

Multi Camera Live Producer

Operating Instructions

MCX-500

Ver. 1.0



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Important Notes

Copyrights

Using the unit for video and/or audio switching, distribution over the Internet, or similar purposes may require the permission of the copyright holder of the video or audio in some cases. To protect copyright, observe the following points carefully when using the unit.

- When connecting a recording device to the unit and recording video or audio, carefully observe laws relating to copyright.
- The showing or distribution of video or audio material for which the copyright is held by a third party, or otherwise permitting private or public access without the permission of the copyright holder is prohibited by law.
- Even with the rights to show or distribute, the act of using the unit to edit original content with wipes or dissolves, for example, may be prohibited by law.
- For the purpose of protecting copyrights, the specifications for the video and audio signals that can be input may change without notice with software upgrades or functional expansions.
- Under copyright law, you may not use recorded video or audio for purposes other than your personal enjoyment without the permission of the copyright holder. Note that shooting may be restricted at live performances, shows, or exhibitions, even if it is for your personal enjoyment.

About the unit

The unit is not dustproof, splashproof, or waterproof.

Condensation

If the unit is suddenly taken from a cold to a warm location, or if ambient temperature suddenly rises, moisture may form on the outer surface of the unit and/or inside of the unit. This is known

as condensation. If condensation occurs, turn off the unit and wait until the condensation clears before operating the unit. Operating the unit while condensation is present may damage the unit.

LCD panels

The LCD panel fitted to this unit is manufactured with high precision technology, giving a functioning pixel ratio of at least 99.99%. Thus a very small proportion of pixels may be “stuck”, either always off (black), always on (red, green, or blue), or flashing. In addition, over a long period of use, because of the physical characteristics of the liquid crystal display, such “stuck” pixels may appear spontaneously. These problems are not a malfunction. Note that any such problems have no effect on recorded data.

Consumable parts

- The fan is a consumable part that will need periodic replacement. When operating at room temperature, a normal replacement cycle will be about 5 years. However, this replacement cycle represents only a general guideline and does not imply that the life expectancy of this part is guaranteed. For details on parts replacement, contact your dealer.
- The life expectancy of the AC adapter and the electrolytic capacitor is about 5 years under normal operating temperatures and normal usage (8 hours per day; 25 days per month). If usage exceeds the above normal usage frequency, the life expectancy may be reduced correspondingly.

Security

SONY WILL NOT BE LIABLE FOR DAMAGES OF ANY KIND RESULTING FROM A FAILURE TO IMPLEMENT PROPER SECURITY MEASURES ON TRANSMISSION DEVICES, UNAVOIDABLE DATA LEAKS RESULTING FROM TRANSMISSION SPECIFICATIONS, OR

SECURITY PROBLEMS OF ANY KIND.

Depending on the operating environment, unauthorized third parties on the network may be able to access the unit. When connecting the unit to the network, be sure to confirm that the network is protected securely.

Do not browse any other website in the Web browser while making settings or after making settings. Since the login status remains in the Web browser, close the Web browser when you complete the settings to prevent unauthorized third parties from using the unit or harmful programs from running.

Network functions

When using the network functions, important personal information (e.g., information necessary for streaming transmissions) will be stored on the unit.

When transferring possession or disposing of the unit, see “Useful Functions (Utilities)” (page 52) and restore the factory default conditions, or see “Configuring the Network Settings for Streaming Transmission” (page 60), and reset the network settings.

Points to check before use

- Perform a test recording, and verify that it was recorded successfully.
- When streaming valuable data, be sure to check the device connections beforehand or carry out a streaming test to make sure that the system is operating normally.

Images used in this manual

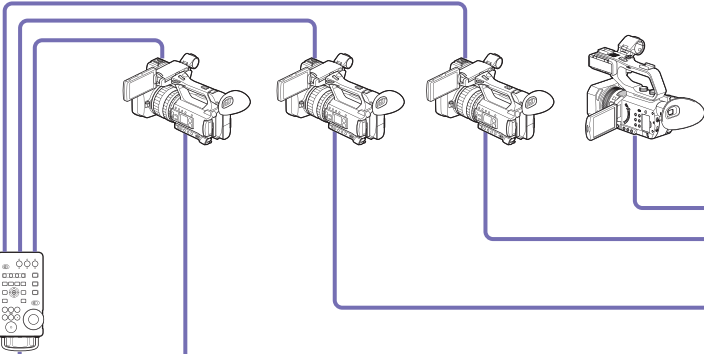
The images used in this manual are created to aid in explaining operations. The actual images that are displayed or output during operations may differ.

Features and Capabilities

The MCX-500 Multi Camera Live Producer is a compact switcher that allows video switching and audio mixing via simple operations without expert knowledge. Live controls via a computer is also possible using the unit's live Internet distribution function. The unit can be used in a wide variety of venues for events, seminars, etc.

Live video switching

The unit allows switching between up to four cameras.



Audio mixing

Mix audio using up to 5 lines of input (four lines of embedded audio input and one LINE input).

Multi-viewer



The videos assigned to the inputs, the program (PGM) output video, the unit status, and other information is displayed on an external monitor. Preparations, such as key composite and audio adjustments, can also be performed while viewing the multi-viewer.

"Multi-Viewer" (page 12)

Simultaneous recording controls and tally lighting can also be performed by linking the cameras to external control devices.

"Linking to Cameras" (page 50)

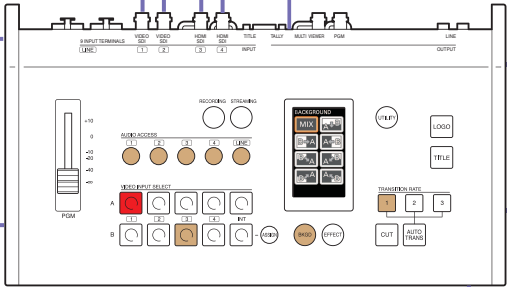
Settings, adjustments and remote controls via PC UI

Unit setting configurations and video composite adjustments are performed on a computer via the "PC UI." The PC UI allows you to perform operations identical to those of the control panel from a remote location.



"PC UI" (page 14)

"Connecting a Computer for Settings Configuration" (page 22)



Simple operation via the control buttons and touch panel.

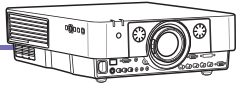
Record program (PGM) outputs to memory cards
Recording to Memory Stick Duo and SD cards is supported.



"Recording the PGM Output" (page 56)



Three lines for simultaneous output of the program (PGM) video are available for output to projectors, large displays, etc.



Steaming transmission using the Ustream service is supported.

"Streaming" (page 54)

More features...

Variety of transition and composite patterns

The unit is equipped with PinP, chroma key, and luminance key video composite functions. Multiple composite patterns are available for PinP and chroma key compositing. Wipe, mix, and cut transition functions are also available. PinP



Chroma keying



Luminance keying



TITLE function

You can overlay text (i.e., images) created on a computer connected to the TITLE (RGB) input connector on the rear of the unit onto the PGM output video.



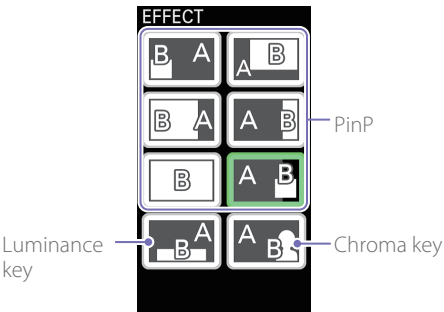
"Adjustments for Inserting Text onto Videos" (page 46)

Variety of inputs and outputs

The unit supports four lines of video input (HD/SD-SDI, VIDEO, HDMI) in addition to the use of PC signals combined with the HD/SD video. Using these features in conjunction with the variety of composite patterns allows you to produce dynamic videos with high visual impact. Three lines of output (HD-SDI, VIDEO, HDMI) are available for the PGM video. Five lines of audio input (HD/SD-SDI, HDMI, LINE) are also available for mixing.

Menu customization for effect patterns

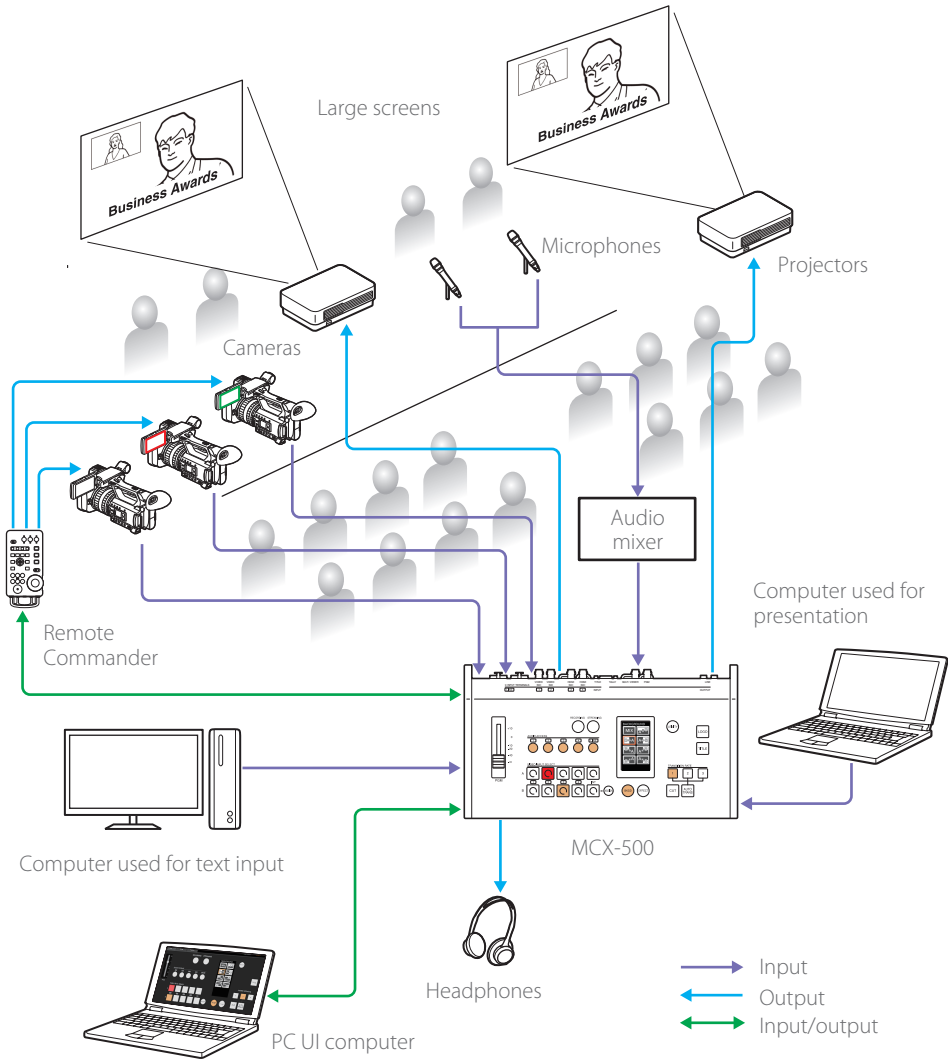
You can register up to eight patterns each for the transition and composite effect patterns displayed in the touch panel. Example for composite patterns



"Customizing the Pattern Icons" (page 39)

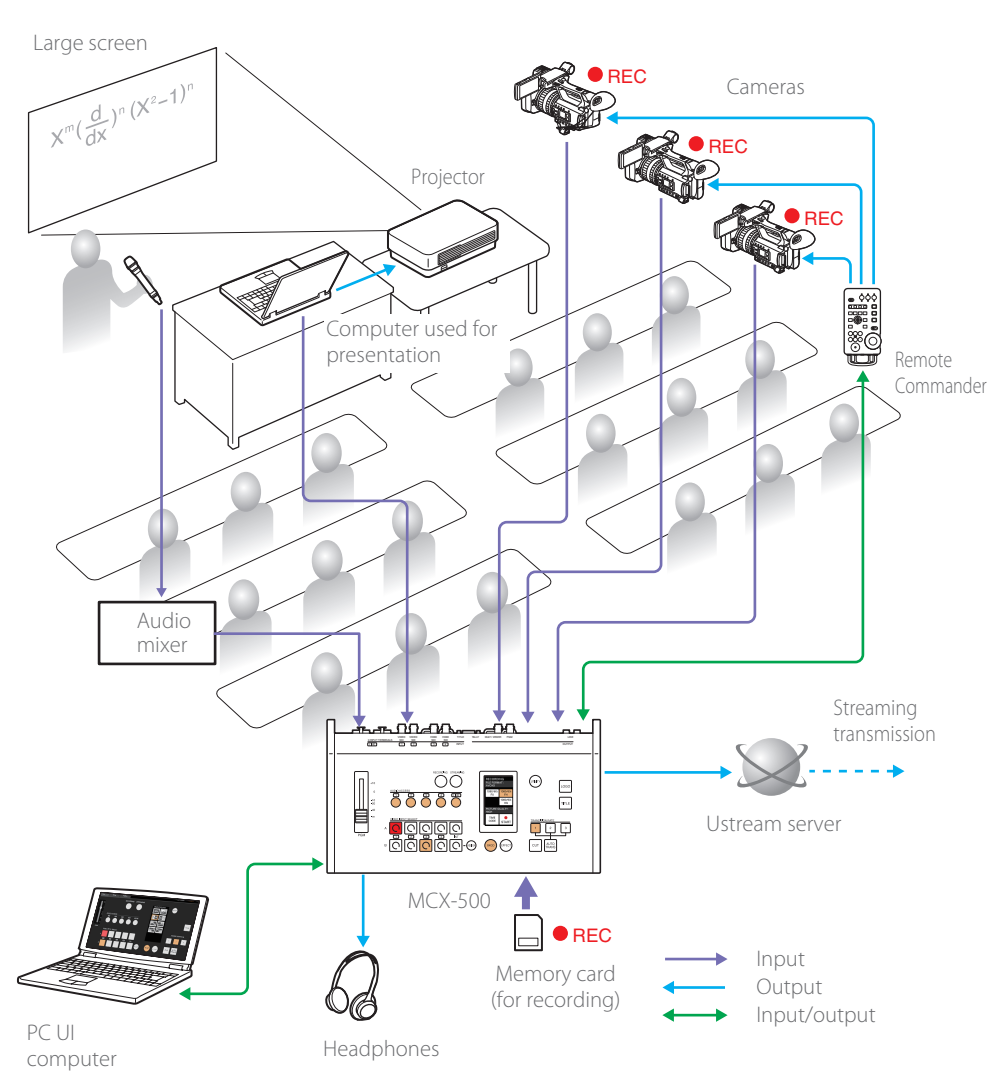
Use at Various Events

You can switch between video inputs from cameras and a computer, and output the video to two projectors. By linking with a Remote Commander, you can light the PGM/NEXT tallies on the cameras. Use the TITLE function to overlay text created on a computer connected via RGB onto the video.



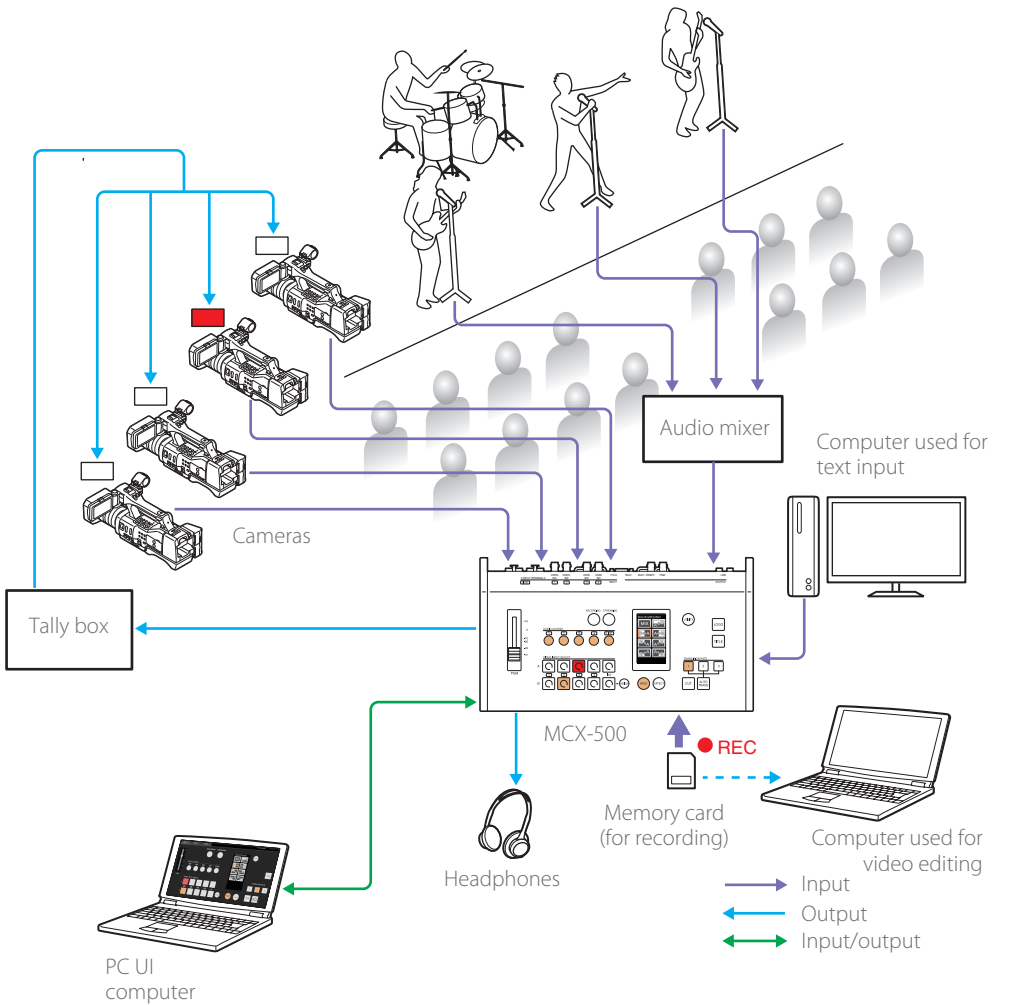
Use at Lectures and Seminars

You can switch between or composite video inputs from cameras and a computer used for presentations and lectures, and stream the video or record it onto a memory card. By linking with a Remote Commander, you can simultaneously control recording start/stop operations on the cameras via recording start/stop controls performed on the unit.



Use at Live Musical Performances

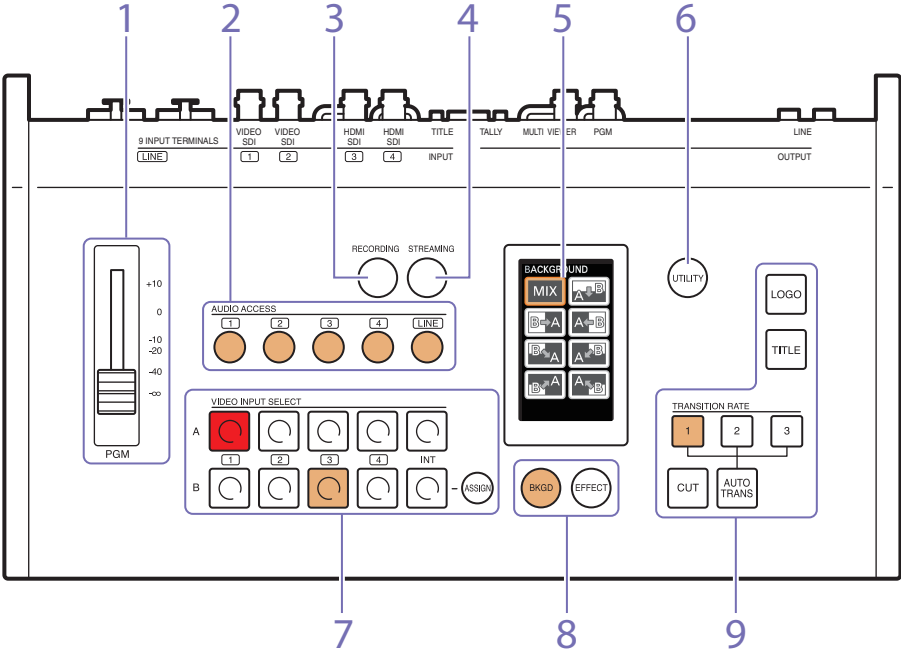
You can switch between live video inputs from cameras, and record them. By linking with a commercially available tally box, you can light the tally of the camera being used for the PGM output. The files recorded to the memory card can be played back or edited on a computer using Sony PlayMemories Home.



Parts Identification

Control Panel

Video switching, audio mixing, and other live controls are performed via the control panel.



- 1. PGM master fader**
Adjusts the audio output level for the PGM output.
The output level will be the same for the L and R channels.
The adjustment results can be monitored via the headphones connected to the (headphones) jack on the front of the unit or via the level meters displayed on the multi-viewer.
- 2. AUDIO ACCESS buttons**
Displays menus for adjusting the audio in the menu panel. Pressing the button again hides the menus.
Buttons 1 to 4: Displays the audio adjustment menus for audio corresponding to inputs 1 to 4 of the video selection block.
LINE button: Displays the audio adjustment menu for the LINE input connectors.

When an audio input is being used for PGM output, the corresponding button lights.

- (Unlit): Not being used as PGM output.
- (Lit): Output as PGM in progress.

For details, see “Live Adjustments” (page 37).

- 3. RECORDING button**
Displays the menu for performing recording operations in the menu panel. Pressing the button again hides the menu.
The lit status of the button indicates the recording status.

- (Unlit): Recording is stopped.
- (Lit): Recording is in progress.

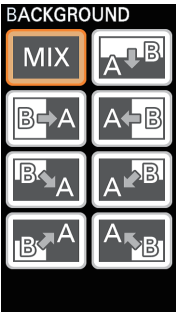
For details, see “Chapter 6: Recording” (page 56).

- 4. STREAMING button**
Displays the menu for performing streaming operations in the menu panel. Pressing the button again hides the menu.
The lit status of the button indicates the streaming status.

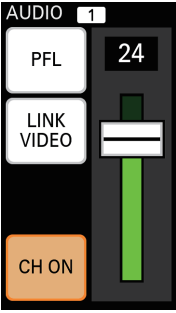
- (Unlit): Streaming is stopped or in standby mode
- (Lit): Streaming is in progress.

For details, see “Chapter 5: Streaming” (page 54).

- 5. Menu panel (touch panel)**
Displays a menu based on the operation or function being performed.
You can perform transition or composite pattern selection and other controls and adjustments for each function here.
Confirmation messages and error messages are also displayed here.
Example display: Transition pattern selection menu



Example display: Audio adjustment menu



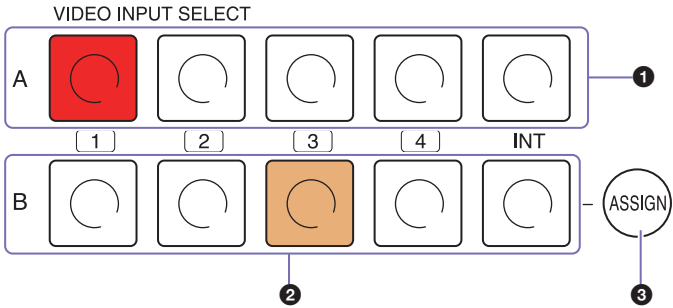
6. UTILITY button

Allows you to adjust the headphone volume, brightness of the menu panel and control buttons, etc. Pressing the button displays the [UTILITY] menu in the menu panel.

For details, see "Useful Functions (Utilities)" (page 52).

7. Video selection block (VIDEO INPUT SELECT)

Allows you to select videos (materials). You can view the images available for selection and the selection results on the multi-viewer.



Buttons 1 to 4: Assigns the materials that are input via video input connectors 1 to 4 on the rear of the unit.

INT buttons: Assigns signals (color bar or black signal) that are generated internally on the unit.

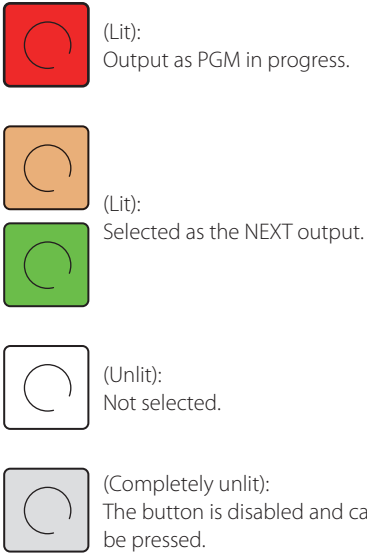
1 Row A buttons

Selects the video (material) to be output as the PGM output. When you press a button in this row, the button lights red and the material assigned to that input number is output as the PGM output.

2 Row B buttons

Selects the material to be output next as the PGM output (NEXT output). When creating a composite video using PinP or chroma keying, for example, use the row B buttons to select the overlay material.

The color and lit status of the buttons indicate the following.



3 ASSIGN button

Allows you to change the video input connectors assigned to inputs 1 to 4. Pressing the button displays the menu for the button selected in row B in the menu panel. When the button is lit, the menu displayed will differ depending on the selected row B button.

For details, see "Assigning Inputs" (page 25).

8. Delegation block

Selects the video switching mode (BKGD mode or EFFECT mode).

BKGD mode is used for transitioning videos, and EFFECT mode is used for compositing videos.

Pressing the BKGD button switches to BKGD mode (amber), and pressing the EFFECT button switches to EFFECT mode (green). The selectable switching patterns for each mode are displayed in the menu panel.

During BKGD mode



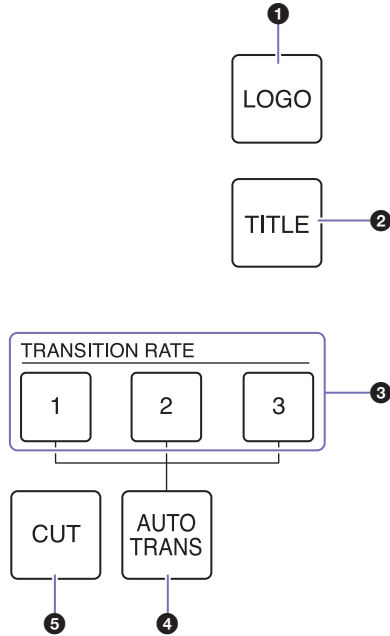
During EFFECT mode



For details on the modes, see "BKGD Mode and EFFECT Mode" (page 17).

9. Transition block

Allows you to perform transition (video switching) controls.

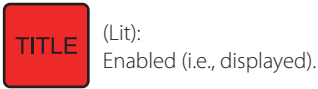


1 LOGO button

Currently not used. (Intended for future expansion.)

