

HD AV MIXER VR-4HD

Reference Manual

Version 2.100 and later



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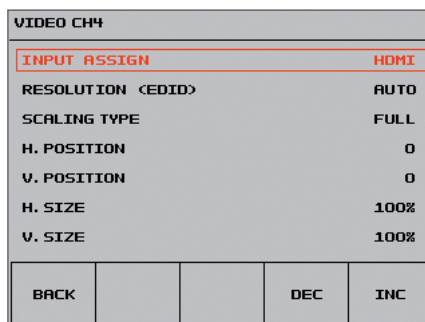
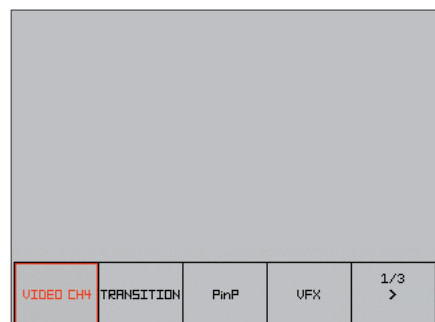
Menu List (Setup Screen)

Display for the various setup screens on the built-in monitor. In these menus change settings for video, audio and for general VR-4HD settings.

* The default value is printed in bold characters.

System (Video, Audio, and Unit) Settings

([SYSTEM SETUP] button → select category)



Category	Setting item	Value	Explanation
Page 1/3			
VIDEO CH4	This adjusts the video to input on video channel 4.		
	INPUT ASSIGN	HDMI, RGB, COMPOSITE	This sets the video source to input on video channel 4. * This is identical to the setting for "INPUT CH4" (p. 20).
	RESOLUTION (EDID)	AUTO, 480/576i, 480/576p, 720p, 1080i, 1080p, 640 x 480, 800 x 600, 1024 x 768, 1280 x 768, 1280 x 1024, 1366 x 768, 1400 x 1050, 1600 x 1200, 1920 x 1200	This sets the input format (the EDID to send) of video input via the RGB/COMPONENT input connector or HDMI IN connector. When this is set to "AUTO," EDID information for all formats that can be input is sent. * EDID information is not sent during component signal input.
	SCALING TYPE	FULL, LETTERBOX, CROP, DOT BY DOT	This sets the scaling type. FULL: This always displays the picture expanded to full screen, irrespective of the aspect ratio of the input video. LETTERBOX: This enlarges or reduces the incoming video to a full-screen view while keeping the aspect ratio unchanged. CROP: This enlarges or reduces the incoming video so that the output picture has no blank margins while keeping the aspect ratio unchanged. Video extending beyond the borders is cut off. DOT BY DOT: This performs no scaling.
	H. POSITION	-1920-0-1920	This adjusts the display position in the horizontal direction.
	V. POSITION	-1200-0-1200	This adjusts the display position in the vertical direction.
	H. SIZE	80-100-200 %	This adjusts the size in the horizontal direction.
	V. SIZE	80-100-200 %	This adjusts the size in the vertical direction.
	CONTRAST	-64-0-63	This adjusts the contrast.
	SATURATION	-64-0-63	This adjusts the saturation.
	BRIGHTNESS	-64-0-63	This adjusts the brightness.
	FLICK FILTER	0-7-10	This reduces flicker.
TRANSITION	INPUT CAPTURE	([EXEC])	You can capture still images from input video on video channel 4. * Either the captured still image or the still image sent from VR-4HD RCS is temporarily stored in the VR-4HD. If a new still image is captured or is sent from VR-4HD RCS while a still image is already saved, the previously saved still image is overwritten. Also, still-image data is deleted when the power is turned off.
	MIX	MIX, FAM, NAM, MOSAIC	This specifies the transition pattern assigned to the [MIX] button.
	WIPE	H-DOWN, H-UP, V-RIGHT, V-LEFT, H-IN, H-OUT, V-IN, V-OUT, R-DOWN, L-DOWN, R-UP, L-UP, BLOCK, V-GRID, H-GRID, H-DOWN s, H-UP s, V-RIGHT s, V-LEFT s, H-IN s, H-OUT s, V-IN s, V-OUT s, R-DOWN s, L-DOWN s, R-UP s, L-UP s, BLOCK s, V-GRID s, H-GRID s	This specifies the transition pattern assigned to the [WIPE] button. * Setting values indicated with "s" are soft edge transition patterns.
	TRANSITION TIME	0.0-4.0 sec	This sets the video transition time.
PinP	SIZE	1/2, 1/4, 1/3	This sets the size of the inset screen. The horizontal width (and vertical height) of the inset screen are set to 1/2, 1/4, or 1/3 the size values of the background video.
	BORDER WIDTH	0-3-15	This adjusts the width of the border for the inset screen.
	BORDER COLOR	BLACK, WHITE, GRAY, RED, GREEN, BLUE, YELLOW	This sets the color of the border for the inset screen.
	PREVIOUS SELECT	OFF, ON	When set to "ON," the channel of the previously selected inset screen is selected automatically when the [PinP] button is pressed.

Category	Setting item	Value	Explanation
PinP	H. POSITION	-50–0–50 %	This adjusts the position of the inset screen in the horizontal direction.
	V. POSITION	-50–0–50 %	This adjusts the position of the inset screen in the vertical direction.
	SHAPE	SQUARE, DIAMOND, CIRCLE, HEART	This specifies the shape of the inset screen.
	ASPECT	16:9, 1:1	This specifies the aspect ratio of the inset screen.
	H. CROPPING	1–100%	This adjusts the crop size of the inset screen.
	V. CROPPING	1–100%	This adjusts the crop size of the inset screen.
	H. VIEW POSITION	-50–0–50%	This adjusts the horizontal position of the inset screen.
	V. VIEW POSITION	-50–0–50%	This adjusts the vertical position of the inset screen.
VFX	EFFECT PATTERN	OFF, NEGATIVE, EMBOSS, COLORIZE, COLOR PASS, POSTERIZE, SILHOUETTE, MONOCOLOR, FINDEDGE	This sets the filter effect applied to the main output video. When this is set to "OFF," no effect is assigned.
	VALUE	0–127	This adjusts the amount of effect applied. Setting this to "0" turns off the effect. * Pressing the [VIDEO FX/KEY LEVEL] button displays the "VIDEO FX" shortcut for "VALUE" at the bottom of the screen.
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KEY	KEY SOURCE CH	OFF, CH1–CH4, STILL	This specifies the channel for the video displayed in the foreground during key compositing. Setting this to "STILL" performs key compositing using a captured still image or a still image sent from VR-4HD RCS dedicated software. When set to "OFF," operating the [KEY] button has no effect.
	KEY TYPE	CHROMA, LUMI	This sets the key type (chroma key or luminance key) for key compositing.
	CHROMA KEY LEVEL	0–64–255	This adjusts the degree of extraction (transparency) for chroma key. * Pressing the [VIDEO FX/KEY LEVEL] button displays, at the bottom of the screen, the "KEY LEVEL" shortcut for either "CHROMA KEY LEVEL" or "LUMI KEY LEVEL," according to setting for "KEY TYPE."
	CHROMA KEY GAIN	0–255	This adjusts the degree of edge blur for chroma key.
	CHROMA KEY COLOR	BLUE, GREEN	This sets the extraction color for chroma key.
	CHROMA KEY HUE WIDTH	-127–0–127	This adjusts the hue width (range) for chroma key.
	CHROMA KEY HUE FINE	-127–0–127	This adjusts the center position of the hue for chroma key.
	CHROMA KEY SAT WIDTH	-127–0–127	This adjusts the saturation width (range) for chroma key.
	CHROMA KEY SAT FINE	0–255	This adjusts the center position of saturation for chroma key.
	LUMI KEY LEVEL	0–64–255	This adjusts the degree of extraction (transparency) for luminance key. * Pressing the [VIDEO FX/KEY LEVEL] button displays, at the bottom of the screen, the "KEY LEVEL" shortcut for either "CHROMA KEY LEVEL" or "LUMI KEY LEVEL," according to setting for "KEY TYPE."
	LUMI KEY GAIN	0–255	This adjusts the degree of edge blur for luminance key.
	LUMI KEY COLOR	BLACK, WHITE	This sets the separation color for luminance key.
SPLIT	PATTERN	V. CENTER, H. CENTER, V. STRETCH, H. STRETCH	This sets the split composition pattern assigned to the [SPLIT] button.
	A-CENTER	0–50–100 %	This is applied when "PATTERN" is set to "V. CENTER" or "H. CENTER." • When at V. CENTER This adjusts the horizontal position of the video displayed on the left. • When at H. CENTER This adjusts the vertical position of the video displayed above.
	B-CENTER	0–50–100 %	This is applied when "PATTERN" is set to "V. CENTER" or "H. CENTER." • When at V. CENTER This adjusts the horizontal position of the video displayed on the right. • When at H. CENTER This adjusts the vertical position of the video displayed below.
	PREVIOUS SELECT	OFF, ON	When set to "ON," the previously selected channel is selected automatically when the [SPLIT] button is pressed. * Only the channel displayed to the right or below is automatically selected.
	CENTER POSITION	-50–0–50%	This is valid when "PATTERN" is "V. CENTER" or "H. CENTER." This adjusts the position of the split boundary.

Menu List (Setup Screen)

Category	Setting item	Value	Explanation
VIDEO OUT	OUTPUT RESOLUTION	AUTO , 480/576i (*1), 480/576p, 720p, 1080i (*1), 1080p, 640 x 480, 800 x 600, 1024 x 768, 1280 x 768, 1280 x 1024, 1366 x 768, 1400 x 1050, 1600 x 1200, 1920 x 1200	This specifies the output format of the main output video (HDMI OUT connector or RGB/COMPONENT output connector). When this is set to "AUTO," the output format follows the setting made for "SYSTEM FORMAT" (p. 5). (*1) The "480/576i" and "1080i" formats are supported for HDMI output only. When the setting is "480/576i" or "1080i," no video is output from the RGB/COMPONENT output connector.
	SCALING TYPE	FULL , LETTERBOX, CROP, DOT BY DOT	This sets the scaling type for the main output video. FULL: This always displays the picture expanded to full screen, irrespective of the aspect ratio of the input video. LETTERBOX: This enlarges or reduces the incoming video to a full-screen view while keeping the aspect ratio unchanged. CROP: This enlarges or reduces the incoming video so that the output picture has no blank margins while keeping the aspect ratio unchanged. Video extending beyond the borders is cut off. DOT BY DOT: This performs no scaling.
	OUTPUT H. POSITION	-1920- 0 -1920	This adjusts the horizontal position of the main output video.
	OUTPUT V. POSITION	-1200- 0 -1200	This adjusts the vertical position of the main output video.
	OUTPUT H. SIZE	80- 100 -200 %	This adjusts the horizontal size of the main output video.
	OUTPUT V. SIZE	80- 100 -200 %	This adjusts the vertical size of the main output video.
	OUTPUT CONTRAST	-64- 0 -63	This adjusts the contrast of the main output video.
	OUTPUT SATURATION	-64- 0 -63	This adjusts the saturation of the main output video.
	OUTPUT BRIGHTNESS	-64- 0 -63	This adjusts the brightness of the main output video.
Category	Setting item	Value	Explanation
VIDEO OUT	OUTPUT COLOR SPACE	AUTO , RGB-FULL, RGB-LIMIT, YCbCr	This sets the color space for HDMI OUT connector and RGB/COMPONENT output connector.
	OUTPUT DVI-D/HDMI	DVI-D, HDMI	This sets the output mode of the HDMI OUT connector.
	PREVIEW CONTRAST	-64- 0 -63	This adjusts the contrast of the preview output video.
	PREVIEW SATURATION	-64- 0 -63	This adjusts the saturation of the preview output video.
	PREVIEW BRIGHTNESS	-64- 0 -63	This adjusts the brightness of the preview output video.
	PREVIEW COLOR SPACE	AUTO , RGB-FULL, RGB-LIMIT, YCbCr	This sets the color space for PVW OUT connector.
	PREVIEW DVI-D/HDMI	DVI-D, HDMI	This sets the output mode for PVW OUT connector.
	OUTPUT FADE	BLACK , WHITE, STILL	"BLACK" or "WHITE" specifies the fade color used during an output fade. - Setting this to "STILL" makes the [OUTPUT FADE] button function as a still-image output button.
	OUTPUT FADE WHITE LEVEL	0 -255	This adjusts the white level during output fade.
	OUTPUT FADE BLACK LEVEL	0 -255	This adjusts the black level during output fade.
	OUTPUT FADE AUDIO FLW	OFF , ON	Setting this to "ON" enables the Audio Follow feature during output fade.
AUDIO	AUTO MIXING SW	OFF , ON	This switches the Auto Mixing feature on or off.
	AUTO MIXING SETUP	[[EDIT]]	This displays the AUTO MIXING Screen (p. 8).
	ECHO CANCEL SW	OFF , ON	This switches the Echo Cancel feature on or off.
	ECHO CANCEL SETUP	[[EDIT]]	This displays the ECHO CANCEL Screen (p. 8).
	AUDIO FOLLOW SW	OFF , ON	This switches the Audio Follow feature on or off.
	AUDIO FOLLOW SETUP	[[EDIT]]	This displays the AUDIO FOLLOW Screen (p. 13).
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USER	The setting items are similar to those for "USER Button Settings" (p. 16).		
MEMORY	SAVE	[[SETUP]]	This displays the MEMORY SELECT Screen (p. 9).
	LOAD	[[SELECT]]	This displays the MEMORY LOAD Screen (p. 9).
	MANUAL MODE	OFF , ON	This sets whether the state of the operation panel is updated (ON) or not updated (OFF) when a memory is recalled.
	POWER ON LOAD	OFF , 1-8	Selecting a memory number causes the settings at the selected memory number to be recalled at startup.

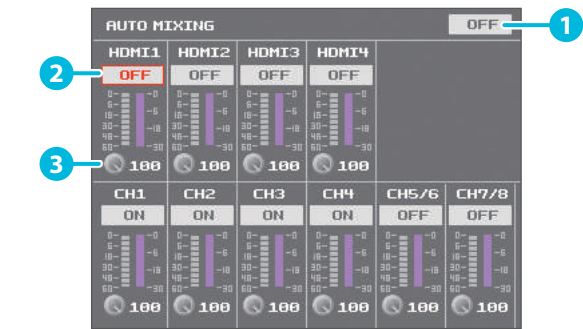
Category	Setting item	Value	Explanation															
REMOTE	MIDI Rx CHANNEL	1–16	This sets the receive channel for MIDI messages when operating the VR-4HD remotely using an external MIDI device.															
	RS-232	OFF, ON	Setting this to “ON” makes it possible to send and receive RS-232 commands.															
	BAUDRATE	9600, 19200, 38400, 115200	This sets the communication speed (bps) of the RS-232 connector.															
	GPI 1 TYPE : GPI 4 TYPE	N/A, VIDEO CH SEL 1–4, MEMORY LOAD 1–8, USER 1–5	This sets the function assigned to the GPI channel. N/A: No function is assigned. VIDEO CH SEL: This switches the video. MEMORY LOAD: This loads a memory. USER: This performs the same operation as pressing the USER button. * When a control signal is input from an external source, the assigned function is executed. The GPI trigger is fixed at the trailing edge (low: ON). For details, refer to “Inputting a Control Signal” (p. 24).															
	GPO 1 TYPE : GPO 4 TYPE	ONE SHOT, ALT	This sets the operation mode of the GPO channel. ONE SHOT: This outputs a control signal for 1 second. ALT: This outputs a control signal using alternate operation. * You can output a control signal by assigning a GPO channel (1–4) to a USER button, then operating the USER button. For details, refer to “Outputting a Control Signal” (p. 25).															
	SYSTEM	HDCP	OFF, ON	When set to “ON,” copyright-protected (HDCP) video can be input. HDCP is also added to the video that is output.														
FRAME RATE		59.94 Hz, 50 Hz	This sets the frame rate. * For output via the USB 3.0 only, the frame rate when set to “59.94 Hz” is “29.97 Hz.” Similarly, when set to “50 Hz,” the frame rate is “25 Hz.”															
SYSTEM FORMAT		720p, 1080i, 1080p	<table><tr><td rowspan="5">System format</td><td>Input format (*2)</td><td colspan="2">Output format</td></tr><tr><td>Input connector: HDMI IN 1–3</td><td>Output connector: PVW OUT, HDMI OUT (*3), RGB/COMPONENT (*3)</td><td>Output connector: USB 3.0</td></tr><tr><td>720p</td><td>720p</td><td>720p</td></tr><tr><td>1080i</td><td>1080i, 1080p</td><td rowspan="2">1080p</td></tr><tr><td>1080p</td><td>1080i, 1080p</td></tr></table> (*2) For the channel 4 input connectors (HDMI IN 4, RGB/COMPONENT 4, and COMPOSITE 4), you set the input format individually using “RESOLUTION (EDID)” (p. 2), irrespective of the system format. (*3) For the HDMI OUT connector and the RGB/COMPONENT output connector, you can specify a desired output format by using “OUTPUT RESOLUTION” (p. 4). The system format setting is followed only when “OUTPUT RESOLUTION” is set to “AUTO.”	System format	Input format (*2)	Output format		Input connector: HDMI IN 1–3	Output connector: PVW OUT, HDMI OUT (*3), RGB/COMPONENT (*3)	Output connector: USB 3.0	720p	720p	720p	1080i	1080i, 1080p	1080p	1080p	1080i, 1080p
System format		Input format (*2)	Output format															
		Input connector: HDMI IN 1–3	Output connector: PVW OUT, HDMI OUT (*3), RGB/COMPONENT (*3)		Output connector: USB 3.0													
		720p	720p		720p													
		1080i	1080i, 1080p		1080p													
		1080p	1080i, 1080p															
AUTO SWITCHING		OFF, ON	This turns the auto switching function on/off. If this is “ON,” the video of channels 1–4 switches automatically.															
AUTO SW TRANSITION TIME		0.0–4.0sec	This specifies the video switching time. * If auto switching is “ON,” video switching uses the time you specify here, not the setting of the [TIME] knob.															
AUTO SWITCHING TYPE	AUTO SCAN, BEAT SYNC SWITCHING, VIDEO FOLLOWS AUDIO	This specifies the type of auto switching. The available parameters change according to the selected type.																
AUTO SCAN	Automatically switch the video of channels 1–4.																	
SEQUENCE	SCAN TIME VIDEO INPUT1	OFF, 1–5–120sec	This specifies the AUTO SCAN switching time for each video channel.															
	SCAN TIME VIDEO INPUT2	OFF, 1–5–120sec																
	SCAN TIME VIDEO INPUT3	OFF, 1–5–120sec																
	SCAN TIME VIDEO INPUT4	OFF, 1–5–120sec																
	SEQUENCE	This specifies the order in which video is displayed.																
NORMAL		Switches in the order of channels 1–4.																
	RANDOM	Switches randomly.																

