not included in AW-HE2)

IP control, a lightweight body, and the turn-lock mounting mechanism enable easy connection and mounting by a single person (indoor mounting only).

Other Functions

- Equipped with ND filters.
(AW-UE70W/K, AW-HE130W/K and AW-HR140 only)
AW-UE70W/K : Auto*⁵, Through, 1/4, 4/16, 1/64
AW-HE130W/K and AW-HR140 : Through, 1/8, 1/64
- The AW-UE70W/K, AW-HE130W/K, AW-HE40 series and AW-HR140 have four types of scene files that can be set by the user. (Not included in AW-HE2)
- Functions such as freeze during preset, digital extender zoom, color temperature settings can be assigned to the user buttons on Panasonic controllers. (Not included in AW-HE2)
- Equipped with RS422 remote terminal; up to five units can be controlled via serial control from a controller. (Not included in AW-HE2)
- Equipped with RS232C remote terminal (Standard serial communication support). (Not included in AW-HE2 and AW-HR140)
- Up to four units can be operated with a wireless remote controller (AW-RM50G sold separately). (Not included in AW-HR140)
- Color variations (black/white) that can be chosen for different applications or conditions. (Black only for AW-HE2. Silver only for AW-HR140.)
- Extensive preset memories for storing up to 100 positions*⁶. (For AW-HE2, up to 9 positions)

*1: The AW-HE2 has only a built-in microphone and output connectors. AW-HR140 is equipped with an audio input connector, but does not include HDMI output connectors.

*2: It may be necessary to upgrade the version of the controller in order to support the unit. For details on upgrading, visit the support page on the following website. <http://pro-av.panasonic.net/>




*3: Depending on the position of the pan and tilt, its own unit may be reflected in the image.

*4: For AW-HR140, the noise level at a pan-tilt speed of $60^\circ/\text{s}$ is NC45 or less.

*5: "Auto" is available when "Scene" setting is "Full Auto".

*6: The number of preset memories that can be used varies depending on the controller.

4K / HD Integrated Camera Specification Comparison

	4K Integrated Camera		HD Integrated Camera
Appearance			
Model No.	AW-UE70W/K	AW-HE130W/K	AW-HE40S/W/SK/HW/HK
General			
Lens / Pan Tilt System	Serial / IP / IR		
Control	Serial / IP / IR		
Power Requirements	DC 12 V (AC Adaptor supplied), DC42 V to 57 V (PoE+ power supply)		
Power Consumption	1.3 A (AC adaptor supplied) 0.5 A (PoE+ power supply)	1.8 A (AC adaptor supplied) 0.6 A (PoE+ power supply)	1.2 A (AC adaptor supplied) 0.4 A (PoE+ power supply)
Weight	Approx. 1.5 kg (3.30 lb)	Approx. 3.1 kg (6.83 lb) [including mount bracket]	Approx. 1.5 kg (3.30 lb)
Dimension (W x H x D)*	160 mm x 186 mm x 179 mm (6-5/16 inches x 7-41/128 inches x 7-3/64 inches)	180 mm x 228 mm x 234 mm (7-3/32 inches x 9 inches x 9-3/16 inches)	160 mm x 186 mm x 166 mm (6-5/16 inches x 7-41/128 inches x 6-17/32 inches)
Camera			
Image Sensors	1/2.3-type MOS	1/2.86 type Full-HD 3MOS	1/2.3 type MOS
Lens	Optical 20x zoom, iZoom 30x (22x when in 4K mode) F1.8 to F3.6 (f=4.08 mm (5/32 inches) to 81.6 mm (3-7/32 inches); 35 mm (1-3/8 inches) equivalent: 29.5 mm (1-5/32 inches) to 612.0 mm (24-3/32 inches)	Optical 20x zoom, Digital zoom 10x, F1.6 to F3.4 (f=4.5 mm to 90 mm; 35 mm equivalent: 32.13 mm to 642.5 mm)	Optical 30x zoom, Digital zoom 10x, iZoom 40x, F1.6 to F4.7 (f=4.3 mm (11/64 inches) to 129 mm (5-5/64 inches); 35 mm (1-3/8 inches) equivalent: 31.6 mm (1-31/128 inches) to 962.0 mm (37-7/8 inches)
Digital Extender Zoom	1.4x, 2.0x, 4.0x, 6.0x, 8.0x,		1.4x
Field of View	Horizontal	65.1° (wide) to 3.26° (tele)*2	61.6° (wide) to 2.10° (tele)*2
	Vertical	39.5° (wide) to 1.83° (tele)*2	37.0° (wide) to 1.18° (tele)*2
	Diagonal	72.4° (wide) to 3.74° (tele)*2	68.7° (wide) to 2.42° (tele)*2
Focus	Auto/Manual		
Focus Distance	Entire zoom range: 1500 mm Wide end: 100 mm	Entire zoom range: 800 mm Wide end: 400 mm	Entire zoom range: 1200 mm Wide end: 100 mm
Horizontal Resolution	4K: 1300 TV lines Typ (Center area) HD: 1000 TV lines Typ (Center area)	1000 TV lines (Center area)	
Minimum Illumination	59.94 Hz: 0.7 lx (50 IRE, F1.8, 48 dB, 1/60 without accumulation) 0.35 lx (50 IRE, F1.8, 48 dB, 1/50 with accumulation [Frame Mix 6 dB]) 50 Hz: 0.7 lx (50 IRE, F1.8, 48 dB, 1/50 without accumulation) 0.35 lx (50 IRE, F1.8, 48 dB, 1/25 with accumulation [Frame Mix 6 dB])	2 lx (50 IRE, F1.6, 36 dB)	59.94 Hz: 0.7 lx (50 IRE, F1.6, 48 dB, 1/60 without accumulation), 0.35 lx (50 IRE, F1.6, 48 dB, 1/30 with accumulation [Frame Mix 6 dB]) 50 Hz: 0.7 lx (50 IRE, F1.6, 48 dB, 1/50 without accumulation), 0.35 lx (50 IRE, F1.6, 48 dB, 1/25 with accumulation [Frame Mix 6 dB])
Gain	Auto, 0 dB to 48 dB (3 dB step)	Auto, 0 dB to 36 dB	Auto, 0 dB to 48 dB (3 dB step)
S/N	54 dB (standard)	60 dB (standard)	54 dB (standard)
Frame mix	Auto, Off, 6dB, 12dB, 18dB, 24dB	0 dB to 24 dB	Auto, Off, 6dB, 12dB, 18dB, 24dB
ND Filter	Auto*, Through, 1/4, 1/16, 1/64	Through, 1/8, 1/64	
P/T Mechanism			
Preset	Up to 100		
Pan/Tilt Operation Speed	Maximum speed during preset: 300*/s Maximum speed during manual: 90*/s	0.08*/s to 60*/s	Maximum speed during preset: 300*/s Maximum speed during manual: 90*/s
Panning Range	±175°		
Tilting Range	-30° to 90**5	-30° to 210**5	-30° to 90**5
Quietness	During preset: NC40 or less During manual: NC35 or less	NC35 or less	During preset: NC40 or less During manual: NC35 or less
System			
Video Output	3G-SDI	✓	✓
	HD-SDI	✓	✓
	SD-SDI	-	✓
	HDMI	✓	✓
	Composite	-	✓
USB	✓	-	✓
Video Output Connector	BNC (3G/HD SDI) x 1 HDMI x 1 USB Mini-B port	BNC (HD/SD-SDI) x 1 BNC (VIDEO OUT) x 1 HDMI x 1	BNC (HD-SDI) x 1 (SW/SK model) HDMI x 1 (HW/HK model) USB Mini-B port
Remote Input/Output Connector	LAN	10BASE-T/100BASE-TX, RJ-45 Equipped with straight/crossover cable auto detection function	10BASE-T/100BASE-TX, RJ-45
	RS-422	CONTROL IN RS422A (RJ-45)	
	RS-232C	Mini DIN 8-pin (IN), Mini DIN 8-pin (OUT)	
Audio Input/Output	✓		
Synchronization System	Internal/External synchronization (BBS/Tri-level sync)		Internal

*1: Excluding protrusions, cable cover, mount bracket. *2: When OIS is OFF/Mode1. *3: Image Stabilizer OFF. *4: "Auto" is available when "Scene" setting is "Full Auto". *5: Depending on the pan or tilt position, the camera may be reflected in the image. *6: The AW-HE2 has only a built-in microphone. *7: Conforms to IEEE802.3bt (Draft ver. 2.0).

	Full-HD Outdoor Integrated Camera
	
AW-HE2	AW-HR140
IP / IR	Serial / IP
DC 5 V (AC Adaptor supplied)	DC 12 V to 21.8 V, DC42 V to 57 V (PoE++ power supply)*7
3.6 W	5.5 A (12 V power supply) 2.1 A (PoE++ power supply)*7
Approx. 0.244 kg (0.538 lbs)	Approx. 9.0 kg (19.8 lb)
80 mm x 118 mm x 138 mm (3-5/32 inches x 4-5/8 inches x 5-7/16 inches)	258 mm x 357 mm x 397 mm (10-5/32 inches x 14-1/16 inches x 15-5/8 inches) (including protrusions and cable cover)
1/4.37 type MOS Effective pixel for movie 3.91M	1/2.86 type Full-HD 3MOS
i.Zoom 2x, Digital zoom 4x F2.0 (f=2.15 mm 35 mm equivalent: 18 mm)	Optical 20x zoom, Digital zoom 10x, F1.6 to F3.4 (f=4.5 mm to 90 mm; 35 mm equivalent: 32.13 mm to 642.5 mm)
-	1.4x
95°	60.2° (wide) to 3.3° (tele)
56°	36.2° (wide) to 1.9° (tele)
102°	67.4° (wide) to 3.8° (tele)
Auto	Auto/Manual
Minimum focus distance: 800 mm Wide end: 400 mm	Entire zoom range: 800 mm Wide end: 400 mm
850 TV lines(Center area)	1000 TV lines (Center area)
20 lx (F2.0)	2 lx (50 IRE, F1.6, 36 dB, no frame accumulation)
-	Auto, 0 dB to 42 dB (1 dB Step), 37 dB to 42 dB (Super Gain Mode)
-	60 dB
-	0 dB to 24 dB
-	Through, 1/8, 1/64
Up to 9	Up to 100
-	Maximum speed: 60 °/s or more
Approx. ±23° (when i.Zoom 2x) Approx. ±35° (when Digital zoom 4x)	±175°
Approx. ±14° (when i.Zoom 2x) Approx. ±21° (when Digital zoom 4x)	-30° to 120°**
-	60 °/s: NC45 or less
-	✓
-	✓
-	-
✓	-
-	-
✓	-
HDMI x 1 USB Micro-B x 1	BNC (HD-SDI) x 2
10BASE-T/100BASE-TX, RJ-45 Equipped with straight/crossover cable auto detection function	10BASE-T/100BASE-TX, RJ-45
-	CONTROL IN RS422A (RJ-45)
-	-
✓**	MiniXLR (Line Input)
Internal	Internal/External synchronization (BBS/Tri-level sync)

4K / HD Integrated Camera Output Format/ Function Comparison

	4K Integrated Camera	HD Integrated camera			Full-HD Outdoor Integrated Camera
Model No.	AW-UE70W/K	AW-HE130W/K	AW-HE40 SW/SK/HW/HK	AW-HE2	AW-HR140
Output Signal Format					
2160/29.97p, 25p	✓ HDMI output only	—	—	—	—
1080/59.94p	✓	✓	✓ HW/HK model only	✓	✓
1080/29.97p	✓	✓*1	✓	—	✓*1
1080/23.98p	—	✓*2	—	—	✓*2
1080/50p	✓	✓	✓ HW/HK model only	✓	✓
1080/25p	✓	✓*1	✓	—	✓*1
1080/59.94i	✓	✓	✓	✓	✓
1080/50i	✓	✓	✓	✓	✓
1080/29.97PsF	✓	✓*3	✓	—	✓*3
1080/25PsF	✓	✓*3	✓	—	✓*3
1080/23.98PsF	—	✓*3	—	—	✓*3
720/59.94p	✓	✓	✓	✓	✓
720/50p	✓	✓	✓	✓	✓
576/50p	—	✓*4	—	✓	—
576/50i	—	✓*4	—	—	—
480/59.94p	—	✓*4	—	✓	—
480/59.94i	—	✓*4	—	—	—
Function					
CineGamma	✓	✓	✓	—	✓
DRS	✓	✓	✓	✓	✓
Hybrid DNR	—	✓	—	—	✓
HDR mode	✓	—	✓	—	—
Optical Image Stabilization (OIS)	✓	✓	—	—	✓
Optical/GYRO	Optical	—	Optical	—	Optical+GYRO
Digital Extender Zoom	✓	✓	✓	—	✓
i.Zoom	✓	—	✓	✓	—
Independent Color Correction Function	16 Color Axes	12 Color Axes + 3 Skin Tone Axes	16 Color Axes	—	12 Color Axes + 3 Skin Tone Axes
Color Temperature Adjustment Mode	✓	✓	✓	—	✓
Scene files	4 files	4 files	4 files	—	4 files
Freeze During Preset function	✓	✓	✓	—	✓
Night mode	✓	✓	✓	—	✓
IP control	✓	✓	✓	✓	✓
IP video monitoring	✓	✓	✓	✓*5	✓
HD video output via IP transmission	H.264	4K/Full HD	Full HD	Full HD	—
	Motion JPEG	4K*/Full HD	Full HD	Full HD	640 x 360
PoE	PoE+	PoE+	PoE+	—	PoE++*7
Wireless Remote Control	Up to 4	Up to 4	Up to 4	Up to 4	—
Turn-lock mechanism	✓	✓	✓	—	—
Fan-less design	✓	✓	✓	✓	—
Color variations	black/white	black/white	black/white	—	silver
USB Video Class 1.0	✓	—	✓	✓	—
Audio Input	✓	✓	✓	built-in microphone	✓

*1: Native output *2: Over 59.94i *3: For 1080/25PsF, there are cases where 50i is displayed on the monitor. *4: A 'P' signal is output as HDMI output, an 'I' signal is output as SDI and an analog output for output formats of 480/59.94p(i) and 576/50p(i). *5: It is unusable at the mobile terminal. *6: USB only. *7: Conforms to IEEE802.3bt (Draft ver. 2.0).

Remote Camera Controller

AW-RP120G

• AC adaptor (DC12 V) is required separately.

Power supply	DC12 V/0.5 A (DC Input range: DC10 V to DC16 V)
Power consumption	6.0 W
Weight	Approx. 3.0 kg (Approx. 6.61 lb)
Dimensions (W x H x D)	Approx. 342 mm x 77 mm x 265 mm (Approx. 13-15/32 inches x 3-1/32 inches x 10-7/16 inches) [excluding protrusions]



* There is a possibility of requiring software update. For details, see "Support & Download" on the Panasonic website (<http://pro-av.panasonic.net/en/>).

Highly Functional Remote Controller with Joystick and Other Operating Enhancements.

- **IP connection:** Up to 100 remote cameras can be connected and controlled via a switching hub. Automatic IP allocation simplifies the configuration of large-scale systems. In addition, it allows five AW-RP120G controllers to simultaneously control one remote camera.
- **Serial control compatibility:** Up to five remote cameras can be connected and controlled. Also compatible with existing systems, and an RS232C port enables external control.
- **Linkage with AW-HS50:** IP connection allows linking with an AW-HS50 Compact Live Switcher, for a highly efficient operating environment.
- **Newly designed control panel:** Features a pan/tilt joystick, seesaw zoom lever, focus dial, and iris dial. A special speed adjustment dial is provided for each of the pan/tilt, zoom and focus functions.
- **Tracing memory:** The remote camera operations (pan, tilt, zoom, focus, iris, and white balance modes) can be memorized and recalled. Up to ten memory items can be stored for each camera.
- **Preset memory:** Up to 100 camera angle settings (pan, tilt, zoom operation) can be registered and retrieved for each camera to greatly simplify a variety of camera controls.
- **Preset batch retrieval function:** By creating groups of any desired preset memories (up to four groups), multiple camera angle settings (up to ten cameras) can be retrieved in a single batch.
- **Camera Image Quality Adjustment:** Equipped with an AWB button for automatic white balance, and an ABB button for automatic black balance. Dedicated dials allow pedestal and gain adjustment for Rch and Bch. Colors can also be easily adjusted by manual control.
- **Direct Selection Buttons:** Ten camera selection buttons are provided. Also, numerical buttons from 1 to 50 and a page button enable quick recall of 100 preset memories and 10 tracing memories.
- **SD Memory Card:** Settings can be backed up on a SD memory card. This also allows settings to be copied to other controllers.

Remote Camera Controller

AW-RP50

Power supply	DC12 V ±10 % (AC adaptor provided)
Power consumption	0.5 A (With DC12 V)
Weight	Approx. 1.1 kg (Approx. 2.4 lb)
Dimensions (W x H x D)	210 mm x 67 mm x 177 mm (8-1/4 inches x 2-9/16 inches x 6-15/16 inches) [excluding protrusions]
Accessory	AC adaptor, Power cable



* There is a possibility of requiring software update. For details, see "Support & Download" on the Panasonic website (<http://pro-av.panasonic.net/en/>).

Compact, easy-to-operate remote controller

- **IP Control:** Up to 100 remote camera units can be controlled by AW-RP50 via IP and Ethernet hubs.
- **Multi-Control:** Up to 5 AW-RP50 can simultaneously control one remote camera unit.
- **Serial Control:** Up to 5 cameras/pan-tilt heads can be controlled via serial connection.
- **AW-HS50 Link:** Linkage with AW-HS50 is available via IP connection, which enables smoother operation.
- **Preset Memory:** Up to 100 preset memories can be set and recalled.

Remote Operation Panel

AK-HRP200G

Power supply	DC12 V
Power consumption	4.2 W
Weight	Approx. 1.3 kg (Approx. 2.87 lb)
Dimensions (W x H x D)	92 mm x 308 mm x 55 mm (3-5/8 inches x 12-1/8 inches x 2-3/16 inches) [excluding protrusions]



* There is a possibility of requiring software update. For details, see "Support & Download" on the Panasonic website (<http://pro-av.panasonic.net/en/>).

Compact operation panel also compatible with Studio Handy Cameras

- **Remote Operation:** The camera can be remotely operated via serial control or IP control. In addition to the AK-HC3800^{*1} Studio Handy Camera, it is also possible for Panasonic Multi-purpose Cameras, HD Convertible Cameras, and 4K/HD Integrated Cameras.
- **Compact 6U Size:** The unit is compact, with a width of 92 mm and a 6U height suitable for easy rack mounting.
- **ROP Menu/Camera Menu Setting:** The menu can be displayed on a monitor connected to the Camera Control Unit, so detailed camera settings can be made by operating the Remote Operation Panel.
- **Joystick Control Lever:** The joystick control lever enables fine manual iris/pedestal adjustment.
- **SD Memory Card Slot:** Scene files, user files^{*2} and lens file^{*2} can be saved on to a SD memory card. SD memory cards can also be used for firmware upgrades.
- **IP Connection^{*3}:** A LAN terminal enables IP connection via Ethernet (RJ45 LAN cable).

*1: When power is supplied from the Camera Control Unit. *2: Only Studio Handy Camera can handle.

*3: External power supply (DC 12 V) required when LAN cable is used.

Remote Camera System Optional Products

Compact Live Switcher



(Rear View)

AW-HS50

A compact Live Switcher with multi-view capability, this unit has 5 inputs and 3 outputs as standard along with frame synchronizers on all inputs. *For details, please see page 63, 76.

Power supply	DC12 V \pm 10 % (AC adaptor provided)
Power consumption	2.0 A (With DC12 V input)
Weight	Approx. 1.4 kg (Approx. 3.08 lb)
Dimensions (W x H x D)	210 mm x 67 mm x 177 mm (8-1/4 inches x 2-5/8 inches x 6-15/16 inches) [excluding protrusions]
Accessory	AC adaptor, Power cable

Protocol Converter



(Rear View)

AW-IF400G

Enables various pan-tilt head and control panel combinations. Using the AW-RP120G/RP50, the AW-PH400 indoor pan-tilt head can be operated. The maximum operation distance can be extended to 1,500 m.

Power supply	DC10.8 V to DC16 V
Power consumption	1.5 W
Weight	Approx. 0.4 kg (Approx. 0.88 lb)
Dimensions (W x H x D)	145 mm x 30 mm x 85 mm (5-11/16 inches x 1-3/16 inches x 3-3/8 inches) [excluding protrusions]

AC Adaptor



AW-PS551

This AC adaptor is designed to be used with Multi-Purpose Cameras, and their peripherals. [For AW-RP120G, AK-HRP200G, AW-HS50]

Power input	AC100 V to 240 V/1.2 A, 50/60 Hz
Power output	DC12 V/3.0 A
Weight	Approx. 260 g (0.57 lb)
Dimensions (W x H x D)	57 mm x 37 mm x 115 mm (2-1/4 inches x 1-7/16 inches x 4-1/2 inches) [excluding protrusions]
Accessories	Power cable x 1, DC cable with ϕ 5.5 plug: Approx. 3 m x 1 DC cable with ϕ 6.5 plug: Approx. 3 m x 1

LCD Monitor



LED

BT-4LH310 (789 mm (31.1 type))



A Reference Monitor Supporting 4K Image Production and 2K/HD operation

Connector:	SDI (3G) 1/2/3/4	Display Port 1/2	HDMI 1/2
	GPI	RS-232C	RS-485
			HEADPHONE
Power:	AC	DC	



WXGA

LED

BT-LH1850 (470 mm (18.5 type))

High-Quality Images and excellent cost performance
Wide-Ranging Broadcast needs

Connector:	SDI 1	SDI 2	VIDEO	DVI-I	HDMI
	AUDIO PIN	GPI	RS-232C	RS-485	HEADPHONE
Power:	AC	DC			



FULL HD

LED

BT-LH2170 (550 mm (21.5 type))

High Picture Quality, High Performance and Rugged Durability, with excellent Cost-Performance

Connector:	SDI 1 (3G)	SDI 2	VIDEO	DVI-I	HDMI
	AUDIO PIN	GPI	RS-232C	RS-485	HEADPHONE
Power:	AC	DC			



WXGA

LED

BT-LH910G (230 mm (9 type))

High-Resolution Meets the needs of Acquisition, OB Van Installation and Live Broadcasting.

Connector:	SDI 1 (3G)*1	SDI 2	VIDEO	HDMI	VF
	YPbPr	GPI	RS-485	HEADPHONE	
Power:	DC	BATTERY			

*1: 3G-SDI supports 1080/50p, 1080/59.94p, and 1080/60p of the SMPTE ST 425-A standard.

Operation-verified 3rd party devices: PoE+ compatible hub/injector list

[GeoVision]



**PoE Adapter
GV-PA901**

*Operation-verified on Mar/2017

[NETGEAR, Inc.]



