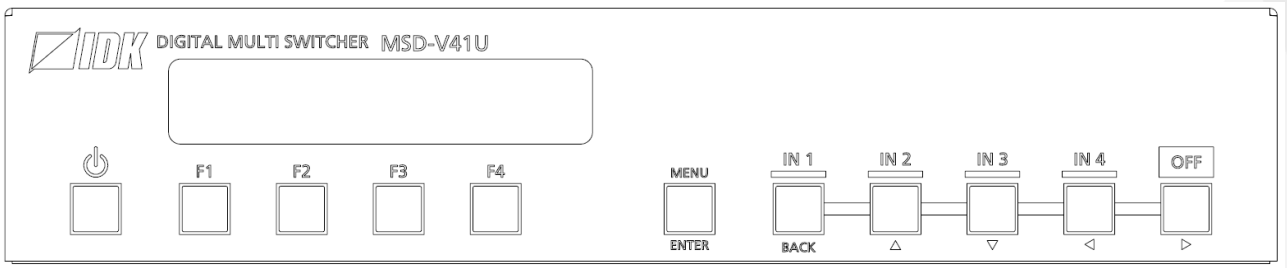
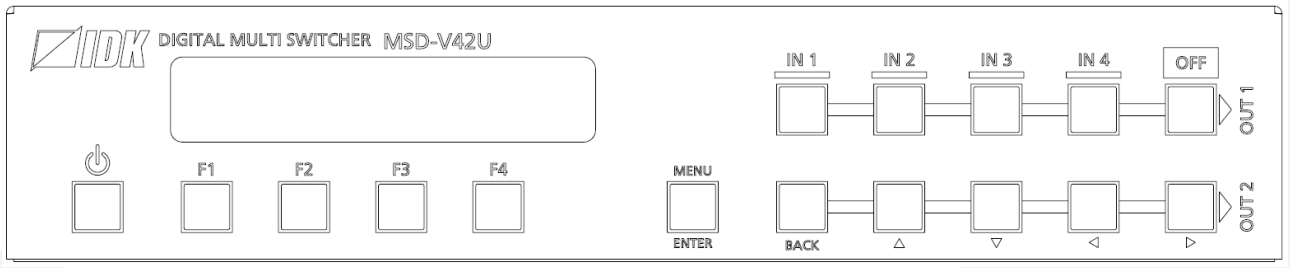
Digital Multi Switcher

MSD-V4 Series

MSD-V41U/MSD-V42U
MSD-V41UC/MSD-V42UC
MSD-V41UT/MSD-V42UT

User Guide
Ver.2.5.0





Thank you for choosing our product.
Please thoroughly familiarize yourself with this guide before installing this equipment. We recommend keeping this manual together with the equipment for future reference as needed.

IDK Corporation

- Some information contained in this guide such as exact product appearance, communication commands, and so on may differ depending on the product version.
- This guide is subject to change without notice. You can download the latest version from IDK's website at: www.idkav.com

About technical documentation

■ **Please read the following guides before connecting this equipment to a power source.**

1. Safety Instructions Contains important safety instructions for the product to help ensure your own personal safety and protect the product and working environment from potential damage.	Provided with the product.
2. Setup Guide Contains setup information and precautions for installing the product and connecting cables.	Download from www.idkav.com

■ **Please refer to the following guides as needed.**

3. Operation Guide Describes how to configure and use the equipment.	Download from www.idkav.com
4. User Guide Contains detailed explanation of functions, setting values, and restrictions.	
5. Command Guide Contains information on controlling the equipment using communication commands through RS-232C or LAN communication.	

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FCC STATEMENT

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

(Class A)

Supplier's Declaration of Conformity
47 CFR § 2.1077 Compliance Information

Unique Identifier

Type of Equipment: Digital Multi Switcher

Model Name: MSD-V41U, MSD-V42U, MSD-V41UC, MSD-V42UC, MSD-V41UT, MSD-V42UT

Responsible Party – U.S. Contact Information

Company Name: IDK America Inc.

Address: 72 Grays Bridge Road Suite 1-C, Brookfield, CT 06804

Telephone number: +1-203-204-2445

URL: www.idkav.com

FCC Compliance Statement

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

(FCC SDoC)

CE MARKING

This equipment complies with the essential requirements of the relevant European health, safety and environmental protection legislation.

WEEE MARKING

Waste Electrical and Electronic Equipment (WEEE), Directive 2002/96/EC
(This directive is only valid in the EU.)
This equipment complies with the WEEE Directive (2002/96/EC) marking requirement.
The left marking indicates that you must not discard this electrical/electronic equipment in domestic household waste.

Safety Instructions

Read all safety and operating instructions before using this product. Follow instructions and heed warnings/cautions.
Instructions and warnings/cautions for all products are provided. Some of them may not be applicable to your product.

Warning	Indicates the presence of a hazard that may result in death or serious personal injury if the warning is ignored or the product is handled incorrectly.
Caution	Indicates the presence of a hazard that may cause minor personal injury or property damage if the caution is ignored or the product is handled incorrectly.

Symbol	Description	Example
 Caution	This symbol is intended to alert the user. (Warning and caution)	 Hot surfaces Caution
 Prohibited	This symbol is intended to prohibit the user from specified actions.	 Do not disassemble
 Instruction	This symbol is intended to instruct the user.	 Unplug

Warning

For lifting heavy products:

 Instruction	**● Lifting must be done by two or more personnel.** To avoid injury: When lifting the product, bend your knees, keep your back straight and get close to it with two or more persons.

For installing and connecting products:

 Prohibited	**● Do not place the product in unstable place.** Install the product in a horizontal and stable place, as this may fall or tip over and cause injury. **● Secure the product if installing in the locations with vibration.** Vibration may move or tip over the product unexpectedly, resulting in injury.

⚠ Warning

 Instruction	**● Installation work must be performed by professionals.** The product is intended to be installed by skilled technicians. For installation, please contact a system integrator or IDK. Improper installation may lead to the risk of fire, electric shock, injury, or property damage. **● Insert the power plug into an outlet that is unobstructed.** Unobstructed access to the plug enables unplugging the product in case of any extraordinary failure, abnormal situation or for easy disconnection during extended periods of non-use. **● Insert the power plug into an appropriate outlet completely.** If the plug is partially inserted, arching may cause the connection to overheat, increasing the risk of electric shock or fire. Do not use a damaged plug or connect to a loose outlet. **● Unplug the product from an AC power source during installation or service.** When connecting peripheral devices to this product, unplug all involved devices from outlets. Ground potential differences may cause fire or other difficulties. **● The product must be electrically earthed/grounded.** To reduce the risk of electric shock, ensure the product is connected to a mains socket outlet with a protective earthing connection. **● For PoE/PoH, use category cables meeting IEEE802.3af/at.** Otherwise, it may cause problems or a fire.

For operating products:

 Prohibited	**● Keep out any foreign objects.** To avoid fire or electric shock, do not permit foreign objects, such as metal and paper, to enter the product from vent holes or other apertures. **● For power cable/plug and Category cable,** **・ Do not scratch, heat, or modify, including splicing or lengthening them.** **・ Do not pull, place heavy objects on them, or pinch them.** **・ Do not bend, twist, tie or clamp them together forcefully.** Misuse of the power cable and plug may cause fire or electric shock. If power cables/plugs become damaged, contact your IDK representative.
 Do not disassemble	**● Do not repair, modify or disassemble.** Since the product includes circuitry that uses potentially lethal, high voltage levels, disassembly by unauthorized personnel may lead to the risk of fire or electric shock. For internal inspection or repair, contact your IDK representative.
 Do not touch	**● Do not touch the product and connected cables during electric storms.** Contact may cause electric shock.
 Instruction	**● Clean the power plug regularly.** If the plug is covered in dust, it may increase the risk of fire.

If the following problem occurs:

 Unplug	**● Unplug immediately if the product smokes, makes unusual noise, or produces a burning odor.** **● Unplug immediately if the product is damaged by falling or having been dropped.** **● Unplug immediately if water or other objects are directed inside.** If you continue to use the product under these conditions, it may increase the risk of electric shock or fire. For maintenance and repair, contact your IDK representative.

⚠ Caution

For installing and connecting products:

 **Prohibited**	**● Do not place the product in a location where it will be subjected to high temperatures.** If the product is subjected to direct sunlight or high temperatures while under operation, it may affect the product's performance and reliability and may increase the risk of fire. **● Do not store or operate the product in dusty, oil smoke filled, or humid place.** Placing the product in such environment may increase the risk of fire or electric shock. **● Do not block the vent holes.** If ventilation slots are blocked, it may cause the product to overheat, affecting performance and reliability and may increase the risk of fire. **● Do not place or stack heavy items on the product.** Failure to observe this precaution may result in damage to the product itself as well as other property and may lead to the risk of personal injury. **● Do not exceed ratings of outlet and wiring devices.** Exceeding the rating of an outlet may increase the risk of fire and electric shock.
 **No wet hands**	**● Do not handle power plug with wet hands.** Failure to observe this precaution may increase the risk of electric shock.
 **Instruction**	**● Use and store the product within the specified temperature/humidity range.** If the product is used outside the specified range of temperature and humidity continuously, it may increase the risk of fire or electric shock. **● Do not place the product at elevations of 1.24 mi. (2,000 m) or higher above sea level.** Failure to do so may shorten the life of the internal parts and result in malfunctions. **● When mounting the product into the rack, provide sufficient cooling space.** Mount the product in a rack meeting EIA standards, and maintain spaces above and below for air circulation. For your safety as required, attach an L-shaped bracket in addition to the panel mount bracket kit to improve mechanical stability. **● Never insert screws without the rubber feet into the threaded holes on the bottom of the product.** Never insert screws alone into the threaded holes on the bottom of the product. Doing so may lead to damage when the screws contact electric circuitry or components inside the product. Reinstall the originally supplied rubber feet using the originally supplied screws only.

For operating products:

 **Hot surfaces Caution**	**For products with the hot surfaces caution label only:** **● Do not touch the product's hot surface.** If the product is installed without enough space, it may cause malfunction of other products. If you touch product's hot surface, it may cause burns.
 **Prohibited**	**● Use only the supplied power cable and AC adapter.** **● Do not use the supplied power cable and AC adapter with other products.** If non-compliant adapter or power cables are used, it may increase the risk of fire or electric shock.
 **Unplug**	**● If the product won't be used for an extended period of time, unplug it.** Failure to observe this precaution may increase the risk of fire. **● Unplug the product before cleaning.** To prevent electric shock.
 **Instruction**	**● Do not prevent heat release.** If cooling fan stops, power off the product and contact IDK. Failure to do so may raise internal temperature and increase the risk of malfunction, fire, or electric shock. **● Keep vents clear of dust.** If the vent holes near the cooling fan or near the fan are covered with dust, internal temperatures increase and may increase the risk of malfunction. Clean the vent holes and near the fan as needed. If dust accumulates inside of the product, it may increase the risk of fire or electric shock. Periodic internal cleaning, especially before humid rainy season, is recommended. For internal cleaning, contact your IDK representative.

