

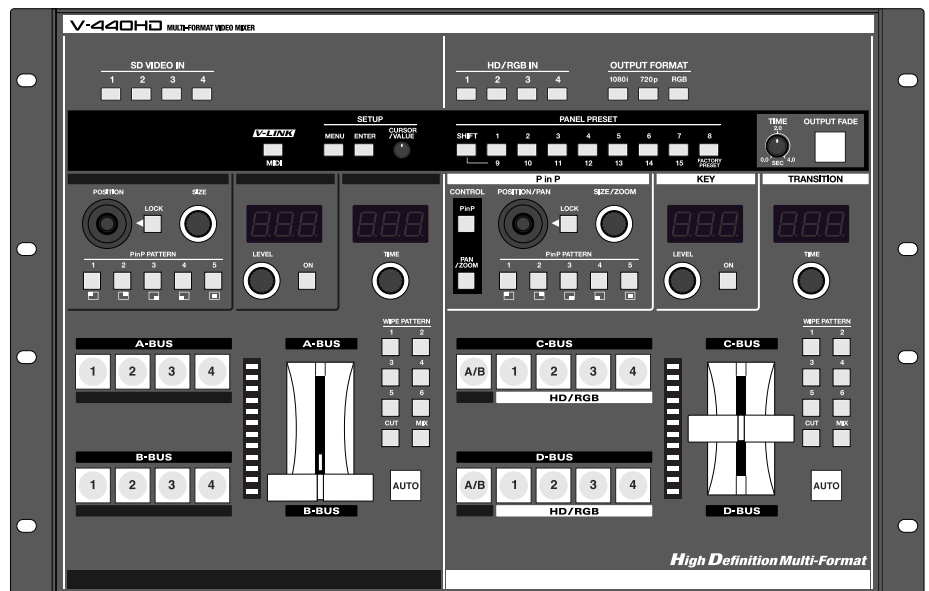
Roland

MULTI-FORMAT VIDEO MIXER

V-440HD

ver 2.0

Owner's Manual






Before using this unit, carefully read the sections entitled: "IMPORTANT SAFETY INSTRUCTIONS" (p. 2), "USING THE UNIT SAFELY" (p. 3-4), and "IMPORTANT NOTES" (p. 5). These sections provide important information concerning the proper operation of the unit. Additionally, in order to feel assured that you have gained a good grasp of every feature provided by your new unit, Owner's Manual should be read in its entirety. The manual should be saved and kept on hand as a convenient reference.

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WARNING: To reduce the risk of fire or electric shock, do not expose this apparatus to rain or moisture.

  
ATTENTION: RISQUE DE CHOC ELECTRIQUE NE PAS OUVRIR
CAUTION: TO REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT REMOVE COVER (OR BACK). NO USER-SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.



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



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

INSTRUCTIONS PERTAINING TO A RISK OF FIRE, ELECTRIC SHOCK, OR INJURY TO PERSONS.

IMPORTANT SAFETY INSTRUCTIONS

SAVE THESE INSTRUCTIONS

WARNING - When using electric products, basic precautions should always be followed, including the following:


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

For the U.K.

WARNING: THIS APPARATUS MUST BE EARTHED

IMPORTANT: THE WIRES IN THIS MAINS LEAD ARE COLOURED IN ACCORDANCE WITH THE FOLLOWING CODE.
GREEN-AND-YELLOW: EARTH, BLUE: NEUTRAL, BROWN: LIVE

As the colours of the wires in the mains lead of this apparatus may not correspond with the coloured markings identifying the terminals in your plug, proceed as follows:

The wire which is coloured GREEN-AND-YELLOW must be connected to the terminal in the plug which is marked by the letter E or by the safety earth symbol  or coloured GREEN or GREEN-AND-YELLOW.

The wire which is coloured BLUE must be connected to the terminal which is marked with the letter N or coloured BLACK.

The wire which is coloured BROWN must be connected to the terminal which is marked with the letter L or coloured RED.

USING THE UNIT SAFELY

INSTRUCTIONS FOR THE PREVENTION OF FIRE, ELECTRIC SHOCK, OR INJURY TO PERSONS

About ⚠ WARNING and ⚠ CAUTION Notices

⚠ WARNING	Used for instructions intended to alert the user to the risk of death or severe injury should the unit be used improperly.
⚠ CAUTION	Used for instructions intended to alert the user to the risk of injury or material damage should the unit be used improperly. * Material damage refers to damage or other adverse effects caused with respect to the home and all its furnishings, as well to domestic animals or pets.

About the Symbols

	The ⚠ symbol alerts the user to important instructions or warnings. The specific meaning of the symbol is determined by the design contained within the triangle. In the case of the symbol at left, it is used for general cautions, warnings, or alerts to danger.
	The ⚡ symbol alerts the user to items that must never be carried out (are forbidden). The specific thing that must not be done is indicated by the design contained within the circle. In the case of the symbol at left, it means that the unit must never be disassembled.
	The Ⓜ symbol alerts the user to things that must be carried out. The specific thing that must be done is indicated by the design contained within the circle. In the case of the symbol at left, it means that the power-cord plug must be unplugged from the outlet.

ALWAYS OBSERVE THE FOLLOWING




⚠ WARNING

- Before using this unit, make sure to read the instructions below, and the Owner's Manual.
- Connect mains plug of this model to a mains socket outlet with a protective earthing connection.
- Do not open or perform any internal modifications on the unit.
- Do not attempt to repair the unit, or replace parts within it (except when this manual provides specific instructions directing you to do so). Refer all servicing to your retailer, the nearest Roland Service Center, or an authorized Roland distributor, as listed on the "Information" page.
- Never use or store the unit in places that are:
 - Subject to temperature extremes (e.g., direct sunlight in an enclosed vehicle, near a heating duct, on top of heat-generating equipment); or are
 - Damp (e.g., baths, washrooms, on wet floors); or are
 - Humid; or are
 - Exposed to rain; or are
 - Dusty; or are
 - Subject to high levels of vibration.
- Make sure you always have the unit placed so it is level and sure to remain stable. Never place it on stands that could wobble, or on inclined surfaces.
- The unit should be connected to a power supply only of the type described in the operating instructions, or as marked on the rear side of unit.











⚠ WARNING

- Use only the attached power-supply cord. Also, the supplied power cord must not be used with any other device.
- Do not excessively twist or bend the power cord, nor place heavy objects on it. Doing so can damage the cord, producing severed elements and short circuits. Damaged cords are fire and shock hazards!
- Do not allow any objects (e.g., flammable material, coins, pins); or liquids of any kind (water, soft drinks, etc.) to penetrate the unit.
- Immediately turn the power off, remove the power cord from the outlet, and request servicing by your retailer, the nearest Roland Service Center, or an authorized Roland distributor, as listed on the "Information" page when:
 - The power-supply cord, or the plug has been damaged; or
 - If smoke or unusual odor occurs
 - Objects have fallen into, or liquid has been spilled onto the unit; or
 - The unit has been exposed to rain (or otherwise has become wet); or
 - The unit does not appear to operate normally or exhibits a marked change in performance.
- Protect the unit from strong impact. (Do not drop it!)

⚠ WARNING

- Do not force the unit's power-supply cord to share an outlet with an unreasonable number of other devices. Be especially careful when using extension cords—the total power used by all devices you have connected to the extension cord's outlet must never exceed the power rating (watts/amperes) for the extension cord. Excessive loads can cause the insulation on the cord to heat up and eventually melt through. 
- Before using the unit in a foreign country, consult with your retailer, the nearest Roland Service Center, or an authorized Roland distributor, as listed on the "Information" page. 
- Do not put anything that contains water (e.g., flower vases) on this unit. Also, avoid the use of insecticides, perfumes, alcohol, nail polish, spray cans, etc., near the unit. Swiftly wipe away any liquid that spills on the unit using a dry, soft cloth. 

⚠ CAUTION

- The unit should be located so that its location or position does not interfere with its proper ventilation. 
- Always grasp only the plug on the power-supply cord when plugging into, or unplugging from, an outlet or this unit. 
- At regular intervals, you should unplug the power plug and clean it by using a dry cloth to wipe all dust and other accumulations away from its prongs. Also, disconnect the power plug from the power outlet whenever the unit is to remain unused for an extended period of time. Any accumulation of dust between the power plug and the power outlet can result in poor insulation and lead to fire. 
- Try to prevent cords and cables from becoming entangled. Also, all cords and cables should be placed so they are out of the reach of children. 
- Never climb on top of, nor place heavy objects on the unit. 
- Never handle the power cord or its plugs with wet hands when plugging into, or unplugging from, an outlet or this unit. 
- Before moving the unit, disconnect the power plug from the outlet, and pull out all cords from external devices. 
- Before cleaning the unit, turn off the power and unplug the power cord from the outlet (p. 23). 
- Whenever you suspect the possibility of lightning in your area, pull the plug on the power cord out of the outlet. 
- Keep any screws you may remove and the included screws in a safe place out of children's reach, so there is no chance of them being swallowed accidentally. 

IMPORTANT NOTES

In addition to the items listed under “IMPORTANT SAFETY INSTRUCTIONS” and “USING THE UNIT SAFELY” on pages 2 and 3–4, please read and observe the following:

Power Supply

- Do not connect this unit to same electrical outlet that is being used by an electrical appliance that is controlled by an inverter (such as a refrigerator, washing machine, microwave oven, or air conditioner), or that contains a motor. Depending on the way in which the electrical appliance is used, power supply noise may cause this unit to malfunction or may produce audible noise. If it is not practical to use a separate electrical outlet, connect a power supply noise filter between this unit and the electrical outlet.
- Before connecting this unit to other devices, turn off the power to all units. This will help prevent malfunctions and/or damage to TV monitors or other devices.
- Although the LCD and LEDs are switched off when the POWER switch is switched off, this does not mean that the unit has been completely disconnected from the source of power. If you need to turn off the power completely, first turn off the POWER switch, then unplug the power cord from the power outlet. For this reason, the outlet into which you choose to connect the power cord’s plug should be one that is within easy reach and readily accessible.
- To ensure long service life, be sure to shut off the power whenever the unit is not being used and limit continuous operation as much as possible.

Placement

- This device may interfere with radio and television reception. Do not use this device in the vicinity of such receivers.
- Noise may be produced if wireless communications devices, such as cell phones, are operated in the vicinity of this unit. Such noise could occur when receiving or initiating a call, or while conversing. Should you experience such problems, you should relocate such wireless devices so they are at a greater distance from this unit, or switch them off.
- When moved from one location to another where the temperature and/or humidity is very different, water droplets (condensation) may form inside the unit. Damage or malfunction may result if you attempt to use the unit in this condition. Therefore, before using the unit, you must allow it to stand for several hours, until the condensation has completely evaporated.

Maintenance

- For everyday cleaning wipe the unit with a soft, dry cloth or one that has been slightly dampened with water. To remove stubborn dirt, use a cloth impregnated with a mild, non-abrasive detergent. Afterwards, be sure to wipe the unit thoroughly with a soft, dry cloth.
- Never use benzine, thinners, alcohol or solvents of any kind, to avoid the possibility of discoloration and/or deformation.

Repairs and Data

- Please be aware that all data contained in the unit’s memory may be lost when the unit is sent for repairs. Important data should always be written down on paper (when possible). During repairs, due care is taken to avoid the loss of data. However, in certain cases (such as when circuitry related to memory itself is out of order), we regret that it may not be possible to restore the data, and Roland assumes no liability concerning such loss of data.

Additional Precautions

- Damage or breakdown of the V-440HD or mistakes in operation may result in the loss of data stored in memory. To avoid problems in the event of the loss of important data, write down the settings on p. 85 or follow the instructions on p. 48 to save the data to your computer or other external device.
- Unfortunately, it may be impossible to restore the contents of data that was stored in the unit’s memory once it has been lost. Roland Corporation assumes no liability.
- Use a reasonable amount of care when using the unit’s buttons, sliders, or other controls; and when using its jacks and connectors. Rough handling can lead to malfunctions.
- When connecting / disconnecting all cables, grasp the connector itself—never pull on the cable. This way you will avoid causing shorts, or damage to the cable’s internal elements.
- A small amount of heat will radiate from the unit during normal operation.
- When you need to transport the unit, package it in the box (including padding) that it came in, if possible. Otherwise, you will need to use equivalent packaging materials.
- This device allows you to switch images or turn video effects on/off at high speed. For some people, viewing such images can cause headache, nausea, or other discomfort. Do not use this device to create video that might cause these types of health problems. Roland Corporation will accept no responsibility for any such health problems that may occur in yourself or in viewers.

Copyright

- Unauthorized recording, distribution, sale, lending, public performance, broadcasting, or the like, in whole or in part, of a work (musical composition, video, broadcast, public performance, or the like) whose copyright is held by a third party is prohibited by law.
- Do not use this unit for purposes that could infringe on a copyright held by a third party. We assume no responsibility whatsoever with regard to any infringements of third-party copyrights arising through your use of this unit.

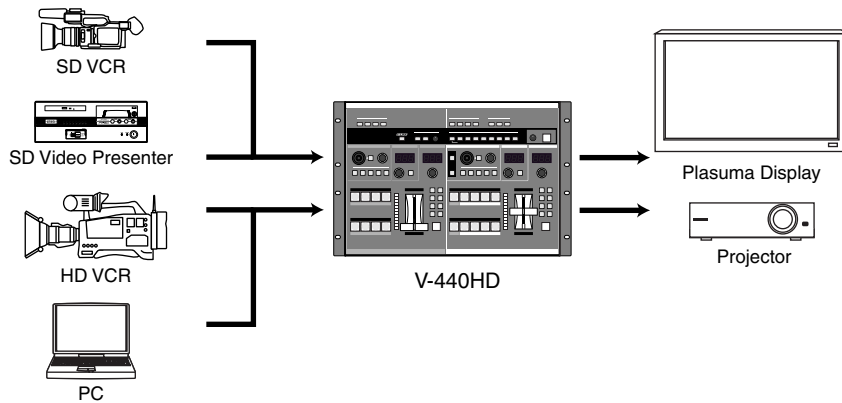
* Microsoft and Windows are registered trademarks of Microsoft Corporation.

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Main Features

The V-440HD multiformat live switcher is capable of switching between four HD/RGB input systems and four SD input systems for seamless switching between HD, RGB, and SD inputs. There is no need to obtain separate converters to handle each type of format. Although housed in a compact body, this one device is capable of handling a wide variety of formats.



About HD

An abbreviation for "High Definition," HD is a generic term for television formats that, in comparison to conventional TV formats, provide higher resolution and an improved angle of view, and deliver a heightened sense of presence by means of large-screen. This is also referred to as HDTV. Although there are a number of different types of HD, which can vary depending on the country where the technology was developed, the V-440HD utilizes the standards recommended in BT.709-3, established by the ITU in February, 1998.

About RGB

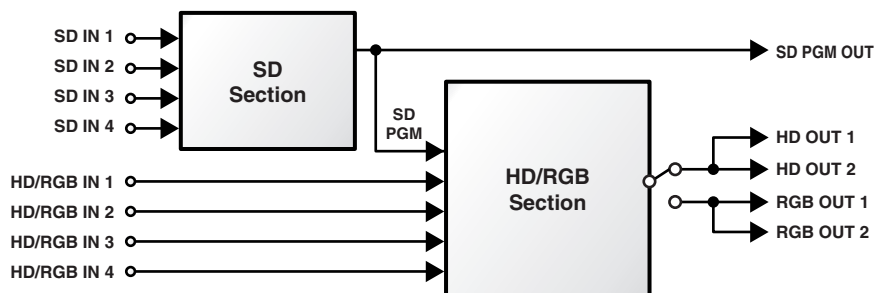
This format, used for output of video images with computers and other digital devices, uses video signals whereby each of three main colors, red (R), green (G), and blue (B), are handled separately.

About SD

An abbreviation for Standard Definition, this refers to formats currently in general use (such as 480I), as opposed to HD (High Definition).

Organization of the V-440HD

The V-440HD comprises two main sections, an "HD/RGB section," which is used to mix all video signals, and an "SD section," used for managing all SD video. The resulting mixes of composite video and S-video signals from the SD section (PGM output) are sent to the HD/RGB section, where the HD and RGB video are mixed and then output in either HD or RGB format.



For a detailed diagram, refer to the "Block Diagram" (p. 78).

Multiformat Video Mixer

The V-440HD converts and seamlessly switches signals in HD, RGB, and SD format to the selected final output format.

HD Effects

- The V-440HD uses a variety of effects, including transitions (effects used when switching video images), P in P, and key composite effects.
- Using the V-440HD in combination with an SD video mixer allows you to compose video using up to six different effects simultaneously.

Equipped with High-Performance SD-to-HD/RGB Up-Converter

The V-440HD features an up-converter that converts SD output to the final output format. This system enables up-conversion of SD video to HD and RGB with superior image quality.

HD/RGB Inputs

- The HD/RGB inputs provide for the input of four channels of HD or RGB video.
- HD inputs are compatible with 1080i as well as the typical 720p format. RGB inputs are compatible with VGA (640 x 480), SXGA (1280 x 1024) formats.
- The HD/RGB inputs allow input through BNC and D-Sub connectors
- Any HD/RGB input component BNC and D-Sub connectors not in use for input can be used as loop thru outputs.

SD Inputs

- The V-440HD features four input channels.
- SD inputs are compatible with both S-Video and composite video.
- A preview output is provided for each of the SD inputs 1–4.

SD Video Mixer

- Capable of switching only SD video input.
- PGM output from the SD video mixer can be switched after being input to the multiformat switcher. In addition, SD PGM output can be output as S-Video or composite video.
- Effects, including transitions (effects used when switching video images), P in P, and key composite effects can be used.

Multiscreen Displays

You can use to synchronize multiple V-440HDs easily, and use simple settings to output the signals from one V-440HD to multiscreen displays. This eliminates any need to prepare video for each individual screen.

Features Added in Ver. 2.0

Additional Functions Related to Operation of the V-440HD

Enabling the Settings for PGM-PST Operation (p. 32, p. 39)

The V-440HD now accommodates the PGM-PST (flip-flop) method of operation employed by professional switching equipment.

Channels can be switched by holding down channel buttons (p. 32, p. 38)

Channel buttons can now be disabled (p. 32, p. 38)

Channel button colors can now be changed (p. 32, p. 38)

Function of OUTPUT FADE button has been expanded (p. 23)

Function of AUTO button has been expanded (p. 30, p. 37)

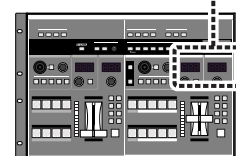
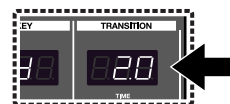
MEMO

Functions described in this manual that have been added in V-440HD ver. 2.0 are indicated by **ver 2.0**.

MEMO

To check the V-440HD's version, observe the numerals indicated in the LED display immediately after turning on the power.

[With Version 2.0]



Additional Input/Output Functions

1366 x 768 RGB output now supported (p. 26)

You can now select more beautiful and crisp output on plasma or other displays.

Automatic RGB input settings (p. 27)

This is feature that is sure to come in handy in situations such as when switching the connection with a PC numerous times using a single RGB input.

Select 4:3 or 16:9 P in P sub screen aspect ratios (p. 34)

Fade out of the SD section PGM output (p. 41)

Additional Functions Related to External Devices

Compatible with PR Series devices (PR-80/PR-50) (p. 56)

Video performances involving switches between SD and HD output can now be controlled from a PR-80 or PR-50.

Settings can be transmitted via MIDI (p. 48)

The V-440HD's settings can now be transmitted from the MIDI connector.

RS-232C backup function (p. 48)

The V-440HD's settings can now be edited and backed up using a computer or similar device.

Preview (standby) TALLY output (p. 52)

Additional Menu Functions

Individual reset of menu items (p. 25)

The settings for menu items can now be reset individually.

Double-click buttons to open menu (p. 25)

Menus can be called up by double-clicking related buttons.

Other Additional Functions

Apply the Master fade when switching panel presets (p. 43)

Select parameters to associate with Panel Presets (p. 43)

Supports the use of MIDI note mode (p. 69)

Connection Example

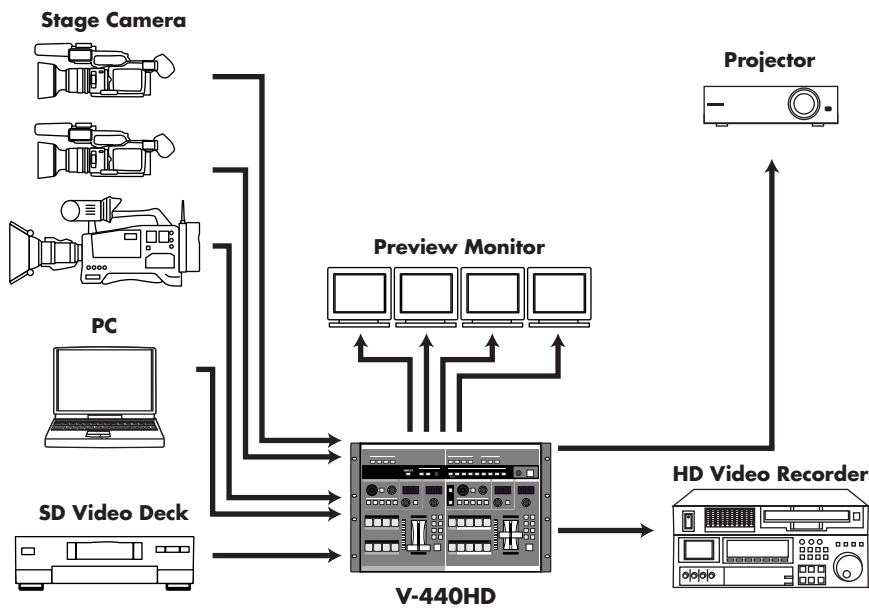
A variety of video formats can be handled with a single V-440HD, providing great flexibility for various different applications.

Live Switching

The V-440HD can be used for live switching with video productions that mix material in SD and HD formats. You can freely switch video from HD cameras and SD cameras and use chroma key and luminance key effects with characters displayed by a computer.

MEMO

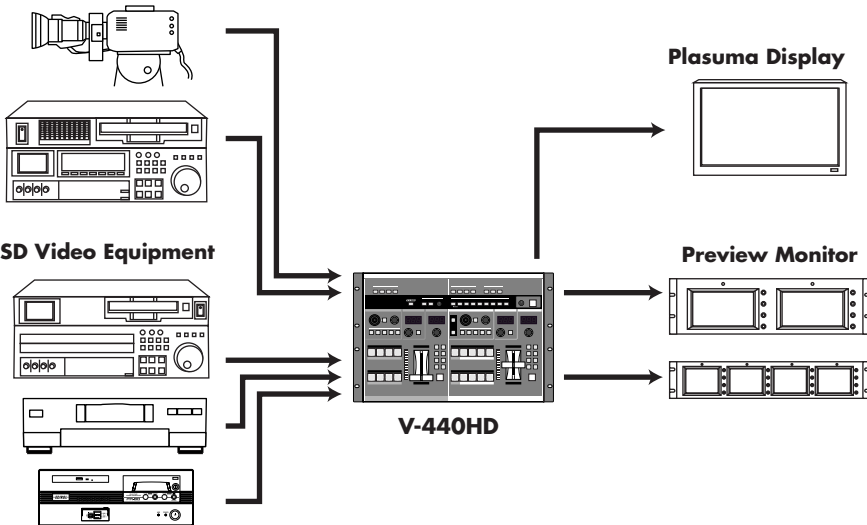
For more detailed instructions on connecting, refer to "Settings and Parameters" (p. 79).



Examples of Devices That Can Be Used

Due to its extensive compatibility with HD, RGB, and SD formats, the V-440HD provides a flexible system that can be tailored for any need and budget.

HD Video Equipment



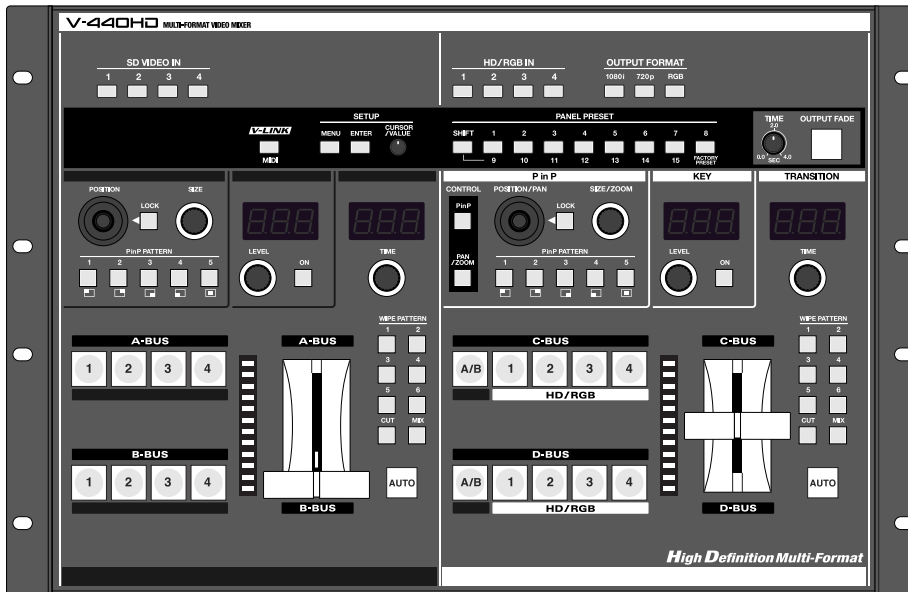
Before Using the V-440HD

Check the Contents of the Package

The V-440HD includes the following accessories. Please take a moment to confirm that all of these items have been included with the V-440HD.

If you find that any item is missing, contact your nearest Roland Service Center.

V-440HD



Power cord

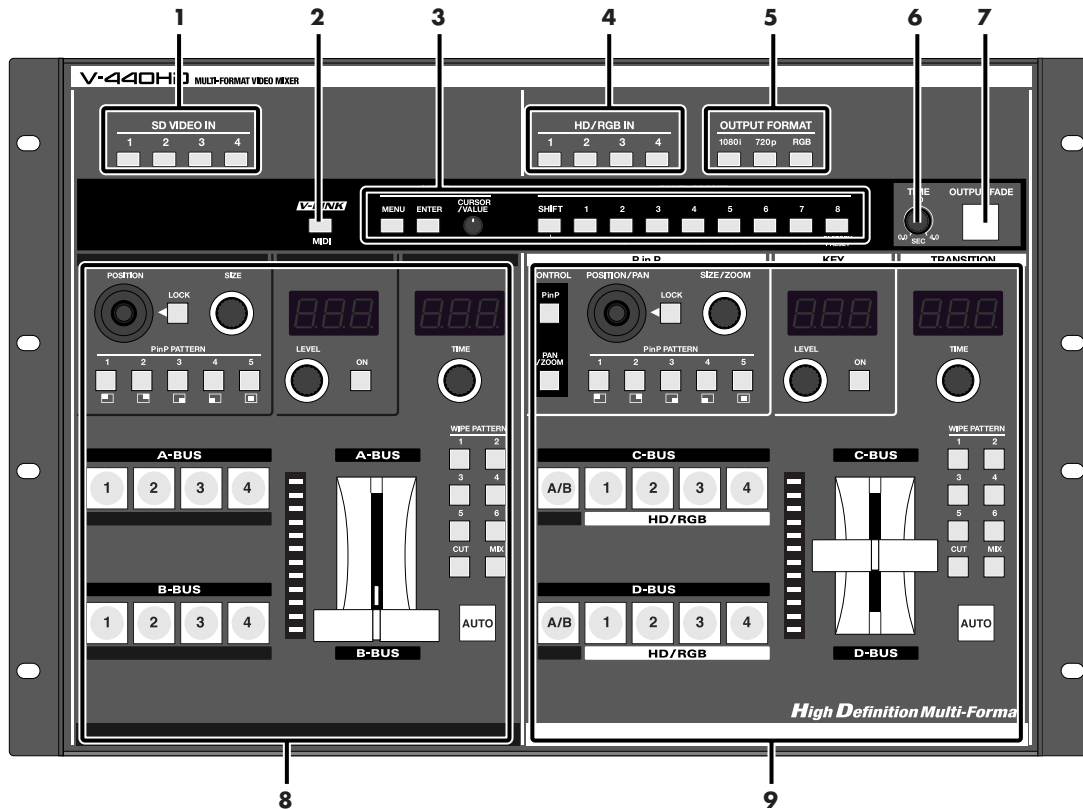
* Use only the attached power cord. Also, must not remove the ferrite core from the supplied power code.

Owner's Manual (this volume)



Names of Things and What They Do

Top Panel



1. SD IN Buttons 1–4..... (p. 29)

- These indicate the status of the video signals input to each of the SD IN inputs (p. 19).

Button	Video Signal Status
Lit (Red)	Input of composite signal
Lit (Green)	Input of S-video signal
Off	No signal input

- Holding down the MENU button while pressing an SD IN button displays the SD input menu parameters (p. 29).

2. MIDI Button..... (p. 54)

- This switches the MIDI functions on and off.
- This switches V-LINK mode on and off when the MIDI button's function is set to "V-LINK Sw."

3. Settings Section (p. 17)

Used for making various settings for the V-440HD.

For descriptions of each of the controllers, refer to "Settings Section" (p. 17).

4. HD/RGB IN Buttons 1–4(p. 27)

- These indicate the status of the video signals input to each of the HD/RGB IN inputs (p. 19).

Button	Video Signal Status
Lit (Red)	Input of RGB signal
Lit (Green)	Input of HD component signal
Off	No signal input

- Holding down the MENU button while pressing an HD/RGB IN button brings up the HD/RGB input menu parameters (p. 27).

5. OUTPUT FORMAT Buttons(p. 26)

- Press an OUTPUT FORMAT button to select the format for the video output from the HD OUT connectors (p. 19) or RGB OUT connectors (p. 19). The selected button lights up.

Button	Output Video Format	Output Connectors
1080i	1080/60i (59.94i) (factory default setting)	HD OUT Connectors 1, 2
720p	720/60p (59.94p) (factory default setting)	HD OUT Connectors 1, 2
RGB	1024x768/60 (factory default setting)	RGB OUT Connectors 1, 2

- * You can change the video format selected with each button in the menu (p. 26).

6. TIME Knob (p. 23)

Enables setting of the time for the video to fade when the OUTPUT FADE button is pressed. Time can be set from 0.0 to 4.0 seconds.

* You can adjust the fadeout level by selecting "1. HD/RGB Output" (p. 58) in the menu and setting "12. Output Fade Mode" to "Manual."

7. OUTPUT FADE Button (p. 23)

Press the OUTPUT FADE button to fade out the video output from the HD OUT connectors (p. 19) or RGB OUT connectors (p. 19).

The status of FADE OUT can be determined by viewing the OUTPUT FADE button's light.

Button	Video Output Mode
Flashing	Fading out
Lit	Black video or white video output
Off	(Normal output)

MEMO

Pressing the OUTPUT FADE button again while the button is lit or flashing causes the video output being faded out to fade back in.

8. SD Section (p. 14)

This section is used for controlling the switching, P in P, key composite, and other functions for the video input to the SD IN inputs.

For descriptions of each button and knob, refer to "SD Section" (p. 14).

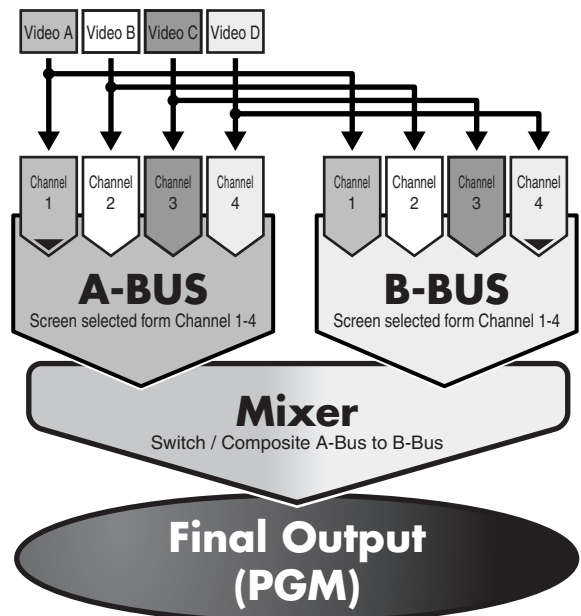
9. HD/RGB Section (p. 16)

This section is used for controlling the switching, P in P, key composite, and other functions for the video input to the HD/RGB IN inputs.

For descriptions of each button and knob, refer to "HD/RGB Section" (p. 16).

"Channels" and "Buses"

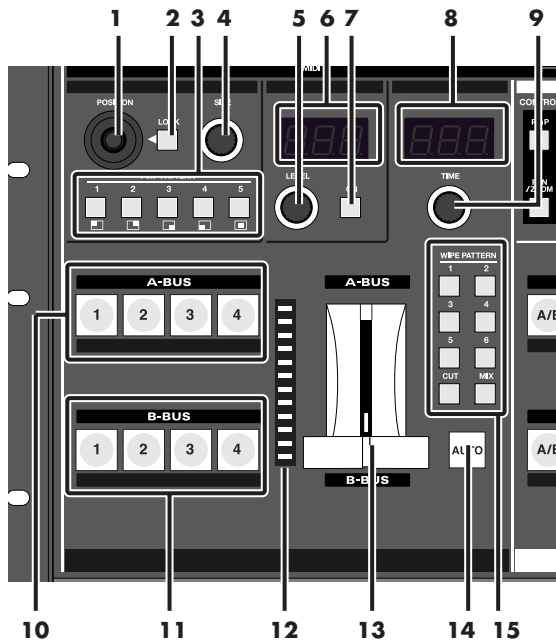
- Channel: Each of the V-440HD's video inputs is called a "channel." The SD and HD/RGB sections feature Channels 1-4, with each channel being independently controlled. Each "channel" is the equivalent of a "path" for the video signals.
- Bus: On the V-440HD, you can select any combination of channels to be controlled as a single group. On the V-440HD, such a grouping of channels is referred to as a "bus," and the video for each bus can be selected from the channels. The SD section features an A-BUS and B-BUS, with the C-BUS and D-BUS included in the HD/RGB section; in each bus you can control groupings of different input channels.



Names of Things and What They Do

SD Section

This section is used for controlling the switching, P in P, key composite, and other functions for the SD video.



1. POSITION Joystick (SD) (p. 40)

This adjusts the positioning of the small screen when the P in P effect is used in the SD section. The POSITION joystick (SD) can be used only when the LOCK button to the right of the joystick is pressed to release the lock.

2. LOCK Button (SD) (p. 40)

When the LOCK button (SD) is lit, the P in P position cannot be changed with the POSITION joystick (SD) to the left of the button. Pressing the LOCK button (SD) so its light is turned off enables operation with the POSITION joystick (SD).

3. P in P PATTERN Buttons (SD) 1-5 (p. 39)

Pressing the P in P PATTERN 1-5 buttons (SD) applies the P in P effect in the SD section. When the P in P effect is applied, the selected P in P PATTERN button (SD) lights up.

Button	Sub-Screen Position (Factory Setting)
1	Upper left
2	Upper right
3	Lower right
4	Lower left
5	Center

4. SIZE Knob (SD) (p. 40)

This adjusts the size of the small screen when the P in P effect is used in the SD section.

5. KEY LEVEL Knob (SD) (p. 41)

This adjusts the key level when key composite effects are used in the SD section.

6. KEY LEVEL Display (SD) (p. 41)

This indicates the value of the key level set with the (5.) KEY LEVEL knob (SD).

7. KEY ON Button (SD) (p. 41)

Pressing the KEY ON Button (SD) causes the key composite effect to be applied in the SD section.

8. TIME Display (SD) (p. 37)

This indicates the transition time used to switch between the A-BUS and B-BUS when the (14.) AUTO button (SD) is pressed. The time is indicated in seconds.

9. TIME Knob (SD) (p. 37)

This sets the transition time used to switch between the A-BUS and B-BUS when the (14.) AUTO button (SD) is pressed. The set time is indicated in the TIME display. The time can be set to any value from 0.0 to 4.0.

10. A-BUS Channel Buttons (SD) 1-4 (p. 38)

These buttons are used to select the video signals to be input to the A-BUS, from the video input to the SD IN connectors 1-4.

Button	V-440HD Status
Lit (Yellow) *	Channel is selected
Lit (Green) *	Channel is selected (not displayed)
Off	Channel selection is cancelled
Flashing (Yellow or Green)	P in P or key composite is in use

* The colors in which buttons light can be changed in "Input Sw LED Color" under "13. System" in the V-440HD menu. For more on menu operations, refer to "Menu Operations" (p. 25).

11. B-BUS Channel Buttons (SD) 1-4 (p. 38)

These buttons are used to select the video signals to be input to the B-BUS, from the video input to the SD IN connectors 1-4.

Button	V-440HD Status
Lit (Yellow) *	Channel is selected
Lit (Green) *	Channel is selected (not displayed)
Off	Channel selection is cancelled
Flashing (Yellow or Green)	P in P or key composite is in use

* The colors in which buttons light can be changed in "Input Sw LED Color" under "13. System" in the V-440HD menu. For more on menu operations, refer to "Menu Operations" (p. 25).

12. TRANSITION Indicators (SD) (p. 37)

These indicate the position of the video fader. When the AUTO button (SD) is in use, these indicate the ratio of video being switched in the SD section. The portion of A-BUS video in the mix increases as the position of the indicator that lights within the TRANSITION indicators (SD) gets closer to the A-BUS, while the relative portion of B-BUS video decreases correspondingly.

13. Video Fader (SD) (p. 37)

Moving the video fader up or down switches between the SD section A-BUS and B-BUS.

Tilt the fader shown in the figure up to switch to the A-BUS; tilt the fader down to switch to the B-BUS. The video switches using the effect selected with the (15.) TRANSITION buttons (SD).

14. AUTO Button (SD)..... (p. 37)

When the AUTO button (SD) is pressed, the SD section video switches over the time indicated in the TIME display (SD).

The video switches using the effect selected with the (15.) TRANSITION buttons (SD).

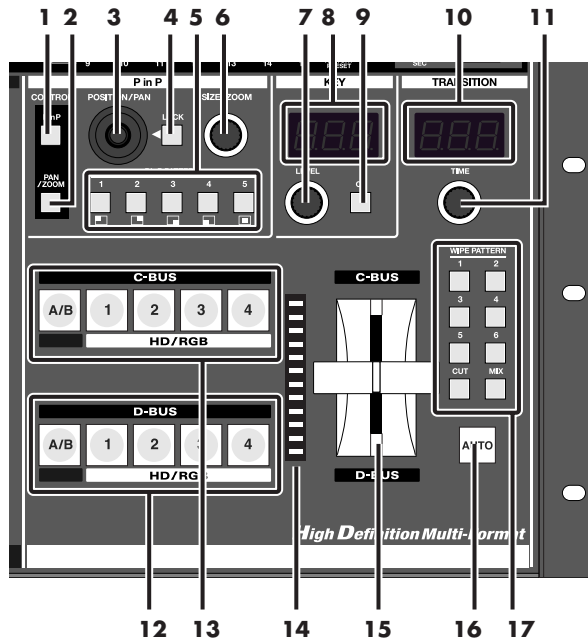
15. TRANSITION Buttons (SD) (p. 38)

These are used to select the effect applied when switching the SD section video with the video fader (SD) or the AUTO button (SD).

Button	Function	Description
CUT	Cut switching	The SD video switches when the SD video fader reaches the half-way point.
MIX	Dissolve switching	The SD video is mixed as it gradually switches according to the angle of the SD video fader.
WIPE PATTERN 1-6	Wipe switching	The SD video switches with a wipe effect, with the wipe corresponding to the angle of the SD fader.

HD/RGB Section

This section is used for controlling the switching, P in P, key composite, and other functions for the HD/RGB video.