**ProSAFE® 8-Port 10/100/1000 PoE Smart
Switch with 2 Gigabit SFP Ports
GS510TP**

*Operation-verified on Sep/2015

[Allied Telesis]



**Gigabit PoE+ Injector
AT-6101GP**

*Operation-verified on Sep/2015

•GeoVision Inc.

(TEL) +886-2-8797-8376 (Email) sales@geovision.com.tw

•NETGEAR, Inc.

<http://www.netgear.com/home/contact-us/>

•Allied Telesis

(North America) <http://alliedtelesis.com/contact> (Asia/Pacific) sales-singapore@alliedtelesis.com
(EMEA) Customer_info@alliedtelesis.com (Central & South America) Customer_info@alliedtelesis.com

Panasonic does not guarantee the quality, performance, or the operation of the 3rd party devices.

Compatibility Overview for Remote Cameras/ Pan-tilt Heads*1 and Related Devices

		AW-RP120G	AW-RP50	AK-HRP200G	AW-IF400G*2
4K Multi Purpose Camera	AK-UB300GJ	✓	✓	✓	✓
4K Integrated Camera	AW-UE70W/K	✓	✓	✓	-
HD Integrated Camera	AW-HE130W/K	✓	✓	✓	-
	AW-HE40SW/SK/HW/HK	✓	✓	✓	-
	AW-HE2	✓	✓	-	-
Full-HD Outdoor Integrated Camera	AW-HR140	✓	✓	✓	-
Pan-Tilt Head	AW-PH400	✓*3	✓*3	-	✓
	AW-PH650	✓	✓	-	✓

*1: Controllable items vary depending on the model. *2: Pan/Tilt Controller (AW-RP400) is discontinued. *3: requires AW-IF400G

Remote Camera System – Specifications & Dimensions

AK-UB300GJ

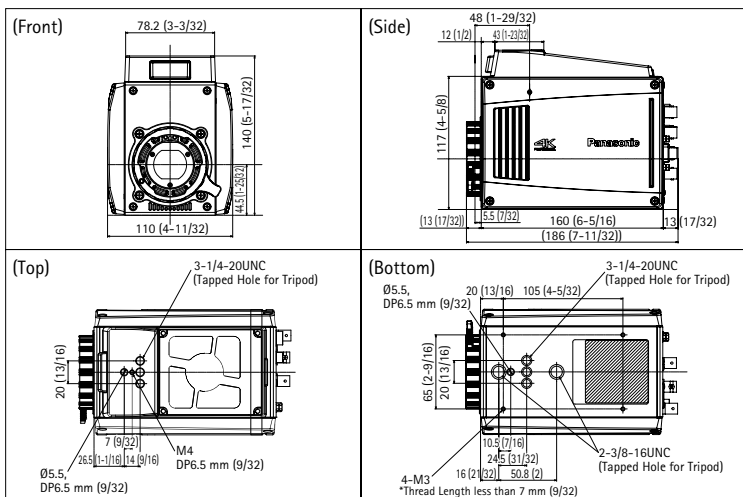
General	
Power	DC12 V (DC11 V to 17 V)
Power Consumption	40 W (body only, when 3G SDI x 4 is output) 60 W (maximum power when all accessories are connected and each output terminal is outputting at maximum)
Ambient Operating Temperature	-10 °C to 45 °C (14 °F to 113 °F) (Preheating required under a temperature 0 °C (32 °F) or below)
Storage Temperature	-20 °C to 60 °C (-4 °F to 140 °F)
Ambient Operating Humidity	85% or less (relative humidity)
Weight	Approx. 1.6 kg (3.53 lbs.) (body only)
Dimensions (W x H x D)	Body only 110 mm x 140 mm x 160 mm (4-11/32 inches x 5-17/32 inches x 6-5/16 inches) (excluding protrusions)
Camera Unit	
Pickup Device	11 million pixels, MOS x 1
Lens Mount	2/3-type bayonet
ND filter	CLEAR, 1/4, 1/16, 1/64
Gain	-6, -3, 0, 3, 6, 9, 12, 15, 18, 21, 24, 27, 30, 33, 36 dB
Total Gain	Selectable from 6, 12, 18, 24 dB
Shutter Speed	<ul style="list-style-type: none"> • [59.94i]/[59.94p] mode: 1/100, 1/120, 1/125, 1/250, 1/500, 1/1000, 1/1500, 1/2000 seconds • [29.97p] mode: 1/48, 1/50, 1/60, 1/96, 1/100, 1/120, 1/125, 1/250, 1/500, 1/1000, 1/1500, 1/2000 seconds • [23.98p] mode: 1/48, 1/50, 1/60, 1/96, 1/100, 1/120, 1/125, 1/250, 1/500, 1/1000, 1/1500, 1/2000 seconds • [50i]/[50p] mode: 1/60, 1/100, 1/125, 1/250, 1/500, 1/1000, 1/1500, 1/2000 seconds • [25p] mode: 1/48, 1/50, 1/60, 1/96, 1/100, 1/125, 1/250, 1/500, 1/1000, 1/1500, 1/2000 seconds • 180.0 deg, 172.8 deg, 144.0 deg, 120.0 deg, 90.0 deg, 45.0 deg

Synchro Scan Shutter	<ul style="list-style-type: none"> • [59.94i]/[59.94p] mode: 1/61.7 to 1/6130 seconds • [29.97p] mode: 1/30.9 to 1/2600 seconds • [23.98p] mode: 1/24.7 to 1/2880 seconds • [50i]/[50p] mode: 1/51.5 to 1/6250 seconds • [25p] mode: 1/25.7 to 1/3130 seconds
Shutter Open Angle	3 deg to 359.5 deg (can be set in 0.5 deg steps)
Sensitivity	[NORMAL]: F6 (2000 lx, 3200 K, 89.9% reflection, 1080/59.94i)/F7 (2000 lx, 3200 K, 89.9% reflection, 1080/50i) [HIGH SENS]: F10 (2000 lx, 3200 K, 89.9% reflection, 1080/59.94i)/F11 (2000 lx, 3200 K, 89.9% reflection, 1080/50i)
Minimum Subject Brightness	Approx. 0.01 lx (50%, F1.4, +36 dB (gain), +24 dB (total gain), 29.97p/59.94 Hz, 25p/50 Hz)
Image S/N	60 dB (standard) ([DNR] = [ONI])
Horizontal Resolution	HD: 1000 TV lines or above (center) UHD: 1800 TV lines or above (center)
Video Input/Output	
[HD SDI OUT 1] Terminal	BNC x 1 3G/1.5G HD SDI: 0.8 V [p-p], 75 Ω
[HD SDI OUT 2] Terminal	BNC x 1 1.5G HD SDI: 0.8 V [p-p], 75 Ω
[UHD/HD SDI OUT 1] Terminal	BNC x 1 3G/1.5G HD SDI: 0.8 V [p-p], 75 Ω
[UHD/HD SDI OUT 2] Terminal	BNC x 1 3G/1.5G HD SDI: 0.8 V [p-p], 75 Ω
[UHD/HD SDI OUT 3] Terminal	BNC x 1 3G/1.5G HD SDI: 0.8 V [p-p], 75 Ω
[UHD/HD SDI OUT 4] Terminal	BNC x 1 3G/1.5G HD SDI: 0.8 V [p-p], 75 Ω
Other Input/Output	
[G/L IN] Terminal	BNC x 1, 1.0 V [p-p], 75 Ω
[I/F] Terminal	D-SUB x 1, 15-pin
[TALLY OUT] Terminal	4-pin x 1
[IRIS] Terminal	12-pin x 1
[ZOOM/FOCUS] Terminal	12-pin x 1
[LAN] Terminal	100BASE-TX/10BASE-T
[DC IN] Terminal	XLR x 1, 4-pin, DC12 V (DC11 V - 17 V)

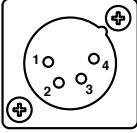
*For informations on "Supported formats", see page 31.

Dimensions

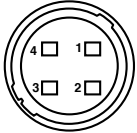
Unit: mm(inches)

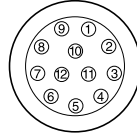


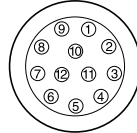
Pin Configuration

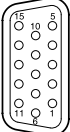
DC IN connector	
	
HA16RA-4P(77) (Hirose Electric Co.)	
Pin NO.	Signal
1	UNREG GND
2	Not used
3	Not used
4	+12 V

* Use the external power supply with correct polarity.

Tally output connector	
<p>The R tally and G tally signals are output from this connector.</p> 	
HR10A-7R-4SC (73) (Hirose Electric Co.)	
Pin NO.	Signal
1	GND
2	R TALLY (open collector)
3	G TALLY (open collector)
4	UNREG+12 V (max. 0.5 A)

IRIS connector	
<p>Used to connect the IRIS control cables of the lens.</p> 	
HR10A-10R-12SC (71) (Hirose Electric Co.)	
Pin NO.	Signal
1	Return control
2	REC-START/STOP
3	GND
4	Iris manual switching
5	Iris control
6	UNREG +12 V (max. 0.75 A)
7	IRIS-POSI
8	IRIS-G-MAX
9	EXT-POSI
10	Zoom position information
11	LENS-RXD
12	LENS-TXD

Zoom/focus connector	
<p>Used to connect the Zoom/focus control cables of the lens.</p> 	
HR10A-10R-12PC (71) (Hirose Electric Co.)	
Pin NO.	Signal
1	Focus control switching
2	Zoom control switching
3	GND
4	Not used
5	Not used
6	Not used
7	Not used
8	Focus control
9	Zoom control
10	Not used
11	COM+V voltage
12	COM-V voltage

IF connector	
	
D02-M15SAG-20L9E (Japan Aviation Electronics Industry)	
Pin NO.	Signal
1	GND
2	Not used
3	Not used
4	TX_N (EIA422)/TXD (EIA232) output
5	RX_N (EIA422)/RXD (EIA232) input
6	Not used
7	G/L signal input
8	Not used
9	TX_P (EIA422) output
10	RX_P (EIA422) input
11	GND
12	Not used
13	GND
14	GND
15	GND

Rear View



Remote Camera System – Specifications & Dimensions

AW-UE70W/K

General	
Power Requirements	DC 12 V (Supplied AC adaptor) DC 42 V to 57 V (PoE+ power supply)
Current consumption	1.3 A (Supplied AC adaptor) 0.5 A (PoE+ power supply)
Ambient Operating Temperature	0 °C to 40 °C (32 °F to 104 °F)
Storage Temperature	-20 °C to 50 °C (-4 °F to 122 °F)
Allowable Humidity Ranges	20 % to 90 % (no condensation)
Mass	Approx. 1.5 kg (3.30 lb)
Dimensions (W x H x D)	160 mm x 186 mm x 179 mm (6-5/16 inches x 7-41/128 inches x 7-3/64 inches) [excluding protrusions, direct ceiling mount bracket]
Finish	[AW-UE70W] Pearl white [AW-UE70 K] Metallic black
Controller Supported*	AW-RP50, AW-RP120G, AK-HRP200G
Camera Unit	
Imaging Sensors	1/2.3-type MOS
Lens	Optical 20x zoom, F1.8 to F3.6 [f=4.08 mm (5/32 inches) to 81.6 mm (3-7/32 inches); 35 mm (1-3/8 inches) equivalent: 29.5 mm (1-5/32 inches) to 612.0 mm (24-3/32 inches)]
Focus	Switching between auto and manual
Focus distance	Entire zooming range: 1.5 m (4.92 ft) Wide end: 10 cm (0.33 ft)
Color separation optical system	On-chip color filter system
Minimum Illumination	59.94 Hz 0.7 lx (50 IRE, F1.8, 48 dB, 1/60 without accumulation) 0.35 lx (50 IRE, F1.8, 48 dB, 1/30 with accumulation [Frame Mix 6 dB])
	50 Hz 0.7 lx (50 IRE, F1.8, 48 dB, 1/50 without accumulation) 0.35 lx (50 IRE, F1.8, 48 dB, 1/25 with accumulation [Frame Mix 6 dB])
Horizontal Resolution	4K: 1300 TV lines Typ (Center area) HD: 1000 TV lines Typ (Center area)
Gain Selection*	Auto, 0 dB to 48 dB (3 dB step)
Frame Mix*	Auto, Off, 6 dB, 12 dB, 18 dB, 24 dB
ND filter	Auto*, Through, 1/4, 4/16, 1/64
Electronic Shutter Speed	During Full Auto 1/60 to 1/2000 (Auto Slow Shutter: Off)[59.94 Hz] 1/30 to 1/2000 (Auto Slow Shutter: On)[59.94 Hz] 1/50 to 1/2000 (Auto Slow Shutter: Off)[50 Hz] 1/25 to 1/2000 (Auto Slow Shutter: On)[50 Hz]
	During Auto 1/60 to 1/2000 [59.94 Hz] 1/50 to 1/2000 [50 Hz]
	During Manual 1/100, 1/250, 1/500, 1/1000, 1/2000, 1/4000, 1/10000 [59.94 Hz] 1/120, 1/250, 1/500, 1/1000, 1/2000, 1/4000, 1/10000 [50 Hz]
Synchro Scan	59.94 Hz 59.94 Hz to 660.09 Hz (255 step)
	50 Hz 50.00 Hz to 570.12 Hz (255 step)
Gamma	Off, Normal (Low, Mid, High), Cinema
White Balance	ATW, AWB A, AWB B, ATW, 3200K, 5600K, VAR (2400K to 9900K)
Chroma Amount Variability	±3 step
Scene File	Full Auto, Manual1, Manual2, Manual3
Synchronization System	
Synchronization System	Internal synchronization/External synchronization (BBS, Tri-level sync)
Image Stabilization	
Image Stabilization	Optical (FHD, 4K)/4-axis hybrid image stabilizer (FHD) for stable

Input	
Power	DC 12 V IN, PoE+ (IEEE802.3at standard)
MIC/LINE Input	Stereo mini-jack (ø3.5 mm) Input impedance: Approx. 2 kΩ (unbalanced) [Mic input] •Supported microphones: Stereo mic (plug-in power, on/off switching via menu) •Supplied voltage: 2.5 V ± 0.5 V •Mic input level: -60 dBV ± 3 dBV (0 dB=1 V/Pa, 1 kHz) [Line input] •Input level: -10 dBV ± 3 dBV
G/L IN	Compatible with BBS (Black Burst Sync) signals and ternary synchronizing signals (BNC x 1)
Output	
Video Output	HDMI HDMI connector • HDCP is not supported. • VIERA Link is not supported.
	3G/HD SDI OUT Compliant with the SMPTE424/SMPT292M standards/75 Ω (BNC x 1)
Input/Output	
Input/Output Connector	LAN LAN connector for IP control (RJ-45) Equipped with straight/crossover cable auto detection function
	RS-232C Mini DIN 8-pin (IN) Mini DIN 8-pin (OUT)
	RS-422 CONTROL IN RS422A (RJ-45)
	USB Mini-B port
	SD Card microSD card slot
USB connection * This may vary depending on the operating environment.	
Video output	USB Video Class Ver1.0
Video compression format	Motion JPEG
Resolution	3840 x 2160, 1920 x 1080, 1280 x 720, 640 x 360
Frame rate	max 30 fps (59.94 Hz) max 25 fps (50 Hz)
Audio output	USB Audio Class Ver1.0
Audio compression format	Linear PCM, 48 kHz, 16-bit, 2 channels
Transfer modes(JPEG)	3840 x 2160 59.94 Hz: 5fps, 50 Hz: 5fps
	1920 x 1080/1280 x 720/640 x 360 59.94 Hz: 30fps/15fps/5fps, 50 Hz: 25fps/12.5fps/5fps
Supported models	Devices standardly equipped with a USB 2.0 compatible port
Pan-tilt Head Unit	
Installation Method	Stand-alone (Desktop) or suspended (Hanging)*5
Pan/tilt Operation Speed	Maximum speed during preset: 300°/s Maximum speed during manual: 90°/s
Panning Range	±175°
Tilting Range*5	-30° to 90°*6
Quietness	During preset: NC40 or less During manual: NC35 or less
Camera/pan-tilt head control	
IP connecting cable	• When connecting through a PoE+ hub: LAN cable*7 (category 5e or above), max. 100 m (328 ft)
	• When a PoE+ hub is not used: LAN cable*7 (category 5 or above) max.100 m (328 ft)
AW protocol connecting cable	LAN cable*7 (category 5 or above, straight cable), max. 1000 m (3280 ft)
Standard protocol connecting cable	Mini DIN 8-pin cable, male

SD card recording	
SD card recording	MPEG-4 AVC file standard compliant (.MP4)
Video compression format	MPEG-4 AVC/H.264 High Profile
Audio compression format	AAC-LC (48 kHz, 16 bit, 2 ch, 128 kbps)
Recording format /Bit rate	59.94 Hz 3840 x 2160/29.97p (Up to 72 Mbps), 1920 x 1080/59.94p (Up to 28 Mbps), 1920 x 1080/29.97p (Average 15 Mbps/ Average 10 Mbps/Average 6 Mbps), 1280 x 720/59.94p (Average 15 Mbps/ Average 8 Mbps/Average 4 Mbps)
	50 Hz 3840 x 2160/25p (Up to 72 Mbps), 1920 x 1080/50p (Up to 28 Mbps), 1920 x 1080/25p (Average 15 Mbps/ Average 10 Mbps/Average 6 Mbps), 1280 x 720/50p (Average 15 Mbps), 1280 x 720/25p (Average 8 Mbps/ Average 4 Mbps/Average 2 Mbps)
Network	
Transfer modes	JPEG 1920 x 1080, 1280 x 720, 640 x 360, 320 x 180, 59.94 Hz (30fps/15fps/5fps)*, 50 Hz (25fps/12.5fps/5fps)*
	H.264 3840 x 2160, 1920 x 1080, 1280 x 720, 640 x 360, 320 x 180, 59.94 Hz (60fps*/30fps/15fps/5fps)*, 50 Hz (50fps*/25fps/12.5fps/5fps)*

Supported protocol	IPv4	TCP/IP, UDP/IP, HTTP, HTTPS, RTSP, RTP, RTP/RTCP, FTP, DHCP, DNS, NTP, IGMP, UPnP, ICMP, ARP, RTSPoverTCP, RTSPoverHTTP, SSL(TLS), MultiCast/UniCast
	IPv6	TCP/IP, UDP/IP, HTTP, HTTPS, RTSP, RTP, RTP/RTCP, FTP, DHCPv6, DNS, NTP, ICMPv6(MLD), RTSPoverTCP, RTSPoverHTTP, SSL(TLS), MultiCast/UniCast
i-OS, Android support	JPEG image display	

Standard Accessories

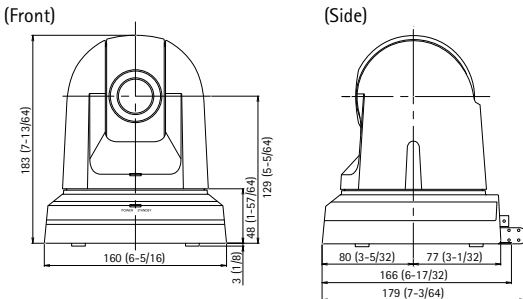
Mount bracket for installation surface (Hanging*10 / Desktop): 1, Drop-prevention wire (already attached to the unit): 1, Bracket mounting screws (bind-head) M4 x 10 mm: 4, Main unit mounting screw (with flat washer, spring washer) M3 x 6 mm: 1, Power cable (1.5 m [4.92 ft]): 1, AC adaptor: 1, CD-ROM: 1

* 1: It may be necessary to upgrade the version of the controller so that the controller will support the unit. * 2: During Auto, 6 dB to 48 dB (6 dB step) are available for AGC Max Gain setting. * 3: During Auto, 0 dB, 6 dB, 12 dB and 18 dB are available for Auto F.Mix Max Gain setting. * 4: "Auto" is available when "Scene" setting is "Full Auto". * 5: To ensure safety, the unit must be secured using the mount bracket supplied. * 6: Depending on the pan or tilt position, the camera may be reflected in the image. * 7: Use of an STP (shielded twisted pair) cable is recommended. * 8: The frame rate may be lower than the setting depending on the operating conditions. * 9: When the image resolution is "3840x2160", "640x360" or "320x180", 60fps or 50fps cannot be selected for the frame rate. * 10: To ensure more safety, AW-UE70W/K can be secured by using the direct ceiling mount bracket (WV-Q105A).

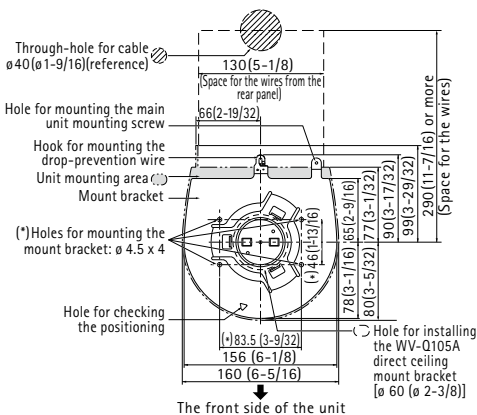
*For informations on "Output Signal Format", see page 38.

Dimensions

Unit: mm(inches)

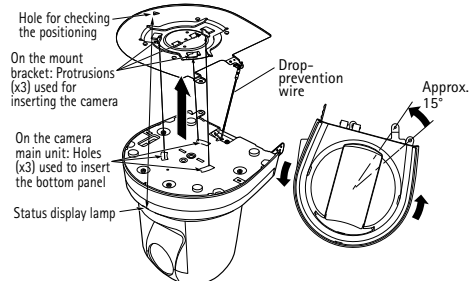
**Rear View****Bottom View**

Unit: mm(inches)

**Ceiling Installation View**

Optimal for both hanging and desktop installation.

The mounting bracket and drop-prevention wire are standard accessories. Ceiling and desktop installation are both possible. Mount the bracket on the installation surface and then put and turn the main unit on the bracket to be installed.



• The mounting bracket for discontinued AW-HE50 and AW-HE60 and current AW-HE40 series can also be used.

* Wiring, mounting, and removal must be done by a qualified technician. To ensure safety, consult with the dealer from whom you purchased the system.

*For "Terminal Pin Configuration", see page 47.