Contents

About this Guide

This guide describes features, notes, and configurations of the MSD-V4 Digital Multi Switcher.

In this guide, all operations and configurations are provided based on MSD-V42U/MSD-V42UC/ MSD-V42UT. The available menus and settings depend on the switcher model.

Conventions

- The following terms are used in this guide.
  - PC : Personal computer
  - OUT A : OUT 1A connector or OUT 2A connector
  - OUT B : OUT 1B connector or OUT 2B connector
  - OUT 1 : Output channel for simultaneous distribution of a single source signal to OUT 1A and OUT 1B
  - OUT 2 : Output channel for simultaneous distribution of a single source signal to OUT 2A and OUT 2B
  - INOFF : Input channel OFF
- The following symbols are used in this guide.
  - [ ] : Menus and messages displayed on the front display and a WEB GUI.
  - “ ” : Reference
- The following notifications are used in this guide.
  - **WARNING** : Indicates a hazardous situation which, if not avoided, may result in malfunction or a fire.
  - ***Note*** : Addresses practices not related to personal injury, such as restrictions and attention.

About this Product

The MSD-V4 series is a digital presentation switcher with built-in scalers and scan converters capable of sending processing and receiving UHD video resolution formats.
With four (4) HDMI/DVI video inputs, the series can accept a wide variety of video formats. Input video signals are output as HDMI signals at up to 4K@60 (4:4:4). The MSD-V41UC/V42UC and MSD-V41UT/V42UT output signals in HDMI format and either 10GbE (IP-NINJAR protocol) or HDBaseT simultaneously.

The MSD-V4 includes four (4) HDMI and one (1) analog audio input. Audio source signals are distributed in digital and analog audio formats simultaneously.

The MSD-V4 series can be configured remotely using RS-232C or LAN.
External devices can be controlled via RS-232C, LAN, CEC, or contact closure by registering control commands.

Basic menus and Advanced menus

The menu consists of basic and advanced menus.
The advanced menus are not displayed by default. To display advanced menus, set [SYSTEM SETTINGS] →[ADVANCED MENU] to [ON].
【Advanced menu display (P.83)】

〇: Basic menu
⦿: Advanced menu

〇	OUTPUT IMAGE		Output video	17
	〇	RESOLUTION	Output resolution	18
	⦿	ASPECT RATIO	Aspect ratio for sink device	19
	〇	IMAGE POSITION	Image position	19
	〇	IMAGE SIZE	Image size	20
	⦿	IMAGE CROP	Cropping	21
	〇	BACKGROUND COLOR	Background color	21
	〇	TEST PATTERN	Test pattern	22
	〇	PinP OUTPUT	PinP window output	23
	〇	IMAGE INITIALIZATION	Initialization of output image settings	23

〇	OUTPUT SETTINGS		Output	24
	〇	SIGNAL OUTPUT	Video synchronous signal output	24
	〇	VIDEO MUTE	Video mute	24
	⦿	NO SIGNAL OUTPUT	Video synchronous signal output for when no video signal input	24
	⦿	NO SIGNAL IMAGE	Video output for when no signal is input	25
	⦿	HDCP AUTHENTICATION	HDCP authentication	25
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	〇	CONNECTION RESET	Connection Reset	26
	⦿	SIGNAL FORMAT	Signal format	27
	⦿	RGB RANGE	RGB range	28
	⦿	HDBT LONG REACH MODE	HDBaseT long reach mode	28
	⦿	DEEP COLOR	Deep Color	28
	⦿	SWITCHING EFFECT	Window transition effect	30
	⦿	SWITCHING EFFECT SPEED	Window transition speed	30
	⦿	FOLLOW SINK EDID	Automatic determining sink device EDID	30
	⦿	HOTPLUG MASK	Hot plug ignoring duration	31
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⦿	INPUT IMAGE		Input resolution	32
	⦿	ASPECT RATIO	Aspect ratio	32
	⦿	ASPECT RATIO CONTROL	Aspect ratio keeping process	33
	⦿	IMAGE POSITION	Image position	34
	⦿	IMAGE SIZE	Image size	34
	⦿	IMAGE CROP	Cropping	35
	⦿	IMAGE INITIALIZATION	Video setting initialization	35

Menu

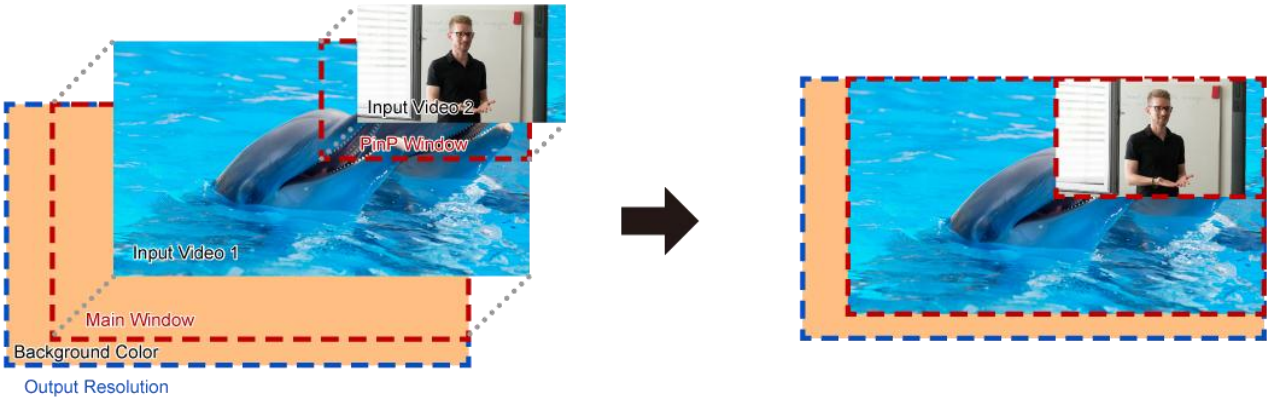
The table below is used in this chapter.
For advanced menus, **Advanced** is mentioned in the table.

Menu	Manu name and menu hierarchy	Advanced	Command
Parameter	Target to be set		
Value	Setting value　　Default value is shaded.		

Output video

This section describes how to set input video or output video, such as resolution, image size, and image position.

Video is output in the following order:
　Background color→Main window→Input video 1→PinP window→Input video 2
If a window size is reduced, the lower layer image is displayed.



The following settings are set by 0.1% from the front panel. Some output resolution settings may not be adjusted by 1 pixel. To adjust the following menus by 1 pixel, set them from the WEB browser or commands by 0.01%.
【Image position (P.19)】
【Image size (P.20)】
【Cropping (P.21)】

Output resolution

Menu	OUTPUT IMAGE→RESOLUTION		@GOT/@SOT
Parameter	OUT1, OUT2		
Value	A (AUTO-A) B (AUTO-B) 4096x2160 60Hz 4096x2160 59.94Hz 4096x2160 50Hz 4096x2160 30Hz 4096x2160 29.97Hz 4096x2160 25Hz 4096x2160 24Hz 4096x2160 23.98Hz 3840x2160 60Hz 3840x2160 59.94Hz 3840x2160 50Hz 3840x2160 30Hz 3840x2160 29.97Hz 3840x2160 25Hz 3840x2160 24Hz 3840x2160 23.98Hz	1080p 60Hz 1080p 59.94Hz 1080p 50Hz 1080i 60Hz 1080i 59.94Hz 1080i 50Hz 720p 60Hz 720p 59.94Hz 720p 50Hz 576p 50Hz 480p 59.94Hz	2560x1600 (WQXGA) 2560x1440 (WQHD) 2048x1152 (QWXGA) 1920x1200 (WUXGA) 1920x1080 (VESAHD) 1680x1050 (WSXGA+) 1600x1200 (UXGA) 1600x900 (WXGA++) 1440x900 (WXGA+) 1400x1050 (SXGA+) 1366x768 (WXGA) 1360x768 (WXGA) 1280x1024 (SXGA) 1280x960 (QuadVGA) 1280x800 (WXGA) 1280x768 (WXGA) 1024x768 (XGA)

Press the MENU/ENTER button to accept the set value.

[A] : Automatically selects the optimal resolution from EDID of the sink device connected to OUT A.
[B] : Automatically selects the optimal resolution from EDID of the sink device connected to OUT B.
[4096x2160]/[3840x2160]/[1080p]/[1080i]/[720p]/[576p]/[480p]: Meets CTA-861.
Other resolutions: Meets VESA DMT/VESA CVT.
[2560x1600]/[2560x1440]/[2048x1152]/[1920x1200]/[1920x1080]: Reduced Blanking

For [A] and[B], the automatically selected resolution is displayed as follows:

If the output resolution is not optimal, [*] appears to the right of the resolution.

In this case, one of the following problem occurs.

- No optimal resolution can be output.
  (The closest resolution to EDID of the sink device is output.)
- The sink device EDID cannot be read or "**Automatic determining sink device EDID (P.30)**" is set to [OFF].
  (Signal is output at the last resolution. If the sink device EDID has not been read after initialization, signal is output at [1080p 59.94Hz].)

Aspect ratio for sink device

Menu	OUTPUT IMAGE→ASPECT RATIO	Advanced	@GUM/@SUM
Parameter	OUT1, OUT2		
Value	RESOLUTION, FULL, 4:3, 5:3, 5:4, 16:9, 16:10, 256:135		

[RESOLUTION]: Outputs video based on aspect ratio that is set in "**Output resolution (P.18)**".
[FULL] : Outputs video on full-screen.

If the aspect ratio of the sink device and the resolution that is output from the MSD-V4 are not the same, the output video is displayed at the selected aspect ratio.

Image position

Menu	OUTPUT IMAGE→IMAGE POSITION	@GSD/@SSD
Parameter	MAIN1, MAIN2, PinP1, PinP2	
	H (Horizontal), V (Vertical)	
Value	-400.0% to +100.0% (0.0%) (by 0.1%)	

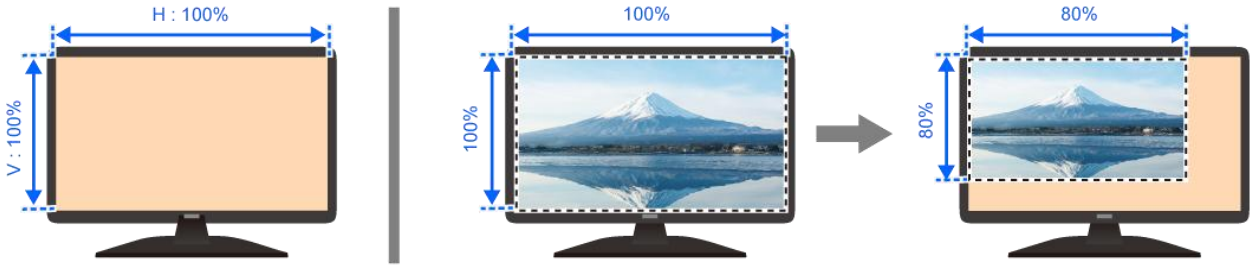
The image position in the window can be set as ratio to the output resolution with reference to the upper left (0%). Its lower right is 100% of the output video.