Menu List (Setup Screen)

Category	Setting item	Value	Explanation
SYSTEM	BEAT SYNC SWITCHING	This switches the video of channels 1–4 in synchronization with the beat of the corresponding audio.	
	SYNC SOURCE	IN1, IN2, IN3, IN4, IN5/6 , IN7/8, HDMI1, HDMI2, HDMI 3, HDMI4, USB FROM PC	This specifies the input audio to which the video is synchronized.
	CYCLE	1– 4 –16	This specifies the number of beats before switching to the next video.
	SEQUENCE	This specifies the order in which video is displayed.	
		NORMAL	Switches in the order of channels 1–4.
		RANDOM	Switches randomly.
	VIDEO INPUT1 SW	OFF, ON	These specify whether the input is (ON) or is not (OFF) affected the video switching.
	VIDEO INPUT2 SW	OFF, ON	
	VIDEO INPUT3 SW	OFF, ON	
	VIDEO INPUT4 SW	OFF, ON	
	VIDEO FOLLOWS AUDIO	The channel 1–4 video is switched according to the volume that is input to an AUDIO INPUT.	
	TIME	1– 2 –120sec	This specifies the time from when mic audio is detected and the video/scene is switched until audio detection resumes.
	INPUT1 SENSE	0– 50 –100	
	INPUT2 SENSE	0– 50 –100	This specifies the detection level of the audio that is input from each AUDIO INPUT connector. The higher the level, the easier it is to detect audio.
	INPUT3 SENSE	0– 50 –100	
	INPUT4 SENSE	0– 50 –100	
	INPUT1 SELECT	OFF, 1, 2, 3, 4, QUAD	This specifies the video that is output when audio is detected at AUDIO INPUT 1.
	INPUT2 SELECT	OFF, 1, 2 , 3, 4, QUAD	This specifies the video that is output when audio is detected at AUDIO INPUT 2.
	INPUT3 SELECT	OFF, 1, 2, 3 , 4, QUAD	This specifies the video that is output when audio is detected at AUDIO INPUT 3.
	INPUT4 SELECT	OFF, 1, 2, 3, 4 , QUAD	This specifies the video that is output when audio is detected at AUDIO INPUT 4.
	MULTI INPUT SELECT	OFF, 1, 2, 3, 4, QUAD	This specifies the video that is output when audio is detected at multiple inputs of AUDIO INPUT 1–4.
	SILENT SELECT	OFF , 1, 2, 3, 4, QUAD, AUTO SCAN	This specifies the video that is output when no audio input is present at any input connector.
	LCD BRIGHTNESS	LOW, HIGH	This sets the brightness of the built-in monitor.
	LCD SCALING	16:9(CROP) , FULL	This sets the method used to scale the preview video that’s displayed on the built-in monitor.
	MENU DISPLAY LEVEL	5– 13 –15	This adjusts the brightness of the menu display.
	LEVEL METER DISPLAY	OFF, ON	Setting this to “ON” displays a volume level meter on the built-in monitor.
	INPUT CH LEVEL DISPLAY	OFF, ON	Setting this to “ON” displays labels identifying the input signals on the built-in monitor.
	TALLY LABEL DISPLAY	OFF, ON	Setting this to “ON” displays a tally border on the built-in monitor and in preview output.
	NO SIGNAL BACK	BLACK , BLUE	This sets the background color of channels that have no video input.
	UNFIT SIGNAL BACK	BLACK , BLUE, THRU	This sets the background color of channels on which video of an incompatible format is input. When set to “THRU,” video in an unsupported format is output unchanged, allowing confirmation of the status of the input signal. Note, however, that the video might contain additional noise artifacts.
	DEINTERLACE MODE	WEAVE, BOB	This specifies the method used when converting interlaced input video to progressive video. WEAVE: This joins the top field and bottom field in a single frame. This is optimal for video that contains little movement. BOB: This interpolates the top field and bottom field, and unites them in a single frame. This is optimal for video that contains much movement.
	COLOR BAR OUTPUT	OFF , ON	Setting this to “ON,” a color bar is output.
	TEST TONE OUTPUT	OFF , ON	Setting this to “ON” outputs a test tone.
	AUTO OFF	OFF, ON	This sets the Auto Off function on or off. When set to “ON,” the power to the VR-4HD is automatically turned off if 240 minutes elapse with no operation performed on the unit.

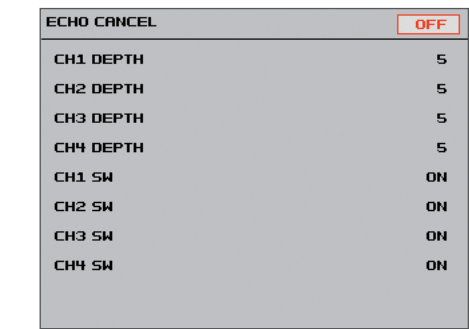
Category	Setting item	Value	Explanation
SYSTEM	PANEL LOCK		This sets whether panel lock is enabled (ON) or disabled (OFF) for all controllers except the [SYSTEM SETUP] button and the [VALUE] knob.
	ALL	OFF, ON	Locks all lockable controllers.
	VIDEO INPUT CH1–4 BUTTON		Individually locks the VIDEO INPUT SELECT [1]–[4] buttons.
	OUTPUT FADE BUTTON		Locks the [OUTPUT FADE] button.
	KEY BUTTON		Locks the [KEY] button.
	IN/OUT SETUP BUTTON		Locks the [IN/OUT SETUP] button.
	MONITOR/PVW BUTTON		Locks the [INPUT][OUTPUT] button.
	VFX/KEY LEVEL BUTTON		Locks the [VIDEO FX/KEY LEVEL] button.
	FREEZE BUTTON		Locks the [FREEZE] button.
	PinP BUTTON		Locks the [PinP] button.
	SPLIT BUTTON		Locks the [SPLIT] button.
	QUAD BUTTON		Locks the [QUAD] button.
	CUT BUTTON		Locks the [CUT] button.
	MIX BUTTON		Locks the [MIX] button.
	WIPE BUTTON		Locks the [WIPE] button.
	TRANSITION TIME KNOB		Locks the [TIME] knob.
	USER1–5 BUTTON		Locks the USER [1]–[5] buttons.
	USER SETUP BUTTON		Locks the USER[SETUP] button.
	HDMI1–4 LEVEL KNOB		Individually locks the HDMI [1]–[4] knobs.
	HDMI SETUP BUTTON		Locks the HDMI[SETUP] button.
	USB FROM PC KNOB		Locks the [FROM PC] button.
	USB TO PC KNOB		Locks the [TO PC] button.
	USB SETUP BUTTON		Locks the USB[SETUP] button.
	INPUT1–4 GAIN KNOB		Individually locks the INPUT1–4 [GAIN] knobs.
	INPUT1–4 LEVEL FADER		Individually locks the INPUT 1–4 channel faders.
	INPUT1–4 SETUP BUTTON		Individually locks the INPUT 1–4 [SETUP] buttons.
	INPUT5/6 LEVEL FADER		Locks the INPUT 5/6 channel fader.
	INPUT5/6 SETUP BUTTON		Locks the INPUT 5/6 [SETUP] button.
	INPUT7/8 LEVEL FADER		Locks the INPUT 7/8 channel fader.
	INPUT7/8 SETUP BUTTON		Locks the INPUT 7/8 [SETUP] button.
	MAIN OUT LEVEL FADER		Locks the [MAIN] fader.
	MAIN OUT SETUP BUTTON		Locks the MAIN [SETUP] button.
	PHONES KNOB		Locks the [PHONES] knob.
	REVERB KNOB		Locks the [REVERB] knob.
	TOUCH PANEL		Locks tap operations on the unit's own monitor.
	FREEZE MODE	ALL, SELECT	This sets the operation mode for freezes.
	TOUCH PANEL CALIBRATION	((EXEC))	This calibrates the tap points for the touch panel (the built-in monitor).
	FACTORY RESET	((EXEC))	This returns the unit to its factory defaults.
	VERSION	—	This displays the version of the system program.

AUTO MIXING Screen



No.	Setting item		Value	Explanation
1	Auto Mixing switch		OFF, ON	This switches the Auto Mixing feature on or off.
2	Channel switches	HDMI1-4	OFF, ON	This specifies whether Auto Mixing is applied (ON) or not applied (OFF).
		CH1-4	OFF, ON	
		CH5/6, 7/8	OFF, ON	
3	Weight level		0-100	This sets the priority for volume-level distribution.

ECHO CANCEL Screen



Setting item	Value	Explanation
Echo Cancel switch	OFF, ON	This switches the Echo Cancel feature on or off.
CH1-4 DEPTH	1-5-10	This sets the effect intensity of Echo Cancel.
CH1-4 SW	OFF, ON	This specifies whether Echo Cancel is applied (ON) or not applied (OFF).

MEMORY SELECT Screen

MEMORY SELECT

MEMORY1	MEMORY2	MEMORY3	MEMORY4
MEMORY5	MEMORY6	MEMORY7	MEMORY8

INIT RENAME SAVE

Setting item	Value	Explanation							
MEMORY1-8	—	These select the memory to work with.							
INIT	—	This returns the content of the selected memory to its factory-default state.							
RENAME	—	This displays the RENAME MEMORY screen .This changes the name of the selected memory.							
SAVE	—	This saves the current settings to the selected memory. * The state of the [OUTPUT FADE] button on the operation panel is not saved in memory. Also, the following system settings (p. 2) are not saved to memory. Only a single set is saved in the unit.							
		<table><tr><th>Category</th><th>Setting items saved in the unit</th></tr><tr><td>SYSTEM</td><td>All setting items except “COLOR BAR OUTPUT” and “TEST TONE OUTPUT” * “COLOR BAR OUTPUT” and “TEST TONE OUTPUT” are always set to “OFF” at startup.</td></tr><tr><td>REMOTE</td><td rowspan="2">All setting items</td></tr><tr><td>MEMORY</td></tr></table>	Category	Setting items saved in the unit	SYSTEM	All setting items except “COLOR BAR OUTPUT” and “TEST TONE OUTPUT” * “COLOR BAR OUTPUT” and “TEST TONE OUTPUT” are always set to “OFF” at startup.	REMOTE	All setting items	MEMORY
		Category	Setting items saved in the unit						
		SYSTEM	All setting items except “COLOR BAR OUTPUT” and “TEST TONE OUTPUT” * “COLOR BAR OUTPUT” and “TEST TONE OUTPUT” are always set to “OFF” at startup.						
		REMOTE	All setting items						
MEMORY									

MEMORY LOAD Screen

MEMORY LOAD

MEMORY1	MEMORY2	MEMORY3	MEMORY4
MEMORY5	MEMORY6	MEMORY7	MEMORY8

Setting item	Value	Explanation
MEMORY1-8	—	These load the selected memory.

Audio Channel 1–4 Settings

(Audio Channel 1–4 [SETUP] buttons)

CH1		SOLO	MUTE
HA GAIN 0.0dB	EQ HI 0dB	EDIT	HPF OFF
GAIN 0.0dB	EQ MID 0dB	EDIT	
LEVEL 0.0dB	EQ LO 0dB	EDIT	
AUX SEND -Inf	GATE OFF	EDIT	PAN CENTER
REV SEND -Inf	COMP OFF	EDIT	DELAY 0.0ms

Setting item	Value	Explanation
SOLO	OFF, ON (blue)	This sets the Solo feature on or off. Only the input audio for the channel which has solo "ON" can be monitored via headphones.
MUTE	OFF, ON (red)	This sets the Mute feature on or off. Input audio for which this is set to "ON" is silenced.
HA GAIN	0–64 dB	This adjusts head amp gain.
GAIN	-42.0–0.0–42.0 dB	This adjusts digital gain.
LEVEL	-Inf–10.0 dB	This adjusts the volume level of input audio.
AUX SEND	-Inf–0.0–10.0 dB	This adjusts the send level of audio to the AUX bus.
REV SEND	-Inf–10.0 dB	This adjusts the send level of audio to Reverb.
EQ HI	-15–0–15 dB	This boosts or attenuates the high band.
FREQ	1.00–10.0–20.0 KHz	This adjusts the center frequency when changing the sound quality in the high band.
EQ MID	-15–0–15 dB	This boosts or attenuates the middle band.
FREQ	20.0 Hz–500 Hz–20.0 KHz	This adjusts the center frequency when changing the sound quality in the middle band.
Q	0.5–1.0–16.0	This adjusts the width of the frequency band when boosting or attenuating the middle band.
EQ LO	-15–0–15 dB	This boosts or attenuates the low band.
FREQ	20.0–100–500 Hz	This adjusts the center frequency when changing the sound quality in the low band.
GATE	OFF, ON	This sets gate on or off.
THRESHOLD	-80–-50–0 dB	This sets the level used as the threshold for removing audio. Audio below the level set here is removed.
RELEASE	30–860–5000 ms	This adjusts the length of time until the audio is fully attenuated after audio falls below the threshold.
COMP	OFF, ON	This sets the compressor on or off.
THRESHOLD	-60–-30–0 dB	This sets the level used as the threshold at which the compressor is applied. Compression is applied to audio that exceeds the level set here.
RATIO	1.00: 1, 1.12: 1, 1.25: 1, 1.40: 1, 1.60: 1, 1.80: 1, 2.00: 1, 2.50: 1, 3.20: 1, 4.00: 1, 5.60: 1, 8.00: 1, 16.0: 1, INF: 1	This specifies the degree of compression applied to the audio. The state in which no compression is applied is defined as "1."
ATTACK	0.2–1–100 ms	This sets the time until compression starts when audio exceeding the threshold is input.
RELEASE	30–380–5000 ms	This adjusts the length of time until compression ends after audio falls below the threshold.
AUTO GAIN	OFF, ON	This switches the auto makeup gain feature on or off. When this is set to "ON," the final output volume level after applying the compressor is automatically adjusted according to the "THRESHOLD" and "RATIO" settings. The total of the "MAKEUP GAIN" setting value described below and the value calculated by auto makeup gain becomes the final output volume level (up to +34 dB).
MAKEUP GAIN	-40–0–40 dB	This adjusts the final output volume level after applying the compressor.
HPF	OFF, ON	This sets the high-pass filter on or off.
PAN	LEFT–CENTER–RIGHT	This adjusts the sound position (pan).
DELAY	0.0–500.0 ms	This adjusts the delay time for audio.

