

Panasonic
ideas for life

AG-HMC150
Memory Card Camera-Recorder

AVCCAM



AVCHD

DOLBY DIGITAL
STEREO CREATOR

HDMI™
HIGH-DEFINITION MULTIMEDIA INTERFACE

LEICA
DICOMAR

SD
CLASS 4



High Image Quality and Advanced Functions in an AVCCAM Camcorder with Easy Mobility and Solid-State Reliability

The powerful new tapeless AG-HMC150 joins the Panasonic line of professional HD camcorders. This new AVCCAM camcorder features highly-acclaimed functions for the popular AG-DVX100 Series of DV-tape based camcorders to tapeless HD recording. Using the cost-saving AVCHD format to record onto SDHC or SD Memory Card media, the AG-HMC150 produces exceptional images and responds to creative production needs. It also features a 28mm (35mm equivalent) wide-angle lens — widest in a professional camera of this class — and a newly developed 1/3-inch 16:9 progressive CCD. It further enhances image quality by adding a higher-quality PH mode to the clean, extended-time recording abilities of the AVCHD format. The AG-HMC150 handles full-pixel (1920 x 1080/1280 x 720) 24p and 30p progressive recording, and includes cinelike gamma and other versatile functions to meet the special needs of creative image production.



Memory-Card Recording Lowers Costs and Helps the Environment

eco
ideas



The SDHC/SD Memory Card media for the AVCCAM camcorder is totally free from abrasion and dropout. There is no drive mechanism required, as there is for tape and disc-based recorders, so power consumption is low and size and weight are reduced. Malfunctions are less likely to occur, and there is no need to replace heads or transport components. This translates into lower costs and easier maintenance, greater energy savings, and less waste when the unit is eventually disposed of. All of these features help to conserve the environment. Panasonic is a leader in creating and promoting the advantages of memory-card recording, both in its AVCCAM camcorders and P2 HD broadcast and professional systems, through a program called the AVCCAM 3-Year Warranty Repair Program.

AVCCAM 3-Year Warranty Repair Program <http://panasonic.biz/sav/pass_e>

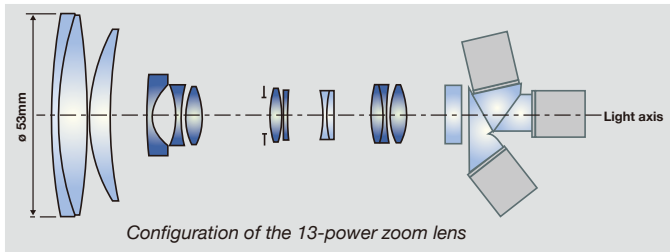
AVCCAM users can join this service program by simply registering on the following website after purchasing a system. There are no annual fees required. Membership benefits include 3-year limited warranty, AVCCAM product information, and integrated management and AVCCAM products by means of an equipment management system.

*AG-HMC150 users qualify for a 3-year warranty on repairs. See the back page for details.



A Camera Block with the Same Design as P2 HD Broadcast Systems Boosts the Quality of HD Images

28mm Wide-Angle, 13X Zoom Leica Dicomar® HD Lens



The wide-angle zoom lens that became so popular in the HVX200 Series has been downsized, lightened, and further widened in this 13X zoom lens. The new lens structure combines 13 lens elements in 10 groups, with 3 aspherical lenses. The diameter of the front lens element has been reduced from 67 to 53.2 mm, while still achieving a 28mm wide angle (35mm equivalent), the widest of the class.*

The new lens covers most shooting situations without requiring a wide-angle conversion lens. Its minimum object distance (MOD) of about 1.9 ft (0.6 meter) at the telephoto setting helps to maximize the handheld camcorder's inherent mobility.

The same cam-driven zoom ring that was so popular in previous models ensures accurate zooming. The Leica Dicomar lens incorporates Leica optical technology and know-how throughout. A multi-coating process minimizes flare and ghosting. This results in sharp, crisp, beautifully rendered images with delicate nuances and exceptional shading.

