

Panasonic

C I N E M A



VARICAM

35





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V
VARICAM

35

4K
PROFESSIONAL



Achieve Your Vision

A New Vision and Revolution in Filmmaking — Cinema VariCam 35

The Cinema VariCam line of cameras has been used on a wide variety of movies, commercials, and TV programs, and is renowned for its color reproduction, look, and for bringing progressive workflows to the production industry.

This technology and know-how are now invigorating a new lineup. VariCam 35 boasts the highest-quality images of the new VariCam Series. It features a dynamic range with 14+ stops of latitude and a wide color gamut, acquisition functions that support 4K/120fps uncompressed RAW recording with Codex V-RAW Recorder* to bring form to the vision of today's image creators. It's part of a revolution, a highly innovative workflow led by dual codec recording, in-camera color grading, and a modular design with superlative durability, system expandability, and operating ease.

Experience what it can do to achieve your vision, and join in the ultimate revolution — with the VariCam 35.

*Codex V-RAW Recorder is a product of Codex.



"VariCam Look" sample image



Upper: Super 35 mm PL lens mount/Lower: HDR (High Dynamic Range) image

Cinematic Images at 4K Resolution

Super 35 mm 4K MOS Sensor

The VariCam 35 is equipped with the super 35 mm format full-size single-chip MOS sensor developed especially for this model. It offers 4K (4096 x 2160) and UHD (3840 x 2160) resolution, and boasts high sensitivity, low noise, wide dynamic range and cinematic depth of field.

14+ Stops of Latitude

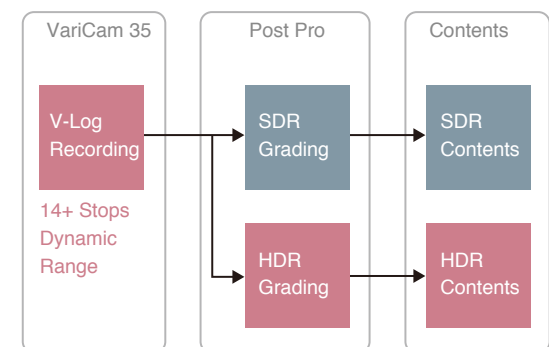
The dynamic range is 14+ stops. The wide dynamic range assures accurate image rendering over the entire image area, from dark parts to highlights. Even in dimly lit scenes, which are particularly important in movie production, the VariCam 35 provides low-noise images without any compromise in picture quality.

The "VariCam Look" with Evolved Color Gamut and Dynamic Range

The VariCam 35 is equipped with the newly developed "V-Gamut" giving it a wider color gamut than that of film. The gamma curve has evolved to "V-Log", further extending the dynamic range. It is capable of recording the 14+ stops of dynamic range offered by the VariCam 35, and enhances grading flexibility. The V-709 gamma provides a tone suitable for previewing on a monitor. It is also suitable for use in producing broadcast content such as TV commercials and TV series.

HDR (High Dynamic Range) Compatible

By providing a dynamic range with 14+ stops of latitude to the footage acquired using the VariCam 35's V-Log gamma, HDR (High Dynamic Range) grading output in compliance with the SMPTE EOTF standard "ST 2084" is available for post production.



