

Panasonic
ideas for life

P2HD

AG-HPX500
Memory Card Camera-Recorder

P2HD



DX **DVCPRO** **DVCPRO50** **DVCPROHD**



Superior Recording Quality in Both HD and SD

Broadcasters and video professionals all around the world have already joined the P2 revolution. Now this advanced technology is available to even more professional videographers.

The AG-HPX500 Memory Card Camera-Recorder debuts as the newest 2/3" camcorder in the P2 HD Professional Series, which includes the AG-HVX200 handheld and the AJ-HPX2000/2100 shoulder-mount units.

Featuring a 2/3-inch lens mount that accepts interchangeable lenses, HD/SD multi-format compatibility with 50/60-Hz selectability, and a variable frame rate function that allows cine-like picture quality, this new camera-recorder has everything professionals need to create high-quality video content.

Equipped with four P2 card slots, the AG-HPX500 allows extended HD recording time and delivers the high reliability, quick recording starts and IT benefits that distinguish P2 and revolutionize the recording and editing workflow.

The AG-HPX500 is an exceptional cost-efficient performer for applications that demand full-fledged HD production quality and the advantages of fast IT-based workflow.

P2 Memory Card Recording Brings the IT Revolution to Video Production


Neither tape nor disc, the P2 card is a semiconductor memory device that can hold large amounts of video and audio data.



The P2 card's advanced AV technology bring the proven benefits of an IT workflow to broadcasting and video production. Memory card recorders have no drive mechanism, so maintenance costs are much lower. And with their outstanding resistance to impact, vibration, temperature change, dust and other environmental conditions, they offer the high reliability you need in news acquisition and video recording. P2 also transfers data at higher speeds than optical discs or hard drives, so video production is quicker. And P2 files can be transferred as they are - no digitizing required - to nonlinear editors and other network-connectable equipment. With all these advantages, it's no wonder many of the world's leading broadcast stations and video production professionals have already adopted P2. Panasonic P2 equipment has turned in gold-medal performances on the biggest stages - such as the 2004

Olympic Games in Athens and the 2006 Winter Olympic Games in Torino. P2 will be on hand for the next Olympics too, as the official broadcasting equipment for the 2008 Games in Beijing.



	 DVTape	 Optical Disc	 HDD	 P2 Card
Maintenance	better	better	good	excellent
Reliability	better	good	good	excellent
Transfer speed	good	better	excellent	excellent