For horizontal +: Right direction -: Left direction
For vertical +: Downward direction -: Upward direction

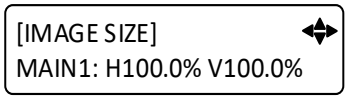
Image size

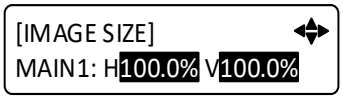
Menu	OUTPUT IMAGE→IMAGE SIZE		@GSD/@SSD
Parameter	MAIN1, MAIN2	PinP1, PinP2	
	H (Horizontal), V (Vertical), HV (Horizontal/Vertical properly)		
Value	20.0% to 400.0% (100.0%) (by 0.1%)	20.0% to 400.0% (20.0%) (by 0.1%)	

The ratio to the output resolution can be set with reference to the upper left.



If the image size increases because of changing this setting, the color space may be converted from YUV 4:4:4 to YUV 4:2:2. To avoid this conversion, select a smaller value, set "**Output resolution (P.18)**" to a value other than [4096x2160]/[3840x2160], or set "**PinP window output (P.23)**" to [OFF].
When the color space is converted to YUV 4:2:2, the font color of the values is changed as below and the following message is shown.



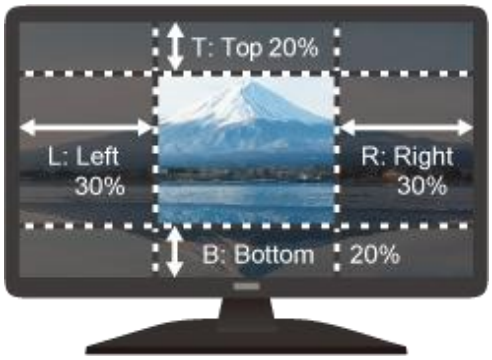


WEB browser [OUTPUT IMAGE]

Cropping

Menu	OUTPUT IMAGE→IMAGE CROP	Advanced	N/A
Parameter	MAIN1, MAIN2, PinP1, PinP2		
	L (Left), R (Right), T (Top), B (Bottom)		
Value	0.0% to 100.0% (by 0.1%)		

The cropping can be set with reference to the window's size (100%).
For the cropped area (left, right, top, bottom), the lower layer image is displayed.



Background color

Menu	OUTPUT IMAGE→BACKGROUND COLOR	N/A
Parameter	OUT1, OUT2	
	R (Red), G (Green), B (Blue), RGB (Red/Green/Blue properly)	
Value	0 to 255	

Default: Black

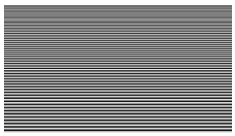
Set to orange

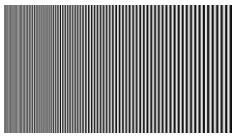
Test pattern

Several test patterns are available via this menu.

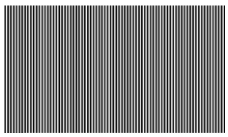
Menu	OUTPUT IMAGE→TEST PATTERN	@GTP/@STP
Parameter	OUT1, OUT2	
	Pattern	Scrolling
Value	OFF (Input video), HORIZONTAL ZEBRA*, VERTICAL ZEBRA*, HORIZONTAL STRIPE, VERTICAL STRIPE, OUTPUT FRAME, CROSS HATCH, BLUE RASTER, GREEN RASTER, RED RASTER, 50% WHITE RASTER, 100% WHITE RASTER, HORIZONTAL RAMP*, VERTICAL RAMP*, H-GRAY SCALE*, V-GRAY SCALE*, H-COLOR BAR*, V-COLOR BAR*	OFF, SLOW, FAST

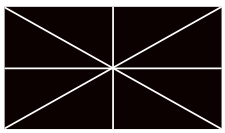
*Navigation buttons: Changes values of adjustable features or navigates the menus/submenus.

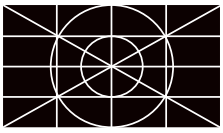

HORIZONTAL ZEBRA


VERTICAL ZEBRA


HORIZONTAL STRIPE


VERTICAL STRIPE


OUTPUT FRAME


CROSS HATCH


BLUE RASTER


GREEN RASTER


RED RASTER


50% WHITE RASTER

100% WHITE RASTER


HORIZONTAL RAMP


VERTICAL RAMP


H-GRAY SCALE


V-GRAY SCALE


H-COLOR BAR


V-COLOR BAR

[OUTPUT FRAME] : Outputs test pattern with the settings of “**Image position (P.19)**” and “**Image size (P.20)**”. Useful if an image is cut on sink device side or to adjust videowall configuration.

Test pattern other than [OUTPUT FRAME] : Disables settings of “**Image position (P.19)**”, “**Image size (P.20)**”, and “**Cropping (P.21)**”. Displays a test pattern at the resolution that is set in “**Output resolution (P.18)**”.

[ZEBRA] : Helps checking residual images.

PinP window output

Menu	OUTPUT IMAGE→PinP OUTPUT	@GPI/@SPI
Parameter	PinP1, PinP2	
Value	ON, OFF	

Initialization of output image settings

Menu	OUTPUT IMAGE→IMAGE INITIALIZATION	N/A
Parameter	MAIN1, MAIN2, PinP1, PinP2	
Value	YES, NO	

Select [YES] and press the MENU/ENTER button to initialize the settings.

【Image position (P.19)】
【Image size (P.20)】
【Cropping (P.21)】

Note

To restore settings, make a backup copy.

Output

Video synchronous signal output

Menu	OUTPUT SETTINGS→SIGNAL OUTPUT	@GVO/@SVO
Parameter	OUT1A, OUT1B, OUT2A, OUT2B	
Value	ON, OFF	

[ON] : Outputs video synchronous signal.
[OFF] : Stops outputting video synchronous signal and DDC 5 V signal electrically.
For some connected sink devices, the device switches into standby mode.

Video mute

Menu	OUTPUT SETTINGS→VIDEO MUTE	@GDB/@SDB
Parameter	OUT1A, OUT1B, OUT2A, OUT2B	
Value	ON, OFF	

[ON]: Mutes output video (outputs black video signal).

Video synchronous signal output for when no video signal input

You can set the video output signal when an input channel without video signal is selected or [OFF] is set to an input channel.

Menu	OUTPUT SETTINGS→NO SIGNAL OUTPUT	Advanced	N/A
Parameter	OUT1A, OUT1B, OUT2A, OUT2B		
Value	ON, 0 s to 60 s		

[ON] : Outputs video synchronous signal.
[0 s] to [60 s] : Stops outputting video signal* and disconnects DDC 5 V signal.
*Only if the following conditions are met:

- An input channel with no video signal or [OFF] is selected for the main window.
- If "**PinP window output (P.23)**" is set to [ON], an input channel with no video signal or [OFF] is selected for the PinP window.
- No test pattern or bitmap is output.

When video signal output stops and DDC 5 V signal is disconnected, a sink device may switch into standby mode.

Video output for when no signal is input

Menu	OUTPUT SETTINGS→NO SIGNAL IMAGE	Advanced	N/A
Parameter	MAIN1, MAIN2, PinP1, PinP2		
Value	BLUE, BLACK, BACKGROUND COLOR, BITMAP1, BITMAP2, BITMAP3, BITMAP4		

[BLUE] : Outputs blue video signal.
[BLACK] : Outputs black video signal.
[BACKGROUND COLOR] : Outputs the color set in "**Background color (P.21)**".
[BITMAP1] to [BITMAP4] : Outputs the bitmap saved to the MSD-V4.

HDCP authentication

Menu	OUTPUT SETTINGS→HDCP AUTHENTICATION	Advanced	@GEN/@SEN
Parameter	OUT1A, OUT1B*, OUT2A, OUT2B*		
Value	HDCP 2.2, HDCP 1.4, HDCP INPUT ONLY, DISABLE		

*Only for device having HDBaseT output.

[HDCP 2.2] : HDCP 2.2 or HDCP 1.4 authentication depending on the sink device
Outputs signal with HDCP.
[HDCP 1.4] : HDCP 1.4 authentication
Outputs signal with HDCP.
[HDCP INPUT ONLY] : HDCP 2.2 or HDCP 1.4 authentication depending on the sink device
Outputs signal depending on HDCP presence of input signal.
If input signal is protected by HDCP, outputs signal with HDCP.
If input signal is not protected by HDCP, outputs signal without HDCP.
[DISABLE] : No HDCP authentication
Outputs signal without HDCP.
Displays video only if input signal is not protected by HDCP.

For sink devices that are not supported by HDCP, signal without HDCP is output; video is displayed only if input signal is not protected by HDCP.

If [HDCP INPUT ONLY] is set, HDCP presence of output signal changes depending on HDCP presence of input signal. Some sink devices may not be displayed temporarily.

If video signal with HDCP 2.2 Type 1 is input, set this setting to [HDCP 2.2] or [HDCP INPUT ONLY] and connect to a sink device supporting HDCP 2.2.

HDCP retries

You can set the number of HDCP retries.

Menu	OUTPUT SETTINGS→HDCP RETRY	Advanced	N/A
Parameter	OUT1A, OUT1B*, OUT2A, OUT2B*		
Value	ETERNITY, 0 to 100		

*Only for device having HDBaseT output.
Press the MENU/ENTER button to accept the set value.

[ETERNITY] : Retires automatically until HDCP authentication is succeeded.
If HDCP authentication error occurs repeatedly, set the number of retries.
[0] to [100] : Retries automatically until reaching the set number of reties.
If authentication error occurs more than the set times, the MSD-V4 determines the sink device as a non-HDCP compliant device. In this case, only non-HDCP video input signal can be displayed.

If "**HDCP authentication (P.25)**" is set to a value other than [DISABLE], HDCP authentication is performed.

Connection Reset

Menu	OUTPUT SETTINGS→CONNECTION RESET	@HAU
Parameter	OUT1A, OUT1B*, OUT2A, OUT2B*	
Value	YES, NO	

*Only for device having HDBaseT output.
Select [YES] and press the MENU/ENTER button to perform this feature.

Signal format

Menu	OUTPUT SETTINGS→SIGNAL FORMAT	Advanced	N/A
Parameter	OUT1A, OUT1B, OUT2A, OUT2B		
Value	HDMI YCbCr 4:4:4 MODE, HDMI YCbCr 4:2:2 MODE, HDMI YCbCr 4:2:0 MODE, HDMI RGB MODE, DVI MODE		

If "**Automatic determining sink device EDID (P.30)**" is set to [ON] (default), video is output according to the priority below:

Value	Output signal format				
	Higher priority ←				→ Lower priority
HDMI YCbCr 4:4:4 MODE	HDMI YCbCr 4:4:4	HDMI YCbCr 4:2:2	HDMI RGB	HDMI YCbCr 4:2:0*	DVI
HDMI YCbCr 4:2:2 MODE	HDMI YCbCr 4:2:2	HDMI RGB	HDMI YCbCr 4:2:0*	DVI	
HDMI YCbCr 4:2:0 MODE	HDMI YCbCr 4:2:0*				
HDMI RGB MODE	HDMI RGB	HDMI YCbCr 4:2:0*	DVI		
DVI MODE	DVI				

*HDMI YCbCr 4:2:0 enabled only for 4K@50/59.94/60.

