

SONY



Digital HD Videocassette Recorder

HVR-M35N/P
HVR-M25AN/AP
HVR-M15AN/AP

HDV
HDV 1080i

PROGRESSIVE

The Perfect Choice for Cost-effective HD Productions-the Sony HVR-M35N/P, HVR-M25AN/AP and HVR-M15AN/AP HDV 1080i VTRs



HVR-M35N/P



HVR-M25AN/AP



HVR-M15AN/AP

Sony has introduced affordable, yet high-performance HD recording systems incorporating the HDV™ 1080i specification for use in its products, thereby offering the HDV format to a wide range of professional videographers. Since they were introduced, HDV systems have gained rapid and wide acceptance due to their high picture quality, outstanding performance, and cost effectiveness.

Today, in response to the demands for greater levels of operability, such as longer recording time and progressive format playback/record capabilities, Sony has introduced its latest HDV recorders – the HVR-M35N/P, HVR-M25AN/AP and HVR-M15AN/AP.

The HVR-M35N/P, HVR-M25AN/AP and HVR-M15AN/AP enable users to record and play back video in a choice of formats –HDV 1080i, DVCAM™, and DV. They also feature the HDV native progressive format capability, which provides stunning 1080p image at 24, 25 or 30 frames per second.*

One of the most powerful features of these VTRs is their compatibility with standard cassettes in addition to mini cassettes, which provides extended recording time of up to 276 minutes.

These models are optimized for use with nonlinear editing systems thanks to their highly compact size and ease of operation. However, the HVR-M35N/P and HVR-M25AN/AP provide additional powerful features such as a built-in 2.7-inch*1 type, 16:9 LCD monitor and an HD-SDI or HDMI (High Definition Multimedia Interface) output for more demanding production environments.

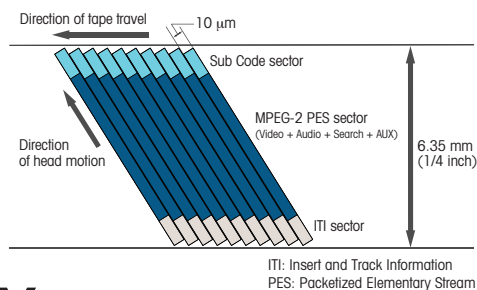
The HVR-M35N/P, HVR-M25AN/AP and HVR-M15AN/AP are highly powerful, yet cost-effective tools for nonlinear editing systems that will serve both today's production needs, as well as those of tomorrow.

*In this brochure, "24p" means "23.98p" video signal and "30p" means "29.97p" video signal.

HDV 1080i Specification

The HDV 1080i specification*2 of the HDV format features 1,080 effective scanning lines (interlace scanning system) and 1,440 horizontal pixels. It adopts the MPEG-2 compression format (MP@H-14 for video), which uses 8-bit digital component recording with a sampling rate of 4:2:0. The HDV 1080i specification provides high picture quality that can be used for HDTV program production. In HDV format, the progressive recording format is also defined as an option for HDV1080i specification. With this format, called HDV native progressive format, 1080p images at 24, 25 or 30 frames per second can be recorded. The HVR-M35N/P/M25AN/AP/M15AN/AP enables users to play back 1080p images recorded with camcorders featuring this format and to record with i.LINK input.

Track Pattern of the HDV 1080i Specification



HDV
HDV 1080i

PROGRESSIVE

ITI: Insert and Track Information
PES: Packetized Elementary Stream

Compatible with Existing and New DV Videocassette Tape

As a member of the proven DV family of formats, the HDV format has, from the outset, been developed for compatibility with all grades of DV videocassette tape. This allows operators to use high-grade DV videocassette tapes for applications where high robustness is critical, or consumer-grade videocassette tapes for more economical operations. For heavy-duty applications, the DigitalMaster™ high-grade cassette tape has been developed. This tape is compatible with the HDV, DVCAM, and DV formats.

Long Recording Time

The HDV format adopts the same track pitch and tape speed as the DV format, thus offering the same recording time – a maximum of 276 minutes when recording on a DigitalMaster standard cassette tape and a maximum of 63 minutes when recording on a DigitalMaster mini cassette tape.