Remote Camera System – Specifications & Dimensions

AW-HE130W/K

General	
Power Requirements	DC 12 V (AC adaptor supplied) DC 42 - 57 V (PoE+ power supply) 1.8 A (AC adaptor supplied) 0.6 A (PoE+ power supply)
Ambient Operating Temperature	0 °C to 40 °C (32 °F to 104 °F)
Allowable Humidity Ranges	20 % to 90 % (no condensation)
Storage Temperature	-20 °C to 50 °C (-4 °F to 122 °F)
Mass	Approx. 3.1 kg (6.83 lb) [Including mount bracket]
Dimensions (W x H x D)	180 mm x 228 mm x 234 mm (7-3/32 inches x 9 inches x 9-3/16 inches) [excluding protrusions, cable cover, direct ceiling mount bracket]
Finish	AW-HE130WP/AW-HE130WE: Pearl white AW-HE130KP/AW-HE130KE: Metallic black
Controller Supported*	AW-RP120G, AW-RP50, AK-HRP200G

Camera Unit	
Imaging Sensors	1/2.86-type Full-HD 3MOS
Lens	Optical 20 zoom, F1.6 to F3.4 (f=4.5 mm to 90 mm; 35 mm equivalent: 32.13 mm to 642.5 mm)
Focus	Switching between auto and manual
Focus Distance	Entire zooming range: 800 mm (2.62 ft) Wide end: 400 mm (1.31 ft)
Color Separation Optical System	3MOS
Minimum Illumination	2 lx (50 IRE, F1.6, 36 dB)
Horizontal Resolution	1000 TV lines Typ (Center area)
Gain Selection	Auto, 0 dB to 36 dB
Frame Mix**	0 dB, 6 dB, 12 dB, 18 dB, 24 dB

Electronic Shutter Speed	59.94p/ 59.94i	1/100, 1/120, 1/250, 1/500, 1/1000, 1/2000, 1/4000, 1/10000
	29.97p	1/30, 1/60, 1/120, 1/250, 1/500, 1/1000, 1/2000, 1/4000, 1/10000
	23.98p	1/24, 1/60, 1/120, 1/250, 1/500, 1/1000, 1/2000, 1/4000, 1/10000
	50p/50i	1/60, 1/120, 1/250, 1/500, 1/1000, 1/2000, 1/4000, 1/10000
	25p	1/25, 1/60, 1/120, 1/250, 1/500, 1/1000, 1/2000, 1/4000, 1/10000
Synchro Scan	59.94 Hz	60.15 Hz to 642.21 Hz
	50 Hz	50.15 Hz to 535.71 Hz

Gamma	HD, SD, FILMLIKE1, FILMLIKE2, FILMLIKE3 0.30 to 0.75 (Manual setting)
White Balance	AWB A, AWB B, ATW, 3200K, 5600K, VAR (2000K to 15000K)
Chroma Amount Variability	OFF, -99 % to 40 %
Scene File	Scene1, Scene2, Scene3, Scene4

Synchronization System	
Synchronization System	Internal/External synchronization (BBS/Tri-level sync)

Input	
Input Connector	DC 12 V IN, G/L IN (BNC) • BBS (Black Burst Sync), tri-level sync supported • Locking to a color subcarrier is not possible with BBS. PoE+ (IEEE802.3at standard)

Output		
Video output	HDMI	HDMI connector • HDCP is not supported. • Viera Link is not supported.
	HD/ SD-SDI OUT	SMPTTE424/SMPTTE292/ SMPTTE259 standards 75 Ω (BNC x 1)
	VIDEO OUT	NTSC/PAL 1.0 V [p-p]/75 Ω (BNC x 1)

Input/Output		
Input/ Output connector	LAN	LAN connector for IP control (RJ-45), PoE+
	RS-422	CONTROL IN RS-422A (RJ-45)
	MIC/LINE input	ø3.5 mm stereo mini jack Input impedance: High impedance • During MIC input Supported mic: Stereo mic (plug-in power, on/off switching via menu) • Supply voltage: 2.5 V ± 0.5 V Mic input sensitivity: Approx. -40 dBV ± 3 dBV (0 dB=1 V/Pa, 1 kHz) • During LINE input Input level: Approx. -10 dBV ± 3 dBV

Pan-tilt Head Unit	
Installation Method	Stand-alone (Desktop) or suspended (Hanging)*3
Camera/Pan-tilt Head Control	IP connecting cable • When connecting through a PoE+ hub: LAN cable** (category 5e or above, straight cable), max. 100 m (328 ft) • When a PoE+ hub is not used: LAN cable** (category 5 or above, crossover cable) max.100 m (328 ft) RP connecting Cable LAN cable** (category 5 or above, straight cable), max. 1000 m (3280 ft) RS-422A, AW series protocol
Pan-tilt Operation Speed	0.08°/s to 60°/s
Panning Range	±175°
Tilting Range**	-30° to 210°*5
Quietness	NC35 or less

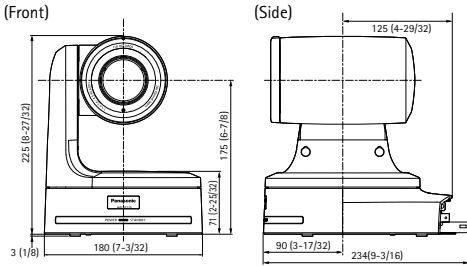
Standard Accessories	
Mount bracket for installation surface (Hanging** / Desktop):	1, Drop-prevention wire: 1, Drop-prevention wire mounting screw (comes attached to the unit): 1, Bracket mounting screws (bind-head) M4 x 10 mm: 4, Main unit mounting screw (with flat washer/spring washer) M3 x 6 mm: 1, Cable cover: 1, Power cable: 1, AC adaptor: 1, CD-ROM

*1: It may be necessary to upgrade the version of the controller in order to support the unit. For details on upgrading, visit the support page on the following website. <http://pro-av.panasonic.net/> *2: This cannot be configured when the format is 1080/29.97p, 1080/23.98p, 1080/29.97PsF, 1080/23.98PsF, 1080/25p, or 1080/25PsF. *3: To ensure safety, the unit must be secured using the mount bracket supplied. *4: Use of an STP (shielded twisted pair) cable is recommended. *5: Depending on the pan or tilt position, the camera may be reflected in the image. *6: To ensure more safety, AW-HE130W/K can be secured by using the direct ceiling mount bracket (WV-Q105A).

*For informations on "Output Signal Format", see page 38.

Dimensions

Unit: mm(inches)



Pin Configuration

(Common for AW-UE70W/K, AW-HE130W/K, AW-HE40 series)

RS-422 Connector <RS-422>

This RS-422 connector (RJ45) is connected when exercising serial control over the unit from an external device. Use a cable with the following specifications for the connection to this connector. The tally lamp can be lit by shorting the TALLY signal (pin 2) with GND (pin 1).

- Do not apply a voltage to the TALLY signal pin.

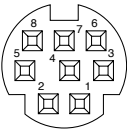
LAN cable*(category 5 or above, straight cable), max. 1000 m (3280 ft)
* Use of an STP (shielded twisted pair) cable is recommended.



Pin NO.	Signal	Pin NO.	Signal
1	GND	5	TXD+
2	TALLY	6	RXD+
3	RXD-	7	-
4	TXD-	8	-

RS-232C Connectors <RS-232C IN/OUT>

Connects to an RS-232C cable.



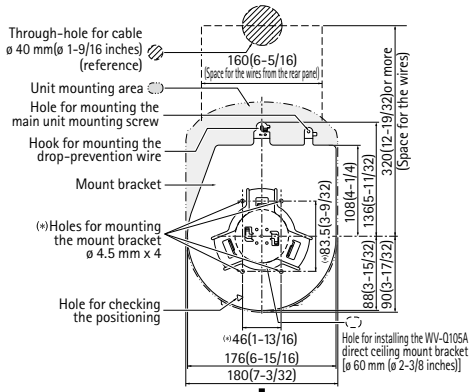
RS-232C IN		RS-232C OUT	
Pin NO.	Signal	Pin NO.	Signal
1	DTR_IN	1	DTR_OUT
2	DSR_IN	2	DSR_OUT
3	TXD_IN	3	TXD_OUT
4	GND	4	GND
5	RXD_IN	5	RXD_OUT
6	GND	6	GND
7	IR OUT R	7	NC
8	IR OUT L	8	NC

Rear View



Bottom View

Unit: mm(inches)

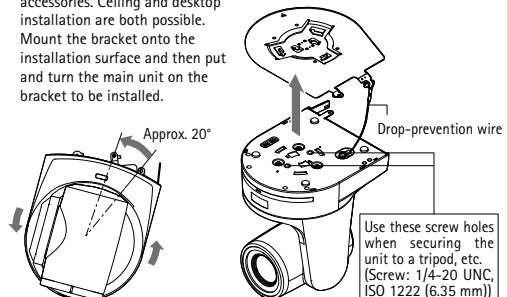


The front panel of the unit on this side.

Ceiling Installation View

Optimal for both hanging and desktop installation.

The mounting bracket and drop-prevention wire are standard accessories. Ceiling and desktop installation are both possible. Mount the bracket onto the installation surface and then put and turn the main unit on the bracket to be installed.



- AW-HE120W/K installation mount bracket can be used. The mounting bracket for HE130 differs from that of discontinued AW-HE50 and AW-HE60 and current AW-HE40 series.

* Wiring, mounting, and removal must be done by a qualified technician. To ensure safety, consult with the dealer from whom you purchased the system.

Remote Camera System – Specifications & Dimensions

AW-HE40SW/SK/HW/HK

General	
Power Requirements	DC 12 V (Supplied AC adaptor) DC 42 - 57 V (PoE+ power supply) 1.2 A (Supplied AC adaptor) 0.4 A (PoE+ power supply)
Ambient Operating Temperature	0 °C to 40 °C (32 °F to 104 °F)
Allowable Humidity Ranges	20 % to 90 % (no condensation)
Storage Temperature	-20 °C to 50 °C (-4 °F to 122 °F)
Mass	Approx. 1.5 kg (3.30 lb)
Dimensions (W x H x D)	160 mm x 186 mm x 166 mm (6-5/16 inches x 7-41/128 inches x 6-17/32 inches) (excluding protrusions, direct ceiling mount bracket)
Finish	AW-HE40HW / AW-HE40SW: Pearl white AW-HE40HK / AW-HE40SK: Metallic black
Controller Supported*	AW-RP50, AW-RP120G, AK-HRP200G

Camera Unit	
Imaging Sensors	1/2.3-type MOS
Lens	Optical 30x zoom, F1.6 to F4.7(f=4.3 mm (11/64 inches) to 129 mm (5-5/64 inches); 35 mm (1-3/8 inches) equivalent: 31.6 mm (1-31/128 inches) to 962.0 mm (37-7/8 inches)]
Focus	Switching between auto and manual
Focus Distance	Entire zooming range: 1.2 m (3.94 ft) Wide end: 10 cm (0.33 ft)
Color Separation Optical System	On-chip color filter system
Minimum Illumination	59.94 Hz 0.7 lx (50 IRE, F1.6, 48 dB, 1/60 without accumulation) 0.35 lx (50 IRE, F1.6, 48 dB, 1/30 with accumulation [Frame Mix 6 dB])
	50 Hz 0.7 lx (50 IRE, F1.6, 48 dB, 1/50 without accumulation) 0.35 lx (50 IRE, F1.6, 48 dB, 1/25 with accumulation [Frame Mix 6 dB])
Horizontal Resolution	1000 TV lines Typ (Center area)
Gain Selection*2	Auto, 0 dB to 48 dB (3 dB step)
Frame Mix*3	Auto, Off, 6 dB, 12 dB, 18 dB, 24 dB
Electronic Shutter Speed	Full Auto 1/30 to 1/2000[59.94 Hz] 1/25 to 1/2000[50 Hz]
	Auto 1/60 to 1/2000[59.94 Hz] 1/50 to 1/2000[50 Hz]
	Manual 1/100, 1/250, 1/500, 1/1000, 1/2000, 1/4000, 1/10000[59.94 Hz] 1/120, 1/250, 1/500, 1/1000, 1/2000, 1/4000, 1/10000[50 Hz]
Synchro Scan	59.94 Hz to 660.09 Hz (255 steps) 50.00 Hz to 570.12 Hz (255 steps)
Gamma	50 Hz Off, Normal (Low, Mid, High), Cinema
White Balance	ATW, AWB A, AWB B, 3200K, 5600K, VAR (2400K to 9900K)
Chroma Amount Variability	±3 step
Scene File	Full Auto, Manual1, Manual2, Manual3
Color Bars	FULL BAR

Synchronization System	
Synchronization System	Internal synchronization

Input	
Power	DC 12 V IN, PoE+ (IEEE802.3at standard)
MIC/LINE Input	Stereo mini-jack (ø3.5 mm) Input impedance: Approx. 2 kΩ (unbalanced) [Mic input] •Supported microphones: Stereo mic (plug-in power/on/off switching via menu) •Supplied voltage: 2.5 V ± 0.5 V •Mic input level: -60 dBV ± 3 dBV [Line input] •Input level: -10 dBV ± 3 dBV

Output		
Video Output	AW-HE40H HDMI	HDMI connector • HDCP is not supported. • Viera Link is not supported.
	AW-HE40S HD-SDI	Compliant with the SMPTE292M standards/75 (BNC x 1)

Input/Output		
Input/Output Connector	LAN	LAN connector for IP control (RJ-45), PoE+ Equipped with straight/crossover cable auto detection function
	RS-232C	Mini DIN 8-pin (IN) Mini DIN 8-pin (OUT)
	RS-422	CONTROL IN RS422A (RJ-45)
	USB	Mini-B port (Used for maintenance)
	SD Card	microSD card slot (Used for maintenance)

USB connection * This may vary depending on the operating environment.	
Video output	USB Video Class Ver1.0
Video compression format	Motion JPEG
Resolution	1920 x 1080, 1280 x 720, 640 x 360
Frame rate	max 30 fps (System frequency 59.94 Hz) max 25 fps (System frequency 50 Hz)
Audio output	USB Audio Class Ver1.0
Audio compression format	Linear PCM, 48 kHz, 16-bit, 2 channels
Supported models	Devices standardly equipped with a USB 2.0 compatible port

Pan-tilt Head Unit	
Installation Method	Stand-alone (Desktop) or suspended (Hanging)*4
Pan-tilt Operation Speed	Maximum speed during preset: 300°/s Maximum speed during manual: 90°/s
Panning Range	±175°
Tilting Range*5	-30° to 90°*5
Quietness	During preset: NC40 or less During manual: NC35 or less
Camera/Pan-tilt Head Control	• When connecting through a PoE+ hub: LAN cable*6 (category 5e or above), max. 100 m (328 ft) • When a PoE+ hub is not used: LAN cable*6 (category 5 or above) max. 100 m (328 ft)
	AW protocol connecting cable • LAN cable*6 (category 5 or above, straight cable), max. 1000 m (3280 ft) Standard protocol connecting cable • Mini DIN 8-pin cable, male

SD card recording	
SD card type	micro SDHC (4 GB to 32 GB), micro SDXC (64 GB to 128 GB), Speed class 10 or higher
System frequency	59.94 Hz/50 Hz
Video compression format	MPEG-4 AVC/H.264 High Profile
Audio compression format	AAC-LC (48 kHz, 16 bit, 2 ch, 128 kbps)
Audio output	USB Audio Class Ver1.0
SD card recording	MPEG-4 AVC file standard compliant (.MP4)
Recording format	1920 x 1080/59.94p, 1920 x 1080/50p, 1920 x 1080/29.97p, 1920 x 1080/25p, 1280 x 720/59.94p, 1280 x 720/50p, 1280 x 720/29.97p, 1280 x 720/25p
Network	
Resolution	JPEG VGA (640 x 360), QVGA (320 x 180) max.30 fps 1920 x 1080, 1280 x 720, 640 x 360, 320 x 180 max.30 fps
	H.264 1920 x 1080, 1280 x 720, 640 x 360, 320 x 180 max.60 fps

Supported protocol	IPv4	TCP/IP, UDP/IP, HTTP, HTTPS, RTSP, RTP, RTP/RTCP, FTP, DHCP, DNS, NTP, IGMP, UPnP, ICMP, ARP, RTSPoverTCP, RTSPoverHTTP, SSL(TLS), MultiCast/UniCast
	IPv6	TCP/IP, UDP/IP, HTTP, HTTPS, RTSP, RTP, RTP/RTCP, FTP, DHCPv6, DNS, NTP, ICMPv6(MLD), RTSPoverTCP, RTSPoverHTTP, SSL(TLS), MultiCast/UniCast
i-OS, Android support	JPEG image display	

Standard Accessories

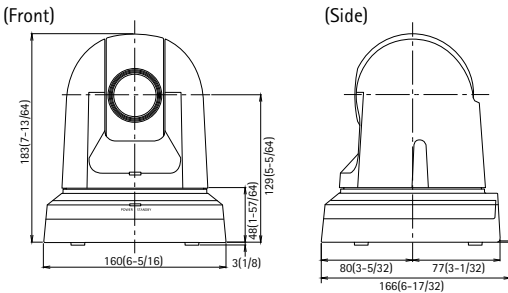
Mount bracket for installation surface (Hanging*/ Desktop): 1, Drop-prevention wire mounting screw (already attached to the unit): 1, Bracket mounting screws (bind-head) M4 x 10 mm: 4, Main unit mounting screw (with flat washer, spring washer) M3 x 6 mm: 1, Power cable (1.8 m [5.9 ft]): 1, AC adaptor: 1, CD-ROM

*1: It may be necessary to upgrade the version of the controller in order to support the unit. *2: During Auto, 6 dB to 48 dB (6 dB step) are available for AGC Max Gain setting. *3: During Auto, 0 dB, 6 dB, 12 dB and 18 dB are available for Auto FMax Gain setting. *4: To ensure safety, the unit must be secured using the mount brackets supplied. *5: Depending on the pan or tilt position, the camera may be reflected in the image. *6: Use of an STP (shielded twisted pair) cable is recommended. *7: To ensure more safety, AW-HE40SW/ SK/HW/HK can be secured by using the direct ceiling mount bracket (VW-Q105A).

*For informations on "Output Signal Format", see page 38.

Dimensions

Unit: mm(inches)



Rear View

AW-HE40SW

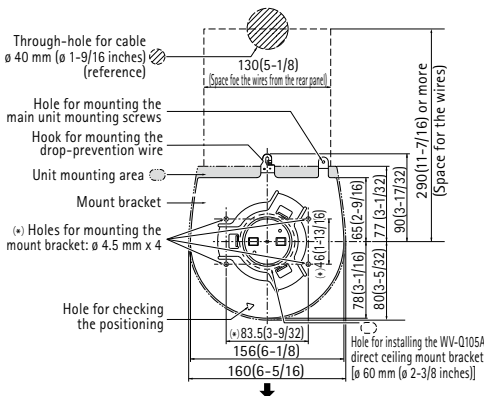


AW-HE40HW



Bottom View

Unit: mm(inches)

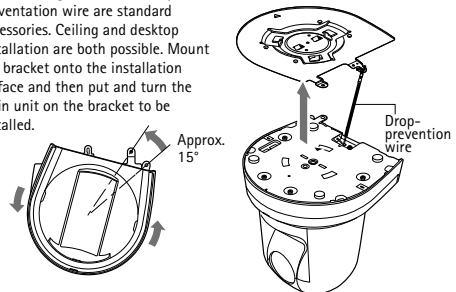


The front panel of the unit on this side.

Ceiling Installation View

Optimal for both hanging and desktop installation.

The mounting bracket and drop-prevention wire are standard accessories. Ceiling and desktop installation are both possible. Mount the bracket onto the installation surface and then put and turn the main unit on the bracket to be installed.



• The mounting bracket for discontinued AW-HE50 and AW-HE60 and current AW-UE70 series can also be used.

* Wiring, mounting, and removal must be done by a qualified technician. To ensure safety, consult with the dealer from whom you purchased the system. *For "Terminal Pin Configuration", see page 47.

Remote Camera System – Specifications & Dimensions

AW-HR140

*Specifications are subject to change without notice.

General	
Power Requirements	DC 12 V to 21.8 V (DC IN connector) DC 42 V to 57 V (PoE++ power supply)
Current Consumption	3.1 A to 5.5 A (DC IN connector) 1.2 A (PoE++ power supply)
Ambient Operating Temperature	-15 °C to 45 °C (5 °F to 113 °F) (preheating is required when -5 °C (23 °F) or less)
Ambient Operating Humidity	10% to 100% (no condensation)
Storage Temperature	-20 °C to 55 °C (-4 °F to 131 °F)
Storage Humidity	10% to 95% (no condensation)
Mass	Approx. 9.0 kg (19.84 lb)
Dimensions (W x H x D)	258 mm x 357 mm x 397 mm (10-5/32 inches x 14-1/16 inches x 15-5/8 inches) (including protrusions and cable cover)
Finish	Silver, salt resistant coating
Waterproof and Dust Proof	IP65 compliant
Maximum Permissible Wind Speed	15 m/sec: Operates normally 50 m/sec: Operation possible 60 m/sec: No damage
Wiper	Installed as standard
Heater	Installed as standard
Defroster	Installed as standard
Controller supported	AW-RP120G, AW-RP50, AK-HRP200G • It may be necessary to upgrade the version of the controller in order to support the unit. For details on upgrading, visit the support page on the following website. (http://pro-av.panasonic.net/)

Camera Unit		
Imaging Sensors	1/2.86-type Full-HD 3MOS	
Lens	Optical 20x zoom/10x digital zoom, F1.6 to F3.4 (F=45 mm to 90 mm; 35 mm equivalent: 32.13 mm to 642.5 mm)	
Focus	Switching between auto and manual	
Focus Distance	Entire zooming range: 800 mm (2.62 ft) Wide end: 400 mm (1.31 ft)	
Color Separation Optical System	3MOS	
Minimum Illumination	2 lx (50 IRE, F1.6, 36 dB, without accumulation)	
Horizontal Resolution	1000 TV lines Typ (Center area)	
Gain Selection	Auto, 0 dB to 42 dB (1 dB steps) 37 dB to 42 dB is Super Gain Mode	
Frame Mix	0 dB, 6 dB, 12 dB, 18 dB, 24 dB • This cannot be configured when the format is 1080/29.97p, 1080/23.98p, 1080/29.97PsF, 1080/23.98PsF, 1080/25p, or 1080/25PsF. • When [Iris Mode] or [Focus Mode] is set to [Auto], this cannot be set to 18 dB or 24 dB.	
Electronic Shutter Speed	59.94p / 59.94i	1/100, 1/120, 1/250, 1/500, 1/1000, 1/2000, 1/4000, 1/10000
	29.97p	1/30, 1/60, 1/120, 1/250, 1/500, 1/1000, 1/2000, 1/4000, 1/10000
	23.98p	1/24, 1/60, 1/120, 1/250, 1/500, 1/1000, 1/2000, 1/4000, 1/10000
	50p / 50i	1/60, 1/120, 1/250, 1/500, 1/1000, 1/2000, 1/4000, 1/10000
	25p	1/25, 1/60, 1/120, 1/250, 1/500, 1/1000, 1/2000, 1/4000, 1/10000
Synchro Scan	59.94 Hz	60.15 Hz to 642.21 Hz (255 steps)
	50 Hz	50.15 Hz to 535.71 Hz (255 steps)
Gamma	HD, FILMLIKE1, FILMLIKE2, FILMLIKE3 0.30 to 0.75 (Manual setting)	
White Balance	AWB A, AWB B, ATW, 3200K, 5600K, VAR (2000K to 15000K)	
Chroma Amount Variability	OFF, -99% to 40%	
Scene File	Scene1, Scene2, Scene3, Scene4	
Intelligent Functions	Auto function for each of accumulation, gain, iris, electronic shutter, ND, and ATW	

Synchronization System		
Synchronization System	Internal/External synchronization (BBS/Tri-level sync)	
Line Input <AUDIO IN(1/2)>	Input impedance	High impedance
	Input	<ul style="list-style-type: none"> • 2 channels, XLR balanced input • Input signal level: +4 dBu/0 dBu/-20 dBu (selectable in menu) • Volume variable range: -40 dB to +12 dB (can be changed in 1 dB steps in the menu)
Line Input <AUDIO IN(1/2)>	Output	<ul style="list-style-type: none"> • 4 channels, superimposed over SDI output • Embedded audio output level: FS-12 dB: -12 dBFS, FS-18 dB: -18 dBFS, FS-20 dB: -20 dBFS (selectable in menu) • Sampling frequency: 48 kHz (synchronized to video) • Quantization bit rate: 24-bit (LPCM) • Audio compression format (IP): G.726, AAC-LC (High quality)

Input		
Input Connector	12V IN	XLR connector
	G/L IN	BNC connector • BBS (Black Burst Sync), tri-level sync supported • Locking to a subcarrier is not possible with BBS.
	Audio input	mini XLR connector (line input) #1: INPUT1 Common, #2: INPUT1 HOT, #3: INPUT1 COLD, #4: INPUT2 Common, #5: INPUT2 HOT, #6: INPUT2 COLD
Output		
Video Output	HD-SDI OUT	SMPTE424/SMPTE292 standards 75 Ω (BNC x 2) • OSD output is possible from the SDI OUT 1/PM connector but not from the SDI OUT 2 connector.