If "**Automatic determining sink device EDID (P.30)**" is set to [OFF], video is output at the selected mode.

[HDMI YCbCr 4:2:0 MODE] : Enable only if "**Output resolution (P.18)**" is set to 4K@50/59.94/60.
If the sink device does not support HDMI YCbCr 4:2:0 or the output resolution is 4K@30 or lower, video is output at the priority of [HDMI YCbCr 4:4:4 MODE].

[DVI MODE] : Enable only for resolutions 4K@30 or lower.
For 4K@50/59.94/60, video is output at the priority of [HDMI RGB MODE].

Note

If DVI signal is output, digital audio is not output.

RGB Range

You can set the RGB range of output video.

Menu	OUTPUT SETTINGS→RGB RANGE	Advanced	N/A
Parameter	OUT1A, OUT1B, OUT2A, OUT2B		
Value	AUTO, FULL, LIMITED		

[AUTO] : Outputs signal at the limited range if "**Output resolution (P.18)**" is set to [4096x2160], [3840x2160], [1080p], [1080i], [720p], [576p] or [480p], the limited range is applied.
Outputs signal at the full range for other output resolutions.
[FULL] : Outputs signal at the full range.
[LIMITED] : Outputs signal at the limited range.

This setting is available only if HDMI RGB signal is output. For DVI signals, signal is output at the full range regardless of this setting.

Note

Clipped whites and black level problems may be solved by changing this setting.

HDBaseT long reach mode

You can enable/disable long reach mode for HDBaseT output.

Menu	OUTPUT SETTINGS→HDBT LONG REACH MODE	Advanced	N/A
Parameter	OUT1B*, OUT2B*		
Value	OFF, ON		

*Only for device having HDBaseT output.

[OFF] : Long reach mode OFF Up to 328 ft. (100 m)
[ON] : Long reach mode ON Up to 492 ft. (150 m)

With long reach mode, up to 1080p (24 bit)/dot clock 148 MHz is supported when using with IDK's HDBaseT product. Set "**Output resolution (P.18)**" and "**Deep Color (P.28)**" to a supported format.

Deep Color

Menu	OUTPUT SETTINGS→DEEP COLOR	Advanced	N/A
Parameter	OUT1A, OUT1B, OUT2A, OUT2B		
Value	24-BIT COLOR, 30-BIT COLOR		

[24-BIT COLOR] : Video is output at 24-BIT COLOR.
[30-BIT COLOR] : Video is output at 30-BIT COLOR only if sink device supporting 30-BIT COLOR is connected.
If output resolution is 4K@50/59.94/60, video is output at HDMI YCbCr 4:2:2 or HDMI YCbCr 4:2:0 regardless of "**Signal format (P.27)**". For the HDBaseT output connector, video is output at HDMI YCbCr 4:2:0, and 24-BIT COLOR regardless of settings of "**Signal format (P.27)**" or this setting.
If a device that does not support 30-BIT COLOR is connected, video is output at 24-BIT COLOR.

If “**Automatic determining sink device EDID (P.30)**” is set to [OFF], video is output at 30-BIT COLOR regardless of the connected sink device status.

This setting is applied only if HDMI signal is output. For DVI signals, video is output at 24-BIT COLOR regardless of this setting.

Note

If 30-BIT COLOR video signal is output, noise may be on video or signal may not be transmitted. In those cases, the noise may be removed by selecting [24-BIT COLOR].

Window transition effect

Menu	OUTPUT SETTINGS→SWITCHING EFFECT	Advanced	N/A
Parameter	MAIN1, MAIN2, PinP1, PinP2		
Value	FREEZE→FADE OUT-IN, FADE OUT-IN, CUT		

[FREEZE→FADE OUT-IN] : Image freezes and then fades out/in.
[FADE OUT-IN] : Image fades out/in.
[CUT] : Switched image instantly.

Several black frames are output at the time of input channel switching.

Window transition speed

You can set the fade out/in speed for if "**Window transition effect (P.30)**" is set to a value other than [CUT].

Menu	OUTPUT SETTINGS→SWITCHING EFFECT SPEED	Advanced	N/A
Parameter	MAIN1, MAIN2, PinP1, PinP2		
Value	100ms to 2000ms (350ms) (by 10ms)		

Automatic determining sink device EDID

The following settings are determined automatically according to the MSD-V4 settings and sink device EDID.
【Output resolution (P.18)】
【Signal format (P.27)】
【Sampling frequency (P.45)】

Menu	OUTPUT SETTINGS→FOLLOW SINK EDID	Advanced	N/A
Parameter	OUT1A, OUT1B, OUT2A, OUT2B*		
Value	ON, OFF		

[ON] : Follows the MSD-V4 settings and sink device EDID to output the optimal video/audio automatically.
[OFF] : Follows the MSD-V4 settings to output video/audio.

Notes

- If [ON] is selected and EDID cannot be acquired or EDID has an error, the sink device is determined as a DVI device. This may be solved by setting this feature to [OFF].
- If [OFF] is selected and an input channel with an Bitstream audio is selected, the Bitstream audio is output regardless of the sink device EDID status. If the sink device does not support the format, noise audio occurs.

Hot plug ignoring duration

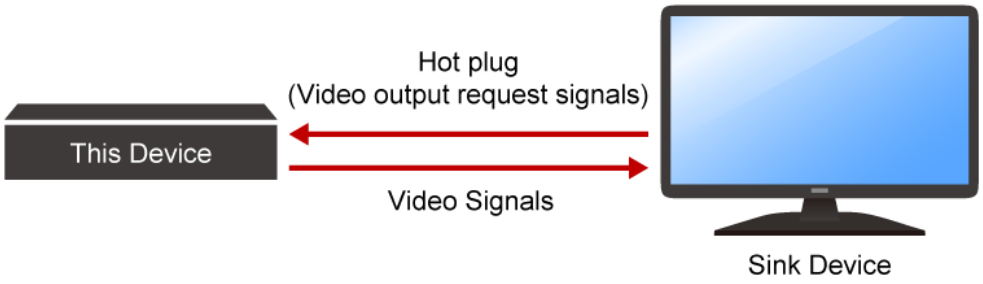
You can set the duration for ignoring video output request signals that are sent from the sink device.

Menu	OUTPUT SETTINGS→HOTPLUG MASK	Advanced	N/A
Parameter	OUT1A, OUT1B*, OUT2A, OUT2B*		
Value	OFF, 2s to 15s		

*Only for device having HDBaseT output.

[OFF] : Always receives video output request signals from sink devices.
[2s] to [15s] : After receiving video output request signals, ignores these signals during the specified period.

If the signal request is repeated in a short cycle, the MSD-V4 resets the video output process. As a result, video may not be output. This problem can be solved by setting the ignoring duration.



CEC connection

Menu	OUTPUT SETTINGS→CEC CONNECTION	Advanced	@GCE/@SCE
Parameter	OUT1A, OUT1B*, OUT2A, OUT2B*		
Value	NOT CONNECTED, IN1 to IN4, SELECTED CHANNEL		

*Only for device having HDBaseT output.
Press the MENU/ENTER button to accept the set value.

[NOT CONNECTED] : Not connecting CEC
[IN1] to [IN4] : Connects to a desired input channel
[SELECTED CHANNEL] : Connects to the input channel that is selected for the main window

If you do not use CEC, select [NOT CONNECTED].
With CEC connection, if status of a sink device that is connected to an output connector is changed (for example, powering on/off) or CEC connection is changed, the MSD-V4 may change its EDID address according to the sink device address. In this case, the MSD-V4 disconnects the connection between the source device temporarily.

CEC connection takes place on a one-to-one basis. If the same input channel is set to multiple output connectors, the channel is selected automatically in alphabetical or numerical order and the other outputs will not be connected.

Input resolution

The size of the input image is increased or decreased while keeping the aspect ratio according to the settings of “**Aspect ratio (P.32)**” and “**Aspect ratio keeping process (P.33)**”.

The following settings are set by 0.1% from the front panel. Some output resolution settings may not be adjusted by 1 pixel. To adjust the following menus by 1 pixel, set them from the WEB browser or commands by 0.01%.

【Image position (P.34)】
【Image size (P.34)】
【Cropping (P.35)】

Aspect ratio

Menu	INPUT IMAGE→ASPECT RATIO	Advanced	@GAP/@SAP
Parameter	IN1 to IN4		
Value	AUTO-1, AUTO-2, THROUGH, FULL, 14:9 SIDE PANEL, 4:3 SIDE PANEL, 16:9 LETTER BOX, 14:9 LETTER BOX, 16:9, 14:9, 4:3		

[AUTO-1]/[AUTO-2] : Follows “**Aspect ratio keeping process (P.33)**”.
When a letter box signal is input, video is output at the following aspect:
[AUTO-1] : 16:9 or 14:9
[AUTO-2] : 4:3
[THROUGH] : Does not increase or decrease the size of the input image.
[FULL] : Increases or decreases the size of the input image to display on the full window.
[14:9 SIDE PANEL] : 14:9 SIDE PANEL
[4:3 SIDE PANEL] : 4:3 SIDE PANEL
[16:9 LETTER BOX] : 16:9 LETTER BOX
[14:9 LETTER BOX] : 14:9 LETTER BOX
[16:9] : 16:9
[14:9] : 14:9
[4:3] : 4:3

Aspect ratio keeping process

You can set the mode for processing aspect ratio.

Menu	INPUT IMAGE→ASPECT RATIO CONTROL	Advanced	@GAR/@SAR
Parameter	IN1 to IN4		
Value	L-BOX/S-PANEL (Letter box/Side panel), S-CUT/TB-CUT (Side cut/Top bottom cut)		

[L-BOX/S-PANEL] : Full image: Increases or decreases the size of the input image without any cropping while keeping the aspect ratio. The lower layer image is displayed for no-image area.

[S-CUT/TB-CUT] : Full window: Increases or decreases the size of the input image to display the image on the full window while keeping the aspect ratio.