*HD camcorders with integrated lens and 1/3-inch CCD, as of July 2008 (according to a Panasonic survey)



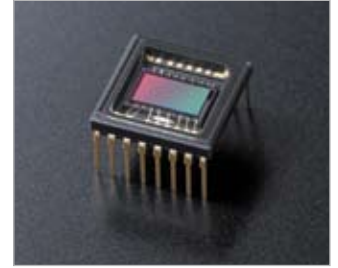
Image of an angle of view equivalent to 32.5 mm



Image of an angle of view equivalent to 28 mm

New Progressive CCD Raises Sensitivity and Lowers Noise and Smear

The new 1/3-inch 16:9 progressive CCD on the AG-HMC150 further raises image quality. It combines a significantly improved S/N ratio and better low-light performance than previous models. Backed by a high-performance digital signal processor, the CCD brings higher quality to HD images to meet the demands of broadcasters and high-end video producers.



High-Resolution Native Progressive 1080/60p Scan

Progressive to interlace conversion, cross conversion and down conversion all start with the 1080/60p scan. That initial 1080p native progressive scan offers the highest level of vertical resolution possible at this level of camera. Keep in mind that the camera does not record this signal but uses it as a basis for all captures. The result is an HD or SD recording with a level of image quality that cannot be matched by electronically processed scans.

DSP with 14-Bit A/D Conversion and 19-Bit Processing

The digital signal processor developed for the AG-HMC150's 1080/60p video signals uses 14-bit A/D conversion and 19-bit inner processing to attain unprecedented accuracy. While the camera does not record 1080/60p, it is from this capture that all other signals are made. The DSP performs a variety of adjustments, including eight types of gamma settings, for each of the R, G and B channels. It also converts the signals to HD or SD format. With a performance equivalent to the processors used in many higher-end HD cameras, this DSP delivers beautiful images in all video formats.



Optical Image Stabilizer (OIS)

Panasonic's advanced OIS dramatically reduces the blurring caused by hand-held camera work. Optical processing with an automatic correction function helps assure consistently clear, sharp images.

Dynamic Range Stretch (DRS)

In scenes with mixed contrast, such as when panning from indoors to outdoors, the DRS function automatically suppresses blocked shadows and blown highlights. A gamma curve and knee slope are estimated to match the contrast of each pixel, and applied in real time. When dark, bright, and intermediate shades are all contained in the same scene, this produces excellent gradation for each shade and minimizes blocked shadows and blown highlights. The images that result are enhanced by a visually wide dynamic range.



7-Mode Gamma for Richer Gradation

Drawing on technologies developed for the VariCam, Panasonic has equipped the AG-HMC150 with advanced gamma functions that address eight different shooting scenarios and enhance your creative abilities. This includes the cinelike gamma, which produces the characteristic warm tone of film recordings.



AG-HMC150 Gamma Modes

HD NORM:	Suitable for HD recording
LOW:	Works to flatten out a high contrast scene
SD NORM:	Normal setting for SD (this was available in the DVX100 series)
HIGH:	Provides more contrast and color gradation
B.PRESS:	Provides more contrast and blacks in low contrast scenes
CINE-LIKE-D:	The Cine-Like mode shifted to prioritize dynamic range
CINE-LIKE-V:	The Cine-Like mode shifted to prioritize contrast

Advanced Image Adjustments Built-In

- Matrix setting including a Cinelike mode
- Adjustable H detail level, V detail level, detail coring and skin detail
- Adjustable chroma level, chroma phase, color temp and master pedestal
- Knee point settings: Auto, Low, Mid and High
- User files (with sets of camera settings) can be transferred to an SD Memory Card and shared with other cameras



Shown above is a sample of operation styles.

AVCHD

Comparison of HD Recording Formats

	HDV	AVCHD
Pixel (H x V)	1440 x 1080	1920 x 1080
Compression Method	MPEG-2	MPEG-4 AVC/H.264

AVCHD Format for High-Quality, Efficient HD Recording

Panasonic AVCCAM camcorders use the AVCHD format for tapeless recording with high image quality and low bit rates. This format complies with the latest H.264 motion image compression standard, and employs the High Profile standard to improve compression efficiency. Featuring twice the compression efficiency of HDV (MPEG-2), the AG-HMC150 achieves extended HD recording. The following four new technologies make this possible.



Sample comparison: When a flash causes large contrast differences and reduces depth perception, HDV shows considerable block noise, while AVCHD in the PH mode minimize break-up.

MPEG-4 AVC/H.264 Technologies

Intra-Frame Prediction

This process generates predictive pixels based on the adjacent pixels within each frame. It then selects the optimal predictive mode. The generated predictive image is subtracted from the original input image, and the residual data is compressed and recorded at a low bit rate. The entire process is conducted within the frame, so prediction accuracy remains high even with fast-motion images.

