AW-HS50 (AW-HS50N, AW-HS50E)
Compact Live Switcher

HD	1080/59.94i, 50i, 24PsF, 23.98PsF, 720/59.94p, 50p	SD	480/59.94i, 576/50i

This is a half-rack size digital video switcher. In spite of its compact size, it features four SDI inputs, one DVI-D input, two SDI outputs, and one DVI-D output. A MultiViewer Display function lets you split the screen in eight different ways, and a Frame Synchronizer ensures easy, high-quality switching. By combining the AW-HS50 with the AW-HE50S HD Integrated Camera and AW-RP50 Remote Camera Controller, a space-saving, low-cost HD image production system can be configured for business use.

Five Inputs/Three Outputs
• **Five inputs:** Four SDI inputs and one DVI-D input come standard.
• **Three outputs:** Two SDI outputs and one DVI-D output come standard.

HD/SD Multi-Format
The AW-HS50 supports a variety of HD/SD formats, including 1080/24PsF, as standard. System frequency is 59.94 Hz/50 Hz/24 Hz switchable. This makes it ideal for digital cinema production and worldwide operation.

Frame Synchronizers on All Inputs
A Frame Synchronizer is embedded in all inputs. This enables asynchronous video signals to be switched without glitches.

Up-Converter, Dot by Dot and Video Processing
The AW-HS50 is equipped with an SD/HD up-converter function for two inputs (SDI IN 3/SDI IN 4), and a dot by dot function that can be used for P-in-P display of HD images from SD footage without degradation. A video processing function with brightness, pedestal level, saturation, and color phase correction is also provided for four inputs.

Versatile Effect Functions
• Transitions: 13 wipe patterns and mixes.
• The built-in key function lets you select from linear, luminance and chroma keying.
• One P-in-P bus and one Aux bus are included. A Bus transition function (P-in-P bus and Aux bus switching effect) enables Mix transitions.

Frame Memory (2 Screens)
Two 8 bit still images can be saved in Frame Memory, and used as bus footage. The still images can also be transferred from a PC over a LAN network.

Simple and Flexible Control Buttons
Five crosspoint buttons in each A bus and B bus (for a maximum of 10 with the Shift function), a Cut button, a P-in-P button, a Key button and an FTB button allow direct control with this simple panel layout. A slide lever also provides easy control of transitions, P-in-P, and Key Fade In/Out. Various functions can also be assigned to two user buttons (for a maximum of four with the Shift function) for one-touch operation.

Up to 10 Split-Screen, MultiViewer Display

The built-in MultiViewer Display function can simultaneously display various images, including program (PGM), preview (PVW) and input signals, on a single monitor. The screen may be split into 4, 5a/5b, 6a/6b, 9 and 10a/10b sections.

On-Screen Display (OSD)

The OSD increases operating ease by outputting setting menus to a monitor screen. (SDI OUT 2 or DVI OUT only)

