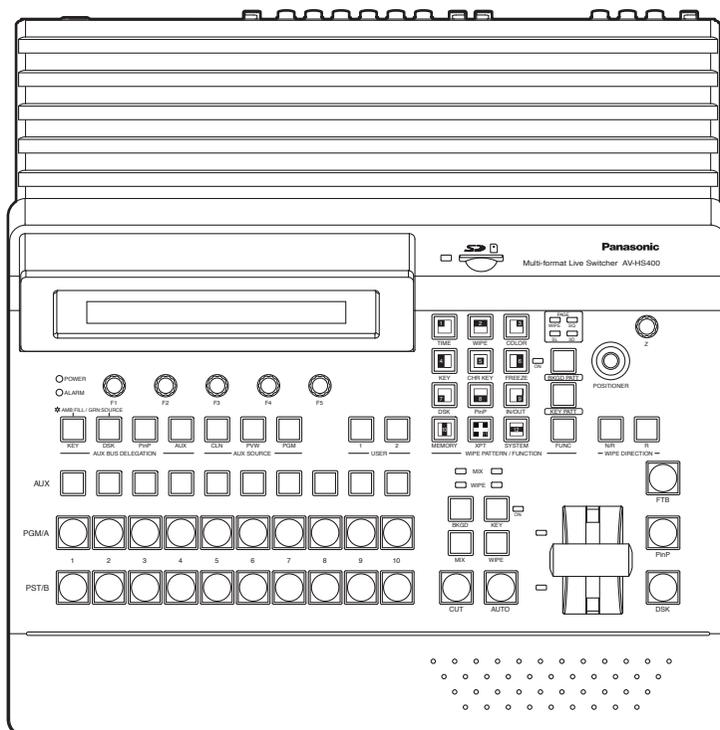


Panasonic®

Operating Instructions

Multi-format Live Switcher

Model No. **AV-HS400N**



Before operating this product, please read the instructions carefully and save this manual for future use.

Safety precautions



CAUTION

**RISK OF ELECTRIC SHOCK
DO NOT OPEN**



CAUTION: TO REDUCE THE RISK OF ELECTRIC SHOCK,
DO NOT REMOVE COVER (OR BACK).
NO USER SERVICEABLE PARTS INSIDE.
REFER TO SERVICING TO QUALIFIED SERVICE PERSONNEL.



The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.



The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (service) instructions in the literature accompanying the appliance.

WARNING:

■ THIS APPARATUS MUST BE EARTHED

To ensure safe operation, the three-pin plug must be inserted only into a standard three-pin power point which is effectively earthed through the normal household wiring.

Extension cords used with the apparatus must have three cores and be correctly wired to provide connection to the earth. Wrongly wired extension cords are a major cause of fatalities.

The fact that the apparatus operates satisfactorily does not imply that the power point is earthed or that the installation is completely safe. For your safety, if you are in any doubt about the effective earthing of the power point, please consult a qualified electrician.

For CANADA

This class A digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

WARNING:

- TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS APPARATUS TO RAIN OR MOISTURE.
- THE APPARATUS SHALL NOT BE EXPOSED TO DRIPPING OR SPLASHING AND THAT NO OBJECTS FILLED WITH LIQUIDS, SUCH AS VASES, SHALL BE PLACED ON THE APPARATUS.

CAUTION:

TO REDUCE THE RISK OF FIRE OR SHOCK HAZARD AND ANNOYING INTERFERENCE, USE THE RECOMMENDED ACCESSORIES ONLY.

FCC Note:

This equipment has been tested and found to comply with the limits for a class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy, and if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Warning:

To assure continued FCC emission limit compliance, the user must use only shielded interface cables when connecting to external units. Also, any unauthorized changes or modifications to this equipment could void the user's authority to operate it.

CAUTION:

In order to maintain adequate ventilation, do not install or place this unit in a bookcase, built-in cabinet or any other confined space. To prevent risk of electric shock or fire hazard due to overheating, ensure that curtains and any other materials do not obstruct the ventilation.

The socket outlet shall be installed near the equipment and easily accessible or the mains plug or a power switch shall remain readily operable.

A warning that an apparatus with CLASS I construction shall be connected to a MAINS socket outlet with a protective earthing connection.

Safety precautions

IMPORTANT SAFETY INSTRUCTIONS

Read these operating instructions carefully before using the unit. Follow the safety instructions on the unit and the applicable safety instructions listed below. Keep these operating instructions handy for future reference.

- 1) Read these instructions.
- 2) Keep these instructions.
- 3) Heed all warnings.
- 4) Follow all instructions.
- 5) Do not use this apparatus near water.
- 6) Clean only with dry cloth.
- 7) Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.
- 8) Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
- 9) Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding-type plug has two blades and a third grounding prong. The wide blade or the third prong are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
- 10) Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.
- 11) Only use attachments/accessories specified by the manufacturer.
- 12) Use only with the cart, stand, tripod, bracket, or table specified by the manufacturer, or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over. 
- 13) Unplug this apparatus during lightning storms or when unused for long periods of time.
- 14) Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.

 indicates safety information.

<For USA-California Only>

This product contains a CR Coin Cell Lithium Battery which contains Perchlorate Material – special handling may apply.

See www.dtsc.ca.gov/hazardouswaste.perchlorate.

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Description

This is a 1 ME digital video switcher which supports a multiple number of HD and SD formats.

Despite its compact dimensions, the video switcher comes standard with 4 input connectors and can support 8 input connectors when an option board is used.

It also has a multi-view display function that allows split-screen display with up to 10 screens.

It is capable of providing transitions (wipe, mix and DVE) as video effects, and keyer (luminance keys and chroma keys), DSK and PinP specialized hardware is provided as a standard feature to enable video productions in many different forms.

The unit also supports SD memory cards so still image data (BMP) can be imported from SD memory cards into the unit's frame memories for use as background images or key materials.

Features

Compact design, wide variety of input/output signals

- As a standard feature, the HD and SD-SDI formats are supported for the input and output signals. If an optional board is added, HD/SD analog component and DVI-I signals can also be accommodated. The input optional board contains an up-converter.
- Under the standard specifications, there are four SDI lines for the input signals, and this number can be optionally increased by the user up to eight lines (supported by the optional board). Similarly, there are three SDI lines for the output signals under the standard specifications, and this number can be optionally increased by the user to five lines (PGM, PVW, AUX, KEYOUT and multi view display).

Multiple formats supported

Both HD formats (1080/59.94i, 1080/50i, 720/59.94p and 720/50p) and SD formats (480/59.94i and 576/50i) as well as the DVI-I format are supported for the signals.

Multi view display function

This unit enables up to 10 lines of program video (PGM), preview video (PVW) and input video signals to be displayed altogether on a single screen at the same time.

Frame synchronizer system and external synchronization system supported

- A high-performance 10-bit frame synchronizer is incorporated for all the inputs, and asynchronous video signals can be input. By using the black burst (BB) output, it is possible to construct a system referenced to the synchronization of the switcher.
- A genlock function is provided, and an external synchronization system using external sync signals (BB or TRI signals) as a reference are also supported.

Many different effect functions incorporated

- Along with the standard wipe, mix and cut functions, the unit can provide size reduction, slide and other DVE transitions.
- The unit comes with luminance keys and chroma keys are provided as keyers as well as specialized hardware in the form of the DSK (downstream key) and PinP (picture in picture) functions as a standard option, enabling video productions in many different forms.

SD memory cards supported

Still image data (BMP) can be imported from SD memory cards into the unit's frame memories for use as background images or key materials. Conversely, the images or setting data in the unit's frame memories can be stored on the SD memory cards.

Simple operations

Live transmissions can be delivered speedily thanks to the simple panel layout which enables the various functions to be operated directly.

Presetting and other similar operations are performed using menus in the form of on-screen displays (OSD) which appear on the unit's LCD screen or an external monitor.

Precautions for use

- **Handle carefully.**

Do not drop the product, or subject it to strong shock or vibration.
Do not carry or move the product by the fader lever. This is important to prevent trouble.

- **Use the product in an ambient temperature of 32 °F to 104 °F (0 °C to 40 °C).**

Avoid using the product at a cold place below 32 °F (0 °C) or at a hot place above 104 °F (40 °C) because extremely low or high temperature will adversely affect the parts inside.

- **Power off before connecting or disconnecting cables.**

Before plugging or unplugging the cables, be sure to switch power off.

- **Avoid humidity and dust.**

Avoid using the product at a humid, dusty place because much humidity and dust will cause damage to the parts inside.

- **Maintenance**

Wipe the product using a dry cloth. To remove stubborn dirt, dip a cloth into a diluted solution of kitchen detergent, wring it out well, and wipe the product gently. Then, after wiping the product with a moist cloth, wipe it again with a dry cloth.

Caution

- Avoid using benzene, paint thinners and other volatile fluids.
- If a chemical cleaning cloth is to be used, carefully read through the precautions for its use.

- **Precaution to be observed during production**

This product's image switching and image effect functions can be used to produce images which flicker rapidly or images which change rapidly.

However, bear in mind when using these functions in production that the kinds of images produced may have an adverse effect on the viewer's physical well-being.

- **Handling the optional boards**

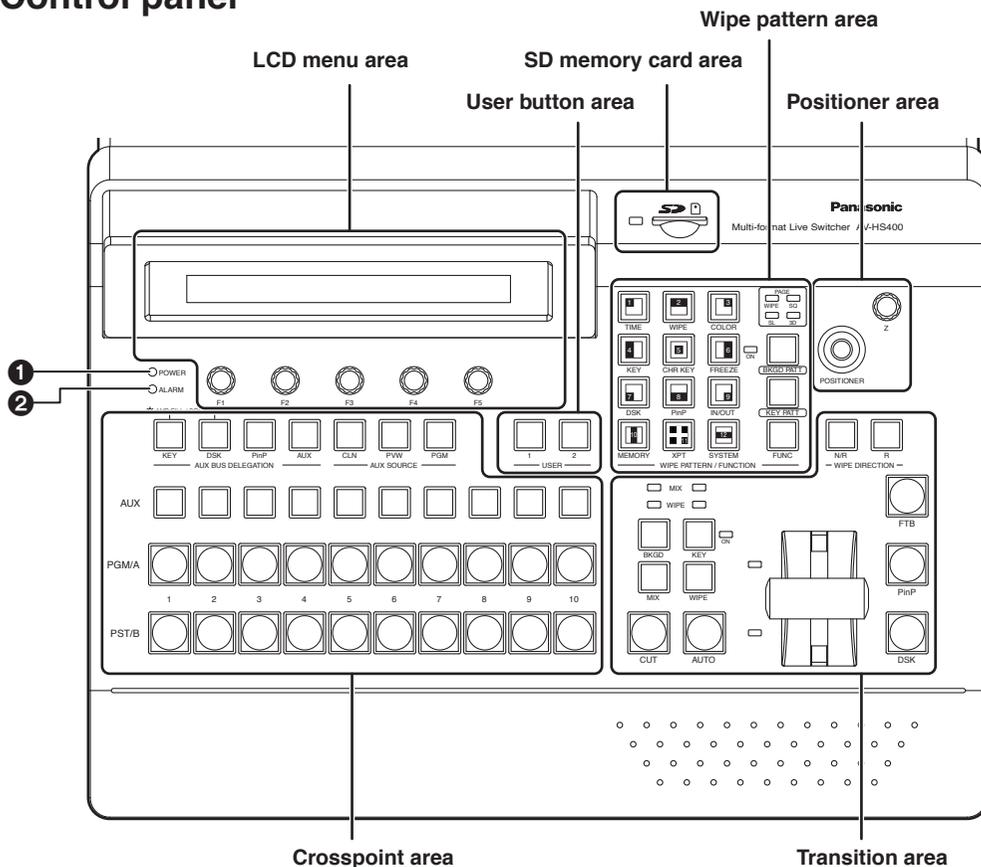
Be absolutely sure to turn off the power of the product before installing or removing any of the optional boards. Furthermore, when installing or removing the optional boards, take care not to hurt yourself on the edges and metal parts of the boards.

- **When the product is to be discarded**

When the product is to be discarded at the end of its service life, ask a specialized contractor to dispose of it properly in order to protect the environment.

1. Functions in each area

1-1. Control panel



1 Power indicator [POWER]

This indicator lights when the power switch (47) on the rear panel is set to ON while power is supplied to the AC power input socket.

It goes off when the power switch (47) is set to OFF.

2 Alarm indicator [ALARM]

This indicator lights when the fan is stopped or there is a problem with the power supply (such as a drop in voltage).

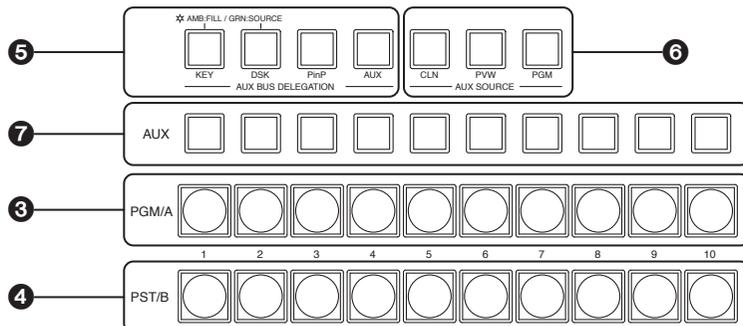
When an alarm has occurred, the type of trouble can be checked on the System/Alarm (6/14) menu. In addition, an alarm message is displayed on the OSD screen of the LCD screen and the external monitor.

ALARM TYPE	System/Alarm (6/14)	ALARM MESSAGE
Fan alarm	Alarm display in Fan items	ALARM! FAN STOP
Power alarm	Alarm display in Power items	ALARM! POWER FAILURE
Power alarm and fan alarm	Alarm display in Fan items and Power items	ALARM! POWER FAILURE & FAN STOP

If the alarm goes off, stop using the unit immediately and be sure to contact your dealer. Continuing to use the unit even after the alarm goes off could damage it.

1. Functions in each area

1-2. Crosspoint area



③ PGM/A bus crosspoint buttons [PGM/A 1 to 10]

These are used to select the PGM/A bus video signals. In the case of the flip-flop system, the main line video (PGM) signals are always selected.

④ PST/B bus crosspoint buttons [PST/B 1 to 10]

These are used to select the PST/B bus video signals. In the case of the flip-flop system, the images inserted next (PST) are always selected.

⑤ AUX bus selector buttons [KEY, DSK, PinP, AUX]

Press the KEY button, DSK button, PinP button or AUX button to switch the bus which is selected using the AUX bus crosspoint buttons (⑦). The indicator of the button that was pressed lights.

[KEY]: Press this button to switch the AUX bus crosspoint buttons to the key fill bus or key source bus.

(Each time the button is pressed, the key fill bus or key source bus is selected alternately. When the key fill bus is selected, the indicator of the button lights in amber, and when the key source bus is selected, it lights in green.)

[DSK]: Press this button to switch the AUX bus crosspoint buttons to the DSK fill bus or DSK source bus.

(Each time the button is pressed, the DSK fill bus or DSK source bus is selected alternately. When the DSK fill bus is selected, the indicator of the button lights in amber, and when the DSK source bus is selected, it lights in green.)

[PinP]: Press this button to switch the AUX bus crosspoint buttons to the PinP bus.

[AUX]: Press this button to switch the AUX bus crosspoint buttons to the AUX bus.

⑥ AUX bus dedicated crosspoint buttons [CLN, PVW, PGM]

These buttons are used to select the AUX bus source while the indicator of the [AUX] button is lighted. The indicator of the pressed button lights in amber.

[CLN]: The clean signals (images whose DSK signals have been removed from the PGM signals) are output to the AUX bus.

[PVW]: PVW signals are output to the AUX bus.

[PGM]: PGM signals are output to the AUX bus.

⑦ AUX crosspoint buttons

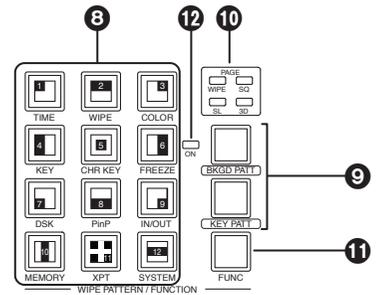
These buttons are used to select the source of the bus which was selected by the [AUX] bus selector button (⑤).

1. Functions in each area

1-3. Wipe area

8 Wipe pattern selector buttons

These 12 buttons are used to select the corresponding wipe patterns while the indicator of the [BKGD PATT] button (9) or KEY PATT button (9) is lighted. They are used to select the corresponding setting menus when the indicator of the FUNC button (11) is lighted. The indicator of the selected button lights in amber.



9 BKGD, KEY pattern selector buttons

These buttons are used to switch the wipe pattern selection. The wipe pattern of a background transition is selected when the indicator of the [BKGD PATT] button is lighted after it was pressed. The wipe pattern of a key transition is selected when the indicator of the [KEY PATT] button is lighted after it was pressed. Each time the [BKGD PATT] button or [KEY PATT] button is pressed, the pattern page is changed in the sequence of WIPE, SQ (squeeze), SL (slide) and 3D (3 dimensions), and the pattern page indicator LED (10) is also switched. 3D cannot be selected using the [KEY PATT] button.

10 Pattern page indicator LEDs

These LEDs indicate the pages selected by the background transitions while the indicator of the [BKGD PATT] button is lighted. They indicate the pages selected by the key transitions while the indicator of the [KEY PATT] button is lighted. The WIPE, SQ (squeeze), SL (slide) or 3D (3 dimensions) LED lights.

11 FUNC button

When this button is pressed, its indicator lights in amber. When a wipe pattern selector button (8) is pressed while the indicator of the FUNC button is lighted, the setting menu indicated below the button is displayed on the LCD screen.

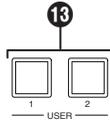
[TIME]:	The auto transition time settings are performed.	☞ See 3-1-5.
[WIPE]:	The modify, border or soft effect decoration settings are performed for wipe.	☞ See 3-2.
[COLOR]:	The color background settings are performed.	☞ See 3-7.
[KEY]:	The key settings are performed.	☞ See 3-3.
[CHR KEY]:	The chroma key settings are performed.	☞ See 3-3-6.
[FREEZE]:	The freeze status is displayed and freeze settings are performed.	☞ See 3-8.
[DSK]:	DSK settings are performed.	☞ See 3-5.
[PinP]:	PinP settings are performed.	☞ See 3-4.
[IN/OUT]:	The input/output signals are set.	☞ See 4.
[MEMORY]:	The preset memory, frame memory or SD card memory settings are performed.	☞ See 3-10, 3-11 and 3-12.
[XPT]:	The crosspoint assignment is displayed and set.	☞ See 5-2.
[SYSTEM]:	The system settings are performed.	☞ See 5.

12 Freeze status indicator LED

When this LED is lighted, it means that one of the input signals is in the freeze status. The freeze status of the input signals assigned to the crosspoint buttons can be checked on the menu. ☞ See 3-8. Since the freeze status is established while this indicator is lighted, the input image handled inside the unit will remain unchanged even when a different image is input.

1. Functions in each area

1-4. User button area



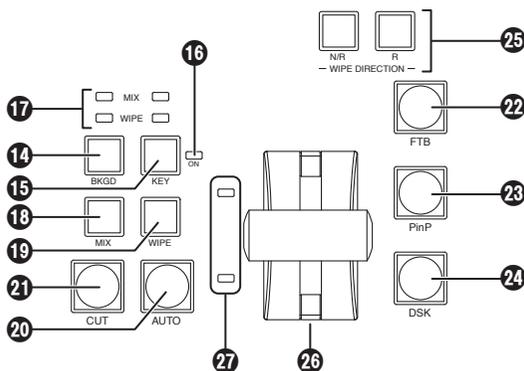
13 User buttons [USER 1, USER 2]

These are used to allocate some functions of the menu settings to the USER 1 button and USER 2 button.

☞ See 5-3-1.

1. Functions in each area

1-5. Transition area



14 [BKGD] button

This executes the background transition when the [AUTO] button (20) or fader lever (26) has been operated. When the [BKGD] button is pressed and it is selected, its indicator lights in amber. If the [KEY] button (15) is now pressed, the indicator goes off, and the de-selected status is established. When the [BKGD] button and [KEY] button (15) are pressed at the same time, both buttons are set to the selected status.

15 [KEY] button

This executes the key transition when the [AUTO] button (20) or fader lever (26) has been operated. When the [KEY] button is pressed and it is selected, its indicator lights in amber. If the [BKGD] button (14) is now pressed, the indicator goes off, and the de-selected status is established. When the [BKGD] button (14) and [KEY] button are pressed at the same time, both buttons are set to the selected status.

16 KEY ON tally LED

This lights in red when the key ON status is established.

17 MIX, WIPE selection status tally LEDs

These light up to indicate whether MIX or WIPE has been selected when background transitions or key transitions are executed.

18 [MIX] button

This is used to switch the A and B bus images while making them overlap. During the transition, the A and B bus output total is kept at 100%. When the [MIX] button is pressed and it is selected, its indicator lights in amber. If the [WIPE] button (19) is now pressed, it goes off, and the de-selected status is established.

19 [WIPE] button

This is used to execute the transition using the pattern selected by the wipe pattern selector button (3). When the [WIPE] button is pressed and it is selected, its indicator lights in amber. If the [MIX] button (18) is now pressed, it goes off, and the de-selected status is established.

1. Functions in each area

20 [AUTO] button

This is used to automatically execute transitions (auto transition) using the transition time which has been set. During auto transition its indicator lights in amber. When the button is pressed again during auto transition, the auto transition operation is suspended, and the indicator lights in green. When it is pressed again while auto transition is suspended, the remaining transition is executed.

The indicator goes off when auto transition is completed.

When the [AUTO] button is pressed while the fader lever (26) is at an interim setting, the transition is executed in the time remaining from the interim setting.

21 [CUT] button

This button is used to execute transitions instantly. Its indicator lights in amber during a transition, and it goes off when the transition is completed.

22 [FTB] button

This button is used to execute fade-out to a black screen or fade-in from a black screen for the transition time which has been set.

23 [PinP] button

This button is used to execute fade-in or fade-out of the picture in picture for the transition time which has been set.

24 [DSK] button

This button is used to execute fade-in or fade-out of downstream key for the transition time which has been set.

25 Wipe direction selection buttons

These buttons are used to select the direction in which to wipe for executing background transitions.

When the indicators are off:

Wiping proceeds in the normal direction.

When the [R] indicator is lighted:

Wiping proceeds in the reverse direction.

When the [N/R] indicator is lighted:

The normal direction is replaced with the reverse direction (or vice versa) when the transition is completed. (The lighted and extinguished statuses of the [R] button are also switched in line with the direction of the wiping.)

26 Fader lever

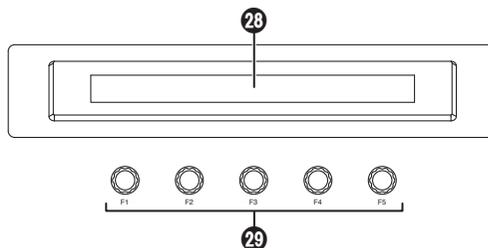
This is used to execute background or key transitions. When it is moved as far as it will go, the transition is completed. When it has been operated during auto transition, auto transition will be switched to manual operation as soon as the fader position overtakes the amount of the transition being executed.