Input/Output		
Input/Output Connector	LAN	LAN connector for IP control/Video output/Audio output/PoE++ power supply PoE++ (IEEE802.3bt Draft ver.2.0 standard)
	RS-422	CONTROL IN RS-422A
	EXT	#1: DC GND, #2: HOT, #3: COLD, #4: 12V-OUT

Pan-tilt Head Unit		
Installation Method	Stand-alone (Desktop) or suspended (Hanging) • To ensure safety, the unit must be secured using the mount bracket supplied.	
Camera/Pan-tilt Head Control	IP connecting cable	<ul style="list-style-type: none"> • When connecting through a PoE++ hub: LAN cable* (category 5e or above, straight cable), max. 100 m (328 ft) • When a PoE++ hub is not used: LAN cable* (category 5 or above, straight cable), max. 100 m (328 ft)
	AW series connecting cable/standard protocol connecting cable	LAN cable* (category 5 or above, straight cable), max. 1000 m (3280 ft)
Pan/Tilt Operation Speed	Maximum speed 60°/s or higher	
Panning Range	±175° • For suspended installations, the positions of the pins that determine the movement range must be changed.	
Tilting Range	-30° to 210° • Depending on the pan or tilt position, the camera may be reflected in the image. • For suspended installations, the positions of the pins that determine the movement range must be changed.	
Quietness	60°/s (NC45 or less)	
Vibration Correction	D.I.S.S. (Dynamic Image Stabilizing System)	

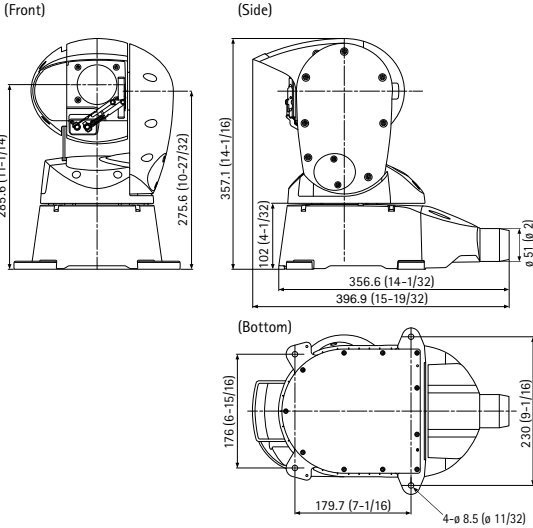
Standard Accessories	
Hexagonal bolt M8 x 30 mm: 4, M8 washer: 4, Spring washer: 4, Cable cover: 1, Washer nozzle mount bracket: 1, Drop-prevention wire: 1, Drop-prevention wire mounting screw (with hexagonal socket, for unit) M4 x 10 mm: 1	

*1: Use of an STP (shielded twisted pair) cable is recommended.
• When connecting directly to a controller without an Ethernet hub, use a cross cable.

*For informations on "Output Signal Format", see page 38.

Dimensions

Unit: mm(inches)



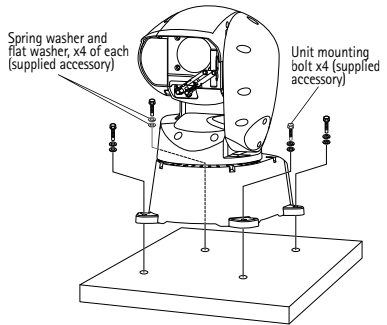
Rear View



Mounting the camera to the installation surface

When fixing directly to the installation surface

Pass the cables through the bottom wiring hole or side wiring hole before putting the camera down on the installation surface.



Pin Configuration

RS-422 Connector <RS-422>

This RS-422 connector (RJ45) is connected when exercising serial control over the unit from an external device. Use a cable with the following specifications for the connection to this connector. The tally lamp can be lit by shorting the TALLY signal (pin 2) with GND (pin 1).

- Do not apply a voltage to the TALLY signal pin.

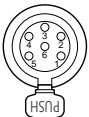
LAN cable*(category 5 or above, straight cable), max. 1000 m (3280 ft)
 * Use of an STP (shielded twisted pair) cable is recommended.



Pin NO.	Signal	Pin NO.	Signal
1	GND	5	TXD+
2	TALLY	6	RXD+
3	RXD-	7	-
4	TXD-	8	-

AUDIO IN Connector [AUDIO IN]

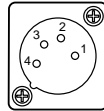
External audio (LINE) input connector



Amphenol LTW
 TECHNOLOGY CO., LTD.

Pin NO.	Signal
1	INPUT1 Common
2	INPUT1 Hot
3	INPUT1 Cold
4	INPUT2 Common
5	INPUT2 Hot
6	INPUT2 Cold

12 V IN Connector

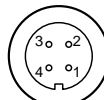


HA16RA-4P (77)
 (Hirose Electric Co.)

Pin NO.	Signal
1	GND
2	-
3	-
4	+12V

EXT Connector [EXT]

Output connector for washer control and DC 12 V



HR10A-7R-4SC (73)
 (Hirose Electric Co.)

Pin NO.	Signal
1	GND
2	Hot
3	Cold
4	DC 12V OUT

Remote Camera System – Specifications & Dimensions

AW-HEA10W/K

General	
Power Requirements	5.0 V DC (when using AC adaptor) 44 – 57 V DC (PoE power supply) 0.86 A (when using AC adaptor) 0.14 A (PoE power supply)
Allowable Operating Temperature	0°C to 40°C (32°F to 104°F)
Allowable Relative Humidity	10% to 80% (no condensation)
Unit Weight	Approx. 0.9 kg (1.98 lb) (excluding mounting brackets)
Dimensions (W x H x D)	183 mm x 65 mm x 225 mm (7-3/16 inches x 2-9/16 inches x 8-7/8 inches)

Camera Unit	
Image Sensor	1/2.33 type MOS solid-state image sensor (Effective size of image sensor: 1/4.37 type) Total pixels: Approx. 15.3 million Effective pixels/Video: Approx. 3.91 million (16:9)
Lens	F2.0 (f = 2.15 mm) 35 mm equivalent; Approx. 18.0 mm (16:9) Field of view: 95° (horizontal), 56° (vertical) [When zoom is 1x]
Shutter Speed	1/60 to 1/12000
White Balance	ATW, Sunny, Cloudy, Indoor1, Indoor2, AWB A, AWB B
Standard Illumination	1,400 lx
Minimum Illumination	Approx. 20 lx (1/60 in auto mode)

Input/Output Connector	
HDMI	HDMI connector • HDCP is not supported. • Viera Link is not supported.
Network	10BASE-T/100BASE-TX, RJ-45 connector, Automatic recognition of straight/crossover cable
USB	Mini-B (for maintenance)
SD Memory Card	microSD card slot (for maintenance)

PTZ Cntrl Compatible Devices and Operating Systems

Supported devices: iPad
Supported operating systems: iOS 8.1

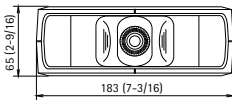
Standard Accessories

Mounting bracket A (for mounting this unit): 1, Mounting bracket B (for securing this unit, for AW-HE130): 2, Mounting bracket C (for AW-HE40): 1, Drop-prevention wire: 1, Drop-prevention wire mounting screw M4 x 8 mm: 1, Bracket mounting screws A M4 x 10 mm: 8, Bracket mounting screws B M3 x 6 mm: 4, AC adaptor: 1, Power cable: 1

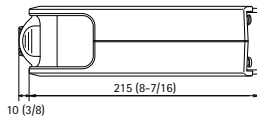
Dimensions

Unit: mm(inches)

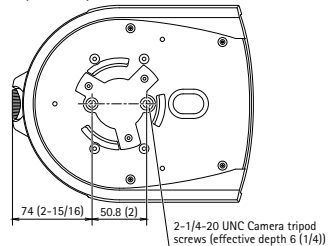
(Front)



(Side)



(Bottom)

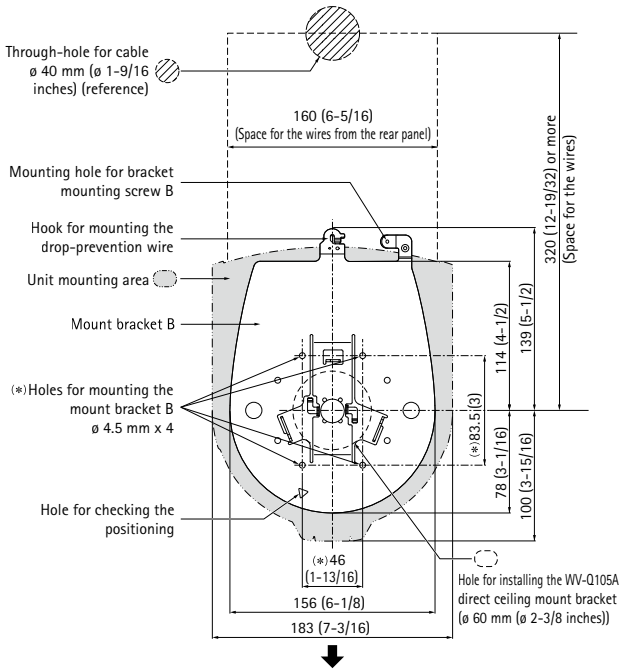


Rear View



Bottom View

Unit: mm(inches)



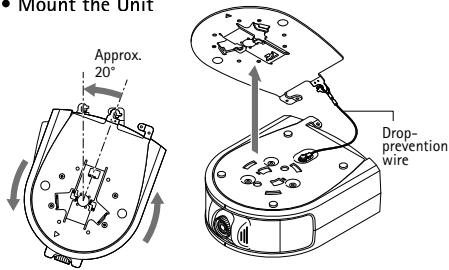
The front panel of the unit on this side.

Ceiling Installation View

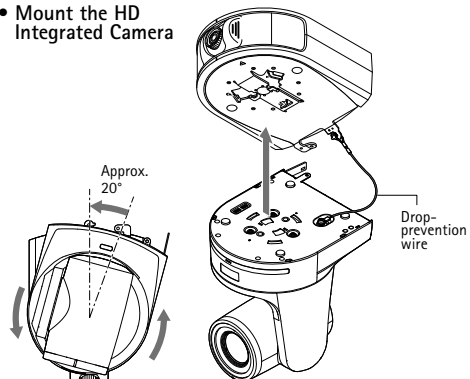
Optimal for both hanging and desktop installation.

The mounting bracket and drop-prevention wire are standard accessories. Ceiling and desktop installation are both possible. Mount the bracket onto the installation surface and then put and turn the main unit on the bracket to be installed.

• Mount the Unit



• Mount the HD Integrated Camera



• The mounting brackets for AW-UE70W/K, AW-HE40 series and AW-HE130W/K are different.

* Wiring, mounting, and removal must be done by a qualified technician. To ensure safety, consult with the dealer from whom you purchased the system.

Remote Camera System – Specifications & Dimensions

AW-360C10 [360-degree Live Camera Head]

*Specifications are subject to change without notice.

General		
Power Requirements	DC 12 V (11 V to 17 V)	
Power Consumption	11 W (TBD)	
Operating temperature	0°C to 40°C	
Weight	620g (TBD)	
Dimensions (W x H x D)	96 mm x 180 mm x 96 mm (TBD) (3-25/32 inches x 7-3/32 inches x 3-25/32 inches)	
Camera Unit		
Sensor	1/2.3" type MOS x 4	
Lens	Fixed focal length SuperFishEye F2.4, f=1.83mm	
Interfaces		
Input/Output Connector	HDMI out	Type D x4
	Power	Camera head option cable
	SD card slot	micro SD card slot (for firmware upgrade)
Others		
Switches	POWER, FUNC	
LED	POWER, ALM	
Internal microphone	4ch.	

AW-360B10 [360-degree Live Camera Base Unit]

General		
Power Requirements	DC12 V (11 V to 17 V)	
Power Consumption	40 W (TBD, including camera head output)	
Operating temperature	0°C to 40°C	
Weight	1100g (TBD)	
Dimensions (W x H x D)	210 mm x 55 mm x 200 mm (8-9/32 inches x 7-7/8 inches x 2-3/16 inches) (TBD)	
Output		
HDMI Output	Stitching Format	2:1 Equirectangular
	Resolution	3840 x 1920/1920 x 960
	Frame Rate	29.97p/25p/59.94p/50p
Interfaces		
HDMI in	Type A x4	
HDMI out	Type A x1	
Power for camera head	Camera head option cable	
DC in	XLR 4pin	
LAN	RJ45 (for monitoring and control)	
SD card slot	SD card slot (for firmware upgrade)	
Others		
SW	POWER, FUNC	
LED	POWER, ALM	
Network Functionality		
Compression	Motion JPEG	
Resolution	1240 x 620, 920 x 460	
Max. connections	Max.4	
Standard protocols	IPv4 TCP/IP, HTTP	

Remote Camera System – Specifications & Dimensions

AW-HE2

General	
Power Requirements	DC 5.0 V (AC adaptor supplied), 3.6 W
Operating Temperature	0°C to 40°C (32°F to 104°F)
Allowable Humidity Range	10 % to 80 % (no condensation)
Storage Temperature	-10°C to 60°C (14°F to 140°F)
Weight	Approx.0.244 kg (Approx.0.538 lbs)
Dimensions (W x H x D)	80 mm x 118 mm x 138 mm (3-5/32 inches x 4-5/8 inches x 5-7/16 inches)
Camera Unit	
Image Sensors	1/4.37 type MOS Effective pixels: Motion picture Approx.3.9 mega pixels
Lens	i.Zoom Approx.2x, Digital zoom Approx.4x F2.0 (f=2.15 mm, 35 mm equivalent: 18 mm) Field of view: 95°(horizontal), 56°(vertical) Minimum focus distance: Approx.80 cm (25°C/77°F)
Standard Illumination	1400 lx
Minimum Illumination	20 lx (1/60 in Auto mode)[AW-HE2P],20 lx (1/50 in Auto mode)[AW-HE2E]
Horizontal Resolution	850 TV line Typ (Center area)
Electronic Shutter Speed	1/60 to 1/12000 [AW-HE2P],1/50 to 1/12000 [AW-HE2E]
White Balance	ATW, AWB A, AWB B, Sunny, Cloudy/Indoor1, Indoor2, Fluorescent(TTL type)
Synchronization System	Internal synchronization
Video Output Connector	HDMI x 1
Audio Output Connector	HDMI x 1, Linear PCM
Network	10BASE-T, 100BASE-TX, RJ-45 Automatic recognition of straight/crossover cable Network output image: JPEG, 640 x 480 (640 x 360) or 320 x 240 (320 x 180), up to 30fps (16:9 video is transmitted in the Letter Box format).
USB	Micro-B terminal x 1, Power supply function (power supplied from the USB terminal when there is no power provided from DC input terminal) Video Output: USB Video Class Compression Motion JPEG Resolution 1920x1080(MAX), 1280x720,640x360 Frame rate 30 fps(MAX)* Audio Output: USB Audio Class Compression Linear PCM
Microphone	2 ch stereo

Pan-Tilt Mechanism	
Panning Range	Approx. ±23° [i.Zoom Approx.2x] Approx. ±35° [Digital zoom Approx.4x]
Tilting Range	Approx. ±14° [i.Zoom Approx.2x] Approx. ±21° [Digital zoom Approx.4x]

Standard Accessories	
Drop-prevention wire: 1, M4 screw 20 mm (0.787 q) length: 4, Flat washer (for M4 screw): 1, M3 screw 8 mm (0.315 q) length: 1, Flat washer (for M3 screw): 1, Perpendicular fixing screw (installed on the unit): 1, Horizontal fixing screw (installed on the unit): 1, AC adaptor: 1, Power cable: 1, Stand: 1, Stand cover: 1, Bundling band: 2, CD-ROM (Operating Instructions <Basics>, <Operations and Settings>))	

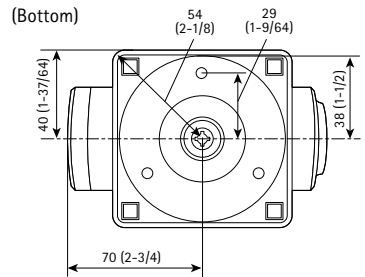
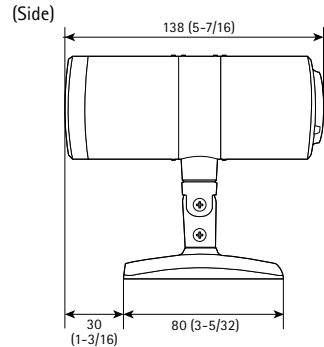
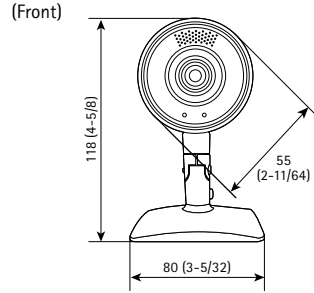
*Depending on your environment and audio input conditions, the rate may vary.
*For informations on "Output Signal Format", see page 38.

Rear View



Dimensions

Unit: mm(inches)

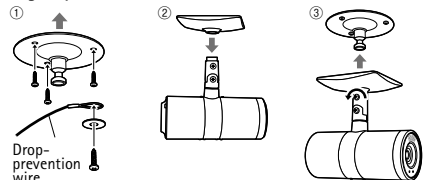


Ceiling Installation View

Optimal for both hanging and desktop installation.

The mounting bracket and drop-prevention wire are standard accessories. Ceiling and desktop installation are both possible. Insert the stand protruding portion in the stand mounting hole, and tighten the horizontal fixing screw.

ceiling-suspended installation



• Tightening torque: 1.176 N-m (12 kgf-cm)

* Wiring, mounting, and removal must be done by a qualified technician. To ensure safety, consult with the dealer from whom you purchased the system.

Computer Requirements

Model No.	AW-UE70W/K	AW-HE130W/K	AW-HE40 SW/SK/HW/HK	AW-HR140	AW-HEA10W/K	AW-HE2		
CPU	When using 1080/60p [59.94Hz] and 1080/50p [50Hz]: Intel® Core™ i7 3.4 GHz or higher recommended Other than above: Intel® Core™ 2 Duo 2.4 GHz or higher recommended	Intel® Core™ 2 DUO 2.4 GHz or more	When using 1080/60p [59.94Hz] and 1080/50p [50Hz]: Intel® Core™ i7 3.4 GHz or higher recommended Other than above: Intel® Core™ 2 Duo 2.4 GHz or higher recommended	Intel® Core™ 2 DUO 2.4 GHz or more				
Network Function	10BASE-T or 100BASE-TX							
Image Display	Resolution: 1024 x 768 pixels or more Color generation: True Color 24-bit or more							
Supported Operating Systems and Web Browsers	For Windows	<ul style="list-style-type: none"> •Microsoft® Windows® 8.1 Pro (64-bit / 32-bit)¹ Windows® Internet Explorer® 11.0 •Microsoft® Windows® 8 Pro (64-bit / 32-bit)¹ Windows® Internet Explorer® 10¹ •Microsoft® Windows® 7 Professional SP1 (64-bit / 32-bit)² Windows® Internet Explorer® 8.0 / 9.0 / 10.0 / 11.0³ 	<ul style="list-style-type: none"> •Microsoft® Windows® 8.1 Pro (64-bit / 32-bit) Windows® Internet Explorer® 11.0 •Microsoft® Windows® 8 Pro (64-bit / 32-bit) Windows® Internet Explorer® 10.0 •Microsoft® Windows® 7 Professional SP1 (64-bit / 32-bit) Windows® Internet Explorer® 11.0 / 10.0 / 9.0 / 8.0 (32-bit) 	<ul style="list-style-type: none"> •Microsoft® Windows® 8.1 Pro (64-bit / 32-bit)¹ Windows® Internet Explorer® 11.0 •Microsoft® Windows® 8 Pro (64-bit / 32-bit)¹ Windows® Internet Explorer® 10¹ •Microsoft® Windows® 7 Professional SP1 (64-bit / 32-bit)² Windows® Internet Explorer® 8.0 / 9.0 / 10.0 / 11.0³ 	<ul style="list-style-type: none"> •Microsoft® Windows® 10 Pro (64-bit / 32-bit) Windows® Internet Explorer® 11.0 •Microsoft® Windows® 8.1 Pro (64-bit / 32-bit) Windows® Internet Explorer® 11.0 •Microsoft® Windows® 8 Pro (64-bit / 32-bit)¹ Windows® Internet Explorer® 10.0 •Microsoft® Windows® 7 Professional SP1 (64-bit / 32-bit)² Windows® Internet Explorer® 11.0 / 10.0 / 9.0 / 8.0 (32-bit) 	<ul style="list-style-type: none"> •Microsoft® Windows® 8 (64-bit / 32-bit) Windows® Internet Explorer® 10.0 (32-bit) •Microsoft® Windows® 7 Professional SP1 (64-bit / 32-bit)² Windows® Internet Explorer® 10.0 / 9.0 / 8.0 (32-bit) 	<ul style="list-style-type: none"> •Microsoft® Windows® 8 (64-bit / 32-bit) Windows® Internet Explorer® 10.0 (32-bit) •Microsoft® Windows® 7 Professional SP1 (64-bit / 32-bit)² Windows® Internet Explorer® 10.0 / 9.0 / 8.0 (32-bit) •Microsoft® Windows® XP SP3 (32-bit) Windows® Internet Explorer® 8.0 (32-bit) 	
	For Mac	<ul style="list-style-type: none"> Mac OS X 10.8 Safari 6.2 Mac OS X 10.9 Safari 7.1 Mac OS X 10.10 Safari 8.0 	<ul style="list-style-type: none"> Mac OS X 10.9 Safari 7.0.2 Mac OS X 10.8 Safari 6.1.2 Mac OS X 10.7 Safari 6.1.2 	<ul style="list-style-type: none"> Mac OS X 10.8 Safari 6.2 Mac OS X 10.9 Safari 7.1 Mac OS X 10.10 Safari 8.0 	<ul style="list-style-type: none"> Mac OS X 10.11 Safari 9.0 Mac OS X 10.10 Safari 8.0.4 Mac OS X 10.9 Safari 7.0.2 Mac OS X 10.8 Safari 6.1.2 	<ul style="list-style-type: none"> Mac OS X 10.8 Safari 6.0 Mac OS X 10.7 Safari 6.0 Mac OS X 10.6 Safari 5.1.7 		
	For iPhone, iPad, iPod touch	iOS 8.3 Standard browser	iOS 7.1 Standard web browsers	iOS 8.3 Standard browser	iOS Standard browser	— ⁴	—	
	For Android	Android OS 4.4 Standard browser	Android OS Standard web browsers	Android OS 4.4 Standard browser	Android OS Standard web browsers	—	—	

In addition, a CD-ROM drive (to use the operating instructions and various types of software), Adobe® Reader® (to view the operating instructions on the CD-ROM), and a mouse or equivalent pointing device are necessary.