Variable Block Size Motion Compensation

In contrast with MPEG-2, in which inter-frame compression based on the correlation between adjacent frames uses fixed blocks of 16 x 16 pixels, AVCHD divides the blocks into multi-sizes as small as 4 x 4 pixels. In this method, it is able to use large blocks to process images that show only slight changes on the screen, and smaller blocks to process images that have considerable change. This raises the accuracy of motion

MPEG-2 (fixed block size)

Blocks of the same size are used to process parts both with and without motion.



compensation to boost the quality of fast-motion images while increasing compression efficiency.

Loop Filter Prevents the Propagation of Compression Distortion

Because MPEG-2 uses a decoding image that contains compression-induced block distortion as a reference image for motion compensation, it exhibits residual distortion — even within the same frame — when a large amount of block distortion is generated. MPEG-4 AVC/H.264 detects block distortion in the decoding image and removes it with a context-adaptive filter that functions according to the degree of distortion. This prevents the propagation of block distortion by keeping the reference image clean at all times.



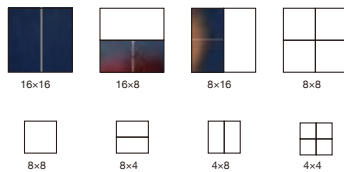
MPEG-2



MPEG-4 AVC/H.264

MPEG-4 AVC/H.264 (variable block size)

Block size is precisely varied to match the size of the moving part contained in each block.



New CABAC Entropy Encoding

The AVCHD format uses CABAC (Context Adaptive Binary Arithmetic Coding) for its variable-length encoding. Compared with the variable-length encoding of MPEG-2, in which the compression efficiency is greatly affected by subject type, CABAC provides lossless compression with constantly high efficiency and no distortion for virtually all subject types. Because MPEG-2 compresses and converts data according to the standard's fixed conversion rules, the compression efficiency may drop for image types other than those that were considered when the standard was established. In place of fixed conversion rules, CABAC provides the best possible conversion method by constantly optimizing and automatically tracking the image that is being processed, in parallel with the compression process.

Recording Format*1	
1080	1080/60i
1080 (only PH mode)	1080/30p (over 60i) 1080/24p (Native)*2
720 (only PH mode)	720/60p 720/30p (over 60p) 720/24p (Native)*2

Recording Mode	Image Size (H x V)	Bit Rate (Average)	Max. Recording Time with a 32GB SDHC Memory Card
PH Mode	1920 x 1080 1280 x 720	Approx. 21 Mbps (Average), Max 24Mbps	Approx. 180 minutes
HA Mode	1920 x 1080	Approx. 17 Mbps	Approx. 240 minutes
HG Mode	1920 x 1080	Approx. 13 Mbps	Approx. 320 minutes
HE Mode	1440 x 1080	Approx. 6 Mbps	Approx. 720 minutes

*1: 24p=23.98p, 30p=29.97p, 60p=59.94p and 60i=59.94i *2: In the Native mode, AG-HMC150 record only active frames.

Large-Capacity SDHC Memory Cards Enable Extended-Time Recording

SDHC Memory Cards are available with up to 32 GB of memory (AG-SDV032G). Combined with a maximum data transfer speed of 20 MB/s,* this makes PC data transfers easy and effortless. SDHC Memory Cards also feature excellent durability, with an operating temperature range of -13 degrees to 185 degrees F (-25° to 85°C). Using the high compression efficiency of the AVCHD format, up to 720 minutes** of HD data can be recorded onto a single SDHC Memory Card. Widely marketed consumer SDHC and SD Memory Cards can also be used when needed, to ensure easy availability.

* Data transfer speed varies depending on the usage of SD devices. The speed given here is the maximum speed according to Panasonic specifications.

** In HE (extended time) mode using a 32-GB SDHC Memory Card. A Class 4 or higher SDHC or SD Memory Card is required for PH and HA recording. Use a Class 2 or higher SDHC or SD Memory Card for other modes. (Panasonic SDHC Memory Cards are recommended.)

Professional PH Mode — High-End Standard for the AVCHD Format

The AG-HMC150 features the image-enhancing PH mode that Panasonic developed exclusively for AVCCAM camcorders. Designed for professional image production, this mode lets you record 1080/30p, 1080/24p, 720/60p, 720/30p, or 720/24p progressive images in addition to 1080/60i from the AG-HMC150's 1920 x 1080 full-pixel HD images. The multi-slice feature of the PH mode also helps to speed up processing by nonlinear editors that are equipped with multi-core CPUs, by using parallel processing to take full advantage of the CPU power.