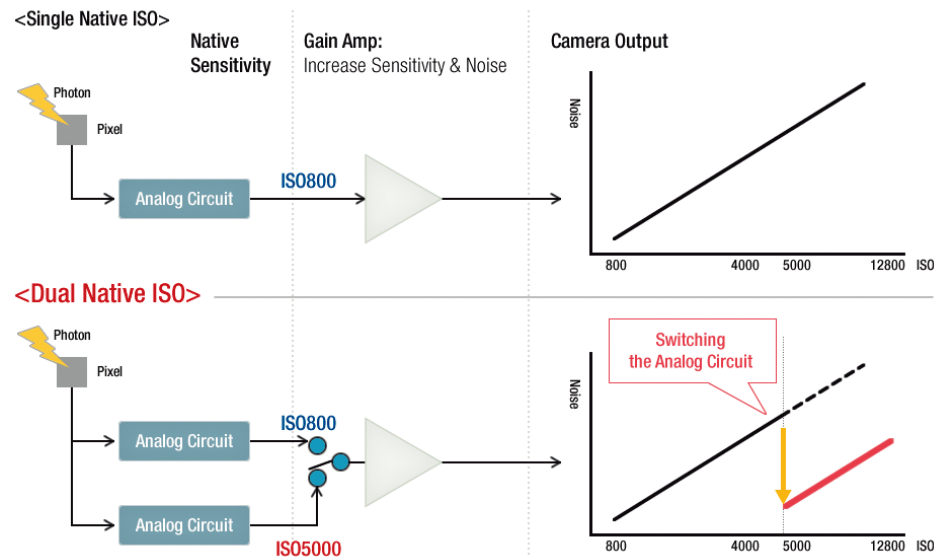


Shooting with ISO 5000

Upper: Shot on Native ISO 800 / Lower: Shot on Native ISO 5000

Dual Native ISO of 800/5000

The VariCam 35 has two native ISO settings: 800 and 5000. This means the VariCam 35 achieves very high sensitivity while maintaining a low noise level at 5000 ISO. The noise level at 5000 ISO is nearly identical to that seen at 800 ISO. In order to achieve this function two dedicated analog circuits are implemented on each pixel of the imager of the VariCam 35 for two native ISO before gain processing. This allows the camera to achieve much higher sensitivity without increased noise. Normally noise is introduced in the gain process of rating ISO in digital cameras. This functionality is revolutionary for low light scene shooting. Especially this ISO 5000 enables the camera to capture with very low available light maintaining a realistic mood.



Multiple Codec 4K Recording



Control panel side: 4K Camera Module, Recording Module



Codex V-RAW Recorder*3

4K-Optimized Internal Optical Filter

The VariCam 35 has a high-precision internal optical filter made by bonding an optical low-pass filter and IR glass and providing it with a UV/IR-cut coating (membrane). The low-pass filter is tuned for 4K, so it eliminates aliasing and provides optimum resolution. The UV/IR-cut filter prevents ghosts and reddening in dark areas inside the camera unit. For frequently used ND filters, the compact body houses a rotary filter system with four filters (0.6ND, 1.2ND, 1.8ND, CLEAR) for easy switching.

4K AVC-ULTRA Codec Recording

AVC-Intra4K is a 4K-compatible version of the AVC-Intra intraframe compression codec suitable for video production. Using this, the VariCam 35 can record with 4K (4096 x 2160) or UHD (3840 x 2160) resolution by AVC-Intra4K444/422/LT codecs. The VariCam 35 supports AVC-Intra2K444/422 for 2K recording and AVC-Intra444/422/200/100 for HD recording. In addition to this, Apple ProRes*1 is also supported for HD acquisition, to enable recording of ProRes 4444/ 422 HQ. Using the new large-capacity expressP2 card*2, it can record approximately 180 minutes of 4K422/24p video, 24 bit/48 kHz/ 4-channel high-quality audio, and metadata.

V-RAW Recording

Using the Codex V-RAW Recorder*3

The Codex V-RAW Recorder*3 for VariCam can be docked to the rear section of the VariCam 35, thus eliminating the need for cable connection. This allows simultaneous recording of V-RAW data using this optional system on top of the recorder of the VariCam 35. The Codex V-RAW Recorder*3 supports uncompressed RAW recording with a frame rate up to 120 fps.

Variable Frame Rate

Variable frame rate recording in the range of 1 fps to 120 fps. Overcranking (slow-motion) and undercranking (quick-motion) effects are also possible. Frame rate can be adjusted while shooting.

*1: ProRes is licensed from Apple Inc. Apple ProRes codec is under license from Atomos.

Atomos is a trademark and copyright of Atomos Global Pty. Ltd.

*2: *Schedule to be released in May 2016.