27 Bus tally LEDs

These indicate the output statuses of the A bus and B bus. The LED corresponding to the bus whose program signals (PGM) are being output lights.

1. Functions in each area

1-6. LCD menu area



28 LCD

The setting menus are displayed on the LCD.

When the [FUNC] button (11) is pressed and its indicator is lighted and then one of the wipe pattern selector buttons (8) is pressed, the setting menu is displayed.

When the buttons listed below are double-clicked, the specified menu is selected. (The menu delegation function)

The operation corresponding to the button pressed is also executed.

<List of menu delegation functions>

	Button	Menu
Crosspoint area (AUX bus selector buttons)	KEY	KEY menu/Adjust sub menu (2/8) CHR KEY menu/Auto sub menu (1/3) (with chroma key selection)
	DSK	DSK menu/Adjust sub menu (2/5)
	PinP	PinP menu/Position sub menu (4/6)
Transition area	BKGD	TIME menu/BKGD sub menu (1/5)
	KEY	TIME menu/KEY sub menu (2/5)
	WIPE	WIPE menu/Border sub menu (1/5)
Wipe area	WIPE #5	WIPE menu/WIPEPos sub menu (3/5) (BKGD or KEY)
	SQ #5	WIPE menu/SQPos sub menu (4/5) (BKGD or KEY)

29 Rotary encoders [F1] to [F5]

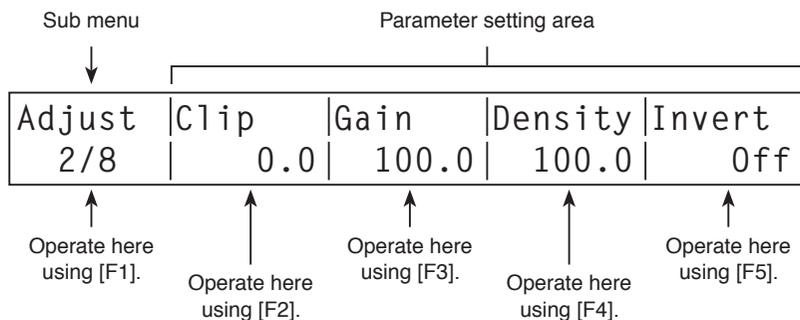
These are used to set the parameters displayed on the menus (LCD screen or external monitor). For details on the operations, refer to the sections in "3. Basic operations".

[F1]: Rotate this rotary encoder to switch the sub menu.

[F2] to [F5]: Rotate these rotary encoders to set the parameters.

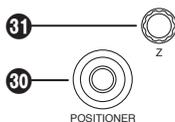
When the down arrow (↓) is shown at a menu item, its parameter is set by pressing the corresponding rotary encoder.

When the parameter is one which is set using a numerical value, its default will be restored when the rotary encoder is held down. (However, the network settings and date and time settings will not be returned to the defaults.)



1. Functions in each area

1-7. Positioner area



30 Positioners [X/Y]

This is used to set the PinP position or wipe start position (WIPE and SQ #5) or to select the chroma key area. It takes effect only when the menu is selected.

The center values of the positioners are set during the time it takes for the unit to start up after its power is turned on. Do not operate the positioners until after the switcher has started up.

31 Rotary encoder [Z]

This is used to set the PinP size or to select the chroma key area. In either case, it takes effect only when the menu is selected.

		PinP	Wipe	Chroma key
Positioner	X/Y	Position adjustments	Start position adjustments	Selected area position adjustments
Rotary encoder	Z	Size adjustments (size increased by rotating the encoder clockwise and reduced by rotating it counterclockwise)	—	Selected area size adjustments (size increased by rotating the encoder clockwise and reduced by rotating it counterclockwise)
	Switch	Hold switch down to restore initial values (X/Y, Z).	Hold switch down to restore initial values (X/Y).	Hold switch down to restore initial values (X/Y, Z).
Valid menu		All PinP menus	WIPE/WIPEPos WIPE/SQPos	CHR KEY/Auto (only when Marker item is set to On)

1-8. SD memory card area

32 SD memory card slot

The SD memory card (sold separately) is inserted into this slot.



SD Logo is a trademark.

33 SD memory card access LED

This LED lights while the data on the SD memory card is being accessed.

Do not turn off the unit's power or eject the SD memory card while the access LED is lighted. Doing so can damage the data on the SD memory card.

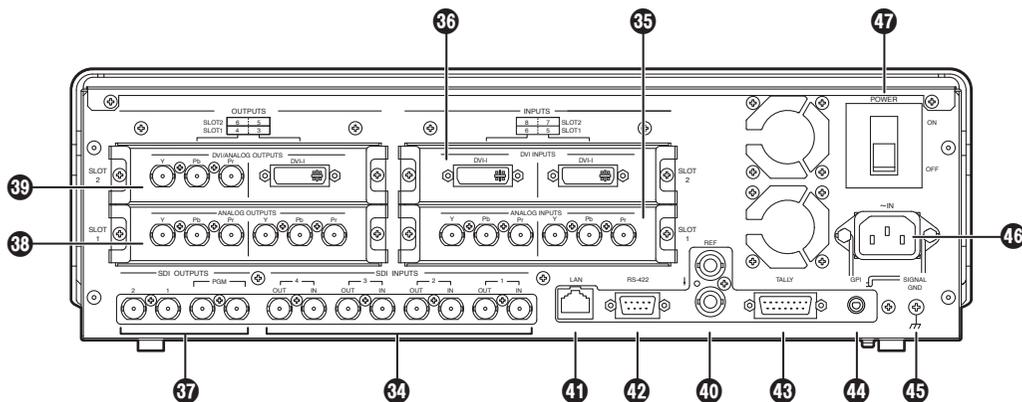
Concerning the recommended SD cards

Use of the following SD memory cards made by Panasonic is recommended.

- RP-SD128BU1A
- RP-SD256BU1A
- RP-SDR512U1A
- RP-SDR01GU1A
- RP-SDM02GU1A

1. Functions in each area

1-9. Rear panel connections area



34 SDI signal input connectors [DIGITAL INPUTS 1 to 4]

IN: SDI signal input; OUT: active through output (use this as a monitor output application).

35 Optional input connector SLOT1 [INPUT 5, 6] (optional)

36 Optional input connector SLOT2 [INPUT 7, 8] (optional)

A board (with built-in up-converter), whether an SDI input board, analog input board or DVI input board, can be connected to each of these slots.

For further details, refer to the operating instructions of the optional board concerned.

37 SDI signal output connectors [DIGITAL OUTPUTS PGM, OUTPUT 1, 2]

PGM: PGM output connectors

OUTPUT 1, 2: The signals for these connectors can be assigned using a menu.

38 Optional output connector SLOT1 [OUTPUT 3, 4] (optional)

A board, whether an analog output board or DVI/analog output board (OUTPUT3: DVI, OUTPUT4: analog), can be connected to this slot.

For further details, refer to the operating instructions of the optional board concerned.

39 Optional output connector SLOT2 [OUTPUT 5, 6] (optional)

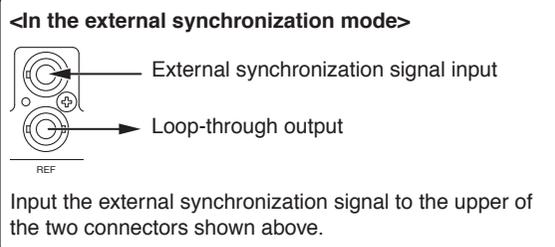
A board, whether an analog output board or DVI/analog output board (OUTPUT5: DVI, OUTPUT6: analog), can be connected to this slot.

For further details, refer to the operating instructions of the optional board concerned.

40 Reference input connector/BB output connector [REF]

Loop-through output in the external sync mode.
If the loop-through output is not going to be used, provide a 75-ohm termination.

BB signals output from both connectors in the internal sync mode.



1. Functions in each area

41 LAN connector [LAN] (RJ-45) (10BASE-T, 100BASE-TX)

42 RS-422 interface connector [RS-422] (D-sub 9-pin, female)

☞ For details on connection, refer to “6. External interfaces”.

43 Tally output connector [TALLY] (D-sub 15-pin, male)

☞ For details on connection, refer to “6. External interfaces”.

44 GPI input connector [GPI] (3.5 mm diameter stereo mini jack)

☞ For details on connection, refer to “6. External interfaces”.

45 Ground connector

Connect to the system’s earth ground.

46 AC power input socket [AC IN] (AC 100V-120V)

Connect one end of the supplied power cable to this socket and the other end to the AC outlet.

The supplied power cable comes with a 3-pin power plug. Be absolutely sure to plug it into a 3-point power outlet as the power source in order to earth the unit securely.

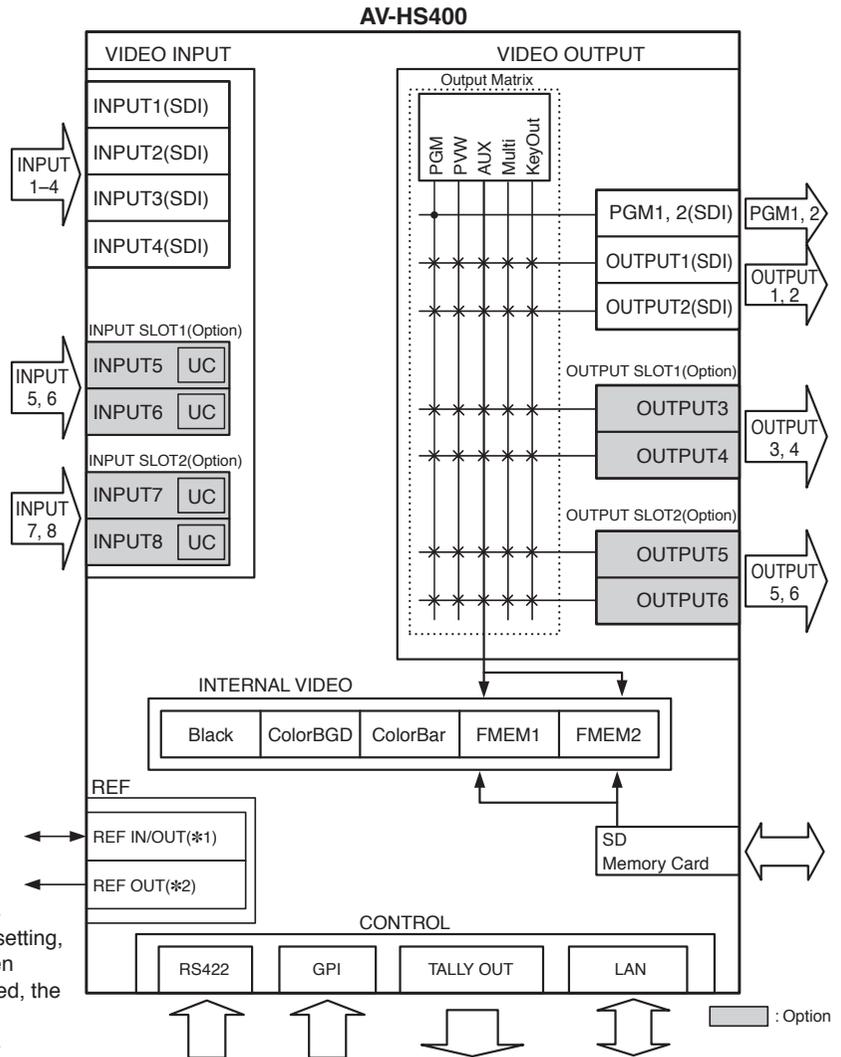
If a 3-point power outlet is not available for this connection, be absolutely sure to consult your dealer.

47 Power switch

This is used to turn the power on and off.

2. System

2-1. Configuration



*1: When external synchronization is selected as the reference signal setting, the reference signal is input. When internal synchronization is selected, the reference signal is output.

*2: When external synchronization is selected as the reference signal setting, the signals are looped through and output. When internal synchronization is selected, the reference signal is output.

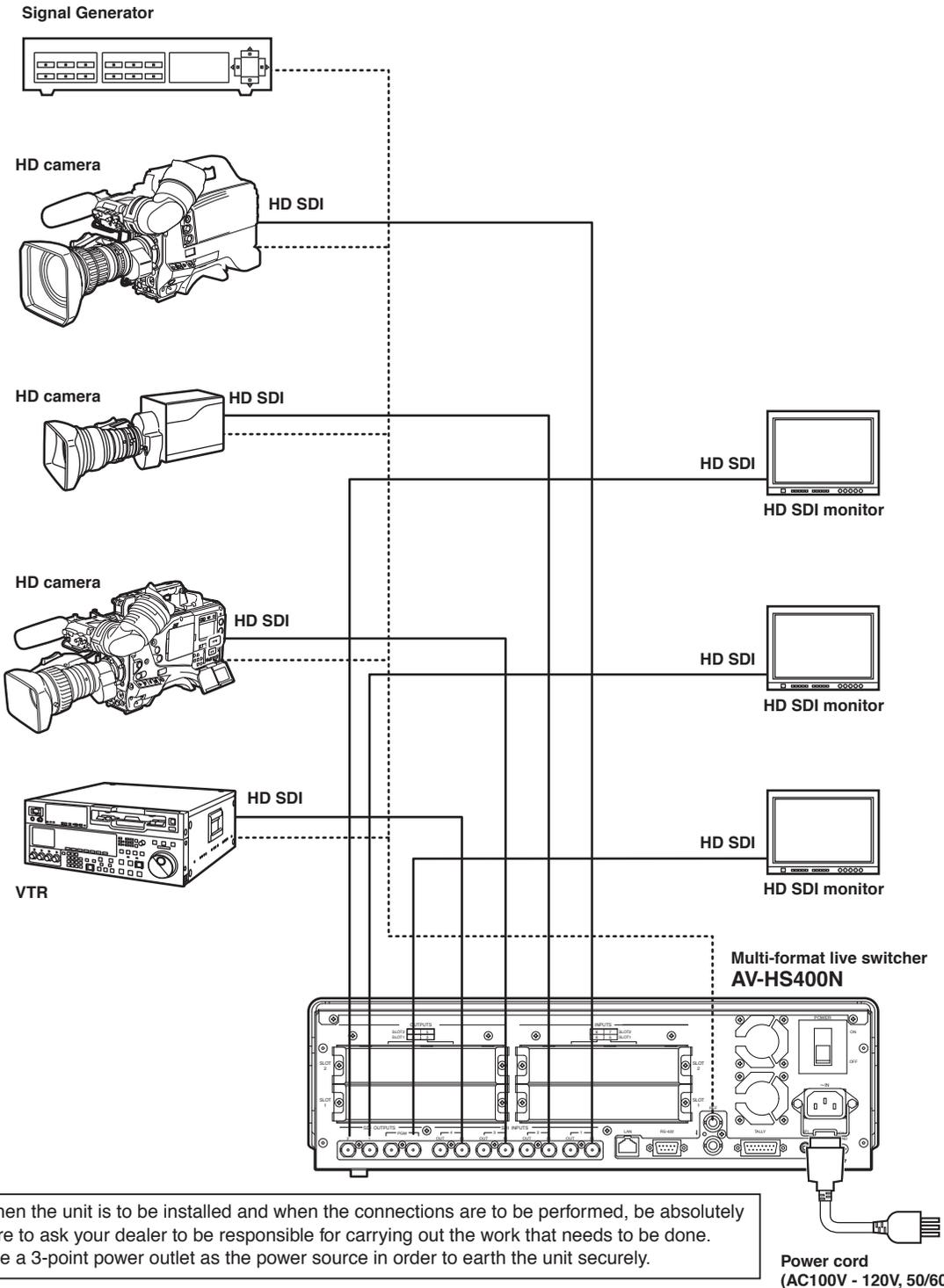
Table of optional boards

Board	Model number	Function	Where connected
SDI Input Board	AV-HS04M1	SDI input x2 lines	INPUT SLOT1 or SLOT2
Analog Input Board	AV-HS04M2	Analog component input x2 lines	
DVI Input Board	AV-HS04M3	DVI-I input x2 lines	
Analog Output Board	AV-HS04M4	Analog component output x2 lines	OUTPUT SLOT1 or SLOT2
DVI/Analog Output Board	AV-HS04M5	DVI output x1 line Analog component output x1 line	

2. System

2-2. Connections

■Connections when implementing gen-lock (frame synchronizer OFF)

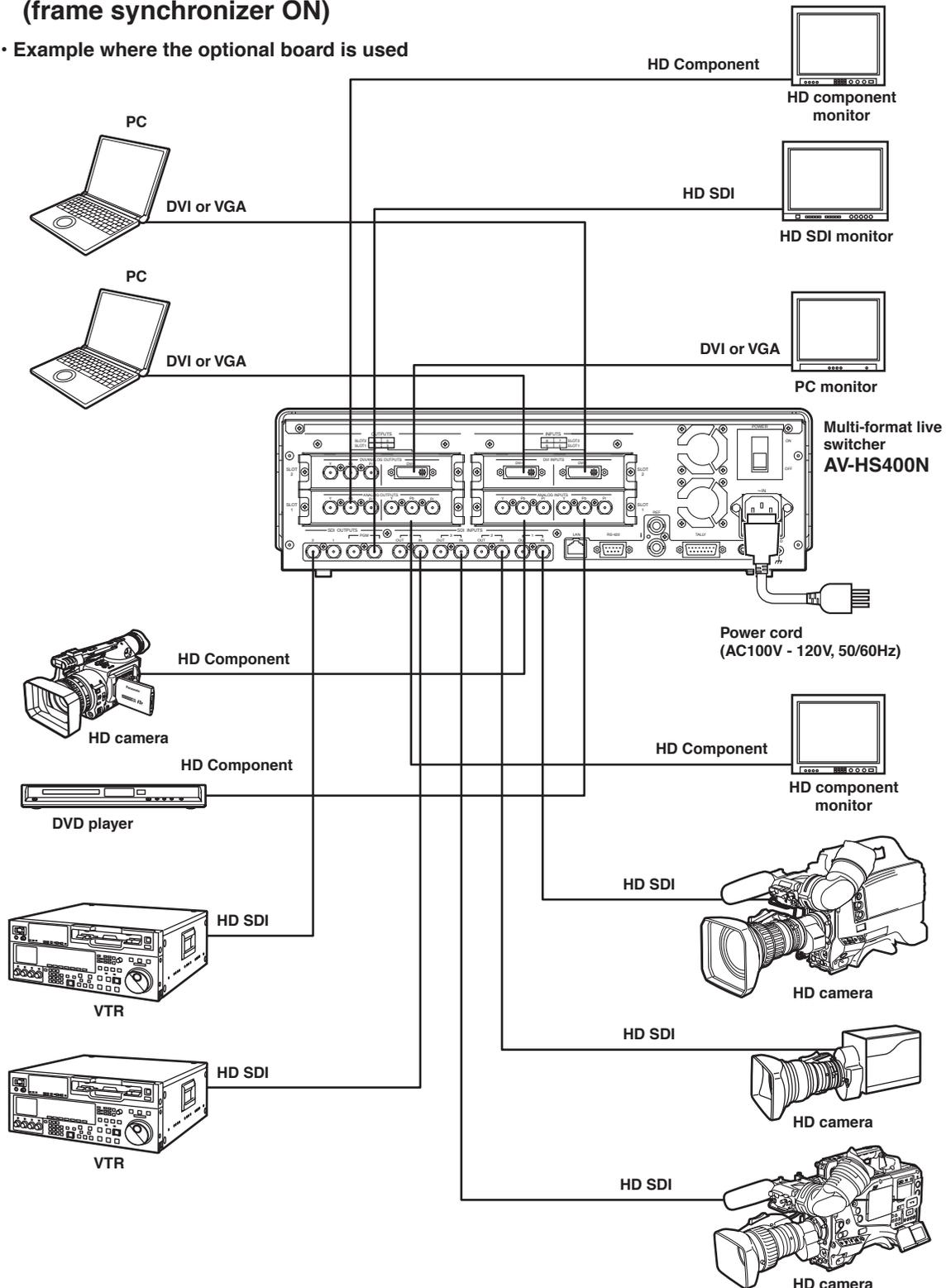


- When the unit is to be installed and when the connections are to be performed, be absolutely sure to ask your dealer to be responsible for carrying out the work that needs to be done.
- Use a 3-point power outlet as the power source in order to earth the unit securely.

2. System

■Connections when not implementing gen-lock (frame synchronizer ON)

- Example where the optional board is used



3. Basic operations

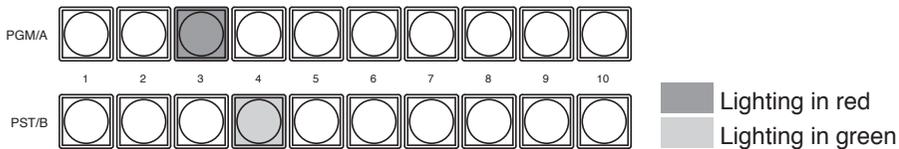
3-1. Background transition

3-1-1. Selecting the bus

Press the crosspoint buttons to select the material which will be targeted for the background transition. By pressing these buttons, the signals are selected, and the indicators of the selected buttons light. The color in which the button indicators light differs depending on the operation status.

Lighting in red: When the selected input signals are output to PGM.
(However, the indicator lights in amber during FTB operations.)

Lighting in green: When the selected input signals are not output to PGM.



3-1-2. Selecting the bus mode

Select the A/B bus system or flip-flop system (PGM/PST system) from the setting menu.

- ① Press the [FUNC] button to light its indicator, and then press the [SYSTEM] button to display the SYSTEM menu.
- ② Turn [F1] to display the System sub menu.
- ③ Turn [F2], and select the A/B or PGM/PST (flip-flop system) using the BusMode item.

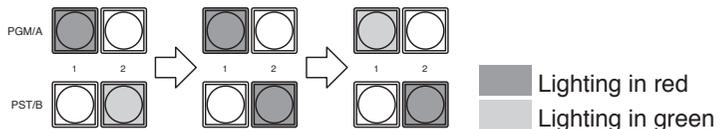
<Menu display>

System	BusMode	BL	EditEN
2/13	PGM/PST	0n	0n
A/B		Off	Off

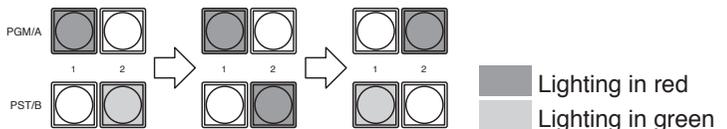
With the flip-flop (PGM/PST) system, the PGM/A bus selected signals are always output as PGM images, and the PST/B bus selected signals are always output as PVW (PST) images.

System	Video output	Before transition	During transition	After transition completion
A/B	PGM	PGM/A	PGM/A, PST/B	PST/B
	PVW (PST)	PST/B	PST/B	PGM/A

- With an A → B transition



System	Video output	Before transition	During transition	After transition completion
Flip-flop PGM/PST	PGM	PGM/A	PGM/A, PST/B	PGM/A
	PVW (PST)	PST/B	PST/B	PST/B



3. Basic operations

3-1-3. Selecting the transition mode

Press the [BKGD] button in the transition area so that its indicator lights in amber. When the [BKGD] button and [KEY] button are pressed at the same time, both buttons are selected.