1. P in P Button (HD/RGB) (p. 33)

When this button is lit, the position of the subscreen when the P in P effect is used in the HD/RGB section can be set with the POSITION joystick (HD/RGB), while the subscreen size can be set with the SIZE/ZOOM knob (HD/RGB).

2. PAN/ZOOM Button (HD/RGB) (p. 34)

When using the P in P effect in the HD/RGB section, the crop position and zoom ratio of the small screen can be set with the POSITION/PAN joystick (HD/RGB) and SIZE/ZOOM knob (HD/RGB) knob when this button is lit.

3. POSITION/PAN Joystick (HD/RGB) (p. 34)

This adjusts the position of, and zoom for the small screen when the P in P effect is used in the HD/RGB section.

The POSITION/PAN joystick (HD/RGB) can be used only when the LOCK button to the right of the POSITION/PAN joystick (HD/RGB) is pressed to release the lock.

4. LOCK Button (HD/RGB) (p. 34)

When the LOCK button (HD/RGB) is lit, neither the position nor panning of the P in P subscreen be changed with the POSITION/PAN joystick (HD/RGB). Pressing the LOCK button (HD/RGB) so enables operation with the POSITION/PAN joystick (HD/RGB).

5. P in P PATTERN Buttons (HD/RGB) 1–5(p. 33)

Pressing the P in P PATTERN 1–5 buttons (HD/RGB) applies the P in P effect in the HD/RGB section.

When the P in P effect is applied, the selected P in P PATTERN button (HD/RGB) lights up.

Button	Sub-Screen Position (Factory Setting)
1	Upper left
2	Upper right
3	Lower right
4	Lower left
5	Center

6. SIZE/ZOOM Knob (HD/RGB)(p. 34)

This adjusts the size of the small screen when the P in P effect is used in the HD/RGB section.

7. KEY LEVEL Knob (HD/RGB)(p. 36)

This adjusts the key level when key composite effects are used in the HD/RGB section.

8. KEY LEVEL Display (HD/RGB) (p. 36)

This indicates the value of the key level set with the (7.) KEY LEVEL knob (HD/RGB).

9. KEY ON Button (HD/RGB)..... (p. 36)

Pressing the KEY ON Button (HD/RGB) causes the key composite effect to be applied in the HD/RGB section.

10. TIME Display (HD/RGB)(p. 30)

This indicates the transition time used to switch between the C-BUS and D-BUS when the (14.) AUTO button (HD/RGB) is pressed. The time is indicated in seconds.

11. TIME Knob (HD/RGB)(p. 30)

This sets the transition time used to switch between the C-BUS and D-BUS when the (14.) AUTO button (HD/RGB) is pressed. The set time is indicated in the TIME display. The time can be set to any value from 0.0 to 4.0.

12. C-BUS Channel Buttons (HD/RGB) 1–4, A/B..... (p. 32)

These buttons are used to select the video signals to be input to the C-BUS, either from the video input to the HD/RGB IN connectors 1–4 or the final output from the SD section (SD PGM video).

Button	V-440HD Status
Lit (Yellow) *	Channel is selected
Lit (Green) *	Channel is selected (not displayed)
Off	Channel selection is cancelled
Flashing (Yellow or Green)	P in P or key composite is in use

* The colors in which buttons light can be changed in "Input Sw LED Color" under "13. System" in the V-440HD menu. For more on menu operations, refer to "Menu Operations" (p. 25).

13. D-BUS Channel Buttons (HD/RGB) 1–4, A/B (p. 32)

These buttons are used to select the video signals to be input to the D-BUS, either from the video input to the HD/RGB IN connectors 1–4 or the final output from the SD section (SD PGM video).

Button	V-440HD Status
Lit (Yellow) *	Channel is selected
Lit (Green) *	Channel is selected (not displayed)
Off	Channel selection is cancelled
Flashing (Yellow or Green)	P in P or key composite is in use

* The colors in which buttons light can be changed in "Input Sw LED Color" under "13. System" in the V-440HD menu. For more on menu operations, refer to "Menu Operations" (p. 25).

14. TRANSITION Indicators (HD/RGB) (p. 30)

These indicate the position of the video fader.

When the AUTO button (HD/RGB) is in use, these indicate the ratio of video being switched in the HD/RGB section. The portion of C-BUS video in the mix increases as the position of the indicator that lights within the TRANSITION indicators (HD/RGB) gets closer to the C-BUS, while the relative portion of D-BUS video decreases correspondingly.

15. Video Fader (HD/RGB) (p. 30)

Moving the video fader up or down switches between the C-BUS and D-BUS of the HD/RGB section.

Tilt the fader shown in the figure up to switch to the C-BUS; tilt the fader down to switch to the D-BUS. The video switches using the effect selected with the (17.) TRANSITION buttons (HD/RGB).

16. AUTO Button (HD/RGB) (p. 30)

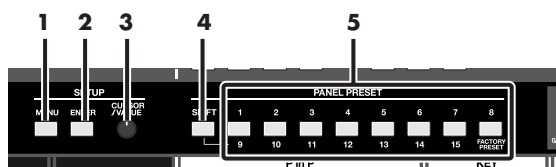
When the AUTO (HD/RGB) button is pressed, the HD/RGB section video switches over the time indicated in the TIME display (HD/RGB). The video switches using the effect selected with the (17.) TRANSITION buttons (HD/RGB).

17. TRANSITION Buttons (HD/RGB) (p. 31)

These are used to select the effect applied when switching the HD/RGB section video with the video fader (HD/RGB) or the AUTO button (HD/RGB).

Button	Function	Description
CUT	Cut switching	The HD/RGB video switches when the HD/RGB video fader reaches the half-way point.
MIX	Dissolve switching	The HD/RGB video is mixed as it gradually switches according to the angle of the HD/RGB video fader.
WIPE PATTERN1-6	Wipe switching	The HD/RGB video switches with a wipe effect, with the wipe corresponding to the angle of the HD/RGB fader.

Settings Section



1. MENU Button (p. 24)

Pressing the MENU button displays the menu in the video monitor connected to the SD PREVIEW OUT connector.

Rotate the VALUE knob to select the parameter to be set, then press the ENTER button to enter the selection.

Pressing the MENU button while the menu is displayed closes the menu.

The MENU button flashes while the menu is shown. When the menu is dismissed, the MENU button goes out.

2. ENTER Button (p. 25)

This is used to confirm a menu choice. The button flashes while the menu is displayed.

3. VALUE Knob (p. 25)

This is used to select parameters from the menu.

4. SHIFT Button (p. 42)

Pressing the SHIFT button so it's lit enables selection of PANEL PRESET 9–15 using the PANEL PRESET buttons (1–8).

5. PANEL PRESET Buttons 1–8 (p. 42)

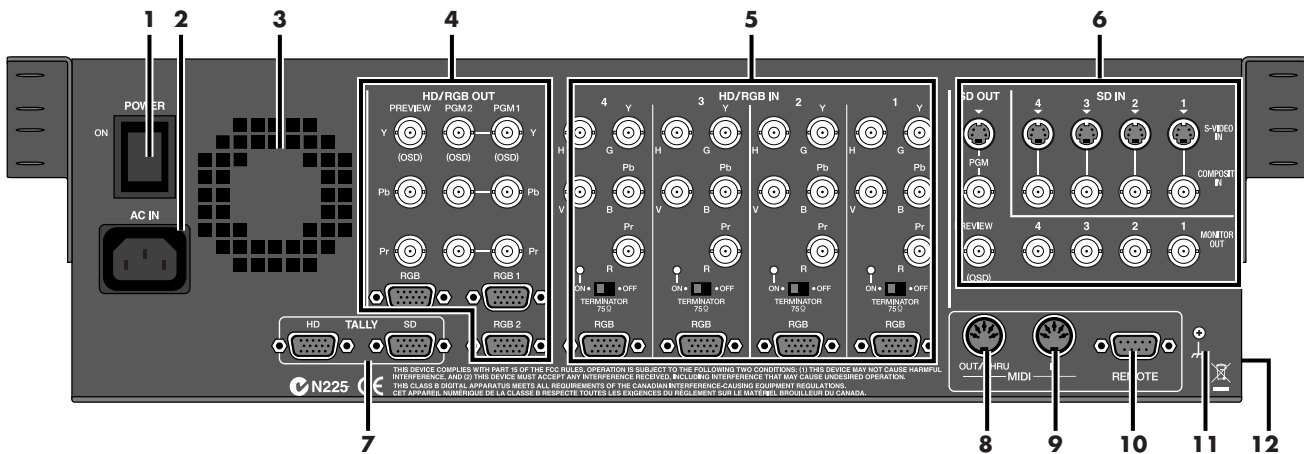
You can store up to 15 separate configurations of parameter settings set in each of the top sections.

You can call up the saved settings by pressing the PANEL PRESET buttons.

PANEL PRESET 9–15 and FACTORY PRESET can be selected when the SHIFT button is lit.

Button	V-440HD Function
Lit (Green)	Selects PANEL PRESET 1–8
Lit (Red)	Selects PANEL PRESET 9–15, FACTORY PRESET
Off	No PANEL PRESET selected

Rear Panel



1. POWER Switch (p. 23)

This switches the V-440HD's power on and off. If you need to turn off the power completely, first turn off the POWER switch, then unplug the power cord from the power outlet. Refer to "Turning Off the Power" (p. 23).

2. AC Inlet (p. 20)

Connect the power cord included with the V-440HD here.

3. Exhaust Vent (p. 22)

Heat generated by the V-440HD is expelled here.

NOTE

Allowing this section of the panel to be blocked may, due to the buildup of excess heat, result in damage to the V-440HD.

4. HD/RGB Output Section (p. 19)

Video in HD or RGB format is output here. For descriptions of each connector, refer to p. 19.

5. HD/RGB Input Section (p. 19)

Four channels of HD or RGB video can be input using the BNC or D-sub connectors. BNC and D-sub terminals not used for signal input can be used as THRU outs. For descriptions of each connector, refer to p. 19.

6. SD Input/Output Section (p. 19)

Four channels of SD video can be input using the composite video or S-video connectors. For descriptions of each connector, refer to p. 19.

7. TALLY Terminals (HD, SD) (p. 52)

TALLY signals are output here. When a television monitor equipped with a TALLY terminal is connected to the V-440HD, the V-440HD can then be used to activate the television monitor's TALLY lamp. Tally signals from the HD/RGB section are output from the TALLY HD terminal; tally signals from the SD section are output from the TALLY SD terminal. For descriptions of each terminals, refer to p. 52.

8. MIDI OUT/THRU Connector (p. 54)

Use this connector to connect the V-440HD to an external MIDI device and transmit MIDI messages to the other MIDI device. Use a MIDI cable (sold separately) to connect the devices. You can also use this connector as a THRU output for MIDI signals received at the MIDI IN connector.

9. MIDI IN Connector (p. 54)

Use this connector to connect the V-440HD to an external MIDI device and receive MIDI messages from the other MIDI device. Use a MIDI cable (sold separately) to connect the devices.

10. REMOTE Connector (p. 53)

Use this connector when using serial control from computers or other external devices. Refer to the chart of serial signals on p. 53.

11. Ground terminal

Depending on the circumstances of a particular setup, you may experience a discomforting sensation, or perceive that the surface feels gritty to the touch when you touch this device, microphones connected to it, or the metal portions of other objects, such as guitars. This is due to an infinitesimal electrical charge, which is absolutely harmless. However, if you are concerned about this, connect the ground terminal (see figure) with an external ground. When the unit is grounded, a slight hum may occur, depending on the particulars of your installation. If you are unsure of the connection method, contact the nearest Roland Service Center, or an authorized Roland distributor, as listed on the "Information" page. Unsuitable places for connection

- Water pipes (may result in shock or electrocution)
- Gas pipes (may result in fire or explosion)
- Telephone-line ground or lightning rod (may be dangerous in the event of lightning)

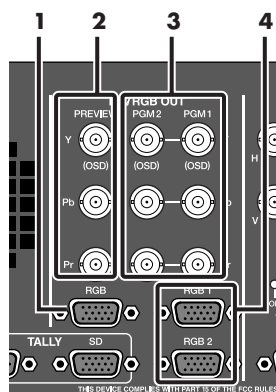
12. SECURITY Slot ()

<http://www.kensington.com/>

About the Preview Screen

The V-440HD's "Preview OUT" outputs video from the bus not being used to output from PGM OUT.

HD/RGB Output Section



1. RGB PREVIEW Connector (Analog RGB) (p. 20)

This is a D-Sub connector for outputting the RGB preview signal.

* *The video in the HD/RGB Preview screen is displayed with the P in P effect (p. 33) and other such effects applied.*

2. HD PREVIEW Connectors (Analog Component)..... (p. 20)

This is a set of BNC connectors for outputting the preview signal of HD as analog component video.

* *The video in the HD/RGB Preview screen is displayed with the P in P effect (p. 33) and other such effects applied.*

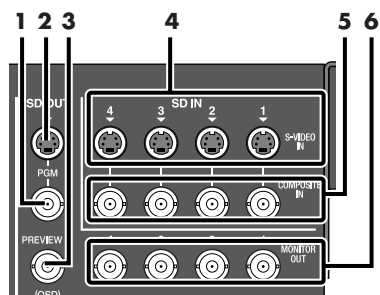
3. HD OUT 1, 2 Connectors (Analog Component)..... (p. 20)

These are BNC connectors for outputting the result of mixing/switching on the HD/RGB bus as analog component video.

4. RGB OUT 1, 2 Connectors (Analog RGB) (p. 20, p. 51)

The result of mixing/switching of the HD/RGB bus is output as RGB signals from these connectors.

SD Input/Output Section



1. SD PGM OUT COMPOSITE Connector (COMPOSITE).. (p. 20)

This connector outputs composite effects from the SD section as composite video signals. Video monitors equipped with a composite video input connector can be connected here.

2. SD PGM OUT S-VIDEO Connector (S-VIDEO) (p. 20)

This connector outputs composite effects from the SD section as S-video signals. Video monitors equipped with an S-Video input connector can be connected here.

3. SD PREVIEW OUT Connector (p. 20, p. 24)

The preview screen from the SD section is output from this connector. The menu (p. 24) is also displayed.

* *The video in the SD Preview screen is displayed without the P in P effect (p. 39) and other such effects applied.*

4. SD S-VIDEO IN 1–4 Connectors (p. 20, p. 29)

These are connectors for input of S-Video. Video devices equipped with an S-Video output connector can be connected here.

As initially set at the factory, when video is simultaneously being input to the SD COMPOSITE IN connector for the same channel, the video input to the SD S-VIDEO IN connector is given priority.

5. SD COMPOSITE IN 1–4 Connectors (Analog) ... (p. 20, p. 29)

These are connectors for input of composite video. Video devices equipped with a composite video output connector can be connected here.

As initially set at the factory, when video is simultaneously being input to the SD S-VIDEO IN connector for the same channel, the video input to the SD S-VIDEO IN connector is given priority.

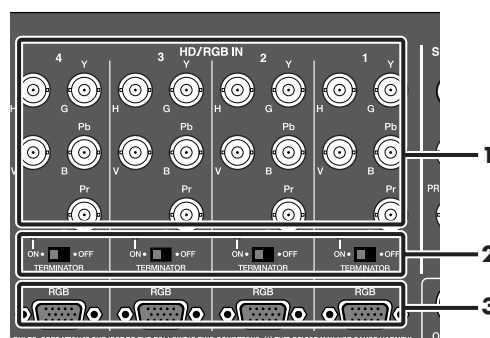
* *You can give priority to the SD COMPOSITE IN connectors. To make this setting, go to "7. SD Input" (p. 61) and select input channel in "1. SD Input Select" in the menu, then select "Composite."*

6. SD MONITOR OUT Output 1–4 Connectors (Analog Composite Video) ..(p. 20)

These BNC connectors output video from the SD S-VIDEO IN connectors or SD COMPOSITE IN connectors as composite video.

When the V-440HD is connected to a video monitor equipped with composite video input connectors, you can monitor the video of each channel.

HD/RGB Input Section



1. HD/RGB IN 1–4 Connectors (Analog Component/RGB) . (p. 20)

These are BNC connectors capable of being used for input of analog component signals or RGB signals.

If not inputting video, connectors to which no video is being input can be used as loop thru outputs for video input via the HD/RGB IN 1–4 connectors (analog RGB).

* *Video cannot be input via both the HD/RGB IN (BNC) connectors and IN (D-Sub) connectors simultaneously. Inputting video simultaneously in this manner may result in disruption of the video images.*

2. HD/RGB 75Ω TERMINATOR 1–4 Switches(p. 21)

Switch to ON if no cables are connected to either the HD/RGB IN (BNC) connectors or the HD/RGB IN (D-Sub) connector.

Switch to OFF if using these connectors as loop thru connectors.

3. HD/RGB IN 1–4 Connectors (RGB/Analog Component) . (p. 20, p. 51)

These are D-Sub connectors capable of being used for input of analog component signals or RGB signals.

If not inputting video, connectors to which no video is being input can be used as loop thru outputs for video input via the HD/RGB IN 1–4 connectors (analog component).

* *Video cannot be input via both the HD/RGB IN (BNC) connectors and IN (D-Sub) connectors simultaneously. Inputting video simultaneously in this manner may result in disruption of the video images.*

Connections and Settings

Making the Connections

To prevent malfunction and/or damage to TV monitors or other devices, always turn down the volume, and turn off the power on all devices before making any connections.

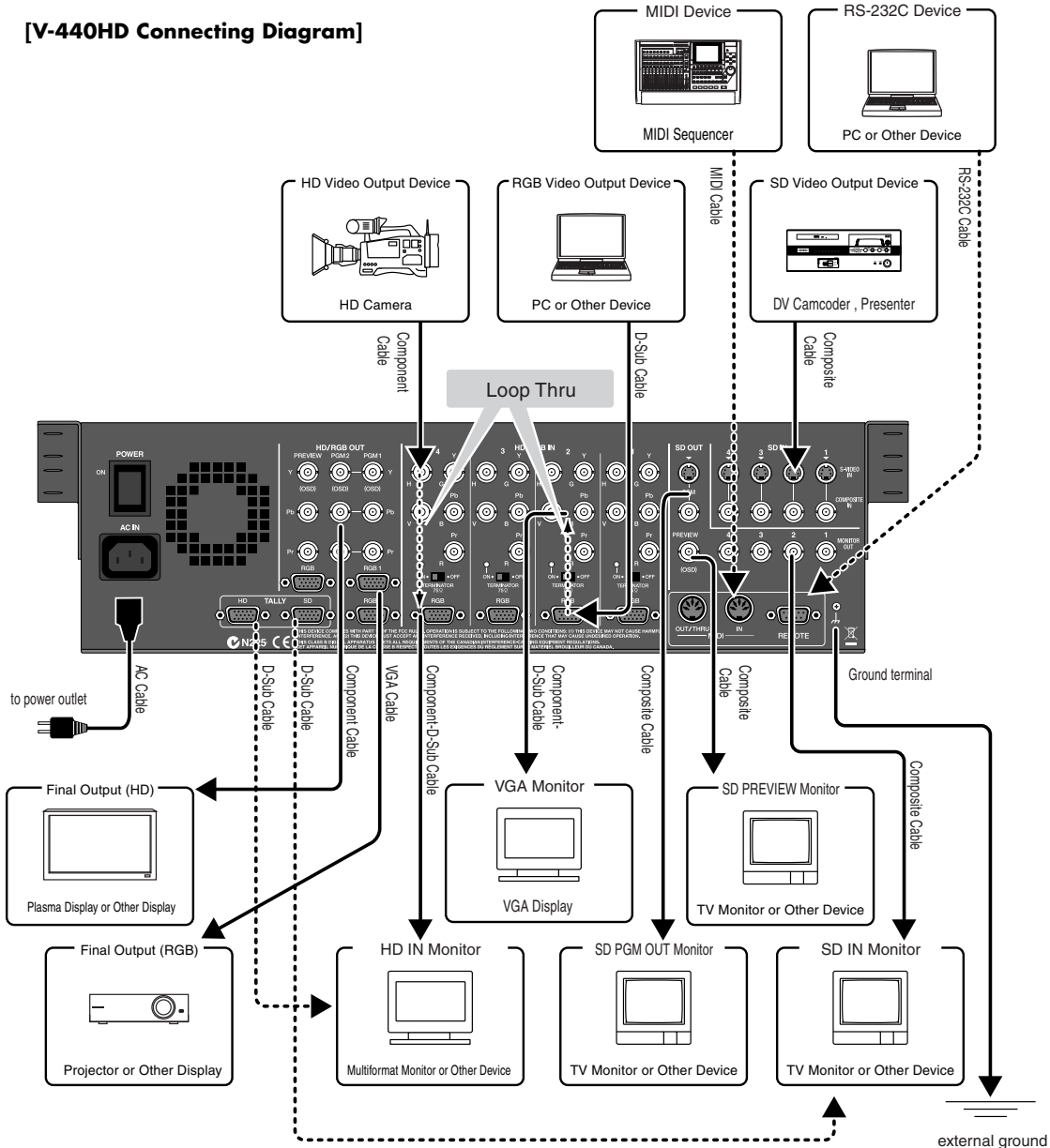
- 1** Before connecting the V-440HD, make sure that the power to all devices to be connected is turned off.
- 2** Connect the included power cord to the V-440HD's AC inlet, then connect the other end of the cord to a power outlet.
- 3** Connect the V-440HD to other devices as shown in the figure.

MEMO

HD/RGB IN Connectors

Make sure that the component Y, Pb, and Pr are properly connected when connecting component video to the HD/RGB IN BNC connectors. If connecting RGB video, connect R, G, B, H, and V. Failure to connect these properly may prevent output of the video or result in problems with the colors.

[V-440HD Connecting Diagram]



About Loop Thru

The HD/RGB IN connector (D-sub) and HD/RGB IN connector (BNC) for any particular channel are linked internally within the unit. So, for example, if analog component signals are input to the Channel 1 HD/RGB IN connector (D-sub), the same signals are output from the Channel 1 HD/RGB IN connector (BNC). This function is called "Loop Thru."

Using Loop Thru, you can monitor the video output of each video input on a television monitor, or even use the connections for multiscreen output.

However, the following precautions must be observed.

- Set the TERMINATOR 75Ω switch to on when Loop Thru function is not used

When not using Loop Thru, some devices will not function properly unless the TERMINATOR 75Ω switch is set to ON.

- Using more than one pass with Loop Thru may result in attenuation of the video

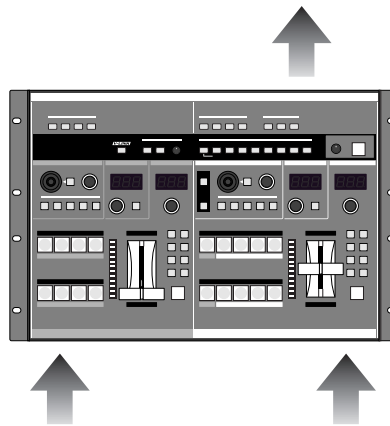
With three or more V-440HDs connected using Loop Thru, the video signal becomes more attenuated the further down the signal path the V-440HD is.

When using identical video with three or more V-440HDs, be sure to use a commercially available video multiplexer.

Precautions When Making Settings

The V-440HD is force cooled, using a cooling fan to dissipate high interior temperatures. Exterior air is drawn through the front panel intake vent and expelled from the rear panel exhaust vent (see figure).

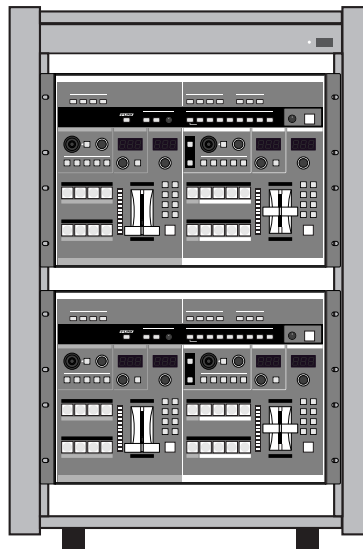
- Use a vacuum cleaner or other means to remove any dust that may accumulate in the intake and exhaust vents.



With Rack-Mounting and Other Enclosures

Observe the following precautions when mounting the V-440HD in a rack or portable case.

- Ensure that the location provides good air flow.
- If the rack's rear panel is not removable, ensure that there is a minimum of 10 cm clearance between the V-440HD's exhaust vent and the rack's rear panel, and that the top of the rack has a ventilation port or exhaust fan to expel any accumulated heat.
- If mounted in a portable case, ensure that the intake vent is not obstructed.
- Use due caution when mounting the V-440HD in a rack or other enclosure so your fingers don't get wedged or pinched between the V-440HD and the rack or enclosure.

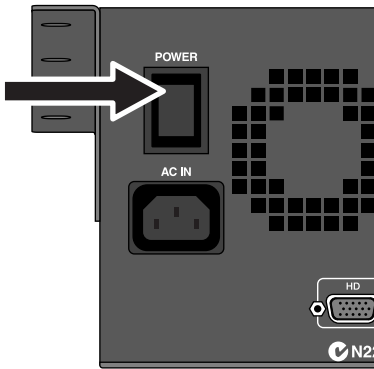


Basic Operation

Turning On the Power

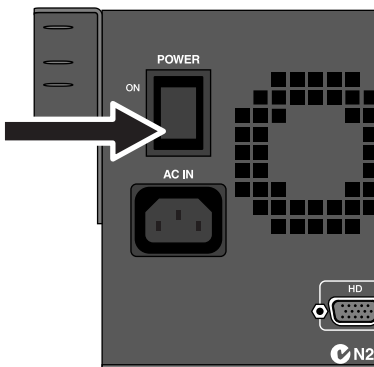
- Once the connections have been completed (p. 20), turn on power to your various devices in the order specified. By turning on devices in the wrong order, you risk causing malfunction and/or damage to TV monitors and other devices.
- This unit is equipped with a protection circuit. A brief interval (a few seconds) after power up is required before the unit will operate normally.

- Before turning on the power, confirm that all other devices are properly connected.
- Switch the POWER switch on the V-440HD's rear panel to ON.



Turning Off the Power

- Switch the POWER switch on the V-440HD's rear panel to OFF.



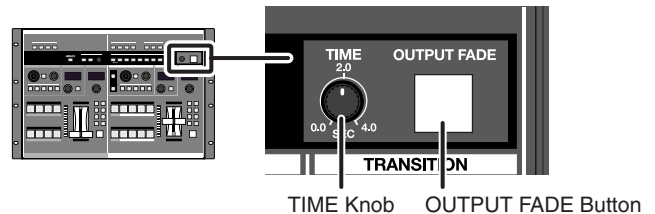
If you need to turn off the power completely, first turn off the POWER switch, then unplug the power cord from the power outlet. Refer to "Making the Connections" (p. 20).

Outputting and Stopping the Final Output

To output and stop the V-440HD's final output, use the OUTPUT FADE button. You can have the final output fade out over the period set with the TIME knob by pressing the OUTPUT FADE button. This period can be set from 0.0 seconds to 4.0 seconds. Pressing the OUTPUT FADE button after the final output has faded out causes the video to fade in again.

MEMO

If you are not going to fade the final output in or out, set the TIME knob to 0.0.



MEMO

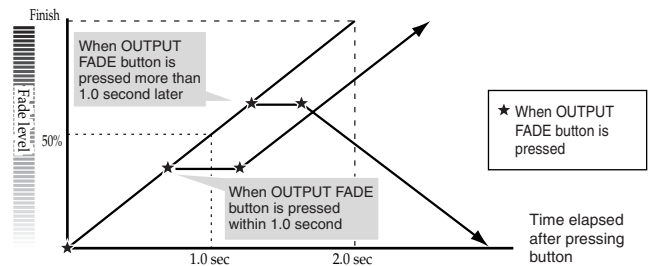
When the OUTPUT FADE button is pressed while a fade-out or fade-in is in progress, the fade-out or fade-in stops at that point. Pressing the OUTPUT FADE button once more starts the fade-out or fade-in again.

Operation when the OUTPUT FADE Button Is Pressed

ver 2.0

If the OUTPUT FADE button is pressed a second time while the video is fading, the output image will be switched as described below.

Response When OUTPUT FADE Button Is Pressed a Number of Times
(Figures show operation with TRANSITION TIME set to 2.0 seconds)



* You can set the operation mode of the OUTPUT FADE button. For more details refer to "OUTPUT FADE Button Operational Mode" (p. 58).

Making the Fade-out Settings

The fade-out settings are made with "12. Output Fade Mode," "13. Output Fade Color," and "14. Output Fade Sw Motion" under "1. HD/RGB Output" in the menu (p. 24). For more details, refer to p. 58.

Output Fade Mode	Sets the final output fade control
Output Fade Color	Sets the final output fade color
Output Fade Sw Motion	Fade-out operation setting

* For more on the menu, refer to "Menu Operations" (p. 25).

* You can move the cursor to the "12. Output Fade Mode" parameter under "1. HD/RGB Output" in the menu by holding down the MENU button and pressing the OUTPUT FADE button.

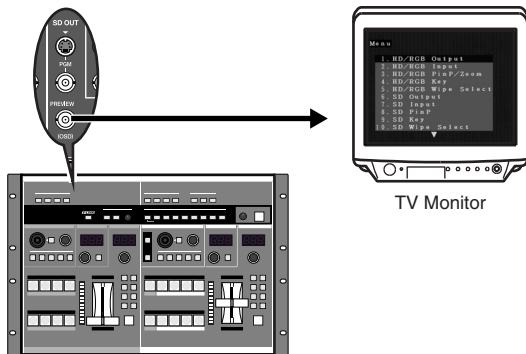
Basic Operation

Making Various Settings

The V-440HD's various settings are set from the menu. The menu is displayed on the video monitor connected to the SD PREVIEW OUT connector.

Displaying Menus

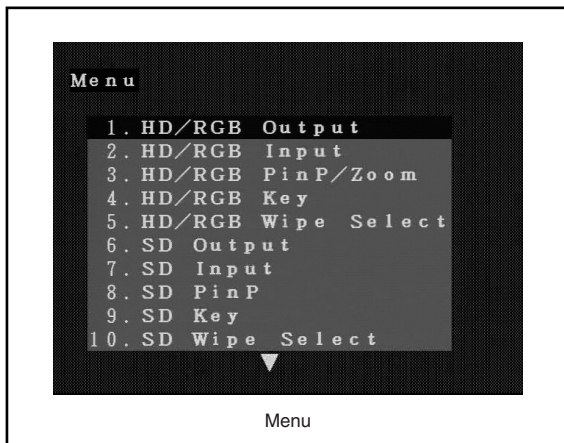
Press the MENU button to display the menu on the video monitor connected to the SD PREVIEW OUT connector.



MEMO

By holding down the SHIFT button and pressing the MENU button, you can overlay the menu on the video from the HD OUT connectors and HD PREVIEW OUT connectors, or from the RGB OUT connectors and RGB PREVIEW OUT connectors.

- * Depending on the RGB output settings, the size of menu characters displayed via the RGB OUT/HD OUT connector may change.
- * This is a shortcut for switching the "11. HD On Screen Display" function in "13. System" (p. 64) on and off.

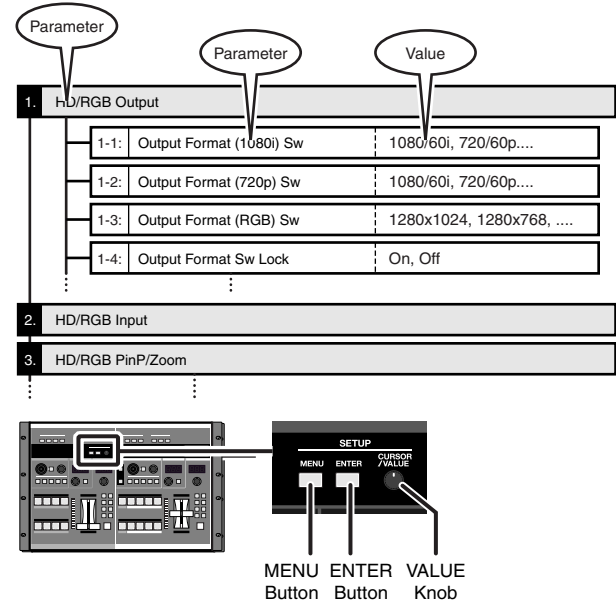


	Parameters Shown in Menu	Notes	Related Page
1	HD/RGB Output	Settings for the final output	p. 58
2	HD/RGB Input	Settings for the input from the HD/RGB IN connectors	p. 59
3	HD/RGB PinP/Zoom	Settings for the HD/RGB section's P in P effect	p. 60
4	HD/RGB Key	Settings for the HD/RGB section's key composite effects	p. 60
5	HD/RGB Wipe Select	Settings for the TRANSITION buttons' (HD/RGB) WIPE PATTERN 1-6	p. 61
6	SD Output	Settings for the SD section's output are made here	p. 61
7	SD Input	Settings for the input from the SD IN connectors	p. 61
8	SD PinP	Settings for the SD section's P in P effect	p. 62
9	SD Key	Settings for the SD section's key composite effects	p. 62
10	SD Wipe Select	Settings for the TRANSITION buttons' (SD) WIPE PATTERN 1-6	p. 62
11	Panel Preset Edit	Screen for managing Panel Presets	p. 63
12	Multi Screen	Settings for the Multi Screen output	p. 63
13	System	The V-440HD's system settings	p. 64
14	MIDI Setup	MIDI-related settings	p. 65
15	Factory Reset	This restores the V-440HD to its original factory default settings.	p. 65

About the Menu Hierarchy

The V-440HD's menus are organized as shown in the figure below. The lowest level is where numerical values and other parameter values are selected.

Press the ENTER button to go to a lower level in the menu. Press the MENU button to move up a level.



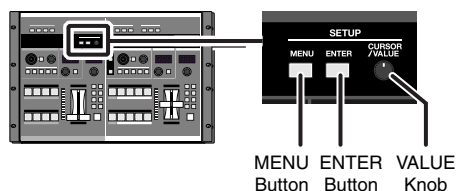
Closing the Menu

To close the menu, press the MENU button while the topmost level is displayed.

Menu Operations

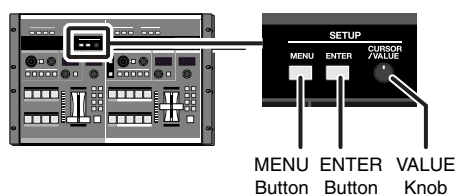
Moving the Cursor and Selecting

Rotate the VALUE knob to move the cursor up and down. The parameter at the cursor position flashes, indicating that the parameter is selected. When selecting numerical or other parameter values, change the value at the cursor position.



Confirming Parameter Selections

Move the cursor to the desired parameter, and confirm selection of the parameter by pressing the ENTER button. When the parameter is selected, the cursor shifts to the next lower line.



Saving Settings Selected in the Menu

Settings are saved in the V-440HD's internal memory by pressing the MENU button a number of times until the menu is closed.

Returning the Settings Made in the Menus to Their Initial Values

To restore the factory preset values of the menu, perform the following procedure.

Returning All Settings to the Original Factory Settings

Select "15. Factory Reset" from the menu; all settings are returned to the original factory presets.

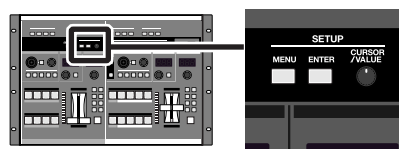
Restoring the Settings for Individual Items

ver2.0

Select "Reset" for the desired item in the menu; the settings for that item are returned to the original factory presets.

Shortcuts to the Menu Parameters

You can easily open parameters corresponding to buttons in the menu by holding down the MENU button and pressing the button for the corresponding settings parameter.



Shortcuts are used with the following buttons.

Button name	Parameter displayed by Shortcut	Related Page
SD IN Button 1-4	7. SD Input (p. 61)	p. 29
HD/RGB IN Button1-4	2. HD/RGB Input (p. 59)	p. 27
OUTPUT FORMAT Button	1. HD/RGB Output (p. 58)	p. 26
OUTPUT FADE Button	1. HD/RGB Output (p. 58)	p. 26
P in P PATTERN Button (SD) 1-5	8. SD PinP (p. 62)	p. 39
P in P PATTERN Button (HD/RGB) 1-5	3. HD/RGB PinP/Zoom (p. 60)	p. 33
KEY ON Button (SD)	9. SD Key (p. 62)	p. 41
KEY ON Button (HD/RGB)	4. HD/RGB Key (p. 60)	p. 36
TRANSITION Button (SD) * WIPE PATTEN1-6	10. SD Wipe Select (p. 62)	p. 38
TRANSITION Button (HD/RGB) * WIPE PATTEN1-6	5. HD/RGB Wipe Select (p. 61)	p. 31
SHIFT Button	* See p. 24	p. 24

Double-Clicking Button to Open Related Menu

ver2.0

When "16. Double Click Short Cut" under "13. SYSTEM" in the menu is set to ON, you can open the related menu by double-clicking a button.

MEMO

The V-440HD interprets pressing of the same button more than once within 0.2 seconds as double-clicking.

MEMO

To use this function to close a menu that has been called up, double-click the button used to call up the menu once again.

NOTE

When using the "Memo" function described on p. 24 to set the display of the menu in the HD/RGB output, proceed slowly, allowing at least 0.2 seconds to elapse after the moment you press the V-440HD's buttons.

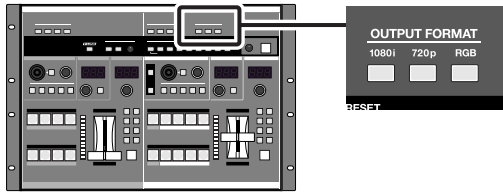
Note that pressing the buttons too soon will cause the menu to appear in the HD/RGB OUT.

Input and Output Settings

Since the V-440HD is capable of handling video input and output with entirely different formats, it may be necessary to make adjustments for the differences of resolution and aspect ratio. The appropriate input/output settings should be made, ones which suit the source and output devices connected to the V-440HD.

Selecting the Output Format

Press an OUTPUT FORMAT button to select the format for the video output from the HD OUT connectors (p. 19) or RGB OUT connectors (p. 19). The selected button lights up.



Button	Output Format (Factory Default Setting)	Output Connectors (Factory Default Setting)
1080i	1080/60i (59.94i)	HD OUT Connectors 1, 2 (not output from RGB OUT connectors 1, 2)
720p	720/60p (59.94p)	HD OUT Connectors 1, 2 (not output from RGB OUT connectors 1, 2)
RGB	1024x768/60	RGB OUT Connectors 1, 2 (not output from HD OUT connectors 1, 2)

* The formats shown above are the factory default settings. You can also select output formats other than these. For more details, refer to "About the Final Output Format" (p. 58).

Start with the Output Settings

When making these settings, start by making the output settings first. Setting the output after making the input settings will result in discrepancies in the color and angle of view if the input video is switched to a format other than those used in the output settings.

About Delayed Output

Note that, due to the process of up-converting and down-converting processes, the use of multiple formats with the V-440HD will result in a lag of several frames.

[Approximate Delays]

Input/Output	SD PGM Out	HD Out / RGB Out
SD Input	1 frame	2 frames
HD/RGB Input	---	1 frame

These delays may cause discrepancies in the timing of the external audio and the video processed by the V-440HD. In such a case you might use an audio delay line in order to synchronize the video and audio.

Making the Output Settings

Make the output settings with "1. HD/RGB Output" in the menu. The menu is displayed in the SD video output from the SD PREVIEW OUT connector.

- * For more on the menus, refer to "Menu Operations" (p. 25).
- * To rapidly get to the output settings menu, hold down the MENU button and press one of the OUTPUT FORMAT buttons.