Audio Level Meter

This function displays the level of the embedded audio signals (group 1/1ch, 2ch) superimposed on the SDI input signal.
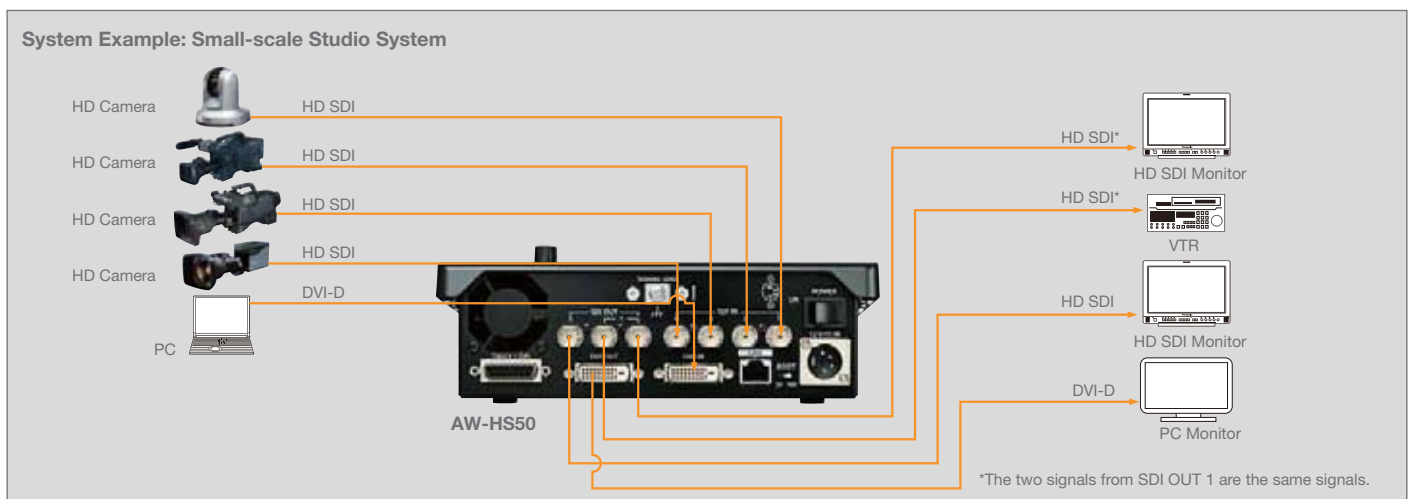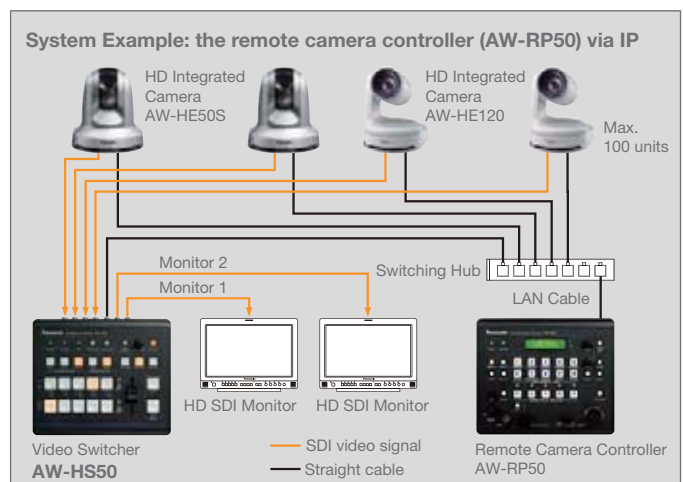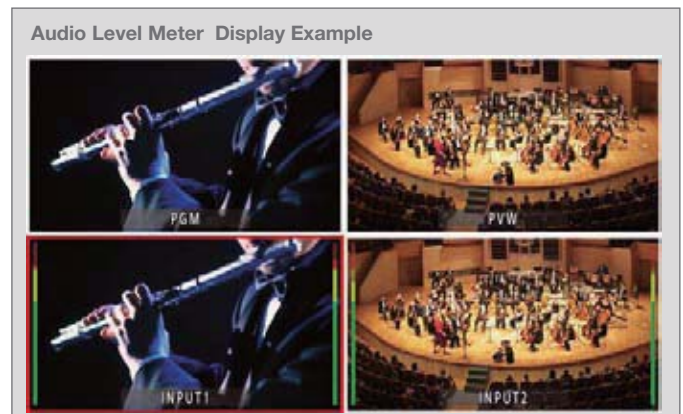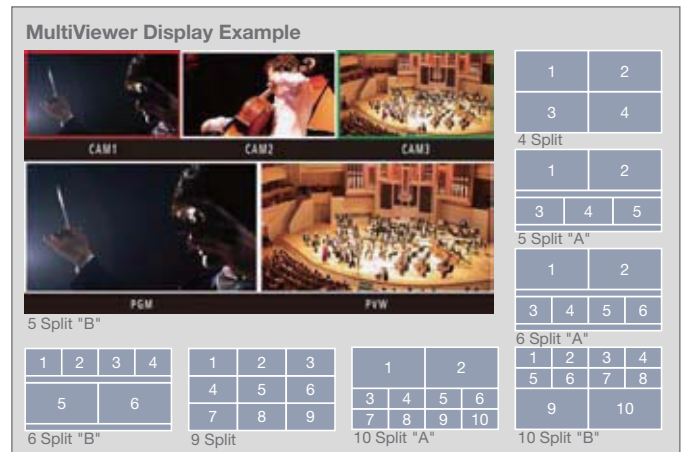
Linking with a Remote Camera Controller