Use the [MIX] and [WIPE] buttons in the transition area to select the background transition mode. The indicator of the selected button lights in amber.

3-1-4. Manual transition (using the fader lever)

Operate the fader lever to execute transitions manually.

If the fader lever has been operated during auto transition, auto transition will be switched to manual operation as soon as the fader position overtakes the amount of the transition being executed.

The bus tally LEDs on the left of the fader lever indicate the program bus output status.

Top LED only lights: PGM/A bus output

Top and bottom LEDs light: during the transition

Bottom LED only lights: PST/B output

3-1-5. Auto transition

- When the [AUTO] button is pressed, the transition is executed automatically using the transition time which has been set.
- When the [AUTO] button is pressed while the fader lever is at an interim setting, the transition is executed in the time remaining from the interim setting.
- The auto transition time is set using the menu.
 - ① Press the [FUNC] button to light its indicator, and press the [TIME] button to display the TIME menu.
 - ② Turn [F1] to display the BKGD sub menu.
 - ③ Turn [F4] to select the display unit using the UNIT item.
 - ④ When frames (F) have been selected as the unit, turn [F2] or [F3] to set the transition time.
 - ⑤ When seconds (SEC) have been selected as the unit, turn [F2] to set the second units or [F3] to set the frame units.

<Menu display>

BKGD	TransTime	Unit	
1/5	16s	39f	Sec

BKGD	TransTime	Unit	
1/5	999f	Frame	

- Any time from 0 to 999f can be set. The time which can be set when seconds are used as the display unit differs depending on the video format.

59.94i: max. 33s09f, **59.94p:** max. 16s39f

50i: max. 39s24f, **50p:** max. 19s49f

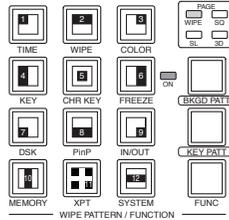
3-1-6. Cut transition

When the [CUT] button is pressed, the transition is executed instantly.

3. Basic operations

3-2. Wipe

3-2-1. Selecting the wipe pattern



The wipe patterns which are allocated to the 12 wipe pattern buttons are used as the basis for wiping, and each button has four pages — wipe, squeeze, slide and 3D — of patterns. (Refer to the table of wipe patterns.) Displayed for each wipe pattern selector button are an image of the basic wipe pattern and a number.

<How to select the wipe patterns>

- ① Press the [BKGND PATT] button or [KEY PATT] button to select the page.
Each time the button is pressed, the page is selected, and the indicator LED (WIPE, SQ, SL or 3D) for the selected page lights. (3D cannot be selected using the [KEY PATT] button.)
- ② Select the button from among the 12 wipe pattern selector buttons for which the number of the pattern concerned is indicated. The selected pattern lights, and a wipe image appears on the external monitor (OSD).

The pattern page indicator LEDs light only when the [BKGND PATT] button or [KEY PATT] button has been selected.

<Table of wipe patterns>

WIPE			SQ (squeeze)			SL (slide)			3D (3 dimensions)		
1	2	3	1	2	3	1	2	3	1	2	3
4	5	6	4	5	6	4	5	6	4	5	6
7	8	9	7	8	9	7	8	9	7	8	9
10	11	12	10	11	12	10	11	12	10	11	12

- There are no corresponding patterns for 11 of SQ and 5, 10, 11 and 12 for SL and, therefore, they cannot be selected.

3. Basic operations

3-2-2. Selecting the wipe direction

Operate the wipe direction selector buttons to select the wipe direction for the background transition. (The key transitions are set by the menu. The direction which is set here will not be reflected. See 3-3-3.)

When the indicators are off:

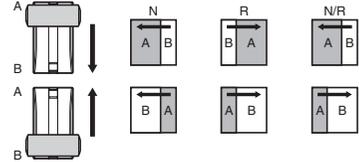
Wiping proceeds in the normal direction.

When the [R] indicator is lighted:

Wiping proceeds in the reverse direction.

When the [N/R] indicator is lighted:

The normal direction is replaced with the reverse direction (or vice versa) when the transition is completed. (The lighted and extinguished statuses of the [R] button are also switched in line with the direction of the wiping.)



3-2-3. Wipe decorations (border, soft effect)

A border effect or soft effect can be added to the wiping of background transitions (but not for key transitions).

Setting the border and soft effect

- ① Press the [FUNC] button to light its indicator, and press the [WIPE] button to display the WIPE menu.
- ② Turn [F1] to display the Border sub menu.
- ③ Turn [F2] to set ON (or OFF) for the border using the Border item.
- ④ Turn [F3] to set the width of the border using the Width item.
- ⑤ Turn [F4] to set the amount of soft effect using the Soft item. The soft effect is OFF if 0 is set.

<Menu display>

Border	Border	Width	Soft
1/5	Off	5.0	0.0
	On	0.1	0.0
		}	}
		100.0	100.0

When “On” has been selected as the Border item setting, the ratio of the soft effect to the border width is indicated as the amount of soft effect.

When only the soft effect is to be added to wipe, select “Off” as the Border item setting.

Setting the border color

- ① On the WIPE menu, turn [F1] to display the BodrCol sub menu.
- ② Turn [F2], [F3] and [F4] to adjust the Hue, Sat and Lum of the border color.
- ③ To call a preset color, turn [F5] to select the preset color using the Load item, and press the [F5] switch. The Hue, Sat and Lum values are changed to the preset color values. (The values which have been set will not be stored in the memory until the [F5] switch is pressed.)

<Menu display>

BodrCol	Hue	Sat	Lum	Load↓
2/5	0.0	0.0	100.0	White
	0.0	0.0	0.0	Yellow
	}	}	}	Cyan
	359.9	100.0	108.0	Green
				Magenta
				Red
				Blue
				Black

3. Basic operations

3-2-4. Setting the wipe start position

Any start position can be set for wipe pattern WIPE and SQ #5. The start position has one set of values for a background pattern and another set for a key pattern.

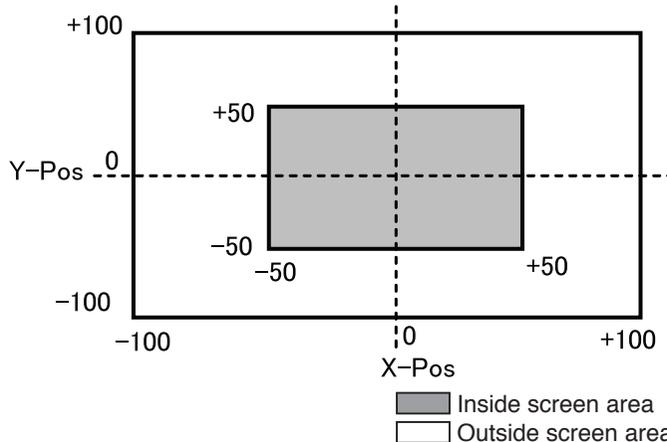
- ① Press the [FUNC] button to light its indicator, and press the [WIPE] button to display the WIPE menu.
- ② Turn [F1] to display the WIPEPos sub menu or the SQPos sub menu.

<Menu display>

WIPEPos	Select	X-Pos	Y-Pos	CopyTo↓
3/5	BKGD	0.00	0.00	KEY
	KEY	-100.00	-100.00	
		}	}	
		+100.00	+100.00	

- ③ Turn [F2] to select the pattern (background or key) to be set using the Select item.
- ④ Either operate the positioners or turn [F3] and [F4] to set the wipe start position using the X-Pos item and Y-Pos item.
These settings can be established only when WIPE or SQ #5 has been selected as the background pattern or key pattern.
- ⑤ Either operate the fader lever or press the [AUTO] button to check the wipe operation. (When, for instance, -50 has been set for X-Pos and -50 for Y-Pos, the following screen (or key) appears from the bottom left and wipe is performed while the screen (or key) moves to the screen center.)

<X-Pos, Y-Pos setting range>



- ⑥ To copy the start position settings, press [F5].
The copy destination appears under the CopyTo item. (It will not change even if [F5] is turned.)

3. Basic operations

3-2-5. Modifying wipe

■ Setting the lighting effect

When 3D (1, 3, 7, 9) has been selected as the wipe pattern, a lighting effect can be added.

- ① Press the [FUNC] button to light its indicator, and press the [WIPE] button to display the WIPE menu.
- ② Turn [F1] to display the Modify sub menu.

<Menu display>

Modify	Light		Trim
5/5	Off		Off
	On		4:3

- ③ Turn [F2] to select whether the lighting effect is to be added using the Light item.
On: The lighting effect is added.
Off: The lighting effect is not added.

■ Setting the trimming

When SQ, SL or 3D has been selected as the wipe pattern, the trimming can be set.
The trimming setting takes effect only when the HD format has been set as the system format.

- ① On the WIPE menu, turn [F1] to display the Modify sub menu.
- ② Turn [F5] to set the aspect ratio to which the images are to be trimmed using the Trim item.
On: No trimming
4:3: The images are trimmed using the 4:3 aspect ratio. Trimming is released when the transition is completed.

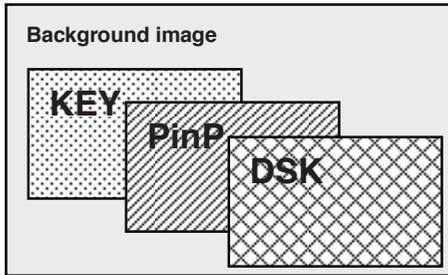
3. Basic operations

3-3. Key

This operation combines the background image with another image. The key definition can be adjusted, and an edge can be added to the combined image.

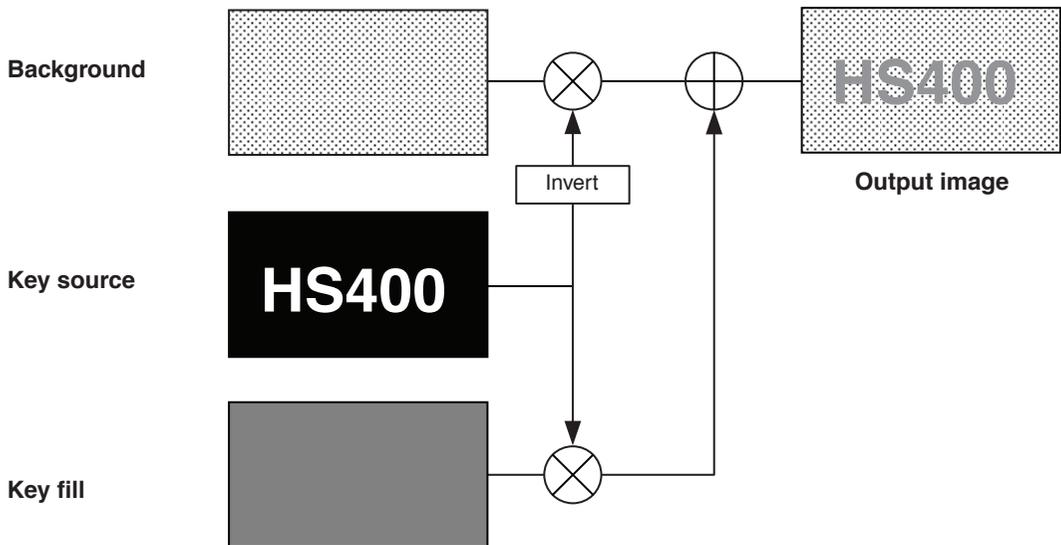
Also available as materials besides KEY for combining with the background image are PinP (picture in picture) and DSK (downstream key). The figure below shows their priorities.

<Key, PinP and DSK priorities>



How key combinations work is shown in the figure below.

<How key composition works>



3. Basic operations

3-3-1. Selecting the key type

- ① Press the [FUNC] button to light its indicator, and press the [KEY] button to display the KEY menu.
- ② Turn [F1] to display the KEY sub menu.
- ③ Turn [F2] to select the Type item.

<Menu display>

KEY	Type	LumKey	Fill	PVW
1/8	Linear	ChrmOff	Bus	Auto
	Lum	ChrmOn	Matte	Off
	Chroma			On

Lum (luminance key/self key):

This is for creating the key signals from the luminance component or luminance and chroma component of the key fill signal.

Linear (linear key/EXT key):

This is for creating the key signals from the luminance component of the key source signal. It is used when the key source signal and key fill signal are different.

Chroma (chroma key/self key):

This is for creating the key signals using a specific hue of the key fill signal as the reference.

Since the luminance and chroma keys are operated as self keys, the key fill signals are used as the key source signals. When the luminance key or chroma key has been selected as the key type, the key signals will remain unchanged even when the key source signals are switched.

Furthermore, when "Lum" or "Chroma" is selected, the KEY button in the crosspoint area changes to lighting in amber (key fill bus selection status).

When using the linear key, use material with a black background and white characters or shape to be combined by the key as the key source signal. Material which is not black and white may not be combined clearly. Material with a white background and black characters, etc. can be reversed using the key invert function for use.

- ④ When the luminance key has been selected, the chroma component can be included in the generation of the key signals in view of the self key application. (This does not apply to the linear key.)
Turn [F3], and select the setting using the LumKey item.

ChrmOn: In addition to the luminance component, the chroma component is also taken into account in the generation of the key signals.

This is the setting for using a color with a low luminance component for the key signals (such as when defining blue characters).

ChrmOff: The key signals are generated from only the luminance component.

- ⑤ Turn [F4] to select the fill type using the Fill item.

Bus: The bus signal is used for the key fill signal.

Matte: The internal fill matte is used for the key fill signal.

3. Basic operations

3-3-2. Selecting the key material

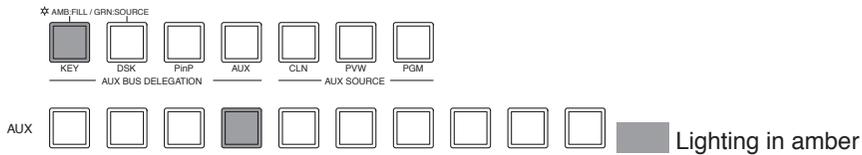
■ Selecting the key fill and key source signals

Press the KEY button in the AUX bus selection area, and switch the selection of the key fill signal (indicator lights in amber) and key source signal (indicator lights in green).

<Selecting the key fill signal>

With the indicator of the KEY button lighted in amber, press one of the AUX crosspoint buttons 1 to 10 to select the key fill signal.

The indicator of the selected crosspoint button lights in amber. (It will light in red if the selected signal is being output from the PGM connector.)

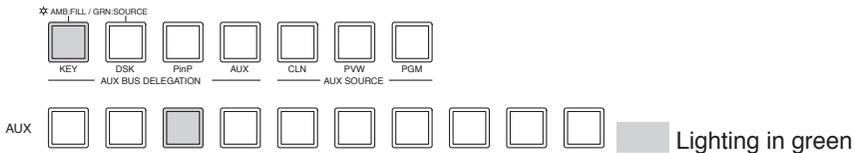


<Selecting the key source signal>

With the indicator of the KEY button lighted in green, press one of the AUX crosspoint buttons 1 to 10 to select the key source signal.

The indicator of the selected crosspoint button lights in green. (It will light in red if the selected signal is being output from the PGM connector.)

Since the luminance and chroma keys are operated as self keys, the key fill signals are used as the key source signals. When the luminance key or chroma key has been selected as the key type, the key signals will remain unchanged even when the key source signals are switched.



■ Setting the fill matte color

- ① Press the [FUNC] button to light its indicator, and press the [KEY] button to display the KEY menu.
- ② Turn [F1] to display the FillMatt sub menu.
- ③ Turn [F2], [F3] and [F4] to adjust the Hue, Sat and Lum of the fill matte.
- ④ To call a preset color, turn [F5] to select the preset color using the Load item, and press the [F5] switch. The Hue, Sat and Lum values are changed to the preset color values. (The values which have been set will not be stored in the memory until the [F5] switch is pressed.)

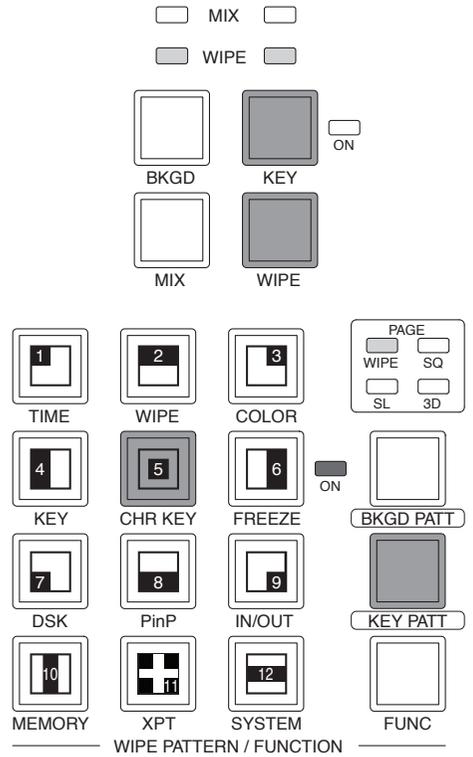
<Menu display>

FillMatt	Hue	Sat	Lum	Load↓
3/8	0.0	0.0	100.0	White
	0.0	0.0	0.0	Yellow
	∫	∫	∫	Cyan
	359.9	100.0	108.0	Green
				Magenta
				Red
				Blue
				Black

3. Basic operations

3-3-3. Key transitions

- ① Select key in the transition mode.
 Press the [KEY] button in the transition area to light its indicator.
 To execute a background transition and key transition at the same time, press the [BKGD] button and [KEY] button together to turn on both indicators.
- ② Select the transition type.
 Use the [MIX] button or [WIPE] button in the transition area to select the key transition mode. The indicator of the selected button lights in amber. At the same time, the MIX or WIPE selection status indicator LED lights.
 When WIPE has been selected, press the [KEY PATT] button to light its indicator, and select the wipe pattern.
- ③ Set the time of the transition.
 On the TIME menu, turn [F1] to display the KEY sub menu.
 As with a background transition, set the transition time.
- ④ Set the wipe direction.
 On the KEY menu, turn [F1] to display the Trans sub menu.
 Turn [F1] to set Nor (normal) or Rev (reverse) using the OutPatt item.



Nor (normal): The key out pattern moves in the same direction as the key in pattern.

Rev (reverse): The key out pattern moves in the opposite direction from the key in pattern.

However, the operations in pattern example 3 are performed for WIPE 5, 10, 11 and 12, and the operations in pattern example 4 are performed for SQ 5, 10 and 12.

<Pattern examples>

	Pattern example 1	Pattern example 2	Pattern example 3 (WIPE5, 10, 11, 12)	Pattern example 4 (SQ5, 10, 12)
Key in				
Key out (Nor)				
Key out (Rev)				

: This indicates the areas where keys are combined.

3. Basic operations

⑤ Execute the transition.

Press the [AUTO] button to execute the transition automatically for the transition time which has been set. Alternatively, execute the transition manually by operating the fader lever.

When the KEYAuto function has been assigned to the [FTB] button, the transition will be executed automatically for the transition time which has been set when the [FTB] key is pressed no matter which transition mode has been selected.

During key in, the indicator of the [FTB] button blinks in red, and it lights in red when the transition is completed.

If the [FTB] button is pressed with the picture completely keyed in, the Key image transition (key out) is executed.

During key out, the indicator of the [FTB] button lights in red, and it goes off when the transition is completed. If the [FTB] button is pressed during the transition, the transition direction is reversed.

3-3-4. Key preview

Key preview images can be output to the preview output, and the keys can be adjusted and checked.

On the KEY menu, turn [F1] to display the KEY sub menu.

Turn [F5] to set the preview mode using the PVW item.

On: An image with key effects added is output to the preview output.

Off: An image with no key effects added is output to the preview output.

Auto: The preview image of the next transition is output to the preview output.

3-3-5. Adjusting the luminance key and linear key

These steps are taken to adjust the luminance key and linear key definition.

① Press the [FUNC] button to light its indicator, and then press the [KEY] button to display the KEY menu.

② Turn [F1] to display the Adjust sub menu.

<Menu display>

Adjust	Clip	Gain	Density	Invert
2/8	0.0	100.0	100.0	Off

③ Turn [F2], [F3] and [F4] to adjust the key definition.

④ Turn [F5] to set key invert.

When On is selected, the key signals to be generated internally are inverted.

Operation	Parameter	Description of setting	Setting range
F2	Clip	Reference level for generating key signals	0.0 to 108.0
F3	Gain	Key amplitude	0.0 to 200.0
F4	Density	Key density	0.0 to 100.0
F5	Invert	Key signal inversion	On, Off

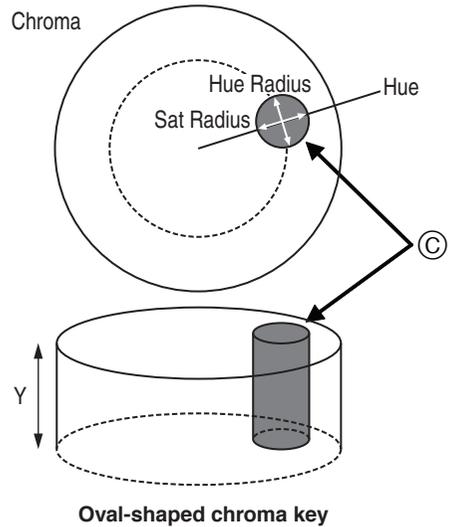
3. Basic operations

3-3-6. Adjusting the chroma key

These steps are taken to adjust the chroma key definition. Before proceeding with the adjustments, select "Chroma" as the Type item setting in "3-3-1. Selecting the key type."

The signal for the chroma key is created using a specific color tone as a reference. For instance, the background color is detected from the image of a person who is standing in front of a specific background color, the key signal is created, and a different background is combined.

This unit employs an area system which is designated using a rectangular frame. The color of the pixels inside the area which have been averaged is used as the reference color of the chroma key (key reference), and the maximum deviation from the average value is used as the radius of the chroma key oval. Chroma keys faithful to the chroma space sample (area © in the figure) can be generated.



■ Executing auto sampling

The chroma component is sampled by specifying the screen area.

- ① Press the [FUNC] button to light its indicator, and press the [CHR KEY] button to display the CHR KEY menu.
- ② Turn [F1] to display the Auto sub menu, and turn [F2] to set On using the Marker item.

<Menu display>

Auto	Marker	Aspect	Sample↓
1/3	On	0.0	Start
	Off	-50.00	
		}	
		+50.00	

- ③ The sample marker is displayed on the preview screen. Select the area to be sampled using the positioners, rotary encoder [Z] and Aspect item (turn [F3] to adjust).

Positioners:

Specify the X coordinate and Y coordinate of the sample marker.

Rotary encoder [Z]:

Adjust the size of the sample marker.

When rotary encoder [Z] is held down, the X and Y coordinates of the sample marker as well as the size of the marker are returned to their initial values.

Aspect:

Change the aspect ratio of the sample marker.