FEATURES OF HVR-M35N/P, HVR-M25AN/AP AND HVR-M15AN/AP

Switchable Recording and Playback

– HDV 1080i/DVCAM/DV SP and 60i/50i M35 M25A M15A

The HVR-M35N/P/M25AN/AP/M15AN/AP can switch between HDV 1080i, DVCAM, and DV*3 recording, providing full flexibility to record in either standard definition or high definition depending on your production needs. In addition, it can be switched between 60i and 50i modes (NTSC and PAL), which allows for flexible production operations, without the need for two separate VTRs of each standard. These models also supports HDV native progressive recording format, so they can playback/record;

- HDV1080i: 60i/50i/24p/30p/25p
- DVCAM/DV:60i/50i

Dual-size Cassette Mechanism

M35 M25A M15A

The HVR-M35N/P/M25AN/AP/M15AN/AP has a dual-size cassette mechanism that accepts both mini- and standard-sized DigitalMaster, DVCAM, and DV cassette tapes – without using any special adaptor. This feature allows the six different types of cassette tape to be used without the cumbersome process associated with additional mechanical hardware.

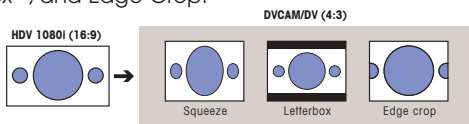


*1 Viewable area measured diagonally. *2 The HDV format also defines the HDV 720P specification, which features 720 effective scanning lines (progressive scanning system) and 1,280 horizontal pixels. *3 The HVR-M35N/P/M25AN/AP/M15AN/AP supports DV SP mode only; no support for DV LP mode.

FEATURES

Down-conversion Playback Capabilities M35 M25A M15A

The HVR-M35N/P/M25AN/AP/M15AN/AP can convert material from 1080i down to 480i and 576i, and output these video signals through its i.LINK interface. In addition, these signals can also be output via the other connectors. This allows users to edit recorded material with a compatible nonlinear editing system using current DV editing software, as well as record SD signals to an external VTR. Video material can also be down-converted to 480P and 576P (as well as 720P on the HVR-M35N/P/HVR-M25AN/AP), and output via the VTR's SDI (on the HVR-M35N/P), HDMI (on the HVR-M25AN/AP) or analog component video connector. When down-converting these signals, the aspect ratio displayed can be converted from 16:9 to 4:3. Display modes can be selected from Squeeze, Letterbox*, and Edge Crop.



Recording Formats

(60i/50i SEL)	Input Terminal		Recording Format		
	Input Format		HDV	DVCAM	DV(SP)
60i	i.LINK	HDV 1080/60i	○	-	-
		HDV 1080/30p	○	-	-
		HDV 1080/24p	○	-	-
		DVCAM/DV 480/60i	-	○	○
Analog Composite / S-Video			○	○	
50i	i.LINK	HDV 1080/50i	○	-	-
		HDV 1080/25p	○	-	-
		DVCAM/DV 576/50i	-	○	○
		Analog Composite / S-Video	-	○	○

○ : Available

Playback Formats

(60i/50i SEL)	Recorded Format		MENU SETTING (COMPONENT)*1 (SDI/CMPNT)*2 (SDI/CMPNT)*3	Output				
				Analog Composite	S-Video	Analog Component (M25AN/AP only)	HDMI (M35NP only)	HD/SD-SDI (M35NP only)
60i	HDV	1080/60i	480i	480/60i	480/60i	480/60i	480/60i	
		1080/30p	480p/480i		480/60p	not available	not available	
		1080/24p	1080/480i		1080/60i	1080/60i ¹⁴	1080/60i ¹⁴	
	DVCAM/DV 480/60i	720p/480i ²⁺³	720/60p		720/60p	720/60p		
		480i	480/60i		480/60i	480/60i		
		480p/480i	480/60p		480/60p	480/60i		
50i	HDV	1080/50i	576i	576/50i	576/50i	576/50i	576/50i	
		1080/25p	576p/576i		576/50p	not available	not available	
		1080/25p	1080/576i		1080/50i	1080/50i ¹⁵	1080/50i ¹⁵	
	DVCAM/DV 576/60i	720p/576i ²⁺³	720/50p		720/50p	720/50p		
		576i	576/50i		576/50i	576/50i		
		576p/576i	576/50p		576/50p	576/50i		

*1 for HVR-M15AN/AP *2 for HVR-M25AN/AP *3 for HVR-M35NP

*4 1080/30p video is converted to 60i (1080/30PsF) *5 1080/25p video is converted to 50i (1080/25PsF)

Output Settings of i.LINK

(60i/50i SEL)	Recorded Format	(HDV DV CONV) MENU SETTING	Output Format via i.LINK Connector
60i	HDV	1080/60i	OFF
		1080/30p	DVCAM
		1080/24p	DV SP
50i	HDV	1080/50i	OFF
		1080/25p	DVCAM
		1080/25p	DV SP

DVCAM/DV signal is output via the i.LINK connector as if it is.