2 TITLE button

Allows you to input RGB text (i.e., images) created on a computer, and overlay it onto the PGM output video. The text is enabled or disabled (i.e., cut in or out) with each press of the button.



For details, see "Adjustments for Inserting Text onto Videos" (page 46).

- 3 **TRANSITION RATE buttons 1 to 3**
Allows you to select from three presets for the PGM video transition rate by pressing the respective button.
You can change the transition rate presets assigned to buttons 1 to 3.

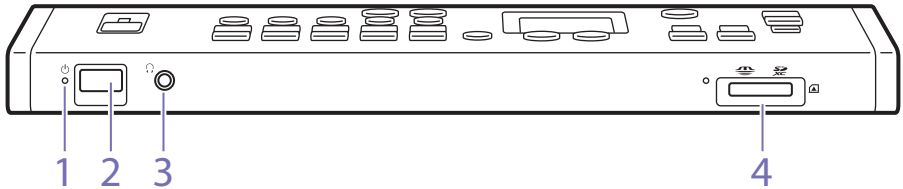
For details on settings, see "Changing the Transition Rates" (page 49).

- 4 **AUTO TRANS button**
Switches the PGM video according to the selected pattern and transition rate.

For details on operations, see "Applying Transition Effects" (page 31) and "Compositing Videos" (page 34).

- 5 **CUT button**
Switches the PGM video instantly via a cut.
For details on operations, see "Switching via Cuts (Basic Switching)" (page 29).

Front



1. **Power indicator**
Indicates the unit's power status.
 (Green): Unit is turned on.
 (Red): Unit is turned off.
2. **Power switch**
Turns the unit on/off (page 21).
3. **Headphones jack (standard stereo phone)**
When monitoring audio, connect headphones here.

For details on adjusting the volume, see "Adjusting the Headphone Volume" (page 37).
4. **Memory card slot**
When recording PGM outputs, insert a memory card here.
The unit supports Memory Stick Duo and SD cards.

- Insert Memory Stick media with their front sides facing up.
- Insert SD cards with their reverse (terminal) sides facing up.

Memory Stick Duo



Front side facing up

SD card



Reverse side (terminal) facing up

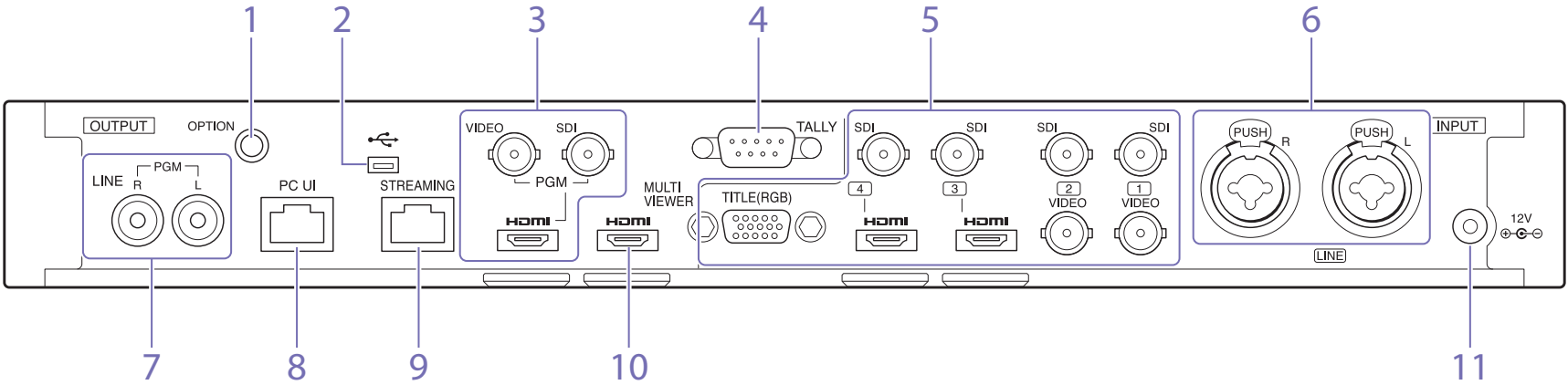
When a memory card is being accessed, the access indicator to the left of the slot blinks.
To remove a memory card, gently push it inward once.

[Notes]

- When the access indicator is lit or blinking red, data is being written or read. Do not subject the unit to vibration or excessive shock in such cases. In addition, do not turn off the unit, remove the memory card, or disconnect the AC adapter.
- Only memory cards that were formatted on the unit can be used.

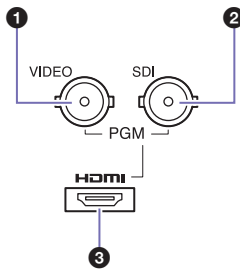
For details on supported memory cards and how to record, see "Chapter 6: Recording" (page 56).

Rear



For details on connections, see "Connecting Devices" (page 18).

- 1. OPTION connector (RS-232C)**
Connect a Remote Commander here when using one to control cameras.
For details, see "Linking to Cameras" (page 50).
- 2. USB port (Mini-B, USB 2.0)**
When connecting to PlayMemories Home to edit recorded data on a computer, connect to the computer via this port.
This is also used when performing system updates for the unit.
For details on connections for editing recorded data, see "Using Recorded Files" (page 58).
- 3. Video output block**
Allows simultaneous PGM output from three video output connectors.



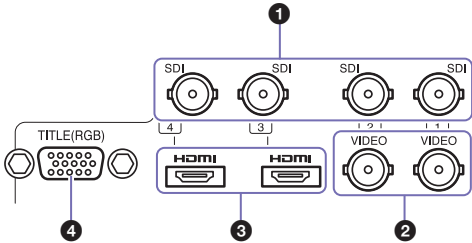
- 1 PGM VIDEO output connector (BNC)**
Outputs the finished video processed internally on the unit (i.e., PGM video) as an analog video signal.
- 2 PGM SDI output connector (BNC)**
Outputs the finished video processed internally on the unit (i.e., PGM video) as an HD-SDI signal.
For details on aspect ratio settings for SD signals, see "[Output] Screen" (page 61) in the "Configuring the System Settings" section.

- 3 PGM HDMI output connector (Type A)**
Outputs the finished video processed internally on the unit (i.e., PGM video) as an HDMI signal.
For details on signal format settings for HDMI, see "[Output] Screen" (page 61) in the "Configuring the System Settings" section.

- [Notes]**
- Proper operation may not be possible on some devices (e.g., video or audio is not output).
 - Do not connect the output connectors on the unit to those on an external device, as doing so will result in malfunction.

- 4. TALLY output connector (D-sub 9-pin)**
Connects to the tally connector on a commercially available tally box, for example. The tally lamp of a camera can be made to light when its images are being output as PGM.
For details on pin assignments, see "TALLY connector" (page 71).

5. Video input block



- 1 SDI input connectors 1 to 4 (BNC)**
Input HD/SD-SDI signals.
- 2 VIDEO input connectors 1 and 2 (BNC)**
Input analog video signals.
[Tips]
For input connectors 1 and 2, SDI and VIDEO signals cannot be input simultaneously from identically numbered connectors. Only one of the signals can be assigned for operation.

3. **HDMI input connectors 3 and 4 (Type A)**

Input HDMI signals.
When displaying data from a computer during a presentation, for example, connect to the computer via this connector.
In addition, when compositing text using an HDMI signal, connect to the computer via this connector.

[Notes]

Proper operation may not be possible on some connected devices (e.g., video or audio is not output).

[Tips]

- For input connectors 3 and 4, SDI and HDMI signals cannot be input simultaneously from identically numbered connectors. Only one of the signals can be assigned for operation.
- Copyright protected (HDCP) signals cannot be input. (A black screen will be displayed.)

4. **TITLE input connector (RGB, mini D-sub 15-pin)**

Inputs an RGB signal.
When overlaying text created with a computer to create a composite, connect to the computer via this connector.

For details on overlaying text, see "Adjustments for Inserting Text onto Videos" (page 46).

6. **LINE (mic / line) input connectors L and R (balanced XLR 3-pin / TRS combo)**

Input analog audio signals from an audio mixer, for example.

7. **LINE output connectors L and R (pin jacks)**

Output PGM audio that was mixed down on the unit.

8. **PC UI network connector (RJ-45 modular jack)**

Connect the computer to be used for the PC UI, which allows settings configuration and control of the unit, here.

For details, see "Connecting a Computer for Settings Configuration" (page 22).

9. **STREAMING network connector (RJ-45 modular jack)**

When using the Ustream service to stream, connect to the network via this connector.

For details, see "Chapter 5: Streaming" (page 54).

CAUTION

For safety, do not connect connectors for peripheral device wiring that may have excessive voltage to the following ports.

- PC UI network connector
 - STREAMING network connector
- Follow the instructions in this document for these ports.

CAUTION

When connecting the unit to a peripheral device via a LAN cable, use a shielded-type cable to prevent malfunction due to radiation noise.

10. **MULTI VIEWER HDMI output connector (Type A)**

Connect the external monitor to be used for the multi-viewer here.

For details, see "Multi-Viewer" (page 12).

For details on signal format settings for HDMI, see "[Output] Screen" (page 61) in the "Configuring the System Settings" section.

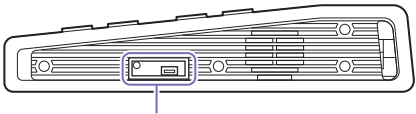
[Notes]

- Proper operation may not be possible on some devices (e.g., video or audio is not output).
- Do not connect the output connectors on the unit to those on an external device, as doing so will result in malfunction.

11. **DC IN 12V (DC power input) connector**

Connect the supplied AC adapter here.
Be sure to use the nearby cable clamp to prevent the cable from disconnecting.

Right Side



Terminal cover removed

1. **USB port (Mini-B, USB 2.0)**
Used for maintenance (e.g., system updates and displaying licenses).

Multi-Viewer

The following items appear on the external monitor (i.e., the multi-viewer) connected to the MULTI VIEWER connector on the rear of the unit.

The multi-viewer allows you to monitor the input materials, PGM output video, video selected as the NEXT output, key compositions, unit status, and other information.

INT material is not displayed.

- 1. [NEXT] viewer
Displays the video selected from among the row B buttons as the NEXT output.
- 2. [PGM] viewer
Displays the video currently being output as the PGM output.
- 3. [INPUT] viewer
Displays the materials assigned to inputs 1 to 4 and the TITLE material signal being input from a computer.



- 1 Input number (1 to 4, TITLE)
- 2 Input connector name
Displays the name of the input connector assigned to the respective input number.

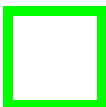
- 3. **Input image**
Displays inputs 1 to 4 and the TITLE material input signal.
- 4. **Remote camera setting**
When using a Remote Commander to control cameras, this displays a camera's assignment setting.
- 5. **Tally indicator**
Displays a tally for the input material based on its status.



(PGM tally): A red frame appears around the material being output as the PGM output.



(NEXT tally in BKGD mode): An amber frame appears around the input that will be output next as the PGM output.



(NEXT tally in EFFECT mode): A green frame appears around the input that will be output next as the PGM output.

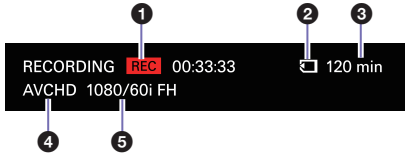
- 6. **Input status**
Displays the following statuses if an error occurs with the input signal.
[No Signal]: There is no signal input.
[Format Mismatch]: A signal that is not supported by the unit is being input.
[HDCP]: A copyright protected (HDCP) signal is being input. This is not supported on the unit.

- 4. **Audio level meters**
Display the audio levels of the PGM output within a range of 0 to -60 dB in 16 levels.
The left end represents $-\infty$ and is always lit green.
Over-level indicator
Lights red at 0 dB.

Lights green up to the current level.

- 5. **[STREAMING] status**
Displays the streaming status using an icon.
 : Streaming is not possible.
 : Streaming is ready to start.
 : Streaming is in progress.

- 6. **[RECORDING] information**
Displays the following information concerning recording.



- 1. **Recording status**
 : Recording is not possible.
 : Recording is ready to start.
 : Recording is in progress. The recording duration is displayed in hours, minutes, and seconds.

- 2. **Memory card status**
 : A memory card is inserted, and recording is possible.
 : A memory card is inserted, but recording is not possible.
 : A memory card is not inserted.

- 3. **Remaining time for the memory card**
When a memory card is inserted, this displays the remaining recording time for the memory card in minutes.
When the remaining time is less than 1 minute, a "0 min" display will blink.
- 4. **File format**
Displays the currently configured file format.
The file format is fixed at AVCHD.

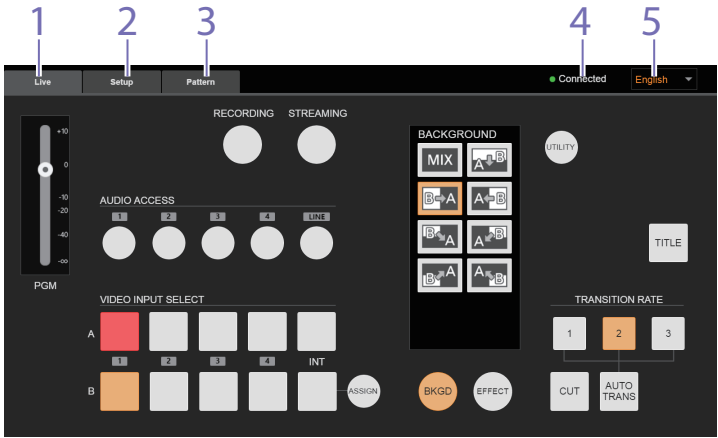
- 5. **Recording format**
Displays the currently configured recording format.
For details on settings, see "Configuring the Recording Settings" (page 56).
- 7. **Clock display**
Displays the current time.
For details on settings, see "[System] Screen" (page 61) in the "Configuring the System Settings" section.

PC UI

Preparations, such as unit setting configurations and composite adjustments, are performed using the PC UI. The PC UI also allows you to perform operations identical to those of the control panel from a remote location.

For details on displaying the PC UI, see "Connecting a Computer for Settings Configuration" (page 22).

The PC UI consists of tabs. Selecting each tab displays its corresponding screen.

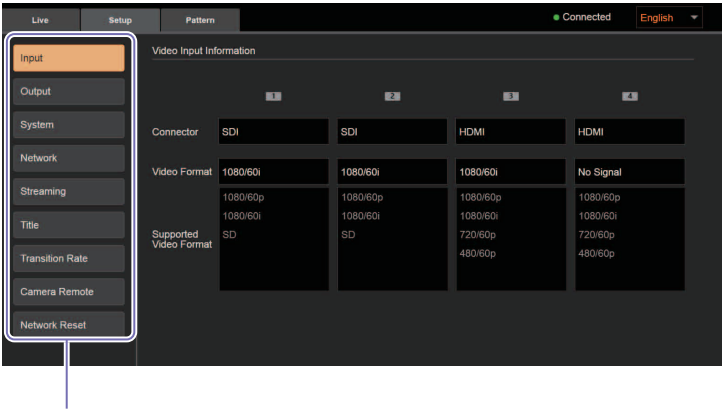


1. [Live] tab

Displays the [Live] screen for performing controls identical to those of the unit's control panel.

2. [Setup] tab

Displays the [Setup] screen for configuring settings necessary for live control and other system settings for the unit.



Select the item you want to configure.

The following configurations and operations can be performed in the [Setup] screen.

[Input]: View assignment information for inputs 1 to 4, for example.

For details, see "[Input] Screen" (page 61).

[Output]: Configure settings related to the PGM output and multi-viewer.

For details, see "[Output] Screen" (page 61).

[System]: Configure the system settings for the unit.

For details, see "[System] Screen" (page 61).

[Network]: Configure the network settings necessary for streaming transmissions.

For details, see "Configuring the Network Settings for Streaming Transmission" (page 60).

[Streaming]: Configure the user account, video size, and server storage settings necessary for streaming transmissions.

For details, see "Chapter 5: Streaming" (page 54).

[Title]: Perform composite adjustments when overlaying text created on a computer using RGB input signals.

For details, see "Adjustments for Inserting Text onto Videos" (page 46).

[Transition Rate]: Configure the durations for the three TRANSITION RATE buttons.

For details, see "Changing the Transition Rates" (page 49).

[Camera Remote]: Configure settings for controlling cameras via a Remote Commander.

For details, see "Linking to Cameras" (page 50).

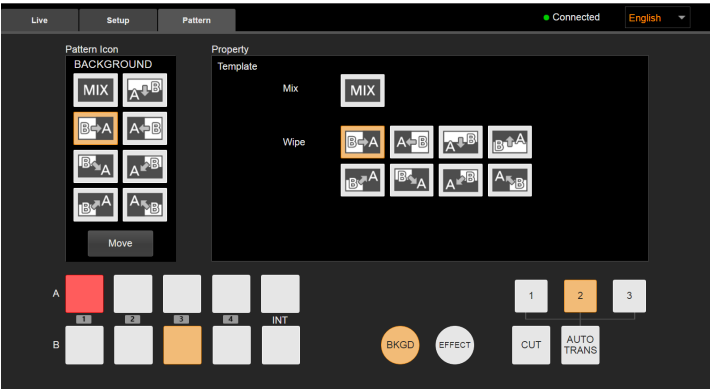
[Network Reset]: Reset network settings and streaming settings if necessary.

For details, see "Configuring the Network Settings for Streaming Transmission" (page 60).

3. [Pattern] tab

Displays the [Pattern] screen for performing the following configurations and adjustments.

- Replacing the eight pattern icons used in BKGD mode and EFFECT mode
- Selecting the pattern (PinP, chroma key, luminance key)
- Chroma key adjustment
- Luminance key adjustment



For details, see “Customizing the Pattern Icons” (page 39), “Selecting Picture-in-Picture (PinP) Patterns” (page 42), “Adjustments for Inserting People onto Backgrounds (Chroma Key)” (page 44), and “Using HDMI Input Signals to Insert Text (EFFECT Mode)” (page 47).

4. Communication status

Indicates the status of communication between the unit and the computer.

- Connected** : Communication with the unit is enabled.
- Reconnecting...** : Communication with the unit has been severed, and the system is attempting to reconnect. Controls via the PC UI will be disabled.

5. Display language

Allows you to change the display language for the PC UI from a pull-down list.

You can select from [English] and [简体中文] (Simplified Chinese).

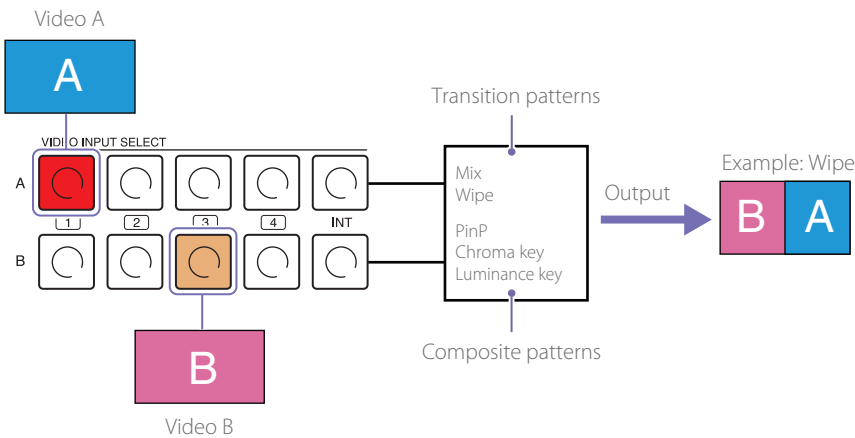
For details on changing the display language for the unit’s menus, see “Changing the Display Language” (page 53).

Basics of Video Switching

“Video switching” refers to the process of switching between video images. You can use the unit to switch between and mix videos (input signals) from multiple cameras, VTRs, and a computer. By applying video effects, inserting text, and compositing images, you can create diverse and dynamic program outputs.

Components of Transitions and Composites

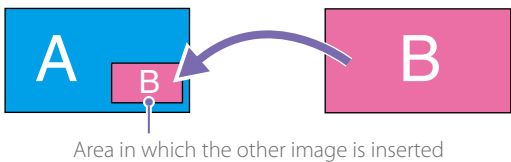
The videos selected in rows A and B are used as a set in a transition or composite.



Compositing Basics

Picture-in-picture (PinP) compositing

This is an effect achieved by embedding a video within another video. A rectangular area is removed from one image, and the other image is inserted in that area.

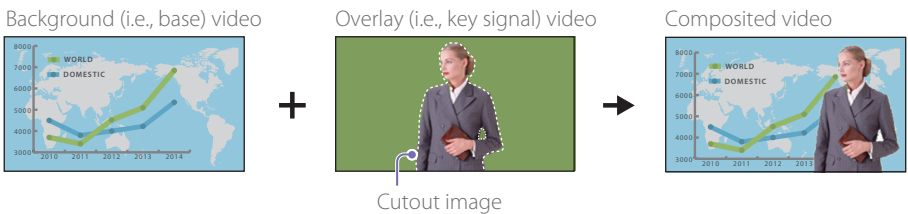


Key compositing

This is an effect achieved by removing parts of an image and placing the cutout on another image that serves as the background. To differentiate between the cutout image and the removed parts of the image, a cutout signal (key signal) is created. There are various methods for creating key signals, but the following describes the methods available on the unit; chroma keying and luminance keying.

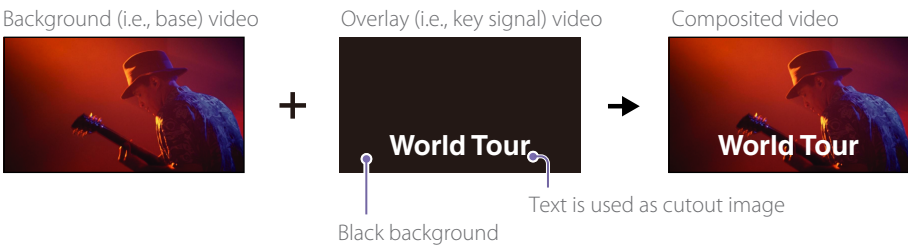
Chroma keying

When using this method, create a key signal that uses color to differentiate between the cutout image and the removed parts of the image. Typically, a subject is captured in front of a blue background, commonly referred to as a "blue screen."



Luminance keying

When using this method, create a key signal that uses brightness to differentiate between the cutout image and the removed parts of the image. Use this method to insert text onto a video. Typically, bright colored text is created on a black background.



BKGD Mode and EFFECT Mode

Transitions are separated into two categories on the unit, BKGD mode and EFFECT mode.

[Tips]
If a B video is currently overlaid when you switch from EFFECT mode to BKGD mode, the B video will be disabled automatically.

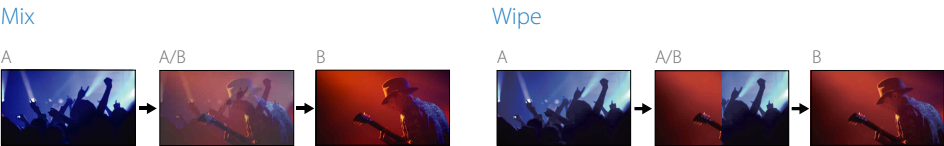
BKGD mode

BKGD

Use this mode to switch completely from image A to image B (i.e., for complete replacement).

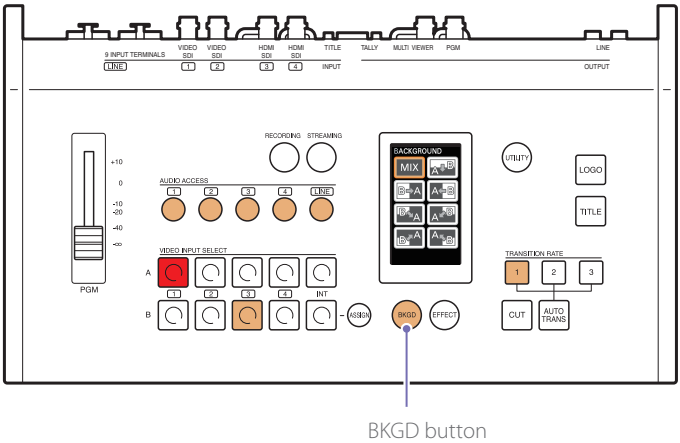


The following transition patterns are available in BKGD mode.



In BKGD mode, the following items light amber along with the BKGD button.

- Row B buttons
- TRANSITION RATE buttons
- Selected menu items
- Tally indicators in the multi-viewer



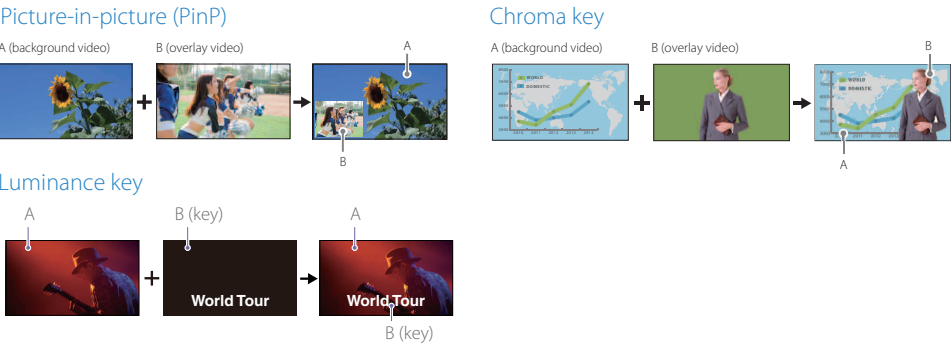
EFFECT mode

EFFECT

Use this mode to insert image B onto image A (i.e., for compositing).

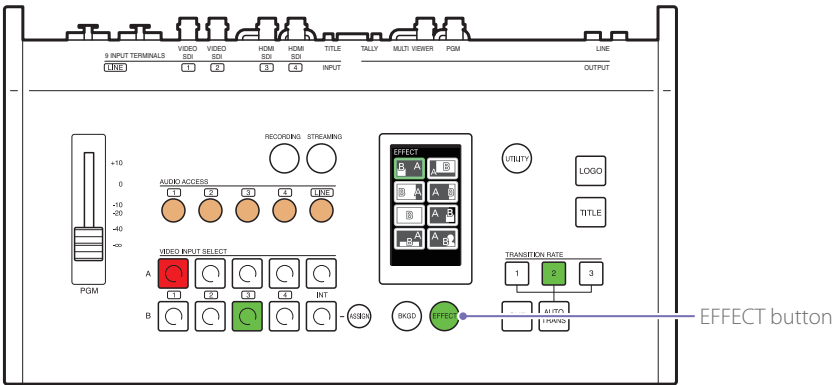


The following composite patterns are available in EFFECT mode.