*1: Use the desktop version of Internet Explorer. (Internet Explorer for Windows UI is not supported.)

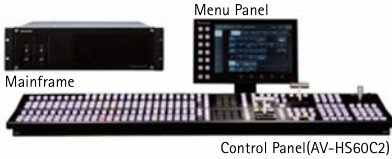
*2: Windows® XP compatibility mode is not supported.

*3: The 64-bit version of Internet Explorer® is not supported.

*4: Use of the supported applications makes display on the iPad possible.

* Microsoft®, Windows®, Windows® 7, Windows® 8, Windows® 8.1, Windows® 10 and Internet Explorer® are either registered trademarks or trademarks of Microsoft Corporation in the United States and other countries. * Apple, Mac, OS X, iPhone, iPod Touch, iPad, and Safari are registered trademarks of Apple Inc., in the United States and other countries. * Android™ is a trademark of Google Inc.

2ME Live Switcher – AV-HS6000 –



2ME Live Switcher

AV-HS6000 Series Composition

		Model no.
Mainframe	Redundant Power Supply Model	AV-HS60U2
	Redundant Power Supply Model	AV-HS60C2
Control Panel	Redundant Power Supply Model	AV-HS60C2
	Redundant Power Supply Model	AV-HS60C4
Menu Panel		AV-HS60C3G
Storage Module		AV-HS60D1G
Chroma Key Software		AV-5FU60G

2 ME	34 Inputs	16 Outputs	4 Keys Per ME
4 DSK	4 USK	4 P-in-P Per ME (dual-use with keys)	
4ch MultiViewer	16 Aux Buses	Redundant Power Supply	

2ME Live Switcher with complete system adaptability, intuitive operations, high reliability, and advanced 4K compatibility*

• Supports a range of video formats including, 2160/59.94p, 50p (4K mode)*, 1080/59.94p, 50p (3G mode), 1080/59.94i, 1080/50i, 480/59.94i and 576/50i.

- 32 SDI and two DVI-D inputs, and 16 SDI with two outputs.
- All inputs are provided with a 10 bit frame synchronizer. Eight inputs equipped with color corrector. Four inputs equipped with frame delay.
- Four outputs equipped with color correctors, and two with downconverters.
- 4 ch of 3D DVE and 2 ch of 2D DVE systems are provided to support background and keys for each ME.
- A luminance key, linear key, chroma key, full key, and PinP are provided for 4 ch per ME (8 ch in total), plus 4 ch of DSK and 4 ch of upstream key (USK).
- Comes with event memory, shot memory and macro memory for recording complex operations.
- Multi-Selection Panel for each ME. The switch-style panel helps in operations by providing a direct, tactile response.
- Crosspoint buttons can be grouped with any eight colors, and bitmap characters can be displayed on the label display panel (OLED).
- 10.1-type(256.5 mm) Menu Panel with touch screen allows quick and easy menu operation
- Operation of up to three control panels is possible through an IP connection.
- System settings and memory information can be stored on an SD card, PCs, and optional storage module.
- Functions are scalable using plug-in software.

* Firmware Ver. 4 or later required. For details, see "Service and Support" on the Panasonic website (<http://pro-av.panasonic.net/en/>).

Control Panel

Control Panel AV-HS60C2

• 24 XPT, Width: 980 mm (38-19/32 inches)



Control Panel AV-HS60C4

• 16 XPT, Width: 656 mm (25-13/16 inches)



Rear Panel

Mainframe



Control Panel





3G/4K format compatibility (Advanced support for high-definition)

This advanced switcher can be used to produce 4K*1 high-definition video as well as HD/SD-SDI and 3G-SDI by switching between three use modes.
*1: Firmware Ver. 4 or later required. For details, see "Service and Support" on the Panasonic website (<http://pro-av.panasonic.net/en/>).

Functions supported by format

		Standard mode	3G mode	4K mode
Input function	Number of SDI inputs	32	16 (3G Level A / B ²)	8 (SQD / 2SI Level A / B ² × 4)
	Number of DVI inputs	2	Not possible	Not possible
	Number of up-converter channel	4	-	8
	Dot by Dot	Possible	-	-
	Number of delay function channel	4	2	-
	Number of color corrector channel	8	4	-
Output function	Number of upstream keyer channel	4	2	-
	Number of SDI output	16	8	3 (SQD 3G Level B × 4)
	Number of down-converter channel	2	2 ³	2 ⁴
ME1 function	Number of color corrector channel	4	2	-
	Number of utility bus	2	1	1
ME2 function	BKGD transition pattern	MIX / WIPE / DVE	MIX / WIPE	MIX / WIPE
	IMAGE	Possible	Not possible	Not possible
	Number of keyer	4	Not possible	Not possible
	Number of utility bus	2	Not possible	Not possible
Number of DSK keyer		4	2	2 ⁵
Number of still image (Still) memory channel		4	2	2 ⁵
Moving image (Clip) memory function	Number of channel	4	2	2 ⁵
	Recording time per channel (standard image quality)	Approximately 60 seconds	Approximately 30 seconds	Approximately 30 seconds
Number of MultiViewer	Recording time per channel (high image quality)	Approximately 30 seconds	Approximately 15 seconds	Approximately 15 seconds
	Number of AUX	16	8	8 ⁵

*2: When FS function is active and 3G-SDI Level A signal is input, it is converted to Level B signal to perform signal processing. When FS function is off and 3G-SDI Level A signal is input, a black screen will be displayed. FS function is always ON when in 4K mode. *3: SDI OUT 14 outputs down-converted HD-SDI signal of SDI OUT 13, and SDI OUT 16 outputs down-converted HD-SDI signal of SDI OUT 15. *4: Same video output on SDI OUT 13(3GSDI) and SDI OUT 14(HD-SDI). Same video output on SDI OUT 15(3GSDI) and SDI OUT 16(HD-SDI). *5: 2K resolution video scaled to 4K resolution.

Easy Direct Switching by Touch and Mouse Operations

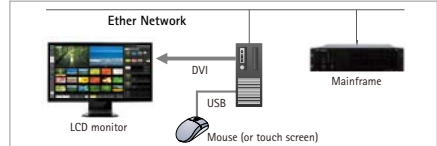
Software Control Panel AV-SF6000G

(Free download for Mac and Windows)

The AV-HS6000 control panel is also available as a PC based application software. Equipped with the MJPEG codec, it allows display of video and image in the application. Intuitive and simple operations while viewing source video or using the display as a sub-panel is possible.

* For information on downloading software control panel, see "Software download" on the Panasonic website (<http://pro-av.panasonic.net/en/>).

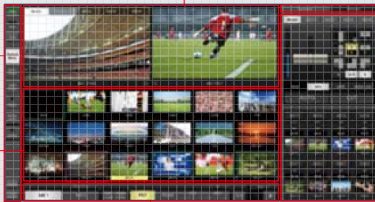
System Composition Example



Mode selection part

- Switches between Control Mode, Menu Panel, and Video Status modes.
- Displays mainframe communications status and error status.
- Switches between connected mainframes by inputting the IP address.
- Allows free arrangement of sources displayed on the input and output windows.

Control Mode screen

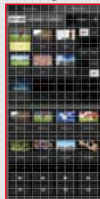


Operation menu part

- Switches ME to be operated.
- Selects PST, PGM, UTIL 1 to 2, and KEY 1 to 4.

Source assignment part

- Selects movie to be assigned to the bus selected with operation menu part.
- A total of 54 sources can be displayed on three pages by displaying 18 sources on one page and switching pages.
- Displays tally status in red and green frames.



Input and output windows

- Displays PGM and PST for the selected ME.
- Displays DSK PGM1 for PGM when PGM (+DSK) button is selected.
- Displays Next Transition setting status superimposed on window for PST.

Page button

- Switches display of operation panel part.

Operation panel part-1

- Operates transitions (fader, AUTO, CUT).
- Selects key type and transition type for KEY 1 to 4 and sets transition time.
- Sets key type for DSK 1 to 4.
- Displays thumbnail for source assigned to KEY and DSK.

Operation panel part-2

- Controls shot memory, event memory, and macro memory.
- Video memory (still/clip) can be controlled.
- Stills and clips can be loaded from the built-in SSD or a PC.

System Composition Example

Menu Panel screen



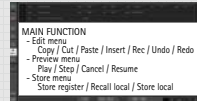
Displays menu panel operation display, showing ME1, ME2 and PGM on left side. It is possible to operate menu panel or to check the result while checking the PGM output.

Video Status screen



Video sources of all inputs, all outputs, ME/DSK/AUX buses, and MultiView screen are displayed in a list.

Macro Edit screen



Added editing function which are adding and deleting operations, wait time setting, etc., recorded Macro memory for more convenience.

AV-HS6000 Main Features

*For information on other switchers, see Specification & Function Comparison on page 64-67.

Ample Input / Output Functions

Inputs and outputs are provided with frame synchronizer, freeze, frame delay, format converter, dot by dot, color corrector and video process functions. The AV-HS6000 supports incorporation of asynchronous signals, virtual system delay difference compensation, and color correction based on differences in camera and display device characteristics, for a smoother program production process.

Multi-Format Support

The AV-HS6000 supports multiple HD/SD formats including 1080/24PsF and 1080/23.98PsF to enable digital cinema production and worldwide operation. It is also compatible with the 3G/4K format*1.

Various Keyers for Flexible Operations

The AV-HS6000 comes with luminance key, linear key, chroma key and full key as well as keyers that can be used with P-in-P. Chroma keying employs the Primatte® algorithm, which is widely used as a plug-in for nonlinear editors. Superior blue-spill processing naturally combines translucent objects, such as silk and glass, with background colors, making it possible to faithfully reproduce extremely fine objects such as individual strands of hair at a very high level of detail. It also comes with upstream and downstream keyers to support a wide range of video renderings. In addition, the preset function lets you register key settings for each DSK keyer and the keyers for each ME.

P-in-P Examples



Sample of 4 keyers in use



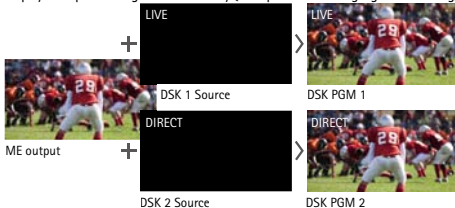
Primatte® High-Quality Chroma Key (picture simulated)



Display Example of Using Upstream Key



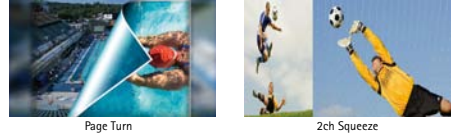
Display Example of using Downstream Key (Example of multi-language broadcasting)



Diverse DVE Transitions

In addition to wipe, mix and cut transitions, 3D DVE effects such as page turn or DVE transitions using dual channel squeeze can be performed. Various renderings of image effects are also possible, including mosaic and defocus.

Transitions and Effects Display Example

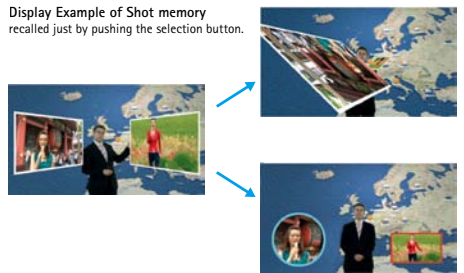


Memory Functions

Using memory function, setting, video and effects can be easily stored and recalled. It allows quick operation of switching and recalling effects in live video production, supports efficient operation and making it easy to perform video effects for more complicated operations.

- Shot memory: This function recalls background transition patterns or other video effects, including PinP size, position, border width, and key on. Effect dissolve can be set to ensure smooth switching from the current effect to the next effect registered in shot memory.

Display Example of Shot memory recalled just by pushing the selection button.



- Event memory: This function allows continuous image effects to be registered and played back in a timeline.

- Macro memory: This function allows record and playback of a series of operations on the Control Panel. It can also record and play back setting information, such as input/output and keyers. Multi-Selection Panel shot memory and event memory operations can also be recorded in macro memory. Macro memories can be played back by assigning them to the cross point buttons, such as macro bus, PGM, and PST.

- Video memory: Moving images (Clip) and still images (Still) can be recorded for use as video sources. Up to 60 seconds of moving images can be saved in standard mode, and up to 30 seconds in high image quality mode.

- **Animation wipe:** Animation wipes can be easily created using moving images (clips) recorded in video memory. Playback linked to a fader transition is also possible.

Animation Wipe Examples

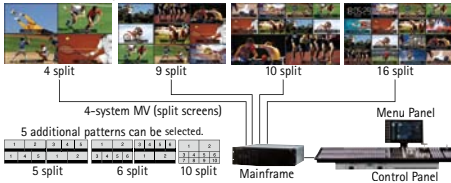


MultiViewer Function

PGM, PVW and video from all sources can be displayed on a single screen as split frames with the MultiViewer function. Display source names, tallies, audio level meters, clocks and safety markers. You can also select between fit mode and squeeze mode.

Fit mode display example Squeeze mode display example

MultiViewer examples



Multi-Selection Panel

A color panel that can display thumbnail images with high visibility. The switches provide a tactile response which allows quick and precise memory operation.

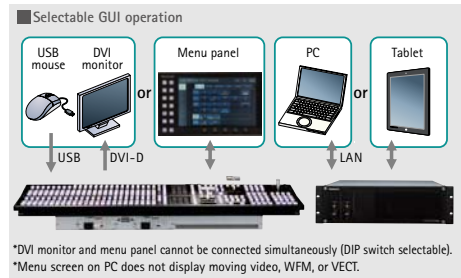


Wipe Pattern

Video memory
(Clip: moving images)

Flexible System Scalability

- **Aux buses are provided.** Bus transition functions include not only Cut but the Mix transition as well. Combined with M/E sections, various operations are possible in a variety of scenarios.
- **Menu operations can be performed from a PC or tablet via a network connection.**
- **Features a range of external interfaces for plug-ins created with the SDK*2, providing flexible functional scalability through the installation of plug-ins.** Seven plug-in software is provided. In addition, the software development kit (SDK) provided by Panasonic makes it possible for software to be freely developed by third parties and SI providers.



Backup System for Peace of Mind

- **The redundant power supply increases reliability for use at live events.**
- **Operation of up to two control panels is possible through an IP connection.**
- **ME rows can be switched by swapping the ME panel and changing the output of the system when ME faults.**
- **Web server function allows access to the GUI menu from a web browser of PC.**
- **Settings and memory information can be exported and saved as a project file on internal mainframe storage*3 or on an external SD memory device or PC.**

*1: Firmware Ver. 4 or later required.

*2: Contact your dealer for more details.

*3: The AV-HS6000 requires an optional AV-HS60D1G storage module.

*For more details, see Specification & Function Comparison on page 64-67.



Multi-Format Live Switcher

AV-HS450

1 ME	Max. 20 Inputs*1	Max. 10 Outputs*2	1 Keyer	2 DSK
2 P-in-P	2ch MultiViewer	4 Aux Buses	Redundant Power Supply	

This high-performance switcher handles the switching needs of broadcast studios, OB vans and multi-camera systems anywhere.

- 16 SDI inputs, four SDI outputs and two DVI-D outputs.
- Luminance and chroma keying, two DSK channels, two P-in-P buses and two DVE channels.
- Supports a variety of HD/SD formats, including 1080/24PsF*3 as standard.
- A wide range of optional boards also allows the input and output of analog component and various other signals. (For details, see the list of optional boards below.)
- Equipped with an SD/HD up-converter function for four standard inputs, and a dot by dot function for 16 standard inputs.
- A video processing function with color correction is also provided for eight inputs.
- Aux 1 bus equipped with Mix transition function.
- Panel layout offers direct control of functions with 16 crosspoint buttons and pattern select buttons.
- Six user buttons.
- Mounting the optional AV-HS04M7D 3D SDI Output Board provides 3D compatibility. Switch up to Nine 3D Image Inputs.

Rear Panel

Mainframe



Control Panel



Live Switcher

AV-HS410

1 ME	Max. 13 Inputs*1	Max. 10 Outputs*2	1 Keyer
1 DSK	2 P-in-P	1ch MultiViewer	4 Aux Buses

This compact, integrated unit includes levels of performance and function that approach many high-end switchers.

- Eight SDI inputs, one DVI-D input, five SDI outputs and one DVI-D output.
- Supports a variety of HD/SD formats, including 1080/24PsF, as standard.
- A wide range of optional boards also allows the input and output of analog component and various other signals. (For details, see the list of optional boards below.)
- Equipped with an SD/HD up-converter function for four standard inputs, and a dot by dot function for eight inputs.
- A video processing function with brightness, pedestal level, saturation, and color phase correction is also provided for eight inputs.
- The Memory Preview function lets you preview shot memory and event memory content. It allows image effects to be easily confirmed while on-air with this 1 M/E switcher.
- Two inputs for still (STILL) and moving (CLIP) images can be saved in Video Memory, and selected as bus footage.
- A 178 mm (seven inches) color LCD monitor with WVGA (800 x 480) resolution is built into the control panel. It can be switched to a wide variety of display modes, including setting menu, image monitoring and waveform/vectorscope.
- 12 crosspoint buttons in each A bus and B bus (for a maximum of 22 with the Shift function) provide direct control. Also comes with eight user buttons.
- Plug-ins allow flexible expansion of software-based functions.

Rear Panel



Input

Option Boards



AV-HS04M1
SDI Input Board
SDI (HD/SD) x 2 (BNC)
(Built-in Up-converter)



AV-HS04M2
Analog Component Input Board
HD/SD Analog Component x 2 (Y/Pa/Ps)
(Built-in Up-converter)



AV-HS04M3
DVI Input Board
DVI-I x 2 (Built-in Scaler)



AV-HS04M6
Analog Composite Input Board
Analog Composite x 2
(Built-in Up-converter)



AV-HS04M8
Full HD DVI Input Board
DVI-D x 2
(compatible with WUXGA)

Output

Option Boards



AV-HS04M4
Analog Output Board
HD/SD Analog Component x 2
(Y/Pa/Ps)



AV-HS04M5
DVI/Analog Output Board
DVI-I x 1, HD/SD Analog
Component x 1 (Y/Pa/Ps)



AV-HS04M7
SDI Output Board
SDI (HD/SD) x 2
(Each one has 2 outputs)
(BNC) (Built-in Down-converter)



AV-HS04M7D
3D SDI Output Board
SDI (HD/SD) x 2
(Each one has 2 outputs)
(BNC) (Built-in Down-converter)



Compact Live Switcher

AW-HS50

1 ME	5 Inputs	3 Outputs	1 Keyer
1 P-in-P	1ch MultiViewer	1 Aux Buses	

Highly functional live switcher in compact, half-rack-size package.

- Four SDI inputs, one DVI-D input, two SDI outputs and one DVI-D output.
- The AW-HS50 is equipped with an SD/HD up-converter function for two inputs.
- All four inputs equipped with a dot by dot function and a video processing function for brightness, pedestal level, saturation and color phase correction.
- Transitions: 13 wipe patterns and mixes.
- Two 8 bit still images can be saved in Frame Memory, and used as bus footage.
- Five crosspoint buttons in each A bus and B bus (for a maximum of 10 with the Shift function), a Cut button, a P-in-P button, a Key button and an FTB button allow direct control with this simple panel layout.
- two user buttons (for a maximum of four with the Shift function).
- Linking the AW-HS50 to the optional AW-RP50 Remote Camera Controller with an IP connection** over a network makes remote operation of Panasonic HD Integrated Cameras and other devices possible.

Rear Panel



*1: When using two input boards. *2: When using two output boards. *3: 1080/24PsF (or 23.98PsF) input signals are supported only by the standard input terminals of the AW-HS450. These signals are not supported by the optional AW-HS04M1/M2/M3/M4/M5/M6/M7/M7D/M8 boards. *4: Only one AW-RP50 can be connected to the switcher via an IP connection. And connection is not possible with a public network.