1. HD/RGB Output Settings Parameters	
Output Format (1080i) Sw	Video format assigned to OUTPUT FORMAT (1080i) button
Output Format (720p) Sw	Video format assigned to OUTPUT FORMAT (720p) button
Output Format (RGB) Sw	Video format assigned to OUTPUT FORMAT (RGB) button
Output Format Sw Lock	OUTPUT FORMAT button lock
Zooming	Final output scaling adjustment
Bright	Final output brightness adjustment
Contrast	Final output contrast adjustment
Saturation	Final output saturation adjustment
Red	Final output red adjustment
Green	Final output green adjustment
Blue	Final output blue adjustment
Output Fade Mode	Final output fade control adjustment
Output Fade Color	Final output fade color setting
Output Fade Sw Motion	Selects the operation mode when OUTPUT FADE button is pressed
Test Pattern Select	Selects the Test Pattern to output
HD/RGB Reset	Resets the above settings to the original factory settings

About the Output Format

The V-440HD handles output in the following formats

[HD OUT]

The HD output formats feature frame rate settings of 60 and 50. The frame rate used in the United States and Japan (NTSC regions) is 60; in Europe (PAL regions), the frame rate is 50. The frame rate can be switched using the procedure described on p. 49.

60 - NTSC	50 - PAL
1080/60i	1080/50i
720/60p	720/50p
480/60p	576/50p
480/60i	576/50i

* The frame rate of 59.94 is shown as 60 in the menu of this unit.

[RGB OUT]

1366x768/75	1280x768/60	800x600/60
1366x768/60	1024x768/75	640x480/75
1280x1024/60	1024x768/60	640x480/60
1280x768/75	800x600/75	

* Units: [horizontal (pixels) x vertical (lines) / frame rate (Hertz)].

About NTSC and PAL SD Output

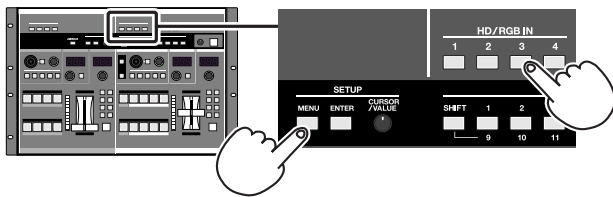
Either NTSC or PAL can be selected for the SD section's input and output. For instructions on making the settings, refer to "Switching Between NTSC and PAL" (p. 49). Additionally, the HD OUT output format frame rate is determined by the format set here.

Setting the HD/RGB Input

With the HD/RGB inputs, the image's dimensions and color may vary with each individual format and/or device, so it may be necessary to make separate settings for each input individually. The default factory setting for the HD/RGB input format is "AUTO," whereby the settings are determined automatically.

Settings

Make the HD/RGB video settings with "2. HD/RGB Input" in the menu. With "2. HD/RGB Input," you can select from the HD/RGB Channel A/B and 1-4, and set the following parameters.



- * For more on the menus, refer to "Menu Operations" (p. 25).
- * To quickly go to the input settings menu, hold the MENU button and press any of the HD/RGB Buttons 1-4.

2. HD/RGB Input Settings Parameters	
Format Auto Detect	Function automatically distinguishes input
Input Format	Input format select
Pre Scaling Mode	Switches scaling adjustment function on and off
Manual Pre Scaling	Adjusts scaling ratio when full scaling used
Scaling Type	Scaling method
Manual X Scale	Adjusts the horizontal expansion ratio
Manual Y Scale	Adjusts the vertical expansion ratio
X Position	Fine adjustment of the horizontal start position
Y Position	Fine adjustment of the vertical start position
Brightness	Brightness adjustment
Contrast	Contrast adjustment
Saturation	Saturation adjustment
Red	Red adjustment
Green	Green adjustment
Blue	Blue adjustment
Frequency	Fine adjustment of the Sampling Frequency
Phase	Fine adjustment of the Sampling Phase
Sw Enable	Selects Enable or Disable for the selected channel button
Input Ch Reset	Resets the above settings to the original factory settings

About HD Input

The V-440HD is compatible with the following HD signal formats.

- 1080 59.94i / 50i: (SMPTE 274M)
- 720 59.94p / 50p: (SMPTE 296M)

About RGB Input

The V-440HD is compatible with the following RGB signal formats.

- 640x480 60 / 75Hz
- 800x600 60 / 75Hz
- 1024x768 60 / 75Hz
- 1280x768 60 / 75Hz
- 1280x1024 60Hz

- * Units: [horizontal (pixels) x vertical (lines) / frame rate (Hertz)].
- * Certain signal conditions may produce differences in the aspect ratio and position of the RGB input. If this occurs, make adjustments with the "X position," "Y position," "Frequency," "Phase" or other relevant settings from the menu.

Automatic setting for the RGB input

ver 2.0

Hold down the HD/RGB IN button corresponding to the RGB signal being input for at least 3 seconds; the V-440HD automatically detects the signal being input and makes the appropriate settings. When the signal detection is completed, all of the HD/RGB buttons flash.

About the Input Video Aspect Ratio

The V-440HD is capable of simultaneously handling video images in differing formats and with different aspect ratios (the ratio of the vertical and horizontal dimensions). The V-440HD outputs video by scaling (enlarging/reducing) the input video so it matches the output format.

* For more on output formats, refer to "Selecting the Output Format" (p. 26).

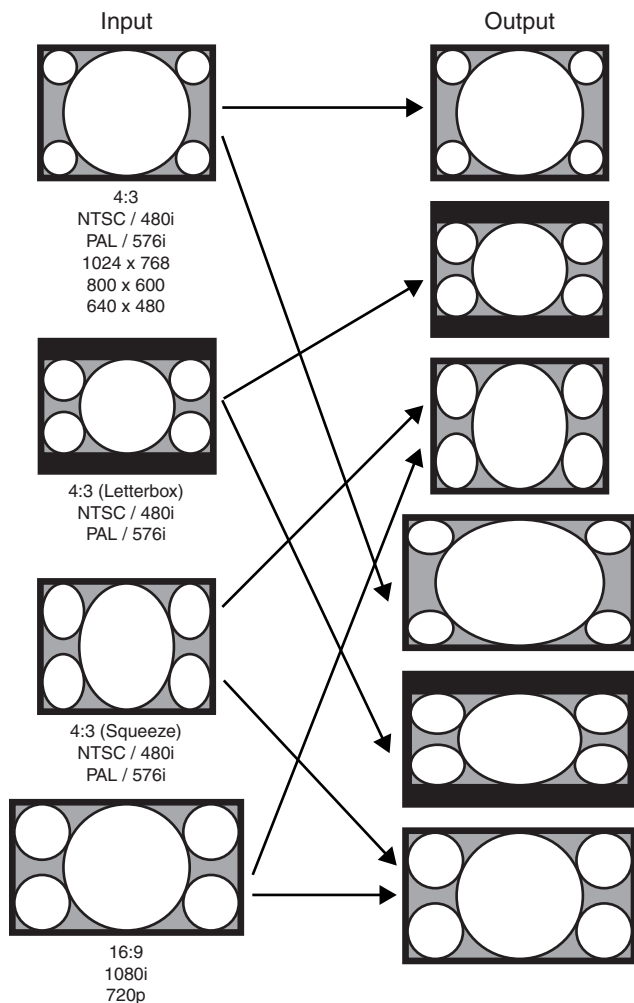
You can select the type of scaling for the video with the following procedure.

1. Press the MENU button.
2. Select "2. HD/RGB Input."
3. Press the ENTER button.
4. Select the channel in which you want to make the settings from "HD/RGB ChA/B"-"HD/RGB Ch4."
5. Press the ENTER button.
6. Select "5. Scaling Type."
7. Press the ENTER button.
8. Select the scaling method.

Select the most suitable scaling type from the menu, selecting from "Full Scale," "Fixed Aspect: Letter," "Fixed Aspect: Crop," or "Manual." The initial setting is "Full Scale."

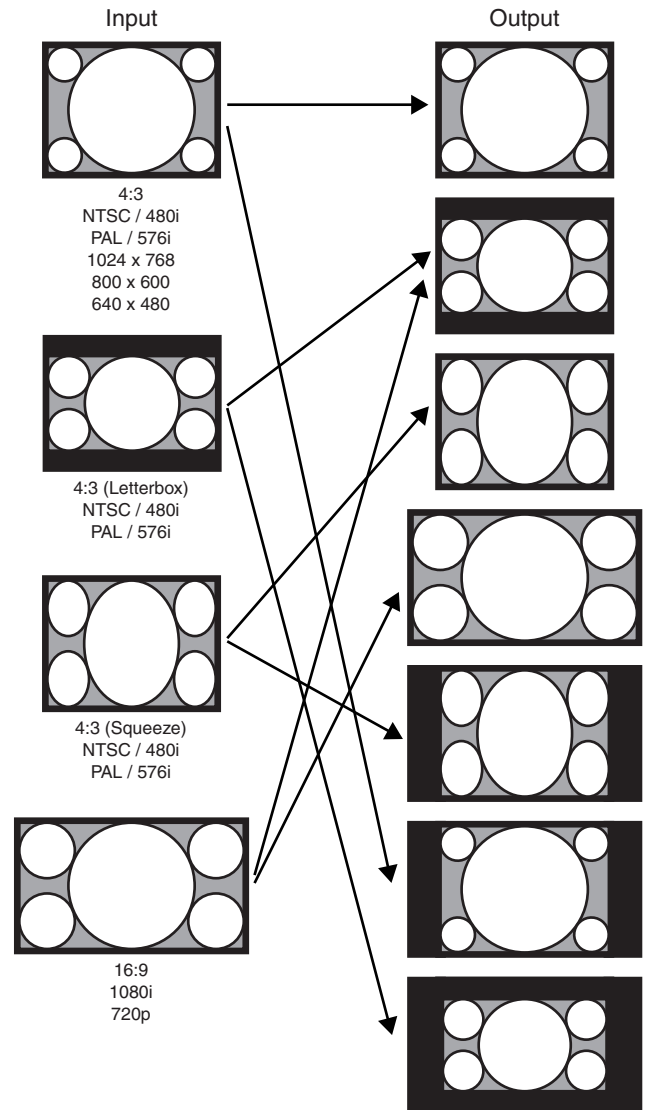
Full Scale

The aspect ratio of the input video is automatically adjusted to conform to the output aspect ratio, with the images displayed in the entire screen (refer to figure below).



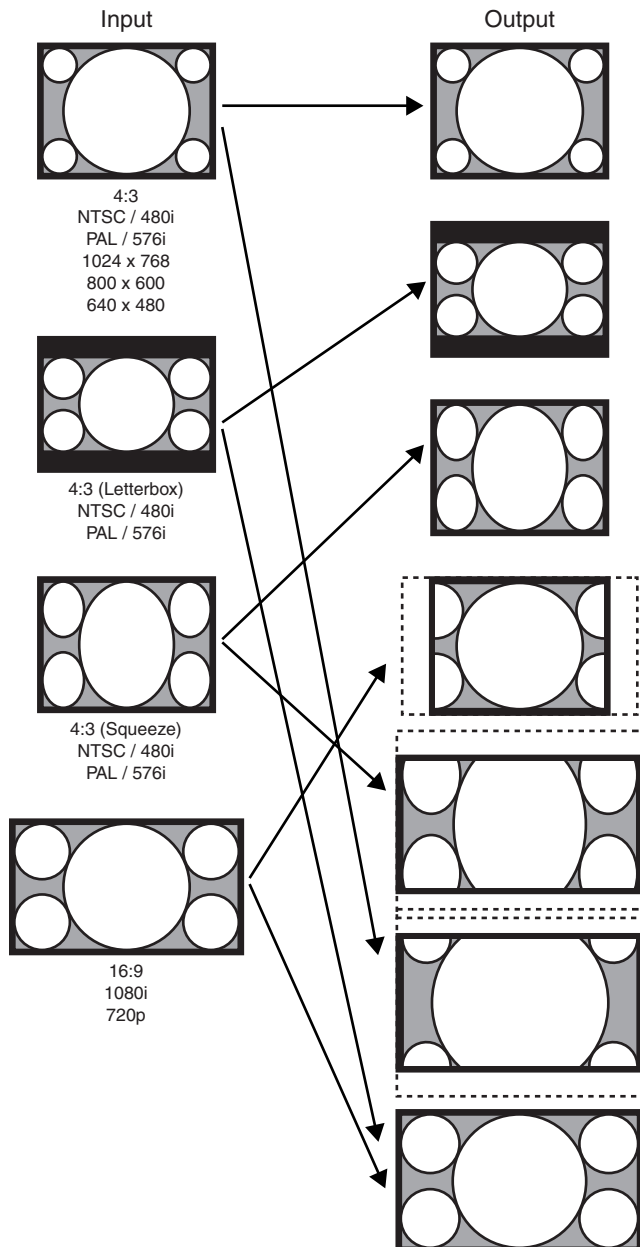
Fixed Aspect: Letter

When "Fixed Aspect: Letter" is selected, the aspect ratio of the input video is maintained, and the images are sized to fit within the screen (refer to figure below). Black matte video appears in parts of the screen not occupied by the video image.



Fixed Aspect: Crop

When "Fixed Aspect: Crop" is selected, the aspect ratio of the input video is maintained, and the images are sized to fit within the screen (refer to figure below). However, if the aspect ratio of the input video differs from the output aspect ratio, a portion of the video image is cropped, and the cropped portion is not displayed.



Manual

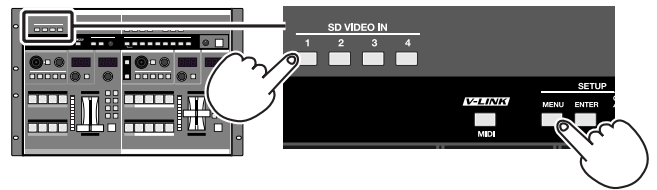
In cases where you are unable to achieve the optimal aspect ratio using either "Full Scale," "Fixed Aspect: Letter," or "Fixed Aspect: Crop," use "Manual" in "5. Scaling Type" to adjust the aspect ratio manually. After selecting "Manual" with the procedure described on p. 28, press the MENU button and adjust the horizontal and vertical dimensions with "6. Manual X Scale" and "7. Manual Y Scale" and adjust the position with the "8. X Position" and "9. Y Position" settings.

Setting the SD Input

Although the SD input is in a fixed format, there may be differences in the type of device used or physical differences, and it may be necessary to set each input individually.

Settings

Make the SD video settings in the menu with "7. SD Input." In "7. SD Input," you can select from the SD Channel 1-4, and make settings the parameters listed below.



- * For more on the menus, refer to "Menu Operations" (p. 25).
- * To quickly go to the Input settings menu, hold down the MENU button and press any of the SD IN buttons 1-4.

7. SD Input Settings Parameters

SD InputSelect	Selects S-Video or composite for the SD input
SD Brightness	Brightness adjustment
SD Contrast	Contrast adjustment
SD Saturation	Saturation adjustment
SD Hue	Hue adjustment
SD Sw Enable	Selects Enable or Disable for the selected channel button
SD Reset	Resets the above settings to the original factory settings

About SD Input

The V-440HD is compatible with the following SD signal formats.

- NTSC 59.94 Hz Composite video format
S-Video format
- PAL 50 Hz Composite video format
S-Video format

MEMO

Select either NTSC or PAL for use with the V-440HD. For instructions on setting the SD signal format to be used, refer to "Switching Between NTSC and PAL" (p. 49).

Inputting Analog Component SD Video

To input SD video to the V-440HD as analog component video, input to the HD/RGB IN BNC connectors. In this case, the input SD video is handled in the HD/RGB section.

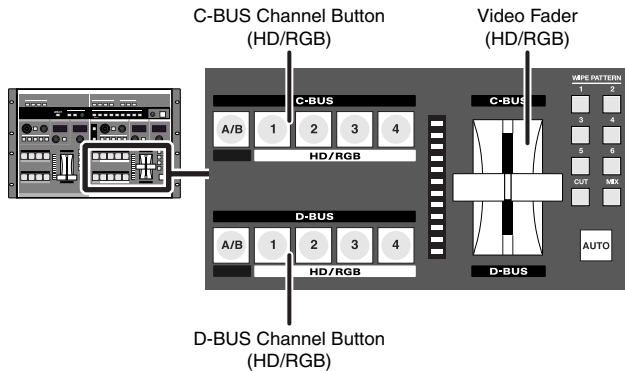
With analog component input, no interlace to progressive conversion is performed. We recommend that a progressive signal (480p/576p) be employed for the SD video input.

HD/RGB Section Operations

In the HD/RGB section, you can switch and compose HD and RGB video and the final video output from the SD section (SD PGM video).

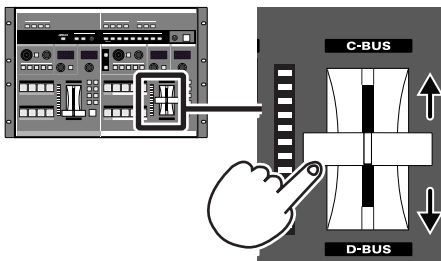
Switching in the HD/RGB Section

Using the V-440HD's video fader (HD/RGB) along with the C-BUS channel buttons (HD/RGB) and D-BUS channel buttons (HD/RGB), you can switch between HD, RGB, and SD video input. Each type of video being input is indicated in the input settings (p. 27).



Switching Buses with the Video Fader (HD/RGB)

When the video fader (HD/RGB) is tilted towards the C-BUS, the video on the C-BUS is output. Similarly, when the video fader (HD/RGB) is tilted towards the D-BUS, the video on the D-BUS is output.



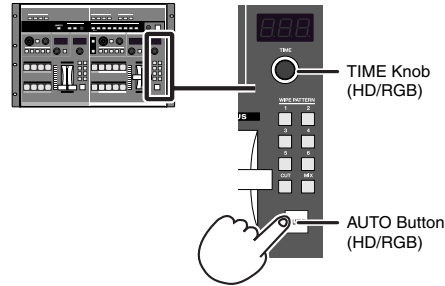
* For instructions on selecting the video on the C-BUS and D-BUS, refer to "Selecting the Bus Input (HD/RGB)" (p. 32).

MEMO

To confirm (preview) the video in the bus opposite that to which the video fader (HD/RGB) is tilted, connect a television monitor either to the "RGB PREVIEW connector (Analog RGB)" (p. 19) or the "HD PREVIEW connector (Analog Component)" (p. 19). As the HD/RGB section can be used to switch video in a variety of different formats, some time may be required to lock the video signals when switching channels with the C-BUS channel buttons (HD/RGB) and D-BUS channel buttons (HD/RGB). Thus, we recommend using Preview to confirm the video when using the video fader (HD/RGB) to switch the video.

Switching Buses with the AUTO Button (HD/RGB)

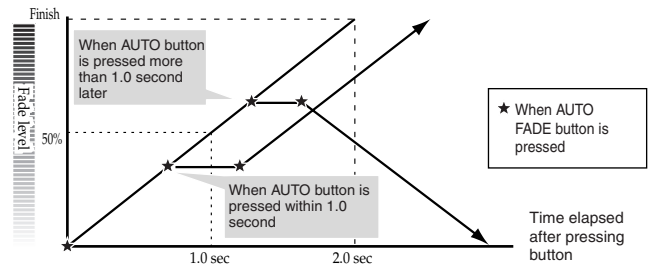
The C-BUS and D-BUS switch automatically when the AUTO Button (HD/RGB) is pressed. The time used for switching between the C-BUS and D-BUS is set by rotating the TIME knob (HD/RGB). The time set with the TIME knob (HD/RGB) is indicated in the HD/RGB TRANSITION TIME display. The time can be set to any value from 0.0 to 4.0 sec.



Operation when the AUTO Button Is Pressed

If the AUTO button is pressed a second time while the video is switching, the output image will be switched as described below.

Response When AUTO Button Is Pressed a Number of Times
(Figures shows operation with TRANSITION TIME set to 2.0 seconds)



* You can set how operations are performed when the AUTO button is pressed. For more details, refer to "AUTO Button Operation Mode" on this page.

AUTO Button Operation Mode

ver 2.0

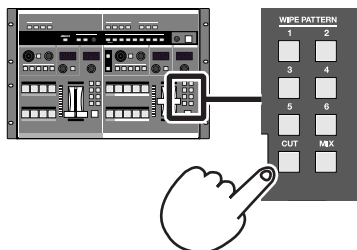
You can switch the operational mode to be used when you press the AUTO button for "17. Autotake Sw Motion" under "13. System" in the menu (p. 24).



Mode Name	When Pressed During Operation	Pressed During Operation and Pressed Again
Change (Initial setting)	Stops	Returns in response to level
Continue	Stops	Continues in same direction as that before stopping
Jump	Forces execution of the operation	---
Cancel	Cancels the operation and returns you to the previous step	---

* When "PGM-PST Mode" is selected in "Changing the Switching Method" (p. 32), then even if Change is selected, operation will in fact be the same as if Continue were selected.

Selecting the Effect Applied when Switching Buses (HD/RGB)

The effect applied when switching the video is selected by pressing the TRANSITION buttons (HD/RGB).









Button	Function	Description
CUT	Cut switching	The video switches when the video fader (HD/RGB) reaches the halfway point.
MIX 	Dissolve switching	The video is mixed as it gradually switches according to the angle of the video fader (HD/RGB).
WIPE PATTERN 1-6 	Wipe switching	The video switches with a wipe effect, with the wipe corresponding to the angle of the video fader (HD/RGB). *This cannot be used when the P in P effect (p. 33) is being used. If the P in P effect is in use when WIPE PATTERN 1-6 is selected, MIX is selected automatically.

Customizing Wipe Transitions

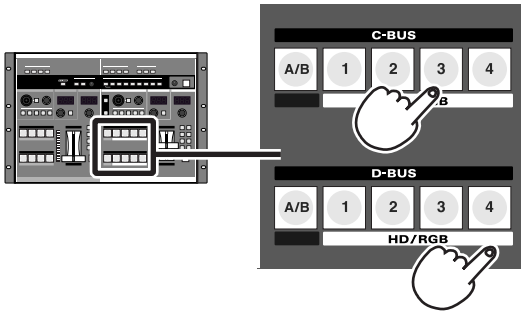
The wipe switching effects assigned to the TRANSITION (HD/RGB) WIPE PATTERN 1-6 buttons can be set from the menu. You can make settings for the wipe pattern, direction, and soft edge, and combine these settings in various ways to create customized wipe transitions.

- * For more on the menus, refer to "Menu Operations" (p. 25).
- * When key composite effect (p. 36) is in use, you can not use the soft edge.

Wipe Patterns	
Horizontal	
Vertical	
Horizontal Open	
Vertical Open	
Box	
Cross	

Selecting the Bus Input (HD/RGB)

The video used on the C-BUS is selected by pressing the C-BUS channel buttons (HD/RGB) 1–4 and A/B button. In the same manner, the video used on the D-BUS is selected by pressing the D-BUS channel buttons (HD/RGB) 1–4 and A/B button.



MEMO

When video is switched using the C-BUS channel buttons (HD/RGB) or D-BUS channel buttons (HD/RGB), a period of time corresponding to several frames is required to switch the video in each bus. This is due to the time required to lock the video signals when the formats for the video input in each channel are switched. To reduce the length of time taken, adjust the following items from the menu.

- * When you want to switch channels rapidly, use the video fader (HD/RGB) (p. 30).
- * Depending on the settings for the following menu items, noise may be generated when the video is switched. Set the values to provide ample leeway to avoid this problem.
- **“HD/RGB Input” - (Each channel)**
 - [1. Format Auto Detect]

If “Auto” is set, set this to “Manual” and then select the format for the video being input.
 - [2. Input Format]

Select the format for the video being input.
- **“13. System”**
 - [9. HD Seamless Delay Time]

Keep the time setting somewhat short. The unit of time is the field.

MEMO

ver 2.0

As programmed at the factory, the V-440HD’s C-BUS channel buttons (D-BUS channel buttons) light yellow for PGM output and green for preview output. You can change these colors with the “15. InputSw LED Color” setting under “13. SYSTEM” in the menu.

MEMO

ver 2.0

If you hold down one C-BUS channel button while you press a different C-BUS channel button, the output image switches to that of the button pressed later. If you release the button pressed later, the output image returns to that of the button you are holding down. The same operation is possible with the channel buttons of D-BUS.

MEMO

ver 2.0

You can disable the operation of any desired button by setting “18. Sw Enable” under “2. HD/RGB Input” in the menu.

Changing the Switching Method

ver 2.0

Version 2.0 of V-440HD provides the PGM-PST (flip-flop) method of operation employed by many professional-grade switchers.

Use the following procedure to switch the method of operation.

1. Press the MENU button.
2. Select “13. System.”
3. Press the ENTER button.
4. Select “14. Panel Operation Mode.”
5. Press the ENTER button.
6. Select “PGM-PST Mode.”

MEMO

The “A/B Mode” is also referred to as the “butterfly” method.

MEMO

When “PGM/PST” is selected, then even if “Change” is selected as the “Operation when the AUTO Button Is Pressed” (p. 30), operation will in fact be the same as if “Continue” were selected.

Flip-Flop Operational Method

ver 2.0

C-BUS Channel Buttons (HD/RGB) (p. 32)

These select the PGM output from the HD/RGB section.

D-BUS Channel Buttons (HD/RGB) (p. 32)

These select the Preview output from the HD/RGB section.

- * This may be referred to as the “preset” with other manufacturer’s equipment.

AUTO Button (HD/RGB) (p. 30)

This switches the video selected with the C-BUS and D-BUS channel buttons.

- * This performs the same function as the “TAKE” button on other manufacturer’s devices.
- * When a wipe switch is selected, the wipe is fixed in one direction.

Video Fader (HD/RGB) (p. 30)

This switches the video selected with the C-BUS and D-BUS channel buttons, regardless of the direction in which the fader is tilted.

- * When a wipe switch is selected, the wipe is fixed in one direction.

P in P PATTERN Button (HD/RGB) (p. 33)

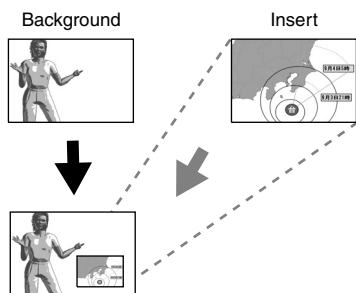
This places the video selected with the D-BUS channel buttons in the sub screen, regardless of the direction in which the fader is tilted.

KEY ON Button (HD/RGB) (p. 36)

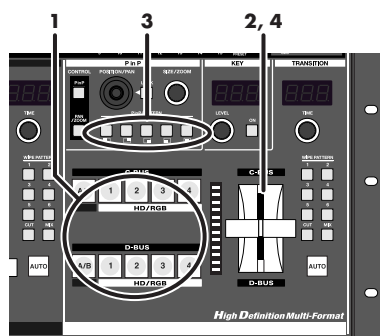
This applies key composite effects to the video selected with the D-BUS channel buttons, regardless of the direction in which the fader is tilted.

HD/RGB Section P in P Effects

P in P (Picture in Picture) effects are applied to the video on the C-BUS or D-BUS. The video on the bus to which the P in P effect is applied appears as a smaller sub-screen displayed in reduced size over the video on the other bus.



Procedure for Setting the HD/RGB Section P in P Effect



1. Select the video to include in the sub-screen with the C-BUS channel buttons (HD/RGB) (or D-BUS channel buttons (HD/RGB)).
2. Tilt the video fader (HD/RGB) to the opposite side from that of the bus selected in Step 1.
3. Press a P in P PATTERN button (HD/RGB).
The button or buttons pressed in Step 1 flash. At this point, a button flashing indicates that the P in P effect is being applied to the video assigned to that button.

Button	Sub-Screen Position (Factory Setting)
1	Upper left
2	Upper right
3	Lower right
4	Lower left
5	Center

4. Tilt the video fader (HD/RGB) to the opposite direction.
The video assigned to the channels corresponding to the flashing buttons in Step 3 appears as the sub-screen.

* When key composite effects are in use, the P in P effect is applied to the selected bus, regardless of the video fader (HD/RGB) position.

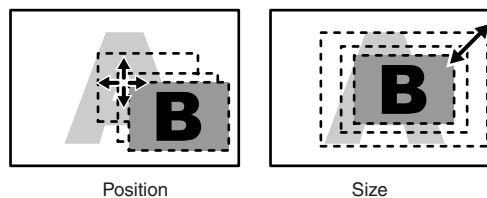
- * Use of the C-BUS channel buttons (HD/RGB) (or D-BUS channel buttons (HD/RGB)) while combining video with the P in P effect may result in disruption of the video image.
- * Wipe Patterns 1–6 cannot be selected with the "TRANSITION buttons (HD/RGB)" (p. 31) while the P in P effect is in use.

Terminology Used with the P in P Effect

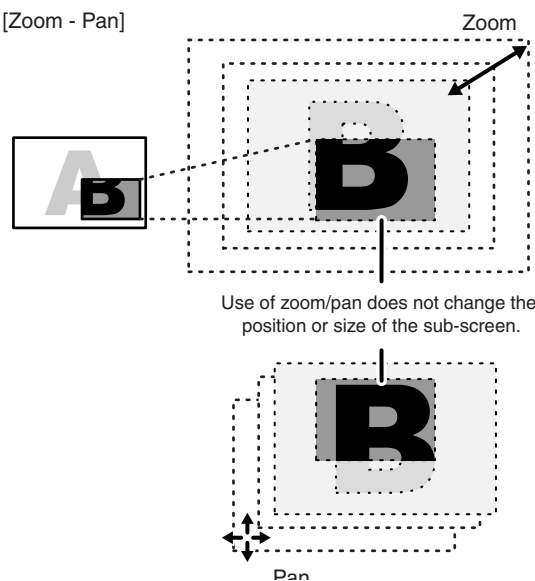
The following terminology is used in describing the V-440HD's P in P effect.

- Position: positioning of the sub-screen
- Size: size of the sub-screen
- Zoom: Magnification of the video in the sub-screen (HD/RGB only)
- Pan: Positioning of the video within the sub-screen (HD/RGB only)

[Position - Size]

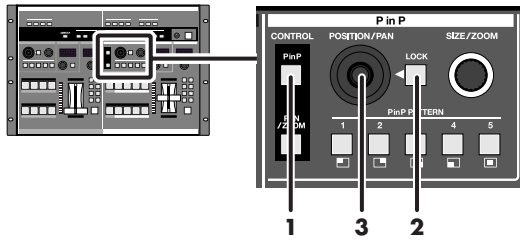


[Zoom - Pan]



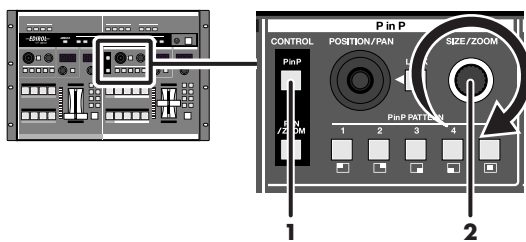
HD/RGB Section Operations

Adjusting the Position of the Sub-Screen (HD/RGB)



- 1. Press the P in P button (HD/RGB).**
The P in P button (HD/RGB) lights up.
- 2. Press the LOCK button (HD/RGB).**
The LOCK button (HD/RGB) is turned off.
At this time, operation of the POSITION/PAN joystick (HD/RGB) is enabled.
- 3. Move the POSITION/PAN joystick (HD/RGB).**
Adjust the placement of the sub-screen while viewing the screen.

Adjusting the Size of the Sub-Screen (HD/RGB)



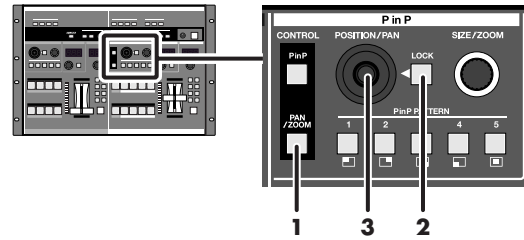
- 1. Press the P in P button (HD/RGB).**
The P in P button (HD/RGB) lights up.
- 2. Rotate the SIZE/ZOOM knob (HD/RGB).**
Adjust the size of the sub-screen while viewing the screen.

MEMO

P in P Settings Cleared When Power Is Turned Off

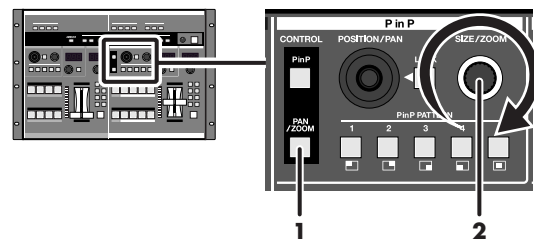
Be sure to save the P in P effect position, size, panning, and zoom settings using the procedure described in "Saving the P in P Effect Settings (HD/RGB)" (p. 35). Turning off the V-440HD's power without saving the P in P settings will result in a loss of the settings.

Adjusting the Panning for the Sub-Screen (HD/RGB)



- 1. Press the PAN/ZOOM button (HD/RGB).**
The PAN/ZOOM button (HD/RGB) lights up.
- 2. Press the LOCK button (HD/RGB).**
The LOCK button (HD/RGB) is turned off.
At this time, operation of the POSITION/PAN joystick (HD/RGB) is enabled.
- 3. Move the POSITION/PAN joystick (HD/RGB).**
Adjust the panning in the sub-screen while viewing the screen.

Adjusting the Zoom in the Sub-Screen (HD/RGB)



- 1. Press the PAN/ZOOM button (HD/RGB).**
The PAN/ZOOM (HD/RGB) lights up.
- 2. Rotate the SIZE/ZOOM knob (HD/RGB).**
Adjust the zoom for the sub-screen while viewing the screen.

MEMO

Restoring the Original Subscreen Pan

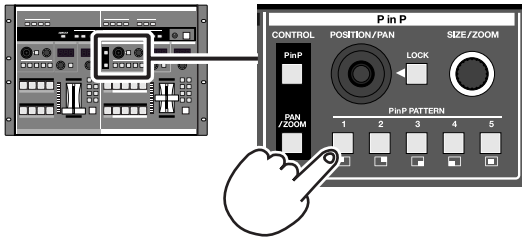
To return the pan in the subscreen to its original settings after changing the pan with the procedure above, hold down the PAN/ZOOM button for at least two seconds.

P in P Position, Size, Pan, and Zoom Settings

The settings processed with the above procedure are stored to the lit P in P PATTERN button and saved until the V-440HD is turned off. Use of the settings that have been changed with the procedure above after the power is turned off requires that the settings be saved to the V-440HD.

For more detailed information, refer to "Saving the P in P Effect Settings (HD/RGB)" (p. 35).

Saving the P in P Effect Settings (HD/RGB)



To use P in P effect settings the next time the V-440HD is turned on, save the settings to the P in P PATTERN buttons (HD/RGB).

When a P in P PATTERN button (HD/RGB) is held down for at least two seconds, the P in P settings are saved to that button. All of the P in P PATTERN buttons (HD/RGB) flash when saving of the settings is completed.

Any settings previously stored to a P in P PATTERN button (HD/RGB) are overwritten when new settings are saved to that button.

* To call up saved settings, press the P in P PATTERN button (HD/RGB) to which the settings are saved.

Advanced P in P Effect Settings (HD/RGB)

Make the P in P effect settings from the menu with the “3. HD/RGB P in P/Zoom” parameters. Select the P in P PATTERN button (HD/RGB) to which the settings are assigned with “P in P 1” to “P in P 5.” Settings can be made for the following parameters.

3. HD/RGB P in P/Zoom Settings Parameters	
Size	Sub screen size adjustment
X Position	Sub screen horizontal position adjustment
Y Position	Sub screen vertical position adjustment
Zoom	Sub screen zoom size adjustment
Pan X Position	Sub screen panning horizontal position adjustment
Pan Y Position	Sub screen panning vertical position adjustment
Border Size	Sub screen border width adjustment
Border Color	Sub screen border color adjustment
Border Edge	Sub screen edge
Crop	Selects crop mode of sub screen
PinP Reset	Resets the above settings to the original factory settings

* For more on the menus, refer to “Menu Operations” (p. 25).

* When key composite effect (p. 36) or multi-screen output (p. 44) are in use, you can not use “Border Size”, “Border Color” and “Border Edge” Function.

* You can quickly access the menu’s P in P parameters by holding down the MENU button and pressing a P in P PATTERN button (HD/RGB).

Changing the Aspect Ratio of the Sub Screen

ver 2.0

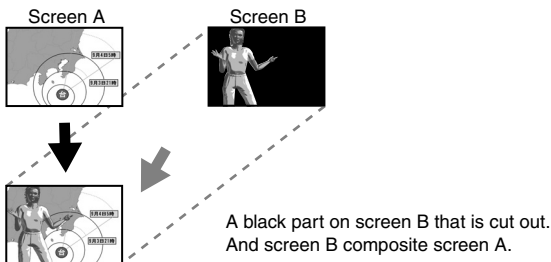
You can select any of three aspect ratios for the sub screen: 16:9, 4:3, or Original.

1. Press the MENU button.
2. Select “3. HD/RGB PinP/Zoom.”
3. Select the channel in which you want to make the settings from “HD/RGB PinP1”-“HD/RGB PinP5.”
4. Press the ENTER button.
5. Select “10. Crop.”
6. Press the ENTER button.
7. Select the aspect ratio of the sub screen.
Select the desired aspect ratio from the menu.
 - Original: The sub screen is displayed with the aspect ratio used for the video being input (4:3 or 16:9).
 - 4:3: Even when video with an aspect ratio of 16:9 is input, the aspect ratio is switched and the sub screen is displayed at 4:3.
 - 16:9: Even when video with an aspect ratio of 4:3 is input, the aspect ratio is switched and the sub screen is displayed at 16:9.

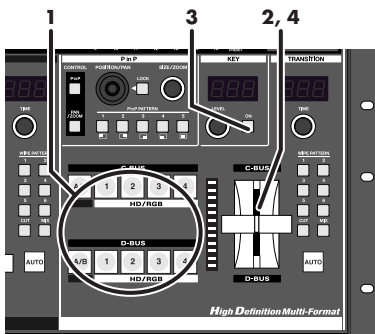
HD/RGB Section Key Composite Effects

You can use key composite effects in combining C-BUS and D-BUS video. The portions with the key color in the video on the bus to which the key composite effect is applied are made transparent, and the video on the other bus is inserted as shown below.

The range of color used as the key is set with the "KEY LEVEL."



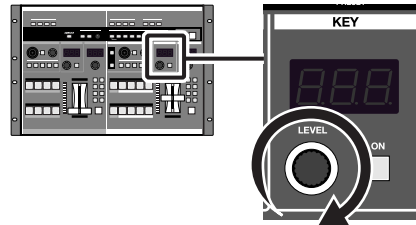
Procedure for Using the HD/RGB Key Composite Effect



- 1. Select the key composite video with the C-BUS channel buttons (HD/RGB) (or D-BUS channel buttons (HD/RGB)).**
The portions of the selected video selected with the key effect are cut out.
- 2. Tilt the video fader (HD/RGB) to the opposite side from that of the bus selected in Step 1.**
- 3. Press the KEY ON Button (HD/RGB).**
The button or buttons pressed in Step 1 flash. At this point, a button flashing indicates that the key effect is being applied to the video assigned to that button.
 - * When using the key composite effects while the P in P effect is in use, the key effect settings are applied to the video with the P in P effect applied.
 - * Use of the C-BUS channel buttons (HD/RGB) (or D-BUS channel buttons (HD/RGB)) while combining video with the key composite effects may result in disruption of the video image.
- 4. Tilt the video fader (HD/RGB) to the opposite direction.**
The key composite effect is applied to the video selected in Step 1, and this is combined with the video on the other bus.
 - * When key composite effect in use, you can not use switching effect's soft edge.

Adjusting the Key Level

Adjust the key level by rotating the KEY LEVEL knob (HD/RGB). The key level is indicated in the KEY LEVEL display (HD/RGB). The key level can be set to any value from 0 to 255.



Advanced Key Composite Settings (HD/RGB)

You can set the following Key Composite parameters under "4. HD/RGB Key" in the menu.