- ④ When the [F5] switch or the rotary encoder [Z] is pressed, the hue component of the area selected by the marker is sampled.
- ⑤ On completion of the sampling, the sampled values are reflected on the Adjust1 and Adjust2 sub menus, and a chroma key combined image is output to preview. (Set the key preview function to ON.)

3. Basic operations

■ Adjusting the chroma key.

- ① Press the [FUNC] button to light its indicator, and press the [CHR KEY] button to display the CHR KEY menu.
- ② Turn [F1] to display the Adjust1 sub menu, and turn [F2] to [F5] to set the items.

<Menu display>

Adjust1	Hue	Sat	Lum	Y-Infl
2/3	100.0	100.0	100.0	0.0

<Item operations>

Operation	Parameter	Setting	Setting range	Initial value
F2	Hue	Hue serving as reference	359.9 to 0.0	*1
F3	Sat	Color saturation serving as reference	0.0 to 100.0	*1
F4	Lum	Luminance serving as reference	0.0 to 108.0	*1
F5	Y-Infl	Extent of Y component influence *2	0.0 to 100.0	0.0

*1: After auto sampling has been executed, the sampled values the reference.

*2: The extent of the Y (Lum) component influence is set using the Y-Infl item. The higher the setting, the greater the influence, and at the 0 setting, the Y component is irrelevant.

- ③ Turn [F1] to display the Adjust2 sub menu, and turn [F2] to [F5] to set the items.

<Menu display>

Adjust2	Hue-Rad	Sat-Rad	Soft	Cancel
3/3	100.0	100.0	0.0	0.0

<Item operations>

Operation	Parameter	Setting	Setting range	Initial value
F2	Hue-Rad	Size of range of hue to be defined	0.0 to 100.0	*1
F3	Sat-Rad	Size of range of saturation to be defined	0.0 to 100.0	*1
F4	Soft	Extent of soft effect on border of color to be defined	0.0 to 100.0	0.0
F5	Cancel	Cancel amount *2	0.0 to 100.0	0.0

*1: After auto sampling has been executed, the sampled values the reference.

*2: The amount of color cancellation is adjusted using the Cancel item. This adjustment is made when the background color covers the fill image.

Tips for chroma key adjustments

Chroma key adjustments can be facilitated by taking the steps below.

- ① Execute auto sampling, and decide on which color is to be removed.
- ② Using the Hue-Rad item and Sat-Rad item, adjust in such a way that the background color is completely removed.
- ③ Using the Soft item, finely adjusting the border of the key signal.

3. Basic operations

■ Making other adjustments

Perform the key density and key invert settings.

- ① Press the [FUNC] button to light its indicator, and press the [KEY] button to display the KEY menu.
- ② Turn [F1] to display the Adjust sub menu.

<Menu display>

Adjust	Clip	Gain	Density	Invert
2/8	-	-	100.0	Off

0.0	On
}	
100.0	

(Neither the Clip item nor the Gain item can be set when the chroma key is selected.)

- ③ Turn [F4] to select the key density using the Density item.
- ④ Turn [F5] to set key invert.

3. Basic operations

3-3-7. Key decorations

A border, shadow or other edge can be added to the key.

■ Setting the key edge

① Press the [FUNC] button to light its indicator, and then press the [KEY] button to display the KEY menu.

② Turn [F1] to display the Edge sub menu.

③ Turn [F2] to select the edge type.

Off: An edge is not added.

Border: A border is added around the entire edge.

Drop: A diagonal border is added but only in the direction toward the bottom right of the key.

Shadow: A shadow is added but only in the direction toward the bottom right of the key.

Outline: An outline (only a border with no fill) is added.

<Menu display>

Edge	Type	Width		
4/8	Off	2		

Border	0~4
Drop	
Shadow	
Outline	



④ Turn [F3] to set the edge width.

■ Setting the edge color

① On the KEY menu, turn [F1] to display the EdgeCol sub menu.

② Turn [F2], [F3] and [F4] to adjust the Hue, Sat and Lum of the edge color.

③ To call a preset color, turn [F5] to select the preset color using the Load item, and press the [F5] switch. The Hue, Sat and Lum values are changed to the preset color values. (The values which have been set will not be stored in the memory until the [F5] switch is pressed.)

<Menu display>

EdgeCol	Hue	Sat	Lum	Load↓
5/8	0.0	0.0	0.0	Black

0.0	0.0	0.0	Yellow
∫	∫	∫	Cyan
359.9	100.0	108.0	Green
			Magenta
			Red
			Blue
			White

3. Basic operations

3-3-8. Masking the key signals

These steps are taken to mask the key signals using the mask signal of the box pattern.

- ① Press the [FUNC] button to light its indicator, and press the [KEY] button to display the KEY menu.
- ② Turn [F1] to display the Mask sub menu.

<Menu display>

Mask	Mask	Invert		
6/8	Off	Off		
	On	On		

- ③ Turn [F2], and select mask On or Off using the Mask item.
 - On:** The key signals are masked.
 - Off:** The key signals are not masked.
- ④ Turn [F3] to set whether to invert the mask signal using the Invert item.
 - On:** The mask signal is inverted.
 - Off:** The mask signal is not inverted.

- ⑤ Turn [F1] to display the MaskAdj sub menu.

<Menu display>

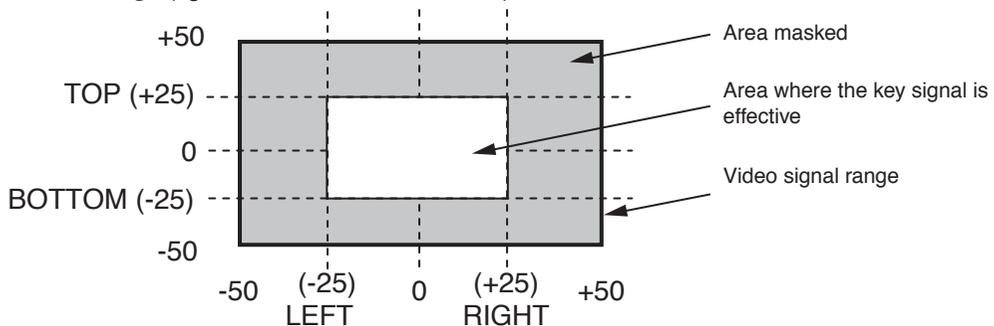
MaskAdj	Left	Top	Bottom	Right
7/8	-25.00	+25.00	-25.00	+25.00

- ⑥ Turn [F2] to [F5] to set the area to be masked.

Operation	Parameter	Setting	Setting range	Initial value
F2	Left	Key left position	-50.00 to +50.00	-25.00
F3	Top	Key top position	-50.00 to +50.00	+25.00
F4	Bottom	Key bottom position	-50.00 to +50.00	-25.00
F5	Right	Key right position	-50.00 to +50.00	+25.00

The Left setting cannot exceed the Right setting (and vice versa) and, similarly, the Top setting cannot exceed the Bottom setting (and vice versa).

<Key mask setting> (figure shows the default values)



3. Basic operations

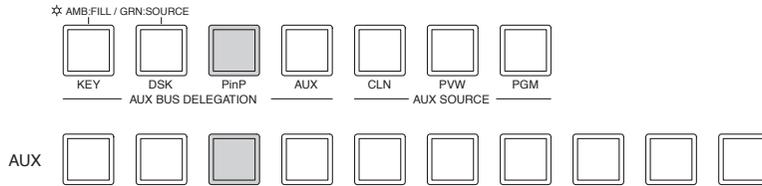
3-4. PinP (picture in picture)

Another image can be combined with the background image.

3-4-1. Selecting the PinP material

Press the [PinP] button among the AUX bus selector buttons to light its indicator, and press one of the AUX bus crosspoint buttons 1 to 10 to select the PinP signal.

The indicators of both the [PinP] button and the selected AUX bus crosspoint button light in amber. (They light in red if the selected signal is being output to the PGM connector.)



3-4-2. PinP transitions

- ① Set the transition time.
On the TIME menu, turn [F1] to display the PinP menu.
Set the transition time in the same way as for background transitions.
- ② When the [PinP] button in the transition area is pressed, the PinP image transition (fade-in) is executed for the transition time which has been set.

During fade-in, the indicator of the [PinP] button blinks in red, and it lights in red when the transition is completed. If the [PinP] button is pressed with the picture completely faded in, the PinP image transition (fade-out) is executed.



During fade-out, the indicator of the [PinP] button lights in red, and it goes off when the transition (fade-out) is completed. If the [PinP] button is pressed during the transition, the transition direction is reversed.

3-4-3. PinP preview

The user can select whether to output the PinP preview image to the preview output. On the PinP sub menu, turn [F5] to set the PVW item.

<Menu display>

PinP	Density			PVW
1/6	100.0			Off
	0.0			On
	}			
	100.0			

On: The image with the PinP effect added is output to the preview output.

Off: The image with no PinP effect added is output to the preview output.

PVW On and Off can be allocated to the user buttons. See 5-3-1.

3. Basic operations

3-4-4. PinP adjustments

■ Adjusting the PinP position and size

While the PinP menu is selected, adjust the X and Y coordinates using the positioners in the positioner area, and adjust the size using the rotary encoder [Z]. Alternatively, the settings can be performed on the menus.

- ① Press the [FUNC] button to light its indicator, and press the [PinP] button to display the PinP menu.
- ② Turn [F1] to display the Position sub menu.
- ③ Either operate the positioners and the rotary encoder [Z] or turn [F2], [F3] and [F4] to set the X and Y coordinates and the size using the X-Pos, Y-Pos and Size items.

<Menu display>

Position	X-Pos	Y-Pos	Size
4/6	0.00	0.00	100.00
	-50.00	-50.00	0.0
	}	}	}
	+50.00	+50.00	100.0

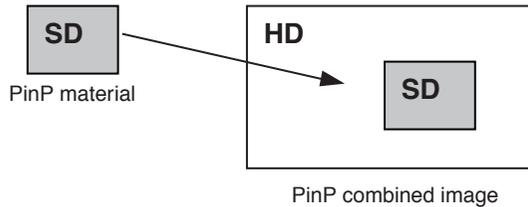
■ Select the dot by dot mode

When the system is set to the HD mode and an SD format image is to be used for the PinP material, the images can be combined in the dot by dot mode (actual-size images).

In this mode, the SD format image will not be up-converted so image deterioration can be prevented.

Furthermore, since the images are handled in their actual size, the PinP size is fixed.

On the IN/OUT menu, turn [F1] to display the Input menu, and select D by D using the Mode item.



■ Adjusting the density

The step below is taken to adjust the PinP transparency (density).

On the PinP sub menu, turn [F2] to set the Density item.

3. Basic operations

3-4-5. PinP decorations

A border or soft effect can be added to PinP.

- ① Press the [FUNC] button to light its indicator, and press the [PinP] button to display the PinP menu.
- ② Turn [F1] to display the Border sub menu.

<Menu display>

Border	Border	Width	Soft
2/6	Off	5.0	0.0
	On	0.1	0.0
		}	}
		100.0	100.0

- ③ Turn [F2] to set ON (or OFF) for the border using the Border item.
- ④ Turn [F3] to set the width of the border using the Width item.
- ⑤ Turn [F4] to set the amount of soft effect using the Soft item. The soft effect is OFF if 0 is set.

When "On" has been selected as the Border item setting, the ratio of the soft effect to the border width is indicated as the amount of soft effect.

When only the soft effect is to be added to PinP, select "Off" as the Border item setting.

■ Setting the border color

- ① On the KEY menu, turn [F1] to display the BodrCol sub menu.
- ② Turn [F2], [F3] and [F4] to adjust the Hue, Sat and Lum of the border color.
- ③ To call a preset color, turn [F5] to select the preset color using the Load item, and press the [F5] switch. The Hue, Sat and Lum values are changed to the preset color values.
(The values which have been set will not be stored in the memory until the [F5] switch is pressed.)

<Menu display>

BodrCol	Hue	Sat	Lum	Load↓
3/6	0.0	0.0	100.0	White
	0.0	0.0	0.0	Yellow
	}	}	}	Cyan
	359.9	100.0	108.0	Green
				Magenta
				Red
				Blue
				Black

3. Basic operations

3-4-6. Trimming settings

- ① Press the [FUNC] button to light its indicator, and press the [PinP] button to display the PinP menu.
- ② Turn [F1] to display the Trim sub menu.

<Menu display>

Trim 5/6	Trim Off	Manual Free		
	4:3 Manual	Pair		

- ③ Turn [F2] to select the trimming type using the Trim item.

Off: No trimming

4:3: Automatic trimming so that the aspect ratio is 4:3

Manual: Trimming using the value set on the TrimAdj sub menu

- ④ Turn [F3] to select the operation to be performed during the manual setting using the Manual item.

Free: The Left, Right, Top and Bottom parameters change independently.

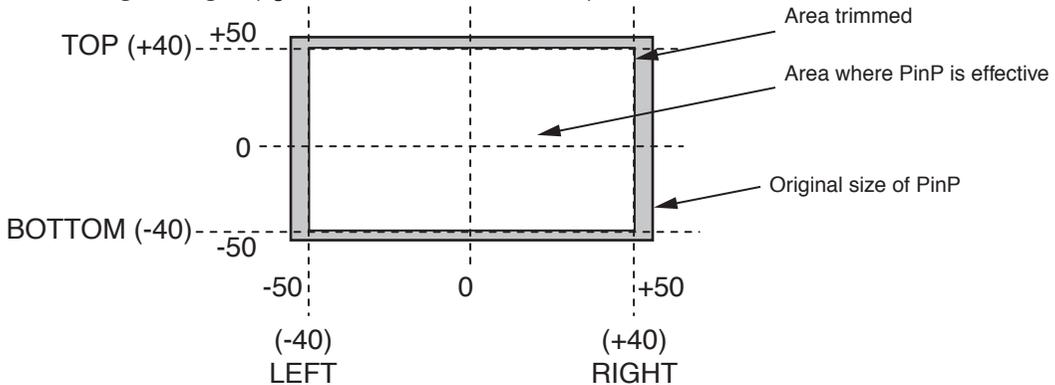
However, the Left setting cannot exceed the Right setting (and vice versa) and, similarly, the Top setting cannot exceed the Bottom setting (and vice versa).

Pair: The settings are changed in such a way that the Left and Right trimming amounts and the Top and Bottom trimming amount are the same. (This makes for a top-bottom and left-right symmetry.)

- ⑤ Turn [F1] to display the TrimAdj sub menu, and turn [F2], [F3], [F4] and [F5] to set the trimming values.

Operation	Parameter	Setting	Setting range	Initial value
F2	Left	Trimming value at left	-50.00 to +50.00	-40.00
F3	Top	Trimming value at top	-50.00 to +50.00	+40.00
F4	Bottom	Trimming value at bottom	-50.00 to +50.00	-40.00
F5	Right	Trimming value at right	-50.00 to +50.00	+40.00

<Trimming settings> (figure shows the default values)



3. Basic operations

3-5. DSK (downstream key)

Characters or other images can be combined with the background image.

3-5-1. Selecting the DSK type

- ① Press the [FUNC] button to light its indicator, and press the [DSK] button to display the DSK menu.
- ② Turn [F1] to display the DSK sub menu.
- ③ Turn [F2] to select the Type item.

<Menu display>

DSK	Type		Fill	PVW
1/5	Linear		Bus	Off
	Lum		Matte	On

Lum (luminance key/self key):

This is for creating the key signals from the luminance component of the key fill signal.

Linear (linear key/EXT key):

This is for creating the key signals from the luminance component of the key source signal. It is used when the key source signal and key fill signal are different.

Since the luminance key is operated as a self key, the key fill signals are used as the key source signals. When the luminance key has been selected as the downstream key type, the key signals will remain unchanged even when the key source signals are switched.

Furthermore, when "Lum" is selected, the DSK button in the crosspoint area changes to lighting in amber (key fill bus selection status).

When using the linear key, use material with a black background and white characters or shape to be combined by the key as the key source signal.

Material which is not black and white may not be combined clearly.

Material with a white background and black characters, etc. can be reversed using the key invert function for use.

- ④ Turn [F4] to select the fill type using the Fill item.

Bus: The bus signal is used for the key fill signal.

Matte: The internal fill matte is used for the key fill signal.

3. Basic operations

3-5-2. Selecting the DSK material

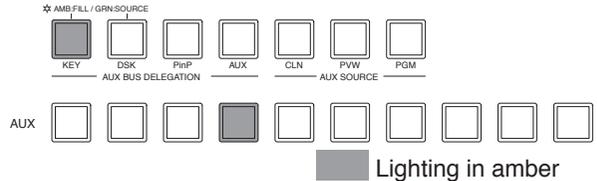
■ Selecting the DSK fill signal and DSK source signal

Press the [DSK] button in the AUX bus selection area to switch the selection of the DSK fill signal (indicator lights in amber) and DSK source signal (indicator lights in green).

<Selecting the DSK fill signal>

While the indicator of the [DSK] button is lighted in amber, press one of the AUX bus crosspoint buttons 1 to 10 to select the DSK fill signal.

The indicator of the selected AUX bus crosspoint button lights in amber. (It lights in red if the selected signal is being output from the PGM connector.)

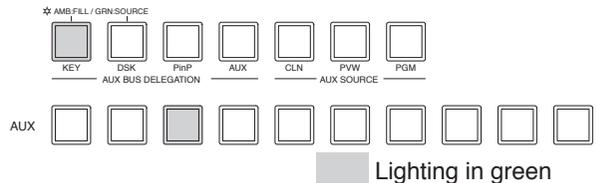


<Selecting the DSK source signal>

While the indicator of the [DSK] button is lighted in green, press one of the AUX bus crosspoint buttons 1 to 10 to select the DSK source signal.

The indicator of the selected AUX bus crosspoint button lights in green. (It lights in red if the selected signal is being output from the PGM connector.)

Since the luminance key is operated as a self key, the key fill signals are used as the key source signals. When the luminance key has been selected as the downstream key type, the key signals will remain unchanged even when the key source signals are switched.



■ Setting the fill matte color

- ① On the KEY menu, turn [F1] to display the FillMatt sub menu.
- ② Turn [F2], [F3] and [F4] to adjust the Hue, Sat and Lum of the fill matte.
- ③ To call a preset color, turn [F5] to select the preset color using the Load item, and press the [F5] switch. The Hue, Sat and Lum values are changed to the preset color values. (The values which have been set will not be stored in the memory until the [F5] switch is pressed.)

<Menu display>

FillMatt	Hue	Sat	Lum	Load↓
3/5	0.0	0.0	100.0	White
	0.0	0.0	0.0	Yellow
	∫	∫	∫	Cyan
	359.9	100.0	108.0	Green
				Magenta
				Red
				Blue
				Black

3. Basic operations

3-5-3. DSK transitions

- ① Set the duration of the transition.

On the TIME menu, turn [F1] to display the DSK sub menu.
As with a background transition, set the transition time.

- ② When the [DSK] button in the transition area is pressed, the DSK image is combined (fade-in) for the transition time which was set.

During fade-in, the indicator of the [DSK] button blinks in red, and it lights in red when the transition (fade-in) is completed. If the [DSK] button is pressed with the picture completely faded in, the DSK image transition (fade-out) is executed.

During fade-out, the indicator of the [DSK] button lights in red, and it goes off when the transition is completed. If the [DSK] button is pressed during the transition, the transition direction is reversed.



3-5-4. DSK preview

The user can select whether to output the DSK preview image to the preview output.

On the DSK sub menu, turn [F5] to set the PVW item.

On: The image with the DSK effect added is output to the preview output.

Off: The image with no DSK effect added is output to the preview output.

PVW On and Off can be allocated to the user buttons. See 5-3-1.

3-5-5. DSK adjustments

The DSK definition can be adjusted.

- ① Press the [FUNC] button to light its indicator, and press the [DSK] button to display the DSK menu.
- ② Turn [F1] to display the Adjust sub menu.

<Menu display>

Adjust	Clip	Gain	Density	Invert
2/5	0.0	100.0	100.0	Off

- ③ Turn [F2], [F3] and [F4] to adjust the DSK (downstream key) definition.

Operation	Parameter	Setting	Setting range
F2	Clip	Reference level for generating key signals	0.0 to 108.0
F3	Gain	Key amplitude	0.0 to 200.0
F4	Density	Key density	0.0 to 100.0
F5	Invert	Key signal inversion	On, Off

3. Basic operations

3-5-6. DSK decorations

A shadow or other type of edge can be added to DSK.

■ Setting the edge

- ① Press the [FUNC] button to light its indicator, and press the [DSK] button to display the DSK menu.
- ② Turn [F1] to display the Edge sub menu.

<Menu display>

Edge	Type	Width		
4/5	Off	2		
	Drop	0~4		
	Shadow			

- ③ Turn [F2] to select the type of edge.

Off: An edge is not added.

Drop: A diagonal border is added. The direction is at the bottom right of the key only.

Shadow: A shadow is added. The direction is at the bottom right of the key only.



- ④ Turn [F3] to set the width of the edge.

■ Setting the edge color

- ① On the DSK menu, turn [F1] to display the EdgeCol sub menu.
- ② Turn [F2], [F3] and [F4] to adjust the Hue, Sat and Lum of the edge color.
- ③ To call a preset color, turn [F5] to select the preset color using the Load item, and press the [F5] switch. The Hue, Sat and Lum values are changed to the preset color values.
(The values which have been set will not be stored in the memory until the [F5] switch is pressed.)

<Menu display>

EdgeCol	Hue	Sat	Lum	Load↓
5/5	0.0	0.0	0.0	Black
	0.0	0.0	0.0	Yellow
	∫	∫	∫	Cyan
	359.9	100.0	108.0	Green
				Magenta
				Red
				Blue
				White

3. Basic operations

3-6. FTB (fade to black)

The user can fade out from a program image to the black screen or fade in to a program image from a black screen.

- ① Set the duration of the transition.

On the TIME menu, turn [F1] to display the FTB sub menu.
As with a background transition, set the transition time.

- ② When the [FTB] button in the transition area is pressed, fade-out to the black screen is initiated.

During fade-out, the indicator of the [FTB] button blinks in red, and it lights in red when the transition (fade-out) is completed, and the black screen is displayed.*1
When the [FTB] button is pressed with the black screen displayed, fade-in to the program image is initiated.



During fade-in, the indicator of the [FTB] button lights in red, and it goes off when the transition (fade-in) is completed. If the [FTB] button is pressed during the transition, the transition direction is reversed.

*1: In the FTB status, the crosspoint button which is normally lighted in red lights in amber. However, it will light in green when the key source and DSK source have been selected.

The KEYAuto function can be assigned to the [FTB] button. See "5-3. Button assignments."

3. Basic operations

3-7. Internal color signals

3-7-1. Setting the color background

The color background to be used by the bus can be set.

Two methods are available: under one method the Hue (hue), Sat (color saturation) and Lum (luminance) are set, and under the other the 8 preset colors (white, yellow, cyan, green, magenta, red, blue and black) are called. The Hue, Sat and Lum of the called colors can also be adjusted.

■ Adjusting the colors

- ① Press the [FUNC] button to light its indicator, and then press the [COLOR] button to display the COLOR menu.
- ② Turn [F2], [F3] and [F4] to perform the color adjustments (Hue, Sat and Lum).