Audio Channel 5/6 and 7/8 Settings

(Audio Channel 5/6 and 7/8 [SETUP] buttons)

CH5/6		SOLO		MUTE	
GAIN	0.0dB	EQ HI	EDIT	DELAY	0.0ms
LEVEL	0.0dB	EQ MID	EDIT		
AUX SEND	-Inf	EQ LO	EDIT		
REV SEND	-Inf				

Setting item	Value	Explanation
SOLO	OFF, ON (blue)	This sets the Solo feature on or off. Only the input audio for the channel which has solo "ON" can be monitored via headphones.
MUTE	OFF, ON (red)	This sets the Mute feature on or off. Input audio for which this is set to "ON" is silenced.
GAIN	-42.0-0.0-42.0 dB	This adjusts digital gain.
LEVEL	-Inf-10.0 dB	This adjusts the volume level of input audio.
AUX SEND	-Inf-0.0-10.0 dB	This adjusts the send level of audio to the AUX bus.
REV SEND	-Inf-10.0 dB	This adjusts the send level of audio to Reverb.
EQ HI	-15-0-15 dB	This boosts or attenuates the high band.
FREQ	1.00-10.0-20.0 KHz	This adjusts the center frequency when changing the sound quality in the high band.
EQ MID	-15-0-15 dB	This boosts or attenuates the middle band.
FREQ	20.0 Hz-500 Hz-20.0 KHz	This adjusts the center frequency when changing the sound quality in the middle band.
Q	0.5-1.0-16.0	This adjusts the width of the frequency band when boosting or attenuating the middle band.
EQ LO	-15-0-15 dB	This boosts or attenuates the low band.
FREQ	20.0-100-500 Hz	This adjusts the center frequency when changing the sound quality in the low band.
DELAY	0.0-500.0 ms	This adjusts the delay time for audio.

Settings for Main Output Audio

(MAIN [SETUP] button)

MAIN		AUX MUTE		MAIN MUTE	
MAIN LEVEL	0.0dB	EQ HI	0dB	AUX DELAY	0.0ms
AUX LEVEL	-Inf	EQ MID	0dB	BUS SELECT	
PHONES LVL	-Inf	EQ LO	0dB	AUDIO FLW	
MAIN LIMITER	OFF	REVERB	-Inf	SOLO CLEAR	
PHONES LIMITER	OFF	MB COMP	OFF	MUTE CLEAR	

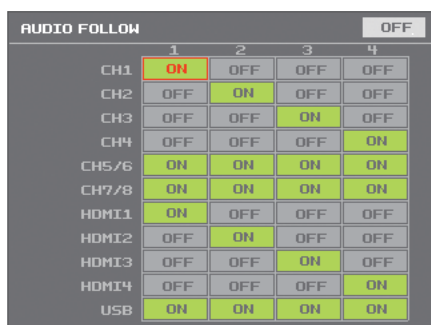
Setting item	Value	Explanation
AUX MUTE	OFF, ON (red)	This sets the Mute feature for the AUX bus on or off. Setting this to "ON" mutes out audio output from the AUX bus.
MAIN MUTE	OFF, ON (red)	This sets the Mute feature for the MAIN bus on or off. Setting this to "ON" mutes out the main output audio.
MAIN LEVEL	-Inf-10.0 dB	This adjusts the volume level of the main output audio
AUX LEVEL	-Inf-10.0 dB	This adjusts the volume level of audio output from the AUX bus.
PHONES LVL	-Inf-10.0 dB	This adjusts the volume level for headphones.
MAIN LIMITER	OFF, ON	This sets the limiter for main output audio on or off.
THRESHOLD	-40--6-0 dB	This sets the level that becomes the threshold at which the limiter is applied. Compression is applied to audio that exceeds the threshold. The volume level of audio that is output is limited so as to stay to below the threshold.
PHONES LIMITER	OFF, ON	This sets the limiter for headphones output audio on or off.
THRESHOLD	-40--6-0 dB	This sets the level that becomes the threshold at which the limiter is applied. Compression is applied to audio that exceeds the threshold. The volume level of audio that is output is limited so as to stay to below the threshold.
EQ HI	-15-0-15 dB	This boosts or attenuates the high band.
FREQ	1.00-10.0-20.0 KHz	This adjusts the center frequency when changing the sound quality in the high band.
EQ MID	-15-0-15 dB	This boosts or attenuates the middle band.
FREQ	20.0 Hz-500 Hz-20.0 KHz	This adjusts the center frequency when changing the sound quality in the middle band.
Q	0.5-1.0-16.0	This adjusts the width of the frequency band when boosting or attenuating the middle band.
EQ LO	-15-0-15 dB	This boosts or attenuates the low band.
FREQ	20.0-100-500 Hz	This adjusts the center frequency when changing the sound quality in the low band.
REVERB	-Inf-10.0 dB	This adjusts the return level from reverb of the audio.
TIME	0.0-1.5-5.0 s	This adjusts the length of the reverb.
TYPE	Room, Hall	This specifies the type of reverb. Room: Produces the natural reverberations of a highly resonant room. Hall: Produces reverberations like that of a performance in a concert hall or other such space.
MB COMP	OFF, ON	This sets multi-band compressor on or off.
HI THRES	-40--20-0 dB	These set the individual levels that become the thresholds for the high, midrange, and low bands at which the compressor is applied. Compression is applied to audio that exceeds the threshold.
MID THRES	-40--16-0 dB	
LO THRES	-40--20-0 dB	
HI RATIO	1.00: 1, 1.12: 1, 1.25: 1, 1.40: 1, 1.60: 1, 1.80: 1, 2.00: 1, 2.50: 1, 3.20: 1, 4.00: 1, 5.60: 1, 8.00: 1, 16.0: 1, INF: 1	These set the amount of compression applied in the high, midrange, and low bands. The state in which no compression is applied is defined as "1."
MID RATIO		
LO RATIO	* The default value for "MID RATIO" is "2.50:1."	
AUX DELAY	0.0-500.0 ms	This adjusts the delay time for audio output from the AUX bus.
BUS SELECT	—	This displays the BUS SELECT Screen (p. 13).
AUDIO FOLLOW	—	This displays the AUDIO FOLLOW Screen (p. 13).
SOLO CLEAR	—	This turns off all Solo settings at once.
MUTE CLEAR	—	This turns off all Mute settings at once.

BUS SELECT Screen



Setting item	Value	Explanation
MAIN	MAIN, AUX	These set the audio bus (MAIN bus or AUX bus) assigned to the respective connector.
AUX	MAIN, AUX	
PHONES	MAIN, AUX	
USB	MAIN, AUX	

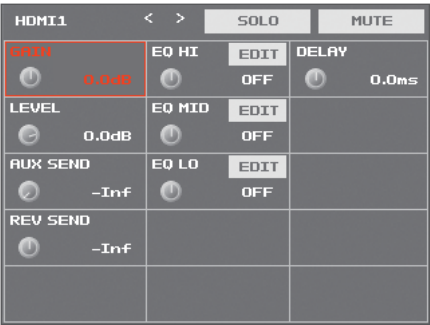
AUDIO FOLLOW Screen



Setting item	Value	Explanation
Audio Follow switch	OFF, ON	This sets the Audio Follow feature on or off.
(Matrix chart)	OFF, ON	This sets the input audio to use with Audio Follow for each video channel. When set to "ON," Audio Follow is applied.

HDMI Audio Channel 1– 4 Settings

(HDMI [SETUP] button → < < > >)



Setting item	Value	Explanation
SOLO	OFF, ON (blue)	This sets the Solo feature on or off. Only the input audio for the channel which has solo "ON" can be monitored via headphones.
MUTE	OFF, ON (red)	This sets the Mute feature on or off. HDMI audio for which this is set to "ON" is silenced.
GAIN	-42.0–0.0–42.0 dB	This adjusts digital gain.
LEVEL	-Inf–10.0 dB	This adjusts the volume level of HDMI audio.
AUX SEND	-Inf–0.0–10.0 dB	This adjusts the send level of audio to the AUX bus.
REV SEND	-Inf–10.0 dB	This adjusts the send level of audio to Reverb.
EQ HI	-15–0–15 dB	This boosts or attenuates the high band.
FREQ	1.00–10.0–20.0 KHz	This adjusts the center frequency when changing the sound quality in the high band.
EQ MID	-15–0–15 dB	This boosts or attenuates the middle band.
FREQ	20.0 Hz–500 Hz–20.0 KHz	This adjusts the center frequency when changing the sound quality in the middle band.
Q	0.5–1.0–16.0	This adjusts the width of the frequency band when boosting or attenuating the middle band.
EQ LO	-15–0–15 dB	This boosts or attenuates the low band.
FREQ	20.0–100–500 Hz	This adjusts the center frequency when changing the sound quality in the low band.
DELAY	0.0–500.0 ms	This adjusts the delay time for audio.

USB Input/Output Audio Settings

(USB [SETUP] button → < > < > < >)

USB FROM PC

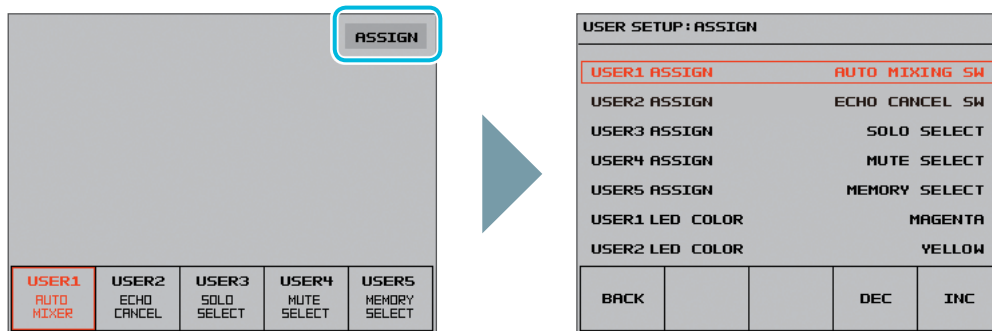
Setting item	Value	Explanation
SOLO	OFF , ON (blue)	This sets the Solo feature on or off. Only the input audio for the channel which has solo "ON" can be monitored via headphones.
MUTE	OFF , ON (red)	This sets the Mute feature on or off. USB input audio for which this is set to "ON" is silenced.
GAIN	-42.0- 0.0 -42.0 dB	This adjusts digital gain.
LEVEL	-Inf-10.0 dB	This adjusts the volume level of USB input audio.
LOOP-BACK	OFF, ON	This sets the LOOP-BACK feature on or off.
AUX SEND	-Inf- 0.0 -10.0 dB	This adjusts the send level of audio to the AUX bus.
REV SEND	-Inf-10.0 dB	This adjusts the send level of audio to Reverb.
EQ HI	-15- 0 -15 dB	This boosts or attenuates the high band.
FREQ	1.00- 10.0 -20.0 KHz	This adjusts the center frequency when changing the sound quality in the high band.
EQ MID	-15- 0 -15 dB	This boosts or attenuates the middle band.
FREQ	20.0 Hz- 500 Hz -20.0 KHz	This adjusts the center frequency when changing the sound quality in the middle band.
Q	0.5- 1.0 -16.0	This adjusts the width of the frequency band when boosting or attenuating the middle band.
EQ LO	-15- 0 -15 dB	This boosts or attenuates the low band.
FREQ	20.0- 100 -500 Hz	This adjusts the center frequency when changing the sound quality in the low band.
DELAY	0.0 -500.0 ms	This adjusts the delay time for audio.
CONNECTION	—	If a USB connection with the computer fails to be established or video is corrupt, select < RESET > to reconnect via USB.
STATUS	—	This indicates a connection using either USB 2.0 or USB 3.0. When no connection to a computer has been made, the message "NC" is displayed.
DROPPED	—	This is normally "0." An increase in this value means that video transmission is not fast enough.

USB TO PC

Setting item	Value	Explanation
MUTE	OFF , ON (red)	This sets the Mute feature on or off. USB output audio for which this is set to "ON" is silenced.
LEVEL	-Inf-10.0 dB	This adjusts the volume level of USB output audio.
DELAY	0.0 -500.0 ms	This adjusts the delay time for audio.
CONNECTION	—	If a USB connection with the computer fails to be established or video is corrupt, select < RESET > to reconnect via USB.
STATUS	—	This indicates a connection using either USB 2.0 or USB 3.0. When no connection to a computer has been made, the message "NC" is displayed.
DROPPED	—	This is normally "0." An increase in this value means that video transmission is not fast enough.

USER Button Settings

(USER [SETUP] button → <ASSIGN>)



Setting item	Value	Explanation
USER1 ASSIGN	NONE, ECHO CANCEL SW, AUTO MIXING SW, AUDIO FLW SW, AUTO SWITCHING SW MEMORY SELECT, MEMORY LOAD, MUTE SELECT, MUTE GROUP, SOLO SELECT, SOLO GROUP, GPO, CH4 INPUT CAPTURE * The default values are as follows. USER1: AUTO SWITCHING SW USER2: ECHO CANCEL SW USER3: SOLO SELECT USER4: MUTE SELECT USER5: MEMORY SELECT	This sets the functions assigned to the USER [1]– [5] buttons. NONE: No function is assigned. ECHO CANCEL SW: This switches the Echo Cancel feature on or off. AUTO MIXING SW: This switches the Auto Mixing feature on or off. AUDIO FLW SW: This switches the Audio Follow feature on or off. AUTO SWITCHING SW: This switches the Auto Switching feature on or off. MEMORY SELECT: This displays the MEMORY LOAD Screen (p. 9). This lets you select and call up a memory. MEMORY LOAD: This calls up a saved memory. MUTE SELECT: This displays the MUTE SELECT Screen (p. 17). This lets you specify whether the Mute feature is on (red) or off for each individual audio input and output. MUTE GROUP: This switches the Mute feature on or off globally for all audio assigned to a group. SOLO SELECT: This displays the SOLO SELECT Screen (p. 17). This lets you specify whether the Solo feature is on (blue) or off for each individual audio input. SOLO GROUP: This switches the Solo feature on or off globally for all audio assigned to a group. GPO: This outputs a control signal from the TALLY/GPIO connector. The USER button lights up during output of the control signal. CH4 INPUT CAPTURE: This captures the video of input CH4 (p. 2).
USER2 ASSIGN		
USER3 ASSIGN		
USER4 ASSIGN		
USER5 ASSIGN		
USER1 LED COLOR		
USER2 LED COLOR		
USER3 LED COLOR		
USER4 LED COLOR		
USER5 LED COLOR		
		This sets the colors of the USER [1]–[5] buttons when they light up.

MUTE SELECT Screen

USER1 SETUP : MUTE SELECT

CH 1	CH 2	CH 3	CH 4
CH5/6	CH7/8	USB FROM PC	
HDMI 1	HDMI 2	HDMI 3	HDMI 4
USB TO PC	AUX	MAIN	

Setting item	Value	Explanation
CH 1–4, CH5/6, CH7/8, USB FROM PC, HDMI 1–4, USB TO PC, AUX, MAIN	OFF, ON (red)	This specifies whether the Mute feature is on (red) or off for each individual audio input and output.

SOLO SELECT Screen

USER1 SETUP : SOLO SELECT

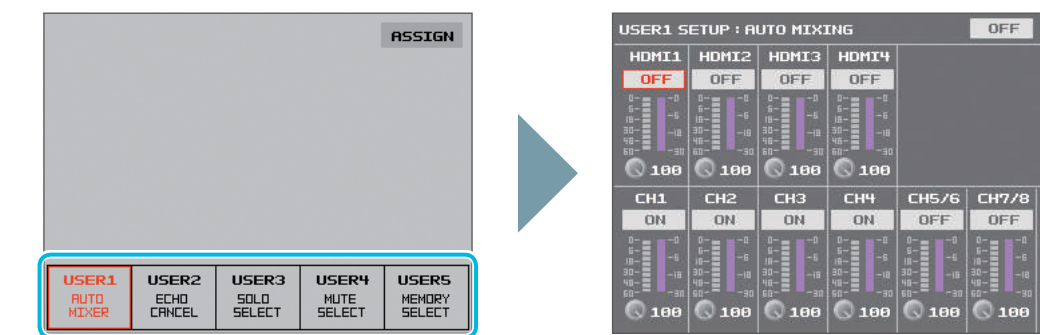
CH 1	CH 2	CH 3	CH 4
CH5/6	CH7/8	USB FROM PC	
HDMI 1	HDMI 2	HDMI 3	HDMI 4

Setting item	Value	Explanation
CH 1–4, CH5/6, CH7/8, USB FROM PC, HDMI 1–4	OFF, ON (blue)	This specifies whether the Solo feature is on (blue) or off for each individual audio input.