Squeezed SD Video Image Output Type can be Selected. M35

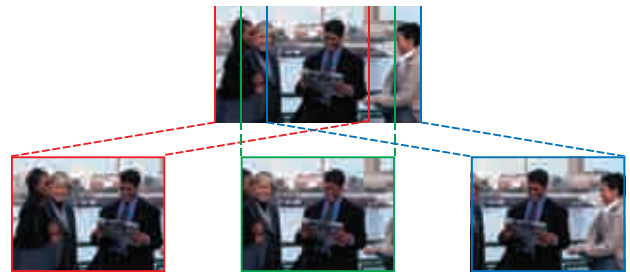
The HVR-M35N/P can convert squeezed SD video images to edge-cropped or letterbox video images for output. This function is convenient when viewing the squeezed SD video image on an SD monitor with 4:3 screen aspect ratio.

HDV Four Channel Audio Playback M35

The HVR-M35N/P can play back four-channel audio recorded with the HVR-S270U shoulder-mount camcorder. The audio data is output via an AES/EBU output terminal. Also the audio data is embedded in the i.LINK or the HD/SD-SDI output signal.

Edge Crop Adjust M35 M25A

When down-converting signals in the Edge Crop mode, the HVR-M35N/P/M25AN/AP's Edge Crop Adjust function is provided to adjust the edge crop position. By displaying the edge crop marker on the LCD monitor, operators can conveniently check the edge crop position before outputting down-converted signals.



i.LINK^{*5} Interface M35 M25A M15A

The HVR-M35N/P/M25AN/AP/M15AN/AP is equipped with a 6-pin^{*6} i.LINK interface. This allows for one cable digital transfer^{*7} of video, audio, and command signals to a compatible connected VTR or nonlinear editing system in HDV, DVCAM, or DV format.

Time Code Copy from External Devices M35 M25A M15A

When the HVR-M35N/P/M25AN/AP/M15AN/AP records signals from the i.LINK port, the time code that was recorded on the original tape can be copied onto other tapes, along with the video and audio signals. This is effective when downloading edited material from nonlinear editors or creating dubs from other VTRs.

Auto Repeat and Custom Repeat M35 M25A M15A

The HVR-M35N/P/M25AN/AP/M15AN/AP has a convenient auto repeat function. This enables the VTR to automatically rewind the tape to either the beginning of the tape, the first complete blank portion, or an index point on the tape, and start playback again from there^{*8}. In addition, the HVR-M35N/P/M25AN/AP has a Custom Repeat function that allows operators to set the number of repeat playbacks, the interval between each playback, and the hour at which the playback should begin.

*4 When outputting down-converted signals in the 4:3 aspect ratio via an i.LINK connector, the Letterbox mode cannot be selected. *5 i.LINK is a trademark of Sony Corporation used only to designate that a product contains an IEEE 1394 connector. Not all products with an i.LINK connector will necessarily communicate with each other. For information on compatibility, operating conditions, and proper connection, please refer to the documentation supplied with any device with an i.LINK connector. For information on devices that include an i.LINK connection, please contact your nearest Sony office. *6 Please use a 4-pin/6-pin i.LINK cable when you connect the HVR-M35N/P/M25AN/AP/M15AN/AP with a device which has a 4-pin i.LINK connector. *7 Insert and assemble editing using HDV material is not recommended with the HVR-M35N/P/M25AN/AP/M15AN/AP. When video programs in the HDV format are transferred via the i.LINK interface and edited, transitions from cut to cut may not be smooth. *8 The HVR-M35N/P/M25AN/AP/M15AN/AP ignores any blank or index point in the first 20 seconds of the tape.