Professional-Level Audio with XLR Line/Mic In

The AG-HMC150 comes equipped with a built-in stereo microphone and with XLR-type audio input terminals (2 channels, mic/line switchable, +48V compatible) on the rear panel. You can switch audio channels 1 and 2 separately to either line or front mic input, which is especially useful when recording interviews or narration.

SMPTE Time-Code Generator/Reader

The built-in SMPTE time-code generator/reader lets you select the Drop Frame/Non-Drop Frame and Free Run/Rec Run modes, preset and regenerate. User bits are also provided.

Fast Scene Searches with Thumbnail View

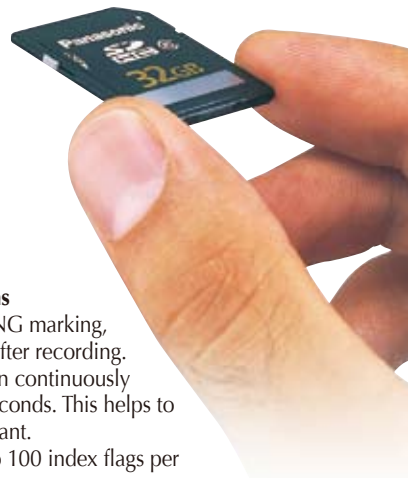
Image data is recorded as a file for each scene. Thumbnail images and file information are automatically attached to each file to enable smooth, easy confirmation and deletion of files displayed on the LCD monitor.

Versatile Solid-State Recording Functions

- Shot mark: Allows convenient OK and NG marking, and can be added to each clip during or after recording.
- Pre-rec: While in standby mode, you can continuously store, and subsequently record, up to 3 seconds. This helps to ensure that you always get the shot you want.
- Index: Scenes can be marked with up to 100 index flags per clip.
- Rec check: You can check the end of the most recently recorded clip with one-touch ease.
- Last clip delete: Only the most recently recorded clip is deleted with this one-touch function, adding practical convenience to everyday operation. It can be assigned as a User button function if desired.
- Time stamp: The date and time can be stamped onto recorded images. Commonly used for recording evidentiary depositions and procedures.



Time stamp



Compact, Lightweight and Perfectly Balanced

The super-compact AG-HMC150 weighs only 3.7 pounds (1.7 kg). It combines small size and light weight with an ideal balance — the center of gravity is in the hand grip — to bring exceptional comfort and maneuverability to handheld recording. The zoom lens further enhances shooting ease and convenience, letting the AG-HMC150 handle a wide range of applications without requiring a conversion lens.

Superb Mobility for Low-Angle Shots and Interviews

- The upper part of the handle grip contains both the Rec Start/Stop button and a lens zoom control (with three speeds). This design assures easy shooting even at low angles.
- The new LCD monitor mirror mode is convenient when shooting interviews.



13X Cam-Driven Optical Zoom and 10X Digital Zoom

The cam-driven (mechanical) manual zoom ring provides the same fast, precise zooming and feeling as cameras with interchangeable lenses. The servo-driven zoom also allows slow zooming. The AG-HMC150 is equipped with a digital zoom that instantly magnifies the image by any of three fixed values — 2X, 5X or 10X. Use it together with the 13X optical zoom lens, and you get super-telephoto magnification equivalent to a 130X zoom, without the drop in light intensity that happens when using a lens extender.



Wide

Tele (13X optical zoom)

13X optical zoom X 10X digital zoom (130X)

Manual Focus and Aperture Control

The manual focus ring, which gives you a level of operating ease that approaches an interchangeable lens, can be used to control the aperture too, by switching the Focus Ring (Focus/Iris) selector. You can also add backlight correction or spotlight correction to the auto aperture function.

New Focus Assist Functions

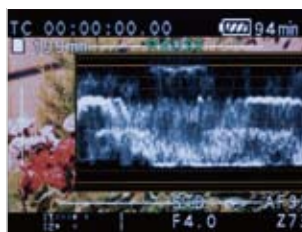
A new focus assist function with HD compatibility has also been added to the AG-HMC150. This is in addition to a center zoom function that enlarges the center of the frame, and a histogram display. You can select from three display modes: center zoom, histogram, or combined center zoom and histogram. And the Push Auto button temporarily activates the AF system for quick focusing in manual mode.