USER Button Advanced Settings

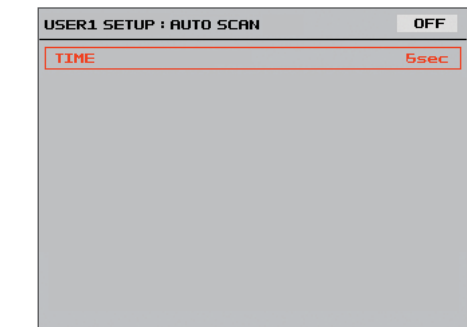
(USER [SETUP] button → <USER1> – <USER5>)

Here you make advanced settings for functions assigned to the USER [1] through [5] buttons. The currently assigned functions are displayed at the buttons at the bottom of the screen.



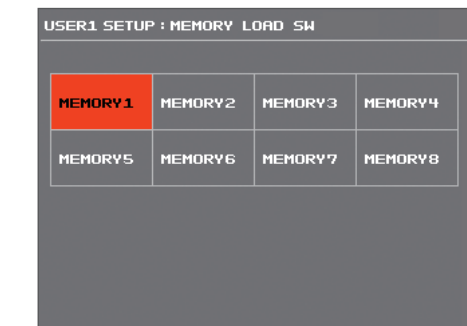
USER1–5 ASSIGN settings	USER1–USER5 SETUP Screen	Page	USER1–5 ASSIGN settings	USER1–USER5 SETUP Screen	Page
NONE	—	—	MEMORY LOAD	MEMORY LOAD SW Screen	p. 18
ECHO CANCEL SW	ECHO CANCEL Screen	p. 8	MUTE SELECT	—	—
AUTO MIXING SW	AUTO MIXING Screen	p. 8	MUTE GROUP	MUTE GROUP Screen	p. 19
AUDIO FLW SW	AUDIO FOLLOW Screen	p. 13	SOLO SELECT	—	—
AUTO SWITCHING SW	AUTO SWITCHING Screen	p. 18	SOLO GROUP	SOLO GROUP Screen	p. 19
MEMORY SELECT	MEMORY SELECT Screen	p. 9	GPO	GPO Screen	p. 19

AUTO SWITCHING Screen



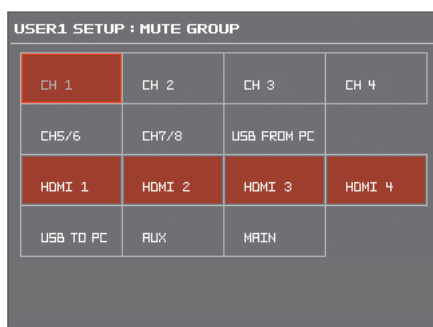
Setting item	Value	Explanation
AUTO SWITCHING SW	OFF, ON	Turns the auto switching function on/off. * This is the same setting as “AUTO SWITCHING” (p. 5).
TRANSITION TIME	0.0–4.0sec	Specifies the display interval when the auto switching function is on. * This is the same setting as “AUTO SW TRANSITION TIME” (p. 5).
TYPE	AUTO SCAN, BEAT SYNC SWITCHING, VIDEO FOLLOWS AUDIO	Specifies the type of auto switching. The available parameters change according to the selected type (p. 5).

MEMORY LOAD SW Screen



Setting item	Value	Explanation
MEMORY1–8	MEMORY1 , MEMORY2–8	The memory you want to call up is saved when you press a USER button. The button it is saved to lights up in red.

MUTE GROUP Screen



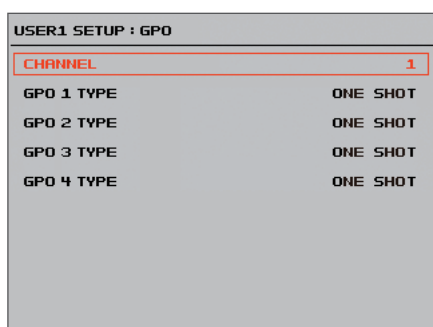
Setting item	Value	Explanation
CH 1–4, CH5/6, CH7/8, USB FROM PC, HDMI 1–4, USB TO PC, AUX, MAIN	—	When you press the USER button, the input/output audio for which the Mute feature is to be switched on are selected and assigned to a group. The button it is assigned to lights up in red.

SOLO GROUP Screen



Setting item	Value	Explanation
CH 1–4, CH5/6, CH7/8, USB FROM PC, HDMI 1–4	—	When you press the USER button, the input audio and output audio for which the Solo feature is to be switched on are selected and assigned to a group. The button it is assigned to lights up in blue.

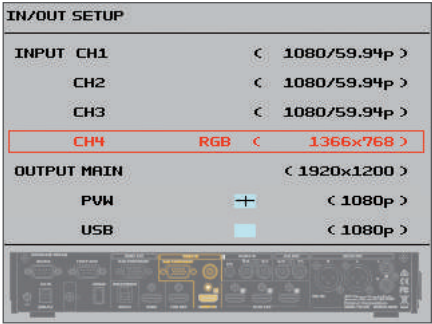
GPO Screen



Setting item	Value	Explanation
CHANNEL	1–4	This sets the GPO channel (1–4) on which the control signal is output.
GPO 1 TYPE : GPO 4 TYPE	ONE SHOT, ALT	This sets the operation mode of the GPO channel. ONE SHOT: This outputs a control signal for 1 second. ALT: This outputs a control signal using alternate operation. * These are identical to the settings for “GPO 1 TYPE”–“GPO 4 TYPE” (p. 5).

Settings for Assignments to Video Input/Output Connectors

([IN/OUT SETUP] button)

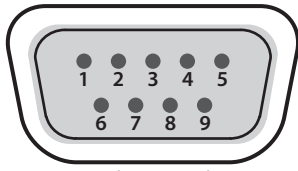


Setting item		Value	Explanation
INPUT	CH1-3	—	This displays the input format of video channel 1-3.
	CH4	HDMI, RGB, COMPOSITE * This is identical to the setting for "INPUT ASSIGN" (p. 2).	This specifies the video source to input on video channel 4.
OUTPUT	MAIN	—	This displays the output format of the HDMI OUT connector and the RGB/COMPONENT output connector.
	PVW	 ,  (Default value)	This specifies the video to output via the PVW OUT connector (PVW) and the USB 3.0 port (USB).  : The main output video is output.
	USB	 (Default value), 	 : The incoming video on channels 1 through 4 is output as a fourway split screen. * The setting for "PVW" is interlinked with the selection of the [INPUT] and [OUTPUT] buttons.

RS-232 Command Reference

Using the RS-232 connector, you can operate the VR-4HD remotely from an external device.

Specification of the RS-232 Connector



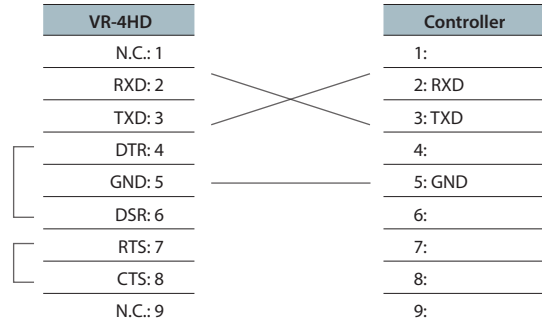
D-sub 9-pin (male)

Pin No.	Signal
1	N.C.
2	RXD
3	TXD
4	DTR
5	GND
6	DSR
7	RTS
8	CTS
9	N.C.

Communication method	Synchronous (asynchronous), full-duplex
Communication speed (bps)	9600, 19200, 38400, 115200
Parity	none
Data length	8 bit
Stop bit	1 bit
Code set	ASCII
Flow control	XON/XOFF

Cable Wiring Diagram

Wire the three lines of RXD, TXD, and GND as shown in the figure below.



- * The connections between 4 and 6 and between 7 and 8 are inside the VR-4HD.
- * When connecting to a controlling device (such as an RS-232 compatible computer), use a crossover cable.

Overview of Commands

Commands are each formatted as an ASCII code string composed of "stx" plus "three alphabetic letters (capitals)" plus ";" (semicolon).

The three letters of the alphabet indicate the type of command.

If the command has an argument, a colon (":") is inserted between the command letters and the argument. When multiple arguments occur, they are separated by commas (",").

stx	An ASCII-code signal name (code number: 02H), this is a control code indicating the start of a command. "H" indicates that it is a hexadecimal value.
:	This is the code that the VR-4HD recognizes as a separator between a command and its argument.
;	This is the code that the VR-4HD recognizes as the end of a command.

* The codes of stx (02H), ACK (06H), and Xon (11H)/ Xoff (13H) are the control codes.

* When successively sending commands to the VR-4HD from an external device, after each command, be sure that "ACK" is returned before sending the next command.

Received Commands (Controller → VR-4HD)

Item	Received Commands	Parameter
Select video input channel	stxPGM:a;	a: 0 (CH 1)–3 (CH 4)
Set input connector for INPUT 4	stxIS4:a;	a: 0 (HDMI), 1 (RGB), 2 (CVBS)
Specify transition effect	stxTRS:a;	a: 0 (CUT), 1 (MIX), 2 (WIPE)
Set transition time	stxTIM:a;	a: 0 (0.0 sec)– 40 (4.0 sec)
Set PinP on/off	stxPIP:a;	a: 0 (OFF), 1 (ON)
Select video input channel for PinP inset screen	stxPIS:a;	a: 0 (CH 1)–3 (CH 4)
Set key compositing on/off	stxDSK:a;	a: 0 (OFF), 1 (ON)
Select source channel for key compositing	stxDSS:a;	a: -1 (OFF), 0 (CH 1)–3 (CH 4)
Set output fade on/off	stxFDE:a;	a: 0 (OFF), 1 (ON)
Set freeze on/off	stxFRZ:a;	a: 0 (OFF), 1 (ON)
Adjust audio channel 1 input level	stxLM1:a;	a: 0–127
Adjust audio channel 2 input level	stxLM2:a;	a: 0–127
Adjust audio channel 3 input level	stxLM3:a;	a: 0–127
Adjust audio channel 4 input level	stxLM4:a;	a: 0–127
Adjust audio channel 5/6 input level	stxLS1:a;	a: 0–127
Adjust audio channel 7/8 input level	stxLS2:a;	a: 0–127
Adjust HDMI 1 input level	stxLH1:a;	a: 0–127
Adjust HDMI 2 input level	stxLH2:a;	a: 0–127
Adjust HDMI 3 input level	stxLH3:a;	a: 0–127
Adjust HDMI 4 input level	stxLH4:a;	a: 0–127
Adjust input level from USB	stxLUB:a;	a: 0–127
Adjust level of main output audio	stxLMN:a;	a: 0–127
Load memory	stxMEM:a;	a: 0 (MEMORY 1)–7 (MEMORY 8)
Reset USB connection	stxRUB;	
Return version information	stxVER;	
Return PinP status	stxQPI;	
Return key compositing status	stxQDK;	
Return selected video input channel	stxQPG;	
Return USB connection status	stxQUB;	
Flow control	XON	
Flow control	XOFF	

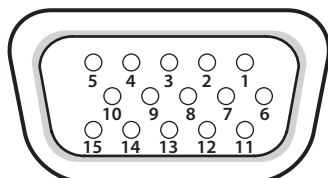
Sent Commands (VR-4HD → Controller)

Item	Sent Commands	Parameter
Sent when a transmitted command has been correctly received * When a VER, QPI, QDK, QPG, QUB, XON, or XOFF command is received, no ACK is sent.	ACK	
Sent when a transmitted command has not been correctly received	stxERR;a;	a: 0 (syntax error) The received command contains an error. 4 (invalid value error) An argument of the received command is invalid. 5 (out of range error) An argument of the received command is out of range.
Sent when a VER command has been received	stxVER:VR-4HD,a;	a: Version * The version info is ASCII text strings.
PinP status is sent at the following times • When PinP status has changed • When a QPI command is received	stxQPI:a,b;	a: 0 (OFF), 1 (ON) b: 0 (CH 1)–3 (CH 4) Selected channel for PinP inset screen
Key compositing status is sent at the following times • When key compositing status has changed • When a QDK command is received	stxQDK:a,b;	a: 0 (OFF), 1 (ON) b: -1 (OFF), 0 (CH 1)–3 (CH 4) Source channel for key compositing
The selected video input channel is sent at the following times • When the selected video input channel has changed • When a QPG command is received	stxQPG;a;	a: 0 (CH 1)–3 (CH 4)
USB connection status is sent at the following times • When USB connection status has changed • When a QUB command is received	stxQUB;a;	a: 0 (unconnected), 2 (USB 2.0), 3 (USB 3.0)
Flow control	XON	
Flow control	XOFF	

Control Using the TALLY/GPIO Connector

You can operate the VR-4HD remotely from an external device by inputting a GPI control signal via the TALLY/GPIO connector.
You can also output a tally signal and a GPO control signal from the TALLY/GPIO connector

Specification of the TALLY/GPIO Connector



Mini D-sub 15-pin (female)

Pin No.	Function
1	TALLY PGM 1
2	GPO 1
3	GPI 1
4	GND
5	TALLY PGM 4
6	TALLY PGM 2
7	GPO 2
8	GPI 2
9	GND
10	GPO 4
11	TALLY PGM 3
12	GPO 3
13	GPI 3
14	GND
15	GPI 4

Tally/control output	
Trigger method	Open collector
Maximum input	12 V/200 mA
Control input	
Trigger method	No-voltage contact (make-contact) triggering
Contact capacity	DC 24 V 0.1 A or higher
Input method	Photocoupler

Inputting a Control Signal

To operate the VR-4HD remotely using control-signal input, you first assign the function to a GPI channel (1 through 4).

1. Press the [SYSTEM SETUP] button to display the setup screen.
2. Select <REMOTE> to display the REMOTE menu.
3. Select the target from among <GPI 1 TYPE> through <GPI 4 TYPE>.

REMOTE	
MIDI Rx CHANNEL	1
RS-232	OFF
BAUDRATE	115200
GPI 1 TYPE	N/A
GPI 2 TYPE	N/A
GPI 3 TYPE	N/A
GPI 4 TYPE	N/A
BACK	DEC
INC	

4. Use the [VALUE] knob to specify the function to assign to the GPI channel (1 through 4).

Value	Explanation
N/A	No function is assigned.
VIDEO CH SEL 1-4	This switches the video.
MEMORY LOAD 1-8	This loads a memory.
USER 1-5	This performs the same operation as pressing the USER button.

5. Press the [SYSTEM SETUP] button several times to quit the setup screen.

When a control signal is input from an external source, the assigned function is executed. The GPI trigger is fixed at the trailing edge (low: ON).

Outputting a Tally Signal

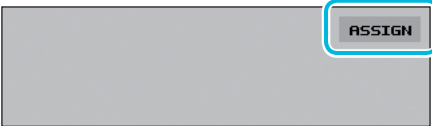
A tally signal is output from the connector pin corresponding to the video channel being output, also including video composition and transition effects.

* The tally-signal output is for the main output video.

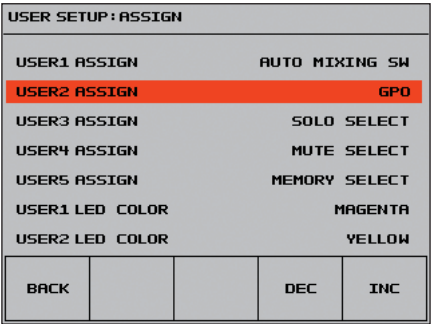
Outputting a Control Signal

You can output a control signal by assigning a GPO channel (1 through 4) to a USER button, then operating the USER button.

1. Press the USER [SETUP] button to display the setup screen.

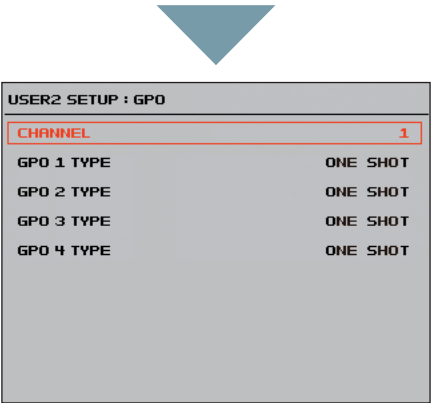
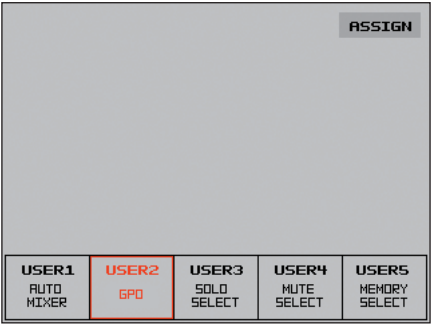
2. Select <ASSIGN> to display the ASSIGN menu.
- 

3. Select the target from among <USER 1 ASSIGN> through <USER5 ASSIGN>, then use the [VALUE] knob to specify "GPO" as the function to assign to the USER button.