By linking the AW-HS50 to the optional AW-RP50 Remote Camera Controller with an IP connection* over a network, a number of remote operations become possible, such as operating the optional AW-HE50S or AW-HE120 HD Integrated Camera. The AW-HS50 and AW-RP50 have a unified design and half-rack size, so they can be mounted side by side in a single rack.

AW-RP50 and AW-HS50 Linking Functions

• The setting data (iris, gain, etc.) for the AW-HE50S or AW-HE120
HD Integrated Camera can be displayed on a split screen using the switcher's Aux output or MultiViewer output.
• The switcher's On-Air tally data can be sent to the Camera Controller.
• The switcher's bus footage (Aux, PVW, P-in-P, Key-F) can be selected at the Camera Controller. Switching of the bus footage can also be linked to the camera selection.
• The switcher's MultiViewer Display can also be changed at the Camera Controller to a full-screen display of the camera image (Aux bus only). This supports the camera's Focus Assist function.
• The Pan/Tilt lever and Zoom button on the Camera Controller can be used to change switcher parameters.

* Only one AW-RP50 can be connected to the switcher via an IP connection. And connection is not possible with a public network.

MultiViewer Display Example

Audio Level Meter Display Example

System Example: the remote camera controller (AW-RP50) via IP

System Example: Small-scale Studio System

*The two signals from SDI OUT 1 are the same signals.