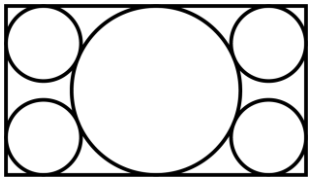
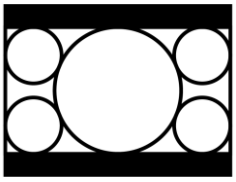
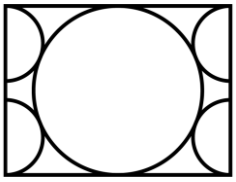
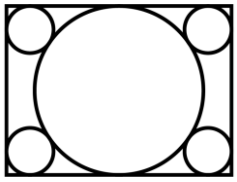
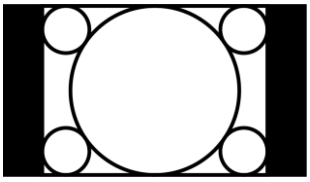
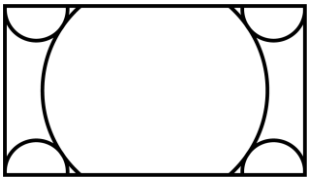
Input video	Output video	
	L-BOX/S-PANEL	S-CUT/TB-CUT
16:9 input image → 4:3 output	Letter box	Side cut
		
4:3 input image → 16:9 output	Side panel	Top/Bottom cut
		

Image position

You can change the position of the image to be displayed as follows:
Upper left of the window : 0%
Lower right of the window : 100%
Horizontal direction
Negative number : Shifts the image to the left.
Positive number : Shifts the image to the right.
Vertical direction
Negative number : Shifts the image to the upper direction.
Positive number : Shifts the image to the lower direction.
Image area that exceeds the window size cannot be displayed.

Menu	INPUT IMAGE→IMAGE POSITION	Advanced	@GNW/@SNW
Parameter	IN1 to IN4		
	H (Horizontal), V (Vertical)		
Value	-400.0% to +100.0% (0.0%) (by 0.1%)		

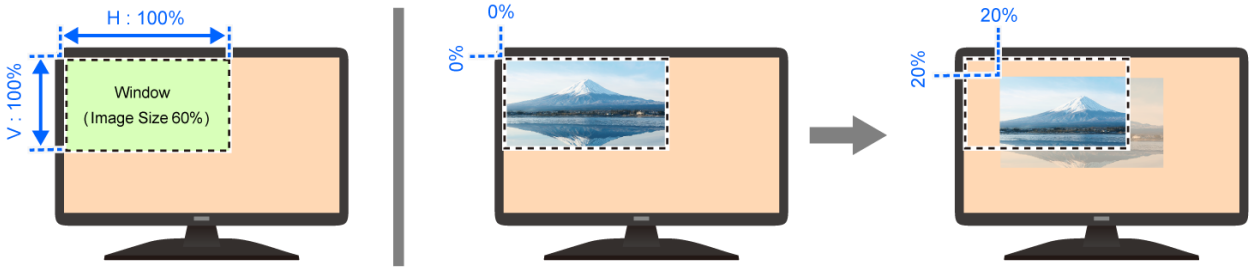
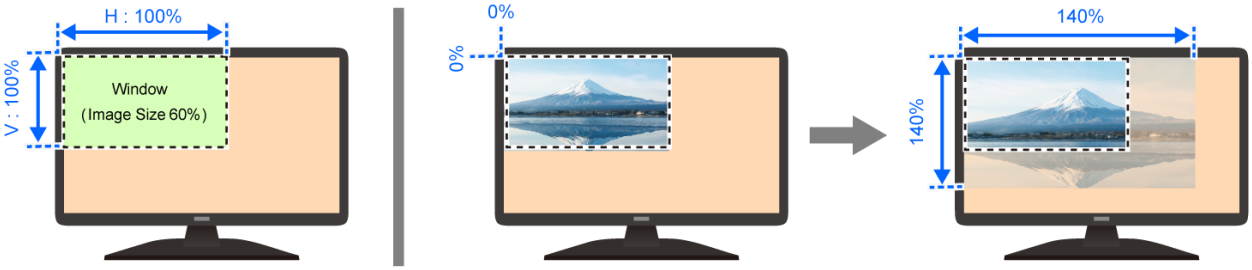


Image size

You can set the size of input image to the window size with reference to the upper left of the image (0%).
Image area that exceeds the window size cannot be displayed.

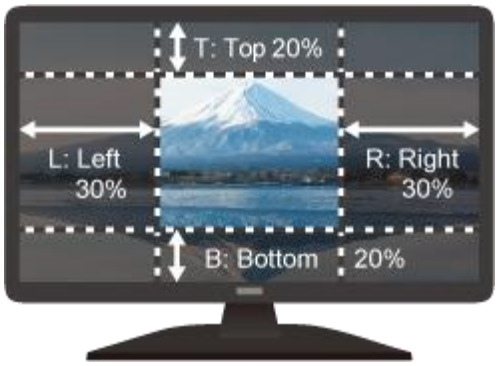
Menu	INPUT IMAGE→IMAGE SIZE	Advanced	@GNW/@SNW
Parameter	IN1 to IN4		
	H (Horizontal), V (Vertical), HV (Horizontal/Vertical properly)		
Value	20.0% to 400.0% (100.0%) (by 0.1%)		



Cropping

The lower layer image is displayed for no-image area with reference to the resolution of the image (100%).

Menu	INPUT IMAGE→IMAGE CROP	Advanced	N/A
Parameter	IN1 to IN4		
	L (Left), R (Right), T (Top), B (Bottom)		
Value	0.0% to 100.0% (by 0.1%)		



Initialization of input image settings

Menu	INPUT IMAGE→IMAGE INITIALIZATION	Advanced	N/A
Parameter	IN1 to IN4		
Value	YES, NO		

Select [YES] and press the MENU/ENTER button to initialize the following settings.

【Aspect ratio (P.32)】
【Image position (P.34)】
【Image size (P.34)】
【Cropping (P.35)】

Note

To restore the settings, save the backup data.

Input

Hot plug output for when there is no active video input signal

The MSD-V4 requests the source device to output video signal by sending hot plug when no active video signal is input. You can enable/disable this feature and set the request interval.

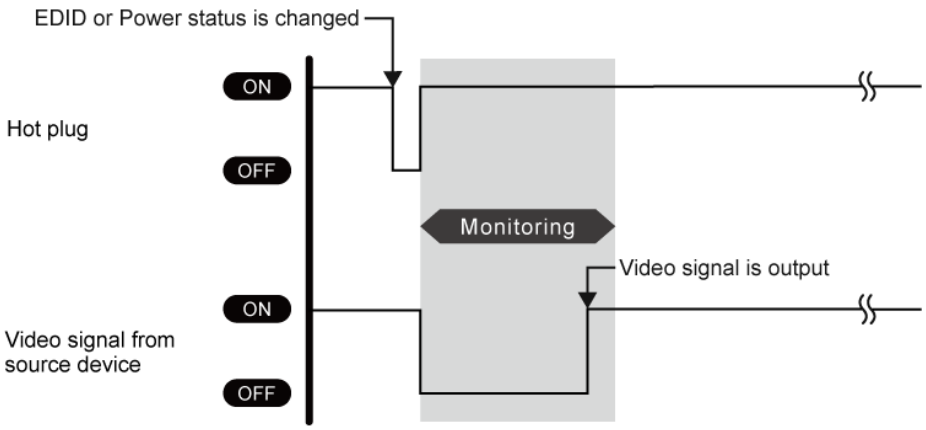
Menu	INPUT SETTINGS→NO INPUT MONITORING	Advanced	N/A
Parameter	IN1 to IN4		
Value	OFF, 2000ms to 15000ms (10000ms) (by 100ms)		

[OFF] : Does not request the source device to output video signal even if there is no active input signal.

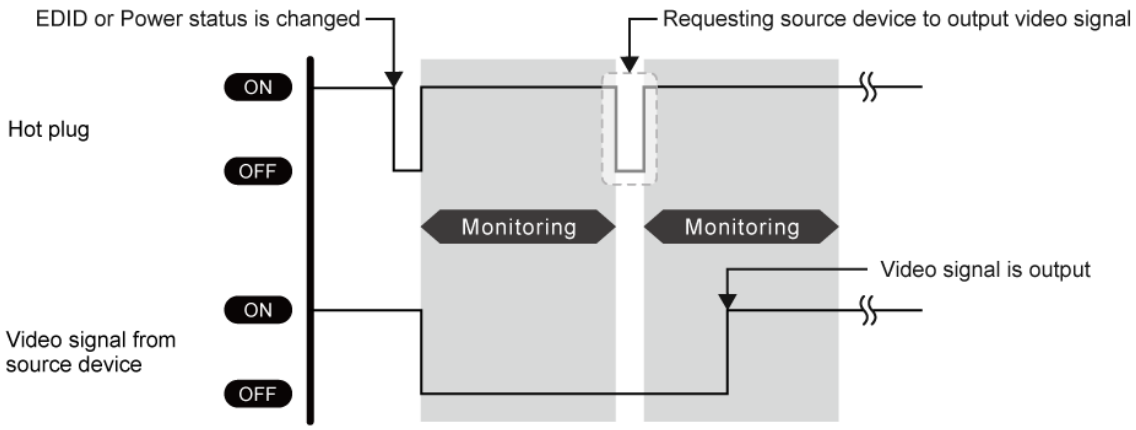
[2000ms] to [15000ms] : Requests the source device to output video signal after the specified monitoring time if there is no active input signal.

If the MSD-V4 is powered on or EDID is changed with the connected source device is powered on, the source device may stop outputting video signal. In this case, use this feature to request the source device to output video signal.

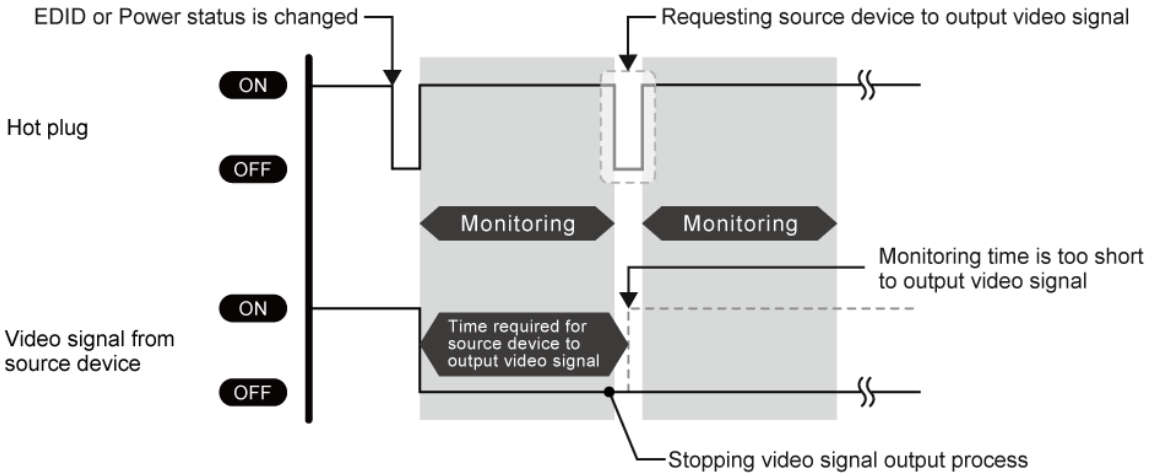
■ **Example: Video signal is output within the specified monitoring time**



■ **Example: The source device stops outputting video signals → Hot plug request is needed.**



■ **Example: The specified monitoring time is too short. → Set the longer monitoring time.**



If the interval is shorter than the time for source device output video signal, the source device repeats the video output process and does not output video signal. This problem can be solved by setting longer monitoring time.