4. Go to the bottom of the screen and select <BACK> to go back to the previous screen.
5. Select where the GPO function is assigned (<USER 1> through <USER 5>) to display the USER1 through 5 SETUP: GPO screen.

The currently assigned functions are displayed at the buttons at the bottom of the screen.



6. Select <CHANNEL>, then use the [VALUE] knob to set the GPO channel (1 through 4) for outputting the control signal.
7. Select one from among <GPO 1 TYPE> through <GPO 4 TYPE>, then use the [VALUE] knob to specify the operation mode of the GPO channel.

Value	Explanation
ONE SHOT	This outputs a control signal for 1 second.
ALT	This outputs a control signal using alternate operation.

8. Press the USER [SETUP] button several times to quit the setup screen.

Operating the USER button where the GPO function is assigned outputs a control signal from the corresponding GPO pin. The USER button lights up during output of the control signal.

MIDI Implementation

Model: VR-4HD
Date: March 16, 2017
Version: 1.50

Symbol	Item	Setting Range
n	MIDI Channel	0H–FH (VR-4HD system settings)

1. MIDI Messages Received at MIDI IN

■ Channel Voice Messages

* Set the receiving channel of VR-4HD according to the master device channel by pressing the [SYSTEM SETUP] button → <REMOTE> → <MIDI Rx CHANNEL>.

● Control Change

○ Undefined (Controller Number 21–30, 52–54)

Status	2nd Byte	3rd Byte
BnH	ccH	vvH

* These control the value of fader/knob level.

cc= Control Change Number: 00H–7FH (See the correspondence table below.)

cc	Corresponding fader/knob	cc	Corresponding fader/knob
15H	CH [1] fader	1CH	HDMI [2] knob
16H	CH [2] fader	1DH	HDMI [3] knob
17H	CH [3] fader	1EH	HDMI [4] knob
18H	CH [4] fader	1FH	USB [FROM PC] knob
19H	CH [5/6] fader	34H	[MAIN] fader
1AH	CH [7/8] fader	35H	[AUX] fader
1BH	HDMI [1] knob	36H	USB [To PC] knob

vv= Control Value: 00H–7FH (0–127)

The following table shows how fader values correspond to control values (unit: dB).

0	-Inf	32	-33.1	64	-11.3	96	-0.3
1	-80.0	33	-32.3	65	-10.7	97	0.0
2	-76.7	34	-31.5	66	-10.3	98	0.3
3	-73.3	35	-30.8	67	-10.0	99	0.7
4	-70.0	36	-30.0	68	-9.7	100	1.0
5	-66.7	37	-29.3	69	-9.3	101	1.3
6	-63.3	38	-28.7	70	-9.0	102	1.7
7	-60.0	39	-28.0	71	-8.7	103	2.0
8	-58.6	40	-27.3	72	-8.3	104	2.3
9	-57.1	41	-26.7	73	-8.0	105	2.7
10	-55.7	42	-26.0	74	-7.7	106	3.0
11	-54.3	43	-25.3	75	-7.3	107	3.3
12	-52.9	44	-24.7	76	-7.0	108	3.7
13	-51.4	45	-24.0	77	-6.7	109	4.0
14	-50.0	46	-23.3	78	-6.3	110	4.3
15	-48.9	47	-22.7	79	-6.0	111	4.7
16	-47.8	48	-22.0	80	-5.7	112	5.0
17	-46.7	49	-21.3	81	-5.3	113	5.3
18	-45.6	50	-20.7	82	-5.0	114	5.7
19	-44.4	51	-20.0	83	-4.7	115	6.0
20	-43.3	52	-19.3	84	-4.3	116	6.3
21	-42.2	53	-18.7	85	-4.0	117	6.7
22	-41.1	54	-18.0	86	-3.7	118	7.0
23	-40.0	55	-17.3	87	-3.3	119	7.3
24	-39.2	56	-16.7	88	-3.0	120	7.7
25	-38.5	57	-16.0	89	-2.7	121	8.0
26	-37.7	58	-15.3	90	-2.3	122	8.3
27	-36.9	59	-14.7	91	-2.0	123	8.7
28	-36.2	60	-14.0	92	-1.7	124	9.0
29	-35.4	61	-13.3	93	-1.3	125	9.3
30	-34.6	62	-12.7	94	-1.0	126	9.7
31	-33.8	63	-12.0	95	-0.7	127	10.0

○ Undefined (Controller Number 14)

Status	2nd Byte	3rd Byte
BnH	0EH	vvH

vv: 00H–03H (CH 1–4)

* This selects the video output.

○ Undefined (Controller Number 15)

Status	2nd Byte	3rd Byte
BnH	0FH	vvH

vv: 00H–03H (CH 1–4)

* This selects the video for composition.

○ Undefined (Controller Number 46)

Status	2nd Byte	3rd Byte
BnH	2EH	vvH

vv: 00H–02H (CUP, MIX, WIPE)

* This selects the type of video transition effect.

○ Undefined (Controller Number 47)

Status	2nd Byte	3rd Byte
BnH	2FH	vvH

vv: 00H–28H (0.0–4.0 sec)

* This controls the value of video transition time.

○ Undefined (Controller Number 55)

Status	2nd Byte	3rd Byte
BnH	37H	vvH

vv: 00H–01H (OFF, ON)

* This turns the [KEY] button on/off.

○ Undefined (Controller Number 56)

Status	2nd Byte	3rd Byte
BnH	38H	vvH

vv: 00H–04H (OFF, CH 1–4)

* This selects the channel for key composition.

○ Undefined (Controller Number 57)

Status	2nd Byte	3rd Byte
BnH	39H	vvH

vv: 00H–7FH (0–127)

- The received value is doubled and the value of the setting on the unit is updated.

* This sets the key-compositing level of the currently selected KEY TYPE.

○ Undefined (Controller Number 58)

Status	2nd Byte	3rd Byte
BnH	3AH	vvH

vv: 00H–7FH (0–127)

* This controls the value of the video effect level.

○ Undefined (Controller Number 59)

Status	2nd Byte	3rd Byte
BnH	3BH	vvH

vv: 00H–03H (OFF, PinP, SPLIT, QUAD)

* This selects the type of video composition effect.

○ Undefined (Controller Number 60)

Status	2nd Byte	3rd Byte
BnH	3CH	vvH

vv: 00H–01H (OFF, ON)

* This turns the [OUTPUT FADE] button on/off.

○ Undefined (Controller Number 61)

Status	2nd Byte	3rd Byte
BnH	3DH	vvH

vv: 00H–01H (OFF, ON)

* This turns the [FREEZE] button on/off.

■ System Exclusive Messages

Status	Data Byte	Status
F0H	iiH, ddH, ..., eeH	F7H

F0H: Status of system exclusive message
 ii= ID number: This is the ID to recognize manufacturer of the exclusive message (manufacturer ID). The manufacturer ID of Roland is 41H. The ID numbers of 7EH and 7FH are expansion of MIDI standards and used as universal non-realtime message (7EH) of universal realtime message (7FH).
 dd, ..., ee= data: 00H–7FH (0–127)
 F7H: EOX (end of exclusive)

● Data Request 1 (RQ1)

This is the message to request of “send data” to the connected device. Specify data type and amount using address and size. When this is received, the unit sends the requested data as “Data Set 1 (DT1)” message in case the unit is in status where the sending of data is possible and requested address and size are appropriate. If not, the unit sends nothing.

Status	Data Byte	Status
F0H	41H, 10H, 00H, 00H, 00H, 29H, 11H, aaH, bbH, ccH, ssH, ttH, uuH, sum	F7H

Byte	Explanation
F0H	Exclusive Status
41H	Manufacturer ID (Roland)
10H	Device ID
00H	1st byte of model ID (VR-4HD)
00H	2nd byte of model ID (VR-4HD)
00H	3rd byte of model ID (VR-4HD)
29H	4th byte of model ID (VR-4HD)
11H	Command ID (RQ1)
aaH	Address upper byte
bbH	Address middle byte
ccH	Address lower byte
ssH	Size upper byte
ttH	Size middle byte
uuH	Size lower byte
sum	Checksum
F7H	EOX (end of exclusive)

* Depending on the data type, the amount of single-time transmission is specified. It is necessary to execute data request according to the specified first address and size. Refer to the “3. Parameter Address Map” (p. 30) for address and size.

* See “Example of an Exclusive Message and Calculating a Checksum” (p. 40) for checksum.

● Data Set 1 (DT1)

This is the message of actual data transmission. Use this when you want to set data to the unit.

Status	Data Byte	Status
F0H	41H, 10H, 00H, 00H, 00H, 29H, 12H, aaH, bbH, ccH, ddH, ..., eeH, sum	F7H

Byte	Explanation
F0H	Exclusive Status
41H	Manufacturer ID (Roland)
10H	Device ID
00H	1st byte of model ID (VR-4HD)
00H	2nd byte of model ID (VR-4HD)
00H	3rd byte of model ID (VR-4HD)
29H	4th byte of model ID (VR-4HD)
12H	Command ID (DT1)
aaH	Address upper byte
bbH	Address middle byte
ccH	Address lower byte
ddH	Data: actual data to transmit. Multiple byte data is sent in address order.
:	:
eeH	Data
sum	Checksum
F7H	EOX (end of exclusive)

* Depending on the data type, the amount of single-time transmission is specified. It is necessary to execute data request according to the specified first address and size. Refer to the “3. Parameter Address Map” (p. 30) for address and size.

* See “Example of an Exclusive Message and Calculating a Checksum” (p. 40) for checksum.

* Data exceeding 256 bytes should be divided into packets of 256 bytes or smaller. If you send data set 1 successively, set interval of 20 ms or longer between packets.

2. MIDI Messages Transmitted from MIDI OUT

■ Channel Voice Messages

● Control Change

○ Undefined (Controller Number 21–30, 52–54)

Status	2nd Byte	3rd Byte
BnH	ccH	vvH

* These transmit the value when fader/knob level has been changed.

cc= Control Change Number: 00H–7FH (See the correspondence table below.)

cc	Corresponding fader/knob	cc	Corresponding fader/knob
15H	CH [1] fader	1CH	HDMI [2] knob
16H	CH [2] fader	1DH	HDMI [3] knob
17H	CH [3] fader	1EH	HDMI [4] knob
18H	CH [4] fader	1FH	USB [FROM PC] knob
19H	CH [5/6] fader	34H	[MAIN] fader
1AH	CH [7/8] fader	35H	[AUX] fader
1BH	HDMI [1] knob	36H	USB [To PC] knob

vv= Control Value: 00H–7FH (0–127)

The following table shows how fader values correspond to control values (unit: dB).

0	-Inf	32	-33.1	64	-11.3	96	-0.3
1	-80.0	33	-32.3	65	-10.7	97	0.0
2	-76.7	34	-31.5	66	-10.3	98	0.3
3	-73.3	35	-30.8	67	-10.0	99	0.7
4	-70.0	36	-30.0	68	-9.7	100	1.0
5	-66.7	37	-29.3	69	-9.3	101	1.3
6	-63.3	38	-28.7	70	-9.0	102	1.7
7	-60.0	39	-28.0	71	-8.7	103	2.0
8	-58.6	40	-27.3	72	-8.3	104	2.3
9	-57.1	41	-26.7	73	-8.0	105	2.7
10	-55.7	42	-26.0	74	-7.7	106	3.0
11	-54.3	43	-25.3	75	-7.3	107	3.3
12	-52.9	44	-24.7	76	-7.0	108	3.7
13	-51.4	45	-24.0	77	-6.7	109	4.0
14	-50.0	46	-23.3	78	-6.3	110	4.3
15	-48.9	47	-22.7	79	-6.0	111	4.7
16	-47.8	48	-22.0	80	-5.7	112	5.0
17	-46.7	49	-21.3	81	-5.3	113	5.3
18	-45.6	50	-20.7	82	-5.0	114	5.7
19	-44.4	51	-20.0	83	-4.7	115	6.0
20	-43.3	52	-19.3	84	-4.3	116	6.3
21	-42.2	53	-18.7	85	-4.0	117	6.7
22	-41.1	54	-18.0	86	-3.7	118	7.0
23	-40.0	55	-17.3	87	-3.3	119	7.3
24	-39.2	56	-16.7	88	-3.0	120	7.7
25	-38.5	57	-16.0	89	-2.7	121	8.0
26	-37.7	58	-15.3	90	-2.3	122	8.3
27	-36.9	59	-14.7	91	-2.0	123	8.7
28	-36.2	60	-14.0	92	-1.7	124	9.0
29	-35.4	61	-13.3	93	-1.3	125	9.3
30	-34.6	62	-12.7	94	-1.0	126	9.7
31	-33.8	63	-12.0	95	-0.7	127	10.0

○ Undefined (Controller Number 14)

Status	2nd Byte	3rd Byte
BnH	0EH	vvH

vv: 00H–03H (CH 1–4)

* This transmits the value when the VIDEO INPUT SELECT [1], [2], [3], or [4] button has been operated and the output video has been switched.

○ Undefined (Controller Number 15)

Status	2nd Byte	3rd Byte
BnH	0FH	vvH

vv: 00H–03H (CH 1–4)

* This transmits the value when the VIDEO INPUT SELECT [1], [2], [3], or [4] button has been operated and the video for composition has been switched.

○ Undefined (Controller Number 46)

Status	2nd Byte	3rd Byte
BnH	2EH	vvH

vv: 00H–02H (CUT, MIX, WIPE)

* This transmits the value when the [CUT], [MIX], or [WIPE] button has been operated.

○ Undefined (Controller Number 47)

Status	2nd Byte	3rd Byte
BnH	2FH	vvH

vv: 00H–28H (0.0–4.0 sec)

* This transmits the value when video transition time has been changed.

○ Undefined (Controller Number 55)

Status	2nd Byte	3rd Byte
BnH	37H	vvH

vv: 00H–01H (OFF, ON)

* This transmits the value when the [KEY] button has been operated.

○ Undefined (Controller Number 56)

Status	2nd Byte	3rd Byte
BnH	38H	vvH

vv: 00H–04H (OFF, CH 1–4)

* This transmits the value when the channel for key composition has been changed.

○ Undefined (Controller Number 57)

Status	2nd Byte	3rd Byte
BnH	39H	vvH

vv: 00H–7FH (0–127)

- The sent value is one-half that of the setting on the unit.

* This transmits the key-compositing level of the currently selected KEY TYPE.

○ Undefined (Controller Number 58)

Status	2nd Byte	3rd Byte
BnH	3AH	vvH

vv: 00H–7FH (0–127)

* This transmits the value when the video effect level has been changed.

○ Undefined (Controller Number 59)

Status	2nd Byte	3rd Byte
BnH	3BH	vvH

vv: 00H–03H (OFF, PinP, SPLIT, QUAD)

* This transmits the value when the [PinP], [SPLIT], or [QUAD] button has been operated.

○ Undefined (Controller Number 60)

Status	2nd Byte	3rd Byte
BnH	3CH	vvH

vv: 00H–01H (OFF, ON)

* This transmits the value when the [OUTPUT FADE] button has been operated.

○ Undefined (Controller Number 61)

Status	2nd Byte	3rd Byte
BnH	3DH	vvH

vv: 00H–01H (OFF, ON)

* This transmits the value when the [FREEZE] button has been operated.

■ System Exclusive Message

Status	Data Byte	Status
F0H	iiH, ddH, ..., eeH	F7H

F0H: Status of system exclusive message

ii= ID number: This is the ID to recognize manufacturer of the exclusive message (manufacturer ID). The manufacturer ID of Roland is 41H. The ID numbers of 7EH and 7FH are expansion of MIDI standards and used as universal non-realtime message (7EH) of universal realtime message (7FH).

dd, ..., ee= data: 00H–7FH (0–127)

F7H: EOX (end of exclusive)

● Data Set 1 (DT1)

This is the message of actual data transmission. Use this when you want to set data to the unit.

Status	Data Byte	Status
F0H	41H, 10H, 00H, 00H, 00H, 29H, 12H, aaH, bbH, ccH, ddH, ..., eeH, sum	F7H

Byte	Explanation
F0H	Exclusive Status
41H	Manufacturer ID (Roland)
10H	Device ID
00H	1st byte of model ID (VR-4HD)
00H	2nd byte of model ID (VR-4HD)
00H	3rd byte of model ID (VR-4HD)
29H	4th byte of model ID (VR-4HD)
12H	Command ID (DT1)
aaH	Address upper byte
bbH	Address middle byte
ccH	Address lower byte
ddH	Data: actual data to transmit. Multiple byte data is sent in address order.
:	:
eeH	Data
sum	Checksum
F7H	EOX (end of exclusive)

* Data exceeding 256 bytes should be divided into packets of 256 bytes or smaller. If you send sequentially, the intervals of packets should be longer than 20 ms.