In EFFECT mode, the following items light green along with the EFFECT button.

- Row B buttons
- TRANSITION RATE buttons
- Selected menu items
- Tally indicators in the multi-viewer



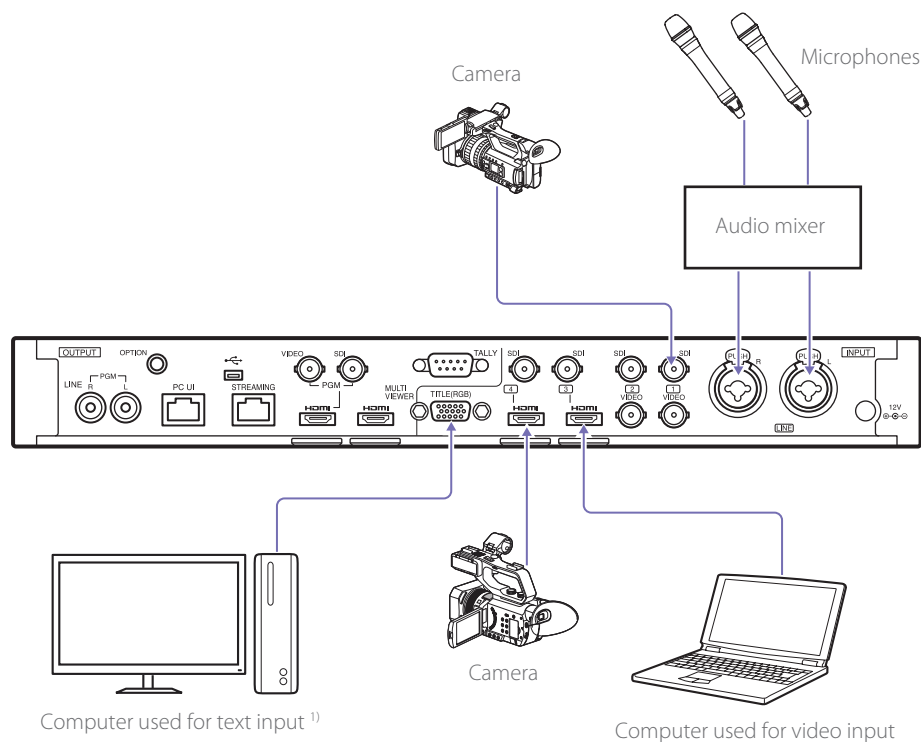
Connecting Devices

Connect each device to the unit.

If you have already connected the devices, proceed to “Chapter 3: Basic Operations” (page 29).

Connecting the Video and Audio Input Devices

Connect cameras, computers, and other video input devices to the video input connectors on the rear of the unit, and connect an audio mixer and other audio input devices to the LINE input connectors.

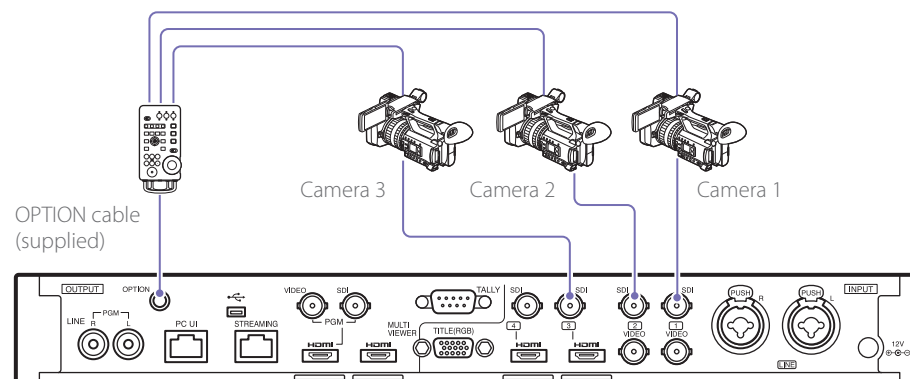


1) When using RGB input signals to composite text, use a computer that supports the 1600x1200 (60p) output resolution.

When linking with a Remote Commander

Use the OPTION cable supplied with the unit to connect the Remote Commander to the unit.

Connect the cameras to the Remote Commander and the unit as follows.

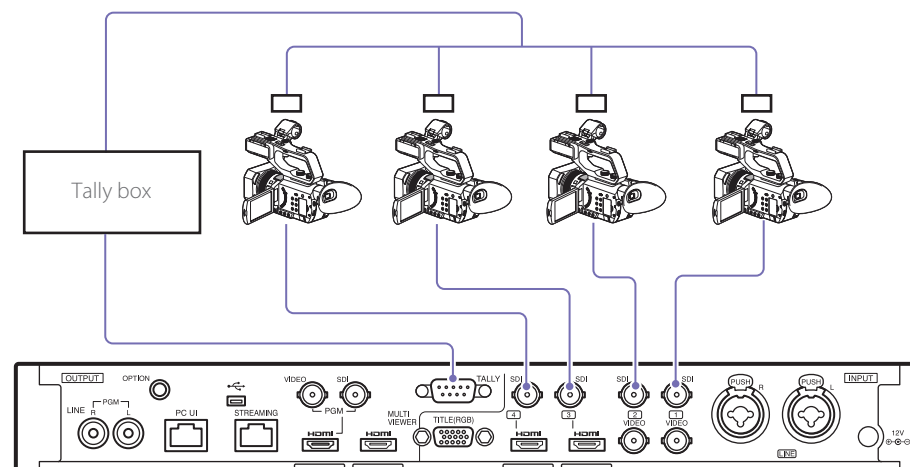


For details on connections, refer to the operating instructions for the Remote Commander and the connected cameras.

For details on necessary settings, see “Linking with the Remote Commander” (page 50).

When linking via GPI connection

Connect the unit's TALLY connector to the tally connector on a commercially available tally box. Connect the cameras to the unit as follows.

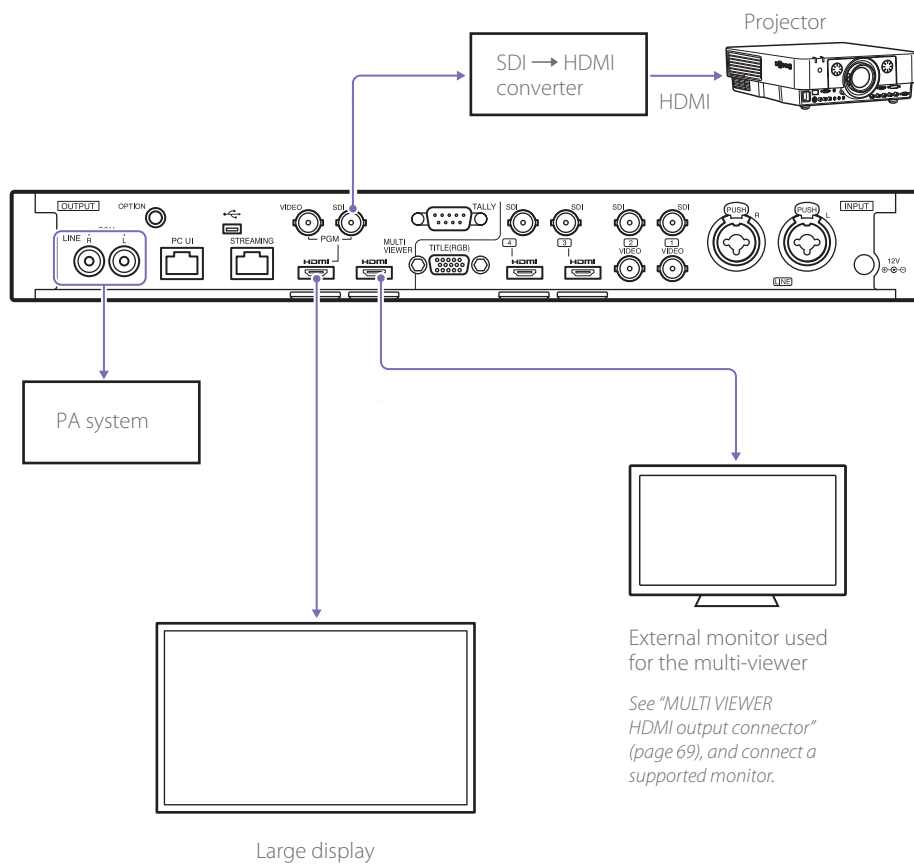


For details on connections, refer to the operating instructions for the tally box and cameras.

For details on pin assignments for the TALLY connector, see "TALLY connector" (page 71) in the "Pin Assignments" section.

Connecting the Video and Audio Output Devices

Connect projectors, large displays, and other video output devices to the video output connectors on the rear of the unit, and connect PA systems and other audio output devices to the LINE output connectors.

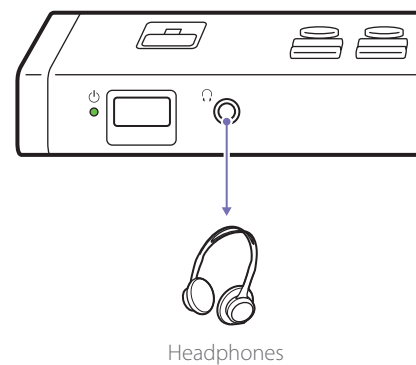


For details on aspect ratio settings for SD signals and format settings for HDMI signals, see "[Output] Screen" (page 61) in the "Configuring the System Settings" section.

If there is a discrepancy between the video and the audio, see "[PGM Output Delay]" (page 61) in the "[Output] Screen" section, and configure a PGM output delay.

Connecting headphones

Connect headphones for audio monitoring to the headphones jack on the front of the unit.



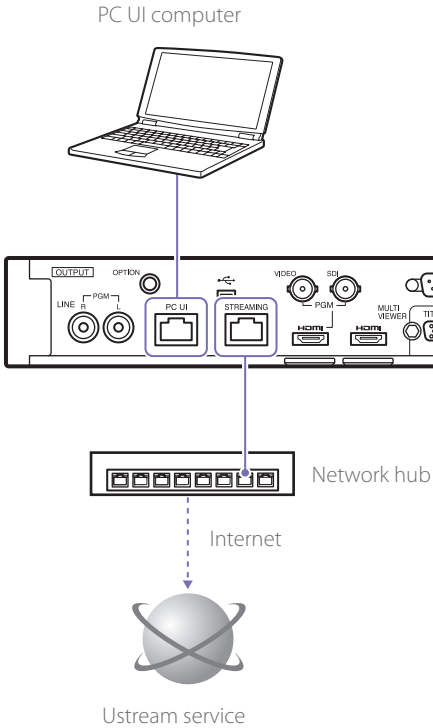
Connecting to a Network

Use the PC UI network connector on the rear of the unit to connect the PC UI computer.

For details on connections, see “Connecting a Computer for Settings Configuration” (page 22).

If you intend to use the Ustream service to stream, connect to the network using the STREAMING network connector on the rear of the unit.

For details on network settings for streaming transmission, see “Configuring the Network Settings for Streaming Transmission” (page 60).



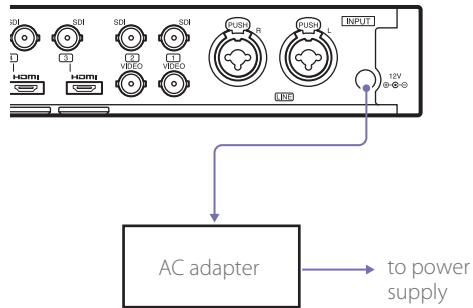
CAUTION
For safety, do not connect connectors for peripheral device wiring that may have excessive voltage to the following ports.

- PC UI network connector
- STREAMING network connector

Follow the instructions in this document for these ports.

Connecting the Power Supply

Connect the DC output plug of the supplied AC adapter to the DC IN 12V connector on the rear of the unit, and connect the AC adapter to a power supply.



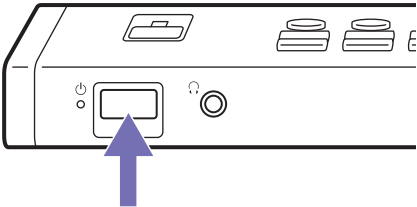
CAUTION
When connecting the unit to a peripheral device via a LAN cable, use a shielded-type cable to prevent malfunction due to radiation noise.

Startup and Shutdown

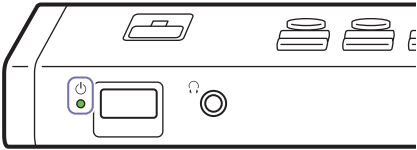
Configuring the Initial Settings (First-Time Startup)

When turning on the unit for the first time, follow the instructions on the screen to configure the initial settings.

- 1 Press the power switch on the front of the unit.



When the unit turns on, the (power) indicator lights green.

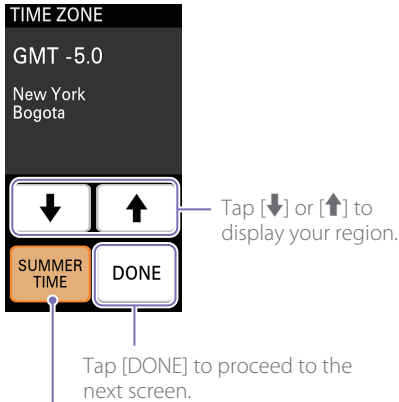


After startup, the initial settings screen appears on the menu panel (touch panel).

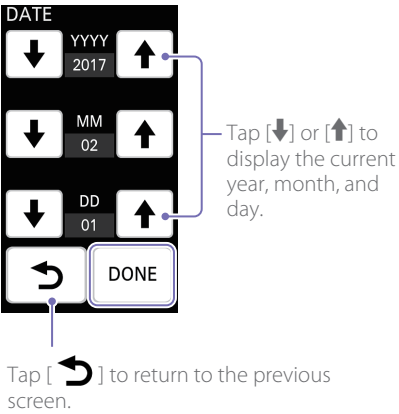
The multi-viewer appears on the external monitor.



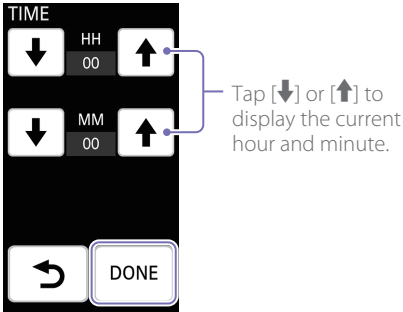
- 2 Configure the initial settings.
 - ① Select the time zone, and tap [DONE].



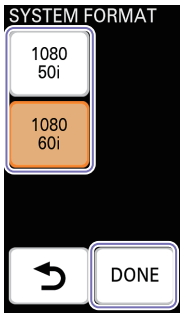
- ② Configure the current date, and tap [DONE].



- ③ Configure the current time, and tap [DONE].



- ④ Select the video signal format for the unit (i.e., system format), and tap [DONE].



This completes the initial settings, and the unit is ready for operations.

[Tips] Controls from a computer connected to the unit will be possible after the initial settings are complete.

Second and Subsequent Startup

Press the power switch on the front of the unit to turn on the unit.
A menu screen will appear on the menu panel (touch panel) after startup, and the unit will be ready for operations.

Auto Power Off Function

The unit is equipped with an auto power off function that automatically turns off the unit if it is not operated for a specified amount of time. A message will appear in the menu panel if no operations are performed on the unit's control panel or on the PC UI computer. If no operations are performed for another 3 minutes, the unit automatically turns off.

You can change the amount of time before auto power off. For details on settings, see "[System] Screen" (page 61) in the "Configuring the System Settings" section.

[Tips] If you perform an operation while the message is displayed, the unit will return to normal status.

To turn on the unit again after auto power off Press the power switch twice.

Turning the Unit Off

Press the power switch. When a confirmation message appears, select [YES] to turn off the unit.

Connecting a Computer for Settings Configuration

This section describes how to connect the unit to a PC UI computer that can perform settings configurations and composite adjustments, and how to access the unit from a web browser to display the PC UI.

[Tips]

The PC UI computer should not be the same as the computers used for video inputs and streaming.

Recommended Computer

Use a computer that meets the following system requirements.
Recommended OS: Windows 10
Web browser: Google Chrome
Recommended monitor size: 10 to 12 in.

[Tips]

- The PC UI supports both mouse and touch panel operations.
- Use the 100% display settings for the computer display and browser display.

Connecting the Computer to the Unit

The following connection modes are available.

- **LAN mode**
A DHCP connection is used in this mode.
The unit and computer are connected using IP addresses assigned by an external DHCP server.
- **Direct mode**
The unit's IP address is fixed (192.168.0.1) in this mode.
Configure the computer's network settings as follows before connection.
IP address: 192.168.0.XXX
Subnet mask: 255.255.255.0

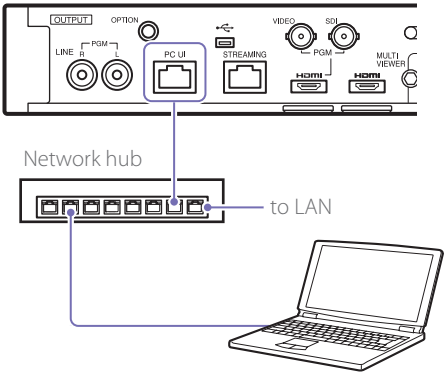
[Tips]

If connection in LAN mode is not possible, connect in direct mode.

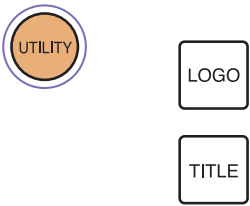
Connecting in LAN mode

Set the computer's network settings to DHCP beforehand.

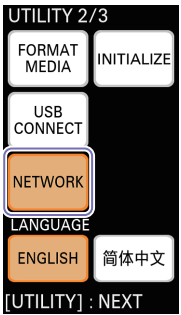
- 1 Use a LAN cable to connect to the LAN via the PC UI network connector on the rear of the unit.



- 2 Press UTILITY button on the control panel to display the [UTILITY 2/3] menu.

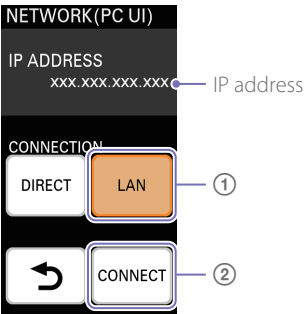


- 3 Tap [NETWORK].



The [NETWORK (PC UI)] menu appears.

- 4 Tap [LAN] (①) to enable it, and tap [CONNECT] (②).



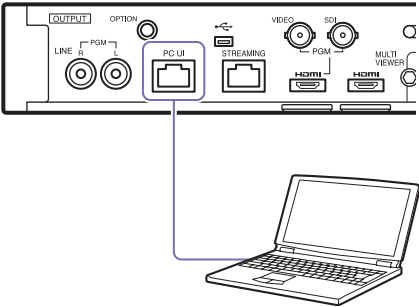
The acquired IP address is displayed.
Use this IP address to access the unit via a web browser.

[Tips]

The IP address is assigned by an external DHCP server.

Connecting in direct mode

- 1 Use a LAN cable to connect to the computer via the PC UI network connector on the rear of the unit.

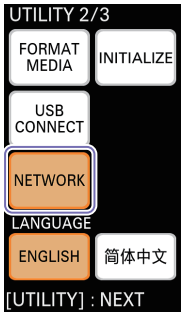


- 2 Change the IP address of the computer to enable communication with the unit. The unit's IP address is fixed at "192.168.0.1." Specify an IP address that is identical to the unit's up to "192.168.0" but is unique to "192.168.0.1" (e.g., "192.168.0.10"). Set the subnet mask to "255.255.255.0."

- 3 Press UTILITY button on the control panel to display the [UTILITY 2/3] menu.

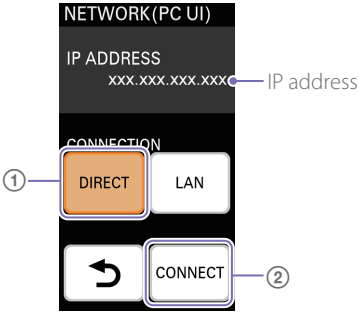


- 4 Tap [NETWORK].



The [NETWORK (PC UI)] menu appears.

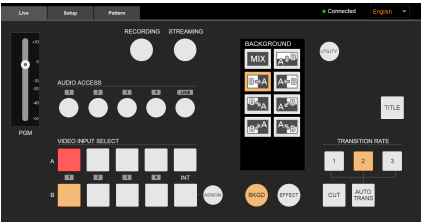
- 5 Tap [DIRECT] (1) to enable it, and tap [CONNECT] (2).



The IP address display is updated.

Accessing the Unit from a Web Browser

Enter "http://<IP address displayed in the [NETWORK (PC UI)] menu>" in the address bar of the web browser to access the unit. When access is successful, the [Live] screen of the PC UI appears.



[Notes]
Communications are not encrypted in HTTP connections, lowering the security level. Be aware of the security risk when using such connections.

Improving Security

Use HTTPS connections with encrypted communications to improve security. After accessing the unit, download the CA certificate, and install it on your web browser.

- 1 Start your computer's web browser, and enter "http://<IP address displayed in the [NETWORK (PC UI)] menu>/RootCA.crt" in the address bar.

When connection is successful, the "CA certificate for the switcher" appears.

- 2 Download the "CA certificate for the switcher" to any location.

- 3 Install the "CA certificate for the switcher" on the web browser. Double-click the downloaded CA certificate file, and follow the instructions on the screen to install.

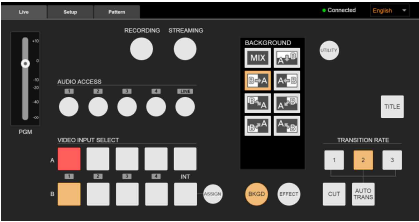
- 4 Access "https://<IP address of the unit>" from the web browser. When the PC UI appears, a warning about the unsecured status of the connection appears. To enable HTTPS connection without a warning display, the name resolution must be configured as follows between the unit's IP address and the CA certificate issue location.

- 5 Reference the CA certificate using the method used by your web browser. When using Google Chrome, perform the following.
 - 1 Click the lock icon on the left side of the address bar, and click [Details] in the menu that appears.
 - 2 Click [View certificate]. The certificate viewer appears.
 - 3 Reference the [Issued to] item. Sony-MCX-500-<serial number>

6 Use the following methods to configure the name resolution between the unit's IP address and the CA certificate issue location.

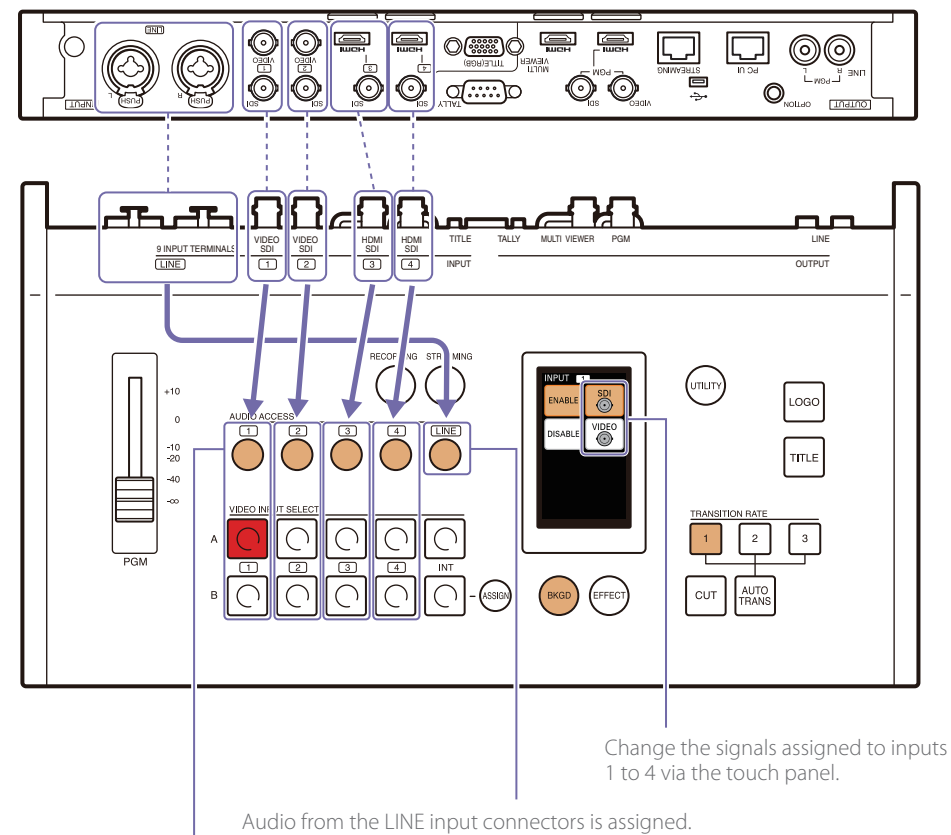
- Register to the hosts file.

7 After finishing configurations, enter "https://Sony-MCX-500-<serial number>" in the address bar to access the unit.
When access is successful, the [Live] screen of the PC UI appears.



Assigning Inputs

To switch videos and mix audio, the signals from the devices connected to the input connectors on the rear of the unit must be assigned to inputs 1 to 4.
Under default conditions, the signals are assigned as follows.



Audio included in SDI and HDMI videos (embedded audio) will automatically be assigned to the audio inputs of the same number.

[Tips]
You can turn off (disable) automatically assigned audio. For details, see "Linking embedded audio to its video" (page 28).

Default conditions

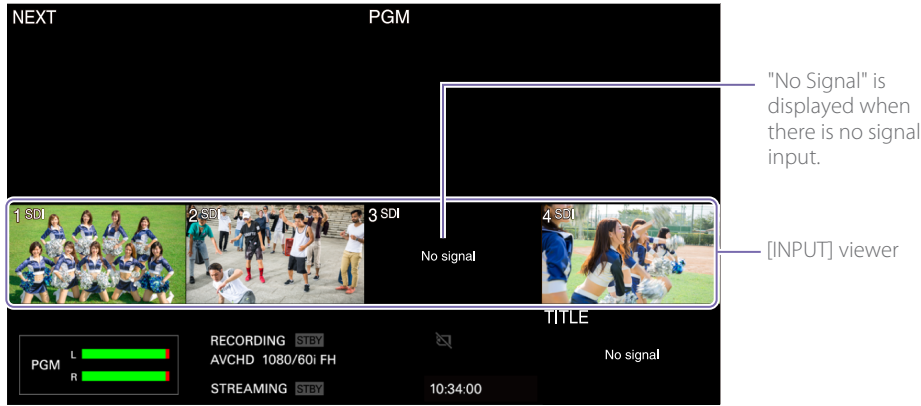
Video input (VIDEO INPUT SELECT)	Audio input (AUDIO ACCESS)	Connector number	Input signal	Status (ENABLE/DISABLE)
1	1	1	SDI	ENABLE
2	2	2	SDI	ENABLE
3	3	3	SDI	ENABLE
4	4	4	SDI	ENABLE
INT	—	—	BLACK	ENABLE
—	LINE	LINE	LINE input audio signals	ENABLE

Assigning Video Inputs

Under default conditions, videos from the devices connected to the SDI input connectors are assigned to inputs 1 to 4. When devices are connected to the VIDEO and HDMI input connectors, you must change the assigned connectors (signals).