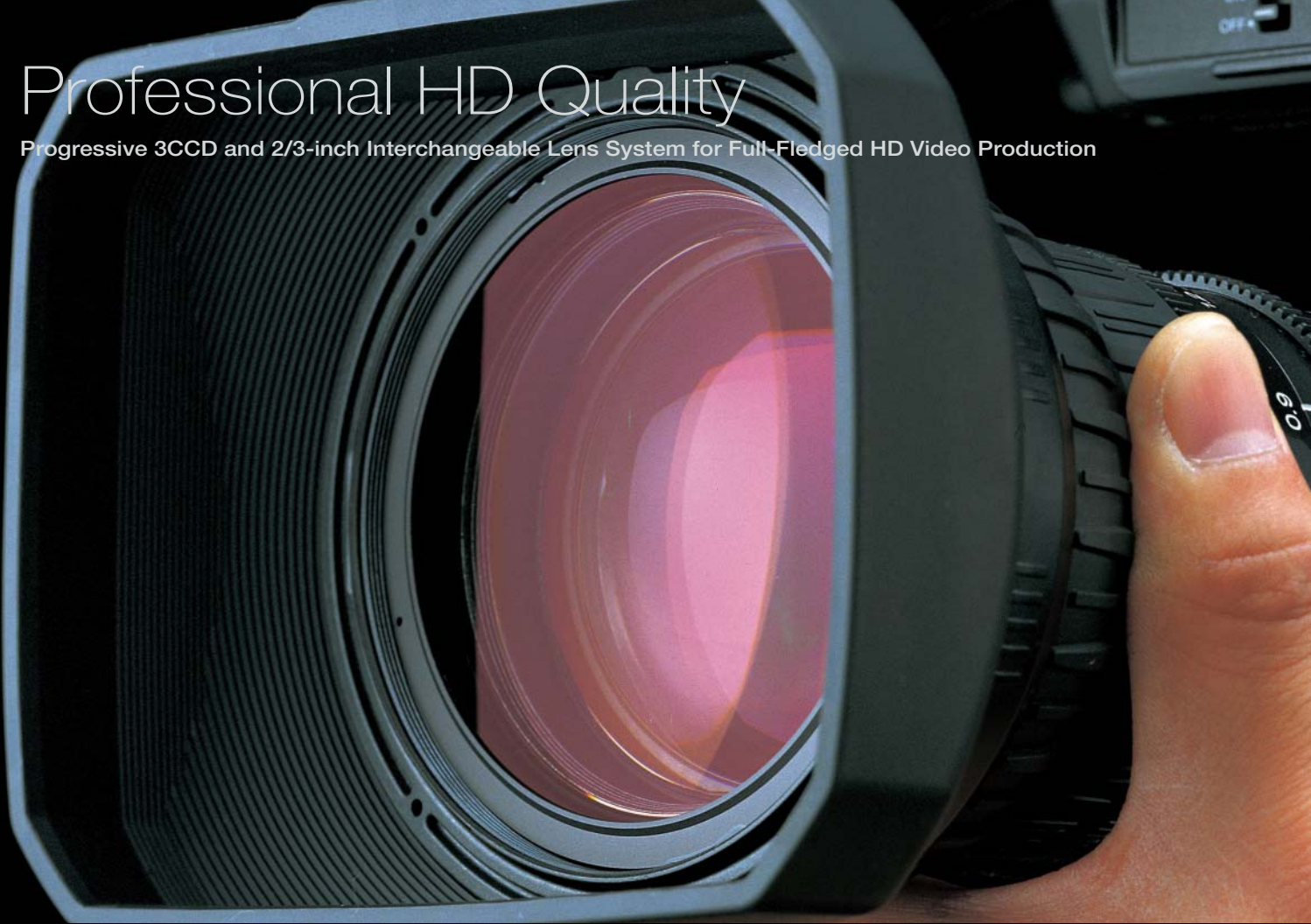
A P2HD Camera-Recorder That's Built for Professionals



- *Supports all HD/SD recording formats at the price of an SD camera-recorder*
- *Advanced P2 technology provides fast, rugged performance plus IT connectivity*
- *2/3-inch interchangeable lens system*
- *Variable frame rate function*

Professional HD Quality

Progressive 3CCD and 2/3-inch Interchangeable Lens System for Full-Fledged HD Video Production



2/3-Inch Interchangeable Lens System

The 2/3-inch bayonet mount allows use of a wide assortment of broadcast and professional lenses from a number of companies*. 2/3-inch zoom lenses make it easier to capture the shallower depth of field often used in professional videos.

Chromatic Aberration Compensation (CAC)

Chromatic Aberration Compensation (CAC) function is a new feature in the AG-HPX500. This exclusive technology sets up a conversation between lens and camera which allows for a highly sophisticated algorithm to be deployed which will automatically compensate the registration error that is caused mainly by lens chromatic aberration, and minimize the circumjacent blur.



Full screen image (simulated**) CAC OFF (simulated**) CAC ON (simulated**)

Progressive 3CCD

The AG-HPX500's 2/3-inch progressive 3CCD* has a larger light receiving area for higher sensitivity, and achieves an optimal balance among image quality, sensitivity and cost.



Interlace scanning frame image (simulated**) Progressive scanning frame image (simulated**)

** "Simulated" images were produced in order to describe the function. It is not a screen capture of an actual image. It differs from an actual image in that the effect of the function has been emphasized for easier understanding.