Note

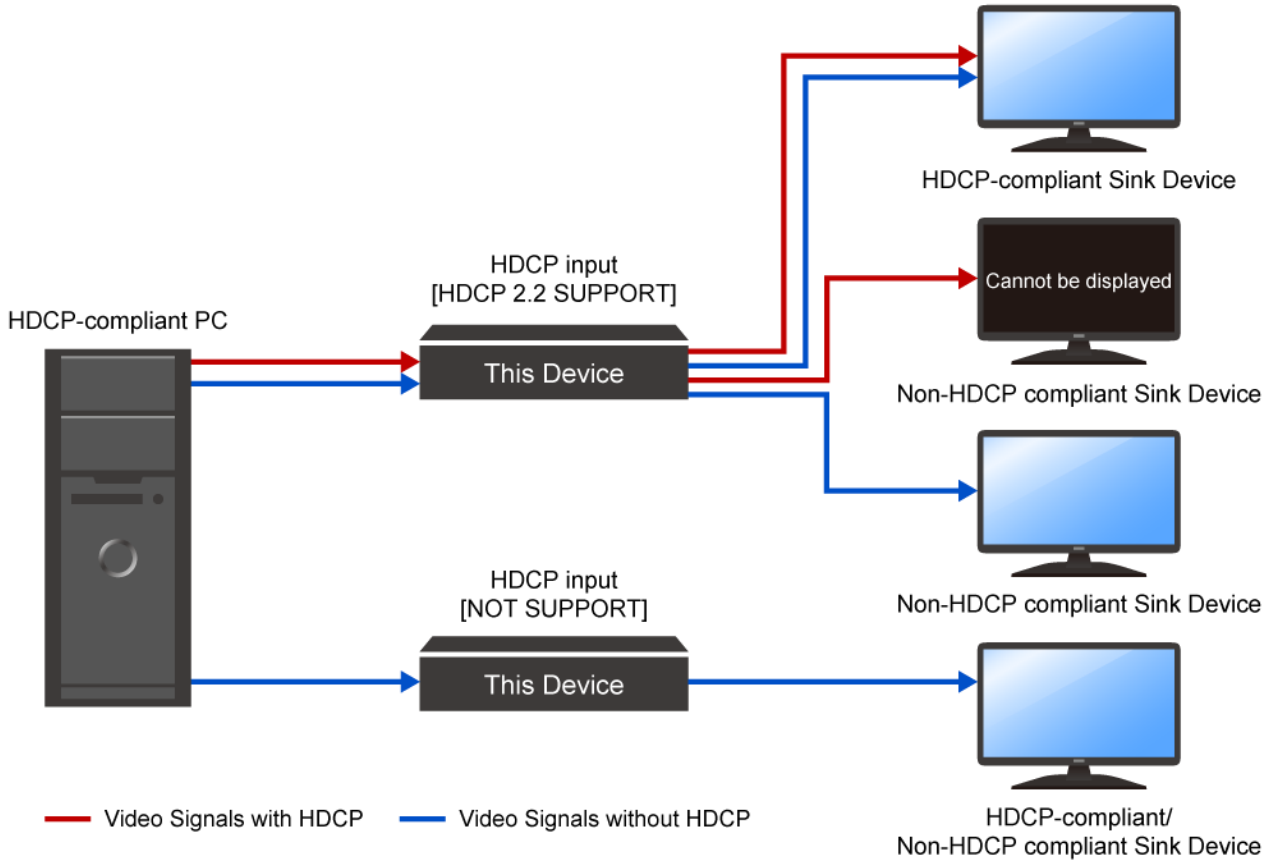
If the source device, such as a PC, disables the monitor power-saving or dual monitor features, set this setting to [OFF].

HDCP input

Menu	INPUT SETTINGS→HDCP INPUT	Advanced	@GHE/@SHE
Parameter	IN1 to IN4		
Value	HDCP 2.2 SUPPORT, HDCP 1.4 SUPPORT, NOT SUPPORT		

[HDCP 2.2 SUPPORT] : Operates as an HDCP 2.2 supported device.
[HDCP 1.4 SUPPORT] : Operates as an HDCP 1.4 supported device.
[NOT SUPPORT] : Operates as a non-HDCP compliant device.

Some source devices negotiate with the connected device to determine if HDCP encryption is supported. After this negotiation, the source device determines whether HDCP signal encryption is enforced or not. This process takes place with some source device, even if the content being presented is not copyright protected. The MSD-V4 is HDCP compliant, if it is connected to a display device that does not support HDCP, unprotected AV content may not be successfully displayed. Under these circumstances and if the content is indeed not protected, the problem can be solved by setting this menu to [NOT SUPPORT].



Note

HDCP 2.2 Type 0 video can be displayed on sink devices supporting HDCP 1.4.
HDCP 2.2 Type 1 video can be displayed on sink devices supporting HDCP 2.2 but cannot be displayed on sink devices supporting HDCP 1.4.

Input channel automatic switching

When video input signal is detected/disconnected, the MSD-V4 automatically switches input channel to the one having highest priority of input channel that has active video input signal.

Automatic switching priority for when a video input signal is detected

You can set the priority for automatic switching at the time of video input signal is detected.

Menu	AUTO SWITCHING→SIGNAL ON PRIORITY	Advanced	@GAU/@SAU
Parameter	MAIN1, MAIN2, PinP1, PinP2		
	IN1 to IN4		
Value	OFF (Disabled), 1 (Highest) to 4 (Lowest)		

Press the MENU/ENTER button to accept the set value.

If the priority of the detected input channel is lower than the priority of the selected input channel, automatic switching is not performed.

If the same priority if set to several input channels, the last detected input channel will have the first priority.

To enable automatic switching for every time detecting a video input signal, set all input channel to the same priority other than [OFF].

Automatic switching priority for when there is no active video input signal

You can set the priority for automatic switching at the time of video input signal of the current selected input is disconnected.

Menu	AUTO SWITCHING→SIGNAL OFF PRIORITY	Advanced	@GOF/@SOF
Parameter	MAIN1, MAIN2, PinP1, PinP2		
	IN1 to IN4, INOFF		
Value	OFF (Disabled), 1 (Highest) to 5 (Lowest)		

Press the MENU/ENTER button to accept the set value.

If the same priority is set to several input channels, the smallest number input channel will have the first priority.

Ignoring duration after automatic switching

You can set the time for disabling automatic switching temporarily after automatic input channel switching is performed.

Menu	AUTO SWITCHING→IGNORING DURATION	Advanced	N/A
Parameter	MAIN1, MAIN2, PinP1, PinP2		
Value	0s000ms to 999s999ms		

If video input signal is detected or disconnected in a short interval, the automatic switching is performed repeatedly. To avoid undesired automatic switching, set the ignoring duration.

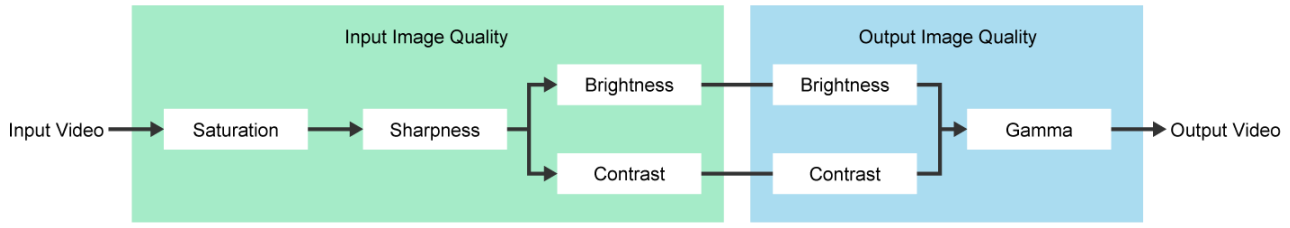
Switching mode of automatic switching

You can set which signals will be switched when automatic switching is performed.

Menu	AUTO SWHITCING→SWITCHING MODE	Advanced	@GAD/@SAD
Parameter	MAIN1, MAIN2		
Value	V&A (Video and Audio), VIDEO, AUDIO		

Picture adjustment

You can adjust the following items of input and output image quality.



Output brightness/contrast/gamma

Menu	PICTURE ADJUSTMENT→OUTPUT BRIGHTNESS	Advanced	N/A
Parameter	OUT1, OUT2		
Value	80% to 120% (100%)		

Menu	PICTURE ADJUSTMENT→OUTPUT CONTRAST	Advanced	N/A
Parameter	OUT1, OUT2		
	R (Red), G (Green), B (Blue), RGB (Red/Green/Blue)		
Value	0% to 200% (100%)		

Menu	PICTURE ADJUSTMENT→OUTPUT GAMMA	Advanced	N/A
Parameter	OUT1, OUT2		
Value	0.1 to 3.0 (1.0) (by 0.1)		

Output image quality setting initialization

You can initialize the following settings: Output brightness, contrast, and gamma.

Menu	PICTURE ADJUSTMENT→OUTPUT SETTING INIT.	Advanced	N/A
Parameter	OUT1, OUT2		
Value	YES, NO		

Select [YES] and press the MENU/ENTER button to initialize the settings.

Note

To restore settings, make a backup copy.

Input sharpness/brightness/contrast/saturation

Menu	PICTURE ADJUSTMENT→INPUT SHARPNESS	Advanced	N/A
Parameter	IN1 to IN4		
Value	-5 to +15 (0)		

Menu	PICTURE ADJUSTMENT→INPUT BRIGHTNESS	Advanced	N/A
Parameter	IN1 to IN4		
Value	80% to 120% (100%)		

Menu	PICTURE ADJUSTMENT→INPUT CONTRAST	Advanced	N/A
Parameter	IN1 to IN4		
	R (Red), G (Green), B (Blue), RGB (Red/Green/Blue)		
Value	0% to 200% (100%)		

Menu	PICTURE ADJUSTMENT→INPUT SATURATION	Advanced	N/A
Parameter	IN1 to IN4		
Value	0% to 200% (100%)		

Input image quality setting initialization

You can initialize the following settings: input sharpness, brightness, contrast, and saturation

Menu	PICTURE ADJUSTMENT→INPUT SETTING INIT.	Advanced	N/A
Parameter	IN1 to IN4		
Value	YES, NO		

Select [YES] and press the MENU/ENTER button to initialize the settings.

Note

To restore settings, make a backup copy.

Output audio

The following audio formats are supported:

Digital audio input/output	: Multi-channel audio and Bitstream audio
Digital audio output and analog audio output	: Downmixed audio

■ Inputting and outputting multi-channel LPCM signal

For digital audio, if multi-channel LPCM is input, the signal is output by setting “**Multi-channel audio output (P.46)**” to [ON].