■ Calling the preset colors

- ③ Turn [F5] to select the preset color using the Load item, and press the [F5] switch. The preset color is now called, and its Hue, Sat and Lum values are displayed.
(The values which have been set will not be stored in the memory until the [F5] switch is pressed.)

<Menu display>

CBGD	Hue	Sat	Lum	Load↓
1/1	100.0	100.0	100.0	White
	0~359.9	0~100.0	0~108.0	Yellow
				Cyan
				Green
				Magenta
				Red
				Blue
				Black

3. Basic operations

3-8. Freezing the input signals

The input signals can be frozen and used. If any of the input signals has been frozen, the freeze status display LED lights. While signals are frozen, the tally signals of the corresponding input will not be output.

3-8-1. Displaying the freeze status

- ① Press the [FUNC] button to light its indicator, and press the [FREEZE] button to display the Freeze menu.
- ② Turn [F1] to display the Status sub menu.
Asterisks (*) appear above the numbers of the crosspoint buttons which are currently in the freeze status.

<Menu display>

Status	FRZ: * *
1/2	XPT:1 2 3 4 5 6 7 8 9 10

3-8-2. Setting freeze

- ① On the freeze menu, turn [F1] to display the Freeze sub menu.

<Menu display>

Freeze	Signal	Select		Freeze↓
2/2	IN1	Frame		Off
	IN1~8	Field		On

- ② Turn [F2] to select the input video signal using the Signal item.

Frame: The images are frozen frame by frame.

Field: The images are frozen field by field.

This is used to freeze moving images.

With interlace signals, however, diagonal lines and moving parts appear jagged.

Frame or Field can also be selected while an image is frozen.

- ③ Press the [F4] switch to freeze the input image or cancel the freeze.

If the [F4] switch is pressed while the display is "Off," the video signal is frozen, and the display is set to "On."

If the [F4] switch is pressed while the display is "On," the video signal freezing is canceled, and the display is set to "Off."

When the unit is used with the frame synchronizer function OFF, the output images may be disturbed when freezing is executed, but the frozen images will not be adversely affected.

The frame synchronizer function will automatically be switched ON.

3. Basic operations

3-9. Switching the AUX output

The user can switch the AUX output signals.

The signals of any of the AUX bus crosspoint button 1 to 10, PGM (program) signals, PVW (preview) signals or CLN (clean) signals can be selected for output to the AUX bus.

[PGM]: The PGM signals are output to the AUX bus.

[PVW]: The PVW signals are output to the AUX bus.

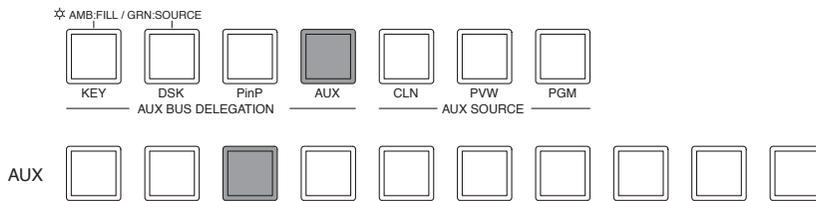
[CLN]: The clean signals (images whose DSK signals have been removed from the PGM signals) are output to the AUX bus.

■ Selecting the output signals using the crosspoint buttons

Press the [AUX] button among the AUX bus selector buttons to light its indicator, and press one of the AUX bus crosspoint buttons 1 to 10, CLN, PVW or PGM button to select the AUX output signals.

The indicators of the [AUX] button and the selected button light in amber.

(They light in red if the selected signal is being output to the PGM connector.)



3. Basic operations

3-10. Preset memory

Up to 10 panel settings can be stored in this memory.
The table below lists the settings which are stored.

<Table of stored preset memory>

Item	Description of setting	Initial value (factory default)
Crosspoint	A bus	1
	B bus	1
	KEY FILL bus	1
	KEY SOURCE bus	1
	PinP bus	1
	DSK FILL bus	1
	DSK SOURCE bus	1
	AUX bus	1
Transition area	BKGD/KEY selection	BKGD
	MIX/WIPE selection	MIX
	N/R selection	N (Normal)
	Auto transition time (BKGD)	1s
	Auto transition time (KEY)	1s
	Transition time (PinP)	1s
	Transition time (DSK)	1s
	Transition time (FTB)	1s
	KEY ON status * ON at an interim point	Off
	PinP ON status * ON at an interim point	Off
	DSK ON status * ON at an interim point	Off
FTB status * ON at an interim point	Off	
Border (BKGD Wipe)	Border ON/OFF	Off
	Border width	5.0
	Soft effect width	0.0
	Border color	Hue: 0.0, Sat: 0.0, Lum: 100.0
Wipe	Wipe pattern (BKGD)	WIPE5
	Center position of BKGD pattern WIPE5	center (X: 0, Y: 0)
	Center position of BKGD pattern SQ5	center (X: 0, Y: 0)
	Wipe pattern (KEY)	WIPE5
	Center position of KEY pattern WIPE5	center (X: 0, Y: 0)
	Center position of KEY pattern SQ5	center (X: 0, Y: 0)
	Lighting (Light)	Off
	Wipe (DVE) trimming (Trim)	Off
Key	Key type (Type)	Linear
	Luminance key setting	ChrmOff
	Key adjustment (Adjust)	Gain: 100.0, Clip: 0.0, Density: 100.0
	Invert	Off
	Fill type	Bus
	Fill matte	Hue: 0.0, Sat: 0.0, Lum: 100.0
	Edge color	Hue: 0.0, Sat: 0.0, Lum: 0.0
	Edge type	Off
	Edge width	2
	Key out pattern (OutPatt)	Nor
	Mask	Off
	Mask invert	Off
	Mask setting	Left, Bottom: -25 Right, Top: +25

3. Basic operations

Item	Description of setting	Initial value (factory default)
Chroma key	Chroma key reference color	Hue: 354.0, Sat: 100.0, Lum: 100.0
	Extent of Y component effect (Y-Infl)	0.0
	Chroma key range	Hue-Rad: 100.0, Sat-Rad: 50.0
	Chroma key border soft effect (Soft)	0.0
	Chroma cancel amount (CANCEL)	0.0
	Marker position, size	(X: 25.0, Y: 25.0, Z: 5.0)
DSK	Marker aspect ratio	0.0
	Key type (Type)	LINEAR
	Key adjustment (Adjust)	Gain: 100.0, Clip: 0.0, Density: 100.0
	Invert	Off
	Fill type	Bus
	Fill matte	Hue: 0.0, Sat: 0.0, Lum: 100.0
	Edge color	Hue: 0.0, Sat: 0.0, Lum: 0.0
	Edge type	Off
PinP	Edge width	2
	Position, Size (X, Y, Z)	(X: 0.0, Y: 0.0, Z: 25.0)
	Border ON/OFF	Off
	Border width	5.0
	Border soft effect amount	0.0
	Border color	Hue: 0.0, Sat: 0.0, Lum: 100.0
	Density	100.0
	Trimming	Off
Color	Trimming setting	Left, Bottom: -40 Right, Top: +40
	CBGD (color background)	Hue: 0.0, Sat: 0.0, Lum: 100.0

■ **STORE: This is used to store the panel settings in the preset memory.**

- ① Press the [FUNC] button to light its indicator, and then press the [MEMORY] button to display the MEMORY menu.
- ② Turn [F1] to display the PSMEM sub menu.
- ③ Turn [F2], select "Store" using the Mode item, turn [F3], and set the preset memory number using the NO.Sel item.
- ④ Press the [F5] switch (Exec) to store the settings.

<Menu display>

PSMEM	Mode	NO.Sel	XPT	Exec↓
1/3	Store	■1	Disable	
Recall	1~10	Enable		
Clear				

The ■ appears at the left of the number when data has been saved in the preset memory.

3. Basic operations

■ **RECALL:** This is used to recall the preset memory data and change the panel settings.

- ① On the MEMORY menu, turn [F1] to display the PSMEM sub menu.
- ② Turn [F2], select "Recall" using the Mode item, turn [F3], and set the preset memory number using the NO.Sel item.
- ③ Turn [F4] to select whether to call the crosspoint selection status using the XPT item.

Enable: The data stored in the preset memory is used.

Disable: The data stored in the preset memory is not used, and the settings prior to recall are retained.

- ④ Press the [F5] switch (Exec) to clear the content.

■ **CLEAR:** This is used to clear contents in the preset memory.

- ① On the MEMORY menu, turn [F1] to display the PSMEM sub menu first.
- ② Turn [F2], select "Clear" using the Mode item, turn [F3], and set the preset memory number using the NO.Sel item.
- ③ Press the [F5] switch (Exec) to clear the content.

3. Basic operations

3-11. Frame memories

Still images can be stored in the unit's two internal frame memories for use.

The still images are transferred to the frame memories through the AUX bus and an SD memory card. Conversely, the images in the frame memories can be transferred to an SD memory card.

Images in the frame memories can be used as bus images by assigning FMEM1 and FMEM2 using the crosspoint assignment function.

Since the images stored in the frame memories are stored in the unit's RAM area, they cannot be used once the power is turned off. Transfer them again after the power has been turned back on.

3-11-1. Transferring images from the AUX bus

- ① Press the [FUNC] button to light its indicator, and press the [MEMORY] button to display the MEMORY menu.
- ② Turn [F1] to display the FMEM sub menu.

<Menu display>

FMEM	Signal	Store		Exec↓
2/3	AUX	FMEM1		
		FMEM2		

- ③ Turn [F3] to select the frame memory in which to store the images using the Store item.
- ④ Press the [F5] switch (Exec) to transfer the still images to the frame memory.

3. Basic operations

3-12. SD memory cards

The unit's frame memory data and system data can be stored on SD memory cards. Conversely, this data can be loaded from the SD memory cards to the unit.

Frame memory data (still image data):

24-bit (uncompressed) BMP (bitmap) is the only file format which is supported. When using still image data created using another device such as a personal computer, save the data as 24-bit (uncompressed) BMP files. This unit cannot resize the images so resize them appropriately using another device such as a personal computer before saving them on the SD memory card.

HD/1080i: 1920×1080, HD/720p: 1280×720, SD/NTSC: 720×487, SD/PAL: 720×576
--

If the sizes are different, the center of the images will be lined up.

If the image is large, it will be cropped.

If the image is small, the area around it will be filled in with a black border.

The pixels of images in SD format are not square, so the aspect ratio will be different when the images are displayed on the computer and when they are imported into frame memory (with NTSC format, they will be vertically long).

To keep the images true to their actual proportions, make sure the original size is 720×540 pixels. If the images are in NTSC format, use images shrunk to 720×487 pixels. If the images are in PAL format, use images enlarged to 720×576 pixels.

System data:

The "system data" refers to all the data stored in the unit with the exception of the date, time and network settings and of the still image data. The extension used for the system data files is "hs4."

SD memory card handling precautions

- Do NOT eject the SD memory card while the SD memory card access LED is lighted.
- The data stored on SD memory cards may be lost as a result of misplacing the cards or performing erroneous operations, for instance. It is recommended that valuable data be stored on a personal computer or other device..

3. Basic operations

3-12-1. Initializing the SD memory cards

In order for an SD memory card to be used in the unit, it must first be initialized by the unit. Initializing an SD memory card optimizes it and creates the dedicated directory.
(All files saved on the SD memory card will be erased.)

*** Use SD memory cards which have been formatted in accordance with the SD standard.**

- ① Insert the SD memory card into the unit's SD memory card slot.
- ② Press the [FUNC] button to light its indicator, and press the [MEMORY] button to display the MEMORY menu.
- ③ Turn [F1] to display the SDCard sub menu.
- ④ Turn [F2] to select "Init" using the Mode item, and then press the [F2] switch.
The "Init ?" message now appears.
If the SD memory card has not been inserted, "No Card" will appear at the Mode item.
When the mode is selected, an asterisk (*) appears on the left of the selected mode (Init, Save or Load). If an asterisk does not appear, press the [F2] switch to select a mode.
- ⑤ Turn [F5] to select "Yes," and press the [F5] switch to initialize the card. To cancel the initializing, turn [F5] to select "No," and press the [F5] switch.

<Menu display>

SDCard	Mode↓	Select	Init?	Exec↓
3/3	*Init	-		No



SDCard	Mode↓	Select	Init?	Exec↓
3/3	*Init	-		Yes

3-12-2. Saving data on SD memory cards

- ① Insert the SD memory card which has been initialized by the unit, into the SD memory card slot.
- ② On the MEMORY menu, turn [F1] to display the SDCard sub menu.
- ③ Turn [F2] to select "Save" using the Mode item, and then press the [F2] switch.

<Menu display>

SDCard	Mode↓	Select	SaveFile	Exec↓
3/3	*Save	FMEM1		

FMEM2
System

- ④ Turn [F3] to select the data which is to be stored on the SD memory card using the Select item.
FMEM1, 2: Still image data of frame memory 1, frame memory 2
System: System data
- ⑤ If the [F5] switch is now pressed, the file is stored on the SD memory card.
(Filenames are allocated automatically.)

System data: "HS400/SYSTEM" folder
Still image data: "HS400/IMAGE" folder

While the file is being stored, the following message and filename are displayed.

SDCard	...	Saving File...
3/3		HS070531100000

3. Basic operations

3-12-3. Loading data from SD memory cards

- ① Insert the SD memory card on which the data is stored into the SD memory card slot.
Load the file after its data has been stored in the each folder. Data stored in other folders will not be recognized by the unit.

System data: "HS400/SYSTEM" folder
Still image data: "HS400/IMAGE" folder

- ② On the MEMORY menu, turn [F1] to display the SDCard sub menu.
③ Turn [F2] to select "Load" using the Mode item, and then press the [F2] switch.

<Menu display>

SDCard	Mode↓	Select	LoadFile	Exec↓
3/3	*Load	FMEM1	HS070531100000	

FMEM2
System

- ④ Turn [F3] to select the transfer destination using the Select item.
⑤ Using the LoadFile item, turn [F4] to select the name of the file to be loaded.
⑥ If the [F5] switch is now pressed, the file is loaded from the SD memory card and stored in the unit's internal memory.

While the file is being loaded, the following message and filename are displayed.

SDCard	...Loading File...
3/3	HS070531100000

- Up to 100 files can be loaded.
- The following alphanumeric characters and symbols can be used as the characters for filenames (see below). Files using other characters will not be displayed by the unit.

<Characters which can be used for filenames>

A to Z, a to z, 0 to 9, Space, ! # \$ % & ' () + , - . : ; = @ [] ^ _ ` { }

4. Input/output signal settings

4-1. Setting the SDI input signals and analog input signals

The user can set the SDI input signals and analog input signals. IN5 to IN8 can be set only when the SDI input board (optional accessory) or analog input board (optional accessory) has been connected.

4-1-1. Setting the frame synchronizer

The frame synchronizer can be set to On or Off for each input.

The DVI input (option) frame synchronizer is permanently On. It cannot be set from On to Off or vice versa.

- ① Press the [FUNC] button to light its indicator, and then press the [IN/OUT] button to display the IN/OUT menu.
- ② Turn [F1] to display the Input sub menu.
- ③ Turn [F2], select the input signals using the Signal item, turn [F3], and select On or Off for the frame synchronizer using the FS item.

* If the output signal phase is set to 0H, Off cannot be selected as the FS item setting.

<Menu display>

Input	Signal	FS	Mode↓	AnaGain
1/11	In1	On	*Normal	0
	IN1~8	Off	D by D UC Auto	-30~+30

AVDL function is active while the frame synchronizer function is set to Off.

The AVDL function automatically adjusts the input image signal phase to the horizontal synchronization reference signal phase.

For details, refer to “4-6. Adjusting the output signal phase”.

4. Input/output signal settings

4-1-2. Setting the input mode

The mode can be set for each input only when HD has been selected as the system format. When SD is selected as the system format, the input mode is always the same as Normal.

Normal: Input signals in conformity with the system format take effect.

D by D: When SD signals with the same frame rate as the system format have been input, they are input on a dot by dot (1x magnification) basis with no up-conversion.

(This setting is only possible when the system format is 1080i.)

In this mode, there is minimal deterioration in the image quality and, as such, the mode is used to combine SD format material using the PinP function.

UC: When SD signals with the same frame rate as the system format have been input, they are up-converted. (This mode can be selected for inputs 5 to 8 only.)

Auto: Input signals in conformity with the system format take effect.

Furthermore, if input signals with the same frame rate as the system format are input when HD is selected as the system format, they are up-converted. (This mode can be selected for SDI inputs 5 to 8 only.)

- In the Auto mode, the images may be disturbed when the input signals are switched.

① On the Input sub menu, turn [F2] to select the input signals using the Signal item.

② Turn [F4] to set the input mode using the Mode item, and press the [F4] switch to enter the selection.

An asterisk (*) appears at the left of the input mode currently selected.

<List of input modes supported>

System	Mode	Input						
		480/59.94i	576/50i	1080/59.94i	1080/50i	720/59.94p	720/50p	
SD	480/59.94i	—	○	■	■	■	■	■
	576/50i	—	■	○	■	■	■	■
HD	1080/59.94i	Normal	■	■	○	■	■	■
		D by D	○	■	■	■	■	■
		UC	○	■	■	■	■	■
		Auto	○ (UC)	■	○	■	■	■
	1080/50i	Normal	■	■	■	○	■	■
		D by D	■	○	■	■	■	■
		UC	■	○	■	■	■	■
		Auto	■	○ (UC)	■	○	■	■
	720/59.94p	Normal	■	■	■	■	○	■
		UC	○	■	■	■	■	■
		Auto	○ (UC)	■	■	■	○	■
	720/50p	Normal	■	■	■	■	■	○
		UC	■	○	■	■	■	■
		Auto	■	○ (UC)	■	■	■	○

● ■ denotes a black screen.

● The UC mode or Auto mode cannot be selected for inputs 1 to 4.

● If D by D, UC or Auto mode is selected, the frame synchronizer will be turned on.

● The input mode cannot be changed when freeze is set to on.

4. Input/output signal settings

4-1-3. Setting the analog input gain

The user can set the gain when the input signals are analog signals. The setting range is ± 30 steps, and the gain changes by ± 2 dB. The amount of change in the gain when it is changed by one step is not fixed.

- ① On the Input sub menu, turn [F2] to select the input signals using the Signal item.
- ② Turn [F5] to set the input signal gain using the AnaGain item.

4-2. Setting the up-converter (option)

The settings for the up-converter contained on the optional SDI input board and analog input board are performed below.

- ① Press the [FUNC] button to light its indicator, and press the [IN/OUT] button to display the IN/OUT menu.
- ② Turn [F1] to display the UpConv menu. An asterisk (*) appears at the left of the parameter currently selected.

<Menu display>

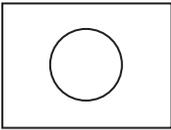
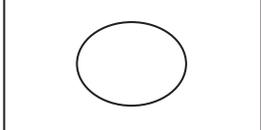
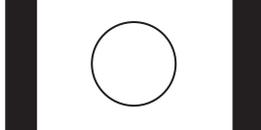
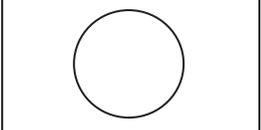
UpConv	Signal	Scale	MovDet	Sharp
11/11	IN5	*SQ	*3	*3
	IN5~8	EC	1~5	1~5
		LB		

- ③ Turn [F2] to select the input signal using the Signal item.
- ④ Turn [F3] to select the scaling system using the Scale item, and press the [F3] switch to enter the selection.

SQ (squeeze): The image is enlarged both horizontally and vertically to fill the entire screen.

EC (edge crop): The aspect ratio of the image is maintained, the image size is increased in accordance with the vertical resolution, and black bands are added at the left and right.

LB (letter box): The aspect ratio of the image is maintained, the image size is increased in accordance with the horizontal resolution, and the image is cropped at the top and bottom.

Input image	SQ	EC	LB
			

- ⑤ Turn [F4] to set the image movement detection sensitivity using the MovDet item, and press the [F4] switch to enter the selection.
 - 1: Toward still images ↔ 3: standard ↔ 5: toward moving images
- ⑥ Turn [F5] to set the extent of the edge sharpness for the images using the Sharp item, and press the [F5] switch to enter the selection.
 - 1: Not sharp edges ↔ 3: standard ↔ 5: very sharp edges

For details on the other settings, refer to the operating instructions of the optional board.

4. Input/output signal settings

4-3. Setting the DVI input signals (option)

4-3-1. Setting the DVI input signals

The user can set the DVI input signals when the DVI input board (optional accessory) has been connected. Signals with the following resolutions can be input. If signals with any other resolution or frequency are input, the picture will turn black.

- XGA (1024 × 768), 60 Hz
- WXGA (1280 × 768), 60 Hz
- SXGA (1284 × 1024), 60 Hz

- ① Press the [FUNC] button to light its indicator, and press the [IN/OUT] button to display the IN/OUT menu.
- ② Turn [F1] to display the DVIIN sub menu.

<Menu display>

DVIIN	Signal	Mode	Scale	Auto↓
8/11	IN5	Dig	Fit-V	Black
	IN5~8	Ana	Fit-H	White
			Full	Init

- ③ Turn [F2] to select the input signal using the Signal item, and turn [F3] to select the signal system using the Mode item.

Dig: Digital input signals of the DVI connector are effective.

Ana: Analog input signals of the DVI connector are effective.

- ④ Turn [F4] to select the scaling method.

Fit-V: The aspect ratio of the input images is maintained, and the size of the images is increased or reduced in accordance with the vertical resolution.

Fit-H: The aspect ratio of the input images is maintained, and the size of the images is increased or reduced in accordance with the horizontal resolution.

Full: The size of the input images is increased or reduced in accordance with the system resolution. (The aspect ratio of the input images is not kept the same. The rate at which the image size is increased or reduced in the vertical direction and in the horizontal direction differs.)

For details on the sizes that correspond to the formats, refer to “DVI input scaling size table” on the next page.

- ⑤ The black level (offset) and white level (gain) of the analog input signals are adjusted automatically. Depending on the personal computer used, there may be some deviation from the correct levels. To proceed with automatic adjustment to correct this deviation, display the black-and-white signals (BW.bmp) on the supplied CD-ROM or the full-screen black signals and full-screen white signals on the personal computer connected to the DVI input connector, and input these signals as the DVI input signals. When using the black-and-white signals, position them so that the boundary between black and white comes to the center of the monitor screen.

When using the full-screen black signals or full-screen white signals, display the black or white in an area that covers at least 80% of the screen from the screen center.

Before making any adjustments, follow the instructions given in the “Automatic adjustment of the black level” section.

Automatic adjustment of the black level

Input the black-and-white signals (BW.bmp) or full-screen black signals.

Turn [F5] to select “Black” in the Auto item, and press [F5] to adjust the black level automatically.

After the level has been adjusted, an asterisk (*) appears to the left of Black.

Automatic adjustment of the white level

Input the black-and-white signals (BW.bmp) or full-screen white signals.

Turn [F5] to select “White” in the Auto item, and press [F5] to adjust the white level automatically.