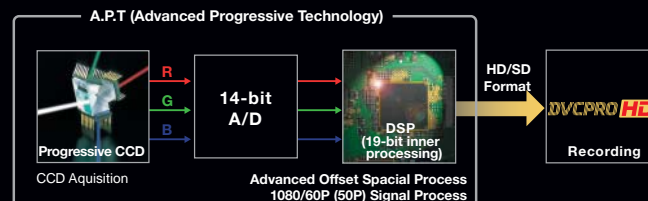
The camera process scans at full 1080/60 (or 50) progressive frames a second. It is this initial capture that is the foundation for all of the formats that this camera generates. While the camera does not record 1080P/60(or 50), the signals start there and are either cross converted or down converted to the format being utilized that day.

* The effective image size of the CCD is equivalent to 2/3.2 inches.

A.P.T for Higher Image Quality

Advanced progressive technology (A.P.T) produces higher total image quality by linking the progressive 3CCD camera system with a high-performance digital signal processor (DSP). In A.P.T, an extremely accurate CCD alignment process is used to offset the pixels on the red and blue channels in both the Horizontal and Vertical directions. This allows for additional resolution to be gained from areas of the green CCD which are non-photo-sensitive. The R, G and B color signals from the 3 CCDs are then sent through a 14-bit A/D converter. Next, a 19-bit DSP performs a highly precise calculation* on the signals to generate 1080/60P (50P) video signals. The signals are then converted into HD or SD format and recorded. By using these progressive video signals, with their excellent vertical resolution, as source signals, a high level of image quality is achieved that would be difficult to obtain by interpolating from interlace scans.

* Called an advanced offset spatial process.





HD/SD Multi-Format Capabilities

Supporting 32 HD/SD video recording formats, the AG-HPX500 meets professional needs in news acquisition and in the production of TV programming, independent films and other demanding video content. Its versatility allows this content to be distributed worldwide. For 1080i/720p HD recording, the AG-HPX500 uses the DVCPRO HD codec, with its proven track record in higher end production applications. For SD recording, the AG-HPX500's multi-codec capabilities let you select from DVCPRO50, DVCPRO and DV video quality.

Extended Recording with Four Slots for 16-GB P2 Cards

The AG-HPX500 has four P2 cards slots so you can record continuously onto all four in sequence. Using four of the new 16-GB P2 cards (available soon), you can record up to 64 minutes of HD recording (1080/60i or 720/60p, 4 cards x 16 minutes = 64) or 128 minutes of SD (DVCPRO 50) recording (4 cards x 32 minutes = 128).

48-kHz/16-bit, 4-Channel Digital Audio

The AG-HPX500 can record full 48-kHz/16-bit digital audio on all four channels. You can freely select the audio source for each channel, choosing from mic-in and line-in. In addition you can control the audio level on each of these channels independently.



Video format and codec supported by AG-HPX500

Recording Video Format *1		Rec. Time*3	Codec
HD 60Hz	1080/60i	64 min.	DVCPRO HD
	1080/24p (over 60i)		
	1080/24pA (over 60i)		
	1080/30p (over 60i)		
	720/60p		
	720/24p (over 60p)		
	720/30p (over 60p)		
HD 50Hz	1080/50i	64 min.	DVCPRO HD
	1080/25p (over 50i)		
	720/50p		
	720/25p (over 50p)		
	720/25pN (Native)*2	128 min.	
SD 60Hz	480/60i	128 min. (DVCPRO 50) 256 min. (DVCPRO/DV)	
	480/24p (over 60i)		
	480/30p (over 60i)		
SD 50Hz	576/50i		
	576/25p (over 50i)		

*1: 24p=23.98p, 30p=29.97p, 60p=59.94p and 60i=59.94i

*2: In the Native mode, AG-HPX500 record only active frames.

*3: using four 16GB P2 cards. (1/4 with a single card)

Recording time varies depending on the video format, codec, and recording setting.

P2 Recording Function

Four Slots for Quick Recording on Reliable P2 Memory Cards



P2 Cards: High Capacity, Fast Transfer and Superior Reliability

Developed for cost effective production applications, the P2 card consists of four SD cards packaged together along with an LSI that works to stripe the cards as a 0 Raid Array. Together these parts form a single compact unit that weighs only about 0.099 lbs (45 grams). This ultra-reliable card has four times the capacity and four times the transfer speed of a single SD card.