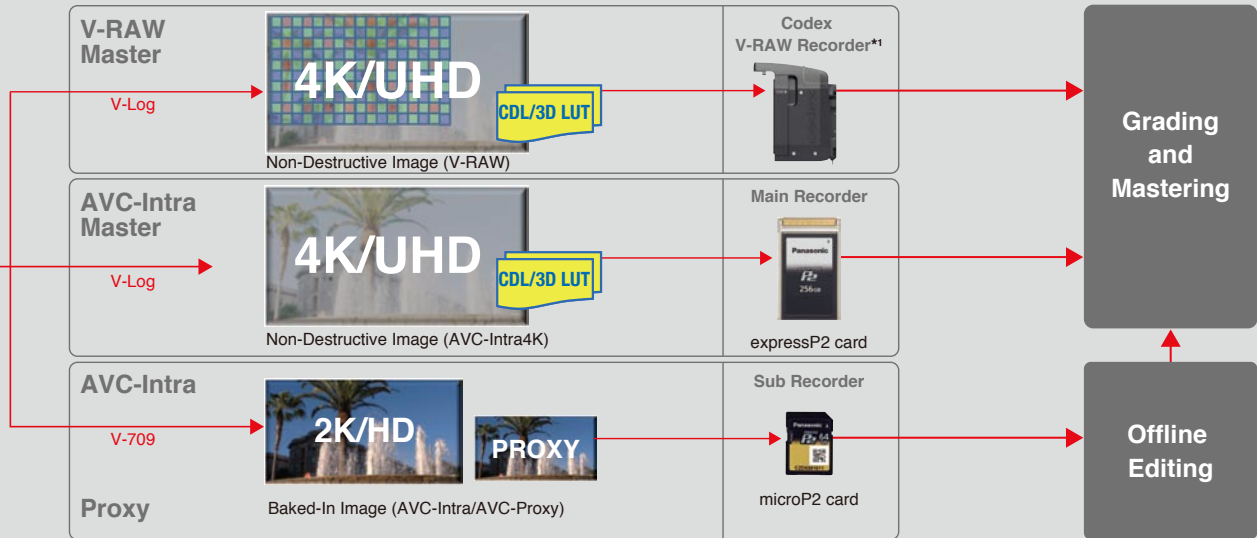
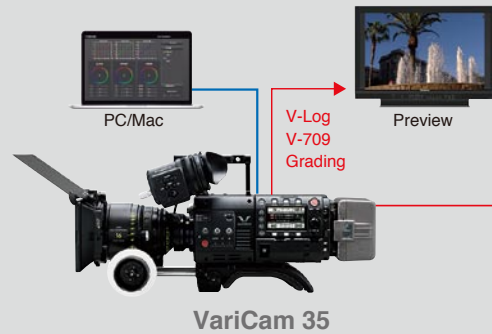
*3: Codex V-RAW Recorder is a product of Codex.



Revolutionary VariCam Workflows “Dailies in Camera”

In Camera Color Grading

Remote operation by control panel or 3rd party software



* This chart shows an example of the workflow using VariCam 35.

*1: Codex V-RAW Recorder is a product of Codex.

In-Camera Color Grading

The VariCam 35 also features an in-camera color grading function (3D LUT/CDL). This enables color tuning in the field, using the control panel of the VariCam or 3rd party software. Dailies that had been created after shooting can now be produced on-set and with only the camera. Grading information, such as a 3D LUT file and CDL file, can be recorded together with the image data of the Main Recorder, Sub Recorder and Codex V-RAW Recorder, thus allowing you to reflect what you imaged on-site to the post production process. LUT and CDL files can also be applied to playback and output images from Ver. 5.0 onward.

Double-Recorder and Double-Codec Recording

The VariCam 35 is provided with two independent recorders. This feature lets you record in two different formats and codecs, and select from V-Log/V-709/Grading, which means both an ungraded V-Log/4K master and graded HD dailies can be recorded simultaneously. It gives you main data for cinema production, as well as HD video for previewing or broadcasting. The sub-recorder records 2K/HD (AVC-Intra422/AVC-Intra100) together with a lower-rate AVC-Proxy file. All files contain common metadata. By using metadata from the proxy/preview file, speedy operation is possible when conducting offline editing.

From Ver. 5.0, the camera index, reel number, and clip number can be added to the filename to support cinema-style file names. Also, the exact same filename and recording time can be created for both MAIN and SUB recorders.