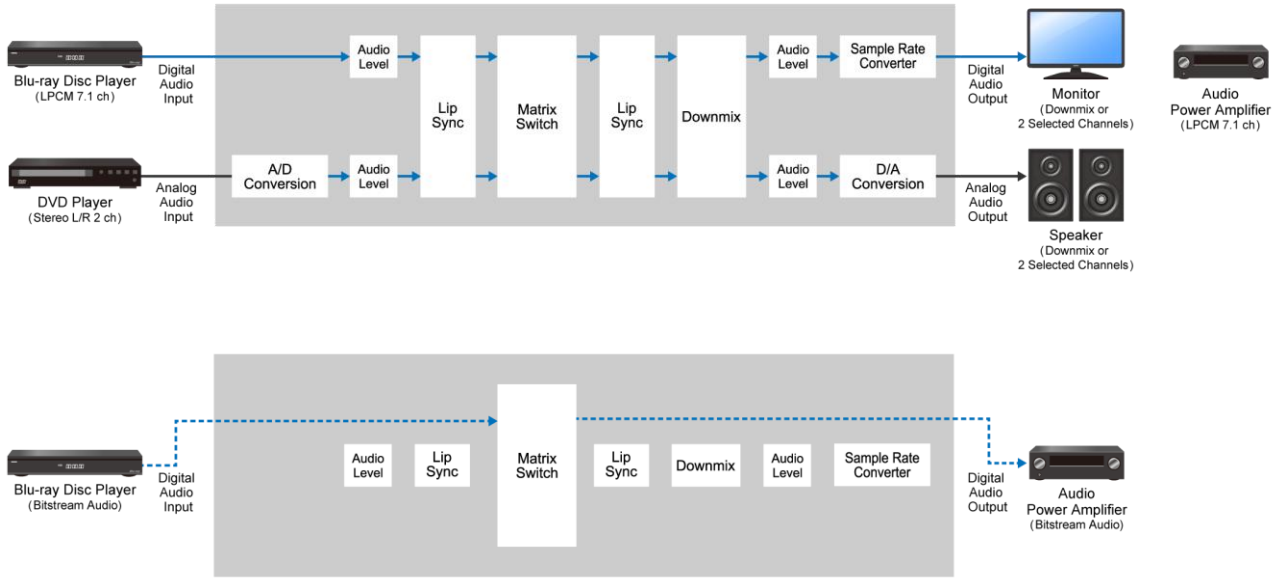
For analog audio, audio signals of two channels that are selected in “**Downmix (P.46)**” or downmixed signal are output.

■ Inputting and outputting Bitstream audio

Bitstream audio cannot be output to an analog audio.

When a Bitstream audio is input, the following settings will be disabled.

【Audio level (P.44)】
【Lip Sync (P.44)】
【Sampling frequency (P.45)】
【Downmix (P.46)】



Audio output

Menu	OUTPUT AUDIO SETTINGS→SIGNAL OUTPUT	@GUC/@SUC
Parameter	OUT1A, OUT1B, OUT2A, OUT2B	
Value	ON, OFF	

[OFF]: Stops outputting audio signal (audio packet)

Audio level

Menu	OUTPUT AUDIO SETTINGS→AUDIO LEVEL	@GAV/@SAV
Parameter	OUT1, OUT2, ANALOG1	
Value	-100dB to +10dB (0dB)	

If you change the output level while “**Mute (P.44)**” is set to [ON], the mute function will be disabled.

If you set “**Top page (P.84)**” to [AUDIO VOLUME], you can change the level from the top page of the front panel.

Mute

You can mute/unmute the output audio.

Menu	OUTPUT AUDIO SETTINGS→MUTE	@GAM/SAM
Parameter	OUT1, OUT2, ANALOG1	
Value	ON (Muted), OFF	

Lip Sync

You can adjust the time gap between video (motion) and audio (sound).

Menu	OUTPUT AUDIO SETTINGS→LIP SYNC	Advanced	N/A
Parameter	OUT1, OUT2		
Value	0ms to 70ms		

The total delay of input and output Lip Sync is up to 70 ms in total.

【Lip Sync (P.47)】

For analog audio output, the lip sync setting that is set in “**Analog audio output (P.45)**” is applied.

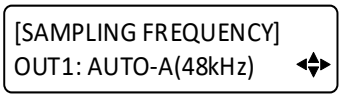
Sampling frequency

You can set the sampling frequency of digital output audio.

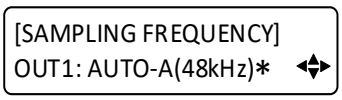
Menu	OUTPUT AUDIO SETTINGS→SAMPLING FREQUENCY	Advanced	N/A
Parameter	OUT1, OUT2		
Value	AUTO-A, AUTO-B, 192kHz, 96kHz, 88.2kHz, 48kHz, 44.1kHz, 32kHz		

[AUTO-A] : Outputs signal at the optimal sampling frequency of the sink device EDID connected to OUT A.
[AUTO-B] : Outputs signal at the optimal sampling frequency of the sink device EDID connected to OUT B.

If setting to AUTO, the output sampling frequency is shown at the right of the setting value.



If optimal sampling frequency is not output, the signal is output at 48 kHz and [*] is shown at the right of the sampling frequency.



If [*] is shown, the following problem occurs:

- EDID cannot be read from the sink device.
- There is no available sampling frequency in the sink device EDID.
- "**Automatic determining sink device EDID (P.30)**" is set to [OFF].

Analog audio output

You can set the audio that is output from the analog audio output connector.

Menu	OUTPUT AUDIO SETTINGS→ANALOG OUTPUT	Advanced	N/A
Parameter	ANALOG1		
Value	OUT1, OUT2		

[OUT1] : Outputs OUT1 audio.
[OUT2] : Outputs OUT2 audio.

Multi-channel audio output

You can set digital output audio mode for when digital input audio is multi-channel LPCM.

Menu	OUTPUT AUDIO SETTINGS→MULTI AUDIO	Advanced	N/A
Parameter	OUT1, OUT2		
Value	ON, OFF		

[ON] : Outputs multi-channel LPCM audio.
[OFF] : Outputs 2-channel LPCM that is set in "**Downmix (P.46)**".

If selecting [ON], connect a sink device that supports multi-channel audio. Otherwise, only some audio channels are output because the audio is not downmixed.

Downmix

You can set the downmix audio of digital and analog output audio if digital input audio is multi-channel LPCM.

Menu	OUTPUT AUDIO SETTINGS→DOWNMIX	Advanced	N/A
Parameter	OUT1, OUT2		
Value	DOWNMIX, CH1/CH2 STEREO, CH3/CH4 STEREO, CH5/CH6 STEREO, CH7/CH8 STEREO, CH1/CH2 MONO, CH3/CH4 MONO, CH5/CH6 MONO, CH7/CH8 MONO		

[DOWNMIX] : Outputs downmixed audio.
[STEREO] : Outputs the audio of the selected two channels.
[MONO] : Outputs the mono-mixed of the selected two channels.

For digital output audio, this feature is enabled if "**Multi-channel audio output (P.46)**" is set to [OFF].

Test tone

Menu	OUTPUT AUDIO SETTINGS→TEST TONE	N/A
Parameter	OUT1, OUT2	
	Tone	Speaker
Value	OFF	—
	400Hz, 1kHz	ALL, FRONT L/R, REAR L/R, REAR L/R CENTER, FRONT LEFT, FRONT RIGHT, LFE (LOW FREQUENCY EFFECT)*, FRONT CENTER, REAR LEFT, REAR RIGHT, REAR L CENTER, REAR R CENTER

*30 Hz test tone

Only specified channels of multi-channel audio (up to eight channels) can be output to the specified speakers.

Input audio

To enable multi-channel LPCM or Bitstream audio, set audio format and speaker configuration in “**EDID (P.48)**”.
If Bitstream audio is input, the following settings will be disabled:
【Audio level (P.47)】
【Lip Sync (P.47)】

Input audio

Menu	INPUT AUDIO SETTINGS→SOURCE SELECTION	@GAS/@SAS
Parameter	IN1 to IN4	
Value	DIGITAL, ANALOG1	

[DIGITAL] : Digital input audio
[ANALOG1] : Analog input audio

Audio level

Menu	INPUT AUDIO SETTINGS→AUDIO LEVEL	@GSO/@SSO
Parameter	IN1 to IN4, ANALOG1	
Value	-100dB to +10dB (0dB)	

This feature adjusts the volume gap when input channels are switched.

Lip Sync

You can set the time gap between video (motion) and audio (sound).

Menu	INPUT AUDIO SETTINGS→LIP SYNC	Advanced	N/A
Parameter	IN1 to IN4		
Value	0ms to 70ms		

The total delay of input and output Lip Sync is up to 70 ms.
【Lip Sync (P.44)】

Stable wait (Audio signal)

This feature is for waiting until input audio becomes stable in order to avoid popping noise when digital audio source is turned on or the like.

Menu	INPUT AUDIO SETTINGS→STABLE WAIT	Advanced	@GAW/@SAW
Parameter	IN1 to IN4		
Value	ON, OFF		

If initial sound cannot be output, disable this feature. In such a case, however, unstable input signal may become noise at the start.

EDID

A source device that is connected to an input connector obtains information of supported video and audio signals from the EDID. You can change the information to be sent to a source device.

EDID selection

You can set the EDID that will be sent to source device.

Menu	EDID SETTINGS→EDID SELECTION	@GED/@SED
Parameter	IN1 to IN4	
Value	BUILT-IN EDID, EXTERNAL EDID OUT1A, EXTERNAL EDID OUT1B, EXTERNAL EDID OUT2A, EXTERNAL EDID OUT2B, COPY DATA1 to COPY DATA8	

Press the MENU/ENTER button to accept the set value.

[BUILT-IN EDID] : Uses built-in EDID. You can change the following EDID information:
【Resolution (P.49)】
【Signal format (P.50)】
【Frame rate (P.50)】
【Deep Color (P.51)】
【LPCM audio (P.51)】
【Bitstream audio (P.52)】
【Speaker configuration (P.53)】

[EXTERNAL EDID] : Uses EDID of the sink device that is connected to the output connector.
If EDID reading fails, the EDID is not changed.

[COPY DATA] : Uses EDID that is saved to the MSD-V4 in “**Copying EDID (P.50)**”.
Available only if there is effective data, the saved name is displayed.

Resolution

You can set the resolution of the MSD-V4 for if "**EDID selection (P.48)**" is set to [BUILT-IN EDID].

Menu	EDID SETTINGS→RESOLUTION	@GVF/@SVF
Parameter	IN1 to IN4	
Value	See the table below. 3840x2160@60Hz 4:4:4	

Press the MENU/ENTER button to accept the set value.