3. Parameter Address Map

* At addresses with “#” appended, the specified data is transmitted divided into 2 bytes or 3 bytes. The data is ignored if the entire continuous sequence is not received in succession.

Start Address	Description
00H 00H 00H	Video Parameter Area
01H 00H 00H	Audio Parameter Area
03H 00H 00H	System Parameter Area

● Video Parameter Area

Address	Parameter Name
00H 00H 00H	CH4 Parameter
00H 01H 00H	TRANSITION Parameter
00H 02H 00H	PinP Parameter
00H 03H 00H	SPLIT Parameter
00H 04H 00H	KEY Parameter
00H 05H 00H	VIDEO FX Parameter
00H 06H 00H	OUTPUT Parameter
00H 07H 00H	PANEL Parameter
00H 08H 00H	IN/OUT SETUP Parameter

○ CH4 Parameter

Address	Parameter Name	Sys.Ex.Value	Meaning of Value
00H 00H 00H	CH4 RESOLUTION (EDID)	00H-0EH	AUTO, 480/576i, 480/576p, 720p, 1080i, 1080p, 640x480, 800x600, 1024x768, 1280x768, 1280x1024, 1366x768, 1400x1050, 1600x1200, 1920x1200
00H 00H 01H	CH4 SCALING TYPE	00H-03H	FULL, LETTERBOX, CROP, DOT BY DOT
#00H 00H 02H 03H	CH4 H. POSITION	0aaaaaaa 0bbbbbbb	aaaaaaabbbbbbb = -1920-1920 * Only values that are multiples of 8 can be specified.
#00H 00H 04H 05H	CH4 V. POSITION	0aaaaaaa 0bbbbbbb	aaaaaaabbbbbbb = -1200-1200
00H 00H 06H	CH4 H. SIZE	00H-78H	80-200 %
00H 00H 07H	CH4 V. SIZE	00H-78H	80-200 %
00H 00H 08H	CH4 CONTRAST	00H-7FH	-64-63
00H 00H 09H	CH4 SATURATION	00H-7FH	-64-63
00H 00H 0AH	CH4 BRIGHTNESS	00H-7FH	-64-63
00H 00H 0BH	Reserved		
00H 00H 0CH	CH4 FLICKER FILTER	00H-0AH	0-10

○ TRANSITION Parameter

Address	Parameter Name	Sys.Ex.Value	Meaning of Value
00H 01H 00H	MIX PATTERN	00H-03H	MIX, FAM, NAM, MOSAIC
00H 01H 01H	WIPE PATTERN	00H-1DH	H-DOWN, H-UP, V-RIGHT, V-LEFT, H-IN, H-OUT, V-IN, V-OUT, R-DOWN, L-DOWN, R-UP, L-UP, BLOCK, V-GRID, H-GRID, H-DOWN/s, H-UP/s, V-RIGHT/s, V-LEFT/s, H-IN/s, H-OUT/s, V-IN/s, V-OUT/s, -DOWN/s, L-DOWN/s, R-UP/s, L-UP/s, BLOCK/s, V-GRID/s, H-GRID/s
00H 01H 02H	TRANSITION TIME	00H-28H	0-4.0 sec

○ PinP Parameter

Address	Parameter Name	Sys.Ex.Value	Meaning of Value
00H 02H 00H	PinP SIZE	00H-02H	1/4, 1/2, 1/3
00H 02H 01H	PinP BORDER WIDTH	00H-0FH	0-15
00H 02H 02H	PinP BORDER COLOR	00H-06H	BLACK, WHITE, GRAY, RED, GREEN, BLUE, YELLOW
00H 02H 03H	PinP PREVIOUS SELECT	00H-01H	OFF, ON
00H 02H 04H	PinP H. POSITION	00H-64H	-50-+50 %
00H 02H 05H	PinP V. POSITION	00H-64H	-50-+50 %
00H 02H 06H	SHAPE	00H-03H	SQUARE, DIAMOND, CIRCLE, HEART
00H 02H 07H	ASPECT	00H-01H	16:9, 1:1
00H 02H 08H	H. CROPPING	01H-64H	1-100%
00H 02H 09H	V. CROPPING	01H-64H	1-100%
00H 02H 0AH	H. VIEW POSITION	00H-64H	-50-+50%
00H 02H 0BH	V. VIEW POSITION	00H-64H	-50-+50%

○ SPLIT Parameter

Address	Parameter Name	Sys.Ex.Value	Meaning of Value
00H 03H 00H	SPLIT PATTERN	00H-03H	V.CENTER, H.CENTER, V.STRETCH, H.STRETCH
00H 03H 01H	SPLIT A-CENTER	00H-64H	0-100 %
00H 03H 02H	SPLIT B-CENTER	00H-64H	0-100 %
00H 03H 03H	SPLIT PREVIOUS SELECT	00H-01H	OFF, ON
00H 03H 04H	CENTER POSITION	4EH-7FH, 00H-32H	-50-+50%

○ KEY Parameter

Address	Parameter Name	Sys.Ex.Value	Meaning of Value
00H 04H 00H	KEY TYPE	00H-01H	CHROMA, LUMI
00H 04H 01H	KEY SOURCE CH	00H-05H	OFF, CH 1-4, STILL
#00H 04H 02H 03H	CHROMA KEY LEVEL	0aaaaaaa 0bbbbbbb	aaaaaaabbbbbbb = 0-255
#00H 04H 04H 05H	CHROMA KEY GAIN	0aaaaaaa 0bbbbbbb	aaaaaaabbbbbbb = 0-255
00H 04H 06H	CHROMA KEY COLOR	00H-01H	BLUE, GREEN
#00H 04H 07H 08H	CHROMA KEY HUE WIDTH	0aaaaaaa 0bbbbbbb	aaaaaaabbbbbbb = -127-127
#00H 04H 09H 0AH	CHROMA KEY HUE FINE	0aaaaaaa 0bbbbbbb	aaaaaaabbbbbbb = -127-127
#00H 04H 0BH 0CH	CHROMA KEY SATURATION WIDTH	0aaaaaaa 0bbbbbbb	aaaaaaabbbbbbb = -127-127
#00H 04H 0DH 0EH	CHROMA KEY SATURATION FINE	0aaaaaaa 0bbbbbbb	aaaaaaabbbbbbb = -127-127
#00H 04H 0FH 10H	LUMI KEY LEVEL	0aaaaaaa 0bbbbbbb	aaaaaaabbbbbbb = 0-255
#00H 04H 11H 12H	LUMI KEY GAIN	0aaaaaaa 0bbbbbbb	aaaaaaabbbbbbb = 0-255
00H 04H 13H	LUMI KEY COLOR	00H-01H	BLACK, WHITE

○ VIDEO FX Parameter

Address	Parameter Name	Sys.Ex.Value	Meaning of Value
00H 05H 00H	EFFECT TYPE	00H-08H	OFF, NEGATIVE, EMBOSS, COLORIZE, COLORPASS, POSTERIZE, SILHOUETTE, MONOCOLOR, FINDEDGE
00H 05H 01H	VALUE	00H-7FH	0-127

○ OUTPUT Parameter

Address	Parameter Name	Sys.Ex.Value	Meaning of Value
00H 06H 00H	OUTPUT RESOLUTION (EDID)	00H-0EH	AUTO, 480/576i, 480/576p, 720p, 1080i, 1080p, 640x480, 800x600, 1024x768, 1280x768, 1280x1024, 1366x768, 1400x1050, 1600x1200, 1920x1200
00H 06H 01H	OUTPUT SCALING TYPE	00H-03H	FULL, LETTERBOX, CROP, DOT BY DOT
#00H 06H 02H 03H	OUTPUT H. POSITION	0aaaaaaa 0bbbbbbb	aaaaaaabbbbbbb = -1920-1920 * Only values that are multiples of 8 can be specified.
#00H 06H 04H 05H	OUTPUT V. POSITION	0aaaaaaa 0bbbbbbb	aaaaaaabbbbbbb = -1200-1200
00H 06H 06H	OUTPUT H. SIZE	00H-78H	80-200 %
00H 06H 07H	OUTPUT V. SIZE	00H-78H	80-200 %
00H 06H 08H	OUTPUT CONTRAST	00H-7FH	-64-63
00H 06H 09H	OUTPUT SATURATION	00H-7FH	-64-63
00H 06H 0AH	OUTPUT BRIGHTNESS	00H-7FH	-64-63
00H 06H 0BH	OUTPUT COLOR SPACE	00H-03H	AUTO, RGB-FULL, RGB-LIMIT, YPbPr
00H 06H 0CH	OUTPUT DVI-D/HDMI	01H-02H	DVI-D, HDMI
00H 06H 0DH	PREVIEW CONTRAST	00H-7FH	-64-63
00H 06H 0EH	PREVIEW SATURATION	00H-7FH	-64-63
00H 06H 0FH	PREVIEW BRIGHTNESS	00H-7FH	-64-63
00H 06H 10H	PREVIEW COLOR SPACE	00H-03H	AUTO, RGB-FULL, RGB-LIMIT, YPbPr
00H 06H 11H	PREVIEW DVI-D/HDMI	01H-02H	DVI-D, HDMI
00H 06H 12H	OUTPUT FADE	00H-02H	BLACK, WHITE, STILL
#00H 06H 13H 14H	OUTPUT FADE WHITE LEVEL	0aaaaaaa 0bbbbbbb	aaaaaaabbbbbbb = 0-255
#00H 06H 15H 16H	OUTPUT FADE BLACK LEVEL	0aaaaaaa 0bbbbbbb	aaaaaaabbbbbbb = 0-255

○ PANEL Parameter

Address	Parameter Name	Sys.Ex.Value	Meaning of Value
00H 07H 00H	VIDEO CH SELECT	00H-03H	CH 1-4
00H 07H 01H	VIDEO SUB CH SELECT	00H-03H	CH 1-4
00H 07H 02H	TRANSITION TYPE	00H-02H	CUT, MIX, WIPE
00H 07H 03H	COMPOSITION TYPE	00H-03H	OFF, PinP, SPLIT, QUAD
00H 07H 04H	KEY SW	00H-01H	OFF, ON
00H 07H 05H	OUTPUT FADE SW	00H-01H	OFF, ON
00H 07H 06H	FREEZE SW	00H-01H	OFF, ON
00H 07H 07H	FREEZE SELECT	00H-03H	CH 1-4

○ IN/OUT SETUP Parameter

Address	Parameter Name	Sys.Ex.Value	Meaning of Value
00H 08H 00H	CH4 INPUT SELECT	00H-02H	HDMI, RGB, COMPOSITE
00H 08H 01H	PVW OUTPUT SELECT	00H-01H	MAIN, PVW
00H 08H 02H	USB OUTPUT SELECT	00H-01H	MAIN, PVW

● Audio Parameter Area

Address	Parameter Name
01H 00H 00H	CH1 Parameter
01H 01H 00H	CH2 Parameter
01H 02H 00H	CH3 Parameter
01H 03H 00H	CH4 Parameter
01H 04H 00H	CH5/6 Parameter
01H 05H 00H	CH7/8 Parameter
01H 06H 00H	HDMI1 Parameter
01H 07H 00H	HDMI2 Parameter
01H 08H 00H	HDMI3 Parameter
01H 09H 00H	HDMI4 Parameter
01H 0AH 00H	USB Parameter
01H 0BH 00H	OUTPUT CH Parameter
01H 20H 00H	AUDIO FOLLOW Parameter
01H 30H 00H	AUTO MIXER Parameter
01H 40H 00H	ECHO CANCEL Parameter

○ CH1-4 Parameter

* "xxH" corresponds to the respective channels as indicated below.

xxH: 00H-03H (CH 1-4)

Address	Parameter Name	Sys.Ex.Value	Meaning of Value
01H xxH 00H	CH1-4 HA GAIN	00H-40H	0-64 dB
#01H xxH 01H 02H	CH1-4 GAIN	0aaaaaaa 0bbbbbbb	aaaaaaabbbbbbb = -42.0-42.0 dB
#01H xxH 03H 04H 05H	CH1-4 LEVEL	0aaaaaaa 0bbbbbbb 0ccccccc	aaaaaaabbbbbbbccccccc = -32768 : -INF dB -80.0-+10.0 dB
#01H xxH 06H 07H 08H	CH1-4 AUX SEND	0aaaaaaa 0bbbbbbb 0ccccccc	aaaaaaabbbbbbbccccccc = -32768 : -INF dB -80.0-+10.0 dB
#01H xxH 09H 0AH 0BH	CH1-4 REV SEND	0aaaaaaa 0bbbbbbb 0ccccccc	aaaaaaabbbbbbbccccccc = -32768 : -INF dB -80.0-+10.0 dB
01H xxH 0CH	CH1-4 PAN	00H-7FH	LEFT-RIGHT
01H xxH 0DH : 01H xxH 0FH	Reserved		
#01H xxH 10H 11H	CH1-4 EQ HI GAIN	0aaaaaaa 0bbbbbbb	aaaaaaabbbbbbb = -15.0-15.0 dB
01H xxH 12H	CH1-4 EQ HI FREQ	44H-78H	1.00-20.0KHz
#01H xxH 13H 14H	CH1-4 EQ MID GAIN	0aaaaaaa 0bbbbbbb	aaaaaaabbbbbbb = -15.0-15.0 dB
01H xxH 15H	CH1-4 EQ MID FREQ	00H-78H	20 Hz-20.0 KHz
01H xxH 16H	CH1-4 EQ MID Q	00H-05H	0.5-16.0

Address	Parameter Name	Sys.Ex.Value	Meaning of Value
#01H xxH 17H 18H	CH1-4 EQ LO GAIN	0aaaaaaa 0bbbbbbb	aaaaaaabbbbbbb = -15.0-15.0 dB
01H xxH 19H	CH1-4 EQ LO FREQ	00H-38H	20-500 Hz
01H xxH 1AH : 01H xxH 1FH	Reserved		
01H xxH 20H	CH1-4 GATE SW	00H-01H	OFF, ON
#01H xxH 21H 22H	CH1-4 GATE THRESHOLD	0aaaaaaa 0bbbbbbb	aaaaaaabbbbbbb = -80.0-0.0 dB
01H xxH 23H	CH1-4 GATE RELEASE	00H-7FH	30-5000 ms
01H xxH 24H	CH1-4 COMP SW	00H-01H	OFF, ON
#01H xxH 25H 26H	CH1-4 COMP THRESHOLD	0aaaaaaa 0bbbbbbb	aaaaaaabbbbbbb = -60.0-0.0 dB
01H xxH 27H	CH1-4 COMP RATIO	00H-0DH	1.0:1, 1.12:1, 1.25:1, 1.40:1, 1.60:1, 1.80:1, 2.00:1, 2.50:1, 3.20:1, 4.00:1, 5.60:1, 8.00:1, 16.0:1, INF:1
01H xxH 28H	CH1-4 COMP ATTACK	00H-19H	0.2-100 ms
01H xxH 29H	CH1-4 COMP RELEASE	00H-7FH	30-5000 ms
01H xxH 2AH	CH1-4 COMP AUTO GAIN SW	00H-01H	OFF, ON
#01H xxH 2BH 2CH	CH1-4 COMP MAKEUP GAIN	0aaaaaaa 0bbbbbbb	aaaaaaabbbbbbb = -42.0-42.0 dB
01H xxH 2DH	CH1-4 HPF	00H-01H	OFF, ON
01H xxH 2EH	Reserved		
01H xxH 2FH	Reserved		
#01H xxH 30H 31H	CH1-4 DELAY	0aaaaaaa 0bbbbbbb	aaaaaaabbbbbbb = 0.0-500.0 ms
01H xxH 32H	CH1-4 SOLO	00H-01H	OFF, ON
01H xxH 33H	CH1-4 MUTE	00H-01H	OFF, ON

○ CH5/6, CH7/8, HDMI1-4, USB Parameter

* "xxH" corresponds to the respective channels as indicated below.

xxH: 04H-0AH (CH5/6, CH7/8, HDMI1-4, USB)