Recording Format (Video Format and Recording Codec)

Recorder	Video Format	Recording Codec
V-RAW	4K (4096 x 2160)	V-RAW 12 bit/10 bit
	UHD (3840 x 2160)	V-RAW 12 bit/10 bit
Main Recorder	4K (4096 x 2160)	AVC-Intra4K444 AVC-Intra4K422 AVC-Intra4K-LT
	UHD (3840 x 2160)	AVC-Intra4K-LT
	2K (2048 x 1080)	AVC-Intra2K444 AVC-Intra2K422
	HD (1920 x 1080)	AVC-Intra444 AVC-Intra200 AVC-Intra422 AVC-Intra100 ProRes 422 HQ ProRes 4444
Sub Recorder	2K (2048 x 1080)	AVC-Intra2K422 + AVC-Proxy
	HD (1920 x 1080)	AVC-Intra422 AVC-Intra100 AVC-LongG50 AVC-LongG25 + AVC-Proxy

*For details, please visit Panasonic website. (<http://pro-av.panasonic.net/>)

4K Multiple Output and Modularity



Side connector panel of the recorder



Example of another employment which uses the crane



AU-VEXT1G Extension Module and AU-VCBL05G Extension Cable

4K-Compatible Input/Output Terminals

VariCam 35 has flexible connection to external recorder and monitor.

- HD/3G SDI 4K QUAD Output (BNC x 4)
- HD/3G SDI Monitor Output (BNC x 2)
- HD/3G SDI VF SDI Output (BNC x 1)
- AUDIO Input (XLR x 2, 3-pin)
- MIC Input (XLR x 1, 5-pin)

Modular Structure

The VariCam 35 is comprised of the AU-V35C1G 4K camera module with PL lens mount and the AU-VREC1G recording module. This recording module is the same as that of the VariCam HS featuring the AU-V23HS1G HD camera module with 2/3-type lens mount. The two camera heads are interchangeable to suit a variety of applications. The camera head docks to the recorder without any cable connection. And the rugged docking mechanism allows easy docking and undocking in the field, without having to use a screwdriver.

Separate Location Operation

Using the AU-VEXT1G Extension Module, the camera module and recording module can be positioned at separate locations and connected with the AU-VCBL05G (5-meter length) or the AU-VCBL20G (20-meter length) Extension Cable. This lets you mount only the camera head to a crane, thus adding flexibility to your camera work.

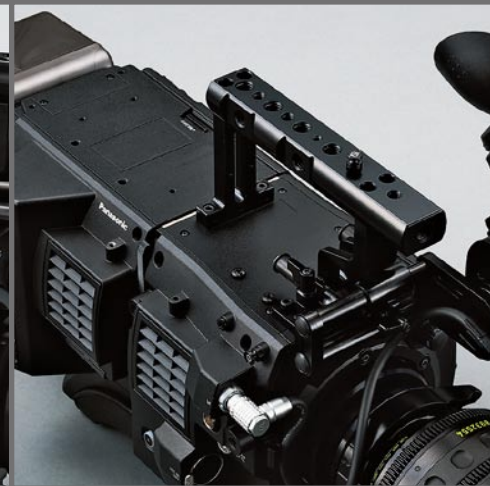
Operability, Durability and Reliability



Detachable control panel



Installation of control panel



Flat top body and handle with screw holes



Large-diameter OLED viewfinder

Detachable Control Panel with Monitor

Control panel on the recording module has a built-in 3.5-type LCD display panel. It can be used as the display for menu operation and also can be used as a live/preview monitor. The keys and dials are laid out around the display for quick and accurate operation so frequently used settings can be accessed directly.

GUI is developed to suit those in filmmaking but the menu suitable for video system users are also available. The detachable structure allows the camera to be operated from a distant location (with 90cm extension cable). The VariCam 35 supports a variety of shooting styles and adds flexibility.

Toughness, Durability and Reliability

- The lens mount section is made of stainless steel, and designed to prevent flange back deviation due to temperature changes.
- Body made of strong and rigid aluminum alloy.
- Cooling system designed for effective dissipation of heat from the circuitry section.