Specifications

	AV-HS450	AV-HS410
Specifications		
Power Requirement	Mainframe: AC 100 V to 120 V(N)/AC 220 V to 240 V (E), 50 Hz/60 Hz, 120 W Control Panel: DC12 V ±10 % (AC adapter provided), 0.8 A	AC 100 V to 240 V, 50 Hz/60 Hz, 88 W
Operating Temperature	0 °C to 40 °C (32 °F to 104 °F)	0 °C to 40 °C (32 °F to 104 °F)
Operating Humidity	10 % to 90 % (no condensation)	10 % to 90 % (no condensation)
Dimensions (W x H x D)	Mainframe: (2RU) 482 mm x 88 mm x 471 mm (19 inches x 3-7/16 inches x 18-9/16 inches) (excluding protrusions) Control Panel: 560 mm x 88 mm x 299 mm (22-1/16 inches x 3-7/16 inches x 11-3/4 inches) (excluding protrusions)	440 mm x 158 mm x 361 mm (17-5/16 inches x 6-7/32 inches x 14-7/32 inches) (excluding protrusions)
Weight	Mainframe: Approx. 9.8 kg (21.6 lb) (without options/excluding accessories) Approx. 10.3 kg (22.7 lb) (with full options/excluding accessories) Control Panel: Approx. 3.9 kg (8.6 lb) (excluding accessories)	Approx. 6.2 kg (13.669 lb) (without options/excluding accessories) Approx. 6.6 kg (14.550 lb) e (with full options/excluding accessories)
Video Format	HD: 1080/59.94i, 1080/50i, 1080/24PsF*1, 1080/23.98PsF*1, 720/59.94p, 720/50p SD: 480/59.94i, 576/50i	HD: 1080/59.94i, 1080/50i, 1080/24PsF*2, 1080/23.98PsF*2, 720/59.94p, 720/50p, SD: 480/59.94i, 576/50i
Video Processing	Y:Cʙ:Cʀ 4:2:2, 10 bit (8 bit for FMEM) /RGB 4:4:4, 8 bit	Y:Cʙ:Cʀ 4:2:2, 10 bit (8 bit for video memory) /RGB 4:4:4, 8 bit
ME	1ME	1ME
Video Input*3	Mainframe, A maximum of 20 inputs Standard SDI: 16 lines, BNC x 16 (IN 1 to 16) HD (SMPTE292M)/SD (SMPTE259M) standard, 0.8 V [p-p] ±10 % (75 Ω) Optional: Maximum of 4 inputs (IN A1, A2, B1, B2)(Up to 2 optional boards may be inserted into the 2 input/output optional slots)	A maximum of 13 inputs Standard SDI: 8 lines, BNC x 8 (IN 1 to 8) (Up-convert support with IN 5 to 8) HD (SMPTE292M)/SD (SMPTE259M) standard, 0.8 V [p-p] ±10 % (75 Ω) Standard DVI-D: 1 line, DVI-D x 1 (Analog input signals are not supported) Optional: Maximum of 4 inputs (IN A1, A2, B1, B2) (Up to 2 optional boards may be inserted into the 2 input/output optional slots)
Video Output*3	Mainframe, A maximum of 10 outputs Standard SDI: 4 lines, BNC x 5 (OUT 1 to 4 x each, 2 output distribution for OUT 1) HD (SMPTE292M)/SD (SMPTE259M) standard, 0.8 V [p-p] ±10 % (75 Ω) Standard DVI-D: 2 lines, DVI-D x 2, (OUT 5, 6) (Analog outputs are not supported) Optional: Maximum of 12 outputs (OUT A1, A2, B1, B2) (Up to 2 optional boards may be inserted into the 2 input/output optional slots)	A maximum of 10 outputs Standard SDI: 5 lines, BNC x 6 (OUT 1 to 5 x each, 2 output distribution for OUT 1) HD (SMPTE292M)/SD (SMPTE259M) standard, 0.8 V [p-p] ±10 % (75 Ω) Standard DVI-D: 1 line, DVI-D x 1 (Analog output signals are not supported) Optional: Maximum of 4 outputs (OUT A1, A2, B1, B2) (Up to 2 optional boards may be inserted into the 2 input/output optional slots)
Reference Input/Output	Mainframe GENLOCK mode: Black burst or Tri-level Sync input signals (with loop-through) Internal sync mode: Black burst output signals x 2 • Same field frequencies as those of the system formats supported. • With the 1080/23.98PsF, 1080/24PsF format, only GENLOCK mode supported. • With the 1080/23.98PsF format, black burst with 10F-ID (SMPTE318M standard met) or TRI signals supported.	GENLOCK mode: Black burst or Tri-level Sync input signals (with loop-through) Internal sync mode: Black burst output signals x 2 • Same field frequencies as those of the system formats supported. • With the 1080/24PsF format, only GENLOCK mode supported. • With the 1080/23.98PsF format, black burst with 10F-ID (SMPTE318M standard met) or TRI signals supported.