Address	Parameter Name	Sys.Ex.Value	Meaning of Value
01H xxH 00H	Reserved		
#01H xxH 01H 02H	GAIN	0aaaaaaa 0bbbbbbb	aaaaaaabbbbbbb = -42.0-42.0 dB
#01H xxH 03H 04H 05H	LEVEL	0aaaaaaa 0bbbbbbb 0ccccccc	aaaaaaabbbbbbbcccccc = -32768 : -INF dB -80.0-+10.0 dB
#01H xxH 06H 07H 08H	AUX SEND	0aaaaaaa 0bbbbbbb 0ccccccc	aaaaaaabbbbbbbcccccc = -32768 : -INF dB -80.0-+10.0 dB
#01H xxH 09H 0AH 0BH	REV SEND	0aaaaaaa 0bbbbbbb 0ccccccc	aaaaaaabbbbbbbcccccc = -32768 : -INF dB -80.0-+10.0 dB
01H xxH 0CH : 01H xxH 0FH	Reserved		
#01H xxH 10H 11H	EQ HI GAIN	0aaaaaaa 0bbbbbbb	aaaaaaabbbbbbb = -15.0-15.0 dB
01H xxH 12H	EQ HI FREQ	44H-78H	1.00-20.0 KHz
#01H xxH 13H 14H	EQ MID GAIN	0aaaaaaa 0bbbbbbb	aaaaaaabbbbbbb = -15.0-15.0 dB
01H xxH 15H	EQ MID FREQ	00H-78H	20 Hz-20.0 KHz
01H xxH 16H	EQ MID Q	00H-05H	0.5-16.0
#01H xxH 17H 18H	EQ LO GAIN	0aaaaaaa 0bbbbbbb	aaaaaaabbbbbbb = -15.0-15.0 dB
01H xxH 19H	EQ LO FREQ	00H-38H	20-500 Hz
01H xxH 1AH : 01H xxH 2FH	Reserved		
#01H xxH 30H 31H	DELAY	0aaaaaaa 0bbbbbbb	aaaaaaabbbbbbb = 0.0-500.0 ms
01H xxH 32H	SOLO	00H-01H	OFF, ON
01H xxH 33H	MUTE	00H-01H	OFF, ON

○ OUTPUT CH Parameter

Address	Parameter Name	Sys.Ex.Value	Meaning of Value
#01H 0BH 00H 01H 02H	MAIN LEVEL	0aaaaaaa 0bbbbbbb 0ccccccc	aaaaaaabbbbbbbccccccc = -32768 : -INF dB -80.0—+10.0 dB
#01H 0BH 03H 04H 05H	AUX LEVEL	0aaaaaaa 0bbbbbbb 0ccccccc	aaaaaaabbbbbbbccccccc = -32768 : -INF dB -80.0—+10.0 dB
#01H 0BH 06H 07H 08H	PHONES LEVEL	0aaaaaaa 0bbbbbbb 0ccccccc	aaaaaaabbbbbbbccccccc = -32768 : -INF dB -80.0—+10.0 dB
#01H 0BH 09H 0AH 0BH	USB OUT LEVEL	0aaaaaaa 0bbbbbbb 0ccccccc	aaaaaaabbbbbbbccccccc = -32768 : -INF dB -80.0—+10.0 dB
01H 0BH 0CH : 01H 0BH 0FH	Reserved		
#01H 0BH 10H 11H	MAIN EQ HI GAIN	0aaaaaaa 0bbbbbbb	aaaaaaabbbbbbb = -15.0—15.0 dB
01H 0BH 12H	MAIN EQ HI FREQ	44H—78H	1.00—20.0 KHz
#01H 0BH 13H 14H	MAIN EQ MID GAIN	0aaaaaaa 0bbbbbbb	aaaaaaabbbbbbb = -15.0—15.0 dB
01H 0BH 15H	MAIN EQ MID FREQ	00H—78H	20Hz—20.0 KHz
01H 0BH 16H	MAIN EQ MID Q	00H—05H	0.5—16.0
#01H 0BH 17H 18H	MAIN EQ LO GAIN	0aaaaaaa 0bbbbbbb	aaaaaaabbbbbbb = -15.0—15.0 dB
01H 0BH 19H	MAIN EQ LO FREQ	00H—38H	20—500 Hz
01H 0BH 1AH : 01H 0BH 2FH	Reserved		
#01H 0BH 30H 31H	USB TO PC DELAY	0aaaaaaa 0bbbbbbb	aaaaaaabbbbbbb = -80.0—0.0 dB
#01H 0BH 32H 33H	AUX DELAY	0aaaaaaa 0bbbbbbb	30—5000 ms
01H 0BH 34H	MAIN MUTE SW	00H—01H	OFF, ON
01H 0BH 35H	AUX MUTE SW	00H—01H	OFF, ON
01H 0BH 36H	USB OUT MUTE SW	00H—01H	OFF, ON
01H 0BH 37H : 01H 0BH 3FH	Reserved		
#01H 0BH 40H 41H 42H	REVERB LEVEL	0aaaaaaa 0bbbbbbb 0ccccccc	aaaaaaabbbbbbbccccccc = -32768 : -INF dB -80.0—+10.0 dB
01H 0BH 43H	REVERB TYPE	00H—01H	ROOM/HALL
01H 0BH 44H	REVERB TIME	00H—32H	0.0—5.0 sec
01H 0BH 45H	Main MBC SW	00H—01H	OFF, ON
#01H 0BH 46H 47H	Main MBC Hi Thres	0aaaaaaa 0bbbbbbb	aaaaaaabbbbbbb = -40.0—0.0 dB
01H 0BH 48H	Main MBC Hi Ratio	00H—0DH	1.0:1, 1.12:1, 1.25:1, 1.40:1, 1.60:1, 1.80:1, 2.00:1, 2.50:1, 3.20:1, 4.00:1, 5.60:1, 8.00:1, 16.0:1. INF:1
#01H 0BH 49H 4AH	Main MBC Mid Thres	0aaaaaaa 0bbbbbbb	aaaaaaabbbbbbb = -40.0—0.0 dB
01H 0BH 4BH	Main MBC Mid Ratio	00H—0DH	1.0:1, 1.12:1, 1.25:1, 1.40:1, 1.60:1, 1.80:1, 2.00:1, 2.50:1, 3.20:1, 4.00:1, 5.60:1, 8.00:1, 16.0:1. INF:1
#01H 0BH 4CH 4DH	Main MBC Low Thres	0aaaaaaa 0bbbbbbb	aaaaaaabbbbbbb = -40.0—0.0 dB
01H 0BH 4EH	Main MBC Low Ratio	00H—0DH	1.0:1, 1.12:1, 1.25:1, 1.40:1, 1.60:1, 1.80:1, 2.00:1, 2.50:1, 3.20:1, 4.00:1, 5.60:1, 8.00:1, 16.0:1. INF:1
01H 0BH 4FH	Main Lmt SW	00H—01H	OFF, ON
#01H 0BH 50H 51H	Main Lmt Thres	0aaaaaaa 0bbbbbbb	aaaaaaabbbbbbb = -40.0—0.0 dB
01H 0BH 52H	Phones Lmt SW	00H—01H	OFF, ON
#01H 0BH 53H 54H	Phones Lmt Thres	0aaaaaaa 0bbbbbbb	aaaaaaabbbbbbb = -40.0—0.0 dB
01H 0BH 55H	MAIN Out Select	00H—01H	MAIN, AUX
01H 0BH 56H	AUX Out Select	00H—01H	MAIN, AUX
01H 0BH 57H	USB Out Select	00H—01H	MAIN, AUX

Address	Parameter Name	Sys.Ex.Value	Meaning of Value
01H 0BH 58H	Phones Out Select	00H-01H	MAIN, AUX
01H 0BH 59H	LOOP-BACK	00H-01H	OFF, ON

○ AUDIO FOLLOW Parameter

Address	Parameter Name	Sys.Ex.Value	Meaning of Value
01H 20H 00H	AUDIO FOLLOW SW	00H-01H	OFF, ON
01H 20H 01H	AUDIO FOLLOW SW Output Fade	00H-01H	OFF, ON
01H 20H 02H :	Reserved		
01H 20H 0FH			
01H 20H 10H	AUDIO FOLLOW CH1 VideoCh1	00H-01H	OFF, ON
01H 20H 11H	AUDIO FOLLOW CH1 VideoCh2	00H-01H	OFF, ON
01H 20H 12H	AUDIO FOLLOW CH1 VideoCh3	00H-01H	OFF, ON
01H 20H 13H	AUDIO FOLLOW CH1 VideoCh4	00H-01H	OFF, ON
01H 20H 14H	AUDIO FOLLOW CH2 VideoCh1	00H-01H	OFF, ON
01H 20H 15H	AUDIO FOLLOW CH2 VideoCh2	00H-01H	OFF, ON
01H 20H 16H	AUDIO FOLLOW CH2 VideoCh3	00H-01H	OFF, ON
01H 20H 17H	AUDIO FOLLOW CH2 VideoCh4	00H-01H	OFF, ON
01H 20H 18H	AUDIO FOLLOW CH3 VideoCh1	00H-01H	OFF, ON
01H 20H 19H	AUDIO FOLLOW CH3 VideoCh2	00H-01H	OFF, ON
01H 20H 1AH	AUDIO FOLLOW CH3 VideoCh3	00H-01H	OFF, ON
01H 20H 1BH	AUDIO FOLLOW CH3 VideoCh4	00H-01H	OFF, ON
01H 20H 1CH	AUDIO FOLLOW CH4 VideoCh1	00H-01H	OFF, ON
01H 20H 1DH	AUDIO FOLLOW CH4 VideoCh2	00H-01H	OFF, ON
01H 20H 1EH	AUDIO FOLLOW CH4 VideoCh3	00H-01H	OFF, ON
01H 20H 1FH	AUDIO FOLLOW CH4 VideoCh4	00H-01H	OFF, ON
01H 20H 20H	AUDIO FOLLOW CH5/6 VideoCh1	00H-01H	OFF, ON
01H 20H 21H	AUDIO FOLLOW CH5/6 VideoCh2	00H-01H	OFF, ON
01H 20H 22H	AUDIO FOLLOW CH5/6 VideoCh3	00H-01H	OFF, ON
01H 20H 23H	AUDIO FOLLOW CH5/6 VideoCh4	00H-01H	OFF, ON
01H 20H 24H	AUDIO FOLLOW CH7/8 VideoCh1	00H-01H	OFF, ON
01H 20H 25H	AUDIO FOLLOW CH7/8 VideoCh2	00H-01H	OFF, ON
01H 20H 26H	AUDIO FOLLOW CH7/8 VideoCh3	00H-01H	OFF, ON
01H 20H 27H	AUDIO FOLLOW CH7/8 VideoCh4	00H-01H	OFF, ON
01H 20H 28H	AUDIO FOLLOW HDMI1 VideoCh1	00H-01H	OFF, ON
01H 20H 29H	AUDIO FOLLOW HDMI1 VideoCh2	00H-01H	OFF, ON
01H 20H 2AH	AUDIO FOLLOW HDMI1 VideoCh3	00H-01H	OFF, ON
01H 20H 2BH	AUDIO FOLLOW HDMI1 VideoCh4	00H-01H	OFF, ON
01H 20H 2CH	AUDIO FOLLOW HDMI2 VideoCh1	00H-01H	OFF, ON
01H 20H 2DH	AUDIO FOLLOW HDMI2 VideoCh2	00H-01H	OFF, ON
01H 20H 2EH	AUDIO FOLLOW HDMI2 VideoCh3	00H-01H	OFF, ON
01H 20H 2FH	AUDIO FOLLOW HDMI2 VideoCh4	00H-01H	OFF, ON
01H 20H 30H	AUDIO FOLLOW HDMI3 VideoCh1	00H-01H	OFF, ON
01H 20H 31H	AUDIO FOLLOW HDMI3 VideoCh2	00H-01H	OFF, ON
01H 20H 32H	AUDIO FOLLOW HDMI3 VideoCh3	00H-01H	OFF, ON
01H 20H 33H	AUDIO FOLLOW HDMI3 VideoCh4	00H-01H	OFF, ON
01H 20H 34H	AUDIO FOLLOW HDMI4 VideoCh1	00H-01H	OFF, ON
01H 20H 35H	AUDIO FOLLOW HDMI4 VideoCh2	00H-01H	OFF, ON
01H 20H 36H	AUDIO FOLLOW HDMI4 VideoCh3	00H-01H	OFF, ON
01H 20H 37H	AUDIO FOLLOW HDMI4 VideoCh4	00H-01H	OFF, ON
01H 20H 38H	AUDIO FOLLOW USB VideoCh1	00H-01H	OFF, ON
01H 20H 39H	AUDIO FOLLOW USB VideoCh2	00H-01H	OFF, ON
01H 20H 3AH	AUDIO FOLLOW USB VideoCh3	00H-01H	OFF, ON
01H 20H 3BH	AUDIO FOLLOW USB VideoCh4	00H-01H	OFF, ON

○ AUDIO MIXER Parameter

Address	Parameter Name	Sys.Ex.Value	Meaning of Value
01H 30H 00H	AUTO MIXER SW	00H-01H	OFF, ON
01H 30H 01H	AUTO MIXER CH1 SW	00H-01H	OFF, ON
01H 30H 02H	AUTO MIXER CH1 WEIGHT	00H-64H	0-100
01H 30H 03H	AUTO MIXER CH2 SW	00H-01H	OFF, ON

Address	Parameter Name	Sys.Ex.Value	Meaning of Value
01H 30H 04H	AUTO MIXER CH2 WEIGHT	00H–64H	0–100
01H 30H 05H	AUTO MIXER CH3 SW	00H–01H	OFF, ON
01H 30H 06H	AUTO MIXER CH3 WEIGHT	00H–64H	0–100
01H 30H 07H	AUTO MIXER CH4 SW	00H–01H	OFF, ON
01H 30H 08H	AUTO MIXER CH4 WEIGHT	00H–64H	0–100
01H 30H 09H	AUTO MIXER CH5/6 SW	00H–01H	OFF, ON
01H 30H 0AH	AUTO MIXER CH5/6 WEIGHT	00H–64H	0–100
01H 30H 0BH	AUTO MIXER CH7/8 SW	00H–01H	OFF, ON
01H 30H 0CH	AUTO MIXER CH7/8 WEIGHT	00H–64H	0–100
01H 30H 0DH	AUTO MIXER HDMI1 SW	00H–01H	OFF, ON
01H 30H 0EH	AUTO MIXER HDMI1 WEIGHT	00H–64H	0–100
01H 30H 0FH	AUTO MIXER HDMI2 SW	00H–01H	OFF, ON
01H 20H 10H	AUTO MIXER HDMI2 WEIGHT	00H–64H	0–100
01H 20H 11H	AUTO MIXER HDMI3 SW	00H–01H	OFF, ON
01H 20H 12H	AUTO MIXER HDMI3 WEIGHT	00H–64H	0–100
01H 20H 13H	AUTO MIXER HDMI4 SW	00H–01H	OFF, ON
01H 20H 14H	AUTO MIXER HDMI4 WEIGHT	00H–64H	0–100

● System Parameter Area

Address	Parameter Name
03H 00H 00H	VERSION Parameter
03H 01H 00H	SETUP Parameter
03H 04H 00H	
03H 02H 00H	REMOTE Parameter
03H 03H 00H	MEMORY Parameter

○ Version Parameter

Address	Parameter Name	Sys.Ex.Value	Meaning of Value
03H 00H 00H	System Version String (1)	00H–7FH	ASCII Character (Read Only)
03H 00H 01H	System Version String (2)	00H–7FH	ASCII Character (Read Only)
03H 00H 02H	System Version String (3)	00H–7FH	ASCII Character (Read Only)
03H 00H 03H	System Version String (4)	00H–7FH	ASCII Character (Read Only)
03H 00H 04H	System Version String (5)	00H–7FH	ASCII Character (Read Only)
03H 00H 05H	System Version String (6)	00H–7FH	ASCII Character (Read Only)
03H 00H 06H	System Version String (7)	00H–7FH	ASCII Character (Read Only)
03H 00H 07H	System Version String (8)	00H–7FH	ASCII Character (Read Only)

○ Setup Parameter

Address	Parameter Name	Sys.Ex.Value	Meaning of Value
03H 01H 00H	HDCP SW	00H–01H	OFF, ON
03H 01H 01H	FRAME RATE	00H–01H	59.94 Hz, 50 Hz
03H 01H 02H	SYSTEM FORMAT	00H–02H	720p, 1080i, 1080p
03H 01H 03H	LCD BRIGHTNESS	00H–01H	LOW, HIGH
03H 01H 04H	MENU DISPLAY LEVEL	05H–0FH	5–15
03H 01H 05H	LEVEL METER DISPLAY	00H–01H	OFF, ON
03H 01H 06H	INPUT CH LABEL DISPLAY	00H–01H	OFF, ON
03H 01H 07H	TALLY LABEL DISPLAY	00H–01H	OFF, ON
03H 01H 08H	NO SIGNAL BACK	00H–01H	BLACK, BLUE
03H 01H 09H	UNFIT SIGNAL BACK	00H–02H	BLACK, BLUE, THRU
03H 01H 0AH	DEINTERLACE MODE	00H–01H	WEAVE, BOB
03H 01H 0BH	COLOR BAR OUTPUT	00H–01H	OFF, ON
03H 01H 0CH	TEST TONE OUTPUT	00H–01H	OFF, ON
03H 01H 0DH	AUTO OFF	00H–01H	OFF, ON
03H 01H 0EH	PANEL LOCK	00H–01H	OFF, ON
03H 01H 0FH	MONITOR BUTTON LOCK	00H–01H	OFF, ON
03H 01H 10H	TOUCH PANEL LOCK	00H–01H	OFF, ON
03H 01H 11H	FREEZE MODE	00H–01H	ALL, SELECT
03H 01H 12H	AUTO SWITCHING SW	00H–01H	OFF, ON