4. HD/RGB Key Settings Parameters	
HD/RGB Key Type	Key type
HD/RGB Key Level	Key level
HD/RGB Key Soft Edge	Key soft edge level
HD/RGB Key Reset	Resets the above settings to the original factory settings

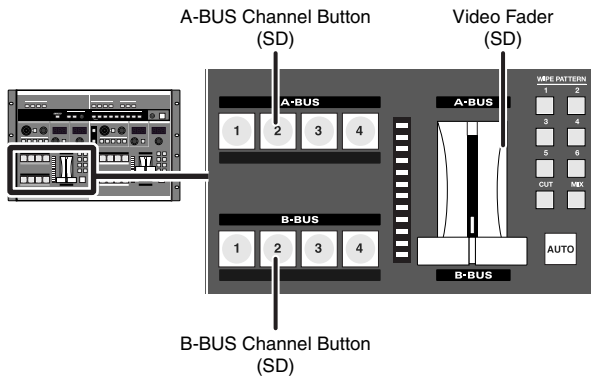
- * For more on the menus, refer to "Menu Operations" (p. 25).
- * You can quickly access the menu's HD/RGB key composite parameters by holding down the MENU button and pressing the HD/RGB KEY ON Button.

SD Section Operations

You can switch and compose SD video in the SD section.

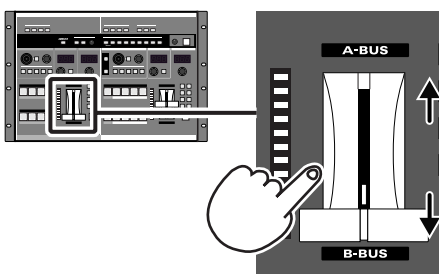
Switching in the SD Section

You can switch the SD video input using the V-440HD's video fader (SD) along with the A-BUS channel buttons (SD) and B-BUS channel buttons (SD).



Switching Buses with the Video Fader (SD)

When the video fader (SD) is tilted towards the A-BUS, the video on the A-BUS is output. Similarly, when the video fader (SD) is tilted towards the B-BUS, the video on the B-BUS is output.



* For instructions on selecting the video on the A-BUS and B-BUS, refer to "Selecting the Bus Input" (p. 38).

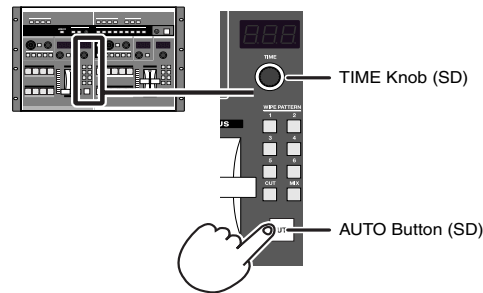
MEMO

To confirm (preview) the video in the bus opposite that to which the video fader (SD) is tilted, connect a television monitor to the "SD PREVIEW OUT connector" (p. 19).

* In addition to the preview video, you can also output from the SD PREVIEW OUT connector the same video that is output from SD PGM OUT. Set this from the menu by selecting "13. SD Preview Out Select" under "13. System."

Switching Buses with the AUTO Button (SD)

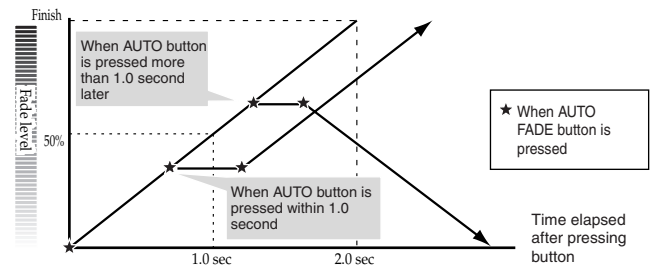
The A-BUS and B-BUS switch automatically when the AUTO Button (SD) is pressed. The time used for switching between the A-BUS and C-BUS is set by rotating the TIME knob (SD). The time set with the TIME knob (SD) is indicated in the TRANSITION TIME display (SD). The time can be set to any value from 0.0 to 4.0 sec.



Operation when the AUTO Button Is Pressed

If the AUTO button is pressed a second time while the video is switching, the output image will be switched as described below.

Response When AUTO Button Is Pressed a Number of Times
(Figures shows operation with TRANSITION TIME set to 2.0 seconds)



* You can set how operations are performed when the AUTO button is pressed. For more details, refer to "AUTO Button Operation Mode" on this page.

AUTO Button Operation Mode

ver 2.0

You can switch the operational mode to be used when you press the AUTO button for "17. Autotake Sw Motion" under "13. System" in the menu (p. 24).

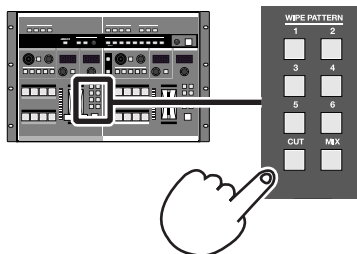
Mode Name	When Pressed During Operation	Pressed During Operation and Pressed Again
Change (Initial setting)	Stops	Returns in response to level
Continue	Stops	Continues in same direction as that before stopping
Jump	Forces execution of the operation	---
Cancel	Cancels the operation and returns you to the previous step	---



* When "PGM-PST Mode" is selected in "Changing the Switching Method" (p. 39), then even if Change is selected, operation will in fact be the same as if Continue were selected.

SD Section Operations

Selecting the Effect Applied When Switching Buses (SD)

The effect applied when switching the video is selected by pressing the TRANSITION buttons (SD).



Button	Function	Description
CUT	Cut switching	The video switches when the video fader (SD) reaches the halfway point.
MIX 	Dissolve switching	The video is mixed as it gradually switches according to the angle of the video fader (SD).
WIPE PATTERN 1-6 	Wipe switching	The video switches with a wipe effect, with the wipe corresponding to the angle of the video fader (SD). * This cannot be selected while the P in P effect (p. 39) is in use. If the P in P effect is in use when WIPE PATTERN 1-6 is selected, MIX is selected automatically.

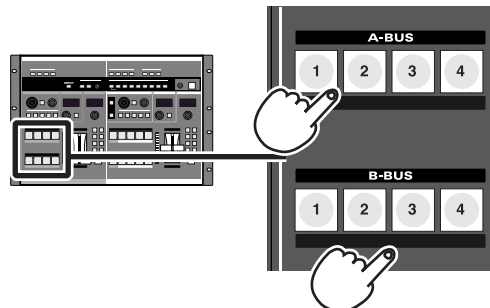
Customizing the Wipe

The wipe switching effects assigned to the TRANSITION (SD) WIPE PATTERN 1-6 buttons can be set from the menu. You can make settings for the wipe pattern, direction, and soft edge, and combine these settings in various ways to create customized wipe transitions.

- * For more on the menus, refer to "Menu Operations" (p. 25).
- * For more information about the different kinds of wipe patterns, refer to "Customizing Wipe Transitions" (p. 31)

Selecting the Bus Input

The video used on the A-BUS is selected by pressing the A-BUS channel buttons (SD) 1-4. In the same manner, the video used on the B-BUS is selected by pressing the B-BUS channel buttons (SD) 1-4.



MEMO

When video is switched using the A-BUS channel buttons (SD) or B-BUS channel buttons (SD), a period of time corresponding to several frames is required to switch the video in each bus. This is due to the time required to lock the video signals when the formats for the video input in each channel are switched. To reduce the length of time taken, adjust the following items from the menu.

- * When you want to switch channels rapidly, use the video fader (SD) (p. 37).
- * Depending on the settings for the following menu items, noise may be generated when the video is switched. Set the values to provide ample leeway to avoid this problem.
 - "13. System" - [10. SD Seamless Delay Time]
Keep the time setting somewhat short. The unit of time is the field.

MEMO

ver 2.0

As programmed at the factory, the V-440HD's A-BUS channel buttons (B-BUS channel buttons) light yellow for PGM output and green for preview output. You can change these colors with the "15. InputSw LED Color" setting under "13. SYSTEM" in the menu.

MEMO

ver 2.0

Holding down one A-BUS channel button and pressing a different A-BUS channel button switches the video for the A-BUS channel button pressed second. When you release the A-BUS channel button that was pressed second, the video for the A-BUS channel button held down first is displayed. This same function applies to the B-BUS channel buttons as well.

MEMO

ver 2.0

You can disable the operation of any desired button by setting "6. SD Sw Enable" under "7. SD Input" in the menu.

Changing the Switching Method ver 2.0

The V-440HD allows you to use the “flip-flop” switching method, the one employed by many professional-level video switchers. Use the following procedure to change the switching method.

1. Press the MENU button.
2. Select “13. System.”
3. Press the ENTER button.
4. Select “14. Panel Operation Mode.”
5. Press the ENTER button.
6. Select “PGM-PST Mode.”

MEMO

The “A/B Mode” is also referred to as the “butterfly” method.

MEMO

When “PGM/PST” is selected, then even if “Change” is selected as the “operational mode to be used when you press the AUTO button” (p. 37), operation will in fact be the same as if “Continue” were selected.

Flip-Flop Operational Method ver 2.0

A-BUS Channel Buttons (SD) (p. 38)

These select the PGM output from the SD section.

B-BUS Channel Buttons (SD) (p. 38)

These select the Preview output from the SD section.

* This may be referred to as the “preset” with other manufacturer’s equipment.

AUTO Button (SD) (p. 37)

This switches the video selected with the A-BUS and B-BUS channel buttons.

* This performs the same function as the “TAKE” button on other manufacturer’s devices.

* When a wipe switch is selected, the wipe is fixed in one direction.

Video Fader (SD) (p. 37)

This switches the video selected with the A-BUS and B-BUS channel buttons, regardless of the direction in which the fader is tilted.

* When a wipe switch is selected, the wipe is fixed in one direction.

P in P PATTERN Button (SD) (p. 39)

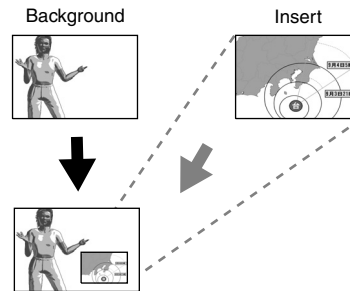
This places the video selected with the B-BUS channel buttons in the sub screen, regardless of the direction in which the fader is tilted.

KEY ON Button (SD) (p. 41)

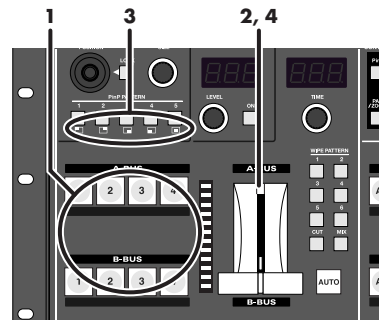
This applies key composite effects to the video selected with the B-BUS channel buttons, regardless of the direction in which the fader is tilted.

SD Section P in P Effects

P in P (Picture in Picture) effects are applied to the video on the A-BUS or B-BUS. The P in P effect is used just by pressing the P in P PATTERN buttons (SD).



Procedure for Setting the SD Section P in P Effect

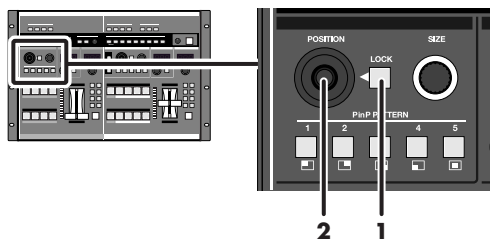


1. Select the video to include in the sub-screen with the A-BUS channel buttons (SD) (or B-BUS channel buttons (SD)).
2. Tilt the video fader (SD) to the opposite side from that of the bus selected in Step 1.
3. Press a P in P PATTERN button (SD).
The button or buttons pressed in Step 1 flash. At this point, a button flashing indicates that the P in P effect is being applied to the video assigned to that button.

Button	Sub-Screen Position (Factory Setting)
1	Upper left
2	Upper right
3	Lower right
4	Lower left
5	Center

4. Tilt the video fader (SD) to the opposite direction.
The video assigned to the channels corresponding to the flashing buttons in Step 3 appears as the sub-screen.
 - * When using the P in P effect while a key composite effect is in use, the P in P is applied to the video with the key effect settings included.
 - * Use of the A-BUS channel buttons (SD) (or B-BUS channel buttons (SD)) while combining video with the P in P effect may result in disruption of the video image.
 - * Wipe Patterns 1–6 cannot be selected with the “TRANSITION buttons (SD)” (p. 38) while the P in P effect is in use.

Adjusting the Position of the Sub-Screen (SD)



1. Press the LOCK button (SD).

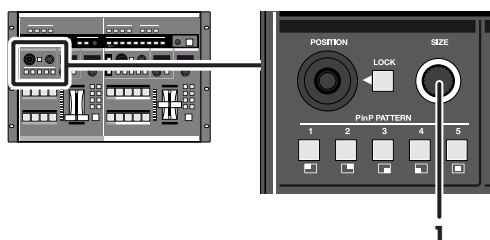
The LOCK button (SD) is turned off.

At this time, operation of the POSITION joystick (SD) is enabled.

2. Move the POSITION joystick (SD).

Adjust the placement of the sub-screen while viewing the screen.

Adjusting the Size of the Sub-Screen (SD)



1. Rotate the SIZE knob (SD).

Adjust the size of the sub-screen while viewing the screen.

MEMO

P in P Settings Cleared When Power is Turned Off

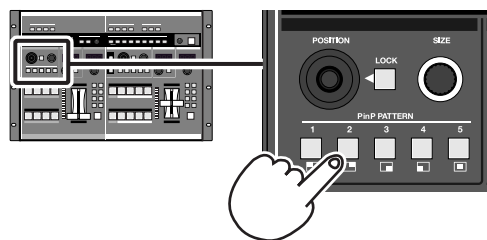
Be sure to save the P in P effect position, size, panning, and zoom settings using the procedure described in "Saving the P in P Effect Settings (SD)" at the right side of this page. Turning off the V-440HD's power without saving the P in P settings will result in a loss of the settings.

P in P Position and Size Settings

The settings processed with the above procedure are stored to the lit P in P PATTERN button and saved until the V-440HD is turned off. Use of the settings that have been changed with the procedure above after the power is turned off requires that the settings be saved to the V-440HD.

For more detailed information, refer to "Saving the P in P Effect Settings (SD)" at the right side of this page.

Saving the P in P Effect Settings



To use P in P effect settings the next time the V-440HD is turned on, save the settings to the P in P PATTERN buttons (SD).

When a P in P PATTERN button (SD) is held down for at least two seconds, the P in P settings are saved to that button. All of the P in P PATTERN buttons (SD) flash when saving of the settings is completed.

Any settings previously stored to a P in P PATTERN button (SD) are overwritten when new settings are saved to that button.

* To call up saved settings, press the P in P PATTERN button to which the settings are saved.

Advanced P in P Effect Settings (SD)

Make the P in P effect settings from the menu with the "8. SD P in P" parameters. Select the P in P PATTERN button (SD) to which the settings are assigned with "P in P 1" to "P in P 5." Settings can be made for the following parameters.

8. SD P in P Settings Parameters

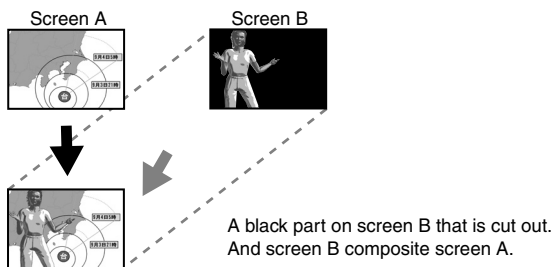
PinP Size	P in P size
PinP X Position	Horizontal position
PinP Y Position	Vertical position
PinP Border Size	Border width
PinP Border Color	Border color
PinP Trimming	Width of portion trimmed from P in P edge
PinP Reset	Resets the above settings to the original factory settings

* For more on the menus, refer to "Menu Operations" (p. 25).

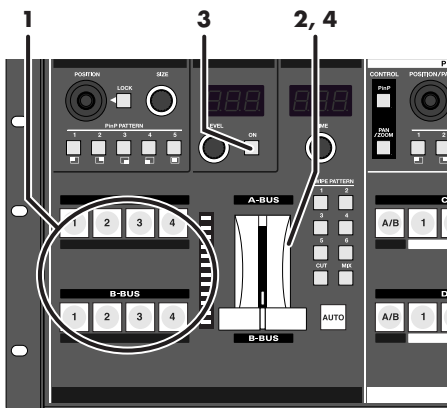
* You can quickly access the menu's P in P parameters by holding down the MENU button and pressing a P in P PATTERN button (SD).

SD Section Key Composite Effects

You can use key composite effects in combining A-BUS and B-BUS video. The portions with the key color in the video on the bus to which the key composite effect is applied are made transparent, and the video on the other bus is inserted as shown below. The range of color used as the key is set with the "KEY LEVEL."



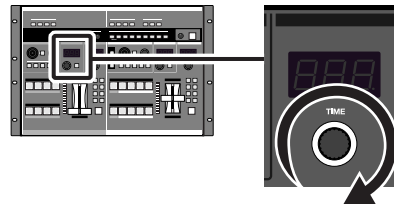
Procedure for Using the SD Key Composite Effect



- Select the key composite video with the A-BUS channel buttons (SD) (or B-BUS channel buttons (SD)).**
The portions of the selected video selected with the key effect are cut out.
- Tilt the video fader (SD) to the opposite side from that of the bus selected in Step 1.**
- Press the KEY ON Button (SD).**
The button or buttons pressed in Step 1 flash. At this point, a button flashing indicates that the key effect is being applied to the video assigned to that button.
 - * When using the key composite effects while the P in P effect is in use, the key effect settings are applied to the video with the P in P effect included.
 - * Use of the A-BUS channel buttons (SD) (or B-BUS channel buttons (SD)) while combining video with the key composite effects may result in disruption of the video image.
- Tilt the video fader (SD) to the opposite direction.**
The key composite effect is applied to the video selected in Step 1, and this is combined with the video on the other bus.

Adjusting the Key Level

Adjust the key level by rotating the KEY LEVEL knob (SD). The key level is indicated in the KEY LEVEL display (SD). The key level can be set to any value from 0 to 255.



Advanced Key Composite Settings

You can set the following Key Composite parameters under "9. SD Key" in the menu.

9. SD Key Settings Parameters	
SD Key Type	Key type
SD Key Level	Key level
SD Key Soft Edge	Soft edge level
SD Key Reset	Resets the above settings to the original factory settings

- * For more on the menus, refer to "Menu Operations" (p. 25).
- * You can quickly access the menu's key composite parameters (SD) by holding down the MENU button and pressing the KEY ON Button (SD).

Fading Out the SD Section PGM Output

ver2.0

You can use the OUTPUT FADE button (p. 13) to fade in/out the video from SD PGM output (p. 19).

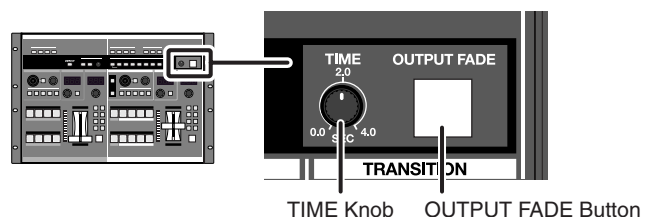
After "6. SD Output Fader" under "6. SD Output" (p. 61) in the menu is set to "On," you can then press the OUTPUT FADE button to fade out the SD PGM output over the time set with the TIME knob. You can use the TIME knob to set the fade time in a range from 0 to 4 seconds. If you press the OUTPUT FADE button again after fading out the SD PGM output, the video fades back in again.

MEMO

If you do not want to apply fade in/out to the SD PGM output, set the TIME knob to 0.0.

MEMO

If you fade in/out the SD PGM output using the OUTPUT FADE button, the output of HD/RGB will also be faded.

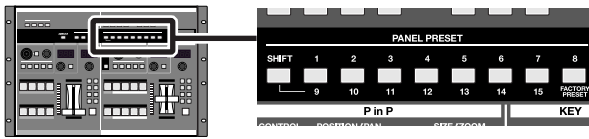


Other Operations

Using the PANEL PRESET Buttons

You can save configurations of panel controller settings to the PANEL PRESET buttons. Saving complex settings to the PANEL PRESET buttons enables you to call up these settings without any complicated operations just by pressing the PANEL PRESET buttons.

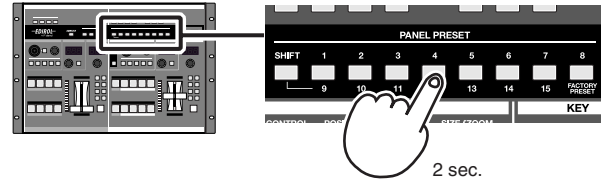
A different configuration of settings can be saved to each of the PANEL PRESET buttons 1–15.



Parameters saved as part of a panel preset		Factory Preset	Related Page
SD Section	P in P PATTERN Buttons (SD)	OFF	p. 39
	P in P LOCK Button (SD)	ON	p. 40
	LEVEL Knob (SD)	128	p. 41
	KEY ON Button (SD)	OFF	p. 41
	Key Type (SD)	Luminance Key2	p. 62
	Key Soft Edge (SD)	03	p. 62
	A-BUS Channel Button (SD)	1 ch	p. 38
	B-BUS Channel Button (SD)	2 ch	p. 38
	TIME Knob (SD)	1.0	p. 37
	Video Fader (SD)	A-BUS	p. 37
	TRANSITION Button (SD)	MIX	p. 38
HD/RGB Section	P in P PATTERN Buttons (HD/RGB)	OFF	p. 33
	P in P LOCK Button (HD/RGB)	ON	p. 34
	PAN/ZOOM Button (HD/RGB)	POSITION/SIZE	p. 34
	LEVEL Knob (HD/RGB)	128	p. 36
	KEY ON Button (HD/RGB)	OFF	p. 36
	Key Type (HD/RGB)	Luminance Key2	p. 60
	Key Soft Edge (HD/RGB)	03	p. 60
	C-BUS Channel Button (HD/RGB)	1 ch	p. 32
	D-BUS Channel Button (HD/RGB)	2 ch	p. 32
	TIME Knob (HD/RGB)	1.0	p. 30
	Video Fader (HD/RGB)	C-BUS	p. 30
TRANSITION Button (HD/RGB)	MIX	p. 31	
Others	Panel Operation Mode	A/B Mode	p. 32
	OUTPUT FADE MODE	Auto	p. 58
	OUTPUT FADE LEVEL	No fade	p. 23
	Multi Screen On/Off	Off	p. 46
	Multi Screen Type	2 x 1	p. 46

Saving PANEL PRESET Settings

To save PANEL PRESET settings, hold down the desired PANEL PRESET button for at least two seconds. Once the PANEL PRESET is saved, all of the PANEL PRESET buttons 1–8 flash.



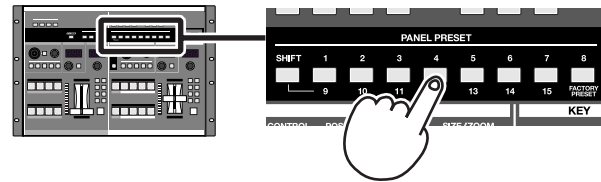
* The content of the V-440HD's internal memory cannot be written to any external device.

Calling Up PANEL PRESET Settings

Press a PANEL PRESET button 1–8.

The pressed button lights up, and the stored settings are called up.

Settings in PANEL PRESET 9–15 can be accessed by pressing the SHIFT button so it's lit, then pressing PANEL PRESET buttons 1–7.



* Pressing PANEL PRESET button 8 while the SHIFT button is lit calls up the "Factory Preset" status (see table).

* Use of certain functions together may result in disruption of the video images. We recommend testing settings configurations beforehand when switching PANEL PRESET settings.

Copying Presets

Use the following procedure to copy settings from one PANEL PRESET to another PANEL PRESET button.

1. **Press the MENU button.**
The menu is displayed.
2. **Select “11. Panel Preset Edit.”**
3. **Press the ENTER button.**
4. **Select “1. Copy.”**
5. **Select the preset to be copied.**
The preset shown at the left of the screen becomes the copy source.
6. **Press the ENTER button.**
7. **Select the preset copy destination.**
8. **Press the ENTER button.**
The message “Are You Sure?” appears.
9. **Select “Yes.”**
10. **Press the ENTER button.**
The preset shown at the left of the screen is copied to the PANEL PRESET button selected in Step 7.

NOTE

Note that any settings in the copy-destination PANEL PRESET are overwritten when this operation is executed.

Exchanging Presets

Use the following procedure to exchange settings stored in one PANEL PRESET with settings stored at another PANEL PRESET button.

1. **Press the MENU button.**
The menu is displayed.
2. **Select “11. Panel Preset Edit.”**
3. **Press the ENTER button.**
4. **Select “2. Exchange.”**
5. **Select the preset to be exchanged.**
The preset shown at the left of the screen becomes the exchange source.
6. **Press the ENTER button.**
7. **Select the preset exchange destination.**
8. **Press the ENTER button.**
The message “Are You Sure?” appears.
9. **Select “Yes.”**
10. **Press the ENTER button.**
The preset shown at the left of the screen is exchanged with the preset stored to the PANEL PRESET button selected in Step 6.

Inserting a Master Fade When Switching Presets

ver 2.0

You can have the output momentarily fade in and out between presets when presets are switched. Use the following procedure to make the necessary settings.

1. **Press the MENU button.**
The menu appears.
2. **Select “11. Panel Preset Edit.”**
3. **Press the ENTER button.**
4. **Select “4. Set Preset Fade Time?”**
5. **Press the ENTER button.**
6. **Set the Master Fade time.**
Set the master Fade times in a range from 0.0 to 4.0 (seconds).

Select Parameters To Save As Presets

ver 2.0

If there are any parameters that you do not want to save as part of the Presets, you can prevent them from being saved by using the following procedure.

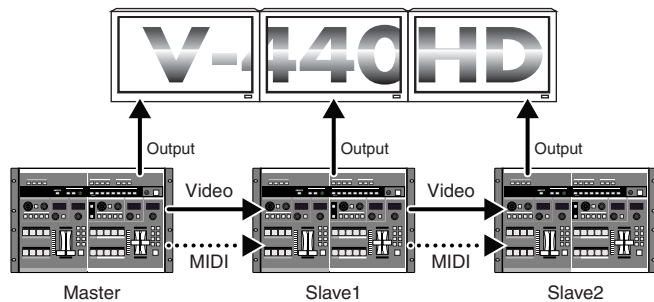
1. **Press the MENU button.**
The menu appears.
2. **Select “11. Panel Preset Edit.”**
3. **Press the ENTER button.**
4. **Select “3. Preset Play Select.”**
5. **Press the ENTER button.**
6. **Select the parameter you do not want to include in the preset.**
7. **Press the ENTER button.**
8. **Select “Free.”**

* Select “Load” to have the parameter applied in the preset.

Multi-Screen Output

With MIDI used to link multiple V-440HDs, you can use the “multi-screen output” function, whereby the video is partitioned and output to multiple screens. With “multi-screen output,” one V-440HD is used for control, with the operation of other V-440HDs linked to it.

[Connecting Diagram]



* The V-440HD used as the control device is referred to here as the “master.” The other V-440HDs whose operations are linked to the master are referred to as “slaves.”

Connection Instructions for Output to Two Screens

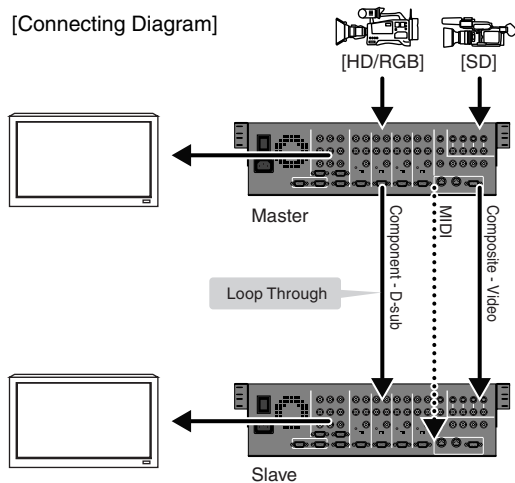
When using multiscreen output, use the following method to connect the V-440HD with other devices.

* When making any connections, always be sure to turn off the power to all devices before connecting them.

Connecting Two V-440HDs

When using multiscreen output with two screens, connect the master and the slave directly to each other.

[Connecting Diagram]



When using multi-screen output with two screens, use loop thru (p. 51) to split the video from the HD/RGB input to the two V-440HDs.

* When using loop thru, turn OFF the HD/RGB 75Ω TERMINATOR switch of the master unit.

1. Connect via MIDI.

Using a MIDI cable, connect the master V-440HD's MIDI OUT/THRU connector to the MIDI IN connector on the slave V-440HD.

2. Connect with 2 displays.

Connect the HD or RGB output of the master V-440HD to the left-side display. The output (HD or RGB) of the slave V-440HD should be connected to the right-side display.

Settings for Two V-440HDs

After completing the connection procedure described in “Connecting Two V-440HDs” (p. 44), make the settings for the V-440HDs. Set all V-440HDs as described below.

* For instructions on making the MIDI settings, refer to “Controlling the V-440HD from an External Device Via MIDI” (p. 54) and “Linking Operations Via MIDI” (p. 54).

i. Setting the Master

Set the V-440HD to be used as the master as follows.

1. Press the MENU button.
2. Select “12. Multi Screen.”
3. Set “2. Multi Screen Type.”
Select “2 x 1.”
4. Set “3. Multi Screen ID.”
Select “Screen1 - Master.” The V-440HD currently being operated is set as the master.

ii. Setting the Slave

Set the V-440HD to be used as the slave as follows.

1. Press the MENU button.
2. Select “12. Multi Screen.”
3. Set “2. Multi Screen Type.”
Select “2 x 1.”

* For more on the screen position, refer to “Slave Numbers and Screen Positions” (p. 45).
4. Set “3. Multi Screen ID.”
Select “Screen2 - Slave.”

iii. Switching On Multi-Screen Output

After completing the settings as described in “i. Setting the Master” and “ii. Setting the Slave” above, use the master V-440HD to select “On” in “1. Multi Screen On/Off” under “12. Multi Screen” in the menu. The multi-screen function is switched on, and the images from each V-440HD are displayed in their corresponding screen positions.

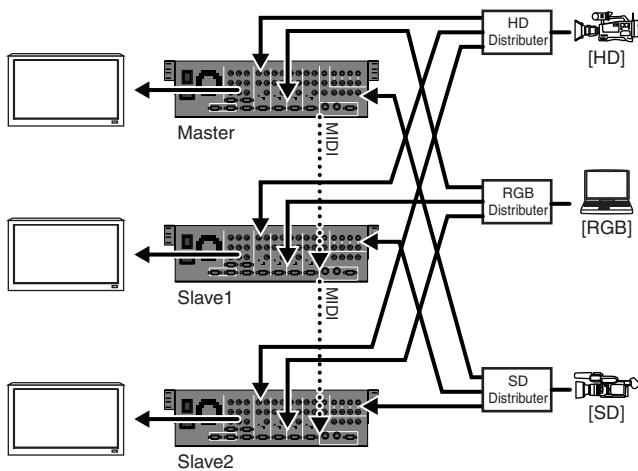
Connection Instructions for Output to 3 or More Screens

Connecting Three or More V-440HDs

Using multiscreen output with three or more screens requires use of to distribute the video and MIDI signals for the master and multiple connected slaves.

* Satisfactory image quality may not be obtainable using loop thru to distribute the video to three or more V-440HD.

[Connecting Diagram]



When using multiscreen output with three or more screens, use to distribute the video to each input.

- * Use an interface compatible with the format of the video being distributed.
- * Make sure that the same type of video signals are input to each V-440HD. If, for example, you are grouping S-Video signals in SD IN Channel 4, make sure that the signal formats are the same, even though the video may have the same field of view.

1. Connect via MIDI.

Connect the MIDI OUT/THRU of the master V-440HD to the MIDI IN of the slave V-440HD with MIDI cable as shown above. Connect the 3rd and later V-440HD units using the same method.

* In you experience latency with the control signal as the result of cascading multiple units, use a MIDI signal splitter to distribute the signal from master unit.

2. Connect multiple displays.

The video output from the master and slaves are distributed as described in "Slave Numbers and Screen Positions" on this page. Connect the HD OUT connector or RGB connector on the master and slaves to the video output devices for each of the corresponding screen positions.

V-440HD Settings

After completing the connection procedure described in "Connecting Three or More V-440HDs" (p. 45), make the settings for the V-440HDs. Set all V-440HDs as described below.

* For instructions on making the MIDI settings, refer to "Controlling the V-440HD from an External Device Via MIDI" (p. 54) and "Linking Operations Via MIDI" (p. 54).

i. Setting the Master

1. Press the MENU button.
2. Select "12. Multi Screen."
3. Set "2. Multi Screen Type."
Select "2 x 2," "3 x 1" or "3 x 2."
4. Set "3. Multi Screen ID."
Select "Screen1 - Master." The V-440HD currently being operated is set as the master.

ii. Setting the Slaves

1. Press the MENU button.
2. Select "12. Multi Screen."
3. Set "2. Multi Screen Type."
Select "2 x 2," "3 x 1" or "3 x 2" in accordance with the settings.
4. Set "3. Multi Screen ID."
Set the position of the slave's screen. Referring to "Slave Number and Screen Position" on this page, select from "Screen2 - Slave" to "Screen6 - Slave." The V-440HD currently being operated is set as a slave.

iii. Switching On Multi-Screen Output

After completing the settings as described in "i. Setting the Master" and "ii. Setting the Slaves" above, use the master V-440HD to select "On" in "1. Multi Screen On/Off" under "12. Multi Screen" in the menu. The multi-screen function is switched on, and the images from each V-440HD are displayed in their corresponding screen positions.

Slave Numbers and Screen Positions

	Position of screen		Position of screen
2x1		3x1	
2x2		3x2	

* Numbers in the figure indicate slave order.

Switching Off the Multi-Screen Functions

Using the master V-440HD, select "Off" in "1. Multi Screen On/Off" under "12. Multi Screen" in the menu.

Temporarily Switching Off the Multi-Screen Function for the Master and Slave Devices

To temporarily switch off the Multi Screen function for the master and slave devices, press the MIDI button so that the button's light goes off. Multi Screen is not operational while the MIDI button light is off.

Advanced Multi-Screen Settings

When using the Multi Screen function, the settings may need to be changed if, for example, screens overlap due to the screen sizes and positions.

Make advanced settings for the Multi Screen function from the menu with "12. Multi Screen" (p. 63). The following parameters are enabled.

12. Multi Parameter Settings Parameters	
Multi Screen On / Off	Switches the Multi Screen function on and off
Multi Screen Type	Number of screens used with Multi Screen
Multi Screen ID	V-440HD rank and screen position
Screen1 X Size	Screen1 (master) screen horizontal size
Screen1 Y Size	Screen1 (master) screen vertical size
Screen1 X Position	Screen1 (master) screen horizontal position
Screen1 Y Position	Screen1 (master) screen vertical position
Screen2 X Size	Screen2 screen horizontal size
Screen2 Y Size	Screen2 screen vertical size
Screen2 X Position	Screen2 screen horizontal position
Screen2 Y Position	Screen2 screen vertical position
Screen3 X Size	Screen3 screen horizontal size
Screen3 Y Size	Screen3 screen vertical size
Screen3 X Position	Screen3 screen horizontal position
Screen3 Y Position	Screen3 screen vertical position
Screen4 X Size	Screen4 screen horizontal size
Screen4 Y Size	Screen4 screen vertical size
Screen4 X Position	Screen4 screen horizontal position
Screen4 Y Position	Screen4 screen vertical position
Screen5 X Size	Screen5 screen horizontal size
Screen5 Y Size	Screen5 screen vertical size
Screen5 X Position	Screen5 screen horizontal position
Screen5 Y Position	Screen5 screen vertical position
Screen6 X Size	Screen6 screen horizontal size
Screen6 Y Size	Screen6 screen vertical size
Screen6 X Position	Screen6 screen horizontal position
Screen6 Y Position	Screen6 screen vertical position
Multi Reset	Resets the above settings to the original factory settings

About Manual Settings for the Master and Slave V-440HDs

You can set the screen size and position of the master and slave V-440HDs manually with the parameters "4. Screen1 X Size" to "27. Screen6 Y Position."

- * The values that can be set manually depend on the size of the final video output.
- * After making manual settings, the values for "4. Screen1 X Size" to "27. Screen6 Y Position" are changed automatically when the value in "2. Multi Screen Type" is changed.
- * After making manual settings, changing the value in "1. HD/RGB Output" (p. 58) may, depending on the settings, result in nothing displayed by the slave devices. If this occurs, set the "2. Multi Screen Type" value again, then redo the manual settings.

About Setting Up and Adjusting Screens

When using the multi-screen function, you may find variations in display position, size, color, and other aspects from one screen to another. If such problems occur, you may be able to correct the problem using the procedures (i) and (ii) below.

i. Adjusting the Displays

First, try adjusting the projects, plasma displays, or other displays receiving the output from the V-440HDs.

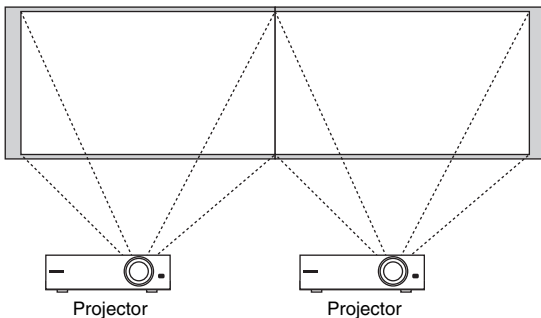
1. Adjust the display position.

If using projectors, adjust the screen position and angle, or the angle and position of the projector output. Certain screen positions may result in distortion of the image; reorient the projectors or use the "keystone correction" or similar corrective functions the projector may have to adjust the image.

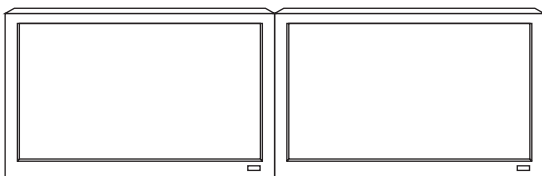
* *Some projectors may not be equipped with the "keystone correction" feature.*

If using plasma displays or LCDs, adjust the position and orientation of the displays.

[When Using a Projector]



[When Using a Plasma Display or Liquid Crystal Display]



2. Adjust the zoom.

Use the zoom feature to adjust the screen sizes until the screen size from all projectors is uniform.

3. Adjust the color.

Adjust the colors of the output video for each individual display device until the same colors are obtained.

ii. Adjusting the V-440HDs

After making adjustments to the displays, adjust the V-440HDs.

1. Adjust the zooming.

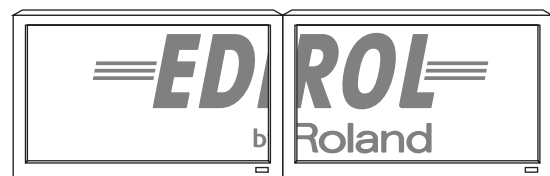
If the plasma displays or other display screens being used are placed within frames, you will need to adjust the video so that the "frame" portion is taken into account.

In such instances, use the following procedure to enlarge or reduce the V-440HD output.

[When Using a Projector]



[When Using a Plasma Display or Liquid Crystal Display]



[Setting the master V-440HD]

1. Select "1. HD/RGB Output" (p. 58) from the menu.
2. Select "5. Zooming."
3. Select the amount of enlargement.
4. Following the instructions in "Transmitting Settings to MIDI-Connected V-440HDs" (p. 48), send the settings to the slave V-440HDs.

* *Adjust the enlargement of any slave V-440HD as needed. The procedure is identical to steps 1-3 above.*

2. Adjust the color.

If there are still any discrepancies in color from the V-440HDs after you have finished adjusting the color with the display devices, use the following procedure to set the color of the output from the V-440HDs.