Focus assist (combined mode)

Simplified Waveform and Vectorscope Display

The AG-HMC150 has waveform and vectorscope display functions as well. A single touch of the WFM key displays the waveform and vectors of the captured video signal on the LCD monitor.



Waveform Monitoring(WFM)



VECTOR (Vectorscope)

Scene File Dial

Set this dial for instant recall of an entire set of shooting conditions. Six preset files are provided, and you can change any of the six file names and their settings as desired. You can also store the settings to an SD Memory Card, and load them when desired.

File Description

F1: —	Standard settings
F2: FLUO.	Indoor shooting under fluorescent lights
F3: SPARK	Provides for Extra Color & Detail
F4: B-STR	Enhanced gradations of luminance in low light scenes
F5: CINE V	Cine-Like setting shifted to prioritize contrast
F6: CINE D	Cine-Like setting shifted to prioritize dynamic range

*The recording image format is not affected when the F5 or F6 file is selected. The 24p/30p recording mode must be set separately.



Three User Buttons

The AG-HMC150 allows 11 functions (listed below) to be assigned to the User buttons. The three buttons are arranged in a group for easy use. Assigned functions can be accessed at the touch of a button.

Assignable Functions

Spotlight:	Automatic aperture correction for scenes with spotlights
Backlight:	Automatic aperture correction for scenes with backlighting
Black Fade:	Fade-in/fade-out from and to black
White Fade:	Fade-in/fade-out from and to white
ATW:	ATW (auto-tracking white balance) on/off
ATW Lock:	ATW lock on/off
Gain:	+18 dB gain on/off
D. Zoom:	Digital zoom (2x, 5x, 10x)
Index:	Scene indexing
Shot Mark:	Adds shot marks to the clip
Last Clip Delete:	Deletes the recently recorded clip

Gain Selector and ND Filter

The gain selector has three positions: L is fixed at 0 dB; and M and H can be set to 0, +3, +6, +9, or +12 dB. +18dB can also be accessed as a User button function. Three ND filters (1/4 ND, 1/16 ND, and 1/64 ND) are built-in.

Slow-Speed, Synchro or High-Speed Shutter

The shutter speed can be freely selected, from the minimum 1/15 second for Slow-Speed to the maximum 1/2000 second for High-Speed. The Synchro Scan function is ideal for recording images from monitors.

HDMI Digital HD Output Terminal

The AG-HMC150 is equipped with a next-generation HDMI (High Definition Multimedia Interface) output terminal for digital transferring of high-quality HD video and audio signals.

*A separately purchased cable may be required for connecting the AG-HMC150 to a professional monitor.

PC Connection via USB 2.0

The standard USB terminal (Type mini B) allows the AG-HMC150 to connect to a PC in device mode. This lets a Windows PC installed with the provided AVCCAM Viewer software to upload, copy, and write HD video files, as well as transfer them to AVCHD-compatible editing software for HD production.

TC Set and User File Copy with Multi-Cameras

Connecting two AG-HMC150 cameras with a RCA cable allows the slave camera to synchronize with the master camera, which enables time-code-matched editing with multiple cameras for "TC synchro editing."



SD Down-Conversion Output (Composite/Component)

The AG-HMC150 is equipped with both composite (RCA) and component (Mini D4) video outputs, allowing HD images to be down-converted and output as SD images while they are being recorded or played. At the same time, a 16:9 or 4:3 aspect ratio can be selected for side crop, letterbox, or squeeze images. Audio output (RCA, 2 channels) enables a wide variety of applications, such as viewing on an external monitor or SD dubbing.



Side crop

Letterbox

Squeeze

Other Professional Features

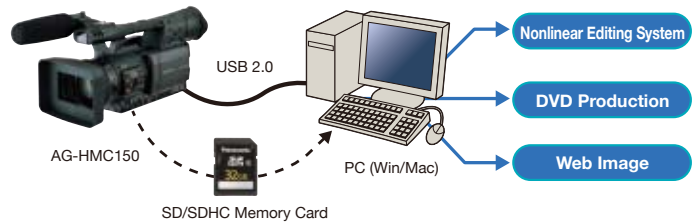
- White balance: Three values (A/B/Preset) of white balance with the auto tracking white function.
- Mode check: Displays a list of the camera settings on the viewfinder and monitor.
- Zebra: Select any two levels from among 50% to 105%, in 5% steps.
- Center marker: Provides an accurate numeric display of the brightness at screen center.
- Tally lamps: Provided on the unit's front and rear.
- Remote: Controls zoom, rec, focus and aperture. Allows use of any camera remote controller that is compatible with the AG-DVX100 or AG-HVX200.
- Color bar signal output.