In addition to the high resistance to impact, vibration and temperature change that semiconductor memory is known for, the P2 card also offers outstanding reliability. Unlike tapes and discs, it has no rotating or contact parts. It's built to withstand repeated recording and initialization over many years of use. The P2 card connector is specifically designed to stand up to the repeated insertion and removal involved in professional use.

The AG-HPX500 records the A/V data for each recording as a file on the P2 card, which eliminates the need for digitizing. The files can be used directly in a nonlinear editing system or transferred over a network. The P2 card transfers data at a speed that discs simply cannot match, giving you faster, easier operation. The P2 card is convenient too - you can plug it directly into the card slot on a certain laptops.



Immediate Startup and Better Data Protection

When you press the Record button in standby mode, the AG-HPX500 instantly finds a blank area on the P2 card and begins recording. It can begin recording immediately even when you're using it to preview video. In normal use, there is no chance of accidentally overwriting a recording. Recordings will not be erased unless you intentionally delete a file or initialize the card.

Advanced Recording Functions Employing Four Card Slots

In addition to continuous, multiple-card recording, the four P2 card slots of the AG-HPX500 also enable some useful new recording functions that are possible only with memory cards.

- **Card selector:** The recording slot can be switched instantly when the unit is in standby mode. Immediately after recording a clip, you can remove the P2 card and use it in editing or transmission. This lets you continue your recording work with much shorter downtime than when changing tapes or discs.
- **Hot-swap-rec:** You can replace a full memory card with a blank one while the P2 cam is recording onto a second card. Successively swapping cards gives you virtually unlimited recording capability.
- **Loop-rec:** This function can be specified in length and the camera will continuously record over that area until you push the pause. This allows for a longer record time than pre-record.

Other Versatile Recording Functions

- **Pre-rec:** While in standby mode, you can continuously store, and subsequently record, up to 3 seconds in HD (7 seconds in SD). In effect, this lets you record footage of the beginning of an event when the beginning is unpredictable, like a whale breaching the surface of the water or the unexpected arrival of a key person. This can give you the confidence that you always have your shot.



- **One-shot rec:** Convenient for producing animation, this mode records for a set time (from 1 frame to 1 second) each time you press the Start button.
- **Interval rec:** Recording one frame at a time at set intervals (from 2 frames to 10 min), this mode is useful for monitoring and special ultra-undercranking effects.

Clip Thumbnail/Data Function

The P2 cam records each recording as a clip (file) and automatically attaches a thumbnail image and file information to it. To preview a clip on the LCD monitor or to check clip data, simply choose the clip you want from the list of thumbnails.

The thumbnail image and file information can also be displayed on a PC (using P2 Viewer*) or nonlinear editing software.

* P2 Viewer software for Windows PCs can be downloaded, free of charge.



Clip Thumbnail Display

Shot Marker and Text Memo

A shot mark, which allows convenient OK and NG marking, can be added to each clip during or after recording. When a P2 card with marked clips is inserted in a PC*, it's possible to have only the marked clips displayed. The AG-HPX500 also has a text memo function. When recording or previewing a clip, press the Text Memo button at any of up to 100 locations and a blank text memo label is registered. On your PC*, you can then search for the label and write a memo into it.

* Must have P2 Viewer installed



P2 Viewer

SD Memory Card Slot

Plug an SD card into the slot provided, and you can save or load scene files and user-setting files. You can create a metadata upload file (produced with P2 Viewer) containing information such as the name of the camera operator, the name of the reporter, the recording location, and text memos on an SD Memory Card, and load it as clip metadata.

System and Interface

Comes Equipped with IEEE 1394, USB 2.0 and HD SDI Interfaces. Allows Remote Control with the AJ-RC10G.