[Setting the master V-440HD]

1. Select "1. HD/RGB Output" (p. 58) from the menu, and adjust the color.
2. Select "2. HD/RGB Input" (p. 59) or "7. SD Input" (p. 61), and adjust the color of the video being input.
3. Following the instructions in "Transmitting Settings to MIDI-Connected V-440HDs" (p. 48), send the settings to the slave V-440HDs.

* *Adjust the zooming of any slave V-440HD as needed. The procedure is identical to steps 1-3 above.*

Transmitting Settings to MIDI-Connected V-440HDs

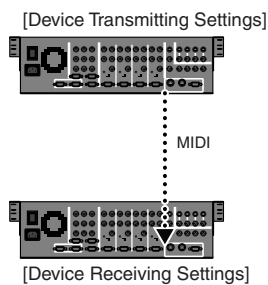
ver 2.0

You can transmit (bulk dump) a V-440HD's settings to another V-440HD connected with a MIDI cable.

MEMO

Connect one end of the MIDI cable to the MIDI OUT connector of the V-440HD transmitting the settings and the other end to the MIDI IN connector of the V-440HD receiving the settings. You can then connect the MIDI OUT connector of the receiving V-440HD to the MIDI IN of another V-440HD to transmit the settings to multiple V-440HDs. When using "Multi-Screen Output" (p. 44), you can use the following procedure without changing the setup to transmit the settings to the slaves.

[Illustration of Connection]



NOTE

This process overwrites the receiving V-440HD's settings. The previous settings are lost when overwritten. If you want to save these settings, use the procedure described in "Saving the V-440HD's Settings to a Computer" (p. 48) to back up the V-440HD's settings to a computer.

Use the procedure below to transmit the settings.

1. Press the MENU button.
2. Select "14. MIDI Setup."
3. Press the ENTER button.
4. Select "31. MIDI Bulk Dump."
5. Press the ENTER button.
6. Select "Yes."
7. Press the ENTER button.
The data is then transmitted.

Saving the V-440HD's Settings to a Computer

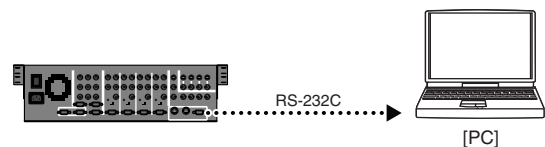
ver 2.0

You can transfer and save the V-440HD's settings to a computer or other device connected with a cable to the V-440HD's REMOTE connector (p. 53).

MEMO

For more on the REMOTE connector specifications, refer to "About the REMOTE Connector" (p. 53).

[Illustration of Connection]



Instructions for Transmitting the Settings

1. Press the MENU button.
2. Select "13. System."
3. Press the ENTER button.
4. Select "18. All Data Transmit."
5. Press the ENTER button.
6. Select "Yes."
7. Press the ENTER button.

The data is transmitted. The progress of the transfer is indicated at the bottom of the screen as a percentage.

* Transfer of all of the data is completed in approximately 30 seconds.

MEMO

You can cancel transmission by pressing the MENU button while the transmission is still in progress.

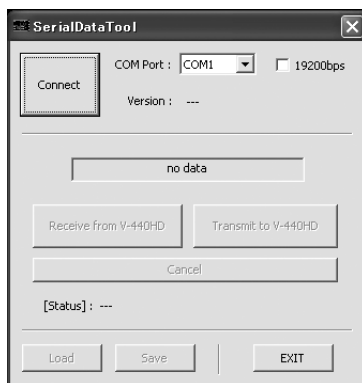
About Computer Software Used in Backing Up the V-440HD's Settings

ver 2.0

Software (for Windows XP only) for use in backing up the V-440HD's settings is available on the Roland Systems Group website. Download the software from the following URL.

[Roland Systems Group Website]

<http://www.rolandsystemsgroup.net/>



Switching Between NTSC and PAL

You can switch the V-440HD between NTSC and PAL formats.

Switching Between NTSC and PAL from the Menu

1. Press the MENU button.

The menu is displayed.

2. Select "13. System."

3. Select "1. System Frame Rate."

4. Select NTSC or PAL.

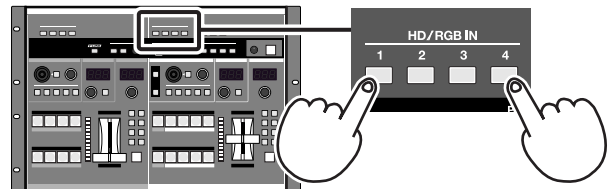
If using NTSC, select "60-NTSC"; select "50-PAL" if using PAL.

The V-440HD can output color bars. This is useful when making output settings.

* For more on the menus, refer to "Menu Operations" (p. 25).

Switching to NTSC or PAL When the Power is Turned On

NTSC and PAL are switched when the V-440HD's power is turned on while HD/RGB button 1 and 4 are held down.


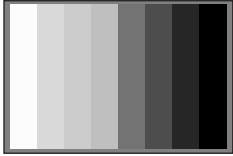


Displaying Test Patterns

The V-440HD outputs color bar test patterns. Use of this patterns is convenient when making the output settings.

Outputting the Test Pattern from the HD/RGB OUT Connectors

- 1. Press the MENU button.**
The menu is displayed.
- 2. Select "1. HD/RGB Output."**
- 3. Select "15. Test Pattern Select."**
Select the pattern to be displayed from the menu.

Value	Displayed
Off	(No output)
Color Bar 75%	
Color Bar 100%	

* For more on the menus, refer to "Menu Operations" (p. 25).

Outputting the Test Pattern from the SD OUT Connectors

- 1. Press the MENU button.**
The menu is displayed.
- 2. Select "6. SD Output."**
- 3. Select "7. Color Bar."**
Select On from the menu and press the ENTER button.

* For more on the menus, refer to "Menu Operations" (p. 25).

About the HD/RGB IN Connectors (D-Sub)

The V-440HD's HD/RGB IN (D-Sub) connectors accept either analog component signals or RGB signals. In addition, the Loop Thru function can be used for thru output of analog component signals or RGB signals input via the HD/RGB IN connectors (BNC).

These input signals are output with the following specifications.

Inputting and Outputting Analog Component Signals

Connector Type: D-SUB 15-pin shrink terminal

Pin number	Signal name	Pin Connections
1	Pr	
2	Y	
3	Pb	
4	GND	
5	GND	
6	Pr-GND	
7	Y-GND	
8	Pb-GND	
9	N.C.	
10	GND	
11	(Reserved)	
12	-	
13	-	
14	-	
15	-	
FG	Frame GND	

Inputting and Outputting RGB Signals

Connector Type: D-SUB 15-pin shrink terminal

Pin number	Signal name	Pin Connections
1	Red / Pr	
2	Green / Y	
3	Blue / Pb	
4	GND	
5	GND	
6	R-GND / Pr-GND	
7	G-GND / Y-GND	
8	B-GND / Pb-GND	
9	N.C.	
10	GND	
11	(Reserved)	
12	(VESA DDC RESERVED)	
13	H-SYNC	
14	V-SYNC	
15	(VESA DDC RESERVED)	
FG	Frame GND	

About the RGB OUT Connectors (D-Sub)

The V-440HD's RGB OUT connectors output RGB signals.

* Analog Component signal is not output from RGB OUT Connector.

Outputting RGB Signals

Connector Type: D-SUB 15-pin shrink terminal

Pin number	Signal name	Pin Connections
1	Red	
2	Green	
3	Blue	
4	GND	
5	GND	
6	R-GND	
7	G-GND	
8	B-GND	
9	N.C.	
10	GND	
11	(Reserved)	
12	(VESA DDC RESERVED)	
13	H-SYNC	
14	V-SYNC	
15	(VESA DDC RESERVED)	
FG	Frame GND	

About Loop Thru

The HD/RGB IN connector (D-sub) and HD/RGB IN connector (BNC) for any particular channel are linked internally within the V-440HD. So, for example, if analog component signals are input to the Channel 1 HD/RGB IN connector (D-sub), the same signals are output from the Channel 1 HD/RGB IN connector (BNC). This function is called "Loop Thru."

Using Loop Thru, you can monitor the video output of each video input on a television monitor, or even use the connections for multiscreen output.

However, the following precautions must be observed.

- **Set the TERMINATOR 75Ω switch to ON when Loop Thru is not being used**

When not using Loop Thru, some devices will not function properly unless the TERMINATOR 75Ω switch is set to ON.

- **Using more than one pass with Loop Thru may result in attenuation of the video**

With three or more V-440HDs connected using Loop Thru, the video signal becomes more attenuated the further down the signal path the V-440HD is. When using identical video with three or more V-440HDs, be sure to use a commercially available video multiplexer.

About the TALLY Connectors

When connecting a television monitor equipped with a TALLY input to the V-440HD, you can have the television monitor's TALLY lamp light up. The TALLY lamp lights up according to the switching status, allowing you to confirm the channel being used on the monitor. The switching status of the SD video is output from the TALLY SD connector, and the switching status of the HD/RGB video is output from the TALLY HD connector.

* Obtain a separate cable for use in connecting the V-440HD with the TALLY input-equipped television monitor.

About TALLY Types

The V-440HD is capable of outputting six types of TALLY signals, Type 1 – Type 6. Selecting from Type 1 to Type 6 enables you to select the connector from which the TALLY signals are output (refer to "TALLY Terminal Specifications" below).

You can select the tally signal output type in "12. Tally Signal" under "13. System" in the menu; select the output type suited to the particular conditions.

* For more on the menus, refer to "Menu Operations" (p. 25).

TALLY Connector Specifications

Connector Type: D-SUB 15-pin shrink terminal

- * No power for TALLY indicator lights is output by the V-440HD. If using a camera control unit or other such device, be sure to have a separate power supply available.
- * TALLY control switches use transistors. Ensure that the leads for the TALLY signals are connected correctly.
- * Signals of 12 V at 200 mA can be controlled.

TALLY SD Connector Pin Assignments

Pin number	Signal name						Pin Connections
	Type 1	Type 2	Type 3	Type 4	Type 5	Type 6	
1	1	-	-	1	1(P)	1(P)	
2	-	1	-	1(P)	1	-	
3	-	-	1	-	-	1	
4	GND						
5	4	-	-	4	4(P)	4(P)	
6	2	-	-	2	2(P)	2(P)	
7	-	2	-	2(P)	2	-	
8	-	-	2	-	-	2	
9	GND						
10	-	4	-	4(P)	4	-	
11	3	-	-	3	3(P)	3(P)	
12	-	3	-	3(P)	3	-	
13	-	-	3	-	-	3	
14	GND						
15	-	-	4	-	-	4	

* For more on the "control type," refer to "About TALLY Types" on this page.

* Numerals in the table indicate the SD input channels to which the TALLY is applied. (P) indicates that the content is in PREVIEW mode.

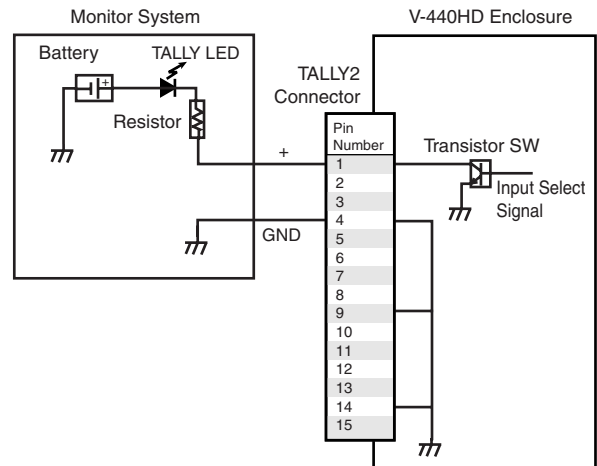
TALLY HD Connector Pin Assignments

Pin number	Signal name						Pin Connections
	Type 1	Type 2	Type 3	Type 4	Type 5	Type 6	
1	1	-	-	1	1(P)	1(P)	
2	-	1	-	1(P)	1	-	
3	-	-	1	-	-	1	
4	GND						
5	4	-	-	4	4(P)	4(P)	
6	2	-	-	2	2(P)	2(P)	
7	-	2	-	2(P)	2	-	
8	-	-	2	-	-	2	
9	GND						
10	-	4	-	4(P)	4	-	
11	3	-	-	3	3(P)	3(P)	
12	-	3	-	3(P)	3	-	
13	-	-	3	-	-	3	
14	GND						
15	-	-	4	-	-	4	

* For more on the "control type," refer to "About TALLY Types" on this page.

* Numerals in the table indicate the HD/RGB input channels to which the TALLY is applied. (P) indicates that the content is in PREVIEW mode.

TALLY Connection Example



About the REMOTE Connector

You can use the REMOTE connector to enable switching, control of effects, and other operations from a computer or other external control device.

* For more on control using the REMOTE connector, refer to "REMOTE Command Reference" (p. 66).

REMOTE Connector Specifications

- Transmission Format: Start-stop synchronization (asynchronous), full duplex
- Transmission Rate: 9600 bps (Initial setting)/19200 bps (This can be changed in the menu with "8. REMOTE Baudrate" under "13. System" (p. 64).)
- Parity: None
- Data Length: 8 bits
- Stop Bit Length: 1 bit
- Encoding: ASCII
- Flow Control: XON/XOFF

Pin number	Signal name	Pin Connections
1	DCD	
2	RXD	
3	TXD	
4	DTR	
5	GND	
6	DSR	
7	RTS	
8	CTS	
9	RI	

* The V-440HD's connectors are male. To connect to a computer, use a female-female crossover cable.

Cable Connections:

V-440HD	Computer
1 : DCD	1 : DCD
2 : RXD	2 : RXD
3 : TXD	3 : TXD
4 : DTR	4 : DTR
5 : GND	5 : GND
6 : DSR	6 : DSR
7 : RTS	7 : RTS
8 : CTS	8 : CTS
9 : RI	9 : RI

Setup Procedure

Use the following procedure to set up the control device and V-440HD.

1. Connect the V-440HD and control device with a REMOTE cable.
2. Turn on the power to the control device.
3. Set the communications protocol for the control device.
4. Turn on the power to the V-440HD.
5. Begin operation.

* For more on commands, refer to "REMOTE Command Reference" (p. 66).

Backing Up the Settings from the REMOTE Connector to a Computer **ver 2.0**

You can back up the V-440HD's settings data by connecting the V-440HD's REMOTE connector to a computer's RS-232C connector.

For more detailed information, refer to "Saving the V-440HD's Settings to a Computer" (p. 48).

Controlling the V-440HD from an External Device Via MIDI

The V-440HD can be controlled from an external device using MIDI. For example, you can use a Roland multitrack recorder to control video performances that are synchronized to the sounds. This section explains some basics of MIDI and describes the use of MIDI messages with the V-440HD.

What is MIDI?

MIDI, an abbreviation for Musical Instrument Digital Interface, is an international standard created to enable exchange of performance data among devices. Any MIDI-compatible device can be connected simply with a MIDI cable, allowing transfer of performance data and control of device operations and settings.

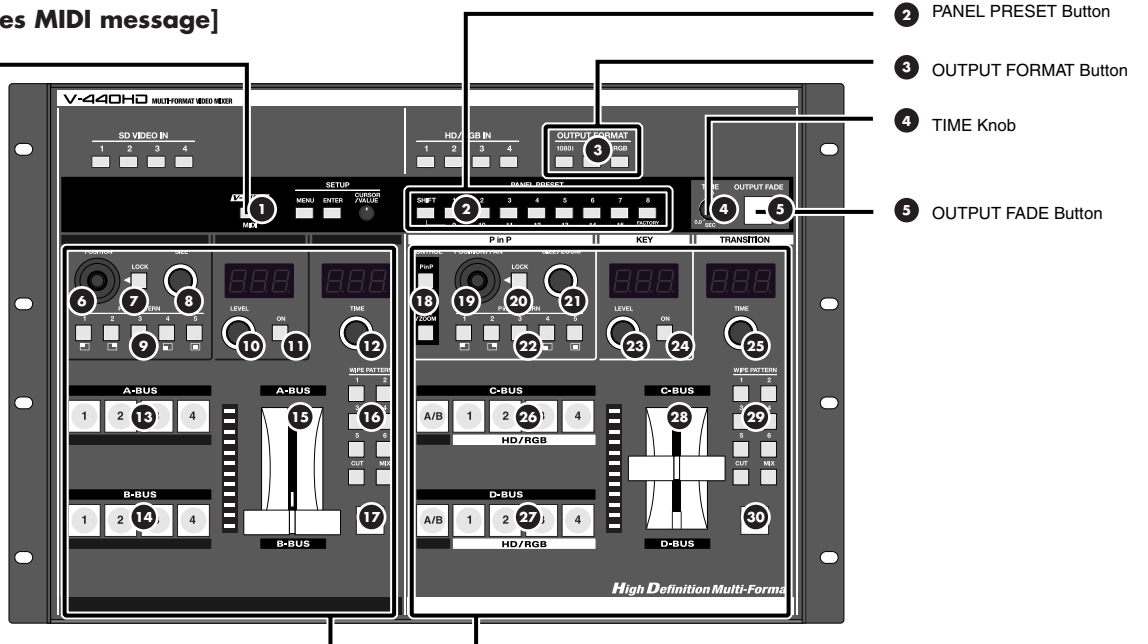
Controlling the V-440HD from an External Device Via MIDI

After switching on the power (when V-LINK is off), MIDI messages are output from MIDI OUT in response to adjustments with the corresponding buttons and knobs. In addition, adjustments identical to those made with the buttons and knobs are made when the corresponding MIDI messages are received at MIDI IN.

* For more about MIDI messages, refer to the "MIDI implementation" (p. 69).

[Things that receives MIDI message]

1 MIDI Button



- 6 POSITION Joystick (SD)
- 7 LOCK Button (SD)
- 8 SIZE Knob (SD)
- 9 P in P PATTERN Button (SD)
- 10 LEVEL Knob (SD)
- 11 KEY ON Button (SD)

- 12 TIME Knob (SD)
- 13 A-BUS Channel Button (SD)
- 14 B-BUS Channel Button (SD)
- 15 Video Fader (SD)
- 16 TRANSITION Button (SD)
- 17 AUTO Button (SD)

- 18 POSITION/SIZE Button (HD/RGB)
PAN/ZOOM Button (HD/RGB)
- 19 POSITION/PAN Joystick (HD/RGB)
- 20 LOCK Button (HD/RGB)
- 21 SIZE/ZOOM Knob (HD/RGB)
- 22 P in P PATTERN Button (HD/RGB)
- 23 LEVEL Knob (HD/RGB)

- 24 KEY ON Button (HD/RGB)
- 25 TIME Knob (HD/RGB)
- 26 C-BUS Channel Button (HD/RGB)
- 27 D-BUS Channel Button (HD/RGB)
- 28 Video Fader (HD/RGB)
- 29 TRANSITION Button (HD/RGB)
- 30 AUTO Button (HD/RGB)

MIDI Connectors

The following three types of connectors are used in exchanging MIDI messages (data handled with MIDI). On the V-440HD, the MIDI OUT and MIDI THRU are combined in one connector. The function is switched according to the operation being performed.

- MIDI IN: MIDI messages from other MIDI devices are received here.
- MIDI OUT: MIDI messages from the V-440HD are transmitted from here.
- MIDI THRU: MIDI messages received at the MIDI IN connector are output as is.

Linking Operations Via MIDI

You can use MIDI to link the operation of multiple V-440HDs. To do so, make the following settings.

- Linking operation of multiple V-440HDs
Select "14. MIDI Setup" (p. 65) from the menu and set "4. MIDI Out/Thru Switch" to "Thru."
- Linking operation using "Multi-Screen Output" (p. 44)
For instructions on linking operation of multiple V-440HDs with the Multi-Screen function, refer to "Multi-Screen Output" (p. 44).

Temporarily Switching Off Linked Operation

You can stop reception of MIDI signals temporarily by pressing the MIDI button. This stops linked operation via MIDI and enables independent functioning of one individual V-440HD.

To restore linked operation through MIDI, press the MIDI button once more so the button is lit.

MIDI Messages Handled by the V-440HD

The following MIDI messages are handled with the V-440HD.

- Bank Select and Program Change

These messages are used for switching tones. On the V-440HD, Bank Select messages are used to select the bus, and Program Change messages are used to select channels.

- Control Change Messages

These generally transmit information, such as vibrato, hold, and volume, that enhances the realism of performances. All functions are organized according to a controller number from 0 to 127, with each function being assigned its own number. On the V-440HD, these messages are used with the video faders and knobs.

- System Exclusive Messages

These messages are used for transmitting device-specific settings. On the V-440HD, these messages are used for transmitting P in P settings and when setting the Multi Screen outputs.

When System Exclusive messages are exchanged, MIDI transmissions are distinguished by Device IDs rather than MIDI channels. When exchanging System Exclusive messages, set the devices to the same Device ID.

MIDI channels

MIDI is able to send information over a single MIDI cable independently to two or more MIDI devices. This is made possible by the concept of MIDI channels. You can think of MIDI channels as being somewhat similar in function to the channels on a television. By changing the channel of a TV set, you can view a variety of programs being transmitted by different broadcast stations. This is because data is received only from the transmitter whose channel is selected on the receiver.

In the same way, a MIDI device whose receive channel is set to [1] will receive only the data being transmitted by another MIDI device whose transmit channel is also set to [1.]

MIDI Implementation Chart

The use of MIDI makes it possible to communicate with a broad range of electronic musical instruments. However, this does not mean that all MIDI messages can be exchanged among all devices. Only those MIDI messages that both of the communicating devices are designed to understand can be exchanged. The owner's manual that comes with a MIDI device includes a MIDI Implementation Chart (p. 77). Such charts allow you to easily find out which MIDI messages that device can transmit and receive. When using MIDI devices, compare the charts for the devices that will be communicating to check which MIDI messages are compatible.

Control Using V-LINK

You can have control of the V-440HD be linked to the performance of a V-LINK compatible instrument (when V-LINK is on)

What is V-LINK?

V-LINK (**V-LINK**) is a function that allows music and images to be performed together. By using MIDI to connect two or more V-LINK compatible devices, you can easily enjoy performing a wide range of visual effects that are linked to the expressive elements of a music performance.

Instructions for Using V-LINK

For information on switching V-LINK on and off, refer to the Owner's Manual for the V-LINK compatible device to be connected to the V-440HD.

- * You can confirm the V-LINK MODE status by checking whether or not the MIDI button is lit. Select "14. MIDI Setup" (p. 65) from the menu and set "MIDI Sw Mode" to "V-Link Indicator".
- * To see which functions can be controlled from an external device with V-LINK, refer to the MIDI Implementation on p. 69 as well as the MIDI Implementation for the device being connected. The functions that can be controlled may vary according to the device being connected and the settings.

Initial V-LINK Status Settings (V-440HD Receives Only the V-LINK ON Message)

Rx Channel	1
Tx Channel	1
SD A Bus	Ach:1
SD B Bus	Bch:2
SD Auto Switch	-
SD Transition Pattern	Mix
SD Transition Time	0.0sec
SD Video Fader	Ach100%
SD Key Switch	OFF
SD PinP Switch	OFF
SD PinP Lock Switch	OFF
HD C Bus	Cch:1
HD D Bus	Dch:2
HD Auto Switch	-
HD Transition Pattern	Mix
HD Transition Time	0.0sec
HD Video Fader	Cch100%
HD Key Switch	OFF
HD PinP Switch	OFF
HD PinP Lock Switch	OFF
PinP/Zoom Switch	PinP
Panel Preset Switch	OFF
Output Format Switch	1
Output Fade Mode	Auto
Fade Switch	-
Fade Level	MAX

Controlling the V-440HD from a PR-80/50

ver 2.0

By setting the V-440HD to “PR Control” from the menu, you can control the V-440HD remotely from an PR-80 or PR-50 (hereafter referred to as PR Series devices). With this setup, the V-440HD functions just like one of the video clips contained in the PR series device.

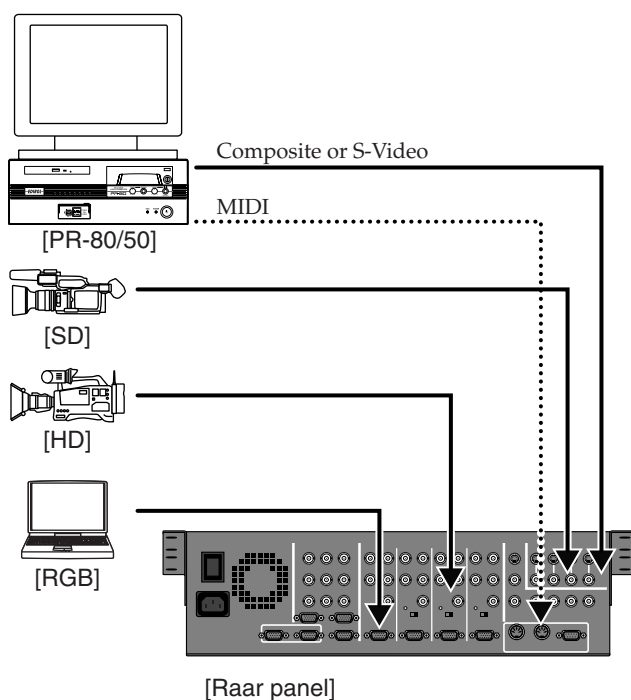
NOTE

Use a PR-80/50 running ver. 1.2 or later. The V-440HD’s PR Control feature is not compatible with earlier versions, which prevents use of the functions described above.

[What you can do when a PR series device and the V-440HD are connected]

- You can seamlessly switch HD, RGB, and SD video input to the V-440HD with the video clips contained in the PR series device. You can employ the user interface of the PR series device for overall control.
- You can use the PR Series Scheduler for automatic operation of the V-440HD.

Example of Connections When Using PR Control Mode



* For instructions on setting and operation of the PR series, refer to the PR-80/50 Owner’s Manual.

* Connect the video output from the PR-80/50 to one of the SD input connectors 1–4 (S-Video or Composite).

Setting PR Control on the V-440HD

Use the following procedure to set PR mode.

1. Press the MENU button.
2. Select “14. MIDI Setup.”
3. Press the ENTER button.
4. Select “30. PR Control.”
5. Press the ENTER button.
6. Select “On.”
Enabling this setting allows the V-440HD to be run from the PR Series device.

Controlling an M-400 from the V-440HD

ver 2.07

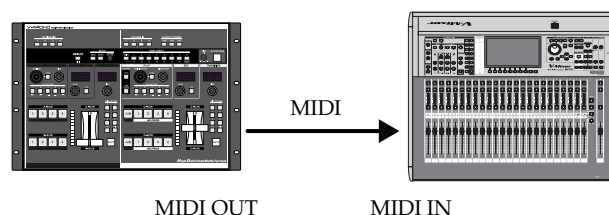
The audio input level of the M-400 live mixing console can be controlled from the V-440HD.

[What you can do when a M-400 device and the V-440HD are connected]

- You can adjust the audio input level of specific channels of the M-400 by pressing the channel buttons of the SD or HD/RGB sections of the V-440HD.
- You can control the audio input level of specific channels of the M-400 by moving the video faders of the SD or HD/RGB sections of the V-440HD.

The crossfading balance of both audio and video can be controlled with the video faders of the SD or HD/RGB sections of the V-440HD.

Connection Example



Switching V-LINK Mode On

1. Press the MENU button.
2. Select “14. MIDI Setup.”
3. Press the ENTER button.
4. Select “5. V-LINK Switch.”
5. Press the ENTER button.
6. Select “On.”

V-LINK mode is switched on. When V-LINK is on, the M-400 is controlled with V-LINK messages (Roland System Exclusive Data Set 1) transmitted from the V-440HD.

* Refer to the M-400 Owner’s Manual while carrying out this procedure.

Installing the Rack Mount Hardware

Precautions to Observe When Attaching the Rack Mount Hardware

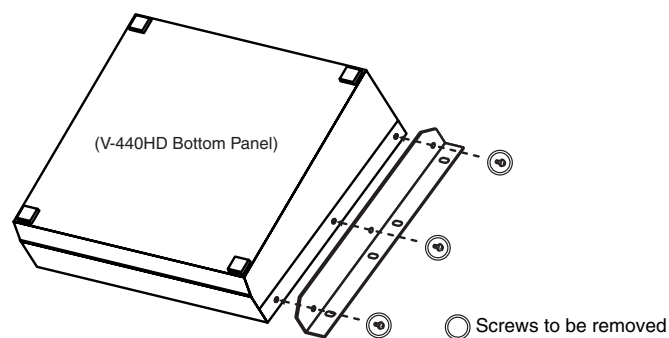
- Use the proper size Phillips head screwdriver for the screw heads (No. 2 driver). Use of a screwdriver that does not fit the screw heads may result in the heads becoming stripped.
- When removing the screws, turn the screwdriver in the counterclockwise direction. To tighten the screws, turn the screwdriver in the clockwise direction.



- Remove only the specified screws when attaching the rack mount hardware.
- Once the installation is complete, check it again to make sure that it has been done correctly.
- When turning the unit upside-down, get a bunch of newspapers or magazines, and place them under the four corners or at both ends to prevent damage to the buttons and controls. Also, you should try to orient the unit so no buttons or controls get damaged.
- When turning the unit upside-down, handle with care to avoid dropping it, or allowing it to fall or tip over.

Instructions for Attaching the Rack Mount Hardware

1. Before attaching the rack mount hardware, turn the power off to the V-440HD and all connected devices and disconnect all power cords and connection cables.
2. Turn the V-440HD over and remove the screws specified in the following figure to remove the rack mount hardware.



3. Return the screws removed in Step 2 to their original holes and secure.

About Maintenance

Daily Maintenance

Loss of air flow due to dust accumulating at the exhaust vent may inhibit the forced cooling function. Using a vacuum cleaner or other means, regularly remove accumulations of dust from the exhaust vent and intake vent.

About the Fan

Malfunctioning of the fan will prevent the forced cooling function from working properly, posing the danger of overheating and other problems. If you cannot confirm that the fan is operational, please consult your Roland dealer or a Roland ED Service Station.

Menu Parameters

* For more on menus, see p. 24.

1. HD/RGB Output

Settings for the final output are made here.

	Parameters	Explanation	Values
	1- 1. Output Format (1080i) Sw	Video format assigned to OUTPUT FORMAT (1080i) button	* Refer to "About the Final Output Format."
	1- 2. Output Format (720p) Sw	Video format assigned to OUTPUT FORMAT (720p) button	* Refer to "About the Final Output Format."
	1- 3. Output Format (RGB) Sw	Video format assigned to OUTPUT FORMAT (RGB) button	* Refer to "About the Final Output Format."
	1- 4. Output Format Sw Lock	OUTPUT FORMAT button lock	Off, On
	1- 5. Zooming	Final output scaling adjustment	80.0–120.0
	1- 6. Bright	Final output brightness adjustment	-64+ +64
	1- 7. Contrast	Final output contrast adjustment	-64+ +64
	1- 8. Saturation	Final output saturation adjustment	-64+ +64
	1- 9. Red	Final output red adjustment	-64+ +64
	1- 10. Green	Final output green adjustment	-64+ +64
	1- 11. Blue	Final output blue adjustment	-64+ +64
	1- 12. Output Fade Mode	Final output fade control adjustment	Auto, Manual * Refer to "About the Final Output Fade Control"
	1- 13. Output Fade Color	Final output fade color setting	Black, White
ver 2.0	1- 14. Output Fade Sw Motion	Selects the operation mode when OUTPUT FADE button is pressed	Change, Continue, Jump, Cancel * Refer to "OUTPUT FADE Button Operational Mode."
	1- 15. Test Pattern Select	Selects the Test Pattern to output	Off, 75% Color Bar, 100% Color Bar
ver 2.0	1- 16. HD/RGB Reset	Resets the above settings to the original factory settings	—

About the Final Output Format

You can select from the following formats for use with the final output.

Component		RGB	
[NTSC]	[PAL]	1366x768/60	1024x768/60
1080/60i	1080/50i	1366x768/75	800x600/75
720/60p	720/50p	1280x1024/60	800x600/60
480/60p	576/50p	1280x768/75	640x480/75
480/60i	576/50i	1280x768/60	640x480/60
		1024x768/75	

* The selectable component format changes as above depending on the setup for "1. System Frame Rate" under "13. System."

* The frame rate of 59.94 is shown as 60 in the menu of this unit.

* RGB units are [horizontal (pixels) x vertical (lines) / frame rate (Hertz)].

About the Final Output Fade Control

There are two final output fade modes (p. 23), which can be changed as needed.

[1-12. Output Fade Mode Settings and Function of Each Controller]

	Auto	Manual
OUTPUT FADE Button	Fades in/out according to value set with TIME knob	Indicates the fade status (no operation is executed, even when button is pressed) - Lights when fade is completed - Flashes while fade is in progress - Off when no fade is being performed
TIME Knob	Sets Fade-in/Fade-out time for final output	Controls fade-in/fade-out time

OUTPUT FADE Button Operational Mode ver 2.0

You can select operation mode of fade in/out using OUTPUT FADE button.

[1-14. Output Fade SW Motion Settings and Operation When the OUTPUT FADE Button is Pressed]

Mode	When Pressed During Operation	Pressed During Operation and Pressed Again
Change (Initial setting)	Stops	Returns in response to level
Continue	Stops	Continues in same direction as that before stopping
Jump	Forces execution of the operation	—
Cancel	Cancels the operation and returns you to the previous step	—

* For more on these parameters, refer to "Switching Buses with the AUTO Button (HD/RGB)" (p. 30).

2. HD/RGB Input

Settings for the input from the HD/RGB IN connectors are made here.

	Parameters	Explanation	Values
2-1.	HD/RGB Ch A/B	Sets input for SD section video input to HD/RGB	* Refer to "HD/RGB Input Parameters." However, content appended with *1 does not appear.
2-2.	HD/RGB Ch 1	Sets video input to Channel 1 of the HD/RGB IN connectors	* Refer to "HD/RGB Input Parameters."
2-3.	HD/RGB Ch 2	Sets video input to Channel 2 of the HD/RGB IN connectors	* Refer to "HD/RGB Input Parameters."
2-4.	HD/RGB Ch 3	Sets video input to Channel 3 of the HD/RGB IN connectors	* Refer to "HD/RGB Input Parameters."
2-4.	HD/RGB Ch 4	Sets video input to Channel 4 of the HD/RGB IN connectors	* Refer to "HD/RGB Input Parameters."

HD/RGB Input Parameters

	Parameters	Explanation	Values
1.	Format Auto Detect	Function automatically distinguishes input *1	Auto, Manual
2.	Input Format	Selects input format *1*2	* Refer to "About the HD/RGB Input Format"
3.	Pre Scaling Mode	Switches scaling adjustment function on and off	Auto, Manual
4.	Manual Pre Scaling	Adjusts scaling ratio when full scaling used *3	90.0–110.0%, Auto
5.	Scaling Type	Scaling method	Full Scale, Fixed Aspect: Letter, Fixed Aspect: Crop, Manual
6.	Manual X Scale	Adjusts the horizontal expansion ratio *4	0010%–1000%, Auto
7.	Manual Y Scale	Adjusts the vertical expansion ratio *4	0010%–1000%, Auto
8.	X Position	Fine adjustment of the horizontal start position	-200– +200
9.	Y Position	Fine adjustment of the vertical start position	-200– +200
10.	Brightness	Brightness adjustment	-64– +64
11.	Contrast	Contrast adjustment	-64– +64
12.	Saturation	Saturation adjustment	-64– +64
13.	Red	Red adjustment	-64– +64
14.	Green	Green adjustment	-64– +64
15.	Blue	Blue adjustment	-64– +64
16.	Frequency	Fine adjustment of the Sampling Frequency *1	-200– +200
17.	Phase	Fine adjustment of the Sampling Phase *1	-64– +64
ver 2.0	18. Sw Enable	Selects Enable or Disable for the selected channel button	Off, On
ver 2.0	19. Input Ch Reset	Resets the above settings to the original factory settings	—

*1 Cannot be set in HD/RGB Channel A/B. Parameter numbers are in sequence, with these parameters omitted.

*2 Enabled when Format Auto Detect is set to Manual.

*3 Enabled when Pre Scaling Mode is set to Manual.

*4 Enabled when Scaling Type is set to Manual.

About the Input Video Aspect Ratio

The parameter "5. Scaling Type" above is initially set to "Full Scale." With this setting, the aspect ratio of the input video is automatically adjusted to conform to the aspect ratio of the HD output or RGB output. For example, since HD video has an aspect ratio of 16:9, input video with an aspect ratio of 4:3 (such as SD video and RGB video) is stretched from side to side. If you do not want to have the input video aspect ratio changed, select "Fixed Aspect: Letter" or "Fixed Aspect: Crop" for "5. Scaling Type."

* For more detailed information, refer to "About the Input Video Aspect Ratio" (p. 28).

About the HD/RGB Input Format

The V-440HD inputs component and RGB video in the formats shown in the following table.

Component		RGB	
480/60p	1080/50i	640 x 480/60	1024 x 768/75
576/50p	720/60p	640 x 480/75	1280 x 768/60
1080/60i	720/50p	800 x 600/60	1280 x 768/75
		800 x 600/75	1280 x 1024/60
		1024 x 768/60	

* The frame rate of 59.94 is shown as 60 in the menu of this unit.

* RGB units are [horizontal (pixels) x vertical (lines) / frame rate (Hertz)].

3. HD/RGB PinP/Zoom

Advanced settings for the HD/RGB section's P in P effect are made here.

	Parameters	Explanation	Values
3- 1.	HD/RGB PinP1	Sets P in P PATTERN button (HD/RGB) 1	* Refer to "HD/RGB P in P Parameters."
3- 2.	HD/RGB PinP2	Sets P in P PATTERN button (HD/RGB) 2	* Refer to "HD/RGB P in P Parameters."
3- 3.	HD/RGB PinP3	Sets P in P PATTERN button (HD/RGB) 3	* Refer to "HD/RGB P in P Parameters."
3- 4.	HD/RGB PinP4	Sets P in P PATTERN button (HD/RGB) 4	* Refer to "HD/RGB P in P Parameters."
3- 5.	HD/RGB PinP5	Sets P in P PATTERN button (HD/RGB) 5	* Refer to "HD/RGB P in P Parameters."

HD/RGB P in P Parameters

	Parameters	Explanation	Values
1.	Size	Sub screen size adjustment	20–100% (Changes according to the subscreen position)
2.	X Position	Sub screen horizontal position adjustment	-50 to +50 (Changes according to the sub screen position)
3.	Y Position	Sub screen vertical position adjustment	-50 to +50 (Changes according to the sub screen position)
4.	Zoom	Sub screen zoom size adjustment	100–1000%
5.	Pan X Position	Sub screen panning horizontal position adjustment	-100.0– +100.0%
6.	Pan Y Position	Sub screen panning vertical position adjustment	-100.0– +100.0%
7.	Border Size	Sub screen border width adjustment	0–15
8.	Border Color	Sub screen border color adjustment	Black, Red, Green, Yellow, Blue, Magenta, Cyan, White
9.	Border Edge	Sub screen edge	Hard, Soft
ver 2.0	10. Crop	Selects crop mode of sub screen	Original, 4:3,16:9
ver 2.0	11. PinP Reset	Resets the above settings to the original factory settings	—

* When key composite effect (p. 36) or multi-screen output (p. 44) are in use, you can not use "Border Size", "Border Color" and "Border Edge" Function.

* For more on the HD/RGB section's P in P effects, see p. 33.

4. HD/RGB Key

Advanced settings for the HD/RGB section's key composite effects are made here.

	Parameters	Explanation	Values
4- 1.	HD/RGB Key Type	Key type	Luminance Key1 (White), Luminance Key2 (Black), Chroma Key1 (Blue), Chroma Key2 (Green)
4- 2.	HD/RGB Key Level	Key level	0–255
4- 3.	HD/RGB Key Soft Edge	Key soft edge level	0–15
ver 2.0	4- 4. HD/RGB Key Reset	Resets the above settings to the original factory settings	—

* For more on the HD/RGB section's key composite effects, see p. 36.