FEATURES

Color Bar and 1-kHz Audio Tone Signal Output

M35 M25A M15A

The HVR-M35N/P/M25AN/AP/M15AN/AP can output several types of color bar, as well as an audio tone signal of 1 kHz. These are useful when checking the system conditions.

External Control

M35 M25A M15A

The HVR-M35N/P/M25AN/AP/M15AN/AP comes equipped with a Remote Commander™ unit, which enables users to control the recorder's functions wirelessly. In addition, the HVR-M35N/P/M25AN/AP/M15AN/AP is equipped with a LANC terminal, as well as a Control S terminal to connect with the optional DSRM-10 Remote Control Unit.



Built-in, 2.7-inch Type, Clear Photo LCD Plus™ Monitor

M35 M25A

The HVR-M35N/P/M25AN/AP is equipped with a 2.7-inch*2 type widescreen color LCD monitor with a high resolution of 211,200 dots. It adopts a newly developed Clear Photo LCD Plus panel, which provides enhanced brightness and a higher level of color reproduction than that used in the DSR-25. This LCD monitor allows operators to view the input source during recording, and check the playback picture in a 16:9 widescreen aspect ratio. Setup menus, VTR/audio settings, and audio level meters can also be displayed.

M35 M25A

Non-compressed Digital HD Output

The HD/SD-SDI output of HVR-M35N/P allows straight duplication to a deck with HD/SD-SDI input such as HDCAM and XDCAM HD. The HVR-M25AN/AP comes equipped with a HDMI interface. This interface allows the HVR-M25AN/AP to transfer non-compressed, high-definition digital video and audio to other HDMI-equipped devices via a single cable.

M35 M25A

DUPLICATE PLUS

The DUPLICATE PLUS function makes it easy to copy video and audio from a VTR or camcorder onto the HVR-M35N/P/M25AN/AP – along with the original time code. Operators simply connect the two i.LINK devices together via their i.LINK interfaces and press the DUPLICATE PLUS and Play buttons on the front panel of the HVR-M35N/P/M25AN/AP. The copying will then begin. This function can also be used for copying the content of multiple tapes onto a single tape, which is convenient when you need to compile multiple mini cassette tapes onto a single standard cassette tape. Another unique feature of DUPLICATE PLUS is the ability to selectively copy portions of material recorded in a designated format from a tape that contains mixed-format recordings. For example, you can choose to copy only HDV format recordings from a tape that includes DVCAM and DV video as well. This DUPLICATE PLUS function is available for any recordable formats (HDV/DVCAM/DV SP).

Playback Zoom

M35

Using the playback zoom function of the HVR-M35N/P, a selected area of the recorded HD images can be enlarged and output in SD format via the i.LINK and analog connectors. This function allows operators to cut out parts of the HD image and use them as SD material.

Built-in Monaural Speaker

M35 M25A

The built-in monaural speaker of the HVR-M35N/P/M25AN/AP allows quick and convenient checking of audio.

Time Code Preset

M35 M25A

The time code of the HVR-M35N/P/M25AN/AP can be preset using any number in H/M/S/F (hours/minutes/seconds/frames) to record desired tape-position information. The time code mode can be selected between "REC RUN" and "FREE RUN". In addition to the time code, user bits can also be set.

Status Check

M35 M25A

At the touch of the STATUS CHECK button of the HVR-M35N/P/M25AN/AP, operators can display the menu settings for Audio Level Meter, Output Signal, Assign Button, and Custom Repeat on the LCD monitor – allowing for easy status or setting checks during recording, playback, and source feeding. It is also possible to display the status of the connected HVR-DR60 hard disk recording unit or the HVR-MRC1 memory recording unit.

Assign Buttons

M35 M25A

The buttons for INDEX, COUNTER RESET, and AUDIO DUB on the front panel of the HVR-M35N/P/M25AN/AP can be used as "Assign Buttons", to which operators can assign another frequently used function.

All Scan Mode

M35 M25A

The All Scan Mode of the HVR-M35N/P/M25AN/AP is similar to the Under Scan Mode of ordinary monitors, in that it displays all effective scanning lines in the LCD monitor when the 1080i mode is selected. This is useful if you want to check pictures for web applications, for example. The All Scan Mode can be easily recalled at the touch of a button if you pre-assign it to one of the three "Assign Buttons".

Compact, Unique Design

M15A

The HVR-M15AN/AP is compact, with a small footprint that enables it to be deployed in existing work environments without disruption. It is also unique in that it can be placed either horizontally or vertically.