Live Switcher Specification Comparison

		AV-HS6000*1	AV-HS450
ME		2ME	
Video Format	4K/3G	2160/59.94p (4K mode)**, 2160/50p (4K mode)**, 1080/59.94p (3G mode), 1080/50p (3G mode)	—
	HD	1080/59.94i, 1080/50i, 1080/24PsF, 1080/23.98PsF, 1080/25PsF, 1080/29.97PsF, 720/59.94p, 720/50p	1080/59.94i, 1080/50i, 1080/24PsF**, 1080/23.98PsF**, 720/59.94p, 720/50p
	SD		
Video Processing	Y:P _s :P _a	4 : 2 : 2 10 bit	4 : 2 : 2 10 bit (8 bit for FMEM)
	RGB		
Video Input	Input	34 signal lines	16 signal lines, standard 20 signal lines, maximum
	SDI	32 lines, BNC x 32 HD (SMPTTE292M)/3G (SMPTTE424M)/SD (SMPTTE259M) standard, 0.8 V [p-p] ± 10 % (75 Ω)	Standard SDI: 16 lines, BNC x 16 HD (SMPTTE292M)/SD (SMPTTE259M) standard, 0.8 V [p-p] ± 10 % (75 Ω)
	DVI-D/DVI-I	2 signal line DVI-D x 2 Digital RGB: XGA (1024 x 768), WXGA (1280 x 768), SXGA (1280 x 1024), WSXGA+ (1680 x 1050), UXGA (1600 x 1200), WUXGA (1920 x 1200) Vertical frequency: 60 Hz Video format inputs: 1080/59.94p, 1080/50p, 1080/59.94i, 1080/50i, 720/59.94p, 720/50p	—
	Optional Board	—	Maximum of 4 inputs (IN A1, A2, B1, B2)(Up to 2 optional)
	Output	16 signal lines	6 signal lines, standard 10 signal lines, maximum
Video Output	SDI	16 lines, BNC x 32 (2 distributed outputs per line) HD (SMPTTE292M)/3G (SMPTTE424M)/SD (SMPTTE259M) standard, 0.8 V [p-p] ± 10 %	Standard SDI: 4 lines, BNC x 5 (2 output distribution for OUT 1) HD (SMPTTE292M)/SD (SMPTTE259M) standard, 0.8 V [p-p] ± 10 % (75 Ω)
	DVI-D	—	Standard DVI-D: 2 lines, DVI-D x 2, (OUT 5, 6) Digital RGB: XGA (1024 x 768), WXGA (1280 x 768), SXGA (1280 x 1024), WSXGA+ (1680 x 1050), UXGA (1600 x 1200), WUXGA (1920 x 1200) Vertical frequency: 60 Hz Video format outputs: 1080/50P, 1080/59.94P (Analog output signals are not supported)
	Optional Board	—	Maximum of 4 outputs (OUT A1, A2, B1, B2)(Up to 2 optional)
	Reference Input/Output	<p>Mainframe BNC</p> <p>GENLOCK mode: Black burst or Tri-level Sync input signals (with loop-through)</p> <ul style="list-style-type: none"> • Same field frequencies as those of the system formats supported. • With the 1080/23.98PsF, 1080/24PsF format, only GENLOCK mode supported. • With the 1080/23.98PsF format, black burst with 10F-ID (SMPTTE318M standard met) or TRI signals supported. <p>Internal sync mode: Black burst output signals x 2</p>	
Interface	PANEL/MAIN-FRAME	RJ45 x 1, Compatible with 100Base-TX and AUTO-MDIX (to connect between the mainframe and the control panel)	RJ45 x 1, 100 Mbps (to connect between the mainframe and the control panel)
	EDITOR	—	Mainframe, D-sub 9 pin x 1, RS-422 (GVG protocol compatible)
	COM	Mainframe, D-sub 9 pin x 4, RS-422** Control Panel: D-sub 9 pin x 2 (RS-422 x 1, RS-232C x 1)	Mainframe, D-sub 9 pin x 1, RS-422 (pan-tilt system control)
	TALLY/GPI	Mainframe: D-sub 25 pin x 1 GPI IN x 18 (general-purpose, photocoupler sensing), GPIOUT x 48 (selected from general purpose, tally, Open collector output), ALARM OUT x 1 (open collector output, negative logic) Control Panel: D-sub 25 pin x 1 GPI IN x 8 (general-purpose, photocoupler sensing), GPIOUT x 10 (selected from general purpose, tally, Open collector output), ALARM OUT x 1 (open collector output, negative logic)	Mainframe: D-sub 50 pin x 1 GPI IN x 8 (general-purpose, photocoupler sensing), GPI OUT x 31 (general-purpose, selected from R/G tally, open collector output), ALARM OUT x 1 (open collector output, negative logic) Control Panel: D-sub 25 pin x 1 GPI IN x 8, GPI OUT x 8, ALARM OUT x 1
	LAN	Mainframe: Compatible with 100Base-TX and AUTO-MDIX (For IP control)	Mainframe, RJ45 x 1, 10 BASE-T/100 BASE-TX
Control Panel	Discrete (menu DVI-D output; USB mouse menu control)	Discrete	
Menu Panel	Discrete		
Multi-Selection Panel	Provided for each ME		
Removable Media	SD Memory Card Supported by the control panel, Capacity: Maximum 32 GB (SDHC Memory Card compatible) Still image file/movie clip file/PROJECT file (including memories): Loading/saving, Software: Loading, Log data: saving	SD Memory Card Supported by the control panel, Capacity: Maximum 32 GB (SDHC Memory Card compatible) Still image file: Loading/saving, setup data: backup	

*1: For information on 4K/3G mode, see page 59.

*2: Firmware Ver. 4 or later required. For details, see "Service and Support" on the Panasonic website (<http://pro-av.panasonic.net/en/>).

AV-HS410	AW-HS50
1ME	
—	—
1080/59.94i, 1080/50i, 1080/24PsF ⁴ , 1080/23.98PsF ⁴ , 720/59.94p, 720/50p	1080/59.94i, 1080/50i, 1080/24PsF, 1080/23.98PsF, 720/59.94p, 720/50p
480/59.94i, 576/50i	
4 : 2 : 2 10 bit (8 bit for video memory)	4 : 2 : 2 10 bit (8 bit for FMEM)
4 : 4 : 4, 8 bit	
9 signal lines, standard 13 signal lines, maximum	5 signal lines
Standard SDI: 8 lines, BNC x 8 (IN 1 to 8) HD (SMPTE292M)/SD (SMPTE259M) standard, 0.8 V [p-p] ±10 % (75 Ω)	4 lines, BNC x 4 HD (SMPTE292M)/SD (SMPTE259M) standard, 0.8 V [p-p] ± 10 % (75 Ω)
Standard DVI-D: 1 signal line, DVI-D x 1 Digital RGB: XGA (1024 x 768), WXGA (1280 x 768), SXGA (1280 x 1024), WSXGA+ (1680 x 1050), UXGA (1600 x 1200), WUXGA (1920 x 1200) Vertical frequency: 60 Hz Video format inputs: 1080/50p, 1080/59.94p (Analog input signals are not supported)	
boards may be inserted into the 2 input/output optional slots)	—
6 signal lines, standard 10 signal lines maximum	3 signal lines
Standard SDI: 5 lines, BNC x 6 (2 output distribution for OUT 1) HD (SMPTE292M)/SD (SMPTE259M) standard, 0.8 V [p-p] ±10 % (75 Ω)	SDI: 2 lines, BNC x 3 (2 output distribution for OUT1) HD (SMPTE292M)/SD (SMPTE259M) standard, 0.8 V [p-p] ±10 % (75 Ω)
Standard DVI-D: 1 lines, DVI-D x 1 Digital RGB: XGA (1024 x 768), WXGA (1280 x 768), SXGA (1280 x 1024), WSXGA+ (1680 x 1050), UXGA (1600 x 1200), WUXGA (1920 x 1200) Vertical frequency: 60 Hz Video format outputs: 1080/50p, 1080/59.94p, 1080/50i, 1080/59.94i, 720/50P, 720/59.94p (Analog output signals are not supported)	Standard DVI-D: 1 lines, DVI-D x 1 Digital RGB: XGA (1024 x 768), WXGA (1280 x 768), SXGA (1280 x 1024), WSXGA+ (1680 x 1050), UXGA (1600 x 1200), WUXGA (1920 x 1200) Vertical frequency: 60 Hz Video format outputs: 1080/50p, 1080/59.94p (Analog output signals are not supported)
boards may be inserted into the 2 input/output optional slots)	—
GENLOCK mode: Black burst or Tri-level Sync input signals (with loop-through) • Same field frequencies as those of the system formats supported. • With the 1080/24PsF format, only GENLOCK mode supported. • With the 1080/23.98PsF format, black burst with 10F-ID (SMPTE318M standard met) or TRI signals supported. Internal sync mode: Black burst output signals x 2	—
—	—
D-sub 9 pin x 1, RS-422	—
D-sub 9 pin x 1, RS-422	—
D-sub15 pin x 2 GPI IN x 8 (general-purpose, photocoupler sensing), GPI OUT x 19 (general-purpose, selected from R/G tally, open collector output), ALARM OUT x 1 (open collector output, negative logic)	D-sub 15 pin x 1, GPI IN x 5 (photocoupler sensing), GPI OUT x 7 (open collector output, negative logic)
RJ45, 10 BASE-T/100 BASE-TX	
Integrated	
Integrated	
—	
SD Memory Card Capacity: Maximum 32 GB (SDHC Memory Card compatible) Still image file/movie clip file/shot memory/ event memory: Loading/saving, Setup data: backup	—

*3: Switchable between master connection and slave connection via menu

*4: 1080/24PsF and 23.98PsF are not supported with the AV-HS04M option board series.

Live Switcher Function Comparison

		AV-HS6000	AV-HS450
BKGD	Wipe	17	12
	Squeeze	16	11
	Slide	8	8
	3D	13	12
	2ch Squeeze	7	4
	2ch Slide	8	4
	2ch 3D	1	4
	Transition Type	Cut, Mix, Wipe (including DVE), EMEMLINK	
Image	Image effect: PGM/A, PST/B Bus	Effect: Mosaic, Defocus, Mono, Paint	
Keyer	Number of Keys	8	
	Key Type	Linear key, Luminance key, Chroma key*, Full key	Linear key, Luminance key, Chroma key, Full key
	Transition Type	Cut, Mix, Wipe (including DVE)	
	Wipe/DVE Pattern	Wipe x 12, Squeeze x 11, Slide x 9, 3D x 12	
USK	Number of Keys	4	
	Key Type	Linear key, Luminance key, Full key	
	Transition Type	Cut	
DSK	Number of Keys	4	2
	Key Type		Linear key, Luminance key
P in P	Transition Type	Cut, Mix	
	Number of PinP	8 ^{*2}	
AUX Bus	Transition Type	Wipe (SL/SQ) / Mix	
		AUX Bus 1 to 16 ^{*3}	AUX Bus
Input Function	Frame Synchronizer	SDI IN 1 to 32, DVI IN 1, 2	SDI IN 1 to 16 ^{*7}
	Freeze	SDI IN 1 to 32, DVI IN 1, 2	SDI IN 1 to 16 ^{*7}
	Frame Delay	SDI IN 27, 28, 31, 32	
	Dot by Dot	SDI IN 1 to 32	SDI IN 1 to 16
	Up-Converter	SDI IN 27, 28, 31, 32	SDI IN 13 to 16 ^{*7}
	Color Corrector	SDI IN 25 to 32	SDI IN 9 to 16
	Video Processing	SDI IN 25 to 32	SDI IN 9 to 16
Output Function	MultiViewer	4 ch, Labels, Tally indication, Audio level meter, Safety marker, Split-screen (10 Patterns: 4, 5a/5b, 6a/6b, 9, 10a/10b, 12 and 16 sections)	2 ch, Labels, Tally indication, Split-screen (4 Patterns: 4, 9, 10 and 16 sections) ^{*8}
	Down-Converter	SDI OUT 14, 16	SDI output
	Color Corrector	SDI OUT 13 to 16	
	Other Function	Phase adjustment, Chroma key sample marker	OSD (P/W and several MULTI outputs), Phase adjustment, Chroma key sample marker
	Frame Memory	—	4 channels (save to flash memory on mainframe; data retained even when power off)
Memory Function	Video Memory	Still (still images): 4 systems (save to volatile memory on mainframe; data erased when power off) ^{*4} Clip (movie clips): 4 systems (save to volatile memory on mainframe; data erased when power off) ^{*4}	—
	Shot Memory	Register 81 shots (effect dissolve function)	Register 10 shots
	Event Memory	Register 64 events in 81 memories	—
	Macro Memory	Register 81 memories (can remember a total of 3,000 procedure operations)	
	BKGD/Wipe Memory	—	Register 10 memories
	P in P Memory	—	Register 10 memories
	Camera Memory	—	Register 10 memories ^{*9}
Key Preset	Register 4 presets for 1 keyer		
Other Function	Project Management Function	✓ (Save/retrieve current settings and memory data as batch file)	
	Plug-in Function	✓ (Register plug-in software created with SDK to add functions/ external interface function)	—
	Redundant Power Supply	✓ (Redundant power model for mainframe and control panel)	✓
	Multiple Panel Connection	✓ (1 mainpanel, 2 subpanels) ^{*5}	
	Web Browser Function	✓ (Menu operations from local PC) ^{*5}	

*1: Chroma keying only available on the Key 1 bus; additions possible by installing the optional AV-SFU60G.

*2: Dual use with keyer; Rotation available only on Key 1 and Key 2 buses.

*3: Mix transition available on Aux 1-4 buses.

*4: Data in volatile memory can be exported and saved on the internal mainframe storage (optional), an SD memory card or LAN port-connected PC.

*5: The subcontrol panel and local PC connects to the mainframe LAN port.

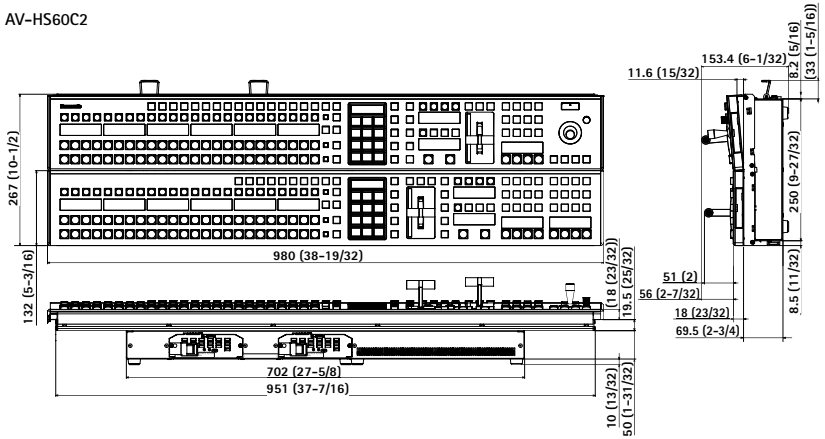
*6: Mix transition available on Aux 1 buses.

Live Switcher Dimensions

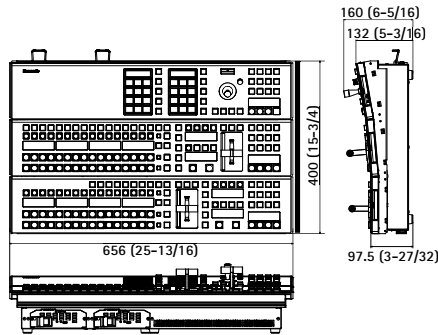
AV-HS6000

Unit: mm(inches)

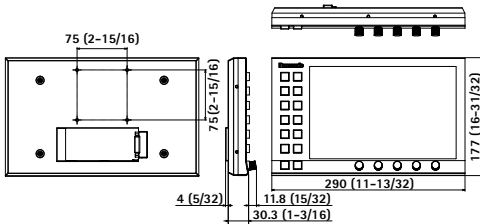
Control Panel AV-HS60C2



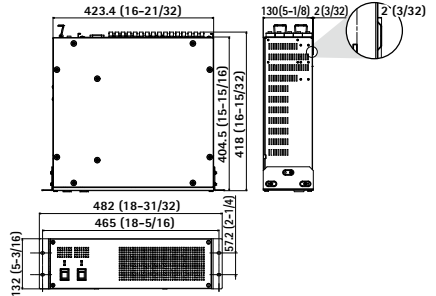
Control Panel AV-HS60C4



Menu Panel



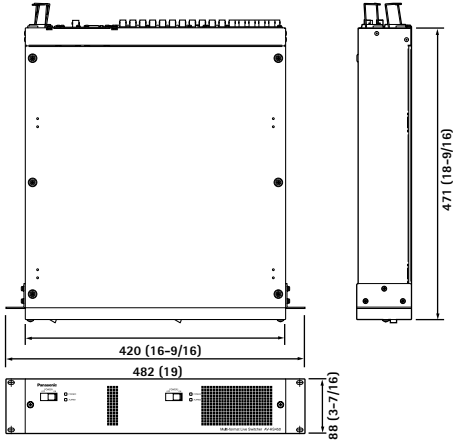
MainFrame



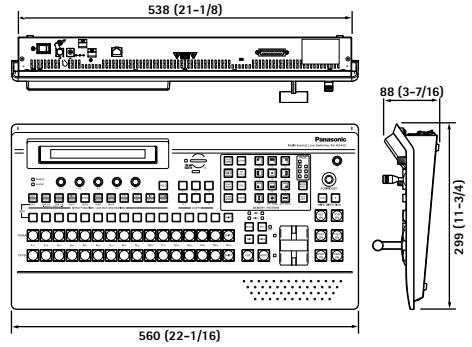
AV-HS450

Unit: mm(inches)

MainFrame

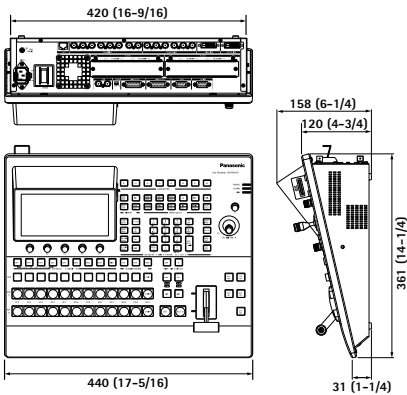


Control Panel



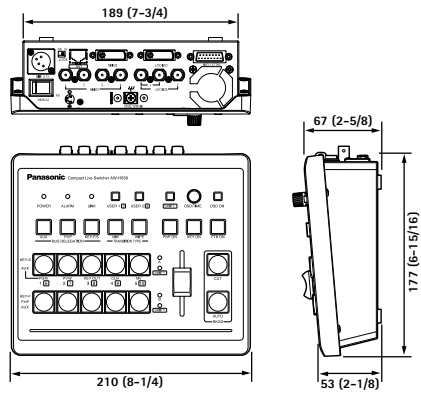
AV-HS410

Unit: mm(inches)



AW-HS50

Unit: mm(inches)



Live Switcher – Specifications

AV-HS6000

■ Mainframe [AV-HS60U2P/E]

General	
Power Supply	AC100 V to 240 V, 50 Hz/60 Hz (AV-HS60U2 supports redundant power supply)
Power Consumption	110 W
Ambient Operating Temperature	0°C to 40°C (32°F to 104°F)
Operating Ambient Humidity	10% to 90% (no condensation)
Storage Temperature	0°C to 40°C (32°F to 104°F)
Storage Humidity	10% to 90% (no condensation)
Weight	Approx. 13.5 kg(29.7 lbs.) [excluding accessories]
Dimensions (W x H x D)	482 mm x 132 mm x 418 mm (18-31/32 inches x 5-3/16 inches x 16-15/32 inches) [excluding protrusions]

Video Terminal

SDI IN 1 to SDI IN 32 Terminals	During Standard mode 32 lines <ul style="list-style-type: none"> Connectors: BNCx32 SDI IN 27, SDI IN 28, SDI IN 31, SDI IN 32 terminals are equipped with up-converters. SDI IN 25 to SDI IN 32 terminals are equipped with color correctors. 	
	HD-SDI	SMPTPE292M (BTA S-004) standard compliant <ul style="list-style-type: none"> 0.8 V [p-p]±10% (75 Ω) Automatic equalizer more than 100 m(328 ft) (when 1.5 Gbps/5C-FB cable is used)
	SD-SDI	SMPTPE259M standard compliant <ul style="list-style-type: none"> 0.8 V [p-p]±10% (75 Ω) Automatic equalizer 200 m (656 ft) (when 5C-2V cable is used)

SDI IN 1 to SDI IN 32 Terminals	During 3G mode 16 lines <ul style="list-style-type: none"> Connector: BNCx16 (only the odd numbered terminals can be used) The even numbered terminals <SDI IN 2>, <SDI IN 4>, ... <SDI IN 32> cannot be used. <SDI IN 25>, <SDI IN 27>, <SDI IN 28>, and <SDI IN 31> terminals are equipped with color correctors.
	During 4K mode 4K signal x 8 lines <ul style="list-style-type: none"> Connector: BNC x 32 (3G-SDI x 4 S/QD / 2SI)

3G-SDI	3G serial digital, SMPTE424M standard compliant <ul style="list-style-type: none"> 0.8 V [p-p] ±10% (75 Ω) Automatic equalizer 100 m (328 ft) (when 3 Gbps/5C-FB cable is used) 3G SDI Level B 3G SDI Level A (FS ON)
	2 lines Digital RGB: XGA (1024 x 768), WXGA (1280 x 768), SXGA (1280 x 1024), WSXGA+ (1680 x 1050), UXGA (1600 x 1200), WUXGA (1920 x 1200) Vertical frequency: 60 Hz Video format inputs: 1080/59.94p, 1080/50p, 1080/59.94i, 1080/50i, 720/59.94p, 720/50p Connectors: DVI-D x 2 <ul style="list-style-type: none"> The terminals do not support HDCP. The DVI-I connector cable cannot be used. For the DVI-D connector cable, use a cable with a length of up to 5 m(16.4 ft) <DVI-D IN1>/<DVI-D IN2> terminals cannot be used during 3G/4K mode.

DVI-D IN 1 to DVI-D IN 2 Terminals	During Standard mode 16 lines (2 distributed outputs per line) <ul style="list-style-type: none"> Connectors: BNC x 32 ME1PGM, ME1PWW, ME1CLN, ME1KEYPWW, ME2PGM, ME2PWW, ME2CLN, ME2KEYPWW, DSKPGM1, DSKPGM2, DSKPWW1, DSKPWW2, DSK1CLN, DSK2CLN, DSK3CLN, DSK4CLN, SEL KEYPW, MV1 to MV4, and AUX1 to AUX16 can be assigned. 	
	HD-SDI	SMPTPE292M (BTA S-004) standard compliant <ul style="list-style-type: none"> Output level: 0.8 V [p-p]±10%
SDI OUT 1 to SDI OUT 16 Terminals	SD-SDI	SMPTPE259M standard compliant <ul style="list-style-type: none"> Output level: 0.8 V [p-p]±10%
	During 3G mode 3G-SDI output: 8 lines (2 distribute outputs per line) HD-SDI output: 2 lines (2 distribute outputs per line) <ul style="list-style-type: none"> Connector 3G-SDI: BNCx16 (odd numbered terminals only) HD-SDI: BNCx4 (<SDI OUT 14> and <SDI OUT 16> terminals only) 3G-SDI signal is not output from the even numbered terminals. <ul style="list-style-type: none"> No signal is output from the <SDI OUT 2>, <SDI OUT 4>, ... <SDI OUT 12> terminals. The HD-SDI signal converted to the 1080i format is output from the <SDI OUT 14> and <SDI OUT 16> terminals. This signal is converted to the 1080i format by decimating the 1080p signal from the <SDI OUT 13> and <SDI OUT 15> terminals. 	