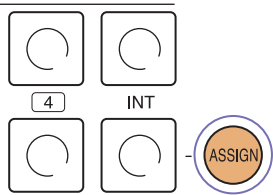
- 1 Check the video inputs in the multi-viewer.
Check that videos from the connected devices appear in the [INPUT] viewer.

Display example: When SDI is assigned to inputs 1 to 4 (default)



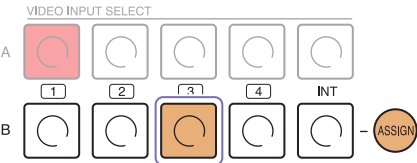
If you want to assign different signals, proceed to step 2.

2 Press and light the ASSIGN button.



The [INPUT] menu for the input currently selected in row B appears in the menu panel.

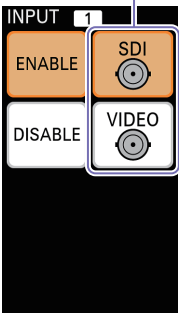
3 Press and light the row B button number for which you want to change the input connector.
If a device is connected to HDMI input connector 3, for example, light button 3.



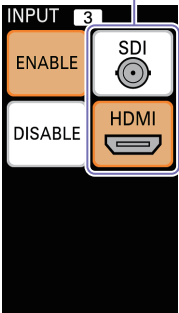
The [INPUT] menu changes to that of the selected button.

4 Tap and select (light) the target connector.
When a connector is selected (lit), it is immediately assigned and its video input appears in the multi-viewer.
The selectable connectors differ depending on the input number.

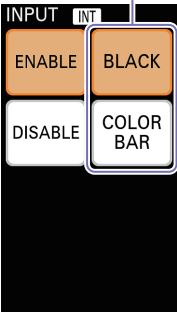
For inputs 1 and 2
Tap and select (light) [SDI] or [VIDEO].
Select an option.



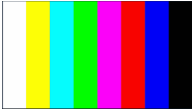
For inputs 3 and 4
Tap and select (light) [SDI] or [HDMI].
Select an option.



For INT
Tap and select (light) [BLACK] or [COLOR BAR].
Select an option.



If there are inputs you do not intend to use
Selecting (lighting) [DISABLE] disables the VIDEO INPUT SELECT button for that number. This prevents accidental pressing of buttons that do not have video inputs.
[Tips]
When [VIDEO] is selected for inputs 1 and 2, the respectively numbered audio inputs will be disabled.

Button	Option	Description
1 and 2	SDI	Assigns the materials input to the SDI input connectors. The embedded audio is also assigned to the respectively numbered audio inputs.
	VIDEO	Assigns the materials input to the VIDEO input connectors. The respectively numbered audio inputs are disabled.
3 and 4	SDI	Assigns the materials input to the SDI input connectors. The embedded audio is also assigned to the respectively numbered audio inputs.
	HDMI	Assigns the materials input to the HDMI input connectors. The embedded audio is also assigned to the respectively numbered audio inputs.
INT	BLACK	Assigns a black signal. 
	COLOR BAR	Assigns a color bar.  [Notes] The color bar is not that of a standard reference signal.

[Tips]
When a 4:3 SDI signal is input, the video is displayed at the center of a 16:9 display with black bars on both sides.



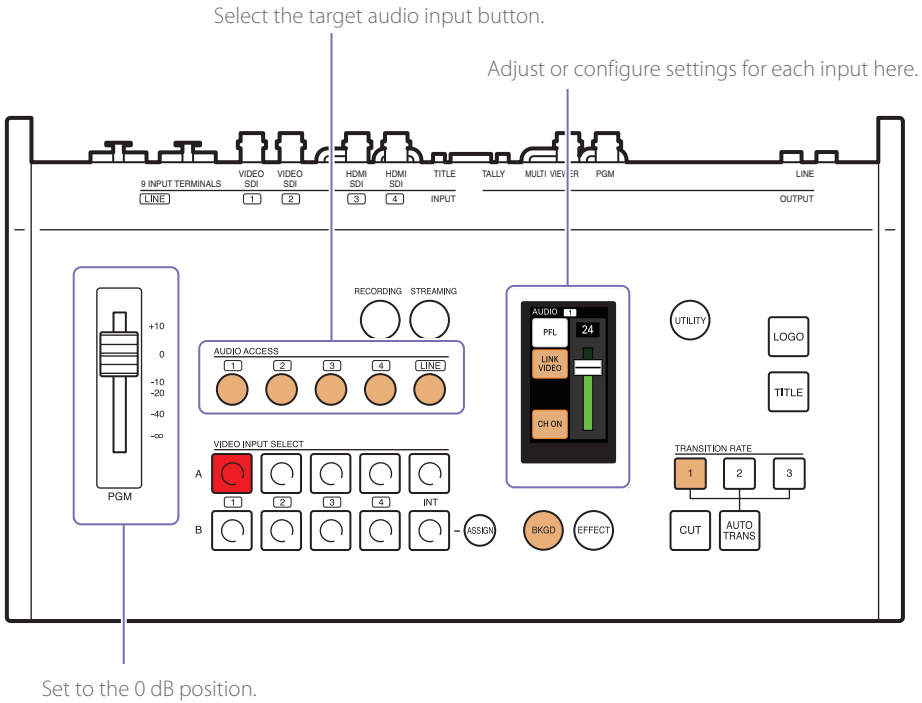
- 5
- After finishing configurations, press and unlight the ASSIGN button. The [INPUT] menu disappears.
- 6
- Check the assigned video input in the multi-viewer.



[Tips]
INT input cannot be checked in the multi-viewer.

Pre-Adjustments and Settings for Audio Inputs

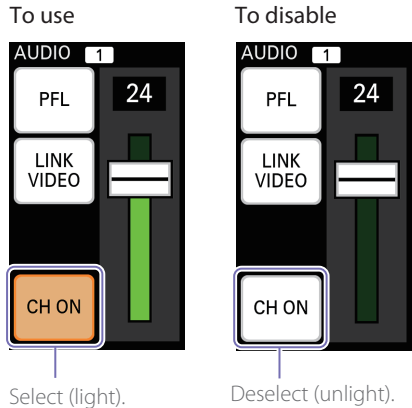
Determine whether to use each channel, adjust input levels, and configure settings for the audio inputs.



[Tips]
Decrease the volume before connecting or disconnecting input devices (input signals).

Determining whether to use each channel

Specify whether to use or disable each channel. Press an AUDIO ACCESS button to display the [AUDIO] menu, and select (use) or deselect (CH ON). When [CH ON] is deselected, the audio will be disabled.

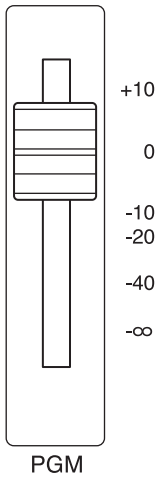


When SDI or HDMI signals are assigned to inputs 1 to 4, the embedded audio is automatically assigned to the respectively numbered audio inputs. However, you can disable the audio via this setting.

Adjusting the audio level of each channel

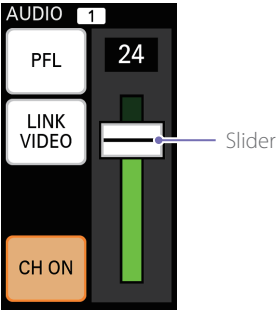
Adjust the audio level of each channel while viewing the audio level meters in the multi-viewer. Perform the adjustments while considering the overall balance.

- 1 Set the PGM master fader to the 0 dB position.



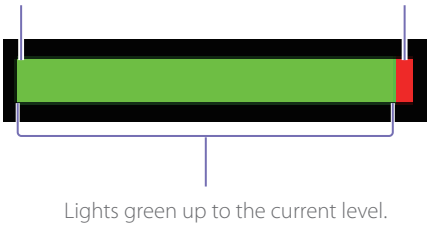
- 2 Press an AUDIO ACCESS button to display the [AUDIO] menu.

- 3 Drag the slider to adjust the audio level. You can adjust to a value between 0 to 31.



Viewing the audio level meters

The left end represents $-\infty$ and is always lit green. Over-level indicator Lights red at 0 dB.

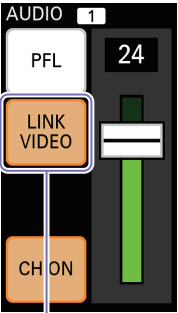


- 4 Repeat the procedure to adjust each audio input.

[Tips] If adjustments via the unit are not sufficient, perform adjustment on the input device as well.

Linking embedded audio to its video

To automatically enable or disable embedded audio in response to PGM output, link the embedded audio to its video. When a video for which the embedded audio channel is specified as linked is output as the PGM output, the embedded audio is also output in the PGM output. When the video is not being output as the PGM output, the embedded audio is disabled. To link, select [LINK VIDEO].



Select (light).

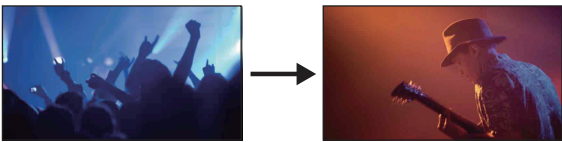
[Tips] The embedded audio can be enabled/disabled manually via [CH ON], even when [LINK VIDEO] is selected.

Switching Videos

This section describes how to switch PGM output videos using simple operations.

Switching via Cuts (Basic Switching)

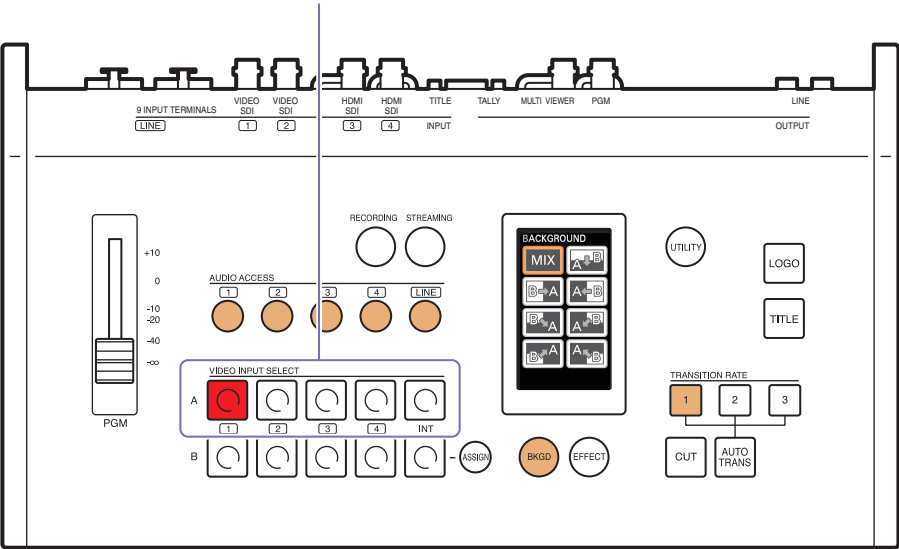
First, let's try switching videos without applying any effects.



Switching videos using only the row A buttons

This is the simplest switching method.

Switch videos using only the buttons in this row.
The buttons in row A are used to select the material to output as the PGM output.



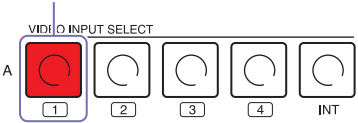
- 1 Check the assigned videos in the [INPUT] viewer of the multi-viewer.



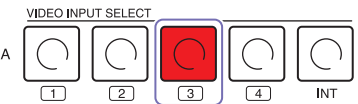
For details on changing the assigned videos, see "Assigning Inputs" (page 25).

- 2 Press the button for the video you want to output as the PGM output.
The selected button lights red, and the video is output as the PGM output.

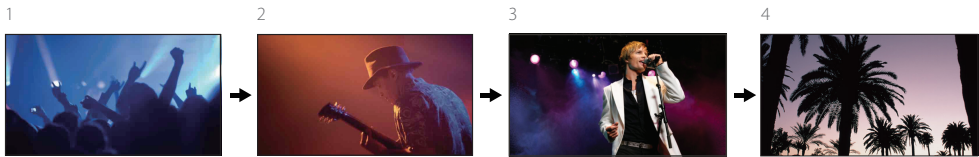
The button for the current PGM output video lights red.



- 3 Press the button for the video to which you want to switch.
The selected button lights red, and the video switches.



The video switches each time you press a row A button.



Previewing videos before switching

Preview the video to be output next as the PGM output in the multi-viewer before switching to it.

Use the buttons in rows A and B.
The buttons in row B are used to select the video to output next as the PGM output.

Check that the BKGD button is lit beforehand.
If the button is unlit, press and light it.

Press this button to switch the video.

1 Check the assigned videos in the [INPUT] viewer of the multi-viewer.



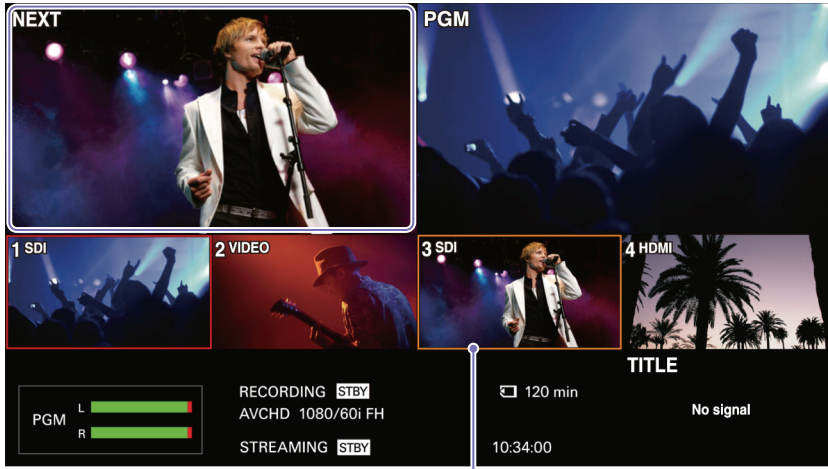
For details on changing the assigned videos, see "Assigning Inputs" (page 25).

2 Press the button for the video you want to output next as the PGM output.

VIDEO INPUT SELECT

Video to be output next as the PGM output

The selected video appears in the [NEXT] viewer of the multi-viewer.



A frame indicating selection as the NEXT output appears around the video selected in row B.

3 Press the CUT button.

TRANSITION RATE

The video switches.

Applying Transition Effects

Now, let's try switching using patterns that slowly transition the current PGM video into the next video.

Mix

Dissolve from one video into the next.

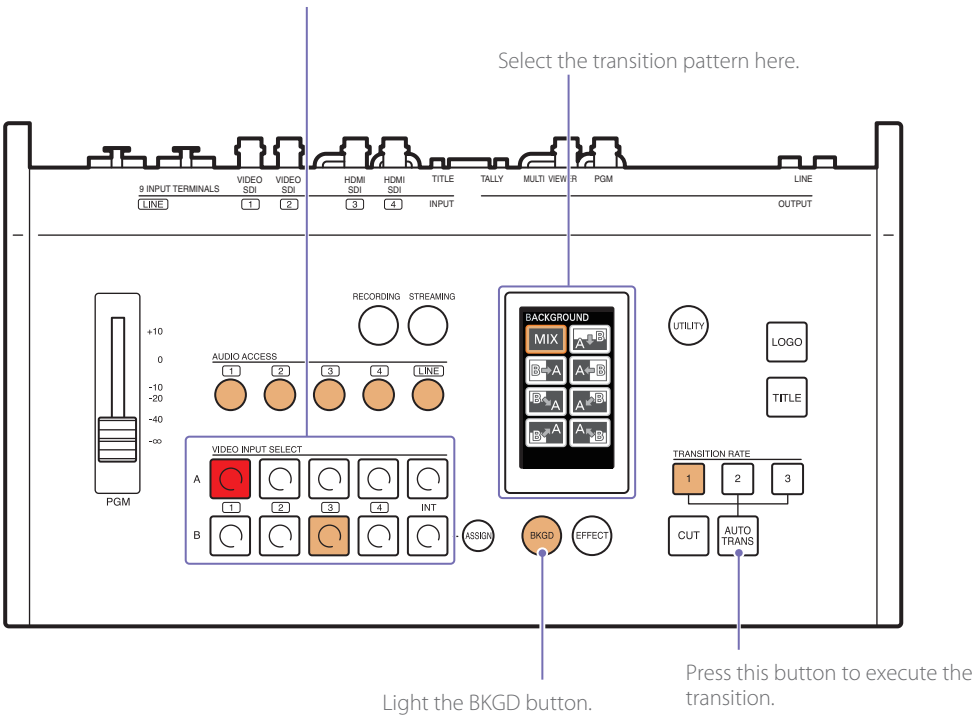


Wipe

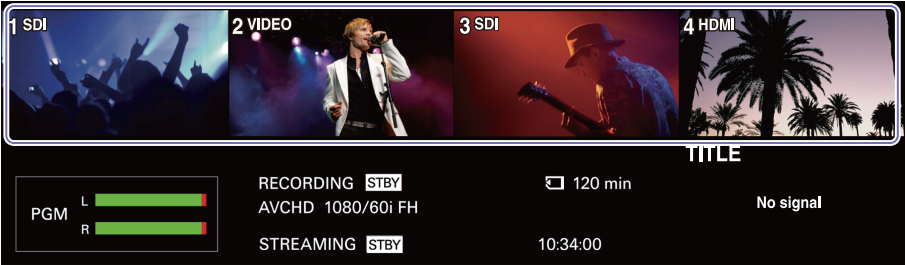
Wipe the next output video over the PGM video.



Use the buttons in rows A and B.
The buttons in row B are used to select the video to output next as the PGM output.



- 1 Check the assigned videos in the [INPUT] viewer of the multi-viewer.



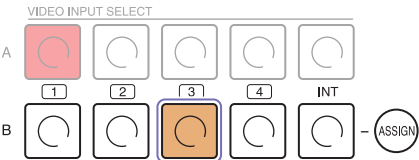
For details on changing the assigned videos, see "Assigning Inputs" (page 25).

- 2 Press the BKGD button to enable BKGD mode.
The pattern icons selectable in BKGD mode are displayed in the menu panel.



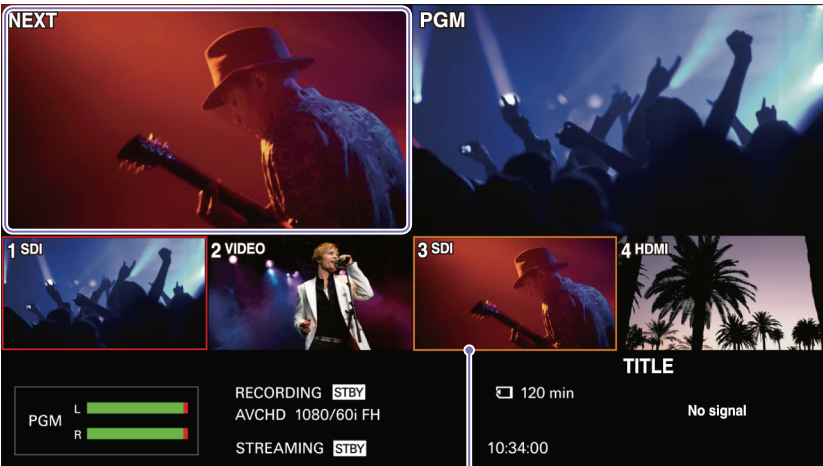
For details on the modes, see “BKGD Mode and EFFECT Mode” (page 17).

- 3 Press the button for the video you want to output next as the PGM output.



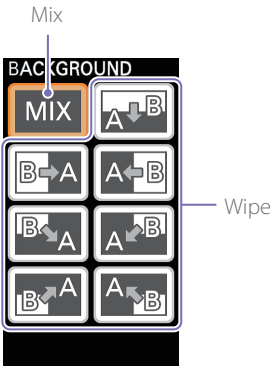
Video to be output next as the PGM output

The selected video appears in the [NEXT] viewer of the multi-viewer.



A frame indicating selection as the NEXT output appears around the video selected in row B.

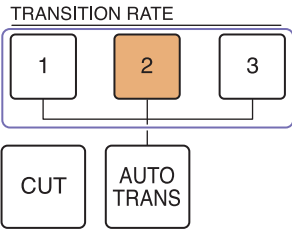
- 4 Tap and select a pattern icon.



[Tips]
Eight wipe patterns are available on the unit.

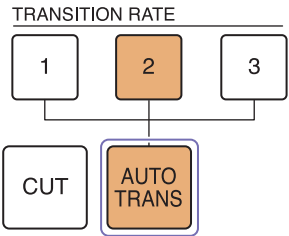
For details on the patterns available on the unit, see “Transition and Composite Patterns List” (page 62).

- 5 Select a transition rate with the TRANSITION RATE buttons.
Under default conditions, transition rates of 0.5, 1.0, and 1.5 seconds are assigned to TRANSITION RATE buttons 1 to 3.



For details on changing the transition rates assigned to each button, see “Changing the Transition Rates” (page 49).

6 Press the AUTO TRANS button.



The transition starts, and the videos switch.



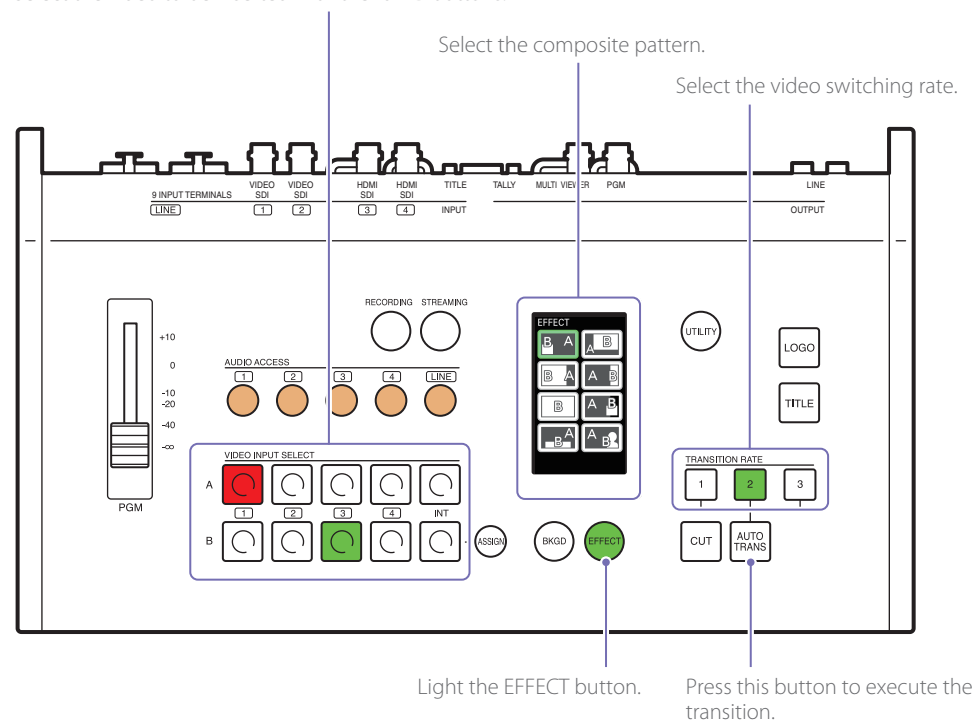
When a link is configured between the video and its embedded audio, the enabling and disabling of the embedded audio is determined by whether the video is being output as the PGM video.

For details on settings, see “Linking embedded audio to its video” (page 28).

Compositing Videos

Switch to EFFECT mode when you want to use the picture-in-picture (PinP) function, insert a person onto a background, or otherwise use composite effects on videos.

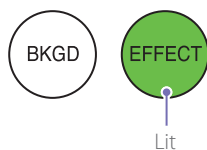
Use the buttons in rows A and B.
Select the video to be inserted with the row B buttons.



- 1 Check the assigned videos in the [INPUT] viewer of the multi-viewer.

For details on changing the assigned videos, see "Assigning Inputs" (page 25).

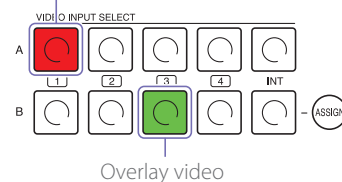
- 2 Press the EFFECT button to enable EFFECT mode.



The pattern icons selectable in EFFECT mode are displayed in the menu panel.

- Press the row B button for the video you want to insert.

Current PGM output video

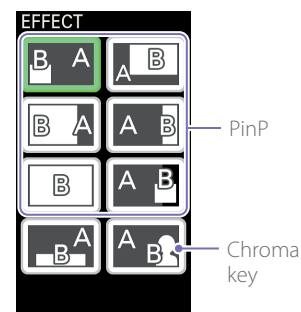


The selected video appears in the [NEXT] viewer of the multi-viewer.



A frame indicating selection as the NEXT output appears around the video selected in row B.

- 4 Tap and select a pattern icon.

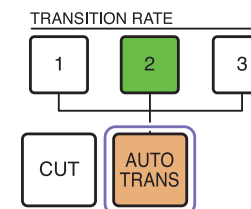


Pre-adjustment may be necessary depending on the pattern. For details, see “Adjustments for Inserting People onto Backgrounds (Chroma Key)” (page 44).

- 5 Select a transition rate with the TRANSITION RATE buttons.

For details on changing the rates assigned to the buttons, see “Changing the Transition Rates” (page 49).

- 6 Press the AUTO TRANS button.



The transition starts, and the videos are composited.



When a link is configured between the video and its embedded audio, the enabling and disabling of the embedded audio is determined by whether the video is being output as the PGM video.

For details on settings, see “Linking embedded audio to its video” (page 28).

[Tips]

Pressing the CUT button will switch to the composite image instantly.

Canceling composites

Press the AUTO TRANS or CUT button.
The composite will be enabled/disabled with each press.

Inserting Text onto Videos

The procedure will differ depending on the format of the text signal being input from the computer.

Using RGB Input Signals to Insert Text (TITLE Function)

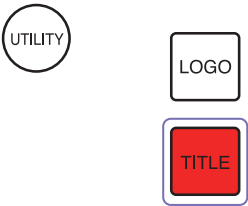
Perform the following to overlay the text (signal) that is input from a computer connected to the TITLE (RGB) input connector on the rear of the unit. The TITLE function can be used in both the BKGD and EFFECT modes, and can be used in conjunction with other video effects.