5. HD/RGB Wipe Select

Settings for the TRANSITION buttons' (HD/RGB) WIPE PATTERN 1–6 are made here.

	Parameters	Explanation	Values
5- 1.	HD/RGB Wipe Sw 1	Sets TRANSITION button (HD/RGB) WIPE PATTERN 1	* Refer to "TRANSITION Button (HD/RGB) Parameters."
5- 2.	HD/RGB Wipe Sw 2	Sets TRANSITION button (HD/RGB) WIPE PATTERN 2	* Refer to "TRANSITION Button (HD/RGB) Parameters."
5- 3.	HD/RGB Wipe Sw 3	Sets TRANSITION button (HD/RGB) WIPE PATTERN 3	* Refer to "TRANSITION Button (HD/RGB) Parameters."
5- 4.	HD/RGB Wipe Sw 4	Sets TRANSITION button (HD/RGB) WIPE PATTERN 4	* Refer to "TRANSITION Button (HD/RGB) Parameters."
5- 5.	HD/RGB Wipe Sw 5	Sets TRANSITION button (HD/RGB) WIPE PATTERN 5	* Refer to "TRANSITION Button (HD/RGB) Parameters."
5- 6.	HD/RGB Wipe Sw 6	Sets TRANSITION button (HD/RGB) WIPE PATTERN 6	* Refer to "TRANSITION Button (HD/RGB) Parameters."

TRANSITION Button (HD/RGB) Parameters

	Parameters	Explanation	Values
1.	Wipe Pattern	Wipe pattern setting	Horizontal, Vertical, Horizontal Open, Vertical Open, Box, Cross *
2.	Wipe Reverse	Wipe direction	Off, On
3.	Wipe Edge Type	Soft edge function	Hard, Soft
ver 2.0	4. Wipe Reset	Resets the above settings to the original factory settings	—

* For more on wipe patterns, see p. 31.

6. SD Output

Settings for the SD section's output are made here.

	Parameters	Explanation	Values
6- 1.	SD Output Brightness	Brightness adjustment	-128- +127
6- 2.	SD Output Contrast	Contrast adjustment	-32- +32
6- 3.	SD Output Cb	Cb adjustment	-32- +32
6- 4.	SD Output Cr	Cr adjustment	-32- +32
6- 5.	SD Output Saturation	Saturation adjustment	-64- +64
ver 2.0	6- 6.	SD Output Fader	* Refer to "Fading Out the SD Section PGM Output" (p. 41).
	6- 7.	Color Bar	Test pattern output
ver 2.0	6- 8.	SD Output Reset	Resets the above settings to the original factory settings

7. SD Input

Settings for the input from the SD IN connectors are made here.

	Parameters	Explanation	Values
7- 1.	SD Ch 1	Sets video input to Channel 1 of the SD IN connectors	* Refer to "SD Input Parameters."
7- 2.	SD Ch 2	Sets video input to Channel 2 of the SD IN connectors	* Refer to "SD Input Parameters."
7- 3.	SD Ch 3	Sets video input to Channel 3 of the SD IN connectors	* Refer to "SD Input Parameters."
7- 4.	SD Ch 4	Sets video input to Channel 4 of the SD IN connectors	* Refer to "SD Input Parameters."

SD Input Parameters

	Parameters	Explanation	Values
1.	SD Input Select	Selects S-Video or composite for the SD input	Auto, S-Video, Composite
2.	SD Brightness	Brightness adjustment	-63- +63
3.	SD Contrast	Contrast adjustment	-8- +7
4.	SD Saturation	Saturation adjustment	-128- +127
5.	SD Hue	Hue adjustment	-128- +127
ver 2.0	6.	SD Sw Enable	Selects Enable or Disable for the selected channel button
ver 2.0	7.	SD Reset	Resets the above settings to the original factory settings

8. SD PinP

Advanced settings for the SD section's P in P effect are made here.

	Parameters	Explanation	Values
8- 1.	SD PinP1	Sets P in P PATTERN button (SD) 1	* Refer to "SD P in P Parameters."
8- 2.	SD PinP2	Sets P in P PATTERN button (SD) 2	* Refer to "SD P in P Parameters."
8- 3.	SD PinP3	Sets P in P PATTERN button (SD) 3	* Refer to "SD P in P Parameters."
8- 4.	SD PinP4	Sets P in P PATTERN button (SD) 4	* Refer to "SD P in P Parameters."
8- 5.	SD PinP5	Sets P in P PATTERN button (SD) 5	* Refer to "SD P in P Parameters."

* For more on the SD section's P in P effects, see p. 39.

SD P in P Parameters

	Parameters	Explanation	Values
1.	PinP Size	P in P size	20–100% (Changes according to the subscreen position)
2.	PinP X Position	Horizontal position	-40– +40% (Changes according to the subscreen position)
3.	PinP Y Position	Vertical position	-40– +40% (Changes according to the subscreen position)
4.	PinP Border Size	Border width	0–15
5.	PinP Border Color	Border color	Black, Red, Green, Yellow, Blue, Magenta, Cyan, White
6.	PinP Trimming	Width of portion trimmed from P in P edge	0–15
ver 2.0	7. PinP Reset	Resets the above settings to the original factory settings	—

9. SD Key

Advanced settings for the SD section's key composite effects are made here.

	Parameters	Explanation	Values	
9- 1.	SD Key Type	Key type	Luminance Key1 (White), Luminance Key2 (Black), Chroma Key1 (Blue), Chroma Key2(Green)	
9- 2.	SD Key Level	Key level	0–255	
9- 3.	SD Key Soft Edge	Soft edge level	0–15	
ver 2.0	9- 4.	SD Key Reset	Resets the above settings to the original factory settings	—

* For more on the SD section's key composite effects, see p. 41.

10. SD Wipe Select

Settings for the TRANSITION buttons' (SD) WIPE PATTERN 1–6 are made here.

	Parameters	Explanation	Values
10- 1.	SD Wipe Sw 1	Sets TRANSITION button (SD) WIPE PATTERN 1	* Refer to "TRANSITION Button (SD) Parameters."
10- 2.	SD Wipe Sw 2	Sets TRANSITION button (SD) WIPE PATTERN 2	* Refer to "TRANSITION Button (SD) Parameters."
10- 3.	SD Wipe Sw 3	Sets TRANSITION button (SD) WIPE PATTERN 3	* Refer to "TRANSITION Button (SD) Parameters."
10- 4.	SD Wipe Sw 4	Sets TRANSITION button (SD) WIPE PATTERN 4	* Refer to "TRANSITION Button (SD) Parameters."
10- 5.	SD Wipe Sw 5	Sets TRANSITION button (SD) WIPE PATTERN 5	* Refer to "TRANSITION Button (SD) Parameters."
10- 6.	SD Wipe Sw 6	Sets TRANSITION button (SD) WIPE PATTERN 6	* Refer to "TRANSITION Button (SD) Parameters."

TRANSITION Button (SD) Parameters

	Parameters	Explanation	Values	
1.	Wipe Pattern	Wipe pattern	Horizontal, Vertical, Horizontal Open, Vertical Open, Box, Cross *	
2.	Wipe Reverse	Reverses wipe direction	Off, On	
3.	Wipe Edge Type	Soft edge function	Hard, Soft	
ver 2.0	4.	Wipe Reset	Resets the above settings to the original factory settings	—

* For more on wipe patterns, see p. 31.

11. Panel Preset Edit

These settings are used to copy and exchange panel presets.

	Parameters	Explanation	Values
	11- 1. Copy	Copies the PANEL PRESET	* Refer to "Copying Presets" (p. 43).
	11- 2. Exchange	Exchanges the panel preset with a different PANEL PRESET	* Refer to "Exchanging Presets" (p. 43).
ver 2.0	11- 3. Preset Play Select	Selects controllers for which the Panel Preset is not applied	Free, Load
ver 2.0	11- 4. Set Preset Fade Time	Fade-out time when switched with PANEL PRESET	0.0-4.0
ver 2.0	11- 5. Preset Reset	Resets the above settings to the original factory settings	—

12. Multi Screen

Settings for the Multi Screen output are made here.

	Parameters	Explanation	Values
	12- 1. Multi Screen On / Off	Switches the Multi Screen function on and off	Off, On
	12- 2. Multi Screen Type	Number of screens used with Multi Screen	2x1, 2x2, 3x1, 3x2
	12- 3. Multi Screen ID	V-440HD rank and screen position	Screen1 - Master, Screen2 - Slave, Screen3 - Slave, Screen4 - Slave, Screen5 - Slave, Screen6 - Slave
	12- 4. Screen1 X Size	Screen1 (master) screen horizontal size	0-2000 (Depends on the final output.)
	12- 5. Screen1 Y Size	Screen1 (master) screen vertical size	0-2000 (Depends on the final output.)
	12- 6. Screen1 X Position	Screen1 (master) screen horizontal position	0-2000 (Depends on the final output.)
	12- 7. Screen1 Y Position	Screen1 (master) screen vertical position	0-2000 (Depends on the final output.)
	12- 8. Screen2 X Size	Screen2 screen horizontal size	0-2000 (Depends on the final output.)
	12- 9. Screen2 Y Size	Screen2 screen vertical size	0-2000 (Depends on the final output.)
	12- 10. Screen2 X Position	Screen2 screen horizontal position	0-2000 (Depends on the final output.)
	12- 11. Screen2 Y Position	Screen2 screen vertical position	0-2000 (Depends on the final output.)
	12- 12. Screen3 X Size	Screen3 screen horizontal size	0-2000 (Depends on the final output.)
	12- 13. Screen3 Y Size	Screen3 screen vertical size	0-2000 (Depends on the final output.)
	12- 14. Screen3 X Position	Screen3 screen horizontal position	0-2000 (Depends on the final output.)
	12- 15. Screen3 Y Position	Screen3 screen vertical position	0-2000 (Depends on the final output.)
	12- 16. Screen4 X Size	Screen4 screen horizontal size	0-2000 (Depends on the final output.)
	12- 17. Screen4 Y Size	Screen4 screen vertical size	0-2000 (Depends on the final output.)
	12- 18. Screen4 X Position	Screen4 screen horizontal position	0-2000 (Depends on the final output.)
	12- 19. Screen4 Y Position	Screen4 screen vertical position	0-2000 (Depends on the final output.)
	12- 20. Screen5 X Size	Screen5 screen horizontal size	0-2000 (Depends on the final output.)
	12- 21. Screen5 Y Size	Screen5 screen vertical size	0-2000 (Depends on the final output.)
	12- 22. Screen5 X Position	Screen5 screen horizontal position	0-2000 (Depends on the final output.)
	12- 23. Screen5 Y Position	Screen5 screen vertical position	0-2000 (Depends on the final output.)
	12- 24. Screen6 X Size	Screen6 screen horizontal size	0-2000 (Depends on the final output.)
	12- 25. Screen6 Y Size	Screen6 screen vertical size	0-2000 (Depends on the final output.)
	12- 26. Screen6 X Position	Screen6 screen horizontal position	0-2000 (Depends on the final output.)
ver 2.0	12- 27. Screen6 Y Position	Screen6 screen vertical position	0-2000 (Depends on the final output.)
	12- 28. Multi Reset	Resets the above settings to the original factory settings	—

13. System

The V-440HD's system settings are made here.

	Parameters	Explanation	Values
	13- 1. System Frame Rate	Switches between NTSC and PAL	60 - NTSC, 50 - PAL
	13- 2. SD Deinterlacer	SD section I/P conversion function	Off, On
	13- 3. SD Input Sync Threshold	SD input sync level adjustment	-48~ +79
	13- 4. SD V-FdrCaribrate A	SD video fader adjustment	* Refer to "Adjusting the Video Faders."
	13- 5. SD V-FdrCaribrate B	SD video fader adjustment	* Refer to "Adjusting the Video Faders."
	13- 6. HD/RGB V-FdrCaribrate C	HD/RGB video fader adjustment	* Refer to "Adjusting the Video Faders."
	13- 7. HD/RGB V-FdrCaribrate D	HD/RGB video fader adjustment	* Refer to "Adjusting the Video Faders."
	13- 8. REMOTE Baudrate	REMOTE bit rate setting	9600bps, 19200bps
	13- 9. HD Seamless Delay Time	Delay time when C-BUS (D-BUS) channel buttons are used	0-50 (Field)
	13-10. SD Seamless Delay Time	Delay time when A-BUS (B-BUS) channel buttons are used	0-50 (Field)
	13-11. HD On Screen Display	Displays HD/RGB output in menu	On, Off
	13-12. Tally Signal	Mode for signals output from TALLY terminals	Type1, Type2, Type3, Type4, Type5, Type6
	13-13. SD Previewout Select	Video output from SD PREVIEW OUT connector	Preview Out, PGM Out
ver 2.0	13-14. Panel Operation Mode	Switches the panel operation mode	A/B Mode, PGM-PST Mode
ver 2.0	13-15. Input Sw LED Color	Sets the colors of the channel button indicators	PGM=YEL:PRV=GRN PGM=YEL:PRV=RED PGM=RED:PRV=GRN PGM=RED:PRV=YEL PGM=GRN:PRV=RED PGM=GRN:PRV=YEL
ver 2.0	13-16. Double Click Short Cut	Determines whether menus appear when buttons are double-clicked	Off, On
ver 2.0	13-17. Autotake Sw Motion	Operation performed when AUTO button is pressed	Change, Continue, Jump, Cancel
ver 2.0	13-18. All Data Transmit	Transmits the V-440HD's settings from the REMOTE connector	* Refer to "Saving the V-440HD's Settings to a Computer" (p. 48).
ver 2.0	13-19. System Reset	Resets the system settings to the original factory settings	—
	13-20. Memory Protect	Memory Protect function	Off, On

Adjusting the SD Input Sync Level

The sync level of the SD signal output by some SD video devices may be lower than standard values, preventing adequate synching when the V-440HD is set to factory default values. If this occurs, you may be able to achieve synchronization by adjusting the "13-3. SD Input Sync Threshold" parameter.

Adjusting the Video Faders

Continued use of the video faders and transport of the V-440HD may make adjustments to the faders necessary. In such cases, use the following procedure to make the adjustments.

[Adjusting the Video Fader (SD)]

1. Display the menu.
2. Select "4. SD V-Fdr Calibrate A" under "13. System."
3. Tilt the video fader (SD) to the A-BUS.
4. The message "Are You Sure?" appears; select "Yes."
5. Select "5. SD V-Fdr Calibrate B."
6. Tilt the video fader (SD) to the B-BUS.
7. The message "Are You Sure?" appears; select "Yes."

* Use the same procedure to adjust the video fader (HD/RGB), using "Video Fader Calibrate C" and "Video Fader Calibrate D."

14. MIDI Setup

MIDI-related settings are made here.

	Parameters	Explanation	Values
	14- 1. MIDI Sw Mode	MIDI button function	MIDI In/Out Sw, V-LINK Sw
	14- 2. MIDI Tx Channel	Sets MIDI Transmit channel	1–16
	14- 3. MIDI Rx Channel	Sets MIDI Receive channel	1–16, Off
	14- 4. MIDI Out/Thru Switch	MIDI OUT/THRU connector function	Out, Thru
	14- 5. V-LINK Switch	Switches the V-LINK function on and off	Off, On
ver 2.0	14- 6. Note Mode	Switches Note mode on and off	Off, 49 Key Mode, Assign Mode
ver 2.0	14- 7. Note Lower Key Assign	Specifies the lowest note for Note mode	00H–07H
ver 2.0	14- 8. Note Upper Key Assign	Specifies the highest note for Note mode	00H–07H
	14- 9. Device ID	Device ID	0x00–0x1F
	14-10. Panel Preset Tx Type	PANEL PRESET (p. 42) transfer method	Settings, Number Only
	14-11. SD Auto Switch Assign	AUTO button (SD) (p. 37) MIDI assign	Off, CC#01–CC#95, ChAftTt, PitchBD
	14-12. SD Transition Assign	TRANSITION button (SD) (p. 38) MIDI assign	Off, CC#01–CC#95, ChAftTt, PitchBD
	14-13. SD Transition Time	TIME knob (SD) (p. 37) MIDI assign	Off, CC#01–CC#95, ChAftTt, PitchBD
	14-14. SD Video Fader Assign	Video Fader (SD) (p. 37) MIDI assign	Off, CC#01–CC#95, ChAftTt, PitchBD
	14-15. SD Key Switch Assign	KEY ON button (SD) (p. 41) MIDI assign	Off, CC#01–CC#95, ChAftTt, PitchBD
	14-16. SD P in P Switch Assign	P in P PATTERN button (SD) 1–5 (p. 39) MIDI assign	Off, CC#01–CC#95, ChAftTt, PitchBD
	14-17. SD P in P Lock Sw Assign	LOCK button (SD) (p. 40) MIDI assign	Off, CC#01–CC#95, ChAftTt, PitchBD
	14-18. HD Auto Switch Assign	AUTO button (HD/RGB) (p. 30) MIDI assign	Off, CC#01–CC#95, ChAftTt, PitchBD
	14-19. HD Transition Assign	TRANSITION button (HD/RGB) (p. 31) MIDI assign	Off, CC#01–CC#95, ChAftTt, PitchBD
	14-20. HD Transition Time	TIME knob (HD/RGB) (p. 30) MIDI assign	Off, CC#01–CC#95, ChAftTt, PitchBD
	14-21. HD Video Fader Assign	Video fader (HD/RGB) (p. 30) MIDI assign	Off, CC#01–CC#95, ChAftTt, PitchBD
	14-22. HD Key Switch Assign	KEY ON button (HD/RGB) (p. 36) MIDI assign	Off, CC#01–CC#95, ChAftTt, PitchBD
	14-23. HD P in P Switch Assign	P in P PATTERN button (HD/RGB) 1–5 (p. 33) MIDI assign	Off, CC#01–CC#95, ChAftTt, PitchBD
	14-24. HD P in P Lock Sw Assign	LOCK button (HD/RGB) (p. 34) MIDI assign	Off, CC#01–CC#95, ChAftTt, PitchBD
	14-25. P in P/Zoom Sw Assign	P in P button (HD/RGB) (p. 34) MIDI assign	Off, CC#01–CC#95, ChAftTt, PitchBD
	14-26. Panel preset Sw Assign	PANEL PRESET button (p. 42) 1–15 MIDI assign	Off, CC#01–CC#95, ChAftTt, PitchBD
	14-27. Output Format Sw Assign	OUTPUT FORMAT button (p. 26) MIDI assign	Off, CC#01–CC#95, ChAftTt, PitchBD
	14-28. Fade Switch Assign	OUTPUT FADE button (p. 23) MIDI assign	Off, CC#01–CC#95, ChAftTt, PitchBD
	14-29. Fade Level Assign	TIME knob (p. 23) MIDI assign	Off, CC#01–CC#95, ChAftTt, PitchBD
ver 2.0	14-30. PR Control	* Refer to “Controlling the V-440HD from a PR-80/50” (p. 56).	Off, On
ver 2.0	14-31. MIDI Bulk Dump	Transmits the settings to MIDI-connected devices	* Refer to “Saving the V-440HD’s Settings to a Computer” (p. 48).
ver 2.0	14-32. MIDI Reset	Resets the above settings to the original factory settings	—

15. Factory Reset

This restores the V-440HD to its original factory default settings.

* Note that when this procedure is executed, all settings made up to that time are deleted.

Restoring the Original Factory Default Settings

1. Display the menu.
2. Select “15. Factory Reset.”
3. The message “Are You Sure?” appears; select “Yes.”
4. Press the ENTER button.

REMOTE Command Reference

For more information on transmission settings, refer to “About the REMOTE Connector” (p. 53).

Overview of Commands

A command consists of an ASCII code sequence containing “stx,” three uppercase letters of the alphabet, and a semicolon (“;”). The three letters of the alphabet indicate the command type. If the command has an argument, a colon (“:”) is inserted between the two letters of the alphabet and the argument. When multiple arguments occur, they are separated by commas (“,”).

“stx” This is the ASCII code signal name (code number 02H [hexadecimal]) and code that signals the command start.

“:” This is the code used by the Presenter to separate the command and its arguments.

“;” This is the code used by the Presenter to signify the end of a command.

Example 1) When transmitting the A-BUS channel select command → the ASCII code string stxSIA; is transmitted.

Example 2) When setting the SD section P in P horizontal placement at 50%, vertical placement at 25%, and size at 50% → the ASCII code string stxSPI:50,70,95; is transmitted.

Commands Transmitted from External Devices to the V-440HD

In the following, stx (02H), ACK (06H), and Xon (11H)/Xoff (13H) are control codes.

* When transmitting commands to the V-440HD from an external device, be sure that ACK is returned before transmitting the next command.

SIA A-BUS Channel Select

stxSIA;a;

a: Channel number (0: SD IN Channel 1, 1: SD IN Channel 2, 2: SD IN Channel 3, 3: SD IN Channel 4)

This selects the A-BUS channels.

ACK is returned by the V-440HD upon proper reception of the command.

SIB B-BUS Channel Select

stxSIB;a;

a: Channel number (0: SD IN Channel 1, 1: SD IN Channel 2, 2: SD IN Channel 3, 3: SD IN Channel 4)

This selects the B-BUS channels.

ACK is returned by the V-440HD upon proper reception of the command.

STB Video Fader (SD) Position

stxSTB;a;

a: Video fader (SD) position (0–255, 0: A-BUS, 255: B-BUS)

This sets the video fader (SD) position.

ACK is returned by the V-440HD upon proper reception of the command.

STM TIME Knob (SD) Setting

stxSTM;a;

a: Time (0.0–4.0)

ACK is returned by the V-440HD upon proper reception of the command.

SAT AUTO Button (SD) Setting

stxSAT;a;

a: Time (0.0–4.0)

This switches the A-BUS and B-BUS over the time set with the number.

ACK is returned by the V-440HD upon proper reception of the command.

STR TRANSITION Button (SD) Select

stxSTR;a;

a: TRANSITION button (SD) number (0:CUT, 1: MIX 2:WIPE 1, 3: WIPE 2, 4: WIPE 3, 5: WIPE 4, 6: WIPE 5, 7: WIPE 6)

This selects the TRANSITION button (SD) for the effect used in switching in the SD section.

ACK is returned by the V-440HD upon proper reception of the command.

SPS SD Section P in P Effect ON

stxSPS;a;

a: P in P status (0–5 (0: Off, 1–5: P in P PATTERN buttons (SD) 1–5 On))

This selects the P in P PATTERN button 1–5 used for the P in P effect in the SD section.

ACK is returned by the V-440HD upon proper reception of the command.

SPI SD Section P in P Effect Setting

stxSPI:a,b,c;

a: P in P horizontal position (%)(-40 to 40)

b: P in P vertical position (%)(-40 to 40)

c: P in P size (%) (20 to 100)

This makes the settings for the P in P currently being displayed.

ACK is returned by the V-440HD upon proper reception of the command.

SKS SD Section Key Composite ON

stxSKS;a;

a: Key composite status (0–4 (0: Off, 1: Luminance Key, 2: Luminance Key, 3: Chroma Key 1, 4: Chroma Key 2))

This switches the SD section’s key composite effects on and off. It also sets the type of key applied when the effect is switched on.

ACK is returned by the V-440HD upon proper reception of the command.

SKL SD Section Key Level

stxSKL;a;

a: Key Level (0–255)

This sets the key level in the SD section.

ACK is returned by the V-440HD upon proper reception of the command.

HIC C-BUS Channel Select

stxHIC:a;

a: Channel number (0: HD/RGB Channel A/B, 1: HD/RGB IN Channel 1, 2: HD/RGB IN Channel 2, 3: HD/RGB IN Channel 3, 4: HD/RGB IN Channel 4)

This selects the C-BUS channels.

ACK is returned by the V-440HD upon proper reception of the command.

HID D-BUS Channel Select

stxHID:a;

a: Channel number (0: HD/RGB Channel A/B, 1: HD/RGB IN Channel 1, 2: HD/RGB IN Channel 2, 3: HD/RGB IN Channel 3, 4: HD/RGB IN Channel 4)

This selects the D-BUS channels.

ACK is returned by the V-440HD upon proper reception of the command.

HTB Video Fader (HD/RGB) Position

stxHTB:a;

a: Video fader (HD/RGB) position (0–255, 0: C-BUS, 255: D-BUS)

This sets the video fader (HD/RGB) position.

ACK is returned by the V-440HD upon proper reception of the command.

HTM TIME Knob (HD/RGB) Setting

stxHTM:a;

a: Time (0.0–4.0)

ACK is returned by the V-440HD upon proper reception of the command.

HAT AUTO Button (HD/RGB) Setting

stxHAT:a;

a: Time (0.0–4.0)

This switches the D-BUS and C-BUS over the time set with the number. ACK is returned by the V-440HD upon proper reception of the command.

HTR TRANSITION Button (HD/RGB) Select

stxHTR:a;

a: TRANSITION button (HD/RGB) number (0:CUT, 1: MIX 2:WIPE 1, 3: WIPE 2, 4: WIPE 3, 5: WIPE 4, 6: WIPE 5, 7: WIPE 6)

This selects the TRANSITION button (HD/RGB) for the effect used in switching in the HD/RGB section.

ACK is returned by the V-440HD upon proper reception of the command.

HPS HD/RGB Section P in P Effect ON

stxHPS:a;

a: P in P status (0–5 (0: Off, 1–5: P in P PATTERN buttons (SD) 1–5 On))

This selects the P in P PATTERN button 1–5 used for the P in P effect in the HD/RGB section.

ACK is returned by the V-440HD upon proper reception of the command.

HPI HD/RGB Section P in P Effect Setting

stxHPI:a,b,c;

a: P in P horizontal position (%) (-40 to 40)

b: P in P vertical position (%) (-40 to 40)

c: P in P size (%) (20 to 100)

This makes the settings for the P in P currently being displayed.

ACK is returned by the V-440HD upon proper reception of the command.

HKS HD/RGB Section Key Composite On

stxHKS:a;

a: Key composite status (0–4 (0: Off, 1: White Key, 2: Black Key, 3: Chroma Key 1, 4: Chroma Key 2))

This switches the HD/RGB section's key composite effects on and off. It also sets the type of key applied when the effect is switched on.

ACK is returned by the V-440HD upon proper reception of the command.

HKL HD/RGB Section Key Level

stxHKL:a;

a: Key Level (0–255)

This sets the key level in the HD/RGB section.

ACK is returned by the V-440HD upon proper reception of the command.

PSE PANEL PRESET Select

stxPSE:a;

a: PANEL PRESET number (0–14: Panel Preset 1–15, 15: Factory Preset)

This selects the PANEL PRESET settings.

ACK is returned by the V-440HD upon proper reception of the command.

OUT OUTPUT FORMAT Button Select

stxOUT:a;

a: 0–2 (0: 1080i, 1: 720p, 2: RGB)

This selects the OUTPUT FORMAT button, changing the format of the video output.

ACK is returned by the V-440HD upon proper reception of the command.

FAD OUTPUT FADE Operation

stxFAD:a;

a: OUTPUT FADE status (0–255, 0: FADE MAX, 255: VIDEO MAX)

This sets the concentration during fadeouts of the video output from the HD OUT and RGB OUT connectors.

ACK is returned by the V-440HD upon proper reception of the command.

RST V-440HD Reset

stxRST;

This resets the V-440HD's panel status, with the Factory Presets called up.

ACK is returned by the V-440HD upon proper reception of the command.

VER Version Information Request

stxVER;

Transmit this when you want to check the V-440HD's version. The version information is returned.

* For more details on version information, refer to "VER Version Information" on this page.

ACS Active Sensing Request

stxACS;

Transmit this when you want to check the V-440HD's status.

ACK is returned when no operation is being performed by the V-440HD.

DAT Data Transmission

ver 2.0

stxDAT:aaaa,bbbb;

aaaa: Address (aaaa, bbbb are in hexadecimal)

bbbb: Data

This overwrites the data at the specified address.

After the required data is transmitted, FFFF,xxxx; is transmitted as the final string of the command, and the data is written (xxxx represents the data version).

ACK is returned by the V-440HD upon proper reception of the command.

- "Serial Data Tool," software which can be used for backing up the V-440HD's settings (for Windows XP only), is available on the Roland Systems Group website. Download the software from the URL shown below.
- A "SERIAL REMOTE/MIDI Address Map" providing a list of addresses has been prepared separately from the Owner's Manual. Download the PDF file from the URL shown below (free of charge).

[Roland Systems Group Website]

<http://rolandssystemsgroup.net>

XON Flow Control

XON

XOFF Flow Control

XOFF

Commands Transmitted from the V-440HD to External Devices

In the following, stx(02H), ACK(06H), and Xon(11H)/Xoff(13H) are control codes.

ACK Acknowledgment of Proper Reception

ACK

This is transmitted when a command is received properly.

ERR Error Information

stxERR:a;

- a: 0 (syntax error) Error in the syntax of the received command.
- 2 (busy error) V-440HD busy, command cannot be processed.
- 5 (out of range error) Number in received command is out of range.
- 20 (something error) Other error. Transmitted when the V-440HD is unable to process the command properly.

VER Version Information

stxVER:"a","b","c";

a: Model Name

b: Version

c: Reserved

This is transmitted when the V-440HD receives a VR command version. The version information is transmitted as an ASCII character string.

DAT Data Transmission

ver 2.0

stxDAT:aaaa,bbbb;

aaaa: Address (aaaa, bbbb are in hexadecimal)

bbbb: Data

The data is transmitted to the specified address.

After the required data is transmitted, FFFF,xxxx; is transmitted as the final string of the command, and the data is written (xxxx represents the data version).

- "Serial Data Tool," software which can be used for backing up the V-440HD's settings (for Windows XP only), is available on the Roland Systems Group website. Download the software from the URL shown below.
- A "SERIAL REMOTE/MIDI Address Map" providing a list of addresses has been prepared separately from the Owner's Manual. Download the PDF file from the URL shown below (free of charge).

[Roland Systems Group Website]

<http://rolandssystemsgroup.net>

XON Flow Control

XON

XOFF Flow Control

XOFF

MIDI implementation

Model: V-440HD
Date: Oct. 14, 2007
Version: 2.07

Symbol	Item	Setting range
n:	MIDI channel	0H-FH (ch.1 - ch.16)
vv:	Control value, Velocity value, etc.	00H-7FH (0 - 127) (Only when the item is the Note On Velocity, the setting range is "01H-7FH (1 - 127)".)
kk:	Note number	00H-7FH (0 - 127)
xx:	Switch on and off	00H-3FH (0 - 63): OFF 40H-7FH (64 - 127): ON

1. MIDI messages received at MIDI IN

* If MIDI Thru is ON, MIDI messages received at MIDI IN will be retransmitted without change from MIDI OUT.

■ Channel Voice Message

● Note Off

Status	Second	Third
8nH	kkH	vvH
9nH	kkH	00H

- * Only received in the Note Mode.
- * Velocity is ignored.

● Note On

Status	Second	Third
9nH	kkH	vvH

- * Received only when "Note Mode" under 14. MIDI Setup (p. 65) in the menu is set to On.
- * Selects the channel to which the note number is assigned.
- * Input switches with Note On.
- * With "PP Mode" under 14. MIDI Setup (p. 65) in the menu set to On, you can use the velocity to set the channel transition time.
- * The correspondence between note numbers and channels in 49-Key MIDI Keyboard Mode is shown below.

Note No.	Assign Ch
24H	A-Bus 1ch
26H	A-Bus 2ch
28H	A-Bus 3ch
29H	A-Bus 4ch
2BH	B-Bus 1ch
2DH	B-Bus 2ch
2FH	B-Bus 3ch
30H	B-Bus 4ch
32H	C-Bus A/Bch
34H	C-Bus 1ch
35H	C-Bus 2ch
37H	C-Bus 3ch
39H	C-Bus 4ch
3BH	D-Bus A/Bch
3CH	D-Bus 1ch
3EH	D-Bus 2ch
40H	D-Bus 3ch
41H	D-Bus 4ch

● Control Change

* By making settings in MIDI Setup, you can use these messages to control a wide variety of things. The control changes that can be used are CC#1-5, 7-31, and 64-95. For details on the factory settings, refer to "Settings Transmitted/Received Using MIDI" (p. 75).

○ Bank Select (controller numbers 0, 32)

Status	2nd byte	3rd byte
BnH	00H	mmH
BnH	20H	llH

mm, ll= bank number: 00 00H - 7F 7FH (bank, 1 - bank, 16384)

- * Processing of a Bank Select message is suspended until a subsequent Program Change is received.
- * Bank Select data that is received will be maintained until a subsequent Bank Select is received.
- * This selects the input for each channel.
- * Bank Select LSB will be ignored.

Controls correspond to bank select messages as follows.

Bank Select MSB/LSB	Program No.	Control
00H/00H	00H - 03H	A ch, INPUT 1-4
01H/00H	00H - 03H	B ch, INPUT 1-4
02H/00H	00H - 04H	C ch, INPUT AB-4
03H/00H	00H - 04H	D ch, INPUT AB-4

○ Modulation (controller number 1)

Status	2nd byte	3rd byte
BnH	01H	vvH

○ Breath-type (controller number 2)

Status	2nd byte	3rd byte
BnH	02H	vvH

○ Foot-type (controller number 4)

Status	2nd byte	3rd byte
BnH	04H	vvH

○ Portamento Time (controller number 5)

Status	2nd byte	3rd byte
BnH	05H	vvH

○ Volume (controller number 7)

Status	2nd byte	3rd byte
BnH	07H	vvH

○ Balance (controller number 8)

Status	2nd byte	3rd byte
BnH	08H	vvH

○ Panpot (controller number 10)

Status	2nd byte	3rd byte
BnH	0AH	vvH

○ Expression (controller number 11)

Status	2nd byte	3rd byte
BnH	0BH	vvH

○ Effect Control 1 (controller number 12)

Status	2nd byte	3rd byte
BnH	0CH	vvH

○ Effect Control 2 (controller number 13)

Status	2nd byte	3rd byte
BnH	0DH	vvH

○ General Purpose Controllers 1-4 (controller numbers 16-19)

Status	2nd byte	3rd byte
BnH	10H - 13H	vvH

MIDI implementation

○Hold 1 (controller number 64)

Status	2nd byte	3rd byte
BnH	40H	xxH

○Portamento (controller number 65)

Status	2nd byte	3rd byte
BnH	41H	xxH

○Sostenuto (controller number 66)

Status	2nd byte	3rd byte
BnH	42H	xxH

○Soft (controller number 67)

Status	2nd byte	3rd byte
BnH	43H	xxH

○Legato (controller number 68)

Status	2nd byte	3rd byte
BnH	44H	xxH

○Hold 2 (controller number 69)

Status	2nd byte	3rd byte
BnH	45H	xxH

○Sound Controllers 1–10 (controller numbers 70–79)

Status	2nd byte	3rd byte
BnH	46 - 4FH	vvH

○General Purpose Controllers 5–8 (controller numbers 80–83)

Status	2nd byte	3rd byte
BnH	50 - 53FH	vvH

○Portamento Control (controller number 84)

Status	2nd byte	3rd byte
BnH	54H	vvH

○Effect Depth 2-5 (controller number 92–95)

Status	2nd byte	3rd byte
BnH	5C - 5FH	vvH

●Program Change

Status	2nd byte
CnH	ppH

pp= program number: 00H - 7FH (prog.1 - Prog.128)

- * This selects the input for Channel A and Channel B. For more detailed information refer to the Bank Select parameters.
- * If a non-selectable Program Change is received, it will be ignored.

●Channel Pressure

Status	2nd byte
DnH	vvH

- * Just as for Control Change messages, you can make settings in MIDI Setup to use Channel Pressure messages to control a wide variety of things. For details on the factory settings, refer to "Settings Transmitted/Received Using MIDI" (p. 75).

●Pitch Bend Change

Status	2nd byte	3rd byte
EnH	llH	mmH

mm, ll= pitch bend value: 00 00H - 40 00H - 7F 7FH (-8192 - 0 → +8191)

- * Just as for Control Change messages, you can make settings in MIDI Setup to use Pitch Bend Change messages to control a wide variety of things. For details on the factory settings, refer to "Settings Transmitted/Received Using MIDI" (p. 75).

■System exclusive messages

Status	Data bytes	Status
F0H	iiH, ddH, ..., eeH	F7H

F0H: System Exclusive Message status

ii= ID number: An ID number (manufacturer ID) that indicates the manufacturer to which the exclusive message belongs. Roland's manufacturer ID is 41H. ID numbers 7EH and 7FH are used for Universal Non-realtime Messages (7EH) and Universal Realtime Messages (7FH) to extend the MIDI specification.

dd, .. ee= data: 00H-7FH (0-127)

F7H: EOX (End Of Exclusive)

●Data Set 1 (DT1)

This is the message that transfers actual data, and is used to specify data for a device.

Status	Data bytes	Status
F0H	41H, dev, 00H, 00H, 10H, 12H, aaH, bbH, ccH, ddH, ..., eeH, sum	F7H

Byte	Explanation
F0H	Exclusive status
41H	ID number (Roland)
dev	Device ID (dev: 00H-1FH, factory setting is 10H)
00H	1st byte of model ID (V-440HD)
00H	2nd byte of model ID (V-440HD)
10H	3rd byte of model ID (V-440HD)
12H	Command ID (DT1)
aaH	Upper byte of address
bbH	Address
ccH	Address
ddH	Data: the actual data to be transmitted. Multi-byte data is transmitted in the order of the address.

:	:
eeH	Data
sum	Checksum
F7H	EOX (End Of Exclusive)

Status	Data bytes	Status
F0H	41H, dev, 00H, 51H, 12H, aaH, bbH, ccH, ddH, ..., eeH, sum	F7H

Byte	Explanation
F0H	Exclusive status
41H	ID number (Roland)
dev	Device ID (dev: 00H-1FH, factory setting is 01H)
00H	Upper byte of model ID (V-Link message)
51H	Lower byte of model ID (V-Link message)
12H	Command ID (DT1)
aaH	Upper byte of address
bbH	Address
ccH	Address
ddH	Data: the actual data to be transmitted. Multi-byte data is transmitted in the order of the address.
eeH	Data
sum	Checksum
F7H	EOX (End Of Exclusive)

- * For details on setting the address, size, and checksum, refer to "Calculating the checksum ('H' is appended to hexadecimal numbers)" (p. 75).
- * Data that exceeds 256 bytes must be divided into packets of 256 bytes or less for transmission. If a subsequent "Data Set 1" message is transmitted, an interval of at least 20 ms must be left between packets.

2. MIDI messages transmitted from MIDI OUT

- * If MIDI Thru is ON, MIDI messages received at MIDI IN are re-transmitted without change from MIDI OUT.
- * If MIDI Thru is ON, messages from the V-440HD itself will not be transmitted.

■Channel voice messages

●Control Change

- * The messages assigned in MIDI Setup will be transmitted when you operate the panel. The control changes that can be used are CC#1-5, 7-31, and 64-95. For the factory settings, refer to "Settings Transmitted/Received Using MIDI" (p. 75).

○Bank Select (controller numbers 0, 32)

Status	2nd byte	3rd byte
BnH	00H	mmH
BnH	20H	llH

mm, ll= bank number: 00 00H - 7F 7FH (bank.1 - bank.16384)

- * When you select channel A or channel B inputs, make memory settings, or specify how sub-channels are mixed in Presentation mode, these messages will be transmitted in conjunction with Program Changes.

* The following controls correspond to each Bank Select message.