FRONT & REAR PANELS

HVR-M35N/P



Front Panel



Rear Panel

HVR-M25AN/AP



Front Panel



Rear Panel

HVR-M15AN/AP



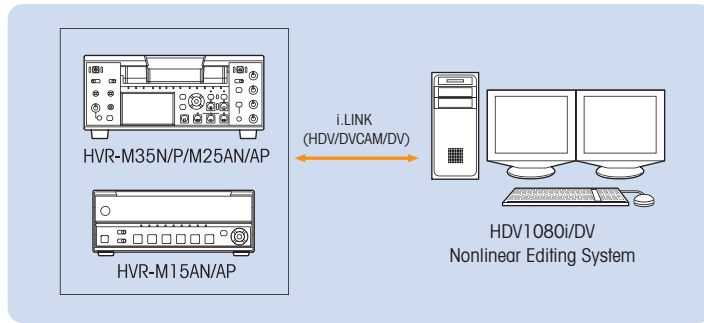
Front Panel



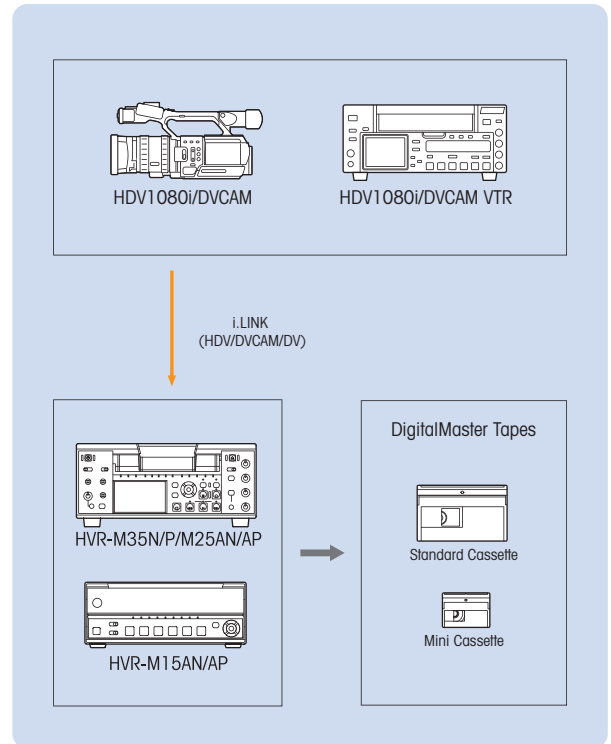
Rear Panel

APPLICATIONS

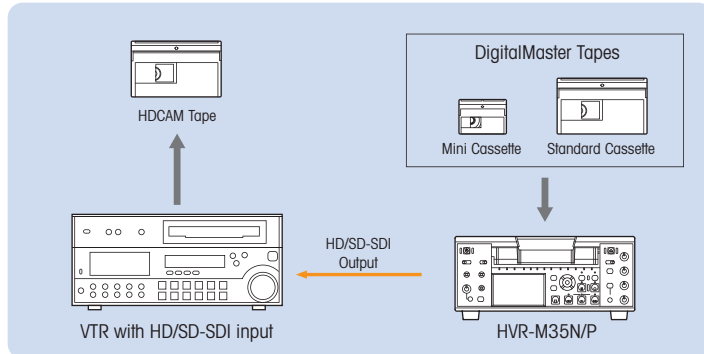
Nonlinear Editing



Dubbing with the Time Code Recording Capability



Dubbing to HD/SD-SDI Deck



COMPARISON

	HVR-M35N/P	HVR-M25AN/AP	HVR-M15AN/AP
HDV native progressive format	30p / 24p / 25p	30p / 24p / 25p	30p / 24p / 25p
HDV 4ch audio	YES	NO	NO
LCD panel	YES	YES	NO
Speaker	Monaural x1	Monaural x1	NO
HD/SD-SDI out	YES	NO	NO
HDMI out	NO	YES	NO
AES/EBU out	YES	NO	NO
TC out	YES	NO	NO
Audio out	XLR x4	RCA x2	RCA x2
Main Power Switch	YES	YES	No
Playback Zoom	YES	NO	No
Color Bar	4 types + BLACK	3 types	3 types
Squeezed SD output type	YES (SQ, LB, EC)	NO	No
Edge Crop Adjust	YES	YES	No
VCR profile	YES	NO	No
Status check	YES	YES	No
Status display of the HVR-DR60/MRC1	YES	YES	YES