Pre-adjustment is necessary when inserting text onto videos. For details, see "Using RGB Input Signals to Insert Text (TITLE Function)" (page 46).

- 1 Check that the RGB signal from the computer is being input in the [INPUT] viewer of the multi-viewer.



- 2 Select (light) the TITLE button.



The text is composited onto the PGM output video via a cut.



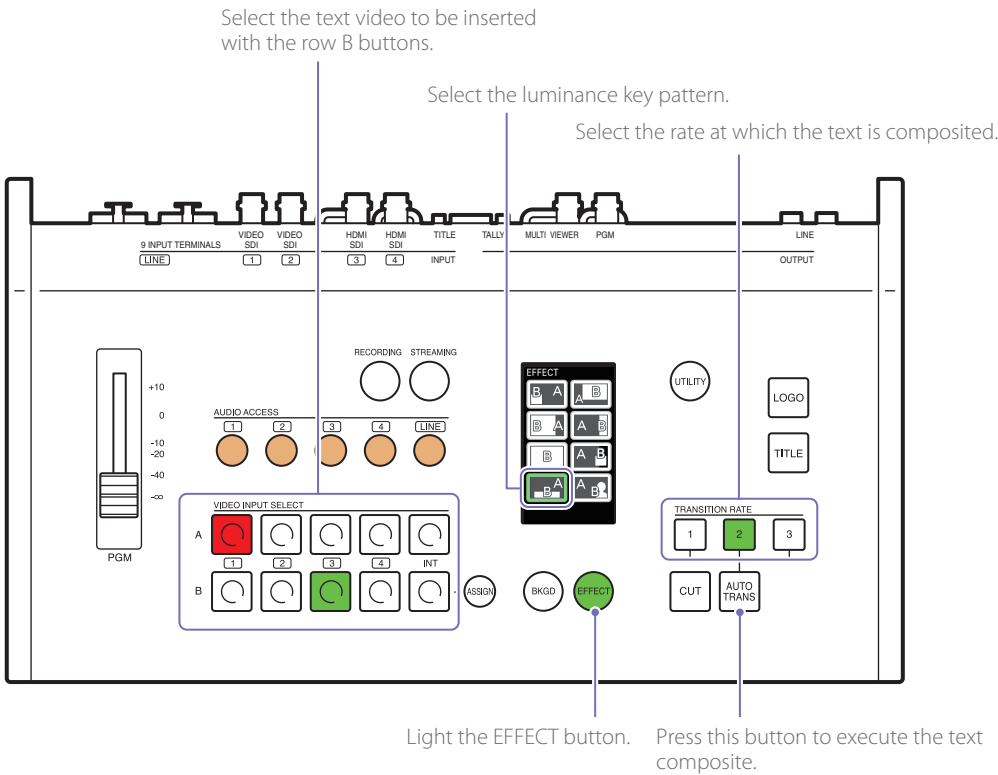
Canceling composites

Press the TITLE button. The composite will be enabled/disabled with each press.

Using HDMI Input Signals to Insert Text (EFFECT Mode)

Perform the following to use EFFECT mode to overlay the text (signal) that is input from a computer connected to an HDMI input connector on the rear of the unit. This method cannot be used in conjunction with other video effects.

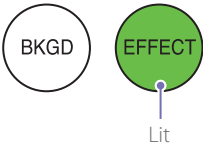
Pre-adjustment is necessary when inserting text onto videos. For details, see "Using HDMI Input Signals to Insert Text (EFFECT Mode)" (page 47).



- 1 Check the assigned videos in the [INPUT] viewer of the multi-viewer.

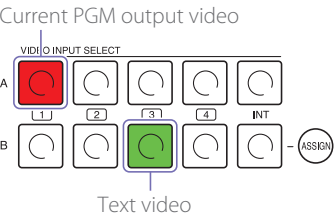
For details on changing the assigned videos, see "Assigning Inputs" (page 25).

2 Press the EFFECT button to enable EFFECT mode.



The pattern icons selectable in EFFECT mode are displayed in the menu panel.

3 Press the row B button for the text video you want to insert.

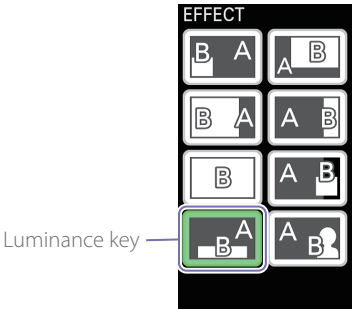


The selected video appears in the [NEXT] viewer of the multi-viewer.



A frame indicating selection as the NEXT output appears around the video selected in row B.

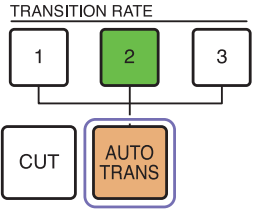
4 Tap and select a luminance key pattern icon.



5 Select a transition rate with the TRANSITION RATE buttons.

For details on changing the rates assigned to the buttons, see “Changing the Transition Rates” (page 49).

6 Press the AUTO TRANS button.



The transition starts, and the text is composited.



When a link is configured between the video and its embedded audio, the enabling and disabling of the embedded audio is determined by whether the video is being output as the PGM video.

For details on settings, see “Linking embedded audio to its video” (page 28).

[Tips]
Pressing the CUT button will switch to the composite image instantly.

Canceling composites

Press the AUTO TRANS or CUT button.
The composite will be enabled/disabled with each press.

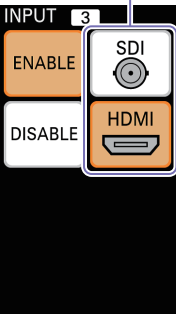
Live Adjustments

Switching between Two Devices Connected to a Single Input

You can connect two video input devices each for inputs 1 to 4 and switch input assignments.

Press the ASSIGN button, press the row B button number for which you want to switch the input, and then tap the connector to which you want to switch in the [INPUT] menu.

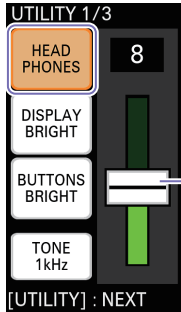
Tap to switch between the two inputs.



The video may distort at the moment of switching, so be sure to check the video in the [NEXT] viewer.

Adjusting the Headphone Volume

Display the [UTILITY 1/3] menu, tap and select (light) [HEAD PHONES], and adjust the volume using the slider. You can adjust too a level between 1 to 16 (increments of 1).

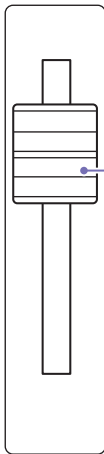


Drag the slider to adjust the volume.

- [Tips]
- Audio is not completely disabled at level 1.
 - When using earphones or headphones, be careful not to raise the volume too high. Prolonged exposure to high volumes that stimulate the ears may cause adverse effects to hearing.
 - Decrease the volume before connecting or disconnecting input devices (input signals) and headphones.

Adjusting the Overall Audio Level

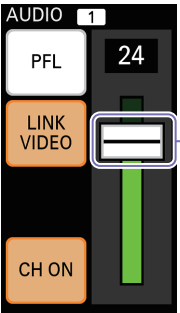
Use the PGM master fader to adjust the PGM output level. Perform adjustments while viewing the audio level meters in the multi-viewer.



Move the fader to adjust the PGM output level.

Adjusting Individual Audio Levels

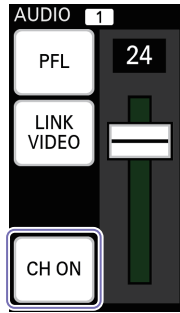
When the voice of a speaker or the sound of an instrument is too loud or small, display the [AUDIO] menu for the corresponding channel and readjust the input level.



Drag the slider to adjust the input level.

Enabling/Disabling Use of Audio Channels

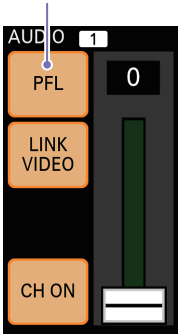
Display the [AUDIO] menu for the corresponding channel, and select or deselect [CH ON].



Listening to the Current Audio Input

By tapping and holding [PFL], you can listen to and monitor only the currently selected audio via headphones or a device connected to the audio output connectors on the rear of the unit.

The button remains lit while it is held, and the current audio can be monitored by itself, regardless of slider adjustments.

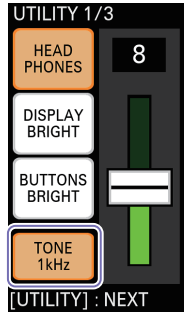


[Tips]
When [CH ON] is deselected, slider adjustments can be performed, but audio cannot be monitored.

For details on headphone volume, see “Adjusting the Headphone Volume” (page 37).

Outputting the Audio Tone Signal with the PGM Output

Display the [UTILITY 1/3] menu, and output the 1 kHz tone signal with the PGM output using [TONE 1kHz].



Select (lit): Outputs the 1 kHz tone signal (fixed level¹⁾) with the PGM output.

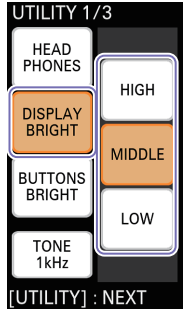
Deselect (unlit): Does not output the tone signal.

1)

System format	Level
50i	-18 dB
60i	-20 dB

Adjusting the Menu Panel Brightness

Display the [UTILITY 1/3] menu, tap and select (light) [DISPLAY BRIGHT], and select the menu panel (touch panel) brightness.



[HIGH]: Brightest level.

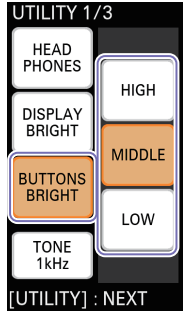
[MIDDLE]: Medium brightness level.

[LOW]: Darkest level.

Adjusting the Button Brightness

Display the [UTILITY 1/3] menu, tap and select (light) [BUTTONS BRIGHT], and select the button brightness.

The brightness level will be applied to all buttons.



[HIGH]: Brightest level.

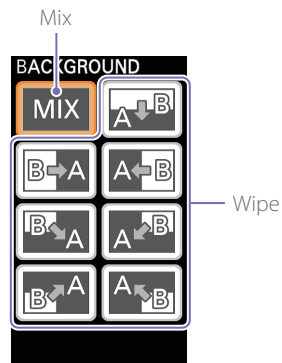
[MIDDLE]: Medium brightness level.

[LOW]: Darkest level.

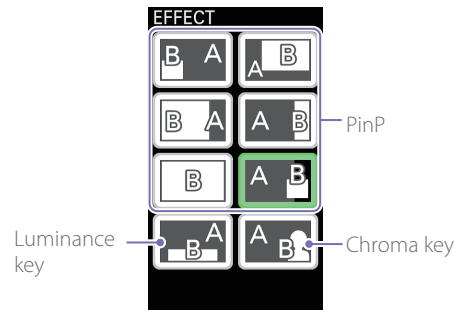
Customizing the Pattern Icons

Up to eight transition pattern or composite pattern icons can be displayed in the [BKGD] and [EFFECT] menus of the menu panel. Under default conditions, the following pattern icons are displayed.

BKGD mode



EFFECT mode



In addition to the above, a number of other pattern icons are available on the unit. If necessary, you can replace the pattern icons that appear in the menus with icons you will use during live operation.

- [Tips]
- You can remove unnecessary pattern icons from the menu to prevent accidental operation.
 - You can rearrange the pattern icons for convenience.

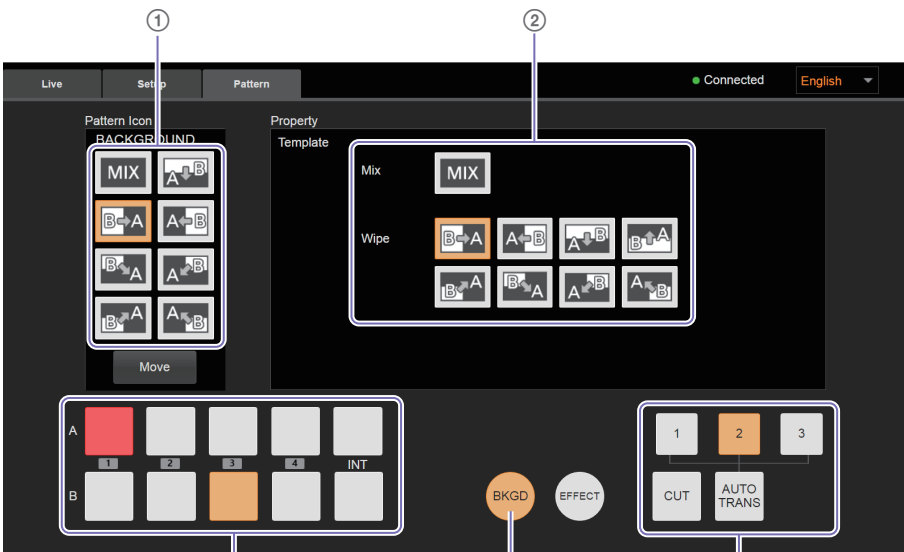
Use the PC UI on a computer to perform pattern icon replacement.

[Notes]
Pattern icons cannot be edited unless the [BKGD] or [EFFECT] menu is displayed on the menu panel of the unit and the PC UI's [Live] screen.

Replacing the Pattern Icons in the [BKGD] Menu

Select the transition patterns you want to display from among the templates.

- 1 Display the [Pattern] screen of the PC UI in BKGD mode.
You can also switch to BKGD mode using the BKGD button after displaying the [Pattern] screen.
- 2 Replace the pattern icons with the desired icons, and check the transitions



When checking the transitions, select the videos using these video selection buttons.

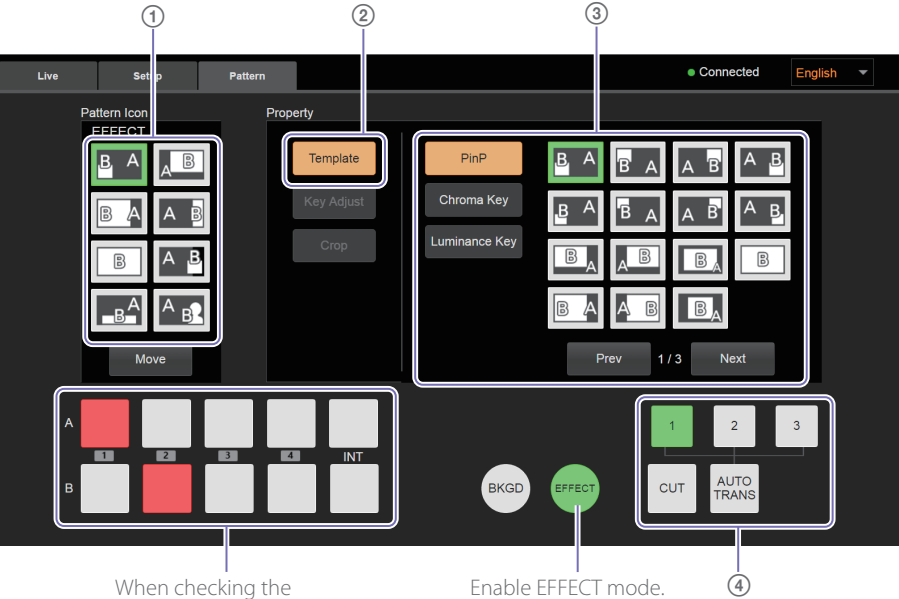
Enable BKGD mode.

- 1 Select the transition pattern icon you want to replace.
- 2 Select the pattern icon you want displayed in the menu from the [Property] area. BKGD pattern icons appear in the [Property] area. When you select a pattern icon in this area, it replaces the other icon immediately.
- 3 Select the AUTO TRANS or CUT button to execute the transition. Check the transition effect by viewing the multi-viewer.

Replacing the Pattern Icons in the [EFFECT] Menu

Select the composite patterns you want to display from among the PinP, chroma key, and luminance key templates. Adjustment values for key compositing can also be configured for chroma key and luminance key pattern icons.

- 1 Display the [Pattern] screen of the PC UI in EFFECT mode.
You can also switch to EFFECT mode using the EFFECT button after displaying the [Pattern] screen.
- 2 Replace the pattern icons with the desired icons, and check the compositions.



When checking the compositions, select the videos using these video selection buttons.

Enable EFFECT mode.

- ① Select the composite pattern icon you want to replace.
- ② Select [Template] in the [Property] area menu.
Pattern icons appear in the editing area on the right.
- ③ Select the effect type, and then select the pattern icon you want displayed in the menu.
Pattern icons for each effect type appear in the editing area.
When you select a pattern icon in this area, it replaces the other icon immediately.
- ④ Select the AUTO TRANS or CUT button to execute the composite.
Check the composition by viewing the multi-viewer.
- ⑤ Adjust the composition.
For details, see the following.

"Adjustments for Inserting People onto Backgrounds (Chroma Key)" (page 44)
"Using HDMI Input Signals to Insert Text (EFFECT Mode)" (page 47)

Removing Pattern Icons

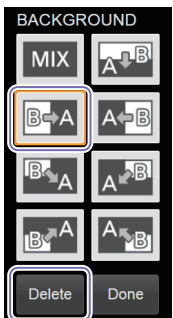
You can remove pattern icons that you do not intend to use.

- 1 Select [Move] in the menu panel.

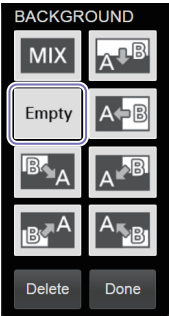


[Move] mode is enabled.

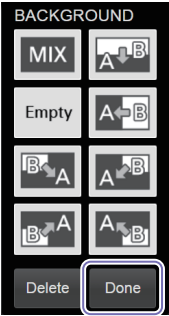
- 2 Select the unnecessary pattern icon, and select [Delete].



The selected pattern icon is removed and replaced by the [Empty] icon.



3 After finishing configurations, select [Done].

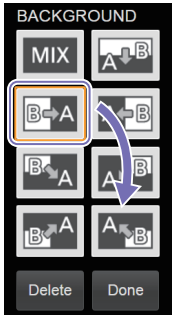


The pattern icons displayed in the menu are changed.

- [Tips]
- The [Empty] icon will not appear on menu panel of the unit and the PC UI's [Live] screen.
 - Performing controls on the unit exits [Move] mode.

Rearranging Pattern Icons

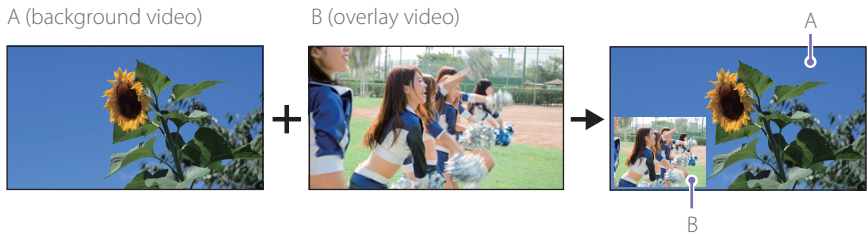
1 Enable [Move] mode, and then drag and drop the pattern icon to the desired position.



2 After finishing configurations, select [Done].
The arrangement of the pattern icons displayed in the menu is changed.

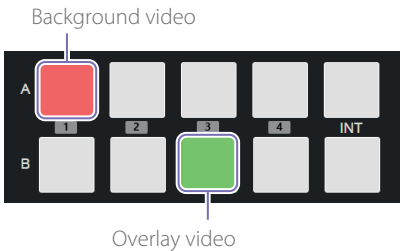
Selecting Picture-in-Picture (PinP) Patterns

This section describes preparations for video composites that use PinP. PinP is a composite effect that inserts an overlay video (B) onto a background video (A).



Thirty-three PinP patterns are available on the unit. As preparation, select the pattern icons that will be used during live operation, and check the video composition.

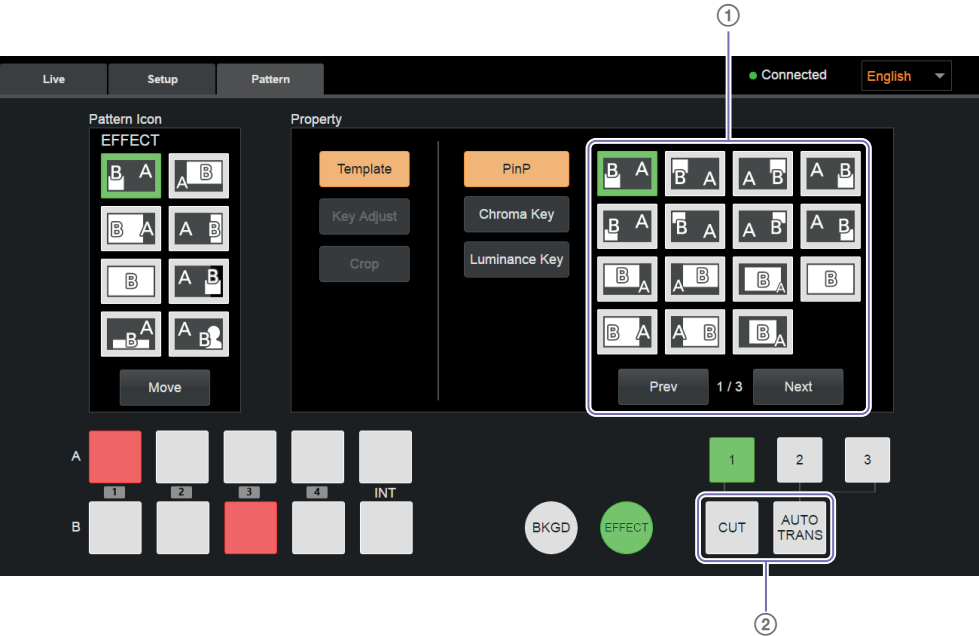
- 1 Display the [Pattern] screen of the PC UI in EFFECT mode.
- 2 Select the button for the background video in row A of the video selection buttons, and select the overlay video in row B.



The background video selected in row A appears in the [PGM] viewer of the multi-viewer, and the overlay video selected in row B appears in the [NEXT] viewer.

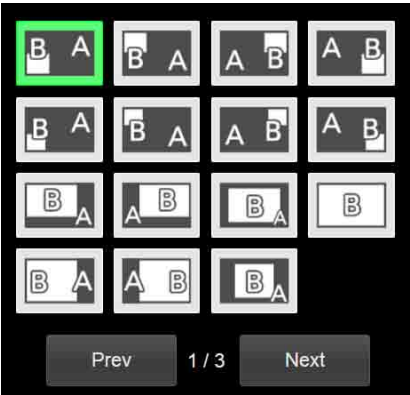


- 3 Select a PinP pattern icon, and check the composition.



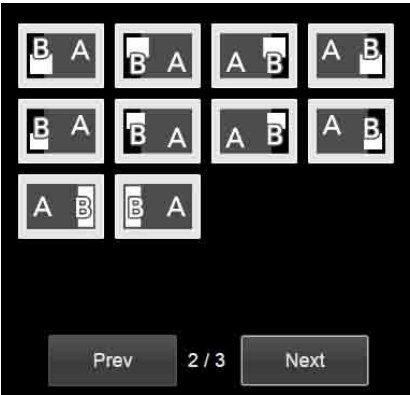
- ① Select the PinP pattern icon.
- There are three pages of PinP pattern icons.
- Selecting [Next] displays the next page, while selecting [Prev] returns to the previous page.

Page 1 (1/3)
Pattern icons for an HD angle of view.

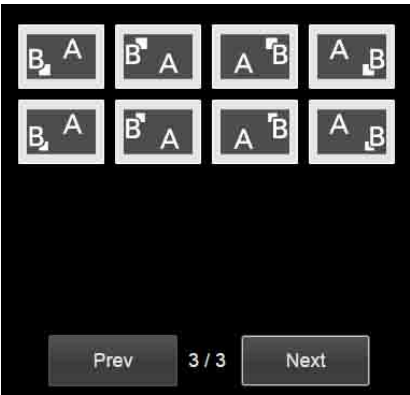


Page 2 (2/3)
Pattern icons for an HD angle of view.

Select these when you want to shift the row A material to the right or left.



Page 3 (3/3)
Pattern icons for an SD angle of view.

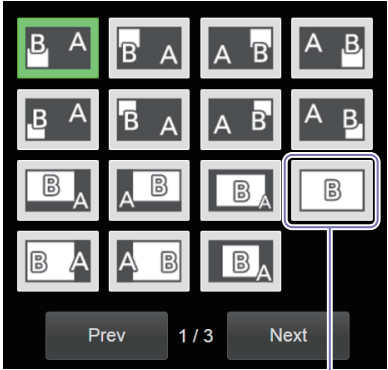


- ② Press the CUT or AUTO TRANS button, and check the composition.
- You can view the composition in the multi-viewer.



Useful tip

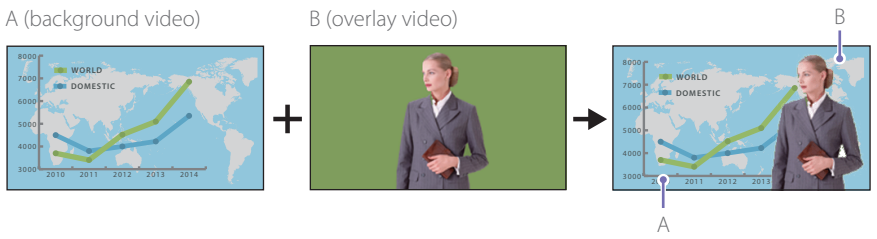
If you want to display the PinP insert image (video B) in full screen, select the following pattern icon (P12).



Video B appears in full screen in this pattern.

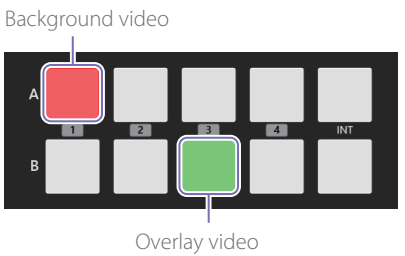
Adjustments for Inserting People onto Backgrounds (Chroma Key)

This section describes preparations for video composites that use chroma keying. Chroma keying is a compositing technique that involves removing a specified color in the overlay video (green in the following example) and overlaying the remaining parts of the video (a person in the following example) onto the background video.