Compatible with a Wide Variety of Cine Style Accessories

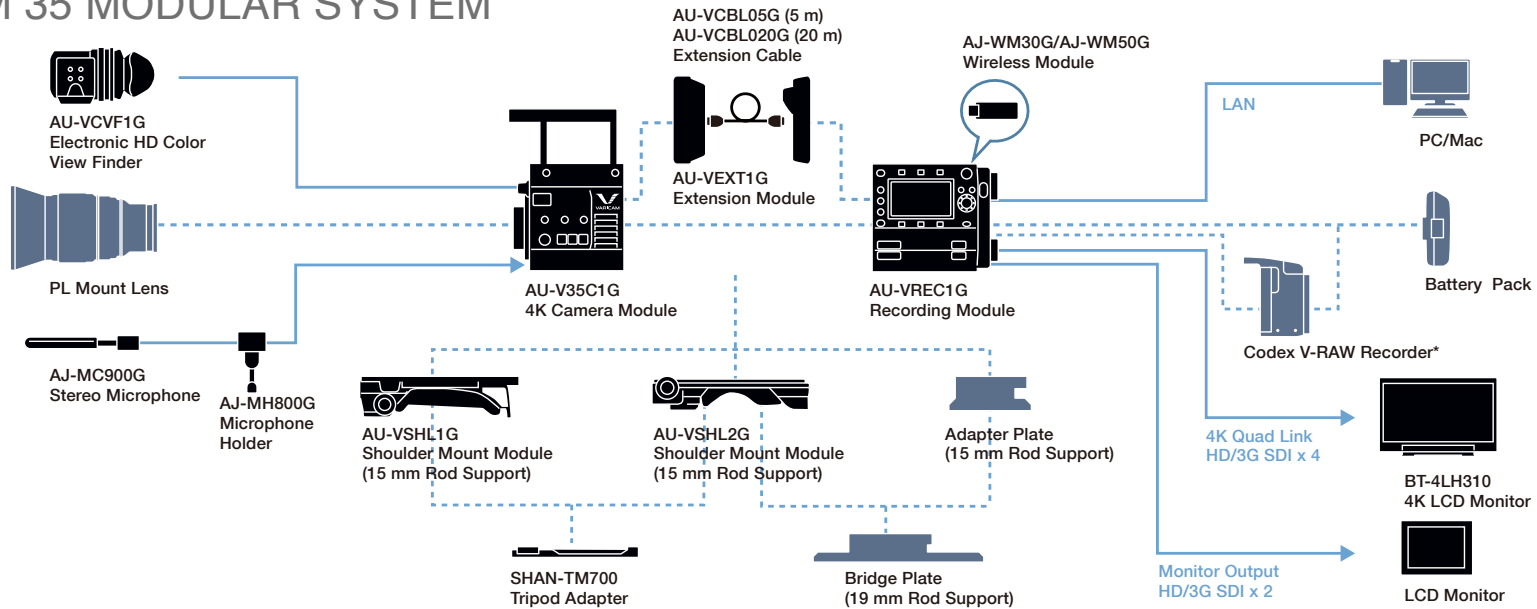
- Flat top and bottom panels for easy installation of various plates.
- Mounting holes provided on both sides and handle for convenient mounting of accessories.
- Shoulder mount module (AU-VSHL1G/AU-VSHL2G) can be moved in a range of 110 mm (4-3/8 Inches) in the front and back direction to accommodate a diversity of lenses.

Large-Diameter OLED Viewfinder (AU-VCVF1G)

The 0.7-type (1280 pixels x 720 pixels) high-resolution OLED panel shows a wide field angle with a viewfinder magnification of 0.78x. The large-diameter 38 mm eyepiece lens with high eye point (minimum vignetting) and the eyepiece filter allow comfortable viewing. The optical zoom function responds to precise focusing needs.

VARICAM 35 MODULAR SYSTEM

As of April 2016



*Codex V-RAW Recorder is a product of Codex.