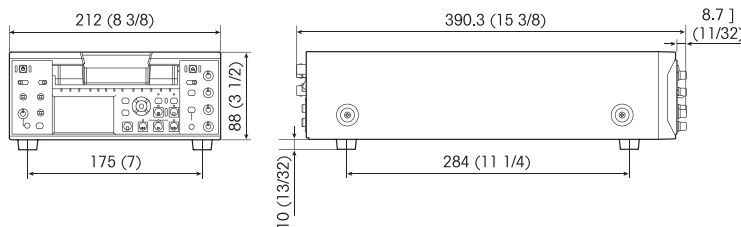
ACCESSORIES



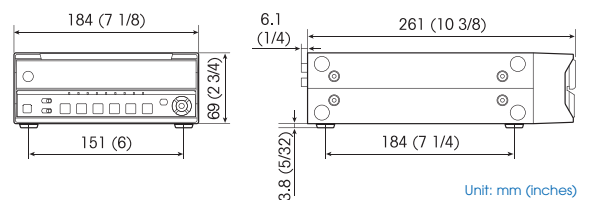
SPECIFICATIONS

	HVR-M35N/P	HVR-M25AN/AP	HVR-M15AN/AP
Recording/playback performance			
Recording format	HDV DVCAM / DV SP	HDV1080/60i, 1080/50i, 1080/24p, 1080/25p, 1080/30p DVCAM, DV SP 480/60i (NTSC), 576/50i (PAL)	HDV1080/60i, 1080/50i, 1080/24p, 1080/25p, 1080/30p DVCAM, DV SP 480/60i (NTSC), 576/50i (PAL)
Playout format	HDV DVCAM / DV SP	HDV1080/60i, 1080/50i, 1080/24p, 1080/25p, 1080/30p DVCAM, DV SP 480/60i (NTSC), 576/50i (PAL)	HDV1080/60i, 1080/50i, 1080/24p, 1080/25p, 1080/30p DVCAM, DV SP 480/60i (NTSC), 576/50i (PAL)
Playout video signal	1080/60i, 1080/50i, 480/60i (NTSC), 576/50i (PAL), 480/60P, 576/50P, 720/60P, 720/50P		1080/60i, 1080/50i, 480/60i (NTSC), 576/50i (PAL)
Tape speed	HDV/DV SP DVCAM	Max. 18.812 mm/s Max. 28.218 mm/s	
Playback/recording time	HDV/DV SP DVCAM	Max. 276 min with PHDV-276DM cassette Max. 63 min with PHDVM-63DM cassette Max. 184 min with PHDV-276DM cassette Max. 41 min with PHDVM-63DM cassette	
Fast forward/rewind time		Approx. 2.5 min with PHDV-276DM cassette	
Input/output connectors/devices			
Video input/output	BNC x1/BNC x1 1Vp-p, 75ohm unbalanced, sync negative Sync signal : 0.286Vp-p (50i / NTSC) , 0.3Vp-p (60i / PAL) Burst signal : 0.286Vp-p (50i / NTSC) , 0.3Vp-p (60i / PAL)		RCA x 1 / RCA x 1 1Vp-p, 75ohm unbalanced, sync negative Sync signal : 0.286Vp-p (50i / NTSC) , 0.3Vp-p (60i / PAL) Burst signal : 0.286Vp-p (50i / NTSC) , 0.3Vp-p (60i / PAL)
S-video input/output	Mini-DIN 4pin x 2 Y : 1Vp-p, 75ohm unbalanced, sync negative Sync signal : 0.286Vp-p (60i / NTSC) , 0.3Vp-p (50i / PAL) Chrominance signal : 0.286Vp-p (60i / NTSC), (burst, 75ohm) , 0.3Vp-p (50i / PAL), (burst, 75ohm)		
Component video output	BNC x 3 Output at 480i NTSC With (BETACAM) selected in (480i LEVEL) of the (IN/OUT REC) menu Y : 1 Vp-p (0.286Vp-p sync negative, output impedance 75ohm unbalanced) Pb / Cb / B-Y , Pr / Cr / R-Y : 0.7Vp-p (output impedance 75ohm unbalanced) (75% color bar with 7.5IRE setup) With (SMPT) selected in (480i LEVEL) of the (IN/OUT REC) menu Y : 1 Vp-p (0.3Vp-p sync negative, output impedance 75ohm unbalanced) Pb / Cb/B-Y , Pr / Cr / R-Y : 0.7Vp-p (output impedance 75ohm unbalanced) (100% color bar with no setup) Output with other settings Y : 1 Vp-p (output impedance 75ohm unbalanced) Pb / Cb / B-Y , Pr / Cr / R-Y : 0.7Vp-p (output impedance 75ohm unbalanced) (100% color bar with no setup) 480i / 480p : Y : with 0.3Vp-p sync negative 1080i / 720p : Y / Pb / Pr : with 