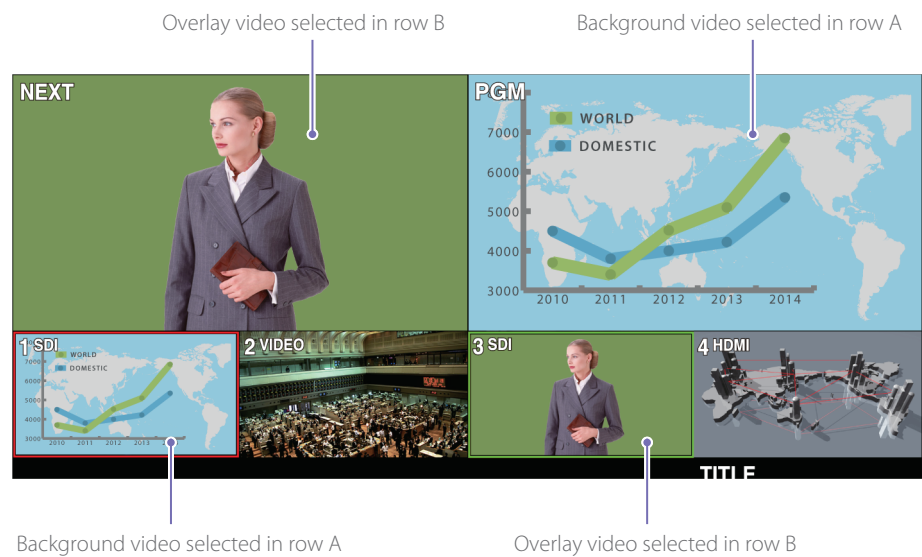


Five chroma key patterns are available on the unit. As preparation, select the pattern icons that will be used during live operation, and adjust the key composition. Composite adjustment values can also be configured for the pattern icon.

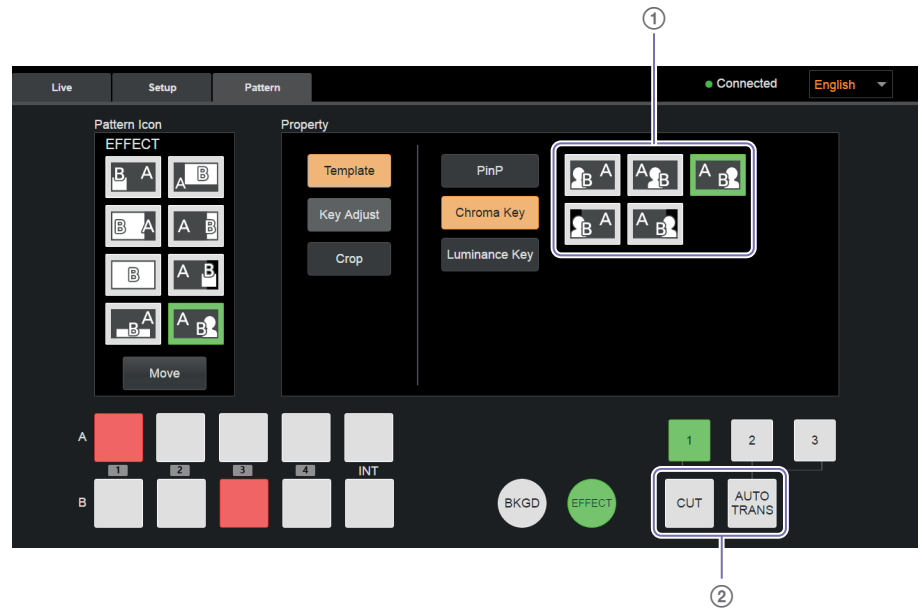
- 1 Display the [Pattern] screen of the PC UI in EFFECT mode.
- 2 Select the button for the background video in row A of the video selection buttons, and select the overlay video in row B.



The background video selected in row A appears in the [PGM] viewer of the multi-viewer, and the overlay video selected in row B appears in the [NEXT] viewer.



- 3 Select a chroma key pattern icon, and adjust the key composition.



- ① Select the chroma key pattern icon.
- [Tips]
If the background video selected in row A has a 4:3 aspect ratio, select a 4:3 template.

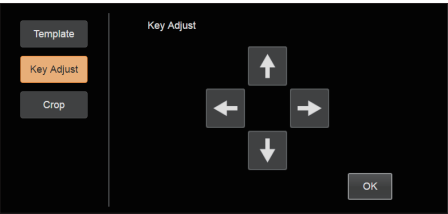


- ② Press the CUT or AUTO TRANS button to composite the videos.

- 4 Select [Key Adjust], and select [Adjust] for [Auto Chroma key].



When you select [Adjust], the following screen appears.

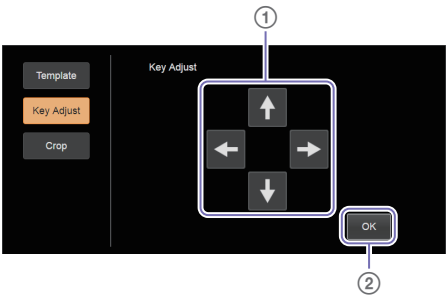


In addition, a sample mark (white frame) appears in the [NEXT] viewer of the multi-viewer.

Sample mark (white frame)



- 5 Move the sample mark to select the color that will be removed for the composite.



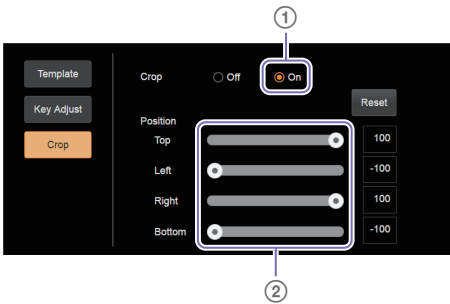
- ① Use the arrow buttons to move the sample mark position to the color you want to remove.
- The sample mark moves in the direction of the selected arrow.

[Tips]

The arrow buttons cannot be used to move the sample mark to positions that cannot be specified.

- ② Select [OK].
- The color on which the sample mark is placed will be used as the basis for color removal.
- Perform adjustments while viewing the results in the multi-viewer.

- 6 Select [Crop] to crop unnecessary areas of the overlay video.



- ① Select [On] to crop unnecessary areas.
- When you select [On], operation of the [Position] sliders is enabled.
- ② Drag each slider to specify the area you want to use.
- Areas of the video that are outside of the specified area will be cropped.
- Perform adjustments while viewing the results in the multi-viewer.

[Top]: Specifies the top edge of the used video as a value between -100 to +100.

This cannot be lower than the [Bottom] position.

Default setting: 100

[Left]: Specifies the left edge of the used video as a value between -100 to +100.

This cannot be to the right of the [Right] position.

Default setting: -100

[Right]: Specifies the right edge of the used video as a value between -100 to +100.

This cannot be to the left of the [Left] position.

Default setting: 100

[Bottom]: Specifies the bottom edge of the used video as a value between -100 to +100.

This cannot be higher than the [Top] position.

Default setting: -100

[Tips]

To restore default values, select [Reset].

Adjustments for Inserting Text onto Videos

Two methods are available for inserting text onto videos.

- **Using RGB input signals to insert text (TITLE function)**
You can overlay the text (signal) that is input from a computer connected to the TITLE (RGB) input connector on the rear of the unit. This feature is called the TITLE function. The TITLE function can be used in both the BKGD and EFFECT modes, and can be used in conjunction with other video effects.
- **Using HDMI input signals to insert text (EFFECT mode)**
You can use EFFECT mode to overlay the text (signal) that is input from a computer connected to an HDMI input connector on the rear of the unit. This method cannot be used in conjunction with other video effects.

This section describes preparations for video composites that insert text.

Using RGB Input Signals to Insert Text (TITLE Function)

The TITLE function can only be used to overlay text inputs from a computer connected to the TITLE (RGB) input connector on the rear of the unit.

Text inserted via the TITLE function



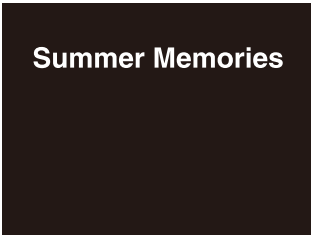
[Tips]
Only 1600x1200 (60p) signals are supported for input. Use a computer that supports this output resolution.

As preparation, create the text on the computer, and adjust the composition.

Creating the text on the computer

As shown in the example, create text on a black background of a color that differs greatly in brightness from the background (e.g., white), or create black text on a white background. We recommend creating a 1600x1200 image.

Example: White text on a black background



[Tips]
Create text with sufficient space around the top and bottom sides. If the space is insufficient, text overlay may not be possible.

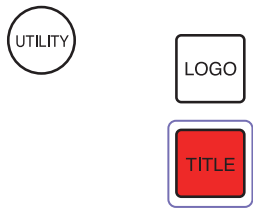
Adjusting the composition

Overlay the text input from the computer onto the PGM output video, and adjust the composition. Use the PC UI to perform adjustments while viewing the output video in the multi-viewer.

- 1 Output the background video as the PGM output. In addition, check that the input signal from the computer appears in the [INPUT] viewer.



- 2 Select (light) the TITLE button.

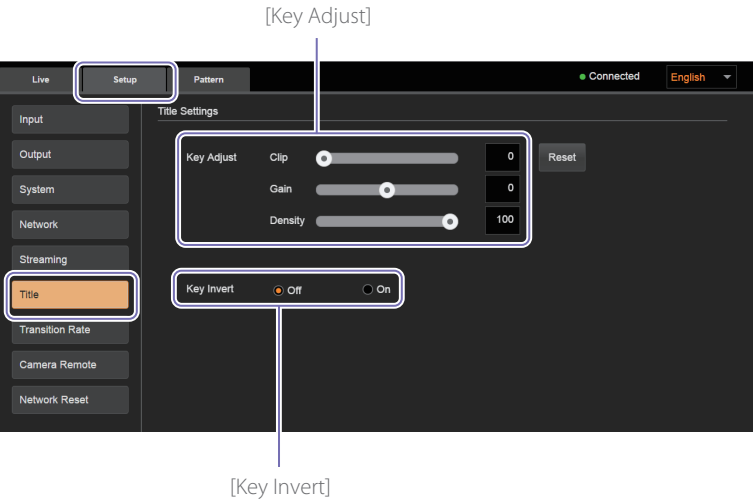


The input signal from the computer is overlaid on the PGM output video.

Input signal from the computer



3 Select [Title] in the [Setup] screen of the PC UI, and adjust the text composition. Perform adjustments while viewing the PGM output video in the multi-viewer.

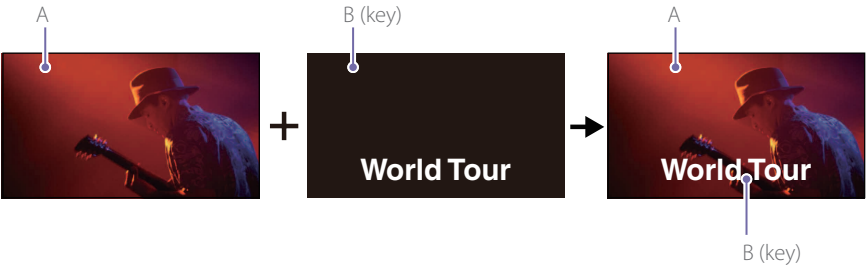


- [Key Adjust]**
Allows you to adjust the composition via the sliders.
- [Clip]:** Adjusts the brightness level of the key color to be removed as a value between 0 to 100. Default setting: 10
 - [Gain]:** Adjusts the sensitivity of the key (i.e., smoothness of the key edges) as a value between -100 to 100. Default setting: 100
 - [Density]:** Adjusts the density of the text as a value between 0 to 100. Default setting: 100
- [Key Invert]**
Specifies whether to invert the key signal.
- [Off]:** Does not invert the signal.
 - [On]:** Inverts the signal.

[Tips]
To restore default values of each adjustment, select [Reset].

Using HDMI Input Signals to Insert Text (EFFECT Mode)

Luminance key patterns are used when inserting text with EFFECT mode. Luminance keying is a compositing technique that involves removing components in the overly video (B) signal based on brightness (luminance) differences, and overlaying the video on the background video (A). Typically, bright colored text is created on a black background to be used as a key. Luminance keying is supported for HDMI input signals assigned to inputs 3 and 4.



Only one luminance key pattern is available. As preparation, create the text on the computer, and adjust the text composition (i.e., level of key removal). Composite adjustment values can also be configured for the pattern icon.

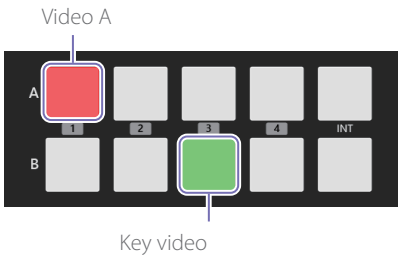
Creating the text on the computer

Create a black background and text of a color (e.g., white) that differs greatly in brightness from the background. When recommend creating the material in the 16:9 aspect ratio.

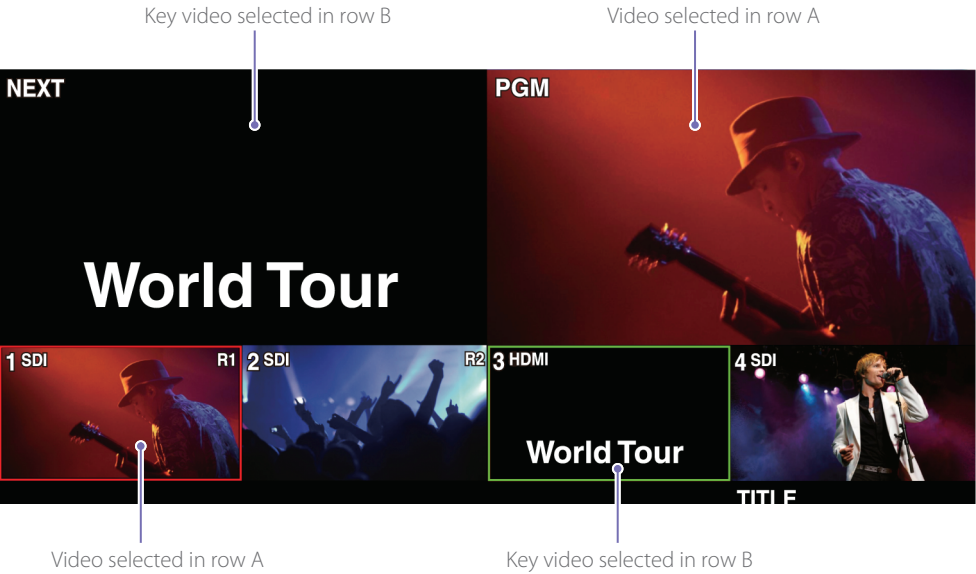


Adjusting the composition (i.e., level of key removal)

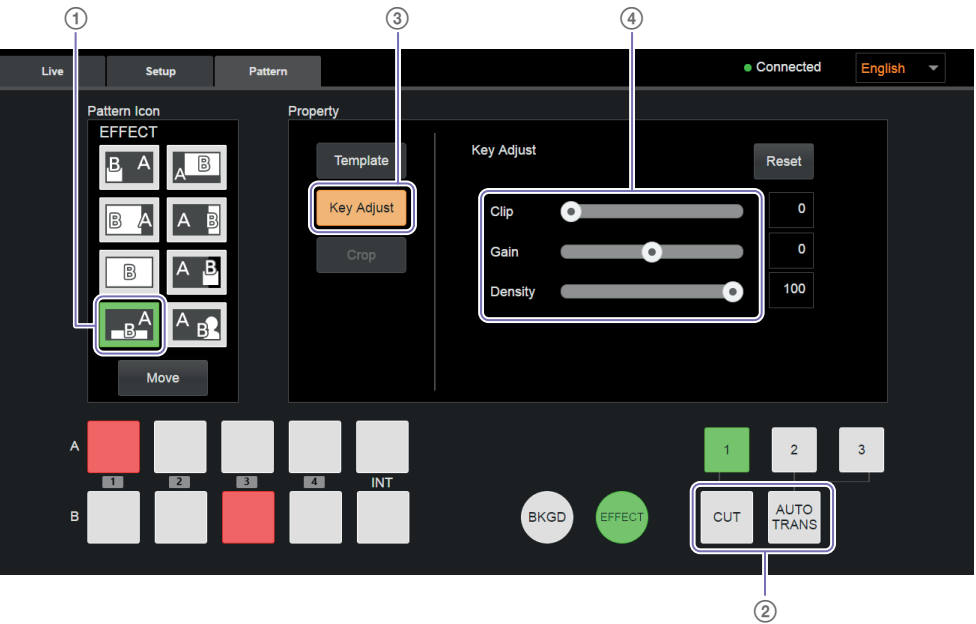
- 1 Display the [Pattern] screen of the PC UI in EFFECT mode.
- 2 Select the button for video A in row A of the video selection buttons, and select the key video in row B.



The video selected in row A appears in the [PGM] viewer of the multi-viewer, and the key video selected in row B appears in the [NEXT] viewer.



3 Select the luminance key pattern icon, and adjust the level of key removal.



① Select the luminance key pattern icon.



② Press the CUT or AUTO TRANS button. The transition starts, and the videos are composited.



③ Select [Key Adjust].
④ Drag each slider to adjust the level of key removal.

Perform adjustments while viewing the results in the [PGM] viewer of the multi-viewer.

[Clip]: Adjusts the brightness level of the key color to be removed as a value between 0 to 100.

Default setting: 10

[Gain]: Adjusts the sensitivity of the key (i.e., smoothness of the key edges) as a value between -100 to 100.

Default setting: 100

[Density]: Adjusts the density of the text as a value between 0 to 100.

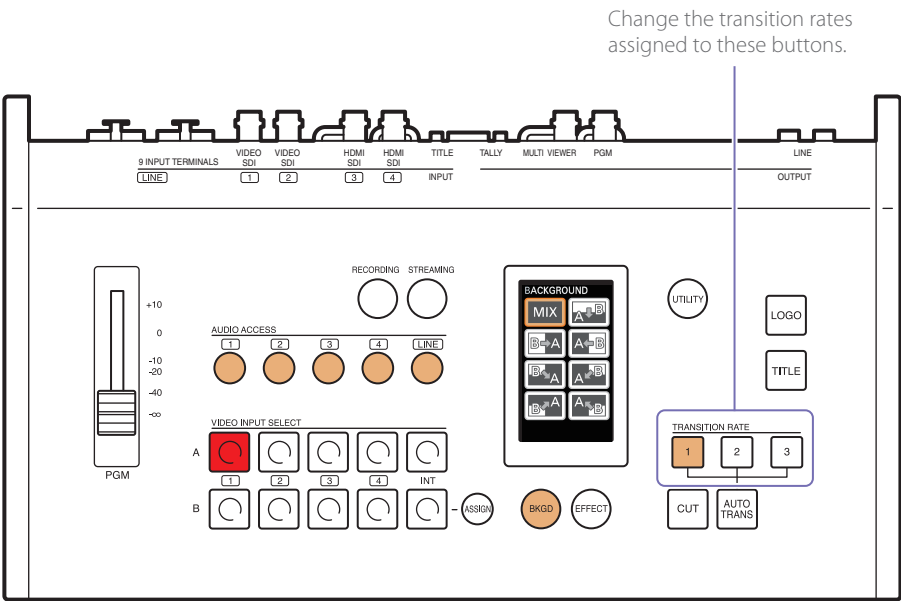
Default setting: 100

[Tips]

To restore default values of each adjustment, select [Reset].

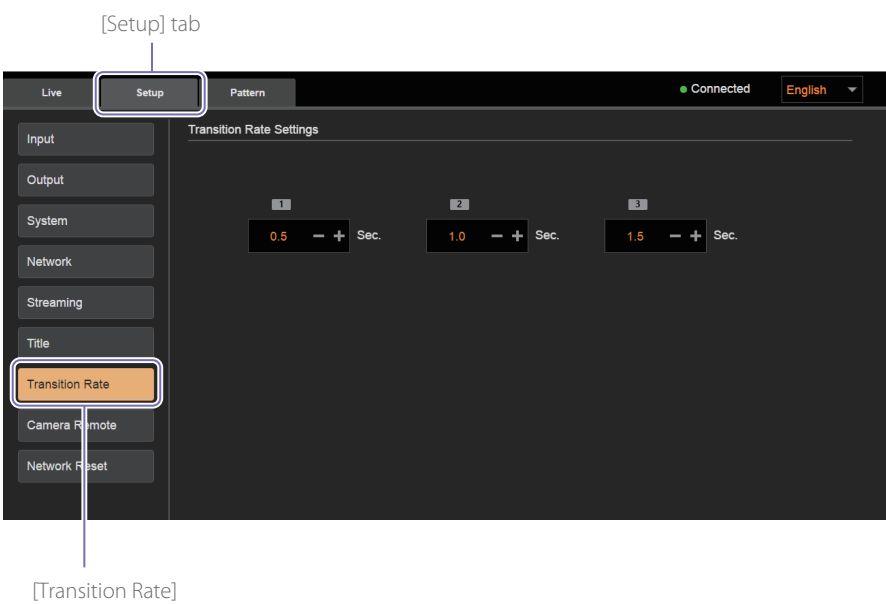
Changing the Transition Rates

Under default conditions, transition rates of 0.5, 1.0, and 1.5 seconds are assigned to TRANSITION RATE buttons 1 to 3, but you can change the rates if necessary.

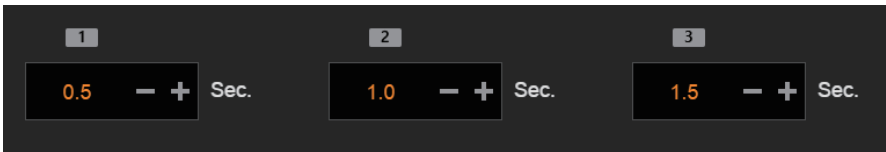


The settings are performed via the PC UI on a computer.

- 1 Select [Transition Rate] in the [Setup] screen of the PC UI.



- 2 Change the transition rates assigned to buttons 1 to 3.
Use [+] or [-] to change the values.
You can specify a value between 0.0 to 9.9 seconds (increments of 0.1).
Long pressing will change the values continuously.



Linking to Cameras

You can perform the following via the unit by linking to cameras.

- **Linking with the Remote Commander**
Simultaneous recording control and lighting PGM/NEXT tallies

Linking with the Remote Commander

You can perform simultaneous recording controls and light PGM/NEXT tallies by linking with the Remote Commander.

Supported models

Support for the following models has been verified as of January 2017.

Remote Commander

Sony RM-30BP

For the latest information on supported models, contact your local Sony representative.

Camera

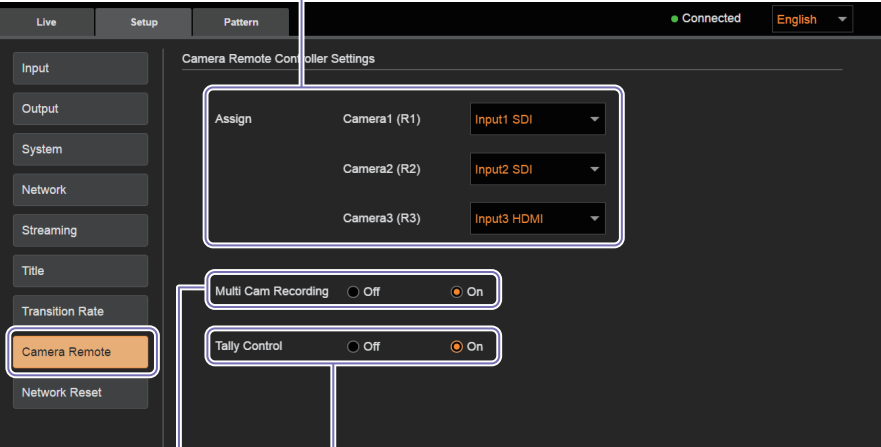
Model	Function
Camcorders supporting LANC connection	Simultaneous recording start/stop control
HXR-NX5R	PGM/NEXT tally control
PXW-FS5 Ver. 3.0 or later	

For details on connecting the Remote Commander and cameras to the unit, see “When linking with a Remote Commander” (page 18) in the “Connecting the Video and Audio Input Devices” section.

Configuring the link settings

Up to three cameras can be connected via linking with the Remote Commander. Select [Camera Remote] in the [Setup] screen of the PC UI, and configure the settings for linking with the Remote Commander.

[Assign]
Assign the cameras to be controlled by the Remote Commander here. Perform assignments by selecting input connectors in the [Camera1 (R1)] to [Camera3 (R3)] pull-down lists.



[Tally Control]
Select [On] to light PGM/NEXT tallies.

[Multi Cam Recording]
Select [On] to perform simultaneous recording control.

[Tips]
When the same input connector is assigned more than once in [Assign], the last assignment setting will be valid. The previous assignment setting will change to [Off].

Assigning cameras

To perform simultaneous recording controls and light PGM/NEXT tallies by linking with the Remote Commander, the cameras to be linked must be assigned.

When a camera is assigned and either [Multi Cam Recording] or [Tally Control] is set to [On], camera number indicators (R1 to R3) appear in the [Input] viewer of the multi-viewer.

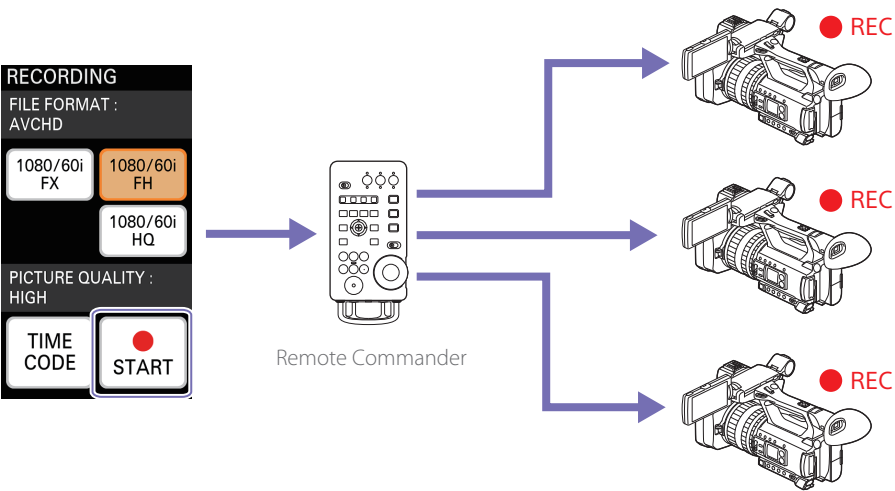


Simultaneous recording control

You can simultaneously apply recording start/stop controls performed in the [RECORDING] menu to the three cameras controlled by the Remote Commander.

When you start recording via [START] in the [RECORDING] menu, recording on the cameras also starts.

When you stop recording via [STOP], recording on the cameras also stops.