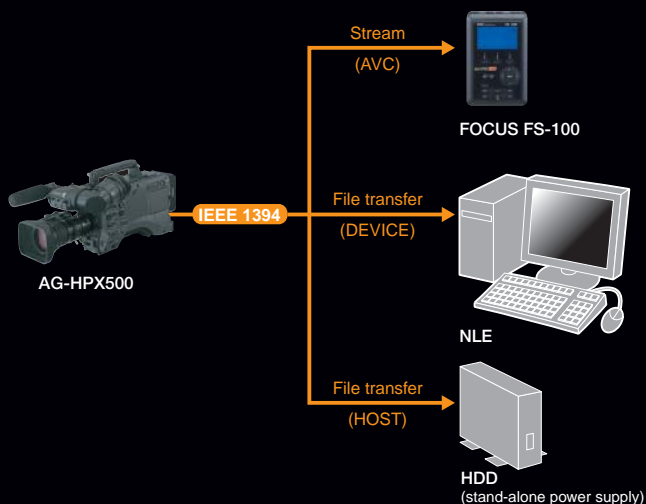


IEEE 1394 Interface

The IEEE 1394-compliant DVCPRO (6-pin) output connector lets you output all HD/SD compression streams without decoding.* This means you can connect and use a DVCPRO HD VTR (such as the AJ-HD1400) or Focus Enhancements FireStore FS-100 for degradation-free backup recording.

The IEEE 1394 interface also makes it easy to upload data to a Mac-based or PC-based nonlinear editing system. The AG-HPX500 also provides a host mode that lets you copy P2 files to a hard drive without using a PC.

* Output is not possible in 720p native mode (24pN 30pN, 25pN).



Compatibility with Nonlinear Editing Systems

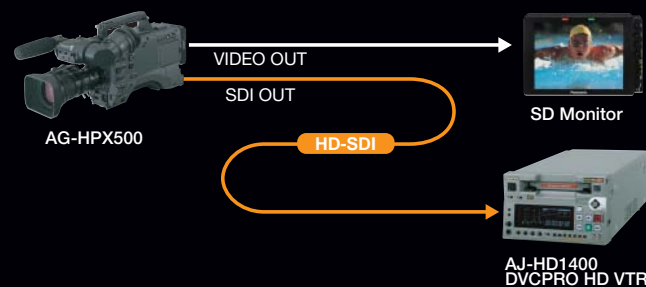
DVCPRO HD P2 files recorded by the AG-HPX500 can be used in nonlinear editing systems made by a variety of manufacturers, making it possible for you to produce HD content in native DVCPRO HD. And because the AG-HPX500 uses the same recording format as the AG-HVX200 or the AJ-HPX2000/HPX2100, the AG-HPX500 is compatible with nonlinear editing systems that support our other P2HD cameras.

*The latest compatibility test report with NLEs is shown at <https://www.pavc.panasonic.co.jp/pro-av/> (P2 compatibility table)

HD SDI/SD Down-Conversion Output

The AG-HPX500 comes equipped with two BNC video line outputs for flexible monitoring or line recording use.

- **SDI OUT:** Switchable between HD-SDI or SD-SDI (down conversion). HD-SDI output simultaneously backs up recordings to an external digital VTR (such as the AJ-HD1400) in sync with Rec start/stop.
- **VIDEO OUT:** Outputs down-converted SD video (composite).





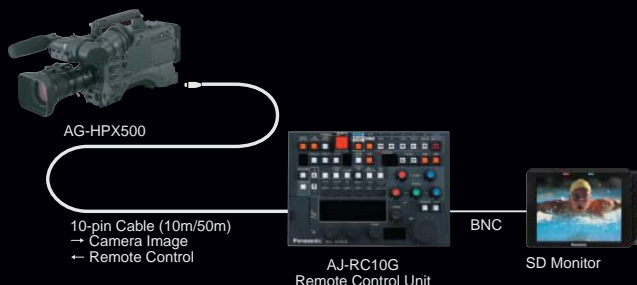
USB 2.0 Interface

The AG-HPX500 comes equipped with a USB 2.0 interface. Connect the AG-HPX500 to a Windows PC, and you can upload files from a P2 card to the PC for nonlinear editing, or to a network server.