0.6Vp-p 3-level sync		RCA pin x 3 Output at 480i NTSC With (BETACAM) selected in (480i LEVEL) of the (IN/OUT REC) menu Y : 1 Vp-p (0.286Vp-p sync negative, output impedance 75ohm unbalanced) Pb / Cb / B-Y , Pr / Cr / R-Y : 0.7Vp-p (output impedance 75ohm unbalanced) (75% color bar with 7.5% IRE setup) With (SMPT) selected in (480i LEVEL) of the (IN/OUT REC) menu Y : 1 Vp-p (0.3Vp-p sync negative, output impedance 75ohm unbalanced) Pb / Cb/B-Y , Pr / Cr / R-Y : 0.7Vp-p (output impedance 75ohm unbalanced)(100% color bar with no setup) Output with other settings Y : 1 Vp-p (output impedance 75ohm unbalanced) Pb / Cb / B-Y , Pr / Cr / R-Y : 0.7Vp-p (output impedance 75ohm unbalanced)(100% color bar with no setup) 480i / 480p : Y : with 0.3Vp-p sync negative 1080i / 720p : Y / Pb / Pr : with 0.6Vp-p 3-level sync
i.LINK		6-pin	
Digital uncompressed output	HD/SD-SDI BNC x 1	HDMI Connector x 1	—
Phones		Stereo minijack (Φ 3.5 mm)	—
LANC		Stereo mini-minijack (Φ 2.5 mm)	—
Control S		Stereo minijack (Φ 3.5 mm)	—
Audio input	RCA x4, stereo Input level: -10/-2/+4dBu, input impedance: min. 47 Ω unbalanced, max Input level: -10:+18dBu (approx. 6Vrms) , -2:+24dBu (approx. 12.5Vrms) , +4:+30dBu (approx. 25Vrms)	RCA x2, stereo Input level: -10 / -2 / +4dBu, input impedance : min. 47 Ω unbalanced, max Input level : -10 : +18dBu (approx. 6Vrms) , -2 : +24dBu (approx. 12.5Vrms) , +4 : +30dBu (approx. 25Vrms)	RCA x2, stereo Input level : -10dBu, input impedance: min. 47 Ω unbalanced, max Input level : +18dBu (approx. 6Vrms) 60i , +16dBu (approx. 5Vrms) 50i
Audio output	XLR 3pin x4, stereo impedance: max. 600 Ω balanced +4dBu	RCA x2, stereo impedance : max. 1kΩ unbalanced, Output level : -10dBu (=full bit -20dB) impedance 47 Ω unbalanced 60i, -10dBu (=full bit -18dB) impedance 47 Ω unbalanced 50i	
LCD monitor	2.7-inch type, approx. 211,200 dots (960 x 220), Clear Photo LCD Plus		—
General			
Mass	Approx. 4.4 kg (9 lb, 12 oz)		Approx. 2.3 kg (5 lb 1 oz)
Power requirements	AC 120 V, 60 Hz		DC 8.4 V
Power consumption	15W (playback mode with LCD monitor on)	11 W (playback mode with LCD monitor on)	6 W (playback mode)
Operating temperature	5 to 40° C (41 to 104° K)		
Storage temperature	-20 to +60° C (-4 to 140° K)		
Supplied accessories	Remote commander (1), power cord (1), cleaning cassette (1), operating instructions (1)		Remote commander (1), AC adaptor (1), power cord (1), stand (1), cleaning cassette (1), operating instructions (1)

HVR-M35N/P / HVR-M25AN/AP



HVR-M15AN/AP



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