Audio Input/Output	—	—
Interface — PANEL/MAINFRAME	RJ45 x 1, 100 Mbps (to connect between the mainframe and the control panel)	—
Interface — EDITOR	Mainframe, D-sub 9 pin x 1, RS-422 (GVG protocol compatible)	DD-sub 9 pin x 1, RS-422
Interface — COM	Mainframe, D-sub 9 pin x 1, RS-422 (pan-tilt system control)	D-sub 9 pin x 1, RS-422
Interface — TALLY/GPI	Mainframe: D-sub 50 pin x 1 (8 IN, 31 OUT and 1 ALARN OUT may be set) Control Panel: D-sub 25 pin x 1 (8 IN and 8 OUT may be set)	D-sub15 pin x 2 (IN 8, OUT 19, ALARM OUT 1)
Interface — LAN	Mainframe, RJ45 x 1, 10 BASE-T/100 BASE-TX	RJ45, 10 BASE-T/100 BASE-TX
Removable Media — SD Memory Card	Supported by the control panel, Capacity: Maximum 32 GB (SDHC Memory Card compatible) Still image file: Loading/saving, setup data: backup	Capacity: Maximum 32 GB (SDHC Memory Card compatible) Still image file/movie clip file/shot memory/event memory: Loading/saving, Setup data: backup
Standard Accessories	CD-ROM (Operating instructions / Image transmission software), AC adapter (for control panel),Power cable (for mainframe and AC adapter), CAT5E cable (STP, straight cable, 10 m (32.8 feet) long)	CD-ROM (Operating instructions/DVI input level adjustment file), Power cable (2 m (6.6 feet) long)
Function		
BKGD — Wipe/DVE Pattern	Wipe x 12, Squeeze x 11, Slide x 8, 3D x 12, 2ch squeeze x 4, 2ch slide x 4, 2ch 3D x 4	Wipe x 16, Squeeze x 16, Slide x 8, 3D x 12
BKGD — Transition Type	Cut, Mix, Wipe (including DVE)	Cut, Mix, Wipe (including DVE)
BKGD — Image	Image effect: PGM/A, PST/B BUS Effect: Mosaic, Defocus, Mono, Paint	—
KEYER — Number of Keys	1	1
KEYER — Key Type	Linear key, Luminance key, Chroma key, Full key	Linear key, Luminance key, Chroma key, Full key*8
KEYER — Transition Type	Cut, Mix, Wipe (including DVE)	Cut, Mix, Wipe (including DVE)
KEYER — Wipe/DVE Pattern	Wipe x 12, Squeeze x 11, Slide x 9, 3D x 12	Wipe x 16, Squeeze x 16, Slide x 8, 3D x 12
DSK — Number of Keys	2	1
DSK — Key Type	Linear key, Luminance key	Linear key, Luminance key
DSK — Transition Type	Mix	Mix
P in P — Number of PinP	2	2
P in P — Transition Type	Mix	Mix
AUX BUS	AUX Bus 1 to 4*4	AUX Bus 1 to 4*4
Input Function — Frame Synchronizer	IN 1 to 16*5	IN 1 to 9 (IN 9 is always-on)*5
Input Function — Freeze	IN 1 to 16*5	IN 1 to 9*5
Input Function — Up-Converter	IN13 to 16*5	IN5 to 8*5
Input Function — Color Corrector	IN9 to 16	
Input Function — Video Processing	—	IN1 to 8*5
Output Function — MultiViewer	2 systems, Labels, Tally indication, Split-screen (the screen may be split into 4, 9, 10 and 16 sections)*6	1 system, Labels, Tally indication, Split-screen (9 Patterns: 4, 5a/5b, 6a/6b, 9, 10a/10b and 16 sections)
Output Function — Other Function	OSD (PVW and several MULTI outputs), Phase adjustment, Chroma key sample marker, Down converter (SDI output board only)	Phase adjustment, Chroma key sample marker, Down converter (SDI output board only)
Frame Memory	4 channels (The data for the images stored in the frame memories can be retained even when the power is turned off by saving it in the flash memory area which is incorporated inside the unit.)	—
Video Memory		2 systems: still images and movie clips (The data for the images stored in the frame memories can be retained even when the power is turned off by saving it in the flash memory*9 area which is incorporated inside the unit.)
Memory Function	Shot memory, BKGD/Wipe memory, PinP memory, Camera memory *7, Effect dissolve function	Shot memory, Event memory, Effect dissolve function