SDI OUT 1 to SDI OUT 16 Terminals	<ul style="list-style-type: none"> <SDI OUT 13> and <SDI OUT 15> terminals are equipped with color correctors. The same color corrector setting is also applied to <SDI OUT 14> and <SDI OUT 16> terminals. ME1PGM, ME1PWW, ME1CLN, ME1KEYPWW, ME2PGM, ME2PWW, ME2CLN, DSKPGM1, DSKPGM2, DSKPWW1, DSKPWW2, DSK1CLN, DSK2CLN, DSK3CLN, SEL KEYPW, MV1 to MV2, and AUX1 to AUX8 can be assigned. 								
	During 4K mode 4K signal output: 3 lines (two distribute outputs per line) 2K signal output: 2 lines (two distribute outputs per line) <ul style="list-style-type: none"> Connector 3G-SDI (for 4K signal): BNC x 24 (terminal number 1 to 12) 3G-SDI (for 2K signal): BNC x 4 (terminal number 13 and 15) HD-SDI (for 2K signal): BNC x 4 (terminal number 14 and 16) The 4K signal is output in SDD format. The HD-SDI signal converted to the 1080i format is output from the <SDI OUT 14> and <SDI OUT 16> terminals. This signal is converted to the 1080i format by decimating the 1080p signal output from the <SDI OUT 13> and <SDI OUT 15> terminals. ME1PGM, ME1PWW, ME1CLN, ME1KEYPWW, ME2PGM, ME2PWW, ME2CLN, DSKPGM1, DSKPGM2, DSKPWW1, DSKPWW2, DSK1CLN, DSK2CLN, SEL KEYPW, MV1 to MV2, and AUX1 to AUX8 can be assigned. 								
	3G-SDI	3G serial digital, SMPTE424M standard compliant <ul style="list-style-type: none"> Output level: 0.8 V [p-p] ±10% 3G-SDI Level B Mapping 							
	Signal Formats	<table border="1"> <tbody> <tr> <td>SD</td> <td>480/59.94i, 576/50i</td> </tr> <tr> <td>HD</td> <td>1080/59.94i, 1080/50i, 720/59.94p, 720/50p, 1080/24PsF, 1080/23.98PsF, 1080/25PsF, 1080/29.97PsF</td> </tr> <tr> <td>3G</td> <td>1080/59.94p, 1080/50p <Level B></td> </tr> <tr> <td>4K</td> <td>2160/59.94p, 2160/50p <SDD></td> </tr> </tbody> </table>	SD	480/59.94i, 576/50i	HD	1080/59.94i, 1080/50i, 720/59.94p, 720/50p, 1080/24PsF, 1080/23.98PsF, 1080/25PsF, 1080/29.97PsF	3G	1080/59.94p, 1080/50p <Level B>	4K
SD	480/59.94i, 576/50i								
HD	1080/59.94i, 1080/50i, 720/59.94p, 720/50p, 1080/24PsF, 1080/23.98PsF, 1080/25PsF, 1080/29.97PsF								
3G	1080/59.94p, 1080/50p <Level B>								
4K	2160/59.94p, 2160/50p <SDD>								
Signal Processing	Y:Pe:Ph 4:2:2 10 bit R:G:B 4:4:4 8 bit								
ME Number	2 ME								

Synchronous Terminal

REF Terminal	<ul style="list-style-type: none"> Connectors: BNC Same field frequencies as those of the system formats supported in Genlock mode: Black burst or Tri-level Sync input signals (with loop-through) If the loop-through output is not used, provide a 75 Ω termination. In the 1080/24PsF and 1080/23.98PsF formats, only Genlock mode supported In the 1080/23.98PsF format, black burst signals with 10 Field ID (SMPTE310M standard compliant) or tri-level Sync signals supported In the 1080/24PsF format, Tri-level Sync signals supported in internal sync mode: Black burst output signal x 2
	LTC IN Terminal

Video Delay Time	During Standard mode	1 line (H) When the frame synchronizer is set to "Off" and the up-converter is set to "Off"
	2 field (V) When the frame synchronizer is set to "On", or the up-converter is set to "On"	
	When the signals have passed through PinP, DVE, MultiView, down-converter, or DVI-IN, a maximum delay of 1 frame is applied in each case.	
	During 3G mode	2 line (H) When the frame synchronizer is set to [Off] 2 frame (V) When the frame synchronizer is set to [On]
Control Terminal	LAN Terminal	Compatible with 100Base-TX and AUTO-MDIX (For IP control) <ul style="list-style-type: none"> Connection cable: LAN cable (CAT5E), max. 100 m (328 ft), STP (Shielded Twisted Pair) cable recommended Connector: RJ-45
	PANEL Terminal	Compatible with 100Base-TX and AUTO-MDIX (For Control Panel AV-HS60C2/AV-HS60C4 connection) <ul style="list-style-type: none"> Connection cable (supplied with AV-HS60C2/AV-HS60C4): LAN cable (CAT5E), straight cable, STP (Shielded Twisted Pair), 10 m (32.8 ft) Connector: RJ-45
COM1(M)/COM2(M)/COM3(M)Terminals	RS-422 Control Terminal	For master connection for controlling external devices <ul style="list-style-type: none"> Connector: D-sub 9-pin (female) x 3, inch screw
	RS-422 Control Terminal	For master/slave connection for controlling external devices <ul style="list-style-type: none"> Connector: D-sub 9-pin (female), inch screw Switchable between master connection and slave connection via menu
COM4(M/S) Terminal	GPI IN: 18 inputs, general-purpose, photocoupler sensing ALARM OUT: 1 output, open collector output (negative logic) <ul style="list-style-type: none"> Connector: D-sub 25-pin (female), inch screw 	

GPI OUT1/GPI OUT 2 terminal	GPI OUT: 48 outputs, selected from general purpose, tally Open collector output • Connector: D-sub 25-pin (female) x 2, inch screw
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Accessories

AC cable -AV-HS60U2P: 2 cables -AV-HS60U2E: 4 cables
Rack-mounted rear panel support bracket
Screws for the rack-mounted rear panel support bracket: 8 screws
Operating Guide for the AV-HS6000 series (Excerpted Version)

■Control Panel [AV-HS60C2P/E]

General	
Power Supply	AC100 V to 240 V, 50 Hz/60 Hz (AV-HS60C2 supports redundant power supply)
Power Consumption	40 W
Operating Ambient Temperature	0°C to 40°C (32°F to 104°F)
Operating Ambient Humidity	10% to 90% (no condensation)
Storage Temperature	0°C to 40°C (32°F to 104°F)
Storage Humidity	10% to 90% (no condensation)
Weight	Approx. 13.9 kg (30.6 lbs.) (excluding accessories)
Dimensions (W x H x D)	980 mm x 153.4 mm x 267 mm (38-19/32 inches x 6-1/32 inches x 10-1/2 inches) (excluding protrusions)

Control Terminal	
Mainframe Terminal	Compatible with 100Base-TX and AUTO-MDIX (For Mainframe AV-HS60U2 connection) Connection cable (supplied with AV-HS60C2): LAN cable (CAT5E), Straight cable, STP (Shielded Twisted Pair), 10 m (32.8 ft) • Connector: RJ-45 When connected to the <LAN> terminal, no video will be displayed on the Menu Panel AV-HS60C3G.
MENU PANEL Terminal	Used only for the Menu Panel AV-HS60C3G • Connector: DVI-D • Because an independent signal format is used, cannot be displayed on a DVI-D monitor. • Cannot be used concurrently with a DVI-D monitor (computer) connected to the <DVI-D> terminal. Select with the display selector switch.
DVI-D Terminal	Used for displaying menus to the DVI monitor (computer) • Connector: DVI-D • Monitor resolution: 1366 x 768 compatible monitor • Cannot be used concurrently with a DVI-D monitor. Select with the display selector switch.
USB Terminal	For DVI monitor (computer) menu operation • Connector: USB (type A, female) • Cannot be used for the Menu Panel AV-HS60C3G.
Display Selector Switch	Switch for selecting <MENU PANEL> terminal or <DVI-D> terminal
COM1(M) Terminal	RS-422 Control Terminal For master connection for controlling external devices • Connector: D-sub 9-pin (female), inch screw
COM2(RS-232) Terminal	RS-232 Control Terminal For master/slave connection for controlling external devices • Connector: D-sub 9-pin (male), inch screw
GPI I/O Terminal	GPI IN: 8 inputs, general-purpose, photocoupler sensing ALARM OUT: 1 output, open collector output (negative logic) GPI OUT: 10 outputs, selected from general purpose, tally Open collector output • Connector: D-sub 25-pin (female), inch screw
ME Number	2 ME

Accessories	
AC Cable -AV-HS60C2P: 2 cables -AV-HS60C2E: 4 cables	
LAN Cable: 1 cable (used to connect with the Mainframe AV-HS60U2)	
Switch blank cap (large): 24 caps Switch blank cap (small): 12 caps	

■Control Panel AV-HS60C4P/E

General	
Power Supply	AC100 V to 240 V, 50 Hz/60 Hz (Supports redundant power supply)
Power Consumption	40 W
Operating Ambient Temperature	0°C to 40°C (32°F to 104°F)
Operating Ambient Humidity	10% to 90% (no condensation)
Storage Temperature	0°C to 40°C (32°F to 104°F)
Storage Humidity	10% to 90% (no condensation)
Weight	Approx. 15.0 kg (33.0 lbs.) (excluding accessories)
Dimensions (W x H x D)	656 mm x 160 mm x 400 mm (25-53/64 inches x 6-19/64 inches x 15-3/4 inches) (excluding protrusions)

Control Terminal	
Mainframe Terminal	Compatible with 100Base-TX and AUTO-MDIX (For Mainframe AV-HS60U2 connection) Connection cable (supplied with AV-HS60C4): LAN cable (CAT5E), Straight cable, STP (Shielded Twisted Pair), 10 m (32.8 ft) • Connector: RJ-45 When connected to the <LAN> terminal, no video will be displayed on the Menu Panel AV-HS60C3G.
MENU PANEL Terminal	Used only for the Menu Panel AV-HS60C3G • Connector: DVI-D • Because an independent signal format is used, cannot be displayed on a DVI-D monitor. • Cannot be used concurrently with a DVI-D monitor connected to the <DVI-D> terminal. Select with the display selector switch.
DVI-D Terminal	Used for displaying menus to the DVI monitor • Connector: DVI-D • Monitor resolution: 1366x768 compatible monitor • Cannot be used concurrently with the <MENU PANEL> terminal. Select with the display selector switch.
USB Terminal	For DVI monitor menu operation • Connector: USB (type A, female) • Cannot be used for the Menu Panel AV-HS60C3G.
Display Selector Switch	Switch for selecting <MENU PANEL> terminal or <DVI-D> terminal
COM1(M) Terminal	RS-422 Control Terminal For master connection for controlling external devices • Connector: D-sub 9-pin (female), inch screw
COM2(RS-232) Terminal	RS-232 Control Terminal For external device control connections • Connector: D-sub 9-pin (male), inch screw
GPI I/O Terminal	GPI IN: 8 inputs, general-purpose, photocoupler sensing ALARM OUT: 1 output, open collector output (negative logic) GPI OUT: 10 outputs, selected from general purpose, tally Open collector output • Connector: D-sub 25-pin (female), inch screw
ME Number	2 ME

Accessories	
AC Cable: 2 cables LAN Cable: 1 cable (used to connect with the Mainframe AV-HS60U2)	
Switch blank cap (large): 16 caps Switch blank cap (small): 8 caps	

■Menu Panel [AV-HS60C3G]

General	
Power Supply	DC12 V/0.54 A (Supplied from AV-HS60C2/AV-HS60C4 using the supplied cable)
Power Consumption	6.48 W
Operating Ambient Temperature	0°C to 40°C (32°F to 104°F)
Operating Ambient Humidity	10% to 90% (no condensation)
Storage Temperature	0°C to 40°C (32°F to 104°F)
Storage Humidity	10% to 90% (no condensation)
Weight	Approx. 1.7 kg (3.7 lbs.) (excluding accessories)
Dimensions (W x H x D)	290 mm x 177 mm x 46.1 mm (11-13/32 inches x 6-31/32 inches x 1-13/16 inches) (excluding protrusions) 4RU
Control Terminal	
Control Panel Terminal	Used only for the Control Panel AV-HS60C2/AV-HS60C4 • Connectors: DVI-D • Because an independent signal format is used, DVI-D source cannot be displayed. • Cannot be used concurrently with a DVI-D monitor connected to the <DVI-D> terminal of the Control Panel AV-HS60C2/AV-HS60C4. Set the display selector switch of the Control Panel AV-HS60C2/AV-HS60C4 to the <MENU PANEL> terminal side.

Accessories	
Connecting cable (with ferrite core) for the Control Panel AV-HS60C2/AV-HS60C4: 1 cable	
Bracket for mounting the Control Panel AV-HS60C2/AV-HS60C4	
Screws for the bracket for mounting the Control Panel AV-HS60C2/AV-HS60C4: 6 screws	

■Storage Module [AV-HS60D1G]

General	
Weight	Approx. 7.0 g (0.3 ozs.)
Dimensions (W x H x D)	29.85 mm x 4.0 mm x 50.8 mm (1-3/16 inches x 5/32 inches x 2 inches)
Accessories	
AV-HS60D1 Installation Guide	

Due to device characteristics, the storage module AV-HS60D1G is subject to data damage and overwriting restrictions. Backup of important data is recommended.

*For information on "AV-HS6000 Block Diagrams", see page 77.

Live Switcher – Specifications

AV-HS450

■ Mainframe [AV-HS450U1N/E]

General	
Power Supply	AC 100 V to 120 V, 50/60 Hz • Redundant power supply standard supported
Power Consumption	120 W
Ambient Operating Temperature	0 °C to 40 °C (32 °F to 104 °F)
Humidity	10 % to 90 % (no condensation)
Dimensions (W x H x D)	2RU size 482 x 88 x 471 mm (19" x 3-7/16" x 18-9/16") [excluding protrusions]
Weight	9.8 kg (21.605 lbs.) [excluding accessory parts when no options have been installed]
	10.3 kg (22.707 lbs.) [excluding accessory parts when all the possible options have been installed]
Video Terminal	
Video Inputs (20 signal lines, maximum)	Standard SDI: 16 signal lines BNC x 16 (IN1 to IN16) Optional: Up to 4 additional signal lines (IN A1, IN A2, IN B1, IN B2) (Up to two option boards can be installed in the two input/output slots.)
	Standard SDI: 4 signal lines BNC x 5 (OUT1 to OUT4 x 1 line each, 2 distributed outputs for OUT1 only) Standard DVI-D: 2 signal lines DVI-D x 2 (OUT5, OUT6) Optional: Up to 4 additional lines (OUT A1, OUT A2, OUT B1, OUT B2) (Up to two option boards can be installed in the two input/output slots.)
Video Outputs (10 signal lines, maximum)	Standard SDI: 4 signal lines BNC x 5 (OUT1 to OUT4 x 1 line each, 2 distributed outputs for OUT1 only) Standard DVI-D: 2 signal lines DVI-D x 2 (OUT5, OUT6) Optional: Up to 4 additional lines (OUT A1, OUT A2, OUT B1, OUT B2) (Up to two option boards can be installed in the two input/output slots.)
	<ul style="list-style-type: none"> • PGM, PVW, AUX1 to AUX4, MV1 (MULTI_PVW1), MV2 (MULTI_PVW2), CLN and KEYOUT can be allocated to each output. • CLN can be pre-selected from KEY, DSK1 or DSK2 using a menu.
Signal Formats	SD 480/59.94i, 576/50i
	HD 1080/59.94i, 1080/50i, 720/59.94p, 720/50p, 1080/24PsF*, 1080/23.98PsF* *The following option boards are not supported: AV-HS04M1, AV-HS04M2, AV-HS04M3, AV-HS04M4, AV-HS04M5, AV-HS04M6, AV-HS04M7, AV-HS04M7D
Signal Processing	Y-Cb-Cr 4: 2: 2, 10 bit (8 bits for frame memory) RGB 4:4:4, 8 bit
ME Number	1ME
SDI Inputs	HD: Serial digital component (SMPT2 292M) SD: Serial digital component (SMPT2 259M) 16 signal lines, standard: IN1 to IN16 20 signal lines, maximum: IN A1, IN A2, IN B1, IN B2 (When two AV-HS04M1 boards are used; with active through)
	HD [SMPT2 292M (BTA S-004B) standard complied with] • 0.8 V [p-p] ± 10 % (75 Ω) • Input return loss More than 15 dB (5 MHz to 750 MHz) More than 10 dB (750 MHz to 1.5 GHz) • Automatic equalizer 100 m (328 ft.) [when 5C-FB cable is used]
SDI Outputs	SD [SMPT2 259M standard complied with] • 0.8 V [p-p] ± 10 % (75 Ω) • Input return loss More than 15 dB (5 MHz to 270 MHz) • Automatic equalizer 200 m (656 ft.) [when 5C-2V cable is used]
	HD: Serial digital component (SMPT2 292M) SD: Serial digital component (SMPT2 259M) 4 signal lines, standard: OUT1 x 2; OUT2, OUT3, OUT4 x 1 each 8 signal lines, maximum: OUT A1, OUT A2, OUT B1, OUT B2 (When two AV-HS04M7 boards are used) HD [SMPT2 292M (BTA S-004B) standard complied with] • Output return loss More than 15 dB (5 MHz to 750 MHz) More than 10 dB (750 MHz to 1.5 GHz) • Output level 0.8 V [p-p] ± 10 % (75 Ω) • Rise time Less than 270 ps • Fall time Less than 270 ps • Difference between rise time and fall time Less than 100 ps • Alignment jitter Less than 0.2 UI (130 ps) • Timing jitter Less than 1.0 UI • Eye aperture ratio More than 90 % • DC offset 0±0.5 V

SDI Outputs	SD [SMPT2 259M standard complied with] • Output return loss More than 15 dB (5 MHz to 270 MHz) • Output level 0.8 V [p-p] ± 10 % (75 Ω) • Rise time Less than 1.5 ns • Fall time Less than 1.5 ns • Difference between rise time and fall time Less than 0.5 ns • Jitter Less than 0.2 UI
Composite Input (Option)	Analog composite signal (NTSC/PAL) (1.0 V [p-p], 75 Ω) 4 signal lines, maximum: IN A1, IN A2, IN B1, IN B2 (When two AV-HS04M6 boards are used; with loop-through)
Analog Input (Option)	SD/HD analog component Y/Pb/Pk (1.0 V [p-p], 75 Ω) 4 signal lines, maximum: IN A1, IN A2, IN B1, IN B2 (When two AV-HS04M2 boards are used)
Analog Output (Option)	SD/HD analog component Y/Pb/Pk (1.0 V [p-p], 75 Ω) 4 signal lines, maximum: OUT A1, OUT A2, OUT B1, OUT B2 (When two AV-HS04M4 boards are used) • 2 signal lines (OUT A1, OUT B1) when two AV-HS04M5 boards are used
DVI-I Input (Option)	Analog/digital RGB: XGA (1024 x 768), WXGA (1280 x 768), SXGA (1280 x 1024) Vertical frequency: 60 Hz 4 signal lines, maximum: IN A1, IN A2, IN B1, IN B2 (When two AV-HS04M3 boards are used)
DVI-I Output (Option)	Analog/digital RGB: XGA (1024 x 768), WXGA (1280 x 768), SXGA (1280 x 1024), WSXGA+ (1680 x 1050), UXGA (1600 x 1200), WUXGA (1920 x 1200) *Selectable only when digital signals are output Vertical frequency: 60 Hz 2 signal lines, maximum: OUT A2, OUT B2 (When two AV-HS04M5 boards are used)
DVI-D Input (Option)	Digital RGB: XGA (1024 x 768), WXGA (1280 x 768), SXGA (1280 x 1024), WSXGA+ (1680 x 1050), UXGA (1600 x 1200), WUXGA (1920 x 1200) Vertical frequency: 60 Hz Digital RGB: 1080/50P, 1080/59.94P *This board is incompatible with the HDCP (High-bandwidth Digital Content Protection). • Analog input signals are not supported.
DVI-D Output	4 signal lines, maximum: IN A1, IN A2, IN B1, IN B2 (When two AV-HS04M8 boards are used) • The DVI-I connector cable cannot be used. • For the DVI-D connector cable, use a cable with a length of up to 5 m (16.4 ft.).
	Digital RGB: XGA (1024 x 768), WXGA (1280 x 1024), WSXGA+ (1680 x 1050), UXGA (1600 x 1200), WUXGA (1920 x 1200) Vertical frequency: 60 Hz Digital RGB: 1080/50P, 1080/59.94P (The vertical frequency is the same as that of the system format. When the system format is 1080/23.98PsF or 24PsF, the images cannot be output.) • Analog output signals are not supported. • High-resolution multi view mode supported: Signals are also output with a high resolution even when SD has been selected as the system mode. With this mode setting, MV1 is output to OUT5 and MV2 to OUT6; MV1 and MV2 cannot be output to any other outputs.

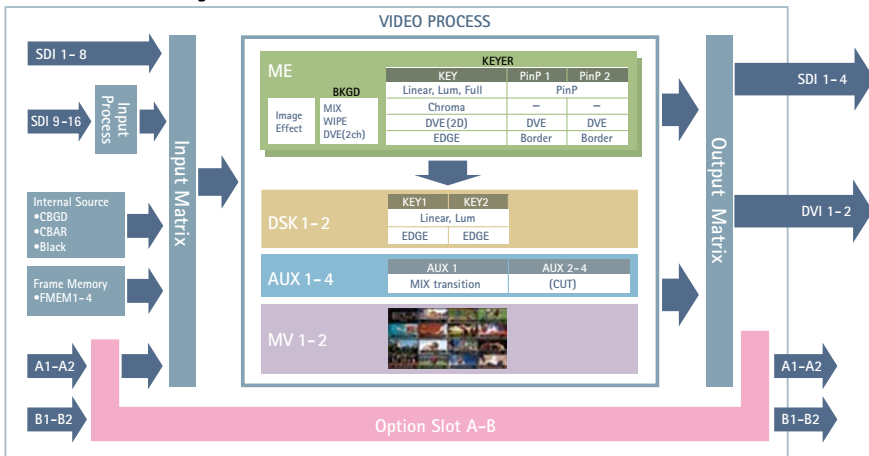
Synchronous Terminal	
Reference Input/Output	In gen-lock mode: Black burst or Tri-level Sync input signals (with loop-through) In internal sync mode: Black burst output signals x 2 <ul style="list-style-type: none"> • Same field frequencies as those of the system formats supported • With the 1080/23.98PsF and 24PsF formats, only GENLOCK mode supported • With the 1080/23.98PsF format, black burst with 10F-ID (SMPTIE318M standard met) or TRI signals supported
Video Delay Time	FS OFF, U/C OFF 1 line (H) FS ON or U/C ON 1 frame (F) <ul style="list-style-type: none"> • When the signals have passed through DVE, multi view, down-converter, DVI-IN or DVI-OUT, a maximum delay of 1 frame is applied in each case.