After the level has been adjusted, an asterisk (*) appears to the left of White.

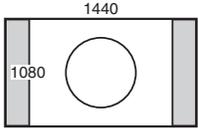
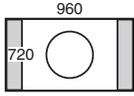
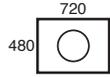
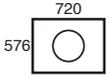
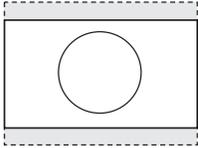
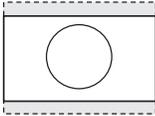
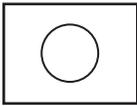
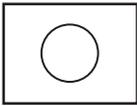
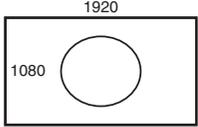
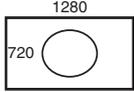
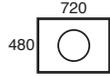
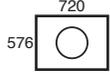
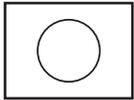
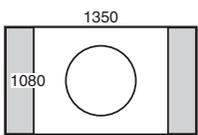
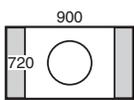
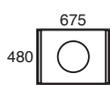
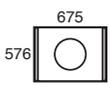
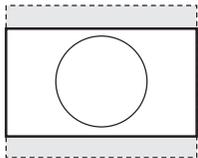
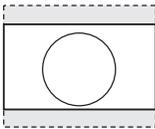
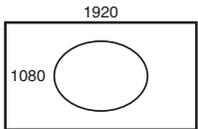
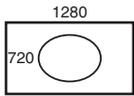
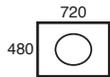
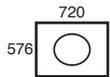
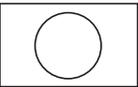
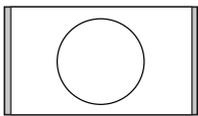
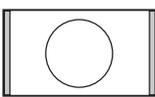
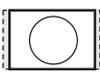
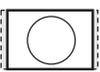
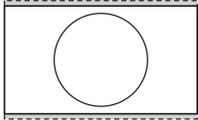
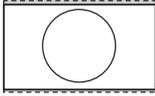
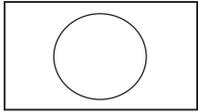
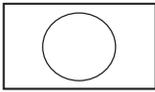
Initializing the adjusted values

Turn [F5] to select “Init” in the Auto item, and press [F5] to return the adjusted values to their factory settings.

At this time, the asterisk (*) displayed on the left is cleared.

4. Input/output signal settings

<DVI input scaling size table>

DVI format	Mode	HD/1080i	HD/720P	SD/NTSC	SD/PAL
		1920 × 1080	1280 × 720	720 × 480	720 × 576
XGA 1024×768 	Fit-V				
	Fit-H				
	Full				
SXGA 1280×1024 	Fit-V				
	Fit-H				
	Full				
WXGA 1280×768 	Fit-V				
	Fit-H				
	Full				

 : Black images are inserted here.
 : The parts of the images protruding in these areas are cropped.

4. Input/output signal settings

4-3-2. Adjusting the DVI input signals

Adjust the clock/phase and position of the DVI input signals.

- ① Press the [FUNC] button to light its indicator, and then press the [IN/OUT] button to display the IN/OUT menu.
- ② Turn [F1] to display the DVIPhs sub menu.

<Menu display>

DVIPhs	Signal	ClkPhs	H-Pos	V-Pos
9/11	IN5	0	0	0
	IN5~8	-16	-100	-100
		}	}	}
		+15	+100	+100

- ③ Turn [F2] to select the input signal using the Signal item.
- ④ Turn [F3] to adjust the clock phase of the analog input signals using the ClkPhs item.
While viewing the image quality, set the value at which the noise level is minimized.
- ⑤ Turn [F4] to adjust the horizontal position using the H-Pos item.
- ⑥ Turn [F5] to adjust the vertical position using the V-Pos item.

4. Input/output signal settings

4-4. Setting the output signals

4-4-1. Types of output signals

There are five output signal types: PGM, PVW, AUX, MULTI and KEYOUT.
Five lines of output signals can be assigned to OUTPUT1 to 6.

PGM: This is the main-line output of the switcher; images with wipe, mix, key and other effects added to them are output.

PVW: This is the preview output which enables the next operation to be checked in advance.

AUX: Signals selected by the AUX bus are output.

MULTI: This is the multi view display output. The multiple input signals and output signals are reduced and output to one screen.

KEYOUT: This outputs the key signals.

Connector	Signal type	Output (default)	Assignment
PGM1, 2	SDI	PGM	Cannot be assigned.
OUTPUT1	SDI	MULTI	PGM, PVW, AUX, MULTI, KEYOut
OUTPUT2	SDI	AUX	
OUTPUT3 (optional slot 1-1)	ANALOG or DVI	MULTI	
OUTPUT4 (optional slot 1-2)	ANALOG	AUX	
OUTPUT5 (optional slot 2-1)	ANALOG or DVI	MULTI	
OUTPUT6 (optional slot 2-2)	ANALOG	AUX	

4-4-2. Assigning the output signals

Assign the output signals to OUTPUT1 to 6.

- ① Press the [FUNC] button to light its indicator, and press the [IN/OUT] button to display the IN/OUT menu.
- ② Turn [F1] to display the Output sub menu.
- ③ Turn [F2] to select the signal name using the Signal item, and turn [F3] to set the type of output signal using the Assign item.

<Menu display>

Output	Signal	Assign		
2/11	OUT1	PGM		
	OUT1~6	PVW		
		AUX		
		Multi		
		KEYOut		

4. Input/output signal settings

4-5. Setting the sync signals

The sync signals to be used by the system can be selected.

External sync: For synchronization with an external sync signal (gen-lock). The reference input signal is looped through and output.

BBST: Black burst signal (vertical phase of 0H)

BBAD: Black burst signal
(Vertical phase of 90H when the 59.94i or 59.94p format is selected;
vertical phase of 75H when the 50i or 50p format is selected)

TRI: Tri-level sync signal (vertical phase of 0H)
This can be selected when HD format signals are supplied.

Internal sync: For synchronization with an internal reference signal (INT). The REFOUT signal (black burst signal) is output from the two reference connectors.

① Press the [FUNC] button to light its indicator, and then press the [IN/OUT] button to display the IN/OUT menu.

② Turn [F1] to display the Ref sub menu.

<Menu display>

Ref	Sync↓	BBSetup	GenLock
3/11	*BBST	7.5IRE	Locked
	BBAD	0IRE	UnLock
	TRI		
	INT		

③ Turn [F2], select the sync signal using the Sync item, and press the [F2] switch to enter the selection.
An asterisk (*) appears at the left of the reference signal currently selected.

④ Turn [F3] to select the setup level of the black burst signal in the internal synchronization mode using the BBSetup item. This setting takes effect when the video system is 59.94i or 59.94p.
The setup level is fixed at 0 IRE when the system is 50i or 50p.

The genlock status is displayed in the GenLock item.

Locked: Synchronized with the external sync signal or internal reference signal

UnLock: Not synchronized with the external sync signal or internal reference signal

4. Input/output signal settings

4-6. Adjusting the output signal phase

The phase of the output video signals can be adjusted.

- ① Press the [FUNC] button to light its indicator, and then press the [IN/OUT] button to display the IN/OUT menu.
- ② Turn [F1] to display the OutPhs sub menu.

<Menu display>

OutPhs	System	H-Phase	V-Phase
4/11	1H	0	0
	0H	-1100	-100
		}	}
		+1099	+100

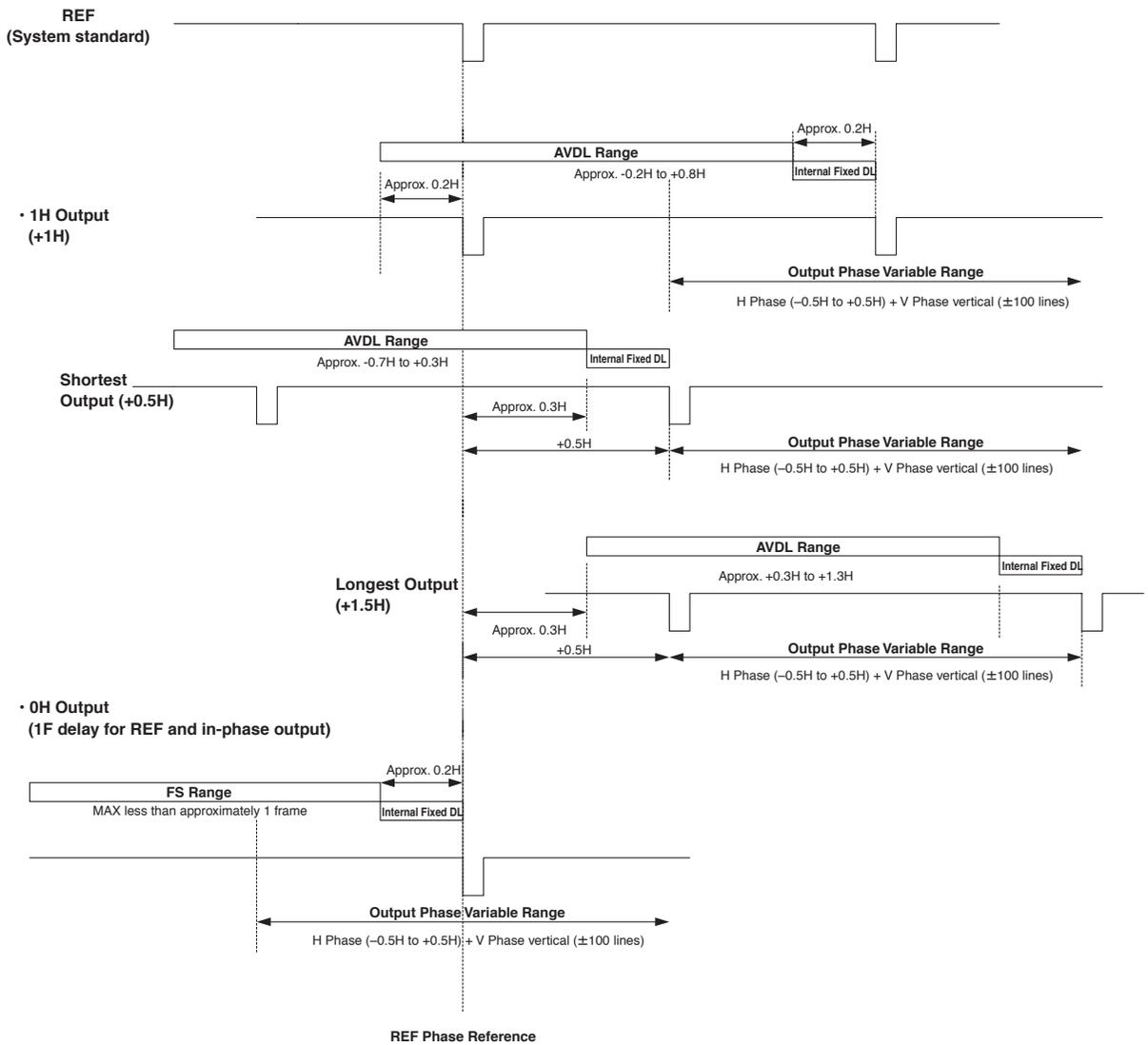
- ③ Turn [F2], and select 0H or 1H using the System item.
 - 0H:** The output video signals are output to the system REF signal with using in-phase. The frame synchronizer function is ON for all input signals.
 - 1H:** The output video signals are output to the system REF signal with 1H delay. When the frame synchronizer function is ON, the output video signals are output with 1 frame + 1H delay.
- ④ Turn [F3] to adjust H phase using the H-Phase item
H-Phase can be adjusted within a range of $-0.5H$ to $+0.5H$.
- ⑤ Turn [F4] to adjust V phase using the V-Phase item.
V-Phase can be adjusted within a range of $-100H$ to $+100H$.

Output video signal phase adjustment

Phase	Video format	Adjustment range
H-Phase	1080i/59.94i	-1100 to 1099
	1080/50i	-1320 to 1319
	720/59.94p	-825 to 824
	720/50p	-990 to 989
	480/59.94i	-429 to 428
	576/50i	-432 to 431
V-Phase	Same for all formats	-100 to 100

4. Input/output signal settings

<Phase adjustment setup>



AVDL Range: Range for automatic phase adjustment.

4. Input/output signal settings

4-7. Setting the multi view display

The input images, program images and preview images can be output side by side on one screen on the external monitor. There are three display modes for multi view display where the screen is divided into 10 parts, 4 parts or 8 parts.

Inputs 1 to 8, frame memories and color background can be assigned to sub-screens ① to ⑧. The images of the program output material are displayed with red frames around them.

<Display modes>

10-division modes A, B (10SPL-A, B):

Eight images are displayed in these modes: the program (PGM) image, preview (PVW) image, input images or frame memory images, and color background (CBGD) image.

4-division mode (4SPL):

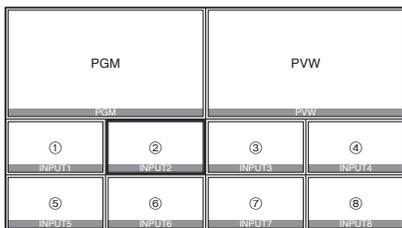
Four images are displayed in this mode: the input images or frame memory images, and color background (CBGD) image.

8-division modes A, B (8SPL-A, B):

Six images are displayed in these modes: the program (PGM) image, preview (PVW) image, input images or frame memory images, and color background (CBGD) image.

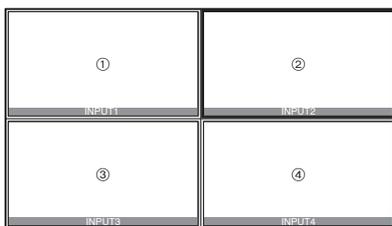
In this mode, the aspect ratio can be kept at 16:9 for the display of HD format images when these images are displayed in the SXGA size from the DVI output (option).

(Size is set to "SXGA" and Scale is set to "5:4" using the DVI output settings.)

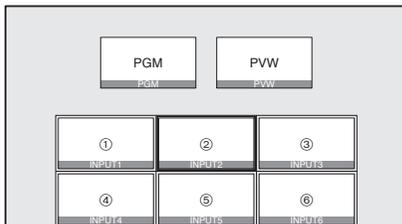


<10-division mode A>

The positions of the PGM and PVW images are fixed.

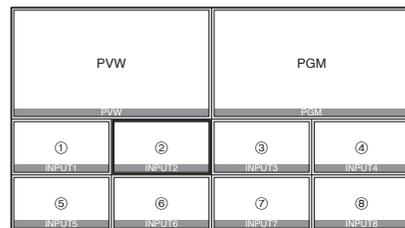


<4-division mode>



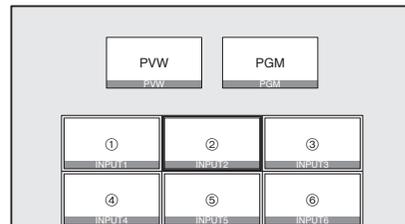
<8-division mode A>

The positions of the PGM and PVW images are fixed.



<10-division mode B>

The positions of the PGM and PVW images are fixed.



<8-division mode B>

The positions of the PGM and PVW images are fixed.

4. Input/output signal settings

- ① Press the [FUNC] button to light its indicator, and press the [IN/OUT] button to display the IN/OUT menu.
- ② Turn [F1] to display the Multi sub menu.

<Menu display>

Multi	Split	Char	Pos	Signal
6/11	10SPL-A	On	1	PGM
	10SPL-B	Off	1~8	IN1~8
	4SPL			FMEM1
	8SPL-A			FMEM2
	8SPL-B			CBGD

- ③ Turn [F2] to select the display mode using the Mode item.
- ④ Turn [F3] to set whether to display the name of the material using the Char item.

ON: The name of the material is displayed under the sub-screen.

The "!" mark appears in front of the name of the material when no signals are input or signals with a different format are input.

OFF: The name of the material is not displayed.

If, however, the menu and the name of the material are selected for the OSD display, the menu display takes priority, and the name of the material is not displayed.

- ⑤ Select the position (① to ⑧ in the figures) using the Pos item, and turn [F4] to set the name of the signal using the Signal item.

Different settings are stored for 10SPL, 4SPL and 8SPL.

IN1-8 is the default setting for Pos1-8 in any of the modes.

4. Input/output signal settings

4-8. Setting the on-screen display (OSD)

The menu screen is superimposed on the preview output or multi view display output for display.

- ① Press the [FUNC] button to light its indicator, and press the [IN/OUT] button to display the IN/OUT menu.
- ② Turn [F1] to display the OSD sub menu.

<Menu display>

OSD	OSD	Select		
5/11	On	PVW		
	Off	Multi		

- ③ Turn [F2] to set whether to display the OSD using the OSD item.

On: OSD is displayed.

Off: OSD is not displayed.

This function can be assigned to a user button. See 5-3-1.

- ④ Turn [F3] to set the output destination using the Select item.

PVW: The menu screen is superimposed onto the preview output, and output.

Multi: The menu screen is superimposed onto the multi view display output, and output.

* When On is selected as the OSD item setting, the multi view display split frame and tally information are not displayed on the monitor.

Examples of OSD displays

">" appears to the left of the selected menu.

This indicates the wipe pattern for the background transition.

This indicates the wipe pattern for the key transition.

The screenshot shows the following OSD menu structure:

```

[BKGD PATT] [KEY PATT]
[IN/OUT]
> Input |Signal|FS|Mode↓|AnaGain
  1/11 | IN1 | On |*Normal| -
Output |Signal|Output|
  2/11 | OUT2| PVW|
Ref |Sync↓|BBSetup|GenLock|
  3/11 |* BBST| - | UnLock|
OutPhs |System|H-Phase|V-Phase|
  4/11 | 1H | 0 | 0 |
OSD |OSD|Select|
  5/11 | On | PVW |
  
```

4. Input/output signal settings

4-9. Setting the DVI output signals (option)

Set the DVI output signals when the DVI/analog output boards (optional accessories) have been connected.

- ① Press the [FUNC] button to light its indicator, and press the [IN/OUT] button to display the IN/OUT menu.
- ② Turn [F1] to display the DVIOut sub menu.
An asterisk (*) appears at the left of the parameter currently selected.

<Menu display>

DVIOut	Signal	Mode↓	Size↓	Scale↓
10/11	OUT3	*Dig	*Auto	*Fit-V
	OUT5	Ana	XGA	Fit-H
			WXGA	Full
			SXGA	5:4
			WSXGA+	
			UXGA	
			WUXGA	

- ③ Turn [F2] to select the output signal using the Signal item.
- ④ Turn [F3] to select the signal system using the Mode item, and press the [F3] switch to enter the selection.
Dig: DVI digital signals are output from the DVI connector.
Ana: DVI analog signals (RGB) are output from the DVI connector.
When “Ana” has been selected, the display position of the image may be off depending on the monitor which is connected. If it is off, adjust the position at the monitor.
For details on the adjustment method, refer to the operating instructions of the monitor.
- ⑤ Turn [F4] to select the resolution of the images to be output, and press the [F4] switch to enter the selection.
Auto: The equipment information of the output destination is captured by the DVI signals, and the images are output at the optimum resolution. (The vertical frequency is 60 Hz, and the maximum resolution is SXGA for analog output signals and WUXGA for digital output signals.)
If the equipment information cannot be captured or if the resolution and frequency which can be output by the product are not contained in the equipment information, the images will be output at the XGA setting.
XGA: The images are output at the 1024 × 768 resolution and 60 Hz frequency.
WXGA: The images are output at the 1280 × 768 resolution and 60 Hz frequency.
SXGA: The images are output at the 1280 × 1024 resolution and 60 Hz frequency.
WSXGA+: The images are output at the 1680 × 1050 resolution and 60 Hz frequency. (This can be selected only when digital signals are output.)
UXGA+: The images are output at the 1600 × 1200 resolution and 60 Hz frequency. (This can be selected only when digital signals are output.)
WUXGA: The images are output at the 1920 × 1200 resolution and 60 Hz frequency. (This can be selected only when digital signals are output.)
- ⑥ Turn [F5] to select the scaling method, and press the [F5] switch to enter the selection.
Fit-V: The aspect ratio of the output images is maintained, and the size of the images is increased or reduced in accordance with the vertical resolution.
(Black bands are inserted into the areas where there are no images. The protruding parts of the images are cropped.)
Fit-H: The aspect ratio of the output images is maintained, and the size of the images is increased or reduced in accordance with the horizontal resolution.
(Black bands are inserted into the areas where there are no images. The protruding parts of the images are cropped.)
Full: The size of the output images is increased or reduced in accordance with the system resolution. (The aspect ratio of the output images is not maintained. The rate at which the image size is increased or reduced in the vertical direction differs from that in the horizontal direction.)
5:4: When HD is set as the system format and SXGA is set for the resolution of the images to be output, the display in the 8-division mode of the multi view display fills the entire screen with no change in the aspect ratio.

4. Input/output signal settings

4-10. Setting the ancillary data

In this section, the function for allowing the ancillary data of the SDI input signals to pass through is set. If SD format signals are input while the HD format has been set as the system format, it will not be possible for their ancillary data to be passed through.

■ Setting the V ancillary data

It is possible to decide whether to allow the V ancillary data, which is superimposed in the vertical blanking period of the input images, to pass through the PGM bus.

The background bus data which is output to program (PGM) is passed through for images whose transition has been cut off.

During a transition, the background bus data which was output to program (PGM) immediately before is passed through.

- ① Press the [FUNC] button to light its indicator, and press the [IN/OUT] button to display the IN/OUT menu.
- ② Turn [F1] to display the VAnci sub menu.

<Menu display>

Anci	VAnci	E.Audio		
7/11	Off	Off		
	On	On		

- ③ Turn [F2] to select On or Off for the V ancillary data using the VAnci item.

On: In the case of the HD format, the ancillary data starting with line 10 is passed through.

In the case of the SD format, the ancillary data starting with line 14 is passed through.

Off: The data is not passed through.

■ Setting the embedded audio data

The embedded audio data of the input images can be passed through the AUX bus.

(If PGM, PVW or CLN is selected as the AUX bus source, the embedded audio data cannot be passed through.)

On the Ancic sub menu, turn [F2] to select On or Off for the embedded audio data using the E.Audio item.

On: The data is passed through.

Off: The data is not passed through.

When "On" has been selected, the V ancillary data of the input images is also passed through at the same time.

5. System settings

5-1. Selecting the video format

One system (input/output signal) video format can be selected.

- ① Press the [FUNC] button to light its indicator, and then press the [SYSTEM] button to display the SYSTEM menu.
- ② Turn [F1] to display the Format sub menu.
- ③ Turn [F2], select the format using the Mode item, and press the [F2] switch to enter the selection.
An asterisk (*) appears at the left of the format currently selected.

<Menu display>

Format	Mode		
1/14	*1080/59.94i		
	1080/50i		
	720/59.94p		
	720/50p		
	480/59.94i		
	576/50i		

5. System settings

5-2. Setting the crosspoints

5-2-1. Assigning signals to the crosspoints

External video input signals and internally generated signals can be assigned to crosspoint buttons 1 to 10.