*1: 1080/24PsF and 23.98PsF are not compatible with optional boards AV-HS04 M1, M2, M3, M4, M5, M6, M7, M7D and M8. *2: 1080/24PsF and 23.98PsF are not compatible with optional boards AV-HS04 M1, M2, M3, M4, M5, M6 and M7. *3: For information on input/output signals, see page 10, "Input Formats." *4: AUX BUS 1 is compatible with MIX transition. *5: Specifications for IN A1, A2, B1, and B2 depend on the specs of the mounted optional equipment. *6: Maximum 20 channels may be simultaneously displayed on two screens.

AW-HS50	AG-HMX100
DC 12 V ±10 % (AC adapter provided), 2.0 A	AC 100 V to 240 V, 50 Hz/60 Hz, 60 W
0 °C to 40°C (32 °F to 104 °F)	5 °C to 40 °C (41 °F to 104 °F)
10 % to 90 % (no condensation)	10 % to 80 % (no condensation)
210 mm x 67 mm x 177 mm (8-1/4 inches x 2-5/8 inches x 6-15/16 inches) (excluding protrusions)	424 mm x 197 mm x 400 mm (16-3/4 inches x 7-3/4 inches x 15-3/4 inches) (excluding protrusions)
Approx. 1.4 kg (3.1 lb) (without options)	Approx. 7.9 kg (17.4 lbs) (without options)
HD: 1080/59.94i, 1080/50i, 1080/24PsF, 1080/23.98PsF, 720/59.94p, 720/50p SD: 480/59.94i, 576/50i	HD: 1080/23.98PsF (for 3D only), 1080/59.94i, 1080/50i, 720/59.94p, 720/50p SD: 480/59.94i, 576/50i *Mixed operation of different video formats is not possible.
Y:C$_B$:C$_R$ 4:2:2, 10 bit (8 bit for FMEM)/ RGB 4:4:4, 8 bit	Y:P$_B$:P$_R$:Key 4:2:2:4, 12 bit (Internal process)
1ME	1ME

SDI: 4 lines, BNC x 4
     HD (SMPTE292M)/SD (SMPTE259M) standard
     0.8 V [p-p] ±10 % (75 Ω)
DVI-D: 1 signal line, DVI-D x 1 (Analog input signals are not supported)
	VIDEO: 2 lines, BNC x 2, Analog Composite, 1.0 V[p-p] (75 Ω)
	SDI: 4 lines, BNC x 4
	     HD (SMPTE292M/296M/299M) /SD (SMPTE259M-C/272M-A, ITU-R. BT.656-4) standard
	HDMI: 2 signal lines, HDMI x 2 (Type A connector), incompatible with HDCP Link and VIERA Link
	DVI-I: TMDS single link (incompatible with HDCP), compatible with digital/analog RGB

SDI: 2 lines, BNC x 3 (2 output distribution for OUT1)
     HD (SMPTE292M)/SD (SMPTE259M) standard
     0.8 V [p-p] ±10 % (75 Ω)
DVI-D: 1 signal line, DVI-D x 1 (Analog output signals are not supported.)
	SDI: 4 lines, BNC x 4 (PGM/PVW/AUX/MULTIVIEW x each)
	     HD (SMPTE292M/296M/299M) /SD (SMPTE259M-C/272M-A, ITU-R. BT.656-4) standard
	DVI-D: 2 lines, DVI-D x 2 (PGM/MULTIVIEW x each)
	     TMDS single link (not compatible with HDCP)

—	External reference (G/L) input:
	     BNC x 2 (with loop-through), 1.0 V [p-p] (75 Ω), Analog composite (NTSC/PAL)
	Advanced reference (ADV-REF) output:
	     BNC x 1, 75 Ω, Analog composite
	     Sync: 0.286 V [p-p] (NTSC)/0.3 V [p-p] (PAL)
	     Burst: 0.286 V [p-p] (NTSC)/0.3 V [p-p] (PAL)