Control Terminal	
PANEL	RJ45 x 1 100 Mbps <ul style="list-style-type: none"> • When the control panel is connected
LAN	RJ45 x 1 100/10 Mbps <ul style="list-style-type: none"> • Used for maintenance purposes
EDITOR	D-sub, 9-pin, female RS-422 control connector <ul style="list-style-type: none"> • GVG standard protocol subset supported
COM	D-sub, 9-pin, female RS-422 control connector <ul style="list-style-type: none"> • For Panasonic pan-tilt head system control, etc.
TALLY/GPI	D-sub, 50-pin, female INPUT: 8 inputs, general-purpose, photocoupler sensing OUTPUT: 31 outputs; selected from R/G tally, general-purpose ALARM: 1 output, open collector output (negative logic)

Control panel [AV-HS450C1N/E]

General	
Power Supply	DC 12 V, 0.8 A <ul style="list-style-type: none"> • Redundant operation enabled by connecting two AC adaptors • Power consumption when using the AC adaptor: AC 14 W Supplied AC adaptor Input: AC 100 V to 240 V, 1.3 A, 47-63 Hz Output: DC 12 V, 3.5 A, 42 W Supplied power cable Maximum rating: AC 125 V • Use within AC 100 V to 120 V.
Ambient Operating Temperature	0 °C to 40 °C (32 °F to 104 °F)
Humidity	10 % to 90 % (no condensation)
Dimensions (W x H x D)	560 x 88 x 299 mm (22-1/16" x 3-7/16" x 11-3/4") [excluding protrusions]
Weight	3.9 kg (8.598 lbs.) [excluding accessory parts]
Control Terminal	
MAINFRAME	RJ45 x 1 100 Mbps <ul style="list-style-type: none"> • For connecting the mainframe
TALLY/GPI	D-sub, 25-pin, female INPUT: 8 inputs OUTPUT: 8 outputs ALARM: 1 output
Other	
SD Memory Cards	Memory size supported: Max. 32 GB (SDHC memory cards supported) Still image files: Load, save Setup data: Backup
Accessories	
Operating instructions, CD-ROM (Operating instructions/Image transmission software), AC adaptors (for control panel), Power cords (for mainframe and AC adaptor), CAT5E cable (STP, straight cable, 10 m (32.8 ft.) long)	

AV-HS450 Block Diagram



Live Switcher – Specifications

AV-HS410 [AV-HS410N/E]

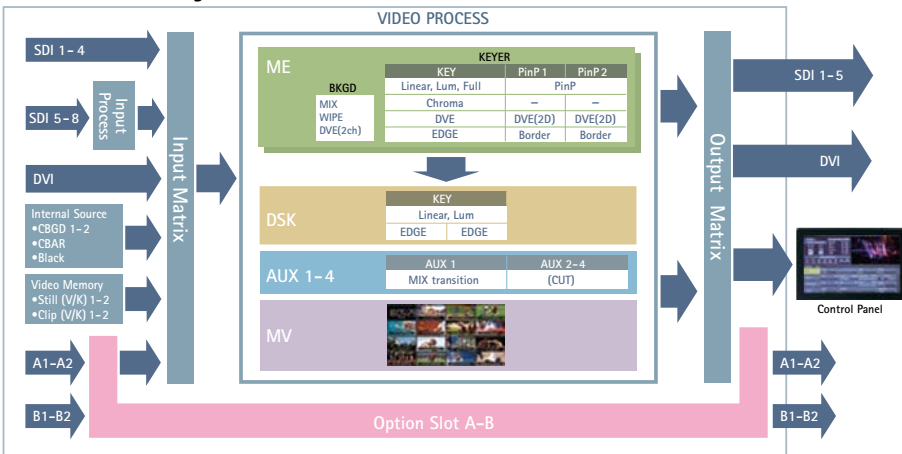
General	
Power Supply	AC 100 V to 240 V, 50/60 Hz
Power Consumption	88 W
Ambient Operating Temperature	0 °C to 40 °C (32 °F to 104 °F)
Humidity	10 % to 90 % (no condensation)
Dimensions (W x H x D)	440 mm x 158 mm x 361 mm (17-5/16 inches x 6-7/32 inches x 14-7/32 inches) [excluding protrusions]
Mass	Approx. 6.2 kg (13.669 lb) [excluding accessory parts when no options have been installed] Approx. 6.6 kg (14.550 lb) [excluding accessory parts when all the possible options have been installed]
Video Terminal	
Video Inputs (13 signal lines, maximum)	Standard SDI: 8 signal lines BNC x 8 (SDI INPUT 1 to SDI INPUT 8) • The up-converter function can be used for the SDI INPUT 5 to SDI INPUT 8 connectors.
	Standard DVI-D: 1 signal line DVI-D x 1 Optional: Up to 4 additional signal lines (IN A1, IN A2, IN B1, IN B2) (Up to two option boards can be installed in the two input/output slots.)
Video Outputs (10 signal lines, maximum)	Standard SDI: 5 signal lines BNC x 6 (SDI OUTPUT 1 to SDI OUTPUT 5 x 1 line each, 2 distributed outputs for SDI OUTPUT 1 only) Standard DVI-D: 1 signal line DVI-D x 1 Optional: Up to 4 additional lines (OUT A1, OUT A2, OUT B1, OUT B2) (Up to two option boards can be installed in the two input/output slots.)
	• PGM, PVW, AUX1 to AUX4, MV (MULTI_VIEW), CLN, KEYOUT and MEM PVW can be assigned to SDI OUTPUT 1 to SDI OUTPUT 5, DVI-D OUT, OUT A1, OUT A2, OUT B1 and OUT B2. • CLN can be pre-selected from KEY or DSK using a menu.
Signal Formats	SD 480/59.94i, 576/50i
	HD 1080/59.94i, 1080/50i, 720/59.94p, 720/50p, 1080/24PsF*, 1080/23.98PsF* *The following option boards are not supported: AV-HS04M1, AV-HS04M2, AV-HS04M3, AV-HS04M4, AV-HS04M5, AV-HS04M6, AV-HS04M7
Signal Processing	Y:Pe:Ph 4: 2: 2, 10 bit (8 bits for video memory) RGB 4:4:4, 8 bit
ME Number	1ME
SDI Inputs	HD-SDI: HD Serial digital (SMPTE 292M) SD-SDI: SD Serial digital (SMPTE 259M) 8 signal lines, standard: IN1 to IN8 12 signal lines, maximum: IN A1, IN A2, IN B1, IN B2 (When two AV-HS04M1 boards are used; with active through)
	HD: SMPTE 292M (BTA S-004B) standard complied with • 0.8 V [p-p] ± 10 % (75 Ω) • Automatic equalizer More than 100 m (328 ft) (when 1.5 Gbps/SC-FB cable is used) SD: SMPTE 259M standard complied with • 0.8 V [p-p] ± 10 % (75 Ω) • Automatic equalizer 200 m (656 ft) (when 5C-2V cable is used)
SDI Outputs	HD-SDI: HD Serial digital (SMPTE 292M) SD-SDI: SD Serial digital (SMPTE 259M) 5 signal lines, standard: OUT1 x 2; OUT2 to OUT5 x 1 each 9 signal lines, maximum: OUT A1, OUT A2, OUT B1, OUT B2 (When two AV-HS04M7 boards are used)

SDI Outputs	HD: SMPTE 292M (BTA S-004B) standard complied with • Output level 0.8 V [p-p] ± 10 % • Rise time HD: Less than 270 ps • Fall time HD: Less than 270 ps • Difference between rise time and fall time HD: Less than 100 ps • Alignment jitter HD: Less than 0.2 UI (130 ps) • Timing jitter HD: Less than 1.0 UI • Eye aperture ratio More than 90 % • DC offset 0 ± 0.5 V
	SD: SMPTE 259M standard complied with • Output level 0.8 V [p-p] ± 10 % • Rise time Less than 1.5 ns • Fall time Less than 1.5 ns • Difference between rise time and fall time Less than 0.5 ns • Jitter Less than 0.2 UI
Composite Input (Option board)	Analog composite signal (NTSC/PAL) (1.0 V [p-p], 75 Ω) 4 signal lines, maximum: IN A1, IN A2, IN B1, IN B2 (When two AV-HS04M6 boards are used; with loop-through)
Analog Input (Option board)	SD/HD analog component Y/Ps/Ph (1.0 V [p-p], 75 Ω) 4 signal lines, maximum: IN A1, IN A2, IN B1, IN B2 (When two AV-HS04M2 boards are used)
Analog Output (Option board)	SD/HD analog component Y/Ps/Ph (1.0 V [p-p], 75 Ω) 4 signal lines, maximum: OUT A1, OUT A2, OUT B1, OUT B2 (When two AV-HS04M4 boards are used) • 2 signal lines (OUT A1, OUT B1) when two AV-HS04M5 boards are used.
DVI-I Input (Option board)	Analog/digital RGB: XGA (1024 x 768), WXGA (1280 x 768), SXGA (1280 x 1024) Vertical frequency: 60 Hz • This connector does not support the HDCP technologies. 4 signal lines, maximum: IN A1, IN A2, IN B1, IN B2 (When two AV-HS04M3 boards are used)
DVI-I Output (Option board)	Analog/digital RGB: XGA (1024 x 768), WXGA (1280 x 768), SXGA (1280 x 1024), WSXGA+* (1680 x 1050), UXGA* (1600 x 1200), WUXGA* (1920 x 1200) *Selectable only when digital signals are output. Vertical frequency: 60 Hz • This connector does not support the HDCP technologies. 2 signal lines, maximum: OUT A2, OUT B2 (When two AV-HS04M5 boards are used)
DVI-D Input (Option board)	Digital RGB: XGA (1024 x 768), WXGA (1280 x 768), SXGA (1280 x 1024), WSXGA+ (1680 x 1050), UXGA (1600 x 1200), WUXGA (1920 x 1200) Vertical frequency: 60 Hz Digital RGB: 1080/50p, 1080/59.94p • Analog input signals are not supported. • This connector does not support the HDCP technologies.
	4 signal lines, maximum: IN A1, IN A2, IN B1, IN B2 (When two AV-HS04M8 boards are used) The DVI-I connector cable cannot be used. • For the DVI-D connector cable, use a cable with a length of up to 5 m (16.4 ft).
DVI-D Input/Output	Digital RGB: XGA (1024 x 768), WXGA (1280 x 768), SXGA (1280 x 1024), WSXGA+ (1680 x 1050), UXGA (1600 x 1200), WUXGA (1920 x 1200) Vertical frequency: 60 Hz Video format inputs: Digital RGB: 1080/50p, 1080/59.94p Vertical frequency: Same as system formats Video format outputs: Digital RGB: 1080/50p, 1080/59.94p, 1080/50i, 1080/59.94i, 720/50p, 720/59.94p • The input and output of analog signals are not supported. • Output support the high-resolution multi view mode: Signals are output with a high resolution even when SD is set as the system mode. (When high-resolution multi view mode has been enabled, MV is selected as the DVI-D OUT output, and it is not possible to select MV with SDI OUT.) • This connector does not support the HDCP technologies.
	Standard input/output: 1 line each (DVI-D IN, DVI-D OUT) • The DVI-I connector cable cannot be used. • For the DVI-D connector cable, use a cable with a length of up to 5 m (16.4 ft).

Synchronous Terminal	
Reference Input/Output	In gen-lock mode: Black burst or Tri-level Sync input signals (with loop-through) In internal sync mode: Black burst output signals x 2 <ul style="list-style-type: none"> Same field frequencies as those of the system formats supported. With the 1080/24PsF format, only gen-lock mode supported. With the 1080/23.98PsF format, black burst with 10F-ID (SMPTE318M standard met) or TRI signals supported.
Video Delay Time	1 line (H) When the frame synchronizer setting is "Off" and the up-converter setting is "Off". 1 frame (F) When the frame synchronizer setting is "On" or the up-converter setting is "On". <ul style="list-style-type: none"> When the signals have passed through PinP, DVE, multi view, down-converter, DVI-IN or DVI-OUT, a maximum delay of 1 frame is applied in each case.
Control Terminal	
LAN	RJ-45 x 1 10BASE-T/100BASE-TX (For IP control) Connecting cable: LAN cable (category 5 or above), max. 100 m (328 ft), STP (Shielded Twisted Pair) cable recommended <ul style="list-style-type: none"> When connecting to a hub (switching hub), use a straight cable. Use a crossover cable when connecting the unit and computer on a 1:1 basis without going through a hub. Use with the same segment is recommended for the equipment which is connected to the unit. If the unit is connected to equipment whose segments are different, events dependent upon the settings inherent to the network equipment, for instance, may occur so thoroughly check the connections with the equipment to which the unit will be connected prior to the start of operation.

EDITOR	D-sub, 9-pin, female Used to control an editor RS-422 control connector Communication format Baud rate: 38400 bps Character length: 8 bit Parity: Odd Stop bit: 1 bit Flow control: None
COM	D-sub, 9-pin, female Used to control an external device RS-422 control connector Communication format (selected using a menu) <ul style="list-style-type: none"> Mode: 1 (default setting) Baud rate: 9600 bps Character length: 8 bit Parity: None Stop bit: 1 bit Flow control: None Mode: 2 Baud rate: 38400 bps Character length: 8 bit Parity: Odd Stop bit: 1 bit Flow control: None Mode: 3 Baud rate: 38400 bps Character length: 8 bit Parity: None Stop bit: 1 bit Flow control: None
TALLY/GPI 1 TALLY/GPI 2	D-sub, 15-pin, female (x 2) Input: 8 inputs, general-purpose, photocoupler sensing Output: 19 outputs; selected from R/G tally, general-purpose Alarm: 1 output, open collector output (negative logic)
Other	
BOOT switch [SV/NM (service/normal)] (for maintenance purposes) Normally, this switch is used as the "NM" position.	
Accessories	
CD-ROM (Operating Instructions <Basics>, Operating Instructions <Operations and Settings>, User Guide "AV-HS410 Image Transmission Software", DVI input level adjustment file (BW.bmp), Image Transmission Software (ImageTrans.exe)), Power cable (2 m [6.6 ft])	

AV-HS410 Block Diagram



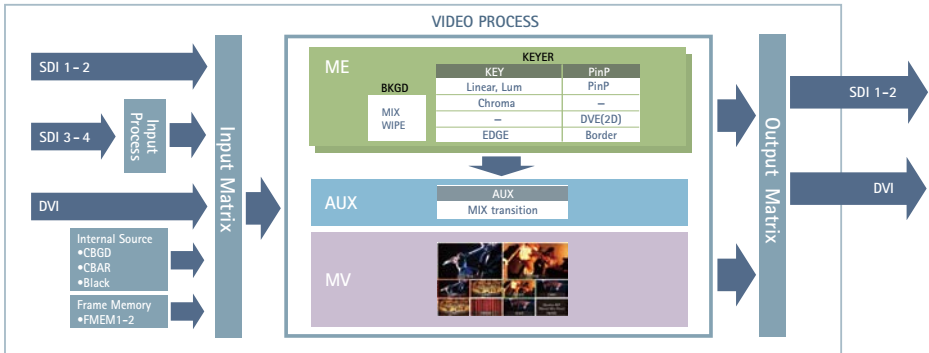
Live Switcher – Specifications

AW-HS50 [AW-HS 50N/E]

General	
Power Requirements	DC 12 V \pm 10% (AC adaptor provided)
Current Consumption	2.0 A (DC 12 V)
Ambient Operating Temperature	0 °C to 40 °C (32 °F to 104 °F)
Humidity	10% to 90% (no condensation)
Dimensions (W x H x D)	210 x 67 x 177 mm (8-1/4" x 2-5/8" x 6-15/16") [excluding protrusions]
Mass	1.4 kg (3.08 lbs.)
Video Terminal	
Inputs	5 video lines SDI 4 signal lines: SDI IN 1 to SDI IN 4 DVI-D 1 signal line: DVI IN
Outputs	3 video lines, 4 outputs SDI 2 signal lines: SDI OUT 1, SDI OUT 2 (Only the SDI OUT 1 signals are split into two) DVI-D 1 signal line: DVI OUT
Signal Formats	SD 480/59.94i, 576/50i HD 1080/59.94i, 1080/50i, 720/59.94p, 720/50p, 1080/24PsF, 1080/23.98PsF
Signal Processing	Y:Cb:Cr 4:2:2, 10 bit (8 bits for frame memory) RGB 4:4:4, 8 bit
ME Number	1ME
SDI Inputs	HD: Serial digital component (SMPT 292M) SD: Serial digital component (SMPT 259M) 4 signal lines: SDI IN 1 to SDI IN 4 HD: SMPTE 292M (BTA S-004B) standard complied with • 0.8 V [p-p] \pm 10% (75 Ω) • Input return loss More than 15 dB (5 MHz to 1.5 GHz) • Automatic equalizer 100 m (328 ft.) (when 5C-FB cable is used)
	SD: SMPTE 259M standard complied with • 0.8 V [p-p] \pm 10% (75 Ω) • Input return loss More than 15 dB (5 MHz to 270 MHz) • Automatic equalizer 200 m (656 ft.) (when 5C-2V cable is used)
DVI-D Input	Digital RGB (Vertical frequency: 60 Hz): XGA (1024 x 768), WXGA (1280 x 768), SXGA (1280 x 1024), WSXGA+ (1680 x 1050), UXGA (1600 x 1200), WUXGA (1920 x 1200) Digital RGB: 1080/50p, 1080/59.94p • Analog input signals are not supported.
SDI Outputs	HD: Serial digital component (SMPT 292M) SD: Serial digital component (SMPT 259M) 2 signal lines: SDI OUT 1, SDI OUT 2 (Only the SDI OUT 1 signals are split into two)

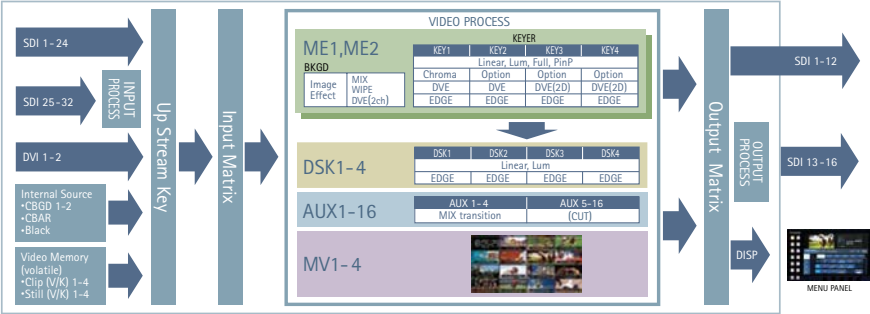
SDI Outputs	HD: SMPTE 292M (BTA S-004B) standard complied with • Output return loss More than 15 dB (5 MHz to 1.5 GHz) • Output level 0.8 V [p-p] \pm 10% (75 Ω) • Rise time Less than 270 ps • Fall time Less than 270 ps • Difference between rise time and fall time Less than 100 ps • Alignment jitter Less than 0.2 UI (130 ps) • Timing jitter Less than 1.0 UI • Eye aperture ratio More than 90% • DC offset 0 \pm 0.5 V
	SD: SMPTE 259M standard complied with • Output return loss More than 15 dB (5 MHz to 270 MHz) • Output level 0.8 V [p-p] \pm 10% (75 Ω) • Rise time Less than 1.5 ns • Fall time Less than 1.5 ns • Difference between rise time and fall time Less than 0.5 ns • Jitter Less than 0.2 UI
DVI-D Output	Digital RGB (Vertical frequency: 60 Hz): XGA (1024 x 768), WXGA (1280 x 768), SXGA (1280 x 1024), WSXGA+ (1680 x 1050), UXGA (1600 x 1200), WUXGA (1920 x 1200) Digital RGB: 1080/50p, 1080/59.94p • High-resolution multi view mode supported: Signals are also output with a high resolution even when SD has been selected as the system mode. <div style="border: 1px solid black; padding: 2px;">When the high-resolution multi view mode is enabled, MV is assigned to the DVI OUT connector, and MV cannot be assigned to the SDI OUT 1 connectors or SDI OUT 2 connector.</div> • Analog output signals are not supported.
Synchronous Terminal	
Video Delay Time	1 frame (F) • Video signals that have passed through the PinP, multi view display, DVI-D input or DVI-D output will be delayed in each case by up to one frame.
Control Terminal	
LAN	RJ-45 x 1 10BASE-T/100BASE-TX (For IP control) Connecting cable: LAN cable (category 5 or above), max. 100 m [328 ft.], STP (Shielded Twisted Pair) cable recommended • When connecting to a hub (switching hub), use a straight cable. Use a crossover cable when connecting the unit and another device on a 1:1 basis without going through a hub.
TALLY/GPI	D-sub 15-pin, female, inch thread INPUT: 5 inputs, photocoupler sensing OUTPUT: 7 outputs, open collector output (negative logic)
Other	
Other	SERVICE switch [SV/NM] (for maintenance purposes) Normally, this switch is used as the "NM" position.
Accessories	
Operating Instructions <Basics> (this manual), CD-ROM (Operating Instructions <Basics>, Operating Instructions <Operations and Settings>, Data Transmission Software), AC adaptor, Power cable (2 m [6.6 ft.]	

AW-HS50 Block Diagram

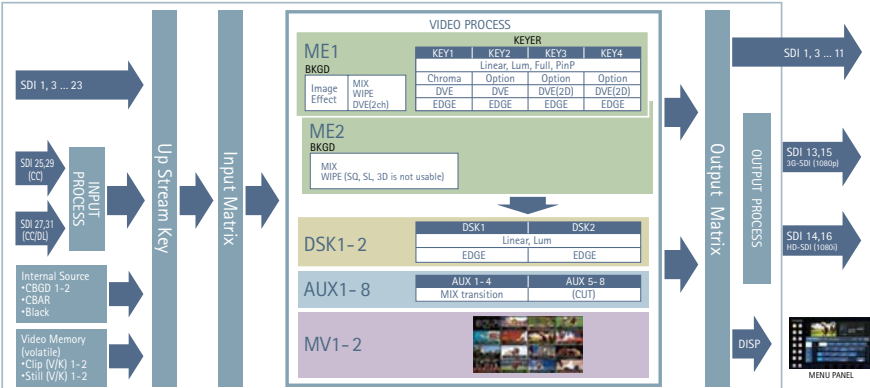


AV-HS6000 Block Diagrams

AV-HS6000 Block Diagram (Standard mode)

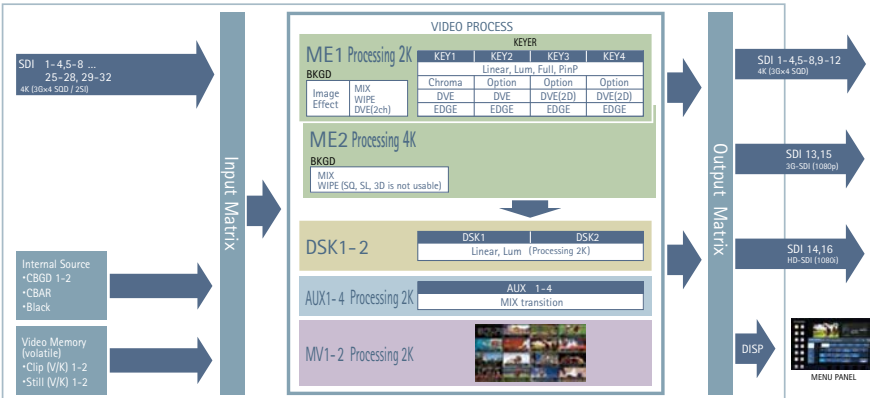


AV-HS6000 Block Diagram (3G mode)



*Input and output is by odd-numbered terminals only. *1080i format signals where half of the lines are thinned out from OUT13 and OUT15 (1080p) format signals are output from OUT14 and OUT16 terminals.

AV-HS6000 Block Diagram (4K mode)



*1080i format signals where half of the lines are thinned out from OUT13 and OUT15 (1080p) format signals are output from OUT14 and OUT16 terminals.

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Panasonic®

Panasonic Corporation
Connected Solutions Company

2-15 Matsuba-cho, Kadoma, Osaka 571-8503 Japan
<http://pro-av.panasonic.net/>



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