MODULE AND ACCESSORY

As of April 2016



AU-V35C1G
4K Camera Module



AU-V23HS1G
2/3 type HD Camera Module



AU-VREC1G
Recording Module



AU-VCVF1G
Electronic HD Color View Finder



AU-VEXT1G
Extension Module



AU-VCBL05G
Extension Cable (5 m)
AU-VCBL20G
Extension Cable (20 m)



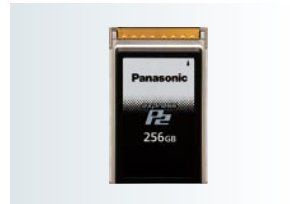
AU-VSHL1G
Shoulder Mount Module



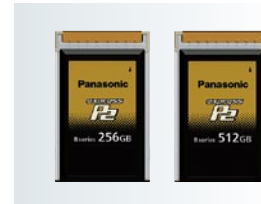
AU-VSHL2G **NEW**
Shoulder Mount Module



AJ-WM30G
AJ-WM50G **NEW**
Wireless Module
*Not available in some areas.



AU-XP0256AG (256 GB)
Memory Card "expressP2 card"



AU-XP0256BG (256 GB) **NEW**
AU-XP0512BG (512 GB) **NEW**
Memory Card "expressP2 card"



AU-XPD1
Memory Card Drive
"expressP2 drive"

*Scheduled for release in May 2016.

VARICAM 35 SPECIFICATIONS*1

As of April 2016

General (Combination of AU-V35C1G and AU-VREC1G)

Power:	DC 12 V (11.0 V – 17.0 V)
Power Consumption:	69 W (body only) 99 W (with all optional accessories connected and maximum power supplied from each output terminal)
Operating Temperature:	0 °C to 40 °C (32°F to 104°F)
Operating Humidity:	10% to 85% (relative humidity)
Storage Temperature:	-20 °C to 60 °C (-4°F to 140°F)
Weight:	Approx. 5.0 kg (11.02 lb) (excluding accessories)
Dimensions (W x H x D) :	179 mm x 230.5 mm x 347 mm (7-1/16 inches x 9-3/32 inches x 13-21/32 inches) (body only, excluding protrusions and accessories)

Ensure that the total current from the DC OUT terminal, VF terminal, and LENS terminal of the camera module, and the DC OUT/RS terminal and USB HOST terminal of the recording module does not exceed 30 W.

Camera Module (AU-V35C1G)

Pickup Device:	super35 mm, MOS, 8.9 megapixels
Number of Pixels:	Total pixels: Approx. 10.3 million pixels, Effective pixels: Approx. 8.9 million pixels
Lens Mount:	35 mm, PL mount
Optical Filter:	ND filter: 1: CLEAR, 2: 0.6 ND, 3: 1.2 ND, 4: 1.8 ND
EI Settings:	Native ISO: 800, 5000 800 Base: 200 to 4000 5000 Base: 1250 to 12800
Shutter Speed:	[deg] mode: 1.0 deg to 358 deg (0.5 deg step) [sec] mode: 1/24 sec to 1/250 sec (for 24p mode)

Recording Module (AU-VREC1G) When used with AU-V35C1G

Memory Card Recorder

Recording Media:	expressP2 card, P2 card, microP2 card
Recording Resolution:	4096 x 2160, 3840 x 2160, 2048 x 1080, 1920 x 1080
Recording Frame Rate:	4K/UHD: Maximum 100p/120p 2K/HD: Maximum 100p/120p
System Frequency:	59.94p, 50p, 29.97p, 25p, 24p, 23.98p, 59.94i, 50i
Recording Format: (Main Recorder)	AVC-Intra4K444, AVC-Intra4K422, AVC-Intra4K-LT, AVC-Intra2K444, AVC-Intra2K422, AVC-Intra444, AVC-Intra200, AVC-Intra422, AVC-Intra100, ProRes 422 HQ, ProRes 4444 *3
Recording Format: (Sub Recorder)	AVC-Intra2K422, AVC-Intra422, AVC-Intra100, AVC-LongG50, AVC-LongG25
Recording Video Signal:	4096 x 2160/59.94p, 50p, 29.97p, 25p, 24p, 23.98p 3840 x 2160/59.94p, 50p, 29.97p, 25p, 23.98p 2048 x 1080/59.94p, 50p, 29.97p, 25p, 24p, 23.98p 1920 x 1080/59.94p, 50p, 29.97p, 25p, 23.98p, 59.94i, 50i