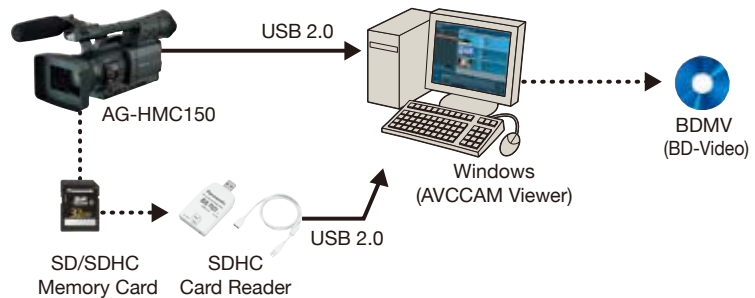
AVCHD Files Transfer Directly to IT Systems

Unlike tape, AVCHD files require no digitizing and can be directly accessed by a PC (Windows/Macintosh). This makes it easier to use motion images in new IT applications, like content production, Internet distribution and source material archiving.

*1: An SDHC Memory Card reader is required if the SDHC Memory Card is not recognized by the PC.
 *2: AVCHD-compatible software is required. The minimum system requirements for using the software must also be satisfied.



Load Data to a PC or Write It to a Blu-ray Disc with AVCCAM Viewer (Download it for Free)



AVCCAM Viewer for Windows PCs makes it easy to preview AVCCAM files and other AVCHD motion images and meta-data, with very simple operation. Files can be played from an SD Memory Card, Blu-ray Disc, or hard disk, and saved to a PC (hard disk) from an SD Memory Card or Blu-ray Disc. Files can also be copied or deleted, meta-data can be displayed, and data can be written to an SD Memory Card or Blu-ray Disc. AVCCAM Restorer software can also be used to restore files that were damaged, for example, by a power interruption during recording.

[PC Minimum System Requirements]

- CPU: Intel® Core™ Duo or better (2.16 GHz or better is recommended)
- OS: Microsoft® Windows Vista® Business, Windows® XP SP2 or later (Macintosh not supported)
- RAM: 1024 MB or more for Windows Vista, 512 MB or more for Windows XP (1024 MB or more recommended)

*Do not insert a disc [DVD (AVCHD)] produced with the provided HD Writer 2.5E software into a device that does not support the AVCHD standard. If it is inserted into such a device, the disc may not eject. Also, do not play the disc with a device that does not support the AVCHD standard.

AVCHD Nonlinear Editing

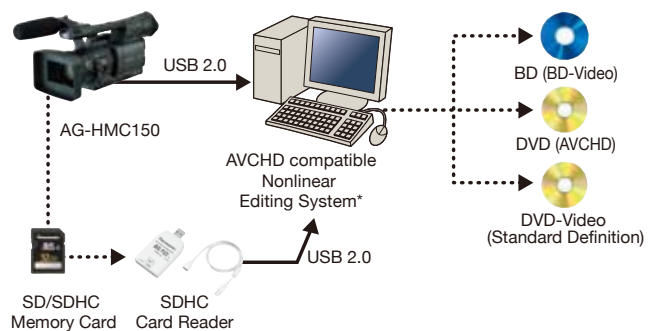
AVCHD files can be transferred at high speed by using the USB 2.0 interface to connect the AG-HMC150 or an SDHC Memory Card reader to a Windows or Macintosh computer. This dramatically improves productivity when compared with the time-consuming task of digitizing.

*Correct operation should be possible with a nonlinear editor that has been confirmed for compatibility with a Panasonic HDC-SD9 camcorder, for data recorded using the same HA, HG, and HE recording modes as on consumer AVCHD equipment. Collaboration to confirm compatibility with the new PH mode is now under way with Adobe, Apple, GrassValley, and other partner companies.

Simultaneous with the shipping of the AG-HMC150, Panasonic is also making new AVCHD transcoder software available for free downloading on the following web site. This software is expected to be compatible with the PH mode and meta-data extension. This will enable the use of existing editing software which already supported DVCPROHD P2.