Remote Control Unit

Another standard feature is a 10-pin RCU terminal for connecting the optional AJ-RC10G Remote Control Unit. The AJ-RC10G comes with a 10-pin multi-cable that can connect to the AG-HPX500's down-conversion video OUT terminal for monitoring at the RCU. The AJ-RC10G provides control of the AG-HPX500's camera and recorder functions.



Multi-Camera-Compatible TC-IN/TC-OUT Terminals

The AG-HPX500 has a built-in SMPTE time code generator/reader. The TC-IN/TC-OUT terminals are independent, so through-connection is possible. The AG-HPX500 supports TC synchronous recording using multiple cameras.

Other System Functions and Options

- Analog component (Y/Pb/Pr) output
- DC power supply for the BT-LH80W 7.9" LCD monitor
- Color bar (full color) and standard audio signal (1-kHz test tone) output
- Multiple battery support, including Anton Bauer batteries

Designed for Easy Operation

The position, function, and shape of all switches, dials and terminals have been designed in response to feedback from video professionals to allow quick operation and prevent errors for greater reliability.

- The Audio Rec level adjustment features a push lock function.
- The Audio Input level adjustment (front) can be switched ON/OFF and allocated to desired channels.
- The viewfinder mount allows easy and precise adjustment.

* The AJ-RC10G can control only functions supported by the AG-HPX500. It cannot control unsupported keys or dials.

Optional Accessories



AJ-VF20WB
2" EVF
16:9/4:3 switchable



AJ-VF15B
1.5" EVF for 4:3



KJ10ex4.5B IRSD PS12
KJ16ex7.7B IRSD PS12
KJ21ex7.6B IRSD PS12
KJ16ex7.7B KRSD PS12
CANON 2/3" LENS



XA17x7.6BERM-M58B
XA17x7.6BERM-M58B
FUJINON 2/3" LENS

*Recommend to use the lens which is correspondent to Chromatic Aberration Compensation (CAC) function.
*Some lenses are not available in some areas.



AG-MC200G
Microphone



AJ-MC700P
Microphone Kit



SHAN-TM700
Tripod Adapter



SD memory card



AJ-SC900
Soft Carrying Case
*Not available in some areas.



AJ-HT901G
Hard Carrying Case
*Not available in some areas.



SHAN-RC700
Rain Cover
*Not available in some areas.



BT-LH2600W
26" Wide
HD/SD LCD monitor



BT-LH1700W
17" Wide
HD/SD LCD monitor



BT-LH900A
8.4" HD/SD LCD monitor



BT-LH80W
7.9" Wide
HD/SD LCD monitor



AJ-RC10G
RCU (Remote Control Unit) with 10m remote control cable

AJ-C10050G
Remote Control cable (50m)