Recording Time**: (Main Codec)	When using 256 GB expressP2 card AVC-Intra4K444 (24p): Approx. 45 min. AVC-Intra4K422 (VFR ON, 50fps/60fps): Approx. 36 min. AVC-Intra4K422 (VFR OFF, 24p): Approx. 90 min. AVC-Intra4K-LT (VFR ON, 100fps/120fps): Approx. 32 min. AVC-Intra100 (VFR ON, 100fps/120fps): Approx. 64 min. ProRes 422 HQ*3 (VFR ON, 60fps): Approx. 60 min.
Recording Time**: (Sub Codec)	When using 64 GB microP2 card AVC-Intra2K422 (25p/29.97p): Approx. 64 min. AVC-Intra100 (25p/29.97p): Approx. 64 min. AVC-LongG50 (25p/29.97p): Approx. 128 min. AVC-LongG25 (25p/29.97p): Approx. 256 min.

Digital Video

Quantizing:	AVC-Intra4K444, AVC-Intra2K444, AVC-Intra444: 12 bit, others: 10 bit
Video Compression Format:	AVC-Intra4K444, AVC-Intra4K422, AVC-Intra4K-LT, AVC-Intra2K444, AVC-Intra2K422, AVC-Intra444, AVC-Intra200, AVC-Intra422, AVC-Intra100: MPEG-4 AVC/H.264 Intra Profile AVC-LongG50, AVC-LongG25: MPEG-4 AVC/H.264 ProRes 422 HQ, ProRes 4444: Apple ProRes*3

Digital Audio

Recording Audio Signal:	48 kHz/24 bit, 4 ch
Head room:	18 dB/20 dB switchable menu
Proxy	
File Format:	MOV
Video Compression Format:	H.264/AVC High Profile
Audio Compression Format:	LPCM
Recording Time (1 GB)**:	Approx. 25 min.

Video Input/Output

SDI OUT:	HD (1.5G)/3G-SDI, 0.8 V[p-p], 75 Ω (1 set, 4 pieces)
MON OUT1:	HD (1.5G)/3G-SDI, 0.8 V[p-p], 75 Ω
MON OUT2:	HD (1.5G)/3G-SDI, 0.8 V[p-p], 75 Ω
VF SDI:	HD (1.5G)/3G-SDI, 0.8 V[p-p], 75 Ω

Audio Input/Output

AUDIO IN (CH1/CH2):	XLR x 2, 3-pin, LINE/MIC/MIC+48 V/AES switchable
MIC IN:	XLR x 1, 5-pin
PHONES:	Stereo mini jack
Speaker:	20 mm diameter, round x 1

Other Input/Output

GENLOCK IN:	HD (1.5G)/3G-SDI, 0.8 V[p-p], 75 Ω
TC IN/OUT:	BNC x 1, Input/Output switching IN: 0.5 V[p-p] to 8 V[p-p], 10 kΩ OUT: 2.0 V ± 0.5 V[p-p], low impedance

DC IN:	XLR 4-pin, DC 12 V (DC 11.0 V to 17.0 V)
DC OUT/RS:	4-pin, DC 12 V (DC 11.0 V to 17.0 V), maximum output current 1.0 A
DC OUT:	2-pin, DC12 V (DC 11.0 V to 17.0 V), maximum output current 1.0 A
LENS:	12-pin x 1, 4-pin x 2
VF:	14-pin
LAN:	100BASE-TX/10BASE-T
USB2.0 (device) :	Type B connector, 4-pin
USB2.0 (host) :	Type A connector, 4-pin
EXT:	50-pin, exclusive for external recording only

Control Panel

Display Panel:	LCD, 3.5-type QHD color monitor, approx. 1.56 million dots
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Extension Module (AU-VEXT1G)