—	AUDIO input: XLR: 4 lines (L and R), +4/0/–3 dBm switchable, balanced, 600 Ω
	     SDI (embedded audio): 4 lines, HD (SMPTE292M/296M/299M)/SD (SMPTE259M-C/272M-A, ITU-R BT.656-4) standard
	     HDMI (embedded audio): 2 lines, Type A connector (not compatible with HDCP)
	AUX input: Pin jack: 1 line (L and R),–10 dBV, High impedance, unbalanced
	MIC input: M6 x 1 line, –60 dBV, 2 kΩ, monaural, unbalanced
	AUDIO output: PGM: XLR 1 line (L and R), +4/0/–3 dBm switchable, Low impedance, balanced
	     Pin jack: 1 line (L and R), –10 dBV, Low impedance, unbalanced
	     PGM/PVW/AUX OUT: SDI (Embedded Audio) x 1,
	     HD (SMPTE292M/296M/299M)/SD (SMPTE259M-C/272M-A, ITU-R BT.656-4) standard
	PHONES output: M6 x 1, 8 Ω, stereo, unbalanced, –∞ dBu to –20 dBu

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—	D-sub 9 pin x 1, RS-232C
D-sub 15 pin x 1, GPI INPUT x 5 channels (photocoupler sensing), GPI OUTPUT x 7 channels (open collector output)	TALLY output: D-sub 9 pin x 1, 8 Cross point, Open-collector, Maximum current: Less than 50 mA, Maximum Voltage: 35 VDC GPI: BNC x 1, Make-Contact
RJ45, 10 BASE-T/100 BASE-TX	—
—	—
CD-ROM (Operating instructions / Image transmission software), AC adapter	CD-ROM (Operating instructions), Power code (3 core cable)
Wipe x 13	Wipe (BASIC1+2) x 37, Wipe (+MULTI) x 16, Wipe (BLIND) x 23, Wipe (MATRIX) x 7, Squeeze (COMP+SINGLE) x 13, 2ch Squeeze (COMP+BOTH) x 8, Slide x 8
Cut, Mix, Wipe	Cut, Mix, Wipe (including DVE)
—	Image effect: PGM/A, PST/B BUS Effect: Mosaic, Defocus, Mono, Time effects, Decay, Paint, Nega, Mirror
1	1
Linear key, Luminance key, Chroma key*8	Linear key, Luminance key, Chroma key, Full key
Mix	Cut, Mix, Wipe (including DVE)
—	Wipe x 6
—	1
—	Luminance key
—	Mix
1	1
Mix	Mix
AUX BUS1	—
SDI-IN 1 to 4, DVI-IN (always-on)	SDI-IN 1 to 4, DVI-I IN, HDMI 1 to 2/Composite video 1 to 2
SDI-IN1 to 4, DVI-IN	SDI-IN 1 to 4, DVI-I IN, HDMI 1 to 2/Composite video 1 to 2
SDI-IN3, 4	—
—	—
SDI-IN 1 to 4	Every A/B bus
1 system*10, Labels, Tally indication, Split-screen (8 Patterns: 4, 5a/5b, 6a/6b, 9 and 10a/10b sections)	1 system Labels, Tally indication, Split-screen (the screen split into 10a only)
OSD [Single Screen Display: SDI-OUT 2,DVI-OUT (unshown on SDI-OUT 1)], Chroma key sample marker, Audio Level Meter: SDI embedded audio (group1/ 1 ch, 2 ch)	OSD (several MULTI outputs), WFM, Audio level meter, Embedded audio(SDI, HDMI)
2 channels *11 (The data for the images stored in the frame memories can be retained even when the power is turned off by saving it in the flash memory area which is incorporated inside the unit.)	1 systems: still images and movie clips
—	—
PinP Preset, Effect dissolve function	Event memory (100 patterns), Key learning (20 patterns)

*7: May store and recall up to 10 presets (per camera) with current Panasonic pan-tilt systems. *8: May also be used for DSK applications by changing the key layer. *9: Plans call for supporting this function in the future. *10: OSD, MV frames, Labels, Tally indications, Audio Level Meters, and Camera setting information are not shown on SDI-OUT 1. *11: OSD, MV frames, Labels, Tally indications, Audio Level Meters, and Camera setting information for MultiViewer Display are not stored in the Frame Memory.

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