Bank Select MSB/LSB	Program No.	Control
00H/00H	00H - 03H	A ch, INPUT 1-4
01H/00H	00H - 03H	B ch, INPUT 1-4
02H/00H	00H - 04H	C ch, INPUT AB-4
03H/00H	00H - 04H	D ch, INPUT AB-4

○Modulation (controller number 1)

Status	<u>2nd byte</u>	<u>3rd byte</u>
BnH	01H	vvH

○Breath-type (controller number 2)

Status	<u>2nd byte</u>	<u>3rd byte</u>
BnH	02H	vvH

○Foot-type (controller number 4)

Status	<u>2nd byte</u>	<u>3rd byte</u>
BnH	04H	vvH

○Portamento Time (controller number 5)

Status	<u>2nd byte</u>	<u>3rd byte</u>
BnH	05H	vvH

○Volume (controller number 7)

Status	<u>2nd byte</u>	<u>3rd byte</u>
BnH	07H	vvH

○Balance (controller number 8)

Status	<u>2nd byte</u>	<u>3rd byte</u>
BnH	08H	vvH

○Panpot (controller number 10)

Status	<u>2nd byte</u>	<u>3rd byte</u>
BnH	0AH	vvH

○Expression (controller number 11)

Status	<u>2nd byte</u>	<u>3rd byte</u>
BnH	0BH	vvH

○Effect Control 1 (controller number 12)

Status	<u>2nd byte</u>	<u>3rd byte</u>
BnH	0CH	vvH

○Effect Control 2 (controller number 13)

Status	<u>2nd byte</u>	<u>3rd byte</u>
BnH	0DH	vvH

○General Purpose Controllers 1-4 (controller numbers 16-19)

Status	<u>2nd byte</u>	<u>3rd byte</u>
BnH	10H - 13H	vvH

○Hold 1 (controller number 64)

Status	<u>2nd byte</u>	<u>3rd byte</u>
BnH	40H	xxH

○Portamento (controller number 65)

Status	<u>2nd byte</u>	<u>3rd byte</u>
BnH	41H	xxH

○Sostenuto (controller number 66)

Status	<u>2nd byte</u>	<u>3rd byte</u>
BnH	42H	xxH

○Soft (controller number 67)

Status	<u>2nd byte</u>	<u>3rd byte</u>
BnH	43H	xxH

○Legato (controller number 68)

Status	<u>2nd byte</u>	<u>3rd byte</u>
BnH	44H	xxH

○Hold 2 (controller number 69)

Status	<u>2nd byte</u>	<u>3rd byte</u>
BnH	45H	xxH

○Sound Controllers 1-10 (controller numbers 70-79)

Status	<u>2nd byte</u>	<u>3rd byte</u>
BnH	46 - 4FH	vvH

○General Purpose Controllers 5-8 (controller numbers 80-83)

Status	<u>2nd byte</u>	<u>3rd byte</u>
BnH	50 - 53FH	vvH

○Portamento Control (controller number 84)

Status	<u>2nd byte</u>	<u>3rd byte</u>
BnH	54H	vvH

○Effect Depth 2-5 (controller number 92-95)

Status	<u>2nd byte</u>	<u>3rd byte</u>
BnH	5C - 5FH	vvH

●Program Change

Status	<u>2nd byte</u>
CnH	ppH

pp= program number:00H - 7FH (prog.1 - prog.128)

* When you select channel A or channel B inputs, make memory settings, or specify how sub-channels are mixed in Presentation mode, these messages will be transmitted in conjunction with Bank Select messages. For details, refer to the section on Bank Select.

●Channel Pressure

Status	<u>2nd byte</u>
DnH	vvH

* Just as for Control Changes, the messages assigned in MIDI Setup will be transmitted when you operate the panel. For the factory settings, refer to "Settings Transmitted/Received Using MIDI" (p. 75).

●Pitch Bend Change

Status	<u>2nd byte</u>	<u>3rd byte</u>
EnH	llH	mmH

mm, ll= pitch bend value:00 00H - 40 00H - 7F 7FH (-8192 - 0 - +8191)

* Just as for Control Changes, the messages assigned in MIDI Setup will be transmitted when you operate the panel. For the factory settings, refer to "Settings Transmitted/Received Using MIDI" (p. 75).

●Data Set 1 (DT1)

This is the message that transfers actual data, and is used to specify data for a device.

Status	<u>Data bytes</u>	<u>Status</u>
F0H	41H, dev, 00H, 00H, 10H, 12H, aaH, bbH, ccH, ddH, ..., eeH, sum	F7H

Byte	Explanation
F0H	Exclusive status
41H	ID number (Roland)
dev	Device ID (dev: 00H-1FH, factory setting is 10H)
00H	1st byte of model ID (V-440HD)
00H	2nd byte of model ID (V-440HD)
10H	3rd byte of model ID (V-440HD)
12H	Command ID (DT1)
aaH	Upper byte of address
bbH	Address
ccH	Address
ddH	Data: the actual data to be transmitted. Multi-byte data is transmitted in the order of the address.
:	:
eeH	Data
sum	Checksum
F7H	EOX (End Of Exclusive)

* For details on setting the address, size, and checksum, refer to "Example of exclusive message and checksum calculation".

* Data that exceeds 256 bytes must be divided into packets of 256 bytes or less for transmission. If a subsequent "Data Set 1" message is transmitted, an interval of at least 20 ms must be left between packets.

MIDI implementation

3. Parameter Address Map

■3-1. V-440HD (Model ID = 00H 00H 10)

* Addresses marked by # are sent as two bytes; an upper nibble (upper 4 bits) and lower nibble (lower 4 bits).

Example) If the original data is BCH, OBH is transmitted as the first byte. The next byte transmitted is 0CH. For reception, this is ignored if two bytes are not received together.

* Addresses marked by ## are sent as two bytes; an upper nibble (upper 6 bits and lower MSB) and lower nibble (lower 7 bits).

Example) If the original data is 01FFH, 03H is transmitted as the first byte. The next byte transmitted is 7FH. This is ignored if two bytes are not received together.

* Do not transmit data to the address whose Parameter Name is "Reserve".

* DEVICE ID = 10H.

Start Address	Description
00H 00H 00H	System Common Preference Area (See 3-1-1)
01H 00H 00H	Panel Control Preference Area (See 3-1-2)
02H 00H 00H	---
03H 00H 00H	Key Control Parameter (See 3-1-3)
04H 00H 00H	HD PinP Control Parameter Area (See 3-1-4)
05H 00H 00H	SD PinP Control Parameter Area (See 3-1-5)
06H 00H 00H	Multi Control Parameter Area (See 3-1-6)
07H 00H 00H	Video Fader Control Parameter (See 3-1-7)

●3-1-1. System Common Preference

Address	Parameter Name	Sys.Ex.Value	Meaning of Value
00H 00H 00H	MIDI Receive Channel	00H - 10H	1 - 16 Ch, OFF
00H 00H 10H	Reserve	---	System Parameter
00H 00H 11H	Reserve	---	System Parameter
00H 00H 12H	Note Mode	00H - 02H	OFF, 49Keys, Assignable
00H 00H 13H	Note Lower Key Assign	00H - 7FH	Note Number
00H 00H 14H	Note Upper Key Assign	00H - 7FH	Note Number
00H 00H 15H	PR Control	00H - 01H	OFF, ON
00H 00H 16H	Panel Operation Mode	00H - 01H	A/B Mode, PGM-PST Mode
00H 00H 17H	Reserve	---	System Parameter
00H 00H 18H	Reserve	---	System Parameter
00H 00H 19H	Reserve	---	System Parameter
00H 00H 1AH	Reserve	---	System Parameter

●3-1-2. Panel Control Preference

Address	Parameter Name	Sys.Ex.Value	Meaning of Value
#01H 00H 00H	Tx/Rx Setting (SD Auto Switch)	01H-05H, 07H-1FH, 40H-5FH, D0H, E0H, FFH	Control Change, Channel Press, Pitch Bend, OFF
#01H 00H 02H	Tx/Rx Setting (SD Transition Pattern)	01H-05H, 07H-1FH, 40H-5FH, D0H, E0H, FFH	Control Change, Channel Press, Pitch Bend, OFF
#01H 00H 04H	Tx/Rx Setting (SD Transition Time)	01H-05H, 07H-1FH, 40H-5FH, D0H, E0H, FFH	Control Change, Channel Press, Pitch Bend, OFF
#01H 00H 06H	Tx/Rx Setting (SD Video Fader)	01H-05H, 07H-1FH, 40H-5FH, D0H, E0H, FFH	Control Change, Channel Press, Pitch Bend, OFF
#01H 00H 08H	Tx/Rx Setting (SD Key Switch)	01H-05H, 07H-1FH, 40H-5FH, D0H, E0H, FFH	Control Change, Channel Press, Pitch Bend, OFF
#01H 00H 0AH	Tx/Rx Setting (SD PinP Switch)	01H-05H, 07H-1FH, 40H-5FH, D0H, E0H, FFH	Control Change, Channel Press, Pitch Bend, OFF
#01H 00H 0CH	Tx/Rx Setting (SD Lock Switch)	01H-05H, 07H-1FH, 40H-5FH, D0H, E0H, FFH	Control Change, Channel Press, Pitch Bend, OFF
#01H 00H 0EH	Tx/Rx Setting (HD Auto Switch)	01H-05H, 07H-1FH, 40H-5FH, D0H, E0H, FFH	Control Change, Channel Press, Pitch Bend, OFF
#01H 00H 10H	Tx/Rx Setting (HD Transition Pattern)	01H-05H, 07H-1FH, 40H-5FH, D0H, E0H, FFH	Control Change, Channel Press, Pitch Bend, OFF
#01H 00H 12H	Tx/Rx Setting (HD Transition Time)	01H-05H, 07H-1FH, 40H-5FH, D0H, E0H, FFH	Control Change, Channel Press, Pitch Bend, OFF
#01H 00H 14H	Tx/Rx Setting (HD Video Fader)	01H-05H, 07H-1FH, 40H-5FH, D0H, E0H, FFH	Control Change, Channel Press, Pitch Bend, OFF
#01H 00H 16H	Tx/Rx Setting (HD Key Switch)	01H-05H, 07H-1FH, 40H-5FH, D0H, E0H, FFH	Control Change, Channel Press, Pitch Bend, OFF
#01H 00H 18H	Tx/Rx Setting (HD PinP Switch)	01H-05H, 07H-1FH, 40H-5FH, D0H, E0H, FFH	Control Change, Channel Press, Pitch Bend, OFF
#01H 00H 1AH	Tx/Rx Setting (HD Lock Switch)	01H-05H, 07H-1FH, 40H-5FH, D0H, E0H, FFH	Control Change, Channel Press, Pitch Bend, OFF
#01H 00H 1CH	Tx/Rx Setting (PinP/Zoom Switch)	01H-05H, 07H-1FH, 40H-5FH, D0H, E0H, FFH	Control Change, Channel Press, Pitch Bend, OFF
#01H 00H 1EH	Tx/Rx Setting (Panel Preset Switch)	01H-05H, 07H-1FH, 40H-5FH, D0H, E0H, FFH	Control Change, Channel Press, Pitch Bend, OFF
#01H 00H 20H	Tx/Rx Setting (OutputFormat Switch)	01H-05H, 07H-1FH, 40H-5FH, D0H, E0H, FFH	Control Change, Channel Press, Pitch Bend, OFF
#01H 00H 22H	Tx/Rx Setting (Fade Switch)	01H-05H, 07H-1FH, 40H-5FH, D0H, E0H, FFH	Control Change, Channel Press, Pitch Bend, OFF
#01H 00H 24H	Tx/Rx Setting (Fade Level)	01H-05H, 07H-1FH, 40H-5FH, D0H, E0H, FFH	Control Change, Channel Press, Pitch Bend, OFF

●3-1-3. Key Control Parameter

Address	Parameter Name	Sys.Ex.Value	Meaning of Value
##03H 00H 00H	HD Key Type	0000H-0003H	HD Key Type
##03H 00H 02H	HD Key Level	0000H-00FFH	HD Key Level
##03H 00H 04H	HD Key Edge	0000H-000FH	HD Key Edge
##03H 00H 06H	SD Key Type	0000H-0003H	SD Key Type
##03H 00H 08H	SD Key Level	0000H-00FFH	SD Key Level
##03H 00H 0AH	SD Key Edge	0000H-000FH	SD Key Edge

●3-1-4. HD PinP Control Preference

Address	Parameter Name	Sys.Ex.Value	Meaning of Value
##04H 00H 00H	HD PinP Size	0014H-0064H	Size (20%-100%)
##04H 00H 02H	HD PinP X Position	0032H-0064H-0096H	X position (-50%-0%- +50%)
##04H 00H 04H	HD PinP Y Position	0032H-0064H-0096H	Y position (-50%-0%- +50%)
##04H 00H 06H	HD PinP Zoom	0064H-03E8H	Zoom (100%-1000%)
##04H 00H 08H	HD PinP X Pan Position	0000H-0064H-00C8H	X Pan position (-100%-0%- +100%)
##04H 00H 0AH	HD PinP Y Pan Position	0000H-0064H-00C8H	Y Pan position (-100%-0%- +100%)

●3-1-5. SD PinP Control Parameter

Address	Parameter Name	Sys.Ex.Value	Meaning of Value
##05H 00H 00H	SD PinP Size	0014H-0064H	X Size (20%-100%)
##05H 00H 02H	SD PinP X Position	000AH-0032H-005AH	X position (-40%-0%- +40%)
##05H 00H 04H	SD PinP Y Position	000AH-0032H-005AH	Y position (-40%-0%- +40%)

●3-1-6. Multi Control Parameter

Address	Parameter Name	Sys.Ex.Value	Meaning of Value
##06H 00H 00H	Multi Screen On/Off	0000H-0001H	Multi Switch
##06H 00H 02H	Multi Screen Type	0000H-0003H	Multi Scale(2x1,2x2,3x1,3x2)
##06H 00H 04H	Reserve	---	System Parameter
##06H 00H 06H	Screen1 X Size	0000H-07D0H	X Size(0-2000)
##06H 00H 08H	Screen1 Y Size	0000H-07D0H	Y Size(0-2000)
##06H 00H 0AH	Screen1 X Position	0000H-07D0H	X position(0-2000)
##06H 00H 0CH	Screen1 Y Position	0000H-07D0H	Y position(0-2000)
##06H 00H 0EH	Screen2 X Size	0000H-07D0H	X Size(0-2000)
##06H 00H 10H	Screen2 Y Size	0000H-07D0H	Y Size(0-2000)
##06H 00H 12H	Screen2 X Position	0000H-07D0H	X position(0-2000)
##06H 00H 14H	Screen2 Y Position	0000H-07D0H	Y position(0-2000)
##06H 00H 16H	Screen3 X Size	0000H-07D0H	X Size(0-2000)
##06H 00H 18H	Screen3 Y Size	0000H-07D0H	Y Size(0-2000)
##06H 00H 1AH	Screen3 X Position	0000H-07D0H	X position(0-2000)
##06H 00H 1CH	Screen3 Y Position	0000H-07D0H	Y position(0-2000)
##06H 00H 1EH	Screen4 X Size	0000H-07D0H	X Size(0-2000)
##06H 00H 20H	Screen4 Y Size	0000H-07D0H	Y Size(0-2000)
##06H 00H 22H	Screen4 X Position	0000H-07D0H	X position(0-2000)
##06H 00H 24H	Screen4 Y Position	0000H-07D0H	Y position(0-2000)
##06H 00H 26H	Screen5 X Size	0000H-07D0H	X Size(0-2000)
##06H 00H 28H	Screen5 Y Size	0000H-07D0H	Y Size(0-2000)
##06H 00H 2AH	Screen5 X Position	0000H-07D0H	X position(0-2000)
##06H 00H 2CH	Screen5 Y Position	0000H-07D0H	Y position(0-2000)
##06H 00H 2EH	Screen6 X Size	0000H-07D0H	X Size(0-2000)
##06H 00H 30H	Screen6 Y Size	0000H-07D0H	Y Size(0-2000)
##06H 00H 32H	Screen6 X Position	0000H-07D0H	X position(0-2000)
##06H 00H 34H	Screen6 Y Position	0000H-07D0H	Y position(0-2000)

●3-1-7.Video Fader Control Parameter

##07H 00H 00H	SD Video Fader	0000H - 3FFFH	Position(0 - 16383)
##07H 00H 02H	HD Video Fader	0000H - 3FFFH	Position(0 - 16383)

■3-2. V-LINK Received Data (Model ID = 00H 51H)

* Addresses marked by # are sent as two bytes; an upper nibble (upper 4 bits) and lower nibble (lower 4 bits).

Example) If the original data is channel B, 0BH is transmitted as the first byte. The next byte transmitted is 0CH. For reception, this is ignored if two bytes are not received together.

* If — is shown in the value field, the V-440HD does not have a corresponding parameter. This will be ignored if received.

Start Address	Description
10H 00H 00H	V-LINK System Preference Area (See 3-2-1)
10H 10H 00H	V-LINK Clip Control Assignment Area (See 3-2-2)
10H 20H 00H	V-LINK Color Control Assignment Area (See 3-2-3)
10H 10H 00H	V-LINK Clip Control Preference Area (See 3-2-4)

●3-2-1. System Preference

Address	Parameter Name	Sys.Ex.Value	Meaning of Value
10H 00H 00H	V-LINK Enabled	00H - 01H	OFF, ON
10H 00H 01H	V-LINK MIDI Rx Channel (Clip)	00H - 0FH	1 - 16 Ch.
10H 00H 02H	V-LINK MIDI Rx Channel (Color)	---	---
10H 00H 03H	V-LINK Note Message Enabled	---	---
10H 00H 04H	V-LINK Fast Control Enabled	---	---
10H 00H 05H	V-LINK MMC Control Mode	---	---
10H 00H 06H	V-LINK MTC Control Mode	---	---
10H 00H 07H	V-LINK Auto Mix Mode	---	---
10H 00H 07H	V-LINK Auto Mix Mode	00H - 01H	OFF, ON

●3-2-2. Clip Control Assignment

Address	Parameter Name	Sys.Ex.Value	Meaning of Value
#10H 10H 00H	V-LINK Rx Setting (PlaybackSpeed)	---	---
#10H 10H 02H	V-LINK Rx Setting (Dissolve Time)	---	---
#10H 10H 04H	V-LINK Rx Setting (Audio Level)	---	---
#10H 10H 06H	V-LINK Rx Setting (T-Bar Control (HD))	01H-05H,07H-1FH, 40H-5FH,DOH,E0H,FFH	HD Video Fader: Control Change, Channel Press, Pitch Bend, OFF
#10H 10H 08H	V-LINK Rx Setting (Dual Stream)	---	---
#10H 10H 0AH	V-LINK Reserved	---	---
#10H 10H 0CH	V-LINK Reserved	---	---
#10H 10H 0EH	V-LINK Reserved	---	---
#10H 10H 10H	V-LINK Rx Setting (TransitionSelect (HD))	01H-05H,07H-1FH, 40H-5FH,DOH,E0H,FFH	CUT, MIX, WIPE1-6: Control Change, Channel Press, Pitch Bend, OFF
#10H 10H 12H	V-LINK Rx Setting (Transformer A)	---	---
#10H 10H 14H	V-LINK Rx Setting (Transformer B)	---	---
#10H 10H 16H	V-LINK Rx Setting (BPM Sync)	---	---

MIDI implementation

●3-2-3. Color Control Assignment

Address	Parameter Name	Sys.Ex.Value	Meaning of Value
#10H 20H 00H	V-LINK Rx Setting (Color Cb)	---	---
#10H 20H 02H	V-LINK Rx Setting (Color Cr)	---	---
#10H 20H 04H	V-LINK Rx Setting (Brightness)	---	---
#10H 20H 06H	V-LINK Rx Setting (VFX A 1)	---	---
#10H 20H 08H	V-LINK Rx Setting (VFX A 2)	---	---
#10H 20H 0AH	V-LINK Rx Setting (VFX A 3)	---	---
#10H 20H 0CH	V-LINK Rx Setting (VFX A 4)	---	---
#10H 20H 0EH	V-LINK Reserved	---	---
#10H 20H 10H	V-LINK Reserved	---	---
#10H 20H 12H	V-LINK Reserved	---	---
#10H 20H 14H	V-LINK Reserved	---	---
#10H 20H 16H	V-LINK Rx Setting (VFX B 1)	---	---
#10H 20H 18H	V-LINK Rx Setting (VFX B 2)	---	---
#10H 20H 1AH	V-LINK Rx Setting (VFX B 3)	---	---
#10H 20H 1CH	V-LINK Rx Setting (VFX B 4)	---	---
#10H 20H 1EH	V-LINK Reserved	---	---
#10H 20H 20H	V-LINK Rx Setting (Output Fader)	01H-05H,07H-1FH, 40H-5FH,DOH,E0H,FFH	Output: Control Change, Channel Press, Pitch Bend, OFF Channel Press, Pitch Bend, OFF

●3-2-4 Clip Control Preference

10H 30H 00H	V-LINK Rx Setting (Velocity Curve Type)	---	---
10H 30H 01H	V-LINK Rx Setting (Playback Speed Control Range)	---	---
10H 30H 02H	V-LINK Rx Setting (Assignable Note Mode:Lower Key)	00H-7FH	Note Number
10H 30H 03H	V-LINK Rx Setting (Assignable Note Mode:Upper Key)	00H-7FH	Note Number

■3-3.V-LINK Transmitted Data (Model ID=00H 51H)

* Addresses marked with “#” are transmitted as two bytes, with the data divided into upper byte (upper 3 bits) and lower byte (lower 7 bits).

Example: If the original data is 028AH, a value of 05H is transmitted as the first byte. A value of 0AH is transmitted as the second byte.

* Where “---” appears for the value, it means that the M-400 does not have a corresponding parameter.

Start Address	Description
10H 00H 00H	V-LINK System Common Preference Area
20H 00H 00H	V-LINK Video System Performance Area
20H 20H 00H	V-LINK Audio Mixer Parameter Area

●3-3-1. System Common Preference Area

Address	Parameter Name	Sys.Ex.Value	Meaning of Value
10H 00H 00H	V-LINK Enabled	00H - 01H	OFF, ON
10H 00H 01H	V-LINK MIDI Rx Channel (Clip)	---	---
10H 00H 02H	V-LINK MIDI Rx Channel (Color)	---	---
10H 00H 03H	V-LINK Note Message Enabled	---	---
10H 00H 04H	V-LINK Fast Control Enabled	---	---
10H 00H 05H	V-LINK MMC Control Mode	---	---
10H 00H 06H	V-LINK MTC Control Mode	---	---
10H 00H 07H	V-LINK Auto Mix Mode	---	---

●3-3-2. Video System Performance Area

Address	Description	Sys.Ex.Value	Meaning of Value
20H 00H 00H	V-LINK Number of Video Mixer Inputs	---	---

●3-3-3. Audio Mixer Parameter Area

Address	Description	Sys.Ex.Value	Meaning of Value
#20H 20H 00H	V-LINK Audio Mixer Master Level	---	---
#20H 21H 00H	V-LINK Audio Mixer Channel1 Level	0000H-0768H	Level 0.0 - 100.0%
#20H 21H 02H	V-LINK Audio Mixer Channel2 Level	0000H-0768H	Level 0.0 - 100.0%
#20H 21H 04H	V-LINK Audio Mixer Channel3 Level	0000H-0768H	Level 0.0 - 100.0%
#20H 21H 06H	V-LINK Audio Mixer Channel4 Level	0000H-0768H	Level 0.0 - 100.0%
#20H 21H 08H	V-LINK Audio Mixer Channel5 Level	0000H-0768H	Level 0.0 - 100.0%
#20H 21H 0AH	V-LINK Audio Mixer Channel6 Level	0000H-0768H	Level 0.0 - 100.0%
#20H 21H 0CH	V-LINK Audio Mixer Channel7 Level	0000H-0768H	Level 0.0 - 100.0%
#20H 21H 0EH	V-LINK Audio Mixer Channel8 Level	0000H-0768H	Level 0.0 - 100.0%

4. Appendices

■Decimal and hexadecimal conversion table

(The letter "H" follows numbers in hexadecimal notation.)

MIDI uses hexadecimal notation in 7-bit units to indicate data values and addresses and sizes within an exclusive message. Hexadecimal and decimal numbers correspond as follows.

Deci	Hexa	Deci	Hexa	Deci	Hexa	Deci	Hexa
0	00H	32	20H	64	40H	96	60H
1	01H	33	21H	65	41H	97	61H
2	02H	34	22H	66	42H	98	62H
3	03H	35	23H	67	43H	99	63H
4	04H	36	24H	68	44H	100	64H
5	05H	37	25H	69	45H	101	65H
6	06H	38	26H	70	46H	102	66H
7	07H	39	27H	71	47H	103	67H
8	08H	40	28H	72	48H	104	68H
9	09H	41	29H	73	49H	105	69H
10	0AH	42	2AH	74	4AH	106	6AH
11	0BH	43	2BH	75	4BH	107	6BH
12	0CH	44	2CH	76	4CH	108	6CH
13	0DH	45	2DH	77	4DH	109	6DH
14	0EH	46	2EH	78	4EH	110	6EH
15	0FH	47	2FH	79	4FH	111	6FH
16	10H	48	30H	80	50H	112	70H
17	11H	49	31H	81	51H	113	71H
18	12H	50	32H	82	52H	114	72H
19	13H	51	33H	83	53H	115	73H
20	14H	52	34H	84	54H	116	74H
21	15H	53	35H	85	55H	117	75H
22	16H	54	36H	86	56H	118	76H
23	17H	55	37H	87	57H	119	77H
24	18H	56	38H	88	58H	120	78H
25	19H	57	39H	89	59H	121	79H
26	1AH	58	3AH	90	5AH	122	7AH
27	1BH	59	3BH	91	5BH	123	7BH
28	1CH	60	3CH	92	5CH	124	7CH
29	1DH	61	3DH	93	5DH	125	7DH
30	1EH	62	3EH	94	5EH	126	7EH
31	1FH	63	3FH	95	5FH	127	7FH

* Decimal expressions used for MIDI channel, bank select, and program change are 1 greater than the decimal value shown in the above table.

* Hexadecimal values in 7-bit units can express a maximum of 128 levels in one byte of data. If the data requires greater resolution, two or more bytes are used. For example, a value indicated by a hexadecimal expression in two 7-bit bytes "aa bb" would be "aa x 128 + bb."

<Example 1> What is the decimal equivalent of 5AH?
From the above table, 5AH = 90.

<Example 2> What is the decimal expression of the hexadecimal expression in two 7-bit bytes "12H 34H"?
From the above table, 12H = 18, and 34H = 52. Thus,
18 x 128 + 52 = 2356

■Examples of MIDI messages

<Example 1> 92H 33H 5F
9n is the Note-on status, and n is the MIDI channel number.
2H = 2, 3EH = 62, and 5FH = 95. Thus, this is a Note-on message of MIDI CH= 3, note number 62 (note name D4), and velocity 95.

<Example 2> CEH 49H
CnH is the Program Change status, and n is the MIDI channel number.
EH = 14, and 49H = 73. Thus, this is a Program Change message of MIDI CH= 15, program number 74 (in the GS sound map, Flute).

<Example 3> EAH 00H 28H
EnH is the Pitch Bend Change status, and n is the MIDI channel number.
The second byte (00H=0) is the lower byte of the pitch bend value, and the third byte (28H=40) is the upper byte. Since the pitch bend value is a signed value with 40H 00H (= 64 x 128 + 0 = 8192) corresponding to 0, the pitch bend value in this case is:

$$28H\ 00H - 40H\ 00H = 40 \times 128 + 0 - (64 \times 128 + 0) = 5120 - 8182 = -3072$$

If the Pitch Bend Sensitivity is set to two semitones, a pitch change of -8192 (00H 00H) would change the pitch by -200 cents, so in this case, a pitch bend of -200 x (-3072) / (-8192) = -75 cents is being designated on MIDI channel 11.

■Exclusive message examples and checksum calculation

Roland exclusive messages (RQ1, DT1) contain a checksum following the data (after F7), which can be used to check whether the message was received correctly. The checksum value is derived from the address and data (or size) of the transmitted exclusive message.

●Calculating the checksum ('H' is appended to hexadecimal numbers)

The checksum is a value that produces a lower 7 bits of zero when the address, size, and checksum itself are summed. If the exclusive message to be transmitted has an address of aaH bbH ccH and the data is ddH eeH, the actual calculation would be as follows:

$$\begin{aligned} &aa + bb + cc + dd + ee = \text{sum} \\ &\text{sum} / 128 = \text{quotient} \bullet\bullet\bullet \text{Eremainder} \\ &128 - \text{remainder} = \text{checksum} \end{aligned}$$

<Example> Assigning Modulation as the control change that controls the transition effect time for the HD "Video Fader" of Tx/Rx Setting.

From the "Parameter address map," the "Video Fader" of Tx/Rx Setting transition effect time has a start address of 01H 00H 14H, and the Modulation control change has a parameter value 01H. Thus,

F0H	41H	10H	00H 00H 10H	12H	01H 00H 14H	00H 01H	??H	7FH
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)

- (1) Exclusive status
- (2) ID number (Roland)
- (3) Device ID (17)
- (4) Model ID (V-440HD)
- (5) Command ID (DT1)
- (6) Address
- (7) Data
- (8) Checksum
- (9) EOX

Next, we calculate the checksum.

$$01H + 00H + 14H + 00H + 01H = 1 + 0 + 20 + 0 + 1 = 22 \text{ (sum)}$$

$$22 \text{ (sum)} / 128 = 0 \text{ (quotient)} \bullet\bullet\bullet 22 \text{ (remainder)}$$

$$\text{Checksum} = 128 - 22 \text{ (remainder)} = 106 = 6AH$$

Thus, the message to be transmitted is F0H 41H 10H 00H 00H 10H 12H 01H 00H 14H 00H 01H 6AH 7FH

■Settings Transmitted/Received Using MIDI

●MIDI Tx Channel

This sets the V-440HD's MIDI Transmit channel.
The factory default setting is 1.

●MIDI Rx Channel

This sets the V-440HD's MIDI Receive channel.
The factory default setting is 1.
The values 0-16 can be set via MIDI, which correspond to 1-16 and OFF.

●MIDI Out/Thru Switch

This sets the MIDI Out.
The factory default setting is OUT.

●V-LINK Switch

This sets the V-LINK ON/OFF.
The factory default setting is OFF.

●Note Mode

This setting determines whether or not the input is switched when a Note ON message is received.
The factory default setting is OFF.
Settings received via MIDI can have the value 0 or 1, which correspond to ON and OFF.

●Note Lower Key Assign

This sets the lower limit for note numbers enabled for Note Mode.
The factory default setting is 0x24.

●Note Upper Key Assign

This sets the upper limit for note numbers enabled for Note Mode.
The factory default setting is 0x35.

●Device ID

This sets the ID for distinguishing devices when System Exclusive messages are received.
The factory default setting is 0x10.

MIDI implementation

●SD Auto Switch

This controls the SD Auto Switch.
This is assigned to CC#01 at the factory.
When set via MIDI, the values 0-63 correspond to OFF; the values 64-127 correspond to ON.

●SD Transition Pattern

This selects the transition pattern.
This is assigned to CC#02 at the factory.
Values 0-7 correspond to CUT, MIX, and WIPE 1-6.

●SD Transition Time

This selects the transition time.
This is assigned to CC#03 at the factory.
Values 0-127 correspond to 0.0 seconds to 4.0 seconds.

●SD Video Fader

This controls the VIDEO FADER.
The factory default setting is OFF.
Values 0-127 set with MIDI correspond to A(BUS) to B(BUS).

●SD Key Switch

This controls the SD Key Switch.
This is assigned to CC#05 at the factory.
Values 0-64 set with MIDI correspond to OFF; values 64-127 correspond to ON.

●SD PinP Switch

This controls the SD P in P Switch.
This is assigned to CC#07 at the factory.
Values 0-5 set with MIDI correspond to OFF and PinP1 ON-PinP5 ON.

●SD PinP Lock Switch

This controls the SD P in P LOCK Switch.
This is assigned to CC#08 at the factory.
Values 0-63 set with MIDI correspond to OFF; values 64-127 correspond to ON.

●HD Auto Switch

This controls the HD Auto Switch.
This is assigned to CC#09 at the factory.
Values 0-63 set with MIDI correspond to OFF; values 64-127 correspond to ON.

●HD Transition Pattern

This selects the transition pattern.
This is assigned to CC#10 at the factory.
Values 0-7 correspond to CUT, MIX, and WIPE 1-6.

●HD Transition Time

This selects the Transition Time.
This is assigned to CC#12 at the factory.
Values 0-127 correspond to 0.0 seconds to 4.0 seconds.

●HD Video Fader

This controls the VIDEO FADER.
The factory default setting is OFF.
Values 0-127 set with MIDI correspond to C(BUS) to D(BUS).

●HD Key Switch

This controls the HD Key Switch.
This is assigned to CC#13 at the factory.
Values 0-63 set with MIDI correspond to OFF; values 64-127 correspond to ON.

●HD PinP Switch

This controls the HD PinP Switch.
This is assigned to CC#14 at the factory.
Values 0-5 set with MIDI correspond to OFF and PinP1 ON-PinP5 ON.

●HD PinP Lock Switch

This controls the HD PinP LOCK Switch.
This is assigned to CC#15 at the factory.
Values 0-63 set with MIDI correspond to OFF; values 64-127 correspond to ON.

●PinP/Zoom Switch

This controls the P in P/Zoom Switch.
This is assigned to CC#16 at the factory.
Values 0-63 set with MIDI correspond to P in P/Zoom Switch On.

●Panel Preset Switch

This controls the Panel Preset Switch.
This is assigned to CC#17 at the factory.
Values 0-15 set with MIDI correspond to Preset...Preset15, Factory Preset.

●OutputFormat Switch

This controls the Output Format Switch.
This is assigned to CC#18 at the factory.
Values 0-2 set with MIDI correspond to Output Format1, Output Format2, Output Format3.

●Fade Switch

This controls the FADE Switch.
This is assigned to CC#19 at the factory.
Values 0-63 set with MIDI correspond to OFF; values 64-127 correspond to ON.

●Fade Level

This controls the FADE.
This is assigned to CC#20 at the factory.
Values 0-127 set with MIDI correspond to FADE OUT(Black) -100%.

●PR Control

This enables control of the V-440HD from an PR-80/50.
The factory default setting is OFF.
The values 0 and 1 can be set using MIDI, which correspond to the settings OFF and ON.

■Factory Setting of V-LINK

The factory setting of V-LINK (receipt of V-LINK ON message only) is as follows.

Parameter	Assign	Value
Rx Channel	-	1
Tx Channel	-	1
Note Mode	OFF	---
Note Lower Key Assign	C+2	Note# 0x24
Note Upper Key Assign	F+3	Note# 0x35
SD A Bus	-	Ach:1
SD B Bus	-	Bch:2
SD Auto Switch	OFF	-
SD Transition Pattern	OFF	Mix
SD Transition Time	cc#5	0.0sec
SD Video Fader	OFF	Ach100%
SD Key Switch	OFF	OFF
SD PinP Switch	OFF	OFF
SD PinP Lock Switch	OFF	OFF
HD C Bus	OFF	Cch:1
HD D Bus	OFF	Dch:2
HD Auto Switch	OFF	-
HD Transition Pattern	OFF	Mix
HD Transition Time	CC#5	0.0sec
HD Video Fader	OFF	Cch100%
HD Key Switch	OFF	OFF
HD PinP Switch	OFF	OFF
HD PinP Lock Switch	OFF	OFF
PinP/Zoom Switch	OFF	PinP
Panel Preset Switch	OFF	OFF
Output Format Switch	OFF	1
Output Fade Mode	-	Auto
Fade Switch	OFF	-
Fade Level	OFF	MAX
PR Control	OFF	-

- * When V-LINK is off, V-LINK message will be ignored.
- * The changes of setting done while V-LINK is on will not be saved.
- * When switching from V-LINK ON to OFF, the MIDI transmit/receive settings revert to the settings that were in effect before V-LINK was switched on.

MIDI implementation

MULTI FORMAT VIDEO MIXER

Date : Aug. 22, 2006

Model V-440HD

MIDI Implementation Chart

Version : 2.00

Function...	Transmitted	Recognized	Remarks
Basic Channel Default Changed	1 1 — 16	1 1 — 16	
Mode Default Messages Altered	Mode 3 X *****	Mode 3 X *****	
Note Number : True Voice	X X	X 0 — 127 *1	
Velocity Note On Note Off	X X	X X	
After Touch Key's Channel's	X ○	X ○	Control various parameters
Pitch Bend	○	○	Control various parameters
Control Change	0, 32 ○	○	Select inputs
	1 — 5 ○	○	Control various parameters
	7 — 31 ○	○	Control various parameters
	64 — 95 ○	○	Control various parameters
Program Change : True Number	○ 0 — 4	○ 0 — 4	Select inputs:
System Exclusive	○	○	Set parameters, V-LINK
System Common : Song Position : Song Select : Tune Request	X X X	X X X	
System Real Time : Clock : Commands	X X	X X	
Aux Messages : All Sound Off : Reset All Controllers : Local On/Off : All Notes Off : Active Sensing : System Reset	X X X X ○ X	X X X X X X	
Notes	*1 Only when Note Mode is set to Assign Mode When Note Mode is set to Keys Mode: 36, 38, 40, 41, 43, 45, 47, 48, 50, 52, 53, 55, 57, 59, 60, 62, 64, 65		

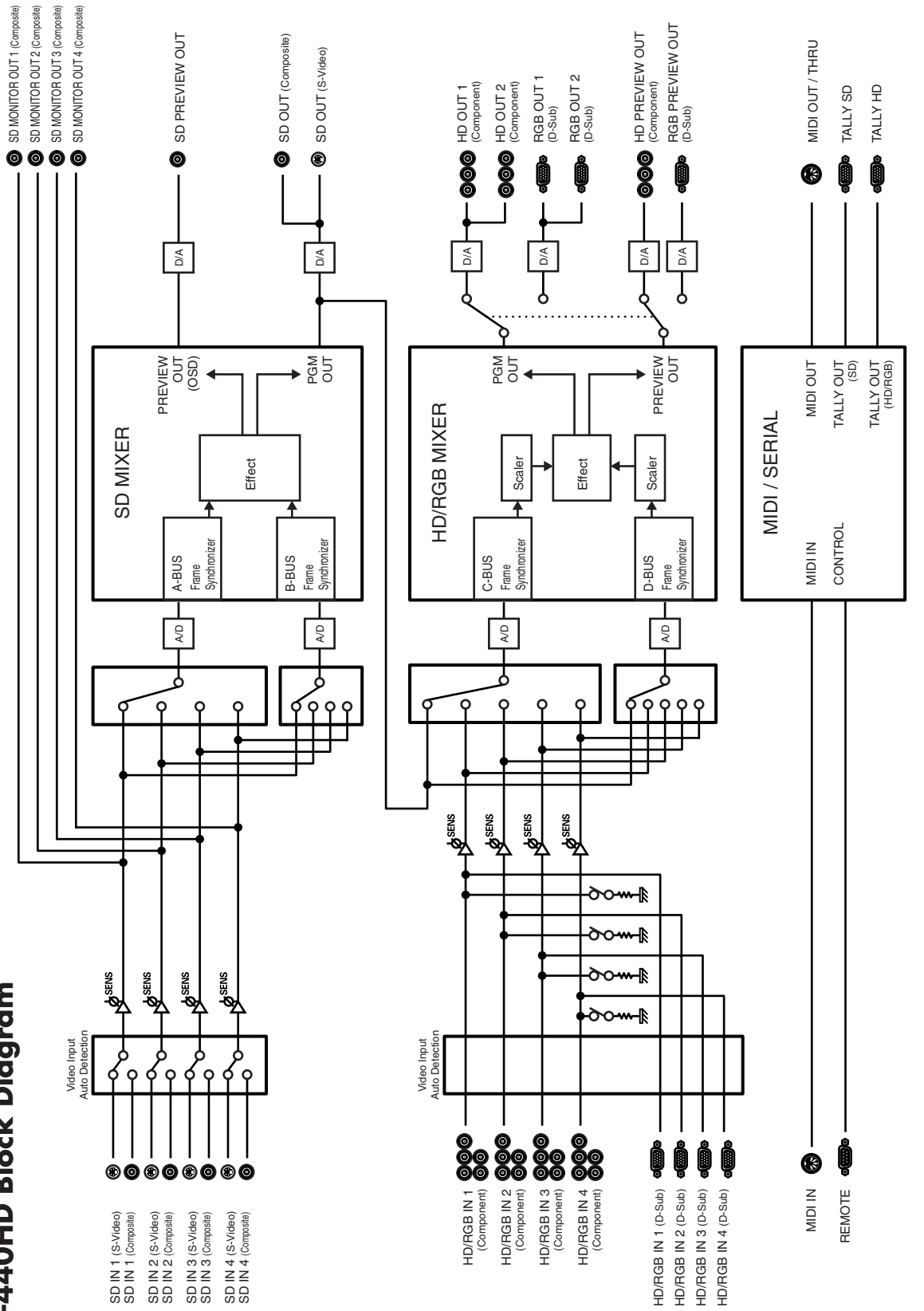
Mode 1 : OMNI ON, POLY
Mode 3 : OMNI OFF, POLY

Mode 2 : OMNI ON, MONO
Mode 4 : OMNI OFF, MONO

○ : Yes
X : No

Block Diagram

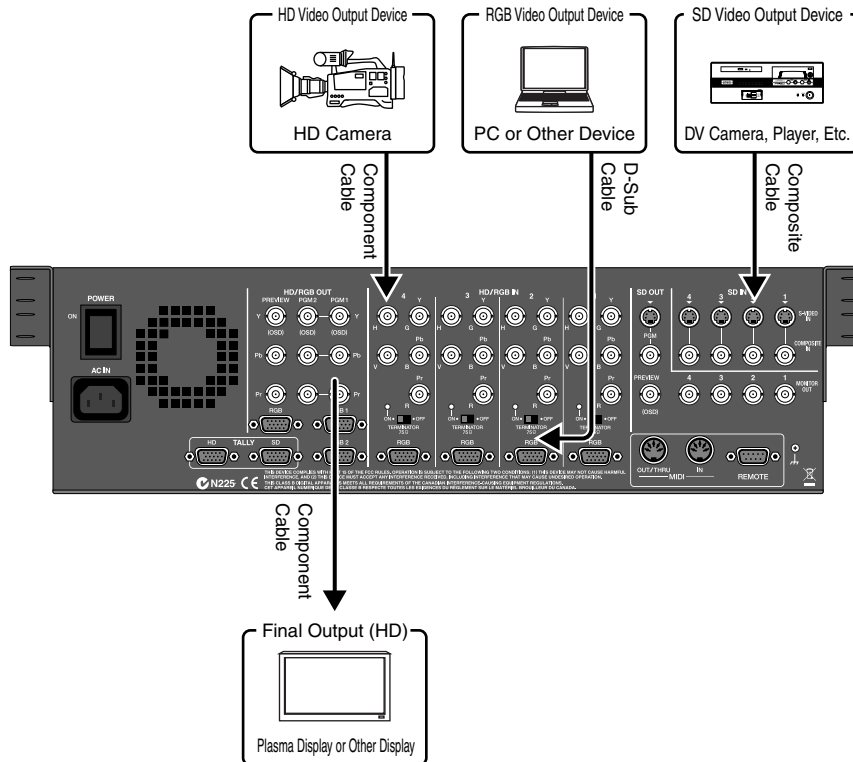
V-440HD Block Diagram



Settings and Parameters

HD Size 16:9 Output

Use the V-440HD's component output for shows and other situations where the video is being output to plasma displays or high-definition projectors.