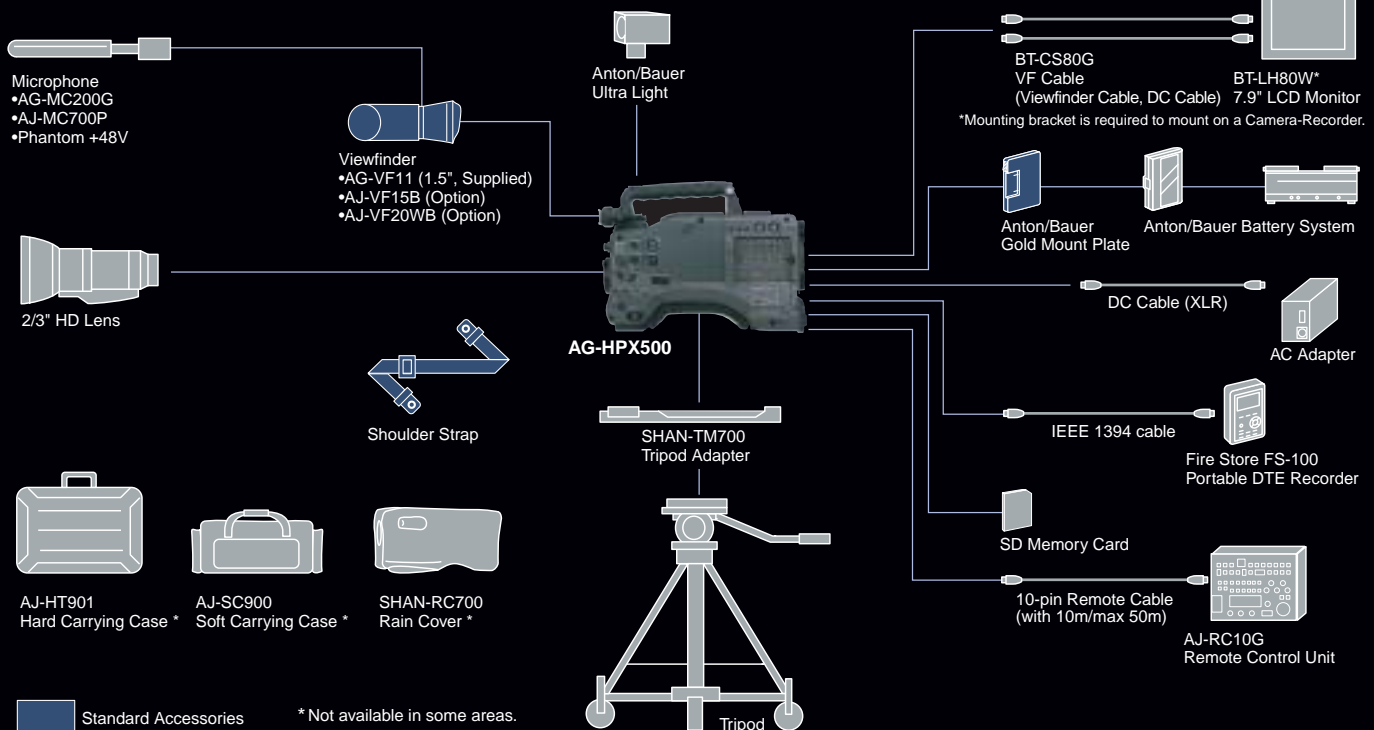
* The AJ-RC10G can control only functions supported by the AG-HPX500. It cannot control unsupported keys or dials.



FireStore FS-100
Portable DTE Recorder (FOCUS Enhancements, Inc.)



Anton/Bauer
Dionic Battery



Standard Accessories

* Not available in some areas.

Profiles



Specifications



General

Supply Voltage:	DC12V (11V to 17V)
Power Consumption:	Approx. 23W (when 1.5" CRT viewfinder, 3.5" LCD monitor used)
Operating Temperature:	32°F to +104°F (0°C to +40°C)
Keeping Temperature:	-4°F to +140°F (-20°C to +60°C)
Operating Humidity:	10% to 85% (no condensation)
Weight:	Approx. 8.4 lbs (3.8kg) excluding battery and accessories
Dimensions (WxHxD):	5-9/16" x 10-7/16" x 12-9/16" (140 x 261 x 318 mm) excluding handle and prominent parts

Camera

Pick-up Device:	3CCD (2/3-inch interline transfer type and progressive modes supported)
Lens Mount:	2/3" bayonet type
Optical Color Separation:	Prism system
ND Filter:	4 position (Clear, 1/4, 1/16, 1/64)
Gain Selection:	60i/60p/50i/50p mode: 0/+3/+6/+9/+12/+18 dB 30p/24p/24pA/25p mode: 0/+3/+6/+12dB [Slow Shutter Mode, Gain fix (0dB)]
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(OFF), 1/50, 1/60, 1/120, 1/250, 1/500, 1/1000 sec. 24p/24pA mode: 1/24(OFF), 1/50, 1/60, 1/120, 1/250, 1/500, 1/1000 sec. 50i/50p mode: 1/50 (OFF), 1/60, 1/120, 1/250, 1/500, 1/1000, 1/2000 sec. 25p mode: 1/25(OFF), 1/50, 1/60, 1/120, 1/250, 1/500, 1/1000 sec.
Shutter Speed (Variable):	60i mode: 1/60.0 to 1/249.8 30p mode: 1/30.0 to 1/249.8 24p/24pA mode: 1/24.0 to 1/249.8 50i/50p mode: 1/50.0 to 1/249.8 25p mode: 1/25.0 to 1/249.8
Shutter Speed (Slow):	60i/60p mode: 1/15, 1/30 30p mode: 1/15 24p/24pA mode: 1/12 (720p mode only) 50i/50p mode: 1/12, 1/25 25p mode: 1/12
Variable Frame Rate :	60 Hz mode: 12/18/20/22/24/26/30/32/36/48/60 fps (frame/sec) 50 Hz mode: 12/18/20/23/25/27/30/32/37/48/50 fps (frame/sec)
Sensitivity:	F10 (Typical) at 2000 lx