Timecode settings must be configured to perform simultaneous recording controls. Make sure the following settings on the unit and each camera match.

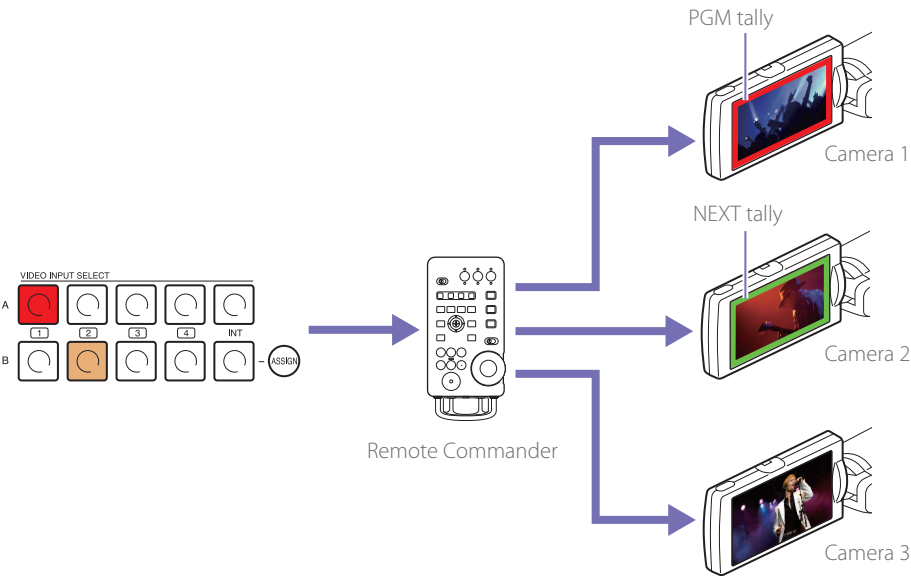
- TC FORMAT (DF/NDF)
- TC RUN (REC RUN/FREE RUN)

When you execute [TC RESET] from the unit, timecode resetting is performed simultaneously for all cameras via the Remote Commander.

For details on recording, see "Recording the PGM Output" (page 56).

Lighting PGM/NEXT tallies

You can display tallies on the cameras that are selected for the PGM output and NEXT output. When shooting with multiple cameras, this function notifies each camera operator of when their video will be used, thereby reducing the number of missed shots.

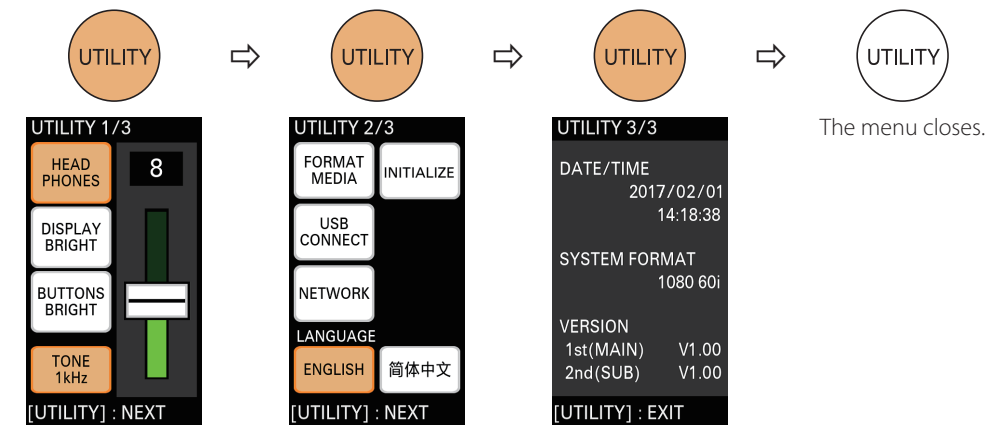


Useful Functions (Utilities)

The unit's [UTILITY] menu allows you to adjust the unit's settings, format memory cards, and perform other operations.

Displaying the [UTILITY] Menu

Press the UTILITY button on the control panel to display the [UTILITY] menu in the menu panel. The [UTILITY] menu consists of three pages. Each press of the UTILITY button switches the page display.



- Page 1 (1/3)**
- Headphone volume adjustment
 - Menu panel brightness adjustment
 - Button brightness adjustment
 - PGM output of the audio tone signal

For details on operations, see "Live Adjustments" (page 37).

- Page 2 (2/3)**
- Memory card formatting
 - USB connection
 - Network settings (PC UI connector)
 - Restoring factory default conditions
 - Display language

For details on USB connections, see "Using Recorded Files" (page 58) in the "Recording the PGM Output" section.

For details on network settings, see "Connecting a Computer for Settings Configuration" (page 22).

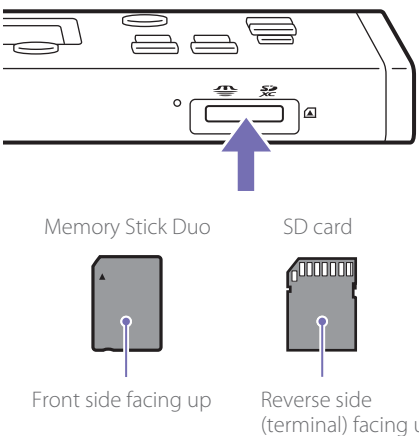
- Page 3 (3/3)**
- Displays the following information.
- Current date and time
 - System format
 - Unit version

Formatting Memory Cards

Format the memory card that will be used for recording the PGM output.

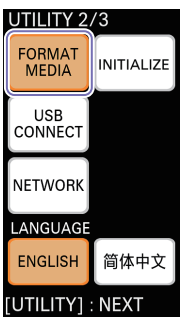
- [Notes]**
- Always use memory cards that were formatted on the unit.
 - Video and audio output may be interrupted while formatting is in progress.

- 1** Insert the memory card in the memory card slot on the front of the unit. Orient the memory card in the proper direction. Insert Memory Stick media with their front sides facing up. Insert SD cards with their reverse (terminal) sides facing up.



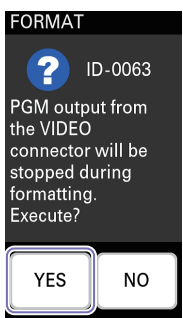
A message will appear in the menu panel when memory card formatting is necessary.

- 2** Display the [UTILITY 2/3] menu, and tap [FORMAT MEDIA].



A confirmation message appears.

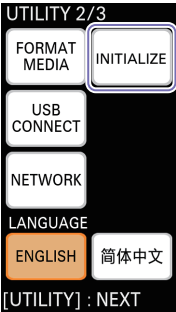
- 3** Tap [YES].



Follow the instructions displayed on the screen to finish formatting.

Restoring Factory Default Conditions

- 1
- Display the [UTILITY 2/3] menu, and tap [INITIALIZE].



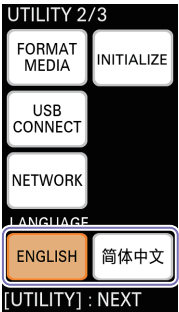
A confirmation message appears.

- 2
- Tap [OK].
The unit restarts automatically.
After the unit restarts, the initial settings screen appears as it did during first-time startup.

For details on initial settings, see "Configuring the Initial Settings (First-Time Startup)" (page 21).

Changing the Display Language

Select the display language for the unit's menus and messages with [LANGUAGE].



For details on changing the display language for the PC UI, see "Display language" (page 15) in the "PC UI" section.

Streaming

You can stream PGM videos using the Ustream service. Limitations and restrictions for streaming videos also apply on the Ustream side. For details, refer to the Ustream website.

[Notes]
The unit's streaming function allows third parties to access streaming data during transmissions. In addition, Ustream is a site at which anyone can view its contents. If you want to protect confidential data during transmissions, we recommend consulting a specialist.

Preparation

Creating a channel on Ustream

Follow the instructions provided by Ustream to create an account and channel.

Configuring the network settings

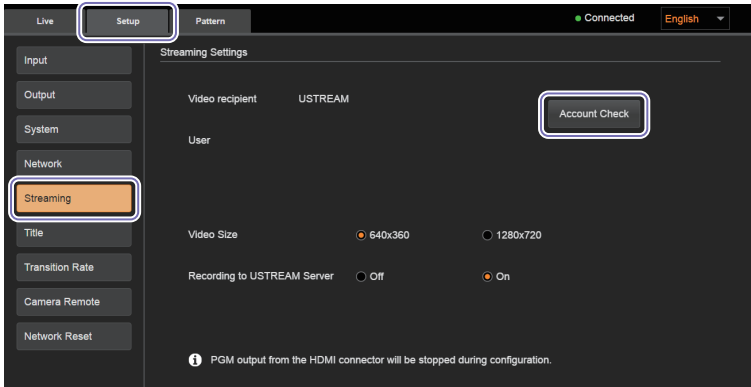
Connect the unit to an external network.

For details on settings, see "Configuring the Network Settings for Streaming Transmission" (page 60).

Configuring the basic information on the unit

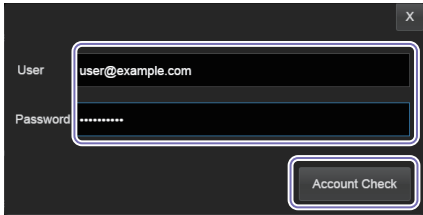
Use the PC UI to configure the basic information necessary for streaming transmissions via the unit.

- 1 Select [Streaming] in the [Setup] screen of the PC UI, and then select [Account Check].



The user name configuration dialog box appears.

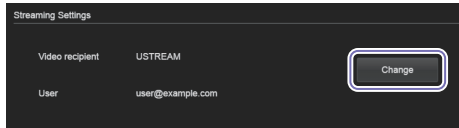
- 2 Enter your Ustream login user name (email address) and password, and select [Account Check].



The system verifies whether Ustream login is possible with the specified user name (email address) and password. When login is successful, the dialog box closes and the user name appears in the [User] field of the [Streaming] screen.

Changing accounts

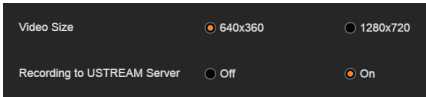
Select [Change], and change the user name in the dialog box that appears. The procedure is identical to that of step 2 in the "Configuring the basic information on the unit" section.



Checking account information

Select [Account Check], and check the user name in the dialog box that appears. Account information is stored on the unit's memory. The user name display will disappear if you turn off the unit after connecting to Ustream, but you can check it with [Account Check].

- 3 Configure the following items.



- [Video Size]:** Specifies the video size.
- 640×360
 - 1280×720
- [Recording to Ustream Server]:** Specifies whether to save recorded data to the Ustream server.
- **[Off]:** Does not save the recorded data.
 - **[On]:** Saves the recorded data.

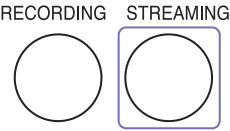
[Notes]
When the basic information is configured, important personal information (e.g., information necessary for streaming transmissions) will be stored on the unit. When transferring possession or disposing of the unit, see "Useful Functions (Utilities)" (page 52) and restore the factory default conditions, or see "Configuring the Network Settings for Streaming Transmission" (page 60) and reset the network settings.

Starting and Stopping Streaming Transmissions

Transmission controls are performed on the control panel.

Starting transmissions

1 Press the STREAMING button.



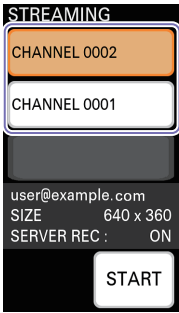
The connection screen of the [STREAMING] menu appears in the menu panel.

2 Tap [USTREAM] to connect to the Ustream server.



When connection to the Ustream server is established, standby mode is entered and **STBY** appears in the multi-viewer.

3 Check the channel to be transmitted.



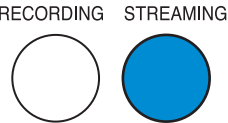
The channel specified as the default will be selected in the [STREAMING] menu. If you want to change the channel, tap the desired channel. Connection to the Ustream server is reestablished, and the screen appears.

[Tips]
Up to three channels will be displayed.

4 Tap [START].



Streaming transmission starts. The STREAMING button lights blue while transmission is in progress.



Stopping transmissions

Tap [STOP].



Streaming transmission stops, and the STREAMING button unlights. The [STREAMING] menu enters standby mode.

Recording the PGM Output

You can record PGM outputs to memory cards. By linking with a Remote Commander, you can have recording start/stop controls on cameras coincide with recording start/stop controls performed on the unit.

For details on the format in which the files are recorded on the unit, see "File Formats" (page 70).

Supported memory cards

Recording format	Media
AVCHD	SD card
	SD memory card (Class 4 or higher)
	SDHC memory card (Class 4 or higher)
	SDXC memory card (Class 4 or higher)
	Memory Stick
	Memory Stick PRO Duo (Mark2)
	Memory Stick PRO-HG Duo
	Memory Stick XC-HG Duo

- [Notes]
- Operation with all memory cards is not guaranteed.
 - Only Memory Stick PRO Duo and Memory Stick XC-HG Duo, which are half the size of the standard Memory Stick, and standard-sized SD memory cards can be used.
 - Videos recorded on a Memory Stick XC-HG Duo or SDXC memory card cannot be loaded or played back on computers or AV equipment devices that are connected via USB cable and that do not support exFAT (i.e., the file system used by Memory Stick XC-HG Duo or SDXC memory card). Verify whether a connected device supports exFAT beforehand. If a device that does not support it is connected, a formatting screen may appear. However, do not execute formatting as doing so will result in the loss of all data.

Preparation

Formatting the memory card

The memory card that you use must be formatted on the unit.

For details on formatting, see "Formatting Memory Cards" (page 52).

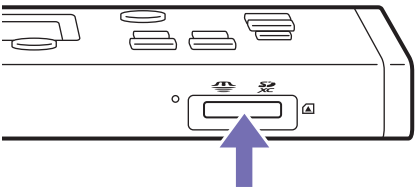
Configuring settings for linking with the Remote Commander

Configure the following settings beforehand to enable recording start/stop controls for cameras via the Remote Commander.

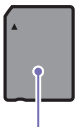
- Remote settings for cameras
For details on settings, see "Linking to Cameras" (page 50).
- Timecode settings
Make sure the following settings on the unit and each camera match.
 - TC FORMAT (DF/NDF)
 - TC RUN (REC RUN/FREE RUN)When you execute [TC RESET] from the unit, timecode resetting is performed simultaneously for all cameras via the Remote Commander. For details on settings, see "Configuring the Recording Settings" (page 56).

Inserting Memory Cards

Orient the memory card in the proper direction, and insert it until it clicks into place. Insert Memory Stick media with their front sides facing up. Insert SD cards with their reverse (terminal) sides facing up.

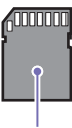


Memory Stick Duo



Front side facing up

SD card



Reverse side (terminal) facing up

Memory card information (status, remaining time, etc.) is displayed in the multi-viewer.



For details, see "[RECORDING] information" (page 13) in the "Multi-Viewer" section.

- [Notes]
- Forcibly inserting a memory card in the improper orientation may damage the memory card or memory card slot.
 - A message will appear in the menu panel when memory card formatting is necessary. Format the memory card in such cases.

Removing memory cards

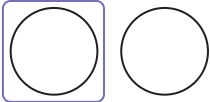
Gently press the memory card inward once, and then remove it.

- [Notes]
- Be careful to avoid dropping the memory card when inserting or removing it.

Configuring the Recording Settings

Configure the recording format and timecode settings.

- 1 Press the RECORDING button.
- RECORDING STREAMING



The [RECORDING] menu appears in the menu panel.

- 2 Select the recording format.



You can select from the following formats depending on the system format.

When the system format is 1080/50i

Recording format	Bit rate	Picture size
1080/50i FX	Up to 24 Mbps	1920×1080
1080/50i FH	Approx. 17 Mbps (average)	1920×1080
1080/50i HQ	Approx. 9 Mbps (average)	1440×1080

When the system format is 1080/60i

Recording format	Bit rate	Picture size
1080/60i FX	Up to 24 Mbps	1920×1080
1080/60i FH	Approx. 17 Mbps (average)	1920×1080
1080/60i HQ	Approx. 9 Mbps (average)	1440×1080

Estimated video recording times

(Unit: minutes)

	FX	FH	HQ
16 GB	80 (80)	110 (110)	185 (145)
32 GB	170 (170)	225 (225)	375 (290)
64 GB	340 (340)	450 (450)	750 (590)

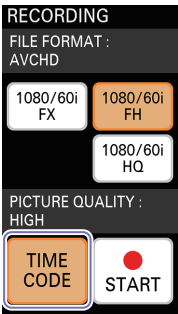
The numbers in parentheses are minimum recording times.

[Tips]

- The file format is fixed at AVCHD.
- The maximum number of recordable scenes is 3,999.
- The continuous recording time is about 13 hours.
- The unit uses VBR (variable bit rate) to automatically adjust the bit rate (volume of data recorded within a specified period) according to the scene. Therefore, recording times for memory cards may vary. For example, a video with fast moving images will take up a larger amount of space on a memory card to record the images clearly, thereby reducing the total recording time for the card.

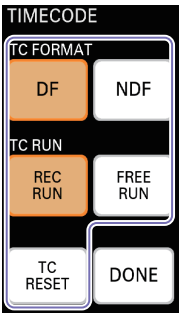
3 Configure the timecode if necessary.

① Tap [TIME CODE].



The timecode configuration screen appears.

② Configure the each item.



[TC FORMAT]: Select the timecode format.

- [DF]: Enable drop frame timecode.
- [NDF]: Enable non-drop frame timecode.

This is fixed at [NDF] when the system format is 50i.

[TC RUN]: Select the run setting for the timecode.

- [REC RUN]: The timecode runs only when recording is in progress.
- [FREE RUN]: The timecode runs regardless of the recording status.

[TC RESET]: Reset the timecode to "00:00:00:00."

[Tips]

The [REC RUN] / [FREE RUN] settings for [TC RUN] apply to the timecodes on recorded files. The timecode embedded in SDI outputs runs in free run mode.

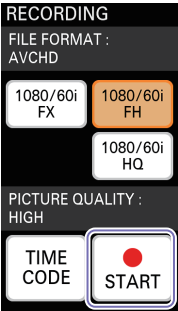
③ Tap [Done].

The previous screen appears again.

Starting and Stopping Recording

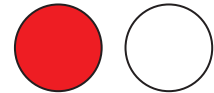
Starting recording

Tap [START ●] in the [RECORDING] menu.



Recording starts, and the button changes to [STOP ■].
The RECORDING button on the control panel lights red while recording is in progress.

RECORDING STREAMING

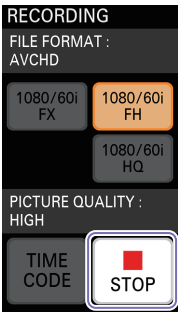


[Notes]

- When the unit is linked with a Remote Commander and simultaneous recording control is enabled, starting to record via the unit while performing a zoom operation on the Remote Commander may temporarily stop the zoom operation.
- Recording media for which formatting or recording was performed in 60i (50i) cannot be used to record in 50i (60i). If you want to do so, use a different recording media or format that media using [FORMAT MEDIA]. For details, see "Formatting Memory Cards" (page 52).
- When you format media, protected videos will also be deleted.

Stopping recording

Tap [STOP ■].



Recording stops, and the button reverts to [START ●].
The RECORDING button on the control panel will unlight when recording stops.

[Notes]

- When the access indicator is lit or blinking red, data is being written or read. Do not subject the unit to vibration or excessive shock in such cases. In addition, do not turn off the unit, remove the memory card, or disconnect the AC adapter. Failure to obey may result in damaged video data.
- When a video file size reaches 2 GB while recording in AVCHD format, file splitting will occur automatically and a new file will be created.

[Tips]

The videos will be recorded into the 16:9 aspect ratio only.

Using Recorded Files

Sony PlayMemories Home is required to play back or edit files recorded with the unit.
Use Sony PlayMemories Home to load the recorded files onto a computer for playback and editing.

For details on operations, refer to the operating instructions for Sony PlayMemories Home.

The files recorded on a memory card can be used via the following methods.

- Inserting the memory card into a computer
- Using the memory card while it is inserted in the unit via a USB connection with the computer (USB connection mode)

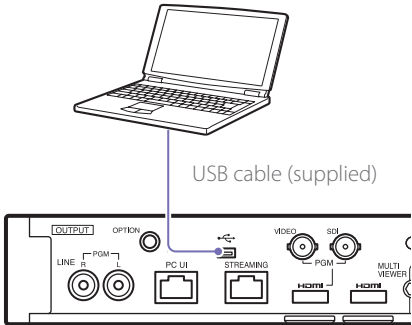
[Notes]

- In either method, the unit must be connected to a computer once in order to use files recorded with the unit. Follow the instructions in the "Using files in USB connection mode" section to perform USB connection.
- In either method, do not modify the files and folders stored on the memory card via a computer. Failure to obey may make the files unplayable.

Using files in USB connection mode

Connect the unit to the computer via a USB connection, and operate the memory card inserted in the unit as a drive on the computer.

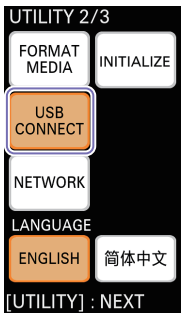
- 1 Use the supplied USB cable to connect the unit to the computer.



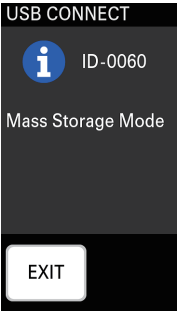
- 2 Press UTILITY button twice to display the [UTILITY 2/3] menu.



- 3 Tap [USB CONNECT].



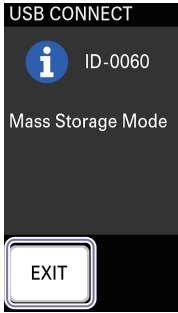
When the connection is established, the following message appears in the menu panel and USB connection mode is enabled. Operation of the memory card inserted in the unit as a drive is now possible.



[Notes]
Video and audio output may be interrupted during USB connection mode.

After use

- 1 Perform safe USB device removal on the computer.
- 2 Tap [EXIT].



A confirmation message appears.

- 3 Tap [YES].
USB connection mode is exited.

- 4 Disconnect the computer that is connected via the USB cable.

Configuring the Network Settings for Streaming Transmission

To perform streaming transmissions, configure the settings for connecting the unit to the external network.

When Connecting to a Network via DHCP

DHCP is configured by default. Generally, you do not need to configure settings to use DHCP.

When Manually Configuring the IP Address and Other Settings

Use the PC UI to configure the network settings for streaming transmission.

[Tips]

- The unit supports only IPv4 network environments.
- You cannot change the network while streaming transmission is in progress.

- 1 Select [Network] in the [Setup] screen of the PC UI.
- 2 Select [Manual] for [Mode] to enable manual configuration of the settings, and enter the IP address, subnet mask, default gateway, and DNS server addresses.

- 3 Select [Set].

[Tips]

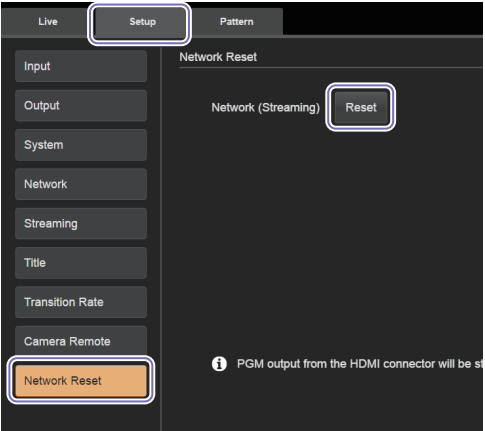
PGM outputs from the HDMI output connector will stop during the few seconds before settings are applied after selecting [Set].

When the settings are successfully applied, a messages appears.

- 4 Select [OK].

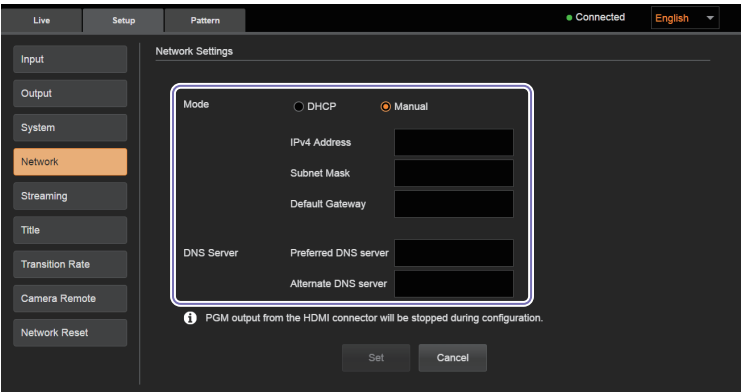
Resetting Network Settings and Streaming Settings

You can reset the network and streaming settings by selecting [Network Reset] in the [Setup] screen, and then selecting [Reset].



[Tips]

- Ustream account settings configured on the unit will also be deleted.
- PGM outputs from the HDMI output connector will stop during the few seconds before the reset process is completed after selecting [Reset].

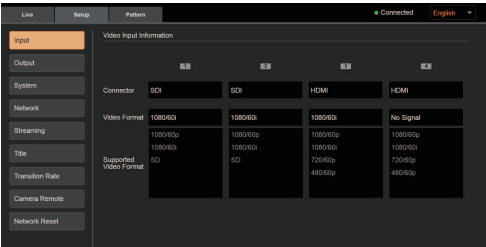


Configuring the System Settings

You can view input settings, configure output settings, and configure the unit's system settings in the [Setup] screen of the PC UI.

[Input] Screen

The [Input] screen allows you to view information on the video inputs assigned to inputs 1 to 4.



- [Connector]:** Displays the input connectors that are enabled for inputs 1 to 4.
- [Video Format]:** Displays the formats of the video signals assigned to inputs 1 to 4. The video format is detected automatically.

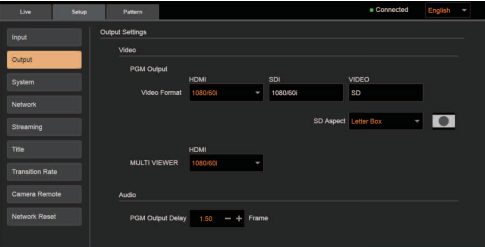
- [Tips]**
- "Format Mismatch" is displayed for signals that are not supported by the unit.
 - "No Signal" is displayed when there is no signal input.
 - "HDCP" is displayed for HDMI signals that are input from devices that support HDCP.

[Supported Video Format]: Displays a list of input signal formats that are supported by the unit.

[Tips]
This screen is used only for viewing. Material assignment changes are performed in the [Live] screen or the unit's [ASSIGN] menu.