■Displaying the assignment statuses

- ① Press the [FUNC] button to light its indicator, and then press the [XPT] button to display the XPT menu.
- ② Turn [F1] to display the XPTStats sub menu.
The names of the assigned signals are abbreviated on the display.

<Menu display>

XPTStats	SIG:B	1	2	3	4	5	6	7	8	G
1/3	XPT:1	2	3	4	5	6	7	8	9	10

When one of the crosspoint buttons 1 to 10 is held down for a long time, the name of the signal assigned is displayed on the LCD while the button is held down.

Example: When crosspoint button 1 is pressed (when the INPUT1 signal has been assigned to this button).

XPTStats	SIG:IN1
	XTP:1

■Assigning signals to the crosspoints

- ① Press the [FUNC] button to light its indicator, and then press the [XPT] button to display the XPT menu.
- ② Turn [F1] to display the XPTAssign sub menu.
- ③ Turn [F2], select the crosspoint button using the XPT item, turn [F3] and select the input signal using the Signal item.

<Menu display>

XPTAssign	XPT	Signal		
2/3	1	IN1		
	1~10	IN1~8		
		Black		
		CBGD		
		CBAR		
		FMEM1		
		FMEM2		
		None		

The table below lists the materials which can be assigned.

Button	Signal	Abbreviation		Description
XP1 to 10	INPUT1 to 8	IN1 to 8	1 to 8	SDI, analog component and DVI
	BLACK	Black	B	Internally generated signal, black
	COLOR BACKGROUND	CBGD	G	Internally generated signal, color background
	COLOR BAR	CBAR	C	Internally generated signal, color bar
	FRAME MEMORY1, 2	FMEM1, 2	F1, F2	Frame memory image
	None	None	—	No assignment

* The image will not be changed by pressing any button to which "None" is assigned.

5. System settings

The table below lists the default settings.

Button	Signal	Description
XP1	BLACK	Internally generated signal, black
XP2	INPUT1	External video input 1: SDI
XP3	INPUT2	External video input 2: SDI
XP4	INPUT3	External video input 3: SDI
XP5	INPUT4	External video input 4: SDI
XP6	INPUT5	External video input 5: SDI, analog component and DVI
XP7	INPUT6	External video input 6: SDI, analog component and DVI
XP8	INPUT7	External video input 7: SDI, analog component and DVI
XP9	INPUT8	External video input 8: SDI, analog component and DVI
XP10	CBGD	Internally generated signal, color background

If the optional circuit board has not been connected, black images are input for INPUT5 to 8.

5-2-2. Setting the crosspoint switching

The timing at which the crosspoints are to be switched can be set.

- ① Press the [FUNC] button to light its indicator, and then press the [XPT] button to display the XPT menu.
- ② Turn [F1] to display the XPTSwch sub menu.
- ③ Turn [F2], and select the switching timing using the Timing item.

<Menu display>

XPTSwch	Timing			
3/3	Any			

Field1
Field2

Any: The crosspoints are switched in the nearest field. This is suited to live applications.

Field1: The crosspoints are switched in field 1. This is suited to editing applications.

Field2: The crosspoints are switched in field 2. This is suited to editing applications.

5. System settings

5-3. Button assignments

5-3-1. Setting the user buttons

The user can assign several functions which can be set using the menu items into two user buttons (USER 1 and USER 2).

The user buttons light in amber when the assigned function is ON and are off when the assigned function is OFF. Each time the user button is pressed, the function setting alternates between ON and OFF.

The table below lists the functions which can be assigned to the user buttons.

Function	Description	Menu
PinPPVW	ON or OFF for preview of picture-in-picture (PinP) effect	PinP menu → PinP sub menu → PVW
DSKPVW	ON or OFF for preview of downstream key (DSK)	DSK menu → DSK sub menu → PVW
EditEN	ON or OFF for enabling control from RS-422 connector	SYSTEM menu → System sub menu → EDITEN
GPIEN	ON or OFF for enabling control from GPI port	SYSTEM menu → GPI sub menu → GPIEN
OSD	ON or OFF for OSD display	IN/OUT menu → OSD sub menu → OSD

<Setting method>

- ① Press the [FUNC] button to light its indicator, and press the [SYSTEM] button to display the SYSTEM menu.
- ② Turn [F1] to display the Button sub menu.
- ③ Turn [F2] to select the function to be assigned to the USER 1 button using the USER1 item.
- ④ Turn [F3] to select the function to be assigned to the USER 2 button using the USER2 item.

<Menu display>

Button	USER1	USER2	FTB	
3/14	PinPPVW	DSKPVW	FTB	
	DSKPVW	PinPPVW	KEYAuto	
	EditEN	EditEN	Disable	
	GPIEN	GPIEN		
	OSD	OSD		

5-3-2. Setting the FTB button

A function can be assigned to the FTB button or the button's function can be disabled.

On the Button sub menu, turn [F4] to set assignment to the FTB button using the FTB item.

FTB: The fade to black (FTB) effect is executed.

KeyAuto: The auto transition of the key is executed.

Disable: The FTB button's function is disabled.

5. System settings

5-4. Setting the date and time

The user can set the date and time to be used as the SD memory card's time stamp. Be absolutely sure to set them when an SD memory card is to be used.

■ Setting the date

- ① Press the [FUNC] button to light its indicator, and press the [SYSTEM] button to display the SYSTEM menu.
- ② Turn [F1] to display the Date sub menu.
- ③ Turn [F2] to set the year using the Year item.
- ④ Turn [F3] to set the month using the Month item.
- ⑤ Turn [F4] to set the day using the Date item.
- ⑥ Press the [F5] switch to enter the year/month/day.

<Menu display>

Date	Year	Month	Date	Set↓
11/14	2007	11	1	
	2000 } 2099	1~12	1~31	

■ Setting the time

- ① Press the [FUNC] button to light its indicator, and press the [SYSTEM] button to display the SYSTEM menu.
- ② Turn [F1] to display the Time sub menu.
- ③ Turn [F2] to set the hour using the Hour item.
- ④ Turn [F3] to set the minutes using the Minute item.
- ⑤ Turn [F4] to set the seconds using the Second item.
- ⑥ Press the [F5] switch to enter the hour/minutes/seconds.

<Menu display>

Time	Hour	Minute	Second	Set↓
12/14	0	0	0	
	0~23	0~59	0~59	

5. System settings

5-5. Network settings

Proceed with the network settings to perform such tasks as updating the software version via LAN. The network initial setup is: IP address: 192.168.0.10, subnet mask: 255.255.255.0 and gateway: 0.0.0.0 (unused). When using the host computer with settings matching the network setup, it is not necessary to setup via the menu.

For the setting to take effect, the system must be rebooted. Turn the system's power off and then back on.

■Setting the IP address

- ① Press the [FUNC] button to light its indicator, and then press the [SYSTEM] button to display the SYSTEM menu.
- ② Turn [F1] to display the Network1 sub menu.
- ③ Turn [F2] to [F5] to set the IP address, and press the [F5] switch (Save) to enter the address.

<Menu display>

NetWork1	IP Address			Save↓
7/14	192	168	0	1
	0~255	0~255	0~255	0~255

■Setting the subnet mask

- ① Press the [FUNC] button to light its indicator, and then press the [SYSTEM] button to display the SYSTEM menu.
- ② Turn [F1] to display the Network2 sub menu.
- ③ Turn [F2] to [F5] to set the subnet mask, and press the [F5] switch (Save) to enter the mask.

<Menu display>

NetWork2	Subnet Mask			Save↓
8/14	255	255	255	0
	0~255	0~255	0~255	0~255

■Setting the gateway

- ① Press the [FUNC] button to light its indicator, and then press the [SYSTEM] button to display the SYSTEM menu.
- ② Turn [F1] to display the Network3 sub menu.
- ③ Turn [F2] to [F5] to set the gateway, and press the [F5] switch (Save) to enter the gateway.

<Menu display>

NetWork3	Gateway			Save↓
9/14	0	0	0	0
	0~255	0~255	0~255	0~255

■Display the MAC address

- ① On the SYSTEM menu, turn [F1] to display the Network4 sub menu.
The MAC address now appears.

<Menu display> (When the MAC address is "008045448000".)

NetWork4	MAC Address
10/14	008045448000

5. System settings

5-6. Other settings

5-6-1. Setting the LCD backlight

The LCD backlight can be set to ON or OFF.

- ① Press the [FUNC] button to light its indicator, and then press the [SYSTEM] button to display the SYSTEM menu.
- ② Turn [F1] to display the System sub menu.
Turn [F3], and select ON or OFF for the backlight using the LCD-BL item.

<Menu display>

System	BusMode	LCD-BL	EditEN
2/14	PGM/PST	On	On
	A/B	Off	Off

5-6-2. Setting editor enable

The user can set whether to enable control from an external device (editor) connected to the RS-422 connector.

On the System sub menu, turn [F4] to set On or Off for control from the external device (editor) connected to the RS-422 connector using the EditEN item.

On: Control is enabled.

Off: Control is disabled.

EditEN item On and Off can be assigned to one of the user buttons.  See 5-3-1.

5. System settings

5-6-3. Setting the GPI

The user can set the functions that are to be controlled from the GPI ports and set whether to enable the control.

- ① Press the [FUNC] button to light its indicator, and press the [SYSTEM] button to display the SYSTEM menu.
- ② Turn [F1] to display the GPI sub menu, and turn [F2] to set the function to be controlled by the GPI port 1 using the GPI1 item.

<Menu display>

GPI	GPI1	GPI2	GPIEN
4/14	AUTO	DSK	On
	CUT	AUTO	Off
	DSK	CUT	
	PinP	PinP	
	FTB	FTB	
	BGDAUTO	BGDAUTO	
	BGDCUT	BGDCUT	
	KEYAUTO	KEYAUTO	
	KEYCUT	KEYCUT	

- ③ Turn [F3] to set the function to be controlled by the GPI port 2 using the GPI2 item.
- ④ Turn [F4] to set On or Off for the control from the GPI port using the GPIEN item.

On: Control is enabled.

Off: Control is disabled.

GPIEN item On and Off can be assigned to one of the user buttons.  See 5-3-1.

5. System settings

5-7. Status displays

5-7-1. Alarm status displays

These displays indicate a trouble status (alarm) in the power supply or fan.

- ① Press the [FUNC] button to light its indicator, and press the [SYSTEM] button to display the SYSTEM menu.
- ② Turn [F1] to display the Alarm sub menu.

<Menu display>

Alarm	Power	Fan		
6/14	NoAlarm	NoAlarm		
	Alarm	Alarm		

Power: This indicates a trouble status (alarm) in the power supply.

Alarm: Trouble

NoAlarm: No trouble

Fan: This indicates a trouble status (alarm) in the fan.

Alarm: Trouble

NoAlarm: No trouble

5. System settings

5-7-2. Displaying the version information and option information

Information on the unit's software and hardware versions and the statuses of the options are displayed.

- ① Press the [FUNC] button to light its indicator, and press the [SYSTEM] button to display the SYSTEM menu.
- ② Turn [F1] to display the MainVer sub menu.
- ③ Turn [F2] to select the item whose version is to be displayed using the Select item.
- ④ The version information is displayed in the Version item.
The system version information is displayed in the SysVer item.

<Menu display>

MainVer	Select	Version	SysVer
13/14	Soft	1.00	1.00.00

Control Panel Input M/E

Soft: The software version information is displayed.

Control, Panel, Input, M/E:

The hardware version information is displayed.

- ⑤ Turn [F1] to display the OptVer sub menu.

<Menu display>

OptVer	Select	Board	Version
14/14	IN-SL1	SDI	0001

IN-SL2 OUT-SL1 OUT-SL2

- ⑥ Turn [F2] to select the option slot using the Select item.
- ⑦ The types of the optional boards connected are displayed in the Board item.

IN-SL1, 2 (option input slots 1, 2)

SDI: SDI input board

Analog: Analog input board

DVI: DVI input board

None: No optional board

OUT-SL1, 2 (option output slots 1, 2)

Analog: Analog output board

DVI/Ana: DVI/analog output board

None: No optional board

- ⑧ The optional board version information is displayed in the Version item.

5. System settings

5-8. Initialization

Initialization returns the set data to the factory shipment status.

(The date and time data is not initialized.)

- ① Press the [FUNC] button to light its indicator, and then press the [SYSTEM] button to display the SYSTEM menu.
- ② Turn [F1] to display the Initial sub menu.

<Menu display>

Initial	Init↓			
5/14				

- ③ Press [F2] to initialize the settings. The “Init?” message appears.
- ④ To initialize the settings, turn [F2] to select YES, and then press the [F2] switch.
To cancel the initialization, turn [F2] to select NO, and then press the [F2] switch.

<Menu display>

Initial	Init?			
5/14	No			

YES

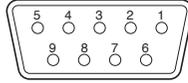
6. External interfaces

This unit comes with RS-422, GPI and tally connectors to serve as external interfaces.

6-1. RS-422 connector

This enables the unit to be controlled by an external device.
Use it with the settings below. (D-sub 9-pin, female)

- Baud rate:** 38400 bps
- Parity:** ODD
- Stop bit:** 1 bit



Pin assignment

Pin No.	Signal name	Description of signal
1	FRAME GROUND	Frame ground
2	TXD -	Send data (-)
3	RXD +	Receive data (+)
4	GROUND	Ground
5	NC	Not used
6	GROUND	Ground
7	TXD +	Send data (+)
8	RXD -	Receive data (-)
9	FRAME GROUND	Frame ground

The following lists the functions which can be controlled by editing controller AG-A850.
(Compliant with the GVG protocol)

- Crosspoint switch
- Wipe pattern selection (BKGD)
- Transition mode (MIX/WIPE) selection
- Auto transition time setting
- Auto transition execution

<Table of wipe patterns supported>

RS-422 control	AV-HS400						
0 *	WIPE #1	12	SQ #1	24	SL #1	36	3D #1
1	WIPE #2	13	SQ #2	25	SL #2	37	3D #2
2	WIPE #3	14	SQ #3	26	SL #3	38	3D #3
3	WIPE #4	15	SQ #4	27	SL #4	39	3D #4
4	WIPE #5	16	SQ #5	28	—	40	3D #5
5	WIPE #6	17	SQ #6	29	SL #6	41	3D #6
6	WIPE #7	18	SQ #7	30	SL #7	42	3D #7
7	WIPE #8	19	SQ #8	31	SL #8	43	3D #8
8	WIPE #9	20	SQ #9	32	SL #9	44	3D #9
9	WIPE #10	21	SQ #10	33	—	45	3D #10
10	WIPE #11	22	—	34	—	46	3D #11
11	WIPE #12	23	SQ #12	35	—	47	3D #12

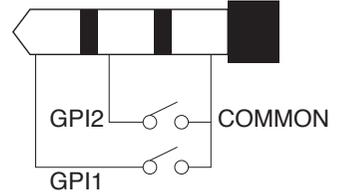
*: Set “No. 256” when control is to be exercised from the AG-A850.

On the System sub menu of the SYSTEM menu, set On or Off for control from the external device (editor) connected to the RS-422 connector.
For details on the settings, see 5-6-2.

6. External interfaces

6-2. GPI connector

These connectors enable the unit to be controlled from an external source. Signals are input using contacts. The following types of control are exercised using the contacts as triggers. Use stereo mini plugs with a 3.5 mm diameter for connection to the unit.



<Control functions that can be assigned>

Function assigned	Description of control	Remarks
AUTO	Control exercised using AUTO button on unit's panel	
CUT	Control exercised using CUT button on unit's panel	
DSK	Control exercised using DSK button on unit's panel	
PinP	Control exercised using PinP button on unit's panel	
FTB	Control exercised using FTB button on unit's panel	
BGDAUTO	Auto transition control for background	Control is exercised regardless of the selection statuses of the switches and buttons on the unit's panel.
BGDCUT	Cut transition control for background	
KEYAUTO	Auto transition control for key	
KEYCUT	Cut transition control for key	

<Initial setting>

Port	Function assigned	Description of control
GPI1	AUTO	Control exercised using AUTO button on unit's panel
GPI2	DSK	Control exercised using DSK button on unit's panel

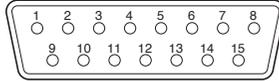
Use the GPI sub menu under the SYSTEM menu to set the functions to be controlled using the external switches connected to the GPI ports and to enable or disable the control using the external switches. For details on the settings, see 5-6-3.

6. External interfaces

6-3. Tally connector

The tally connector comes with tally output, output enable, power supply or fan alarm output pins. The output signals from the tally output pins are for lighting the tally lamps, and these outputs are open collector outputs.

(D-sub 15-pin male)



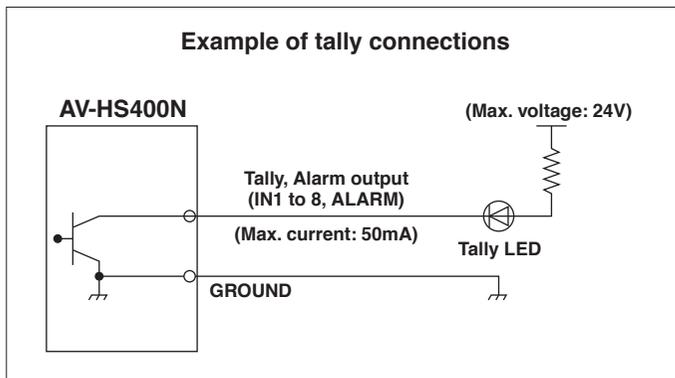
Pin assignment

Pin No.	Signal name	Input/output	Description of signal
1	IN1	Open collector output	Tally output of input video 1
2	IN2	Open collector output	Tally output of input video 2
3	IN3	Open collector output	Tally output of input video 3
4	IN4	Open collector output	Tally output of input video 4
5	IN5	Open collector output	Tally output of input video 5
6	IN6	Open collector output	Tally output of input video 6
7	IN7	Open collector output	Tally output of input video 7
8	IN8	Open collector output	Tally output of input video 8
9	ALARM	Open collector output	Fan alarm or power supply alarm output
10, 11, 12	RESERVED		Keep these pins unconnected.
13	ENABLE	Input	Enable signal of tally output and alarm output Open: Output; GND: no output
14, 15	GROUND	GROUND	Ground

Pins 1 to 9 must satisfy the following conditions:

Dielectric strength: Max. DC 24 V

Current: Max. 50 mA



7. Setting menu table

A setting is entered when an item displayed (↓) is selected and then the [F1], [F2], [F3], [F4] or [F5] switch is pressed.

(It will not be entered unless the switch is pressed.)

Menu	Sub menu		Parameter 1	Parameter 2	Parameter 3	Parameter 4
	Turn F1 to select.		Turn F2 to select.	Turn F3 to select.	Turn F4 to select.	Turn F5 to select.
TIME	BKGD	Parameter	TransTime		Unit	—
	1/5	Setting range	0 to 13s	0 to 999f	Frame, Sec	—
		Default value	1s	0f	Sec	—
	KEY	Parameter	TransTime		Unit	—
	2/5	Setting range	0 to 13s	0 to 999f	Frame, Sec	—
		Default value	1s	0f	Sec	—
	DSK	Parameter	TransTime		Unit	—
	3/5	Setting range	0 to 13s	0 to 999f	Frame, Sec	—
		Default value	1s	0f	Sec	—
	PinP	Parameter	TransTime		Unit	—
	4/5	Setting range	0 to 13s	0 to 999f	Frame, Sec	—
		Default value	1s	0f	Sec	—
	FTB	Parameter			Unit	—
	5/5	Setting range	0 to 13s	0 to 999f	Frame, Sec	—
	Default value	1s	0f	Sec	—	
WIPE	Border	Parameter	Border	Width	Soft	
	1/5	Setting range	On, Off	0.1 to 100.0	0.0 to 100.0	
		Default value	Off	5.0	0.0	
	BodrCol	Parameter	Hue	Sat	Lum	Load ↓
	2/5	Setting range	0.0 to 359.9	0.0 to 100.0	0.0 to 108.0	White, Yellow, Cyan, Green, Magenta, Red, Blue, Black
		Default value	0.0	0.0	100.0	White
	WIPEPos	Parameter	Select	X-Pos	Y-Pos	CopyTO ↓
	3/5	Setting range	BKGD, KEY	-100.00 to +100.00	-100.00 to +100.00	Display only
		Default value	BKGD	0.00	0.00	
	SQPos	Parameter	Select	X-Pos	Y-Pos	CopyTO ↓
	4/5	Setting range	BKGD, KEY	-100.00 to +100.00	-100.00 to +100.00	Display only
	Default value	BKGD	0.00	0.00		
Modify	Parameter	Light			Trim	
5/5	Setting range	On, Off			Off, 4:3 (Selection enabled when HD format is used)	
	Default value	Off			Off	
COLOR	CBGD	Parameter	Hue	Sat	Lum	Load ↓
	1/1	Setting range	0.0 to 359.9	0.0 to 100.0	0.0 to 108.0	White, Yellow, Cyan, Green, Magenta, Red, Blue, Black
		Default value	0.0	0.0	100.0	White

7. Setting menu table

Menu	Sub menu		Parameter 1	Parameter 2	Parameter 3	Parameter 4
	Turn F1 to select.		Turn F2 to select.	Turn F3 to select.	Turn F4 to select.	Turn F5 to select.
KEY	KEY	Parameter	Type	LumKey	Fill	PVW
	1/8	Setting range	Lum, Linear, Chroma	ChrmOn, ChrmOff	Bus, Matte	Auto, On, Off
		Default value	Linear	ChrmOff	Bus	Auto
	Adjust	Parameter	Clip	Gain	Density	Invert
	2/8	Setting range	0.0 to 108.0	0.0 to 200.0	0.0 to 100.0	On, Off
		Default value	0.0	100.0	100.0	Off
	FillMatt	Parameter	Hue	Sat	Lum	Load ↓
	3/8	Setting range	0.0 to 359.9	0.0 to 100.0	0.0 to 108.0	White, Yellow, Cyan, Green, Magenta, Red, Blue, Black
		Default value	0.0	0.0	100.0	White
	Edge	Parameter	Type	Width		
	4/8	Setting range	Off, Border, Drop, Shadow, Outline	0 to 4		
		Default value	Off	2		
	EdgeCol	Parameter	Hue	Sat	Lum	Load ↓
	5/8	Setting range	0.0 to 359.9	0.0 to 100.0	0.0 to 108.0	White, Yellow, Cyan, Green, Magenta, Red, Blue, Black
		Default value	0.0	0.0	0.0	Black
	Mask	Parameter	Mask	Invert		
6/8	Setting range	On, Off	On, Off			
	Default value	Off	Off			
MaskAdj	Parameter	Left	Top	Bottom	Right	
7/8	Setting range	-50.00 to +50.00	-50.00 to +50.00	-50.00 to +50.00	-50.00 to +50.00	
	Default value	-25.00	+25.00	-25.00	+25.00	
Trans	Parameter	OutPatt				
8/8	Setting range	Nor, Rev				
	Default value	Nor				
CHR KEY	Auto	Parameter	Marker	Aspect		Sample ↓
	1/3	Setting range	On, Off	-50.00 to +50.00		Start
		Default value	Off	0.00		
	Adjust1	Parameter	Hue	Sat	Lum	Y-Infl
	2/3	Setting range	0.0 to 359.9	0.0 to 100.0	0.0 to 110.0	0.0 to 100.0
	Default value	354.0	100.0	7.0	0	
Adjust2	Parameter	Hue-Rad	Sat-Rad	Soft	Cancel	
3/3	Setting range	0.0 to 100.0	0.0 to 100.0	0.0 to 100.0	0.0 to 100.0	
	Default value	100.0	50.0	0	0	
FREEZE	Status	Display only	FRZ:* * * * * * * * * * * XPT:1 2 3 4 5 6 7 8 9 10			
	1/2					
	Freeze	Parameter	Signal	Select		Freeze ↓
2/2	Setting range	IN1 to 8	Frame, Field		Toggleing between On and Off	
	Default value	—	Frame		Off	