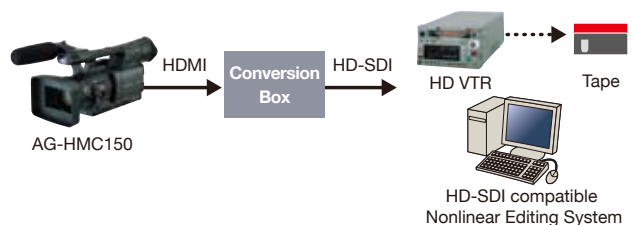
<For US customers: www.panasonic.com/broadcast>

<Outside US: <http://www.pavc.panasonic.co.jp/pro-av/support/desk/e/download.htm>>



Compatibility with Existing HD Editing Environments

By using an HDMI/HD-SDI conversion box, the AG-HMC150 can be linked to existing linear/non-linear HD production environments using the DVCPRO HD format.



Options



VW-VBG260PPK

Battery Pack
 • 7.2V 2,640mAh
 (Supplied with the AG-HMC150)



VW-VBG6PPK

Battery Pack
 • 7.2V 5,800mAh



AG-MC200G

XLR microphone
 •Sensitivity: •40 •3.5 dB (0 dB=1V/Pa, 1kHz) •Maximum Input level: 127 dB (1000Hz, Distortion within 1%) •S/N: More than 69 dB



AG-SDV016G

AG-SDV032G

SDHC memory card



BT-LH2600W

26" HD/SD LCD monitor



BT-LH1760

17" 100Hz/120Hz
 HD/SD LCD monitor



BT-LH1700W

17" HD/SD LCD monitor



BT-LH900A

8.4" HD/SD LCD monitor



BT-LH80WU

7.9" HD/SD LCD monitor

*An HDMI-DVI-D conversion connector is required to connect the AG-HMC150 to the BT-LH1760 monitor. For all other monitors, a D-Terminal component (Y/Pb/Pk BNC terminal) conversion cable is required.

Specifications

[GENERAL]

Power Supply:	DC7.2V (using with battery), 7.3V (using with AC adaptor)
Power Consumption:	9.8W (when recording)
Operating Temperature:	32°F to 104°F (0°C to 40°C)
Operating Humidity:	10% to 80% (No condensation)
Weight:	Approx. 3.7 lb. (Approx. 1.7 kg) camcorder only Approx. 4.3 lb. (Approx. 1.98 kg) including SD memory cards, supplied battery, and microphone
Dimensions (W x H x D):	6-1/16 x 6-15/32 x 15-5/8 inches (154 x 164 x 397 mm) excluding the projection part

[CAMERA]

Pick-up Device:	3CCD (1/3-inch interline transfer type, and progressive modes supported)
Lens:	LEICA DICOMAR lens with optical image stabilizer, motorized/manual mode switching, 13 x zoom, F1.6 - 3.0 (f=3.9mm to 51mm/35mm equivalent: 28mm to 368mm)
Optical Color Separation:	Prism system
ND Filter:	1/4, 1/16, 1/64
Gain Selection:	60i/60p mode: 0/+3/+6/+9/+12/+18 dB, (0dB fixed in slow shutter mode) 30p/24p mode: 0/+3/+6/+9/+12 dB, (0dB fixed in slow shutter mode)
Shutter Speed: (Preset)	60i/60p mode: 1/60 (OFF), 1/100, 1/120, 1/250, 1/500, 1/1000, 1/2000 sec. 30p mode: 1/30, 1/50 (OFF), 1/60, 1/120, 1/250, 1/500, 1/1000 sec. 24p mode: 1/24, 1/50 (OFF), 1/60, 1/120, 1/250, 1/500, 1/1000 sec
Shutter Speed: (Synchro Scan)	60i/60p mode: 1/60.0 sec. to 1/249.8 sec. 30p mode: 1/30.0 sec. to 1/249.8 sec. 24p mode: 1/24.0 sec. to 1/249.8 sec.
Slow Shutter Speed:	60i/60p mode: 1/15, 1/30 sec. 30p mode: 1/15 sec.
Minimum Luminance:	3lx, (F1.6, Gain: +12dB, Shutter: 1/25sec.)
Digital Zoom:	3x/5x/10x (only in 1080/60i or 720/60p video format)
Filter Diameter:	72mm

[Recording]