V-440HD Settings Parameters

Set the following parameters from the menu. Make parameter settings suited for the particular usage environment.

Settings Parameter			Related Page
1. HD/RGB Output	1. Output Format (1080i) sw, etc.	Selects optimal format, e.g., 1080i or 720p, for the connected device.	p. 26 p. 58
	5. Zooming	Set value to 100 when entire screen is not being displayed.	
2. HD/RGB Input	3. Pre Scaling Mode	There are times when the RGB video is not displayed on the entire screen. Set the "3. Pre Scaling Mode" to Manual and adjust with the "4. Manual Pre Scaling" parameter.	p. 27 p. 59
	4. Manual Pre Scaling		
	5. Scaling Type (Channel input to RGB and Channel A/B only)	As the aspect ratio of the video in the RGB and SD sections (Channel A/B) is not 16:9, set this to "Fixed Aspect: Letter" or "Fixed Aspect: Crop."	
3. System	1. System Frame Rate	Select the format appropriate for the output device you are using.	p. 49 p. 64

* For more on the menus, refer to Menu Operations (p. 25).

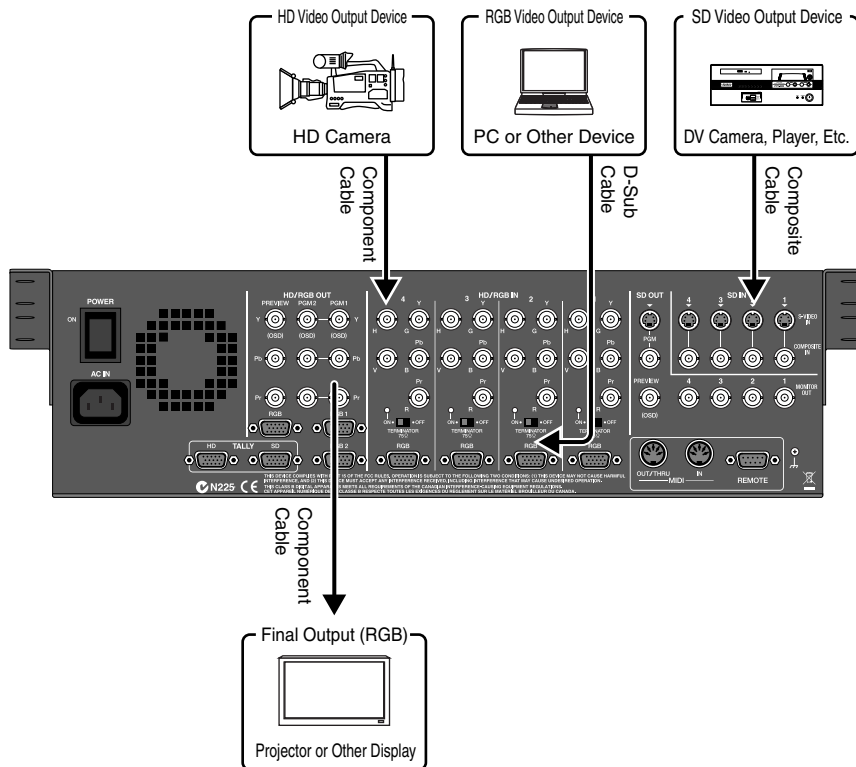
Settings Parameters for Devices Other Than V-440HD

It may be necessary to set the following parameters for connected plasma displays or high-definition projectors.

Settings Parameter	Values
Output Device (e.g., plasma display, high-definition projector)	Set the input to "Component Input."

RGB Video Live Output

In business presentations and other such situations, use the V-440HD's RGB output when outputting video to a data projector.



V-440HD Settings Parameters

Set the following parameters from the menu. Make parameter settings suited for the particular usage environment.

Settings Parameter			Related Page
1. HD/RGB Output	1. Output Format (RGB) Sw, etc.	Selects optimal format, e.g., 1280 x 1024/60 to 640 x 480/60, for the connected device.	p. 26 p. 58
	5. Zooming	Set value to 100 or lower when entire screen is not being displayed, adjusting as you observe the screen being displayed.	
2. HD/RGB Input	3. Pre Scaling Mode	There are times when excess video is displayed on the screen. In such cases, Set the "3. Pre Scaling Mode" to Manual and adjust with the "4. Manual Pre Scaling" parameter.	p. 27 p. 59
	4. Manual Pre Scaling		
	5. Scaling Type	As RGB video features various differing aspect ratios, such as 4:3 and 16:9, it may be necessary to adjust the aspect ratio while observing the screen. If satisfactory results cannot be obtained with "Full Scale," "Fixed Aspect: Letter," or "Fixed Aspect: Crop," select "Manual" and make fine adjustments to the "6. Manual X Scale" and "7. Manual Y Scale" parameters.	

* For more on the menus, refer to Menu Operations (p. 25).

Settings Parameters for Devices Other Than V-440HD

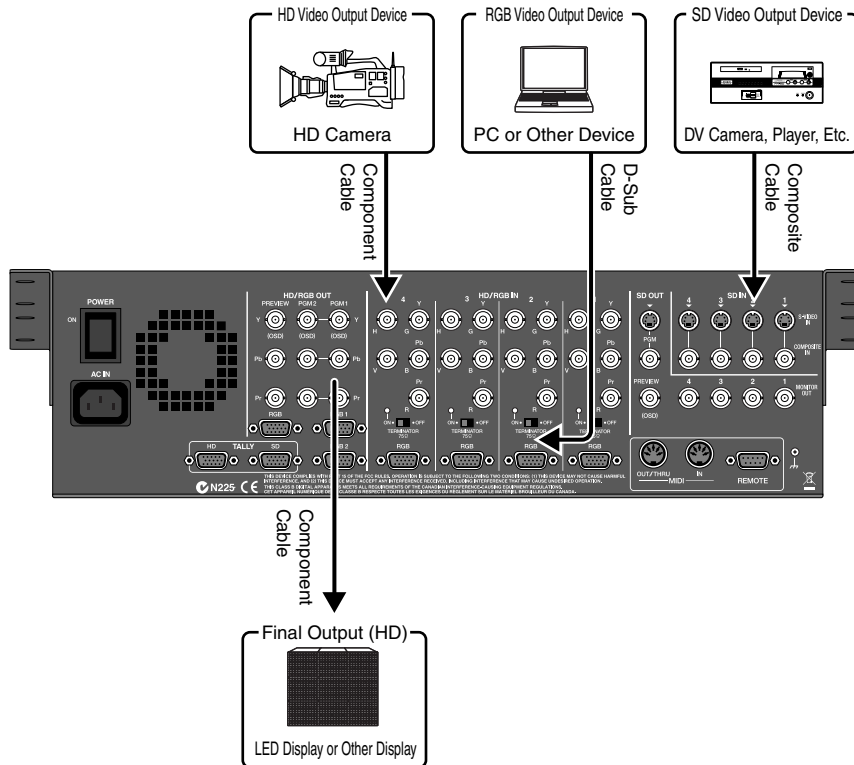
It may be necessary to set the following parameters for the data projector.

Settings Parameter	Values
Output Device (e.g., data projector, computer-use liquid crystal display)	Set the input to "RGB Input." Switch off if the screen features a 16:9 wide output function.

SD Size4:3 Output

In shows and other situations where SD video is being output to LED displays or similar displays, you can output video from the V-440HD's HD OUT connectors.

* Only the resulting composite video from the SD section is output from the V-440HD's SD PGM OUT connectors.



V-440HD Settings Parameters

Set the following parameters from the menu. Make parameter settings suited for the particular usage environment.

Settings Parameter		Related Page
1. HD/RGB Output	1. Output Format (1080i) Sw, etc.	p. 26 p. 58
2. HD/RGB Input	3. Pre Scaling Mode	p. 27 p. 59
	4. Manual Pre Scaling	
	5. Scaling Type	
13. System	1. System Frame Rate	p. 49 p. 64

* For more on the menus, refer to Menu Operations (p. 25).

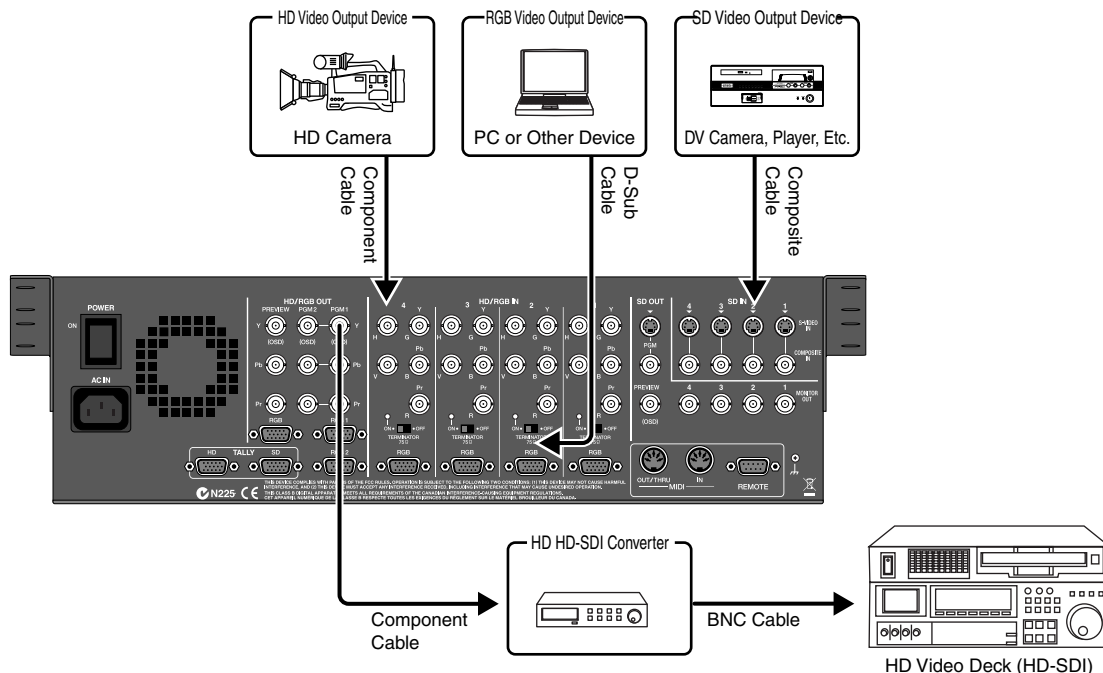
Settings Parameters for Devices Other Than V-440HD

It may be necessary to set the following parameters for the connected LED display being used.

Settings Parameter	Values
Output Device (e.g., LED display)	Set the input to "Component Input."

HD-SDI Recording

When recording the V-440HD's video output with an HD CAM deck, DVC PRO HD deck, HD non-linear editing device, or other such equipment, it may be necessary to convert the V-440HD's component output to HD-SDI signals. For this, you will need to obtain a separate HD HD-SDI converter to convert the component signals to HD-SDI.



V-440HD Settings Parameters

Set the following parameters from the menu. Make parameter settings suited for the particular usage environment.

Settings Parameter			Related Page
1. HD/RGB Output	1. Output Format (1080i) Sw, etc.	Selects appropriate format for the HD-SDI converter being used.	p. 26 p. 58
	5. Zooming	Set to 100.	
2. HD/RGB Input	3. Pre Scaling Mode	There are times when the RGB video is not displayed fully on the screen. Set the "3. Pre Scaling Mode" to Manual and adjust with the "4. Manual Pre Scaling" parameter.	p. 27 p. 59
	4. Manual Pre Scaling		
	5. Scaling Type (RGB)	As RGB video features various differing aspect ratios, such as 4:3 and 16:9, it may be necessary to adjust the aspect ratio while observing the screen.	
13. System	1. System Frame Rate	Select the format appropriate for the output device you are using.	p. 49 p. 64

* For more on the menus, refer to Menu Operations (p. 25).

Settings Parameters for Devices Other Than V-440HD

It may be necessary to set the following parameters for connected HD recorder.

Settings Parameter	Values
HD HD-SDI Converters	Sync Signal: Use internal sync signal* Frame Rate: 59.94 Hz*
HD Recorder	Input Signal: HD-SDI signals* Sync Signal: Use internal sync signal*

* Indications may vary with the device used.

Troubleshooting

If the V-440HD does not function properly, first check the following points before determining there is some malfunction. If after checking these points the problem persists, consult the nearest Roland Service Center or Roland dealer.

Video Output

Video not being output

Confirm that the connected video device is properly connected as described in "Making the Connections" (p. 20). If the connections are correct, check the following points.

- Appropriate format for video device not selected
Check to confirm whether or not the output selected is suited for the video device connected to the HD/RGB output connectors.
- Output connectors and output format not properly selected
If the video device is connected to the HD OUT connectors, confirm that 1080i or 720p is selected with the OUTPUT FORMAT button. If the video device is connected to the RGB OUT connectors, confirm that RGB is selected with the OUTPUT FORMAT button.

Video output is disrupted

- Final output not locked
Changing the V-440HD's output format settings may prevent locking of the video with the device receiving the video. If this occurs, try turning off the power to all devices, then turning on the power to the transmitting device (e.g., video deck), the V-440HD, and the receiving video device, in that order.
- Video output incompatible with receiving device
If the video output from the V-440HD is in a format that is not compatible with the receiving device (such as a television monitor or projector), the receiving device may be unable to output images well. After confirming the formats compatible with the receiving device, set the video output in the menu (p. 24).
- Reference signal (black burst signal) properly connected to device requiring it
The V-440HD does not input or output reference signals (black burst signals), thus video images may become disrupted when the reference signals are connected to devices that require them. If this occurs, use the following methods of avoiding disruption of the video images.
 - Input the signals output from the V-440HD's HD OUTPUT connector 2 Y connector to the reference signal input connector on the device requiring reference signals.
 - Switch the device requiring the reference signal to a mode that uses reference signals within the component signals.

Video input to the HD/RGB IN connectors is disrupted

- Instability of the video
Depending on the condition of the video signals input to the V-440HD, the video image may become very unstable when the C-BUS or D-BUS channel buttons are used to switch the video (when the lock is off). If this occurs, go to "2. HD/RGB Input" (p. 59) in the menu and set "1. Format Auto Detect" to "Manual," then select the video to be input with "Input Format."
- Video being input to the BNC and D-Sub connectors on the same channel
Inputting two video sources to the same channel creates interference in the internal circuitry, resulting in disruption of the images. Input video sources to different channels.

Color of input video is incorrect

As the V-440HD inputs and outputs HD, RGB, and SD signals as analog signals, differences in individual devices can lead to color variance, even with the same video sources. Correct these differences with "2. HD/RGB Input" (p. 59) in the menu.

- Mistake in BNC connector used for inputting component video
When inputting component signals, connecting to the wrong BNC connectors may result in video being displayed monochrome image. Confirm that the connections to each BNC connector are correct.

Video images input to HD/RGB are disrupted

- Video being input with differing System Frame Rate settings (p. 49)
When the video format uses a different frame rate than the system frame rate set for the V-440HD, the video image may at times move in a disjointed fashion due to the frame rate conversion processing required.
- Video being input with frame rate different than that for the output format (p. 26)
When the video format uses a different frame rate than the frame rate set for the V-440HD's output format, the video image may at times move in a disjointed fashion due to the frame rate conversion processing required.

Aspect ratio of video input using RGB signals is off

- Settings not matching screen's aspect ratio
In some instances, the screen aspect ratio of the device to which the finished video images are being input may not match the aspect ratio of the RGB input video. Make the settings selected in the menu (p. 24) to achieve the proper aspect ratio.
- RGB input's horizontal synchronization set to rate other than 60 Hz or 75 Hz
If the horizontal synchronization of the RGB video is not properly matched to the 60 or 75 settings, the video image will be extended vertically as a result.
- Does the signal conform to VESA standards?
- The RGB signal output of some devices may not properly conform to VESA standards. When such signals are used, the screen image may be extended vertically or horizontally as a result.
If this occurs, you can adjust the aspect ratio of the RGB video images by setting "6. Manual X Scale" and "7. Manual Y Scale" under "2. HD/RGB Input" (p. 59) in the menu.

Screen shows visible vertical discrepancies

The screen aspect ratio may be distorted if the format of the output video does not match the settings of the device receiving HD output or RGB output.

Not all of the video appearing in the screen

Some receiving devices may not display all of the video output from the V-440HD. This may be due to differences in the size of the region in which video is not displayed (the safe area) in some receiving devices. To adjust the video size so that it does not reach into the safe area, set "4. Zooming" under "1. HD/RGB Output" in the menu.

Effects

Screen is disrupted when video is switched

- When using transition, P in P, or key composite effects
Disruption of the video images may occur when the video is switched with the A-BUS (B-BUS) SD IN select buttons or the C-BUS (D-BUS) HD/RGB IN select buttons. Switch the video after first stopping the effect.

Subscreen not displayed when P in P is used

- Subscreen positioned near the edge of the screen
When setting the subscreen position with the POSITION joystick or by other means, most of the subscreen may end up outside of the screen itself. If this occurs, the subscreen will not appear in the screen. In such instances, use the POSITION joystick to move the subscreen back to a position where it is visible.
- When using the Multi Screen function
When the Multi Screen function (p. 44) is used, part of the screen is expanded when displayed. In this case, the subscreen portion does not expand, and as a result, the subscreen may cease to appear. If this occurs, use the POSITION joystick to move the subscreen back to a suitable position.

Video image not being removed properly with the key effects

Adjust the value of the "Soft Edge" setting in the menu. If the value is set too high, portions of the video not belonging to the key image may also end up being masked.

Use video input that features a high signal-to-noise ratio. For example, you can achieve better key composite results with HD key images than with SD key images.

- When using the Multi Screen function
When the Multi Screen function (p. 44) is used, the key composite conditions of the master and slave V-440HDs may differ. This is because the video input for these V-440HDs comprises analog signals, with the resulting differences in video signals being the physical cause of this problem.
To mitigate these conditions, adjust the "Brightness" and "Contrast" parameters with "2. HD/RGB Input" (p. 59) and "7. SD Input" (p. 61) while using the key composite effects, adjusting each V-440HD so that the same video is synthesized.

* When using the Multi Screen function, the LEVEL knob function is linked to the master and slave devices, so you should lock in a fixed value.

Effects not being applied

- Monitor is connected to PREVIEW OUT_{use} "PGM OUT" output video to preview the P in P effect and other such effects applied. Effects are not reflected in the outputs through PREVIEW OUT.

Operations in Individual Sections

Screen is disrupted when video is switched

- When using transition, P in P, or key composite effects
Disruption of the video images may occur when the video is switched with the A-BUS (B-BUS) SD IN select buttons or the C-BUS (D-BUS) HD/RGB IN select buttons. Switch the video after first stopping the effect.

Video fader not operating properly

- Video fader calibration setting seems to be wrong
With time and extended use, the settings for the video faders' top and bottom positions may drift into inaccuracy. If this occurs, adjust the video faders (p. 64) with the settings in "13. System" (p. 64) in the menu.

No movement when POSITION joystick adjusted

The P in P position may fail to move even when the POSITION joystick is adjusted. If this occurs, check the LOCK button next to the POSITION joystick to see whether or not the button is lit. If the button is lit, it indicates that the POSITION button is locked, which prevents the POSITION joystick from functioning. To enable operation of the POSITION joystick, press the LOCK button so its light is off.

Other

V-440HD becoming hot

- Something is blocking the exhaust vent or ventilation port
The V-440HD is cooled with forced air, so if anything impeding the exhaust vent or any other air flow intake or vent, it will prevent proper cooling of the V-440HD.
- Other equipment is stacked on top of the V-440HD
Setting other devices directly on top of the V-440HD may result in heat from these devices being transferred to the V-440HD, thus causing the V-440HD to overheat. In such situations, either raise the other device upwards away from the V-440HD or provide shelving or racks placed between the devices.

Odd noises coming from inside the unit

- Debris is caught in the exhaust vent
The V-440HD is cooled with forced air, using a cooling fan installed inside the exhaust vent. If anything caught up in cooling fan, it can cause audible noises from the interior of the V-440HD, and may even lead to damage. Do not place any objects liable to enter the exhaust vent near the vent.
If something does get inside the exhaust vent and you are unable to remove it from the outside, contact the nearest Roland Service Center.

Menu Settings Memo

1. HD/RGB Output

1: Output Format (1080i) Sw	
2: Output Format (720p) Sw	
3: Output Format (RGB) Sw	
4: Output Format Sw Lock	
5: Zooming	
6: Bright	
7: Contrast	
8: Saturation	
9: Red	
10: Green	
11: Blue	
12: Output Fade Mode	
13: Output Fade Color	
14: Output Fade Sw Motion	
15: Test Pattern Select	

2. HD/RGB Input

(HD/RGB Ch)	A/B	1	2	3	4
1: Format Auto Detect					
2: Input Format					
3: Pre Scaling Mode					
4: Manual Pre Scaling					
5: Scaling Type					
6: Manual X Scale					
7: Manual Y Scale					
8: X Position					
9: Y Position					
10: Brightness					
11: Contrast					
12: Saturation					
13: Red					
14: Green					
15: Blue					
16: Frequency					
17: Phase					
18: Sw Enable					

3. HD/RGB P in P / Zoom

(HD/RGB PinP)	1	2	3	4	5
1: Size					
2: X Position					
3: Y Position					
4: Zoom					
5: Pan X Position					
6: Pan Y Position					
7: Border Size					
8: Border Color					
9: Border Edge					
10: Crop					

4. HD/RGB Key

1: Key Type	
2: Key Level	
3: Key Soft Edge	

5. HD/RGB Wipe Select

(HD/RGB Wipe Sw)	1	2	3	4	5	6
1: Wipe Pattern						
2: Wipe Reverse						
3: Wipe Edge Type						

6. SD Output

1: Brightness	
2: Contrast	
3: Cb	
4: Cr	
5: Saturation	
6: Fader	
7: Color Bar	

7. SD Input

(SD Wipe Sw)	1	2	3	4
1: SD Input Select				
2: SD Brightness				
3: SD Contrast				
4: SD Color				
5: SD Hue				
6: SD Sw Enable				

Menu Settings Memo

8. SD PinP

	(Size)	1	2	3	4	5
1: P in P Size						
2: P in P X Position						
3: P in P Y Position						
4: P in P Border Size						
5: P in P Border Color						
6: P in P Trimming						

9. SD Key

1: Key Type	
2: Key Level	
3: Key Soft Edge	

10. SD Wipe Select

	(SD Wipe Sw)	1	2	3	4	5	6
1: Wipe Pattern							
2: Wipe Reverse							
3: Wipe Edge Type							

12. Multi Screen

1: Multi Screen On/Off							
2: Multi Screen Type							
3: Multi Screen ID							
	(Screen)	1	2	3	4	5	6
		(Master)	(Slave)	(Slave)	(Slave)	(Slave)	(Slave)
1: X Size							
2: Y Size							
3: X Position							
4: Y Position							

13. System

1: System Frame Rate	
2: SD Deinterlacer	
3: SD Input Sync Threshold	
8: REMOTE Baudrate	
9: HD Seamless Delay Time	
10: SD Seamless Delay Time	
11: HD On Screen Display	
12: Tally Signal	
13: SD Previewout Select	
14: Panel Operation Mode	
15: Input Sw LED Color	
16: Double Click Short Cut	
17: Autotake Sw Motion	

14. MIDI Setup

1: MIDI Sw Mode		16: SD P in P Switch Assign	
2: MIDI Tx Channel		17: SD P in P Lock Sw Assign	
3: MIDI Rx Channel		18: HD Auto Switch Assign	
4: MIDI Out/Thru Sw		19: HD Transition Assign	
5: V-LINK Switch		20: HD Transition Time	
6: Note Mode		21: HD Video Fader Assign	
7: Note Lower Key Assign		22: HD Key Switch Assign	
8: Note Upper Key Assign		23: HD P in P Switch Assign	
9: Device ID		24: HD P in P Lock Sw Assign	
10: Panel Preset Tx Type		25: P in P/Zoom Sw Assign	
11: SD Auto Switch Assign		26: Panel Preset Sw Assign	
12: SD Transition Assign		27: Output Format Sw Assign	
13: SD Transition Time		28: Fade Switch Assign	
14: SD Video Fader Assign		29: Fade Level Assign	
15: SD Key Switch Assign		30: PR Control	

As the settings for the following items are not saved, they are not included in the list above.

HD/RGB Reset, Input Reset, PinP Reset, HD/RGB Key Reset, Wipe Reset, SD Output Reset, SD Reset, Preset Reset, Multi Reset, System Reset, Memory Protect, MIDI Reset, Panel Preset Edit

Panel Preset Memo

Date: _____
No. _____

Title: _____

Parameters saved as part of a panel preset	Panel Preset Button No.															Related Page
	FACTORY PRESET	1	2	3	4	5	6	7	8	9	10	11	12	13	14	
SD Section																
P in P PATTERN Buttons (SD)	OFF															
P in P LOCK Button (SD)	ON															
KEY LEVEL Knob (SD)	128															
KEY ON Button (SD)	OFF															
Key Type (SD)	Luminance Key2															
Key Soft Edge (SD)	03															
A-BUS Channel Button (SD)	1 ch															
B-BUS Channel Button (SD)	2 ch															
TIME Knob (SD)	1.0															
Video Fader (SD)	A-BUS															
TRANSITION Button (SD)	MIX															
HD/RGB Section																
P in P PATTERN Buttons (HD/RGB)	OFF															
P in P LOCK Button (HD/RGB)	ON															
PAN/ZOOM Button (HD/RGB)	POSITION/SIZE															
KEY LEVEL Knob (HD/RGB)	128															
KEY ON Button (HD/RGB)	OFF															
Key Type (HD/RGB)	Luminance Key2															
Key Soft Edge (HD/RGB)	03															
C-BUS Channel Button (HD/RGB)	1 ch															
D-BUS Channel Button (HD/RGB)	2 ch															
TIME Knob (HD/RGB)	1.0															
Video Fader (HD/RGB)	C-BUS															
TRANSITION Button (HD/RGB)	MIX															
Others																
Panel Operation Mode	A/B Mode															
OUTPUT FADE MODE	Auto															
OUTPUT FADE LEVEL	No fade															
Multi Screen On/Off	Off															
Multi Screen Type	2 x 1															

Main specifications

V-440HD: MULTI FORMAT VIDEO MIXER

Video Processing		
Video Format:	SD	NTSC or PAL [CVBS, S (Y/C)]
	HD	1080/59.94i/50i SMPTE274M (Y/Pb/Pr TriLevel Sync) 720/59.94p/50p SMPTE296M (Y/Pb/Pr TriLevel Sync)
	RGB	Input: 640x480/60/75, 800x600/60/75, 1024x768/60/75, 1280x768/60/75, 1280x1024/60 * RGB VH: positive/negative logic * VESA DMT Version 1.0 Revision 10 conform Output: 640x480/75, 800x600/60/75, 1024x768/60/75, 1280x768/60/75, 1280x1024/60, 1366x768/60/75 * VESA DMT Version 1.0 Revision 10 conform 640x480/60 (*1)
Video Sampling Rate:	SD	4:2:2 (Y/Cb/Cr) 8-bit 13.5 MHz (BT.601)
	HD	4:4:4 (Y/Pb/Pr) 8-bit 74.1758 MHz / 74.25 MHz
	RGB	4:4:4 (R/G/B) 8-bit 25 MHz to 110 MHz
Effects	Video Transition	Cut Mix Wipe: 6 Patterns, Reverse, SoftEdge
	Composition FX	Picture in Picture, Chroma Key (Blue/Green), Luminance Key (White/Black) Picture in Picture with Zoom/Pan (HD/RGB side)
	Multi-Screen Presentation	2 screens x 1 line, 3 screens x 1 line, 2 screens x 2 line, 3 screens x 2 lines
	Synchronization Multiple Units by MIDI	
	Master Fade	0 to 4 seconds Black or White
Connectors		
SD Input	S-Video (Y/C) Preferential x 4	4 pin mini DIN type (Y: 1.0 Vp-p, C: 0.286 Vp-p, 75 ohms)
	Video (composite) x 4	BNC type (1.0 Vp-p, 75 ohms)
HD/RGB Input <i>* BNC Type or D-sub Type are In/Thru/Out Use combinedly</i>	BNC Type x 4	HD: Y/Pb/Pr (1.0 Vp-p, 75 ohms, TriLevel Sync) RGB:R/G/B (0.7 Vp-p, 75 ohms), H (5VTTL), V (5VTTL)
	D-SUB 15pin Shrink Type x 4	HD: Y/Pb/Pr (1.0 Vp-p, 75 ohms, TriLevel Sync) RGB:R/G/B (0.7 Vp-p, 75 ohms), H (5VTTL), V (5VTTL)
SD Output	PGM S-Video (Y/C)	4-pin mini DIN type (Y: 1.0 Vp-p, C: 0.286 Vp-p, 75 ohms)
	PGM Video (composite)	BNC type (1.0 Vp-p, 75 ohms)
	Preview (composite)	BNC type (1.0 Vp-p, 75 ohms), OSD Menu Output
HD Output	PGM Component HD	BNC Type x 2 (1.0 Vp-p, 75 ohms, TriLevel Sync)
	Preview Component HD	BNC type (1.0 Vp-p, 75 ohms, TriLevel Sync), OSD Menu Output (selectable Display)
RGB Output	PGM RGB	D-sub 15 pin Shrink Type x 2 (R/G/B 0.7 Vp-p, 75 ohms, 5 VTTL Sync)
	Preview RGB	D-sub 15 pin Shrink type (0.7 Vp-p, 75 ohms, 5 VTTL Sync), OSD Menu Output (selectable Display) * Component & RGB Outputs are selectable
Remote Control Interfaces	MIDI 5 pin DIN Type (In, Out/Thru)	
	REMOTE terminal (RS-232C D-sub 9pin)	
TALLY Output	for SD Section	D-sub 15 pin Shrink type Input (max): 12 V, 200 mA Open collector Type
	for HD Section	D-sub 15 pin Shrink type Input (max): 12 V, 200 mA Open collector Type
Others		
Power Supply	AC 117 V, AC 230 V, AC 240 V (50/60 Hz), AC 220 V (60 Hz)	
Power Consumption	50 W	
Dimensions	482 (W) x 308 (D) x 130 (H) mm 19 (W) x 12-1/8 (D) x 5-1/8 (H) inches * EIA-7U Rack Mount Size	
Weight	6.8 kg 15 lbs	
Accessories	Owner's Manual, Power Cord	

*1 640x480/60 pixel rate is 25.0MHz (± 0.014) It may not be displayed correctly, depending on the display/projector.

* In the interest of product improvement, the specifications and/or appearance of this unit are subject to change without prior notice.

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This product complies with the requirements of EMC 2004/108/EC and LVD 2006/95/EC.

For EU Countries

For the USA

FEDERAL COMMUNICATIONS COMMISSION RADIO FREQUENCY INTERFERENCE STATEMENT

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- (1) this device may not cause harmful interference, and
- (2) this device must accept any interference received, including interference that may cause undesired operation.

Unauthorized changes or modification to this system can void the users authority to operate this equipment. This equipment requires shielded interface cables in order to meet FCC class B Limit.

For Canada

NOTICE

This Class B digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

AVIS

Cet appareil numérique de la classe B respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

For C.A. US (Proposition 65)

WARNING

This product contains chemicals known to cause cancer, birth defects and other reproductive harm, including lead.

For EU Countries



UK This symbol indicates that in EU countries, this product must be collected separately from household waste, as defined in each region. Products bearing this symbol must not be discarded together with household waste.

DE Dieses Symbol bedeutet, dass dieses Produkt in EU-Ländern getrennt vom Hausmüll gesammelt werden muss gemäß den regionalen Bestimmungen. Mit diesem Symbol gekennzeichnete Produkte dürfen nicht zusammen mit dem Hausmüll entsorgt werden.

FR Ce symbole indique que dans les pays de l'Union européenne, ce produit doit être collecté séparément des ordures ménagères selon les directives en vigueur dans chacun de ces pays. Les produits portant ce symbole ne doivent pas être mis au rebut avec les ordures ménagères.

IT Questo simbolo indica che nei paesi della Comunità europea questo prodotto deve essere smaltito separatamente dai normali rifiuti domestici, secondo la legislazione in vigore in ciascun paese. I prodotti che riportano questo simbolo non devono essere smaltiti insieme ai rifiuti domestici. Ai sensi dell'art. 13 del D.Lgs. 25 luglio 2005 n. 151.

ES Este símbolo indica que en los países de la Unión Europea este producto debe recogerse aparte de los residuos domésticos, tal como está regulado en cada zona. Los productos con este símbolo no se deben depositar con los residuos domésticos.

PT Este símbolo indica que nos países da UE, a recolha deste produto deverá ser feita separadamente do lixo doméstico, de acordo com os regulamentos de cada região. Os produtos que apresentem este símbolo não deverão ser eliminados juntamente com o lixo doméstico.

NL Dit symbool geeft aan dat in landen van de EU dit product gescheiden van huishoudelijk afval moet worden aangeboden, zoals bepaald per gemeente of regio. Producten die van dit symbool zijn voorzien, mogen niet samen met huishoudelijk afval worden verwijderd.

DK Dette symbol angiver, at i EU-lande skal dette produkt opsamlles adskilt fra husholdningsaffald, som defineret i hver enkelt region. Produkter med dette symbol må ikke smides ud sammen med husholdningsaffald.

NO Dette symbolet indikerer at produktet må behandles som spesialavfall i EU-land, iht. til retningslinjer for den enkelte regionen, og ikke kastes sammen med vanlig husholdningsavfall. Produkter som er merket med dette symbolet, må ikke kastes sammen med vanlig husholdningsavfall.

SE Symbolen anger att i EU-länder måste den här produkten kasseras separat från hushållsavfall, i enlighet med varje regions bestämmelser. Produkter med den här symbolen får inte kasseras tillsammans med hushållsavfall.

FI Tämä merkintä ilmaisee, että tuote on EU-maissa kerättävä erillään kotitalousjätteistä kunkin alueen voimassa olevien määräysten mukaisesti. Tällä merkinnällä varustettuja tuotteita ei saa hävittää kotitalousjätteiden mukana.

HU Ez a szimbólum azt jelenti, hogy az Európai Unióban ezt a terméket a háztartási hulladéktól elkülönítve, az adott régióban érvényes szabályozás szerint kell gyűjteni. Az ezzel a szimbólummal ellátott termékeket nem szabad a háztartási hulladék közé dobni.

PL Symbol oznacza, że zgodnie z regulacjami w odpowiednim regionie, w krajach UE produktu nie należy wyrzucać z odpadami domowymi. Produktów opatrzonych tym symbolem nie można utylizować razem z odpadami domowymi.

CZ Tento symbol udává, že v zemích EU musí být tento výrobek sbírán odděleně od domácího odpadu, jak je určeno pro každý region. Výrobky nesoucí tento symbol se nesmí vyhazovat spolu s domácím odpadem.

SK Tento symbol vyjadruje, že v krajinách EÚ sa musí zber tohto produktu vykonávať oddelene od domového odpadu, podľa nariadení platných v konkrétnej krajine. Produkty s týmto symbolom sa nesmú vyhazovať spolu s domovým odpadom.

EE See sümbol näitab, et EL-i maades tuleb see toode olemprügist eraldi koguda, nii nagu on igas piirkonnas määratletud. Selle sümboliga märgitud tooteid ei tohi ära visata koos olmeprügiga.

LT Šis simbolis rodo, kad ES šalyse šis produktas turi būti surenkamas atskirai nuo buitinių atliekų, kaip nustatyta kiekviename regione. Šiuo simboliu paženklinėti produktai neturi būti išmetami kartu su buitiniomis atliekomis.

LV Šis simbols norāda, ka ES valstīs šo produktu jāievāc atsevišķi no mājsaimniecības atkritumiem, kā noteikts katrā reģionā. Produkts ar šo simbolu nedrīkst izmest kopā ar mājsaimniecības atkritumiem.

SI Ta simbol označuje, da je treba proizvod v državah EU zbirati ločeno od gospodinskih odpadkov, tako kot je določeno v vsaki regiji. Proizvodka s tem znakom ni dovoljeno odlagati skupaj z gospodinskimi odpadki.

GR Το σύμβολο αυτό υποδηλώνει ότι στις χώρες της Ε.Ε. το συγκεκριμένο προϊόν πρέπει να συλλέγεται χωριστά από τα υπόλοιπα οικιακά απορρίμματα, σύμφωνα με όσα προβλέπονται σε κάθε περιοχή. Τα προϊόντα που φέρουν το συγκεκριμένο σύμβολο δεν πρέπει να απορρίπτονται μαζί με τα οικιακά απορρίμματα.



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