7. Setting menu table

Menu	Sub menu		Parameter 1	Parameter 2	Parameter 3	Parameter 4
	Turn F1 to select.		Turn F2 to select.	Turn F3 to select.	Turn F4 to select.	Turn F5 to select.
DSK	DSK	Parameter	Type		Fill	PVW
	1/5	Setting range	Lum, Linear		Bus, Matte	On, Off
		Default value	Linear		Bus	Off
	Adjust	Parameter	Clip	Gain	Density	Invert
	2/5	Setting range	0.0 to 108.0	0.0 to 200.0	0.0 to 100.0	On, Off
		Default value	0.0	100.0	100.0	Off
	FillMatt	Parameter	Hue	Sat	Lum	Load ↓
	3/5	Setting range	0.0 to 359.9	0.0 to 100.0	0.0 to 108.0	White, Yellow, Cyan, Green, Magenta, Red, Blue, Black
		Default value	0.0	0.0	100.0	White
	Edge	Parameter	Type	Width		
	4/5	Setting range	Off, Drop, Shadow	0 to 4		
		Default value	Off	2		
	EdgeCol	Parameter	Hue	Sat	Lum	Load ↓
	5/5	Setting range	0.0 to 359.9	0.0 to 100.0	0.0 to 108.0	White, Yellow, Cyan, Green, Magenta, Red, Blue, Black
	Default value	0.0	0.0	0.0	Black	
PinP	PinP	Parameter	Density			PVW
	1/6	Setting range	0.0 to 100.0			On, Off
		Default value	100.0			Off
	Border	Parameter	Border	Width	Soft	
	2/6	Setting range	Off, On	0.1 to 100.0	0.0 to 100.0	
		Default value	Off	5.0	0.0	
	BodrCol	Parameter	Hue	Sat	Lum	Load ↓
	3/6	Setting range	0.0 to 359.9	0.0 to 100.0	0.0 to 108.0	White, Yellow, Cyan, Green, Magenta, Red, Blue, Black
		Default value	0.0	0.0	100.0	White
	Position	Parameter	X-Pos	Y-Pos	Size	
	4/6	Setting range	-50.00 to +50.00	-50.00 to +50.00	0.00 to 100.00	
	Default value	0.00	0.00	25.00		
Trim	Parameter	Trim	Manual			
5/6	Setting range	Off, 4:3, Manual	Free, Pair			
	Default value	Off	Free			
TrimAdj	Parameter	Left	Top	Bottom	Right	
6/6	Setting range	-50.00 to +50.00	-50.00 to +50.00	-50.00 to +50.00	-50.00 to +50.00	
	Default value	-40.00	+40.00	-40.00	+40.00	

7. Setting menu table

Menu	Sub menu		Parameter 1	Parameter 2	Parameter 3	Parameter 4
	Turn F1 to select.		Turn F2 to select.	Turn F3 to select.	Turn F4 to select.	Turn F5 to select.
IN/OUT	Input	Parameter	Signal	FS	Mode ↓	AnaGain
	1/11	Setting range	IN1 to 8	On, Off	*Normal, UC, AUTO, D by D	-30 to +30
		Default value	—	On	Normal	0
	Output	Parameter	Signal	Assign		
	2/11	Setting range	OUT1 to 6	PGM, PVW, AUX, Multi, KEYOut		
		Default value	—			
	Ref	Parameter	Sync ↓	BBSetup	GenLock	
	3/11	Setting range	*BBST, BBAD, TRI, INT	0IRE, 7.5IRE	Locked, UnLock	
		Default value	BBST	7.5IRE	—	
	OutPhs	Parameter	System	H-Phase	V-Phase	
	4/11	Setting range	0H, 1H	-1320 to +1319	-100 to +100	
		Default value	1H	0	0	
	OSD	Parameter	OSD	Select		
	5/11	Setting range	On, Off	PVW, Multi		
		Default value	On	PVW		
	Multi	Parameter	Split	Char	Pos	Signal
	6/11	Setting range	10SPL-A, 10SPL-B, 4SPL, 8SPL-A, 8SPL-B	On, Off	1 to 8 (1 to 4) (1 to 6)	IN1 to 8, FMEM1, FMEM2, CBGD
		Default value	10SPL-A	On	—	—
	Anci	Parameter	VAnci	E.Audio		
	7/11	Setting range	On, Off	On, Off		
		Default value	Off	Off		
DVIn	Parameter	Signal	Mode	Scale	Auto ↓	
8/11	Setting range	IN5 to 8	Dig, Ana	Fit-V, Fit-H, Full	Black, White, Init	
	Default value	—	Dig	Fit-V	Black	
DVIPhs	Parameter	Signal	ClkPhs	H-Pos	V-Pos	
9/11	Setting range	IN5 to 8	-16 to 15	-100 to 100	-100 to 100	
	Default value	—	0	0	0	
DVIOut	Parameter	Signal	Mode ↓	Size ↓	Scale ↓	
10/11	Setting range	OUT3, OUT5	*Dig, Ana	*Auto, XGA, WXGA, SXGA, WSXGA+, UXGA, WUXGA	*Fit-V, Fit-H, Full, 5:4 ("5:4" can be selected when SXGA has been selected as the Size item setting.)	
	Default value	—	Dig	Auto	Fit-V	
UpConv	Parameter	Signal	Scale ↓	MovDet ↓	Sharp ↓	
11/11	Setting range	IN5 to 8	*SQ, EC, LB	*1 to 5	*1 to 5	
	Default value	—	SQ	3	3	

7. Setting menu table

Menu	Sub menu		Parameter 1	Parameter 2	Parameter 3	Parameter 4
	Turn F1 to select.		Turn F2 to select.	Turn F3 to select.	Turn F4 to select.	Turn F5 to select.
MEMORY	PSMEM	Parameter	Mode	NO.Sel	XPT	Exec ↓
	1/3	Setting range	Store, Recall, Clear	■1 to 10	Disable, Enable	
		Default value	—	—	—	—
	FMEM	Parameter	Signal	Store		Exec ↓
	2/3	Setting range	AUX	FMEM1, FMEM2		
		Default value	—	—		—
MEMORY	SDCard	Parameter	Mode ↓	Select	SaveFile	Exec ↓
	3/3	Setting range	*Load, Save, Init, No Card	FMEM1, FMEM2, System	HS070531100000	
		Default value	—	—	—	
XPT	XPTStats	Display only	SIG:B 1 2 3 4 5 6 7 8 G XPT:1 2 3 4 5 6 7 8 9 10			
	1/3					
	XPTAsign	Parameter	XPT	Signal		
	2/3	Setting range	1 to 10	IN1 to 8, Black, CBGD, CBAR, FMEM1, FMEM2, None		
		Default value	—	—		—
XPT	XPTSwch	Parameter	Timing			
	3/3	Setting range	Any, Field1, Field2			
		Default value	Any			
SYSTEM	Format	Parameter	Mode ↓			
	1/14	Setting range	*1080/59.94i, 1080/50i, 720/59.94p, 720/50p, 480/59.94i, 576/50i			
		Default value	1080/59.94i			
	System	Parameter	BusMode	LCD-BL	EditEN	
	2/14	Setting range	A/B, PGM/PST	On, Off	On, Off	
		Default value	PGM/PST	On	On	
SYSTEM	Button	Parameter	USER1	USER2	FTB	
	3/14	Setting range	PinPPVW, DSKPVW, EditEN, GPIEN, OSD	PinPPVW, DSKPVW, EditEN, GPIEN, OSD	FTB, KEYAuto, Disable	
	Default value	PinPPVW	DSKPVW	FTB		

7. Setting menu table

Menu	Sub menu		Parameter 1	Parameter 2	Parameter 3	Parameter 4
	Turn F1 to select.		Turn F2 to select.	Turn F3 to select.	Turn F4 to select.	Turn F5 to select.
SYSTEM	GPI	Parameter	GPI1	GPI2	GPIEN	
	4/14	Setting range	AUTO, CUT, DSK, PinP, FTB, BGDAUTO, BGDCUT, KEYAUTO, KEYCUT	AUTO, CUT, DSK, PinP, FTB, BGDAUTO, BGDCUT, KEYAUTO, KEYCUT	ON, OFF	
		Default value	AUTO	DSK	ON	
	Initial	Parameter	Init ↓			
	5/14	Setting range				
	Alarm	Parameter	Power	Fan		
	6/14	Setting range	Alarm, NoAlarm	Alarm, NoAlarm		
		Default value				
	NetWork1	Parameter	IP Address	Save ↓		
	7/14	Setting range	0 to 255	0 to 255	0 to 255	0 to 255
		Default value	192	168	0	1
	NetWork2	Parameter	Subnet Mask	Save ↓		
	8/14	Setting range	0 to 255	0 to 255	0 to 255	0 to 255
		Default value	255	255	255	0
	NetWork3	Parameter	Gateway	Save ↓		
	9/14	Setting range	0 to 255	0 to 255	0 to 255	0 to 255
		Default value	0	0	0	0
	NetWork4	Parameter	MAC Address			
	10/14	Display only				
	Date	Parameter	Year	Month	Date	Set ↓
	11/14	Setting range	2000 to 2099	1 to 12	1 to 31	—
		Default value	—	—	—	—
	Time	Parameter	Hour	Minute	Second	Set ↓
12/14	Setting range	0 to 23	0 to 59	0 to 59	—	
	Default value	—	—	—	—	
MainVer	Parameter	Select	Version		SysVer	
13/14	Setting range	Soft, Control, Panel, Input, M/E	Version number		Version number	
OptVer	Parameter	Select	Board	Version		
14/14	Setting range	IN-SL1, IN-SL2, OUT-SL1, OUT-SL2	SDI, Analog, DVI, DVI/Ana, None	Version number		

9. Specifications and standard accessories

■ Specifications

Inputs	<p>8 video input lines (maximum)</p> <p>4 standard video input lines: SDI inputs ×4</p> <p>Maximum of an additional 4 video input lines as options: SDI inputs ×2, analog (HD/SD) inputs ×2, DVI inputs ×2 Up to two circuit boards from among the various optional input boards (incorporating two up-converter lines) can be additionally connected.</p> <p>Reference × 1</p>
Outputs	<p>7 video signal lines (maximum)</p> <p>3 standard video output lines (SDI): PGM outputs ×2, OUTPUT1 output ×1, OUTPUT2 output ×1</p> <p>Maximum of an additional 4 video output lines as options: OUTPUT3 to 6 ×1 output Up to two circuit boards from among the analog (HD/SD) ×2, DVI ×1 and analog ×1 output boards can be additionally connected. * PGM, PVW, AUX, MULTI and KEYOUT can be assigned to OUTPUT1 to 6.</p> <p>Reference × 1</p>
Signal formats	<p>SD: 480/59.94i, 576/50i HD: 1080/59.94i, 1080/50i, 720/59.94p, 720/50p</p>
Signal processing	<p>Y:Cb:Cr 4: 2: 2, 10 bit RGB 4:4:4, 8 bit</p>
ME number	1ME
SDI inputs	<p>HD: Serial digital (SMPTE 292M) SD: Component digital (SMPTE 259M)</p> <p>BNC connector, IN1 to 8 (with active through) * IN5 to 8 are optional inputs.</p> <p>HD [SMPTE 292M (BTA S-004B) standard complied with]</p> <ul style="list-style-type: none"> • 0.8 Vp-p ±10 % (75 Ω) • Input return loss More than 15 dB (5 MHz to 750 MHz) More than 10 dB (750 MHz to 1.5 GHz) • Automatic equalizer 100 m (when 5C-FB cable is used) <p>SD [SMPTE 259M standard complied with]</p> <ul style="list-style-type: none"> • 0.8 Vp-p ±10 % (75 Ω) • Input return loss More than 15 dB (5 MHz to 270 MHz) • Automatic equalizer 200 m (when 5C-2V cable is used)
SDI outputs	<p>HD: Serial digital (SMPTE 292M) SD: Component digital (SMPTE 259M)</p> <p>BNC connector, PGM × 1 (2 output), OUTPUT × 2</p> <p>HD [SMPTE 292M (BTA S-004B) standard complied with]</p> <ul style="list-style-type: none"> • Output return loss More than 15 dB (5 MHz to 750 MHz) More than 10 dB (750 MHz to 1.5 GHz) • Output level 0.8 Vp-p ±10 % (75 Ω) • Rise time Less than 270 ps • Fall time Less than 270 ps • Difference between rise time and fall time Less than 100 ps • Alignment jitter Less than 0.2 UI (130 ps) • Timing jitter Less than 1.0 UI • Eye aperture ratio More than 90 % • DC offset 0 ±0.5 V

9. Specifications and standard accessories

SDI outputs	SD [SMPTE 259M standard complied with]	
	• Output return loss	More than 15 dB (5 MHz to 270 MHz)
	• Output level	0.8 Vp-p \pm 10 % (75 Ω)
	• Rise time	Less than 1.5 ns
	• Fall time	Less than 1.5 ns
	• Difference between rise time and fall time	Less than 0.5 ns
	• Jitter	Less than 0.2 UI
Analog input (option)	SD/HD analog component Y/Pb/Pr (1.0 Vp-p, 75 Ω)	
	BNC connector, IN5 to 8	
Analog output (option)	SD/HD analog component Y/Pb/Pr (1.0 Vp-p, 75 Ω)	
	BNC connector, OUTPUT3 to 6, up to 4 lines (which can be assigned)	
DVI-I input (option)	XGA 1024 \times 768, WXGA 1280 \times 768, SXGA 1280 \times 1024	
	Vertical frequency: 60 Hz	
DVI-I output (option)	DVI-I connector, IN5 to 8	
	XGA 1024 \times 768, WXGA 1280 \times 768, SXGA 1280 \times 1024, *WSXGA+ 1680 \times 1050, *UXGA 1600 \times 1200, *WUXGA 1920 \times 1200 (*: Selectable only when digital signals are output)	
	Vertical frequency: 60 Hz	
	DVI-I connector, OUTPUT3, OUTPUT5, up to 2 lines (which can be assigned)	
Key input	1 input from video inputs	
Downstream Key input	1 input from video inputs	
Reference input	BNC connector, Black burst or Tri-level Sync (with loop-through) \times 1	
Reference output	In gen-lock mode: BNC connector, loop-through output \times 1, In internal sync mode: BNC connector, black burst \times 2	
Video delay time	Frame synchronizer OFF	1H
	Frame synchronizer ON	1F
Control I/O	LAN (10BASE-T, 100BASE-TX)	100 Mbps/10 Mbps \times 1 (RJ-45) Port used for maintenance work
	Serial communication interface	RS-422 \times 1 (D-sub 9-pin, female) GVG standard protocol subset supported
	Tally output	Open collector outputs (negative logic) 1 to 8 (D-sub 15-pin, male)
	GPI	GPI \times 2 (3.5 mm diameter stereo mini jack)
External media	SD memory cards	Memory size supported: Max. 2GB Still image file transfer (24-bit uncompressed bitmap)
Ambient operating temperature	32 $^{\circ}$ F to 104 $^{\circ}$ F (0 $^{\circ}$ C to 40 $^{\circ}$ C)	
Humidity	10 % to 90 % (no condensation)	
Power supply	AC100V - 120V, 50/60Hz	
	Power consumption	98 W
Dimensions (W \times H \times D)	16-9/16" \times 5-3/16" \times 16-1/16" (420 \times 132 \times 408 mm) [Excluding protrusions]	
Weight	14.1 lbs. (6.4 kg): when no options have been installed 15.9 lbs. (7.2 kg): when all the possible options have been installed	

9. Specifications and standard accessories

■ Standard accessories

Operating instructions	1
Operating instructions (CD-ROM)	1
Power Cord	1

■ Optional circuit boards (sold separately)

SDI Input Board:	AV-HS04M1
Analog Input Board:	AV-HS04M2
DVI Input Board:	AV-HS04M3
Analog Output Board:	AV-HS04M4
DVI/Analog Output Board:	AV-HS04M5

Refer to the operating instructions that come with the optional board for details about the installation method.

Appendix (glossary)

Defined below are the terms used in this manual.

Word	Explanation
AB Bus system	A bus control mode. By executing a transition, the A bus and B bus signals are output to the program images alternately.
Ancillary Data	The auxiliary data other than the video signals which is transmitted inside the data stream of the video serial interface. The data superimposed on the vertical blanking period is referred to as the V ancillary data (VANC).
Aspect ratio	The ratio between the horizontal and vertical dimensions of an image or screen. It is 16:9 for the HD format and 4:3 for the SD format.
AUX [Auxiliary Bus]	A spare bus which can be switched by signals other than the main line output signals.
AVDL [Automatic Video Delayline]	A function to automatically adjust the input image signal phase to the horizontal synchronization reference signal phase.
BB [Black burst]	The black burst signal. A full-screen black level composite signal which is used as the reference signal for gen-lock.
Border	The area or margin that is added to the edge of a wipe or key. Its width and color can be adjusted. The defocusing of the area around a border is referred to as the soft effect.
Chroma key	This refers to the function for creating the key signals based on the color information of the video signals and combining the keys.
Clip	The threshold level of the luminance when key signals are created from a key source.
Color Background	The signals which are output from the internal color generator and used as the background image.
Cut	This refers to the effect where the display is instantly switched to the next image.
Density	A parameter which is used to adjust the density of the key signals.
Dot by Dot	This treats images as actual size (1×) images. With PinP, it allows SD images to be combined with HD images with no accompanying deterioration in the images themselves.
DSK [Downstream Key]	This refers to the key combination process which is performed at the end of the mix effect. The key is always combined with the foremost image.
DVE [Digital Video Effect]	This refers to the transition patterns accompanying size reductions or slide effects.
DVI [Digital Visual Interface]	A digital video interface standard. DVI-I can handle both digital signals and analog signals.
Embedded Audio	This refers to the audio data packets which are transferred inside the data stream of the video serial interface.
Flip Flop system (PGM/PST system)	A bus control mode. The signals selected by the program bus are always output as the program images. By executing a transition, the program bus and preset bus signals are switched over.
Frame Memory	A memory which can hold the video signals equivalent to one frame.
Frame Synchronizer	A function which matches the synchronization of non-synchronized video input signals.

Appendix (glossary)

Word	Explanation
Freeze	A function which continues the display of the same image, creating the impression that the image has been "frozen".
FTB [Fade to Black]	This is the effect where the background image is faded out to the black screen.
Genlock	A function for synchronizing the video signals using an external sync signal as the reference.
GPI [General Purpose Interface]	Interface signals which control auto transition from an external source.
IRE	A unit used for video signal levels. The setup level (black level) of the signals is expressed as 0 IRE, 7.5 IRE, etc.
Hue	The color tone of the video signals.
Key Edge	The border or shadow added to the edges of keys.
Key Fill	The signal that uses key combination processing to fill in the areas left blank by the key signals.
Key Gain	A parameter which is used to adjust the amplitude of the key signals.
Key invert	A function which inverts the key signals.
Key Mask	This is the function that specifies the area for key combination using the box pattern, etc. When only part of the area of the key signals is used, key combination is executed with the unnecessary area masked.
Key Source	The video signals for creating the key signals.
Linear Key	The function which combines keys using monochrome key signals with gradations in its outlines as a reference.
Lum [Luminance]	The brightness portion of the video signals.
Luminance Key	The function which creates key signals based on the luminance (brightness) information of the video signals to combine keys.
ME [Mix Effect]	A video effect device which combines a number of video signals to create mix, wipe, key and other video signals.
Mix	The picture-changing effect produced by overlapping one image with the next. It is also referred to as "dissolve".
Multi View Display	This is the function that combines a multiple number of materials. PGM, PVW and the input material can be previewed at the same time on a single screen.
OSD [On Screen Display]	This function enables settings to be performed on the menu screens which are displayed in the monitor output.
PinP [Picture in Picture]	This function combines a sub screen image with the background image.
PVW [Preview]	The function for checking ahead of time the image which will be output after the next transition. The image is output from the PVW system.
PGM [Program Bus]	The bus which always carries the program output signals.

Appendix (glossary)

Word	Explanation
PST [Preset Bus]	The bus which carries the program output signals after the next background transition.
Preset Memory	The memory in which the control panel statuses can be saved and recalled. The button selection statuses as well as the border, color and other setting information can be saved in this memory.
RS-422	A serial interface standard. It is the interface used to control the switcher from an editor or other external device.
Sat [Saturation]	This refers to the intensity of the color chrominance level of video signals.
SDI [Serial Digital Interface]	The standard by which video signals in various SD and HD formats are transmitted along a single coaxial cable.
Self Key	A function that creates key signals from key fill signals for combining keys.
Tally	The signal which outputs the program output statuses of the input signals to an external device. The LED that indicates the program output status on the control panel is also referred to as tally.
Transition	A function that switches from one image to another. Wipe, mix and other effects are available for the images during switching.
Tri-level Sync	The sync signal used for HD formats.
Trimming	This is the function that eliminates the unnecessary parts at the top, bottom, left and/or right of the images which are combined using the PinP function.
Up Converter	This is the function that converts material in the SD format into the HD format which yields a high resolution.
Wipe	A video effect in which one image is gradually replaced by another as the boundary between the two is moved using a preselected pattern.

Panasonic[®]

PANASONIC BROADCAST & TELEVISION SYSTEMS COMPANY
UNIT COMPANY OF PANASONIC CORPORATION OF NORTH AMERICA

Headquarters:

3 Panasonic Way 4E-7, Secaucus, NJ 07094 (201) 348-5300

EASTERN ZONE:

3 Panasonic Way 4E-7, Secaucus, NJ 07094 (201) 348-7196

WESTERN ZONE:

3330 Cahuenga Blvd. West, Los Angeles, CA 90068 (323) 438-3608

Government office:

(201) 348-7587

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Panasonic Canada Inc.

5770 Ambler Drive, Mississauga, Ontario L4W 2T3 (905) 624-5010

Corporativo Panasonic de México

Moras No. 313, Col. Tlacoquemecatl del Valle, Del. Benito Juárez, México, Distrito Federal, C.P. 03200. 01 (55) 54 88 10 00

Panasonic Puerto Rico Inc.

San Gabriel Industrial Park, 65th Infantry Ave., Km. 9.5, Carolina, Puerto Rico 00630 (787) 750-4300