Address	Parameter Name	Sys.Ex.Value	Meaning of Value
03H 01H 14H	USB CONNECTION STATUS	00H–02H	NC, USB2.0, USB3.0 (Read Only)
03H 04H 00H	AUTO SWITCHING TYPE	00H–02H	AUTO SCAN, BEAT SYNC SWITCHING, VIDEO FOLLOWS AUDIO
03H 04H 01H	AUTO SW TRANSITION TIME	00H–28H	0.0–4.0sec
03H 04H 02H	AUTO SCAN SCANTIME VIDEO INPUT 1	00H–78H	OFF, 1–120sec
03H 04H 03H	AUTO SCAN SCANTIME VIDEO INPUT 2	00H–78H	OFF, 1–120sec
03H 04H 04H	AUTO SCAN SCANTIME VIDEO INPUT 3	00H–78H	OFF, 1–120sec
03H 04H 05H	AUTO SCAN SCANTIME VIDEO INPUT 4	00H–78H	OFF, 1–120sec
03H 04H 06H	AUTO SCAN SEQUENCE	00H–01H	NORMAL, RANDOM
03H 04H 07H	BEAT SYNC SWITCHING SYNC SOURCE	00H–0AH	IN1, IN2, IN3, IN4, IN5/6, IN7/8, HDMI1, HDMI2, HDMI3, HDMI4, USB FROM PC
03H 04H 08H	BEAT SYNC SWITCHING CYCLE	01H–10H	1–16
03H 04H 09H	BEAT SYNC SWITCHING SEQUENCE	00H–01H	NORMAL, RANDOM
03H 04H 0AH	BEAT SYNC SWITCHING VIDEO INPUT1 SW	00H–01H	OFF, ON
03H 04H 0BH	BEAT SYNC SWITCHING VIDEO INPUT2 SW	00H–01H	OFF, ON
03H 04H 0CH	BEAT SYNC SWITCHING VIDEO INPUT3 SW	00H–01H	OFF, ON
03H 04H 0DH	BEAT SYNC SWITCHING VIDEO INPUT4 SW	00H–01H	OFF, ON
03H 04H 0EH	VIDEO FOLLOWS AUDIO TIME	01H–78H	1–120sec
03H 04H 0FH	VIDEO FOLLOWS AUDIO INPUT1 SENSE	00H–64H	0–100
03H 04H 10H	VIDEO FOLLOWS AUDIO INPUT2 SENSE	00H–64H	0–100
03H 04H 11H	VIDEO FOLLOWS AUDIO INPUT3 SENSE	00H–64H	0–100
03H 04H 12H	VIDEO FOLLOWS AUDIO INPUT4 SENSE	00H–64H	0–100
03H 04H 13H	VIDEO FOLLOWS AUDIO INPUT1 SELECT	00H–05H	OFF, 1, 2, 3, 4, QUAD
03H 04H 14H	VIDEO FOLLOWS AUDIO INPUT2 SELECT	00H–05H	OFF, 1, 2, 3, 4, QUAD
03H 04H 15H	VIDEO FOLLOWS AUDIO INPUT3 SELECT	00H–05H	OFF, 1, 2, 3, 4, QUAD
03H 04H 16H	VIDEO FOLLOWS AUDIO INPUT4 SELECT	00H–05H	OFF, 1, 2, 3, 4, QUAD
03H 04H 17H	VIDEO FOLLOWS AUDIO MULTI INPUT SELECT	00H–05H	OFF, 1, 2, 3, 4, QUAD
03H 04H 18H	VIDEO FOLLOWS AUDIO SILENT SELECT	00H–06H	OFF, 1, 2, 3, 4, QUAD, AUTO SCAN
03H 04H 1AH	PANEL LOCK VIDEO INPUT CH1 BUTTON	00H–01H	OFF, ON
03H 04H 1BH	PANEL LOCK VIDEO INPUT CH2 BUTTON	00H–01H	OFF, ON
03H 04H 1CH	PANEL LOCK VIDEO INPUT CH3 BUTTON	00H–01H	OFF, ON
03H 04H 1DH	PANEL LOCK VIDEO INPUT CH4 BUTTON	00H–01H	OFF, ON
03H 04H 1EH	PANEL LOCK OUTPUT FADE BUTTON	00H–01H	OFF, ON
03H 04H 1FH	PANEL LOCK KEY BUTTON	00H–01H	OFF, ON
03H 04H 20H	PANEL LOCK IN/OUT SETUP BUTTON	00H–01H	OFF, ON
03H 04H 21H	PANEL LOCK VFX / KEY LEVEL BUTTON	00H–01H	OFF, ON
03H 04H 22H	PANEL LOCK FREEZE BUTTON	00H–01H	OFF, ON
03H 04H 23H	PANEL LOCK PinP BUTTON	00H–01H	OFF, ON
03H 04H 24H	PANEL LOCK SPLIT BUTTON	00H–01H	OFF, ON
03H 04H 25H	PANEL LOCK QUAD BUTTON	00H–01H	OFF, ON
03H 04H 26H	PANEL LOCK CUT BUTTON	00H–01H	OFF, ON
03H 04H 27H	PANEL LOCK MIX BUTTON	00H–01H	OFF, ON
03H 04H 28H	PANEL LOCK WIPE BUTTON	00H–01H	OFF, ON

Address	Parameter Name	Sys.Ex.Value	Meaning of Value
03H 04H 29H	PANEL LOCK TRANSITION TIME KNOB	00H-01H	OFF, ON
03H 04H 2AH	PANEL LOCK USER1 BUTTON	00H-01H	OFF, ON
03H 04H 2BH	PANEL LOCK USER2 BUTTON	00H-01H	OFF, ON
03H 04H 2CH	PANEL LOCK USER3 BUTTON	00H-01H	OFF, ON
03H 04H 2DH	PANEL LOCK USER4 BUTTON	00H-01H	OFF, ON
03H 04H 2EH	PANEL LOCK USER5 BUTTON	00H-01H	OFF, ON
03H 04H 2FH	PANEL LOCK USER SETUP BUTTON	00H-01H	OFF, ON
03H 04H 30H	PANEL LOCK HDMI1 LEVEL KNOB	00H-01H	OFF, ON
03H 04H 31H	PANEL LOCK HDMI2 LEVEL KNOB	00H-01H	OFF, ON
03H 04H 32H	PANEL LOCK HDMI3 LEVEL KNOB	00H-01H	OFF, ON
03H 04H 33H	PANEL LOCK HDMI4 LEVEL KNOB	00H-01H	OFF, ON
03H 04H 34H	PANEL LOCK HDMI SETUP BUTTON	00H-01H	OFF, ON
03H 04H 35H	PANEL LOCK USB FROM PC KNOB	00H-01H	OFF, ON
03H 04H 36H	PANEL LOCK USB TO PC KNOB	00H-01H	OFF, ON
03H 04H 37H	PANEL LOCK USB SETUP BUTTON	00H-01H	OFF, ON
03H 04H 38H	PANEL LOCK INPUT1 GAIN KNOB	00H-01H	OFF, ON
03H 04H 39H	PANEL LOCK INPUT2 GAIN KNOB	00H-01H	OFF, ON
03H 04H 3AH	PANEL LOCK INPUT3 GAIN KNOB	00H-01H	OFF, ON
03H 04H 3BH	PANEL LOCK INPUT4 GAIN KNOB	00H-01H	OFF, ON
03H 04H 3CH	PANEL LOCK INPUT1 LEVEL FADER	00H-01H	OFF, ON
03H 04H 3DH	PANEL LOCK INPUT2 LEVEL FADER	00H-01H	OFF, ON
03H 04H 3EH	PANEL LOCK INPUT3 LEVEL FADER	00H-01H	OFF, ON
03H 04H 3FH	PANEL LOCK INPUT4 LEVEL FADER	00H-01H	OFF, ON
03H 04H 40H	PANEL LOCK INPUT1 SETUP BUTTON	00H-01H	OFF, ON
03H 04H 41H	PANEL LOCK INPUT2 SETUP BUTTON	00H-01H	OFF, ON
03H 04H 42H	PANEL LOCK INPUT3 SETUP BUTTON	00H-01H	OFF, ON
03H 04H 43H	PANEL LOCK INPUT4 SETUP BUTTON	00H-01H	OFF, ON
03H 04H 44H	PANEL LOCK INPUT 5/6 LEVEL FADER	00H-01H	OFF, ON
03H 04H 45H	PANEL LOCK INPUT 5/6 SETUP BUTTON	00H-01H	OFF, ON
03H 04H 46H	PANEL LOCK INPUT 7/8 LEVEL FADER	00H-01H	OFF, ON
03H 04H 47H	PANEL LOCK INPUT 7/8 SETUP BUTTON	00H-01H	OFF, ON
03H 04H 48H	PANEL LOCK MAIN OUT LEVEL FADER	00H-01H	OFF, ON
03H 04H 49H	PANEL LOCK MAIN OUT SETUP BUTTON	00H-01H	OFF, ON
03H 04H 4AH	PANEL LOCK PHONES KNOB	00H-01H	OFF, ON
03H 04H 4BH	PANEL LOCK REVERB KNOB	00H-01H	OFF, ON

○ Remote Parameter

Address	Parameter Name	Sys.Ex.Value	Meaning of Value
03H 02H 00H	MIDI RX Ch	00H-0FH	1-16
03H 02H 01H	RS232 SW	00H-01H	OFF, ON
03H 02H 02H	RS232 BaudRate	00H-03H	9600, 19200, 38400, 115200
03H 02H 03H	GPI 1 ASSIGN	00H-11H	N/A, CH SEL 1-4, MEMLOAD 1-8, USER 1-5
03H 02H 04H	GPI 2 ASSIGN	00H-11H	N/A, CH SEL 1-4, MEMLOAD 1-8, USER 1-5
03H 02H 05H	GPI 3 ASSIGN	00H-11H	N/A, CH SEL 1-4, MEMLOAD 1-8, USER 1-5
03H 02H 06H	GPI 4 ASSIGN	00H-11H	N/A, CH SEL 1-4, MEMLOAD 1-8, USER 1-5
03H 02H 07H	GPO 1 TYPE	00H-01H	ONESHOT, ALT
03H 02H 08H	GPO 2 TYPE	00H-01H	ONESHOT, ALT
03H 02H 09H	GPO 3 TYPE	00H-01H	ONESHOT, ALT
03H 02H 0AH	GPO 4 TYPE	00H-01H	ONESHOT, ALT

○ Memory Parameter

Address	Parameter Name	Sys.Ex.Value	Meaning of Value
03H 03H 00H	MEMORY RECALL TRIGGER	00H-07H	MEMORY 1-8
03H 03H 01H	LOADED MEMORY NO	00H-07H, 7FH	0H-07H: MEMORY 1-8, 7FH = no load (Read Only)
03H 03H 02H	MEMORY SAVE TRIGGER	00H-07H	MEMORY 1-8
03H 03H 03H	MEMORY INIT TRIGGER	00H-07H	MEMORY 1-8
03H 03H 04H	MANUAL MODE	00H-01H	OFF, ON
03H 03H 05H	POWER ON LOAD	00H-08H	OFF, MEMORY 1-8

4. Supplementary Material

● Decimal and Hexadecimal Table

(Hexadecimal Numbers are Indicated by 'H')

In MIDI documentation, data values and addresses/sizes of exclusive messages etc. are expressed as hexadecimal values for each 7 bits.

The following table shows how these correspond to decimal numbers.

D	H	D	H	D	H	D	H
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

D: decimal

H: hexadecimal

- * 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 bbH would be $aa \times 128 + bb$.
- * Data marked "nibbled" is expressed in hexadecimal in 4-bit units. A value expressed as a 2-byte nibble 0a 0bH has the value of $a \times 16 + b$.

<Example1>

What is the decimal expression of 5AH?

From the preceding table, 5AH = 90

<Example2>

What is the decimal expression of the value 12 34H given as hexadecimal for each 7 bits?

From the preceding table, since 12H = 18 and 34H = 52

$$18 \times 128 + 52 = 2356$$

<Example3>

What is the decimal expression of the nibbled value 0A 03 09 0DH?

From the preceding table, since 0AH = 10, 03H = 3, 09H = 9, 0DH = 13

$$((10 \times 16 + 3) \times 16 + 9) \times 16 + 13 = 41885$$

<Example4>

What is the nibbled expression of the decimal value 1258?

$$16 \overline{) 1258}$$

$$16 \overline{) \underline{78} \dots 10}$$

$$16 \overline{) \underline{4} \dots 14}$$

$$0 \dots 4$$

Since from the preceding table, 0 = 00H, 4 = 04H, 14 = 0EH, 10 = 0AH, the answer is 00 04 0E 0AH.

● MIDI Message Examples

<Example 1> 92H 3EH 5FH

9n is a note on status and n is the MIDI channel number.

As 2H = 2, 3EH = 62 and 5FH = 95, this is a note on message of MIDI CH = 3, note number 62 (D4) and velocity 95.

<Example 2> CEH 49H

CnH is program change status, and n is the MIDI channel number.

As EH = 14 and 49H = 73, this is a program change message of MIDI CH = 15 and program number 74 (in the GS sound map, Flute).

● Example of an Exclusive Message and Calculating a Checksum

Roland Exclusive messages are transmitted with a checksum at the end (before F7) to make sure that the message was correctly received. The value of the checksum is determined by the address and data (or size) of the transmitted exclusive message.

○ How to Calculate the Checksum (Hexadecimal Numbers are Indicated by 'H')

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 aa bb ccH and the data is dd ee ffH, the actual calculation would be as follows:

$$aa + bb + cc + dd + ee + ff = \text{sum}$$

$$\text{sum} / 128 = \text{quotient} \dots \text{remainder}$$

$$128 - \text{remainder} = \text{checksum}$$

(However, the checksum will be 0 if the remainder is 0.)

<Example>

Setting Dissolve Time Ctrl Assign in MIDI Visual Control to Modulation for Control Changes

From the "Parameter Address Map", the start address of the Dissolve Time Ctrl Assign in MIDI Visual Control is 10H 10H 02H and the Modulation parameter in Control Change is 00H 01H. Therefore ...

F0H	7EH	00H	0CH 01H	10H 10H 02H	00H 01H	??H	F7H
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)

- (1) Exclusive Status
- (2) ID Number (Universal SysEx Non Realtime)
- (3) Device ID (0)
- (4) Sub ID (MIDI Visual Control Version 1.0)
- (5) Address
- (6) Data
- (7) Checksum
- (8) EOF

Next calculate the checksum. Add (5) to (6).

$$10H + 10H + 02H + 00H + 01H = 16 + 16 + 2 + 0 + 1 = 35 \text{ (sum)}$$

$$35 \text{ (sum)} / 128 = 0 \text{ (quotient)} \dots 35 \text{ (remainder)}$$

$$\text{Checksum} = 128 - 35 \text{ (remainder)} = 93 = 5DH$$

Thus, the message to transmit is :

F0H 7EH 00H 0CH 01H 10H 10H 02H 00H 01H 5DH F7H

MIDI Implementation Chart

Function		Transmitted	Recognized	Remarks
Basic Channel	Default	1-16	1-16	
	Changed	1-16	1-16	
Mode	Default	×	×	
	Messages	×	×	
	Altered	*****	*****	
Note Number	True Voice	×	×	
Velocity	Note On	×	×	
	Note Off	×	×	
After Touch	Key's	×	×	
	Channel's	×	×	
Pitch Bend		×	×	
Control Change	14-15	O	O	Controls various parameters
	21-30	O	O	
	52-54	O	O	
	46-47	O	O	
	55-61	O	O	
Program Change	: True Number	×	×	
System Exclusive		O	O	
System Common	: Song Position	×	×	
	: Song Select	×	×	
	: Tune Request	×	×	
System Real Time	: Clock	×	×	
	: Commands	×	×	
Aux Messages	: All Sound Off	×	×	
	: Reset All Controllers	×	×	
	: Local On/Off	×	×	
	: All Notes Off	×	×	
	: Active Sensing	×	×	
	: System Reset	×	×	
Notes				