[Output] Screen

The [Output] screen allows you to configure output settings for video and audio.



[Video]

Configure video output settings.

- [PGM Output]**
Allows you to configure the PGM output settings.
- [HDMI]:** Specifies the signal format to be used when the HDMI output connector is used for the PGM output.
- [SDI]:** Displays the signal format to be used when the SDI output connector is used for the PGM output. (This cannot be changed.) Outputs will be in HD SDI only.
- [VIDEO]:** Displays the signal format to be used when the VIDEO output connector is used for the PGM output. (This cannot be changed.)

[SD Aspect]: Specifies the output method for SD signals.

-  **[Letter Box]:** Outputs with black bars on the top and bottom.
-  **[Squeeze]:** Outputs with the image squeezed to the 4:3 aspect ratio.
-  **[Edge Crop]:** Outputs with the left and right sides of the image cropped.

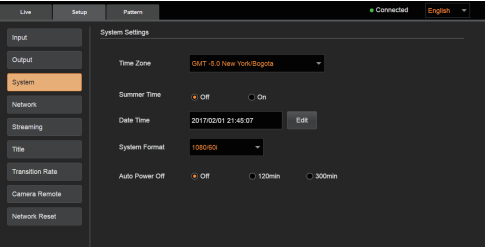
- [MULTI VIEWER]**
Specifies the setting for output to the multi-viewer (external monitor).
- [HDMI]:** Specifies the signal format to be used for outputs to the MULTI VIEWER output connector.

[Audio]
Configure audio output settings.

[PGM Output Delay]: Specifies the number of frames to delay the L/R channels of the PGM output to ensure that the video and audio match. Use [+] or [-] to set a value between 0.5 to 2.5 (increments of 0.25).

[System] Screen

The [System] screen allows you to configure the unit's system settings.



- [Time Zone]:** Specifies the time zone.
- [Summer Time]:** Specifies whether to enable daylight savings time. Select [On] to add 1 hour to the time configured and displayed in [Date Time].
- [Date Time]:** Displays the current date and time configured on the unit. Select [Edit] to change the date and time settings.
- [System Format]:** Specifies the system format for the unit. If you change the system format, the unit will restart after a message is displayed.
- [Auto Power Off]:** The unit is equipped with an auto power off function that automatically turns off the unit if it is not operated for a specified amount of time. You can specify the amount of time before auto power off is activated. Select [Off] to disable the auto power off function.

Transition and Composite Patterns List

Transition patterns
(BKGD mode)

Mix

1 pattern

1

Wipe

8 patterns

2

3

4

5

6

7

8

9

Composite patterns
(EFFECT mode)

PinP

33 patterns

Pattern icons for HD angle of view

P1

P2

P3

P4

P5

P6

P7

P8

P9

P10

P11

P12

P13

P14

P15

Pattern icons for SD angle of view

P16

P17

P18

P19

P20

P21

P22

P23

P24

P25

P26

P27

P28

P29

P30

P31

P32

P33

Chroma key

5 patterns

C1

C2

C3

C4

C5

Luminance key

1 pattern

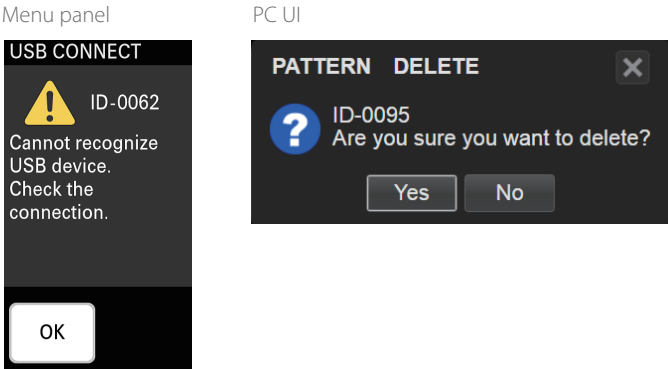
L1

Register transition patterns and composite patterns to the [BKGD] menu and [EFFECT menu respectively to enable use.
For details on registration, see "Customizing the Pattern Icons" (page 39).

Troubleshooting

Message Displays

If a problem occurs during operation of the unit, a message will appear in the menu panel and the PC UI. Check the content of the message and respond accordingly. If the problem persists, write down the displayed ID number, and contact your local Sony representative.



The following types of message exist.

Icon	Type	Description
	Information	Notifications
	Verification	Messages that request verification
	Warning	Warnings that indicate that continued operation may result in error
	Error	Warnings that indicate severe errors, such as inability to continue operation or malfunction

Problems and Solutions

Check the following before requesting repairs. If the problem persists, contact your local Sony representative.

Symptom	Possible cause	Solution
The unit does not turn on or start up properly.	The connected devices are not turned on.	Restart the devices.
The power turns off automatically.	The unit automatically turned off due to the auto power off function.	The unit is equipped with an auto power off function that automatically turns off the unit if it is not operated for a specified amount of time. If the unit automatically turns off, pressing the power switch twice will turn the unit back on. <i>For details, see "Auto Power Off Function" (page 21).</i>
Videos cannot be input, or videos do not appear in the multi-viewer.	The cables are not connected properly.	Connect the cables properly.
	The video input signals are not assigned properly.	Assign the video input signals properly. <i>For details, see "Assigning Inputs" (page 25).</i>
	Signals that are not supported by the unit are being input.	Check the input signals. If a signal that is not supported by the unit is being input, "Format Mismatch" or "HDCP" will appear in the [INPUT] viewer of the multi-viewer.
Nothing occurs when the VIDEO INPUT SELECT buttons are pressed.	[DISABLE] is selected	Select (light) [ENABLE] in the [INPUT] menu of the respective input. <i>For details, see "Assigning Inputs" (page 25).</i>
The PC UI cannot be displayed.	–	Connect to the unit in direct mode. <i>For details, see "Connecting in direct mode" (page 23).</i>
The [Pattern] tab of the PC UI is grayed out and cannot be selected.	A menu other than the [BACKGROUND] menu or [EFFECT] menu is displayed in the menu panel.	The [Pattern] tab is only activated when the [BACKGROUND] menu or [EFFECT] menu is displayed.
Text created on a computer is not inserted properly.	Adjustments have not been performed properly.	When inserting text using an RGB input, perform adjustments in the [Title] screen of the PC UI. When inserting text using luminance keying in EFFECT mode, perform adjustments in the [Pattern] screen of the PC UI. <i>For details, see "Adjustments for Inserting Text onto Videos" (page 46).</i>

Symptom	Possible cause	Solution
Text cannot be inserted using an RGB input.	The output resolution of the computer is not 1600×1200.	Use a computer with an output resolution of 1600×1200 (60p).
	The frequency is not 60 Hz.	
I want to insert text using RGB inputs, but the 1600×1200 signal from the computer cannot be output.	–	Set your computer’s output setting to extended mode to enable external output, and set the resolution for the external output to 1600×1200.
The computer is not equipped with RGB output, so text insertion with the TITLE function is not possible.	–	Use luminance keying in EFFECT mode. <i>For details, see “Using HDMI Input Signals to Insert Text (EFFECT Mode)” (page 47).</i>
Audio is not output from the headphones or speakers.	The connected devices are not turned on.	Restart the devices.
	The cables are not connected properly.	Connect the cables properly.
	[CH ON] is deselected (unlit) in the [AUDIO] menu.	Select (light) [CH ON]. <i>For details, see “Live Adjustments” (page 37).</i>
	The audio output level is low.	Use the channel fader in the [AUDIO] menu to increase the audio level. <i>For details, see “Live Adjustments” (page 37).</i>
	The PGM master fader is lowered.	Raise the PGM master fader. <i>For details, see “Live Adjustments” (page 37).</i>
	Inputs are not assigned.	For embedded audio, the audio will not be output if the video input is not assigned.
	The headphone output level is low.	Raise the headphone volume with [HEAD PHONES] of the [UTILITY 1/3] menu. <i>For details, see “Adjusting the Headphone Volume” (page 37).</i>
The audio turns off by itself.	[LINK VIDEO] is selected in the [AUDIO] menu.	When [LINK VIDEO] is selected, embedded audio is enabled/ disabled in response to whether the video is output as the PGM output. <i>For details, see “Linking embedded audio to its video” (page 28).</i>

Symptom	Possible cause	Solution
Camera control from the RM-30BP is not possible.	The remote control settings have not been configured.	Configure the remote control settings. <i>For details, see “Linking to Cameras” (page 50).</i>
Camera images are displayed upside down.	The settings on the camera are upside down.	Check the vertical image flip setting on the camera. <i>For details, refer to the operating instructions for the camera.</i>

Maintenance and Usage Precautions

Maintenance

Vent care

Remove dust from the ventilation holes once per month or whenever necessary.

Touch panel care

The surface of the LCD has a coating that can peel off when scratched or damaged. Beware of the following during handling or cleaning.

- Handling with excessive hand oil, hand cream, or other oils on your hands can make it easier for the coating to peel off, so be sure to wipe them off the surface as soon as possible.
- Wiping with excessive force using tissue paper, for example, can scratch the coating.
- Remove any dust, dirt, or sand using a blower, for example, before wiping the surface.
- When wiping the surface, use a cleaning cloth made of soft material, such as an eyeglass cleaning cloth, and wipe gently.

Unit surface care

- For stubborn dirt, use a soft cloth dampened with cold or warm water to gently wipe the unit, and then wipe it with a dry cloth.
- Avoid the following to prevent deformation of the unit's surface and damage to the coating.
 - Application of thinner, benzine, alcohol, chemical cleaning cloths, insect repellents, insecticides, sunscreen, or other chemicals.
 - Handling the unit with the above applied on your hands.
 - Prolonged contact with rubber or vinyl products.

AVCHD Standard

The unit is capable of recording in HD (high definition) according to the AVCHD standard.

Video: MPEG-4AVC / H.264

- When 60i is selected
1920×1080/60i, 1440×1080/60i
- When 50i is selected
1920×1080/50i, 1440×1080/50i

Audio: LPCM 2ch

Storage media: Memory card

- The AVCHD standard uses compression. Therefore, significant changes in the image, angle of view, or brightness may cause distortion in the video. This is not a malfunction.

Memory Cards

- Operation of memory cards that have been formatted on a computer (Windows OS or Mac OS) is not guaranteed on the unit.
- The data read/write speed will vary depending on the pairing of the memory card and device used.
- Video files can be damaged in the following cases. Sony will not be liable for damaged data resulting from circumstances of any kind.
 - Removing a memory card or turning off the unit while video files are being read or while data is being written to the memory card (i.e., while the access indicator is lit or blinking).
 - Use in environments exposed to static electricity or electrical noise.
- We recommend backing up important data to your computer's hard disk, for example.
- Do not affix labels, for example, onto memory cards.
- Do not touch the terminals or bring them into contact with metal objects.
- Do not bend, drop, or subject memory cards to excessive shocks.
- Do not dismantle or modify memory cards.
- Do not wet memory cards.
- Keep memory cards away from small children to prevent accidental swallowing.
- Do not insert memory cards of unsupported sizes into the memory card slot, as doing so may result in malfunction.
- Avoid use and storage in the following environments.
 - High-temperature locations, such as the inside of an automobile parked in the sun.
 - Locations exposed to direct sunlight.
 - Locations with excessive humidity or corrosive materials present.

If videos are not recorded properly

Format the memory card.

After prolonged use and repeated recording/deleting, the files on the memory card can become fragmented, preventing proper recording of files. In such cases, copy the recorded files to other media before formatting the memory card.

For details, see "Formatting Memory Cards" (page 52).

Video compatibility

- The unit supports the DCF (Design rule for Camera File system) specification as defined by the JEITA (Japan Electronics and Information Technology Industries Association).
- If a memory card that was used on a different device cannot be used, perform the procedure in "Formatting Memory Cards" (page 52) to format the card on the unit. Be aware that formatting the memory card will delete all data stored on the card.

Precautions on disposal and transfer

The [FORMAT MEDIA] function in the unit's [UTILITY 2/3] menu and the formatting and file deletion functions on a computer may not completely erase the data stored on memory cards in some cases. When transferring possession of a memory card, use data erasure software on a computer, for example, to completely erase the data. When disposing of a memory card, we recommend physically destroying the memory card as well.

Precautions on the Touch Panel (LCD)

- Do not press the touch panel with excessive force. Failure to obey may result in distorted image display and damage to the touch panel.
- A trailing effect may appear in the image when operating in cold environments. However, this is not a malfunction.
- The area around the touch panel may heat up during use. However, this is not a malfunction.
- Do not face the LCD toward the sun or other powerful light sources, as doing so may result in malfunction.

Memory Sticks

Supported Memory Sticks

The unit supports Sony Memory Stick PRO Duo (Mark2), Memory Stick PRO-HG Duo, and Memory Stick XC-HG Duo media.

Data read/write speeds

The data read/write speed will vary depending on the pairing of the Memory Stick and device used.

Memory Sticks

- The unit does not support standard-sized Memory Stick media.
- Data can be damaged in the following cases.
 - Removing a Memory Stick or turning off the unit while data is being read or written to the Memory Stick.
 - Use in environments exposed to static electricity or electrical noise.
- We recommend backing up important data.

[Notes]

- Do not touch the terminals or bring them into contact with metal objects.
- Do not bend, drop, or subject Memory Sticks to excessive shocks.
- Do not use excessive force when writing in the memo area.
- Do not dismantle or modify Memory Sticks.
- Do not wet Memory Sticks.
- Avoid use and storage in the following environments.
 - High-temperature locations, such as the inside of an automobile parked in the sun.
 - Locations exposed to direct sunlight.
 - Locations with excessive humidity or corrosive materials present.
- When the access indicator is lit or blinking, data is being read from or written to the Memory Stick. Do not subject the unit to vibration or excessive shock in such cases. In addition, do not turn off the unit or remove the Memory Stick. Failure to obey may result in damaged data.

Usage precautions

- Back up data frequently to prevent data loss. Sony will not be liable for loss of data resulting from circumstances of any kind.
- Under copyright law, you may not use recorded data for purposes other than your personal enjoyment without the permission of the copyright holder. When material such as images or data that is subject to copyright is recorded on a Memory Stick, the material may only be used in accordance with copyright laws.
- Software specifications are subject to change without notice.
- Note that shooting may be restricted at live performances, shows, or exhibitions, even if it is for your personal enjoyment.

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Specifications

Main Unit

General

Power requirements	12 V DC
Power consumption	Approx. 23 W
Dimensions	Approx. 362 × 43.5 × 206 mm (14 ³ / ₈ × 1 ³ / ₄ × 8 ¹ / ₈ in.) (W×H×D)
Mass	Approx. 2.1 kg (4 lb. 10 oz.)

System

Video format	1080/59.94i Hz (60i) 1080/50i Hz (50i)
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Streaming

Codec Format / Protocol	AVC/RTMP (Ustream)
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Recording

Format	AVCHD
Media	SD, SDHC, and SDXC memory cards (Class 4 or higher), Memory Stick PRO Duo, Memory Stick PRO-HG Duo, Memory Stick XC-HG Duo

Video switching

Function	Input: 8 video inputs (4 channels can be used at the same time) + Title 1 M/E + 2 keyers (PinP×1, Title×1) Output: PGM output, multi-viewer output
Key type	Chroma key, luminance key

Audio mixer

Function	Input: Analog stereo (1) / stereo embedded audio input (4) Mixing: Stereo mixing (5) Output: PGM (stereo) (1)
----------	--

Video input

SDI	BNC (4), 75 Ω, 3G SDI/HD/SD SMPTE 292M/259M/424M/425M
HDMI	Type A (2) (720×480/576, 1280×720, 1920×1080)
VIDEO	BNC (2), NTSC/PAL VIDEO: 1.0 Vp-p 75 Ω, negative sync
TITLE	D-Sub Shrink 15-pin (1) (female) RGB (1600×1200)

Video output

HD SDI	BNC (1) (PGM) 75 Ω, 1.5 Gbps SMPTE 292M
HDMI	HDMI (Type A) (1) (PGM) (720×480/576, 1280×720, 1920×1080) HDMI (Type A) (1) (multi-viewer) (720×480/576, 1280×720, 1920×1080)
VIDEO	BNC (1) VIDEO: 1.0 Vp-p 75 Ω, negative sync

Audio input

Embedded audio input	SDI/HDMI 16-bit, sampling: 48 kHz
Analog input	XLR/TRS combo type (CH-1, CH-2)

Audio output

Embedded audio output

SDI/HDMI	16-bit, sampling: 48 kHz
Analog output	Phono jack (CH-1, CH-2)
Headphones	Stereo mini jack (1)

Other interfaces

LAN	RJ-45 (2) (PC UI, Streaming) 100BASE-TX, 1000BASE-T
USB 2.0	USB Type-Mini-B (1)
Option	φ3.5 mm jack (1)
TALLY	D-Sub 9-pin (1) (male)

Supplied accessories

Before Using This Unit (1)
CD-ROM (Operating Instructions) (1)
AC adapter (1)
USB cable (1)
OPTION cable (1)

Design and specifications are subject to change without notice.

Notes

- Always make a test recording, and verify that it was recorded successfully.
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Supported Input Formats

SDI input connectors 1 to 4

Video

HD/SD	Resolution	Frequency / ip
HD	When the system format is 1080 50i	
	1920×1080	50p
	1920×1080	50i
	When the system format is 1080 60i	
	1920×1080	59.94p
	1920×1080	59.94i
SD	When the system format is 1080 50i	
	720×576 (D1 625)	50i
	When the system format is 1080 60i	
	720×480 (D1 525)	59.94i

Audio

16-bit, 48 kHz, L-PCM, 2 ch (1/2 ch only)

VIDEO input connectors 1 and 2

Resolution	Frequency / ip
When the system format is 1080 50i	
720×576 (PAL)	50i
When the system format is 1080 60i	
720×480 (NTSC)	59.94i

HDMI input connectors 3 and 4

Video

Resolution	Frequency / ip
When the system format is 1080 50i	
720×576 (SD)	50p
1280×720 (HD)	50p
1920×1080 (HD)	50i
1920×1080 (HD)	50p
When the system format is 1080 60i	
720×480 (SD)	59.94p
1280×720 (HD)	59.94p
1920×1080 (HD)	59.94i
1920×1080 (HD)	59.94p

Audio

16-bit, 32 kHz, 44.1 kHz, 48 kHz, L-PCM, 2 ch

TITLE (RGB) input connector

Resolution	Frequency / ip
1600×1200	60p

LINE input connectors L and R

Audio

Analog input
XLR/TRS combo type (CH-1, CH-2)

Supported Output Formats

PGM SDI output connector

Video

Resolution	Frequency / ip
HD	When the system format is 1080 50i
	1920×1080 50i
	When the system format is 1080 60i
	1920×1080 59.94i

Audio

16-bit, 48 kHz, L-PCM, 2 ch (1/2 ch only)

PGM VIDEO output connector

Resolution	Frequency / ip
When the system format is 1080 50i	720×576 (PAL) 50i
	When the system format is 1080 60i
	720×480 (NTSC) 59.94i

PGM HDMI output connector

Video

Resolution	Frequency / ip
When the system format is 1080 50i	720×576 ¹⁾ 50p
	1280×720 (HD) 50p
	1920×1080 (HD) 50i
	1920×1080 (HD) 50p
	When the system format is 1080 60i
720×480 ¹⁾	59.94p
	1280×720 (HD) 59.94p

Resolution	Frequency / ip
1920×1080 (HD)	59.94i
1920×1080 (HD)	59.94p

1) Edge Crop: 

Audio

16-bit, 48 kHz, 2 ch (fixed)

MULTI VIEWER HDMI output connector

Resolution	Frequency / ip
When the system format is 1080 50i	720×576 ¹⁾ 50p
	1280×720 (HD) 50p
	1920×1080 (HD) 50i
	1920×1080 (HD) 50p
When the system format is 1080 60i	720×480 ¹⁾ 59.94p
	1280×720 (HD) 59.94p
	1920×1080 (HD) 59.94i
	1920×1080 (HD) 59.94p

1) Letter Box: 

Audio

Not output from the MULTI VIEWER HDMI output connector.

LINE output connectors L and R

Analog output

Phono jack (CH-1, CH-2)

File Formats

Recording function

Recorded video format

Determined by the [FILE FORMAT] setting in the [RECORDING] menu.

Recording format

File format	Recording format	Bit rate	Picture size
When the system format is 1080 50i			
AVCHD	1080/50i FX	Up to 24 Mbps	1920×1080
	1080/50i FH	Approx. 17 Mbps (average)	1920×1080
	1080/50i HQ	Approx. 9 Mbps (average)	1440×1080
When the system format is 1080 60i			
AVCHD	1080/60i FX	Up to 24 Mbps	1920×1080
	1080/60i FH	Approx. 17 Mbps (average)	1920×1080
	1080/60i HQ	Approx. 9 Mbps (average)	1440×1080

Recorded file

Timecode	The beginning of the file will be the timecode specified in the [RECORDING] menu.
File name	Sequential 5-digit number starting with "00000"
File extension	.MTS

Streaming function

Video

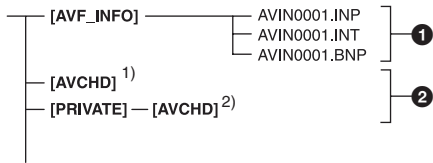
Frame rate	When the system format is 50i: 25 fps When the system format is 60i: 30 fps
Bit rate	When the streaming video size is 640×360: 1 Mbps When the streaming video size is 1280×720: 3 Mbps

Audio

Sampling rate	48 kHz
Bit rate	128 kbps

Directory Structure on Memory Cards

The unit uses the following directory structure for files and folders on memory cards. Generally, you do not need to be concerned with this when recording with the unit.

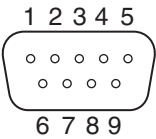


- 1) Memory Stick PRO Duo
- 2) SD memory card, SDHC memory card, SDXC memory card

- 1 Image management files
Deleting these files may prevent proper recording and playback of images.
The files are set as hidden files and are not normally displayed.
- 2 AVCHD video management information folders
Recorded data for AVCHD videos is stored in these folders. Do not operate the folders or the files within the folders on a computer. Failure to obey may result in file damage and prevention of playback.

Pin Assignments

TALLY connector



Pin No.	GPI	Description		
		Function	Target	Specifications
1	OUT	PGM OUT TALLY	INPUT1 (SDI)	On: SHORT, Off: OPEN
2	OUT	PGM OUT TALLY	INPUT2 (SDI)	On: SHORT, Off: OPEN
3	OUT	PGM OUT TALLY	INPUT3 (SDI)	On: SHORT, Off: OPEN
4	OUT	PGM OUT TALLY	INPUT4 (SDI)	On: SHORT, Off: OPEN
5	OUT	PGM OUT TALLY	INPUT1 (VIDEO)	On: SHORT, Off: OPEN
6	OUT	PGM OUT TALLY	INPUT2 (VIDEO)	On: SHORT, Off: OPEN
7	OUT	PGM OUT TALLY	INPUT3 (HDMI)	On: SHORT, Off: OPEN
8	OUT	PGM OUT TALLY	INPUT4 (HDMI)	On: SHORT, Off: OPEN
9	–	GND	–	–

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AND /OR

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Software is installed in the unit. We provide this
software based on the license agreements of
the copyright owners. Based on requests by the
owners of copyright of these software applications,
we have an obligation to inform you of the
following.

Licenses (in English) are recorded in the internal
memory of the unit. Connect a computer to the
USB port on the right side of the unit, and read the
files in the "PMHOME" > "LICENSE" folder.

GNU GPL/LGPL applied software

The software that is eligible for the following GNU
General Public License (hereinafter referred to
as "GPL") or GNU Lesser General Public License
(hereinafter referred to as "LGPL") are included in
the unit.

This informs you that you have a right to have
access to, modify, and redistribute source code for
these software programs under the conditions of
the supplied GPL/LGPL.

Source code is provided on the web.

Use the following URL to download it.

<http://oss.sony.net/Products/Linux/>

We would prefer you do not contact us about the
contents of source code.

Licenses (in English) are recorded in the internal
memory of the unit.

Connect a computer to the USB port on the
right side of the unit, and read the files in the
"PMHOME" > "LICENSE" folder.

Glossary

Chroma keying

A method of compositing images that removes components in the foreground image that contain a specified color (chroma). Typically, a subject is captured in front of a blue background, commonly referred to as a “blue screen,” and the blue background is removed, leaving only to subject for compositing.

Color bar

A test signal which displays vertical colored stripes on a monitor. Used to adjust the hue and saturation of colors on video cameras and monitors.

Default gateway

A router or computer on a network which serves as an entrance to an outside network. Other computers in the network access the outside network via the default gateway.

Delay

A function that delays audio to bring it into synchronization with video and is used when video is input later than the corresponding audio.

DHCP (Dynamic Host Configuration Protocol)

A protocol for automatically assigning IP addresses to devices when they connect to a network, and recovering the addresses when they disconnect.

DNS (Domain Name System)

A system which allows Internet domain names to be translated into IP addresses.

Embedded audio

Audio that is included in a video signal.

Encoding

Data rate conversion that uses compression technology and is performed based on the transmission bandwidth and the capacity of the recording media.

HDCP (High-bandwidth Digital Content Protection)

A form of copyright protection that encrypts digital signals as they travel across connections and prevents unauthorized copying of content.

HDMI (High-Definition Multimedia Interface)

A transmission interface standard for transferring video and audio as a digital signal.

Luminance keying

A method of compositing images that removes components in the foreground image based on brightness (luminance) differences. Typically, this is used to composite text by placing bright colored text on a black background.

Material

Video and audio data that is input to the unit in an unchanged state.

Mix

A transition effect that mixes the next picture into the current picture to eventually replace the current picture.

Mixdown

Combining audio inputs from multiple channels into one channel.

Monitor

Viewing video or listening to audio. Alternatively, a device for viewing and listening.

Picture-in-picture (PinP)

An effect achieved by embedding a video within another video.

Program (PGM)

The final video and audio signals output from this system after the application of effects. This is the video seen by viewers.

RGB

An output signal format which displays pictures by using the three primary colors; Red, Green, and Blue.

SDI (serial digital interface)

A standard for transmitting uncompressed digital video signals and embedded audio over a single coaxial cable.

Streaming

A method of transferring audio and data over a network for real-time playback.

Transition

Switching the video and audio within a specified duration.

Wipe

A transition effect that slides the next picture into the current picture, as if wiping the current picture away.

XLR

A 3-pin connector, often called a Cannon connector. A locking mechanism keeps the connector securely connected even when the cable is pulled. Very stable despite its simple structure, and often used on microphones to suppress handling noise.

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