Recording Format:	AVCHD
Compression Method:	MPEG-4 AVC/H.264
Recording Media*:	SD Memory Card : 512MB, 1GB, 2GB (FAT12, FAT16) SDHC Memory Card : 4GB, 6GB, 8GB, 12GB, 16GB, 32GB (FAT32)
Recording Video Format:	PH mode: 1080/60i, 1080/30p (over 60i), 1080/24p (native), 720/60p, 720/30p(over 60p) and 720/24p (native) HA, HG and HE mode: 1080/60i only
Transmission Rate:	PH mode: approx. 21 Mbps (VBR, Max 24Mbps) HA mode: approx. 17 Mbps (VBR) HG mode: approx. 13 Mbps (VBR) HE mode: approx. 6 Mbps (VBR)

[Video System]

Video Signals:	1080/60i, 720/60p
HDMI Output:	HDMI x 1, 1080/60i, 720/60p, 480/60p (Not compatible with ViEa Link)
Component Output:	Mini-D x 1, Y: 1.0 Vp-p, 75 Ω, PB/PR: 0.7 Vp-p, 75 Ω
Composite Output:	Pin jack x 1, 1.0 Vp-p, 75 Ω

[Audio System]

Compression Method:	Recording/Playback: Dolby Digital (Dolby AC3)/2 ch
Sampling Frequency:	48 kHz
Quantization:	16 bit
Compression Bit-Rate:	PH mode: 2 CH 384 kbps, HA, HG and HE mode: 2 CH 256 kbps

[Audio IN/OUT]

XLR Input:	XLR (3 pins) x 2 (INPUT1, INPUT2), LINE/MIC selectable, High impedance LINE: 0 dBu, MIC: -50 dBu/-60 dBu (selectable in menu)
Internal Microphone:	Stereo microphone
Line Output:	Pin jack x 2 (CH1, CH2), Output: 316 mV, 600 Ω
HDMI Output:	2 ch (Linear PCM), 5.1 ch (AC3)
Headphone:	Stereo mini jack (3.5 mm diameter) x 1
Built-in Speaker:	20 mm (round) x 1

[Other Connectors]

USB:	Type mini B connector (compliant with USB ver. 2.0)
Camera Remote:	Super Mini jack (2.5mm diameter) x 1, for zoom and rec start/stop operations Mini jack (3.5mm diameter) x 1, for focus and iris controls
TC PRESET IN/OUT : (also used for VIDEO OUT)	IN: 1.0 to 4.0 Vp-p, 10 kΩ OUT: 2.0±0.5 Vp-p, low impedance

[Monitor]

LCD Monitor:	3.5 inches, LCD color monitor, 210,000 pixels
Viewfinder:	0.44 inches, LCD color viewfinder, 235,000 pixels

[Standard Accessories]

AC adapter/charger, 2640mAh battery pack, AC cord, DC cord, Wireless remote controller with button-type battery, Microphone holder, Eye cup, Shoulder Belt, Component video cable, PIN-BNC conversion plugs, Ferrite core, Binder, CD-ROM
 The following accessories are attached to the unit. Lens hood cap and INPUT 1/2 terminal cover

*SD/SDHC Memory card (8MB to 32GB) can be used for storing/reading scene file and user file, and reading metadata. Weight and dimensions shown are approximate. Specifications are subject to change without notice.

AVCCAM 3-Year Warranty Repair Program*1

Customers who register as users on the website will receive an extended warranty repair valid for up to three years.



	1 st year	2 nd year	3 rd year
AVCCAM device*2	Basic warranty*3	Extended warranty repair*4	

*1: Please note that this extended warranty is not available in some countries/regions. *2: Not all models eligible for extended warranty coverage.
*3: The basic warranty period may vary depending on the country/region. *4: Not all repair work is covered by this extended warranty.



Details about user registration and the extended warranty:

For US Customer: www.panasonic.com/broadcast
For Outside US: http://panasonic.biz/sav/pass_e

Please note, this is a site that is not maintained by Panasonic U.S. or Panasonic Canada Inc. The Panasonic Canada Inc. privacy policy does not apply and is not applicable in relation to any information submitted. This link is provided to you for convenience.

Please refer to the latest Non-linear Compatibility Information, AVCHD Support and Download and Service Information, etc. at panasonic web site.



For US Customer: www.panasonic.com/avccam
For Outside US: <https://www.pavc.panasonic.co.jp/pro-av/index.html>

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JQA-0443



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