Video P2 HD General

Sampling Frequency:	Y: 74.25MHz Pb/Pr: 37.125Mhz
Quantizing:	8 bits
Compression:	Compression ratio 1/6.7, DCT + variable length code
Recording Bit Rate:	100Mbps

Audio P2 HD General

Sampling Frequency:	48 kHz
Quantizing:	16 bit/4CH
Head Room:	20 dB

Memory Card Recorder

Recording Format:	DVCPRO HD/DVCPRO 50/DVCPRO/DV selectable
Audio Recording Format:	PCM digital recording 48 kHz /16 bits 4ch (DVCPRO HD / DVCPRO 50), 2ch/4ch selectable (DVCPRO / DV)
Recording Time*1:	8 minutes with one AJ-P2C008HG (DVCPRO HD, 4CH) (Approx.) 16 minutes with one AJ-P2C016RG (DVCPRO HD, 4CH)
P2 Card Slot:	4 Slot (4G, 8G, 16G Card)
SD Card Slot:	SD Format standard (MMC not used) 1 Slot (Camera setup, Reading/Writing)
Recording File:	MXF File
File System:	FAT32

Input/Output Signal

Gen Lock:	BNC x 1, 1.0Vp-p, 75Ω
Component Out:	D4 terminal (Component) , Y: 1.0Vp-p, 75Ω, Pb/Pr: 0.7Vp-p, 75Ω
Video Out:	BNC x 1, 1.0Vp-p, 75Ω
SDI Out:	BNC x 1, 0.8Vp-p, 75Ω (HD:SMPTE292M/296M/299M/ SD:SMPTE259M-C/272M-A/ITU-R.BT656-4 Standard)
TC In:	BNC x 1, 0.5 to 8Vp-p, 10KΩ
TC Out:	BNC x 1, Low impedance, 2.0 ±0.5V p-p
IEEE 1394:	6 pin, Digital In/Out, based on IEEE 1394 Standard
DC In:	XLR x 1, 4-pin, DC12V (DC11.0 to 17.0V)
DC Out:	4-pin, DC12V (DC11.0 to 17.0V), max 1.5 A.
Remote:	10 pin
Lens:	12 pin
EVF:	20 pin
USB 2.0 (Device):	Type-B, 4-pin (USB ver2.0)

Audio Input

MIC IN:	XLR x 2 (FRONT1, FRONT2), High impedance, +48V compatible MIC: -40/-50/-60 dBu (Switch on Menu)
AUDIO IN:	XLR x 2 (REAR1, REAR2), High impedance, LINE/MIC+48V switchable LINE: 0 dBu, MIC: -50/-60 dBu (Switch on Menu)
Line Out:	Pin Jack x 2 (CH1/CH2), Out: 600Ω, 316mV
Phones:	Stereo Mini jack (3.5mm diameter)
Internal Speaker:	28mm round shape x 1

Monitor, Speaker and Other packages

LCD Monitor:	3.5", LCD color Monitor, 210,000 pixels, 4:3
Supplied Accessories:	1.5", CRT B/W Viewfinder (4:3 CRT, NTSC/PAL switchable), Component Video Cable, Shoulder strap, P2 card software driver (CD-ROM)

* Product image and the specifications are subject to change without notice.