Power:	DC 12 V (11.0 V to 17.0 V)
Power Consumption:	33 W (body only) 63 W (with all optional accessories connected and maximum power supplied from each output terminal)
Operating Temperature:	0 °C to 40 °C (32°F to 104°F)
Operating Humidity:	10% to 85% (relative humidity)
Storage Temperature:	-20 °C to 60 °C (-4°F to 140°F)
Weight:	Camera Extension Module: Approx. 0.95 kg (2.09 lb) Recording Extension Module: Approx. 0.65 kg (1.43 lb)
Dimensions (W x H x D) :	Camera Extension Module: 121 mm x 143 mm x 73 mm (4-25/32 inches x 5-21/32 inches x 2-7/8 inches) Recording Extension Module: 106 mm x 143 mm x 61 mm (4-3/16 inches x 5-21/32 inches x 2-13/32 inches)

Input/Output

DC IN:	XLR 4-pin, DC 12 V (DC 11.0 V to 17.0 V)
DC OUT:	2-pin, DC 12 V (DC 11.0 V to 17.0 V), maximum output current 1.0 A
EXT:	48-pin

Electronic HD Color View Finder (AU-VCVF1G)

Display Panel:	OLED, 0.7-type, approx. 2.76 million dots
Signal Input:	1080/59.94p, 1080/50p, 1080/60p

*1: Specification is as of April 2016. Specification subject to change upon firmware upgrade. For the latest specification, please visit Panasonic website. (<http://pro-av.panasonic.net/>)

*2: Figures are for continuous recording as one clip. Depending on the number of clips, the overall recording time may be shorter than the above.

*3: ProRes is licensed from Apple Inc. Apple ProRes codec is under license from Atomos. Atomos is a trademark and copyright of Atomos Global Pty. Ltd.

VariCam Series



4K Camera Recorder AU-V35LT1G

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The 4K camera recorder enables highly flexible camera work. Installed the same super 35 mm image sensor with VariCam 35. A dynamic range with 14+ stops of latitude and dual native ISO (800/5000) are integrated into this compact and lightweight (approx. 2.7 kg / 6.0 lb) camera recorder. This invites flexibility in the form of shoulder mounting, gimbal, and drone applications. An EF lens* mount comes as standard equipment, and can be exchanged with a PL mount (optional).

* Panasonic does not guarantee the compatibility or performance of all EF lenses. Details will be updated on the Panasonic website.



2/3-type HD Camera Recorder AU-V23HS1G with AU-VREC1G

V HS
VARICAM

Equipped with a 2/3-type lens mount, the VariCam HS enables HD acquisition with a high-speed frame rate of 240 fps max. The recorder module is the same as that of the VariCam 35. By simply exchanging the camera module with the AU-V23HS1G 2/3-type HD camera module, this model is capable of high-speed captures.

4K Line-Up



4K Camera Recorder

AG-DVX200 **4K**

This 4K camera recorder with integrated lens offers excellent mobility. Its large 4/3-type image sensor produces superb bokeh effects, and a dynamic range with 12 stops of latitude, and the 4K/24p, UHD/60p, FHD/60p multi-codec renders high-quality images. A built-in 13x zoom lens combines with a high-speed, high-precision full-auto function and professional manual function to provide levels of operating ease and maneuverability that only a camera with an integrated lens can do.

Digital Camera/Interface Unit

AG-GH4U **4K**



This digital single lens mirrorless camera excels in 4K video recording (Professional Interface Unit Model). V-Log L*1 adds a dynamic range with 12 stops of latitude. The interface unit features a Quad Link SDI output*2 that connects to professional 4K recorders and 4K monitors, as well as 2 channels of XLR audio input, and TC input.

*1: You may need to update the firmware. Please refer to "service and support" on the Panasonic Website.

*2: Motion pictures cannot be recorded onto the memory card in the camera when 4:2:2/10 bit output is selected.



787.4 mm (31 inches) 4K LCD Monitor

BT-4LH310 **4K**

This reference monitor is actively used in 4K, 2K, and HD image production. BT-4LH310 offers 4K (4096 x 2160), QFHD (3840 x 2160) resolution and a DCI (P3) color gamut. An LUT (Look-up Table) upload function also supports digital cinema color management.

Panasonic®

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