Value \ Resolution	640x480	800x600	1024x768	1280x720	1280x768	1280x800	1280x960	1280x1024	1360x768	1366x768	1400x1050	1440x900	1600x900	1600x1200	1680x1050	1920x1080	1920x1200	2048x1152	2560x1440	2560x1600	3840x2160 (30Hz)	4096x2160 (30Hz)	3840x2160 (60Hz)	4096x2160 (60Hz)
800x600 (SVGA)	Y	Y	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
1024x768 (XGA)	Y	Y	Y	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
1280x720 (VESA720)	Y	Y	Y	Y	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
720p	Y	Y	N	Y	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
1280x768 (WXGA)	Y	Y	Y	Y	Y	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
1280x800 (WXGA)	Y	Y	Y	Y	Y	Y	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
1280x960 (QuadVGA)	Y	Y	Y	Y	Y	Y	Y	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
1280x1024 (SXGA)	Y	Y	Y	Y	Y	Y	Y	Y	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
1360x768 (WXGA)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N	N	N	N	N	N	N	N	N	N	N	N	N
1366x768 (WXGA)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N	N	N	N	N	N	N	N	N	N	N	N	N
1400x1050 (SXGA+)	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	N	N	N	N	N	N	N	N	N	N	N	N	N
1440x900 (WXGA+)	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	N	N	N	N	N	N	N	N	N	N	N	N
1600x900 (WXGA++)	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	N	N	N	N	N	N	N	N	N	N	N
1600x1200 (UXGA)	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N	N	N	N	N	N	N	N	N
1680x1050 (WSXGA+)	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N	N	N	N	N	N	N	N
1080i	Y	Y	Y	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
1920x1080 (VESA1080)	Y	Y	Y	N	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N	N	N	N	N	N	N
1080p	Y	Y	Y	N	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N	N	N	N	N	N	N
1920x1200 (WUXGA)	Y	Y	Y	N	N	Y	Y	Y	N	N	Y	Y	Y	Y	Y	Y	Y	N	N	N	N	N	N	N
2048x1152 (QWXGA)	Y	Y	Y	N	N	N	Y	Y	N	N	Y	Y	Y	Y	Y	Y	Y	Y	N	N	N	N	N	N
2560x1440 (WQHD)	Y	Y	Y	N	N	N	N	Y	N	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N	N	N	N
2560x1600 (WQXGA)	Y	Y	Y	N	N	N	N	Y	N	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N	N	N
3840x2160@30	Y	Y	Y	N	N	N	N	Y	N	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N	N
3840x2160@60 4:2:0	Y	Y	Y	N	N	N	N	Y	N	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	P	N
3840x2160@60 4:4:4	Y	Y	Y	N	N	N	N	Y	N	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	N
4096x2160@30	Y	Y	Y	N	N	N	N	Y	N	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N
4096x2160@60 4:2:0	Y	Y	Y	N	N	N	N	Y	N	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	P	P
4096x2160@60 4:4:4	Y	Y	Y	N	N	N	N	Y	N	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y

Y: Supported, P: Only YCbCr4:2:0, N: Not supported

Timing of [720p]/[1080i]/[1080p]/[3840x2160]/[4096x2160] meets the CTA-861 standard.
For other resolutions, timing parameters meet the VESA DMT or VESA CVT standard.

Copying EDID

EDID of sink device is read and saved to the MSD-V4.
You can name the EDID at the time of saving by using ASCII code 20 to 7D (Up to 10 characters).

Menu	EDID SETTINGS→SINK DEVICE EDID COPY		N/A
Parameter	No.1 to No.8		
	Output connector	EDID name	
Value	OUT1A, OUT1B, OUT2A, OUT2B	ASCII 20 to 7D (Up to 10characters) COPY DATA1 to COPY DATA8	

Press the MENU/ENTER button to accept the set value.

EDID of the sink device connected to the selected output connector is read and saved.
To use the saved EDID, set "**EDID selection (P.48)**".

If no sink device is connected to the selected output connector, a message, [UNCONNECTED], appears and data cannot be saved.

Signal format

You can set the signal format of the MSD-V4 for if "**EDID selection (P.48)**" is set to [BUILT-IN EDID].

Menu	EDID SETTINGS→SIGNAL FORMAT	Advanced	N/A
Parameter	IN1 to IN4		
Value	HDMI, DVI		

Press the MENU/ENTER button to accept the set value.
[HDMI] : Sets the MSD-V4 as an HDMI device.
[DVI] : Sets the MSD-V4 as an DVI device. Audio signal is not supported.

If selecting [DVI], the following settings will be disabled:
【Deep Color (P.51)】
【LPCM audio (P.51)】
【Bitstream audio (P.52)】
【Speaker configuration (P.53)】

Frame rate

You can set the vertical synchronous frequency (frame rate) of the MSD-V4 for if "**EDID selection (P.48)**" is set to [BUILT-IN EDID].

Menu	EDID SETTINGS→FRAME RATE	Advanced	N/A
Parameter	IN1 to IN4		
Value	60Hz, 50Hz		

Press the MENU/ENTER button to accept the set value.

If selecting [50Hz], 60 Hz and 30 Hz vertical synchronous frequency of "**Resolution (P.49)**" will be 50 Hz and 25 Hz, respectively.

Deep Color

You can set the color depth of the MSD-V4 for if “**EDID selection (P.48)**” is set to [BUILT-IN EDID] and “**Signal format (P.50)**” is set to [HDMI].

Menu	EDID SETTINGS→DEEP COLOR	Advanced	N/A
Parameter	IN1 to IN4		
Value	24-BIT COLOR, 30-BIT COLOR		

Press the MENU/ENTER button to accept the set value.

If selecting [30-BIT COLOR] and the source device outputs video at 30 bit, it may cause noise on the video or signal may not be transmitted. In such a case, the problem may be solved by setting the color to [24-BIT COLOR].

LPCM audio

You can set the MSD-V4’s maximum sampling frequency of the LPCM audio for if “**EDID selection (P.48)**” is set to [BUILT-IN EDID] and “**Signal format (P.50)**” is set to [HDMI].

Menu	EDID SETTINGS→Linear PCM	Advanced	N/A
Parameter	IN1 to IN4		
Value	192kHz, 176.4kHz, 96kHz, 88.2kHz, 48kHz, 44.1kHz, 32kHz		

Press the MENU/ENTER button to accept the set value.

Bitstream audio

You can set the MSD-V4's maximum sampling frequency of the Bitstream audio for if "**EDID selection (P.48)**" is set to [BUILT-IN EDID] and "**Signal format (P.50)**" is set to [HDMI].

Menu	EDID SETTINGS→AAC	Advanced	N/A
Parameter	IN1 to IN4		
Value	OFF, 96kHz, 88.2kHz, 48kHz, 44.1kHz, 32kHz		

Menu	EDID SETTINGS→Dolby Digital	Advanced	N/A
Parameter	IN1 to IN4		
Value	OFF, 48kHz, 44.1kHz, 32kHz		

Menu	EDID SETTINGS→Dolby Digital Plus	Advanced	N/A
Parameter	IN1 to IN4		
Value	OFF, 48kHz, 44.1kHz, 32kHz		

Menu	EDID SETTINGS→Dolby TrueHD	Advanced	N/A
Parameter	IN1 to IN4		
Value	OFF, 192kHz, 176.4kHz, 96kHz, 88.2kHz, 48kHz, 44.1kHz		

Menu	EDID SETTINGS→DTS	Advanced	N/A
Parameter	IN1 to IN4		
Value	OFF, 96kHz, 48kHz, 44.1kHz, 32kHz		

Menu	EDID SETTINGS→DTS-HD	Advanced	N/A
Parameter	IN1 to IN4		
Value	OFF, 192kHz, 176.4kHz, 96kHz, 88.2kHz, 48kHz, 44.1kHz		

Press the MENU/ENTER button to accept the set value.

Speaker configuration

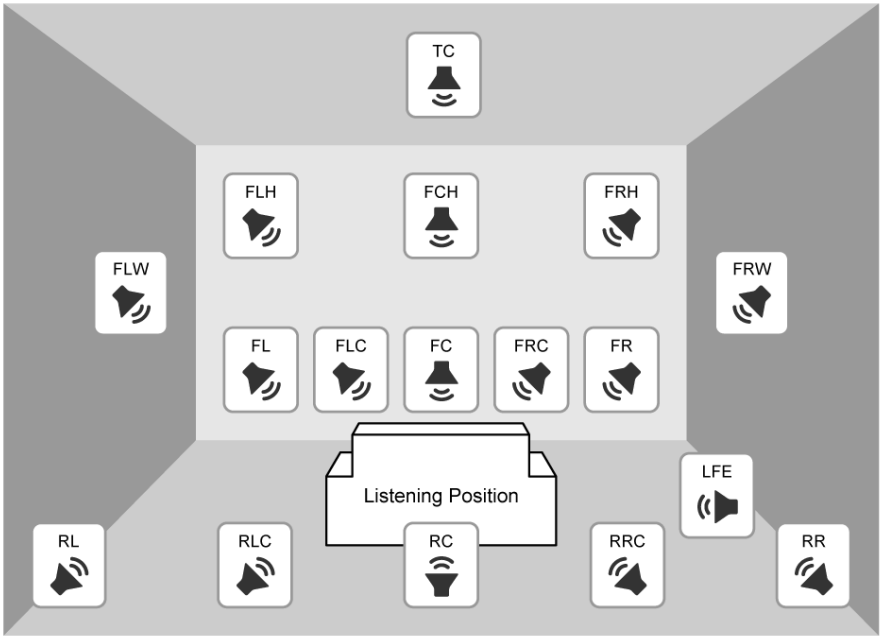
You can set the MSD-V4's speaker configuration of multi-channel audio for if "**EDID selection (P.48)**" is set to [BUILT-IN EDID] and "**Signal format (P.50)**" is set to [HDMI].

Menu	EDID SETTINGS→SPEAKER CONFIGURATION		Advanced	N/A
Parameter	IN1 to IN4			
	Mode	Number of speakers	Speaker configuration	
Value	AUTO	1 to 8 (2)	See the table below.	
	MANUAL	1 to 8	ON, OFF* *Only FL/FR: ON	

Press the MENU/ENTER button to accept the set value.

[AUTO] : Once the number of speakers is set, the speaker configuration will be set automatically.
[MANUAL] : Sets speaker configuration manually. Up to eight speakers can be used.
If the total number of the speakers exceeds the set value, a message, [DATA INVALID] appears on the front panel and the settings will not be applied.

Number of speakers	FL/ FR	LFE	FC	RL/ RR	RC	FLC/ FRC	RLC/ RRC	FLW/ FRW	FLH/ FRH	TC	FCH
1	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
2	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
3	ON	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
4	ON	ON	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
5	ON	ON	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF
6	ON	ON	ON	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF
7	ON	ON	ON	ON	ON	OFF	OFF	OFF	OFF	OFF	OFF
8	ON	ON	ON	ON	OFF	OFF	ON	OFF	OFF	OFF	OFF



FL	Front Left
FC	Front Center
FR	Front Right
FLC	Front Left Center
FRC	Front Right Center
RL	Rear Left
RC	Rear Center
RR	Rear Right
RLC	Rear Left Center

RRC	Rear Right Center
LFE	Low Frequency Effect
FLW	Front Left Wide
FRW	Front Right Wide
FLH	Front Left High
FCH	Front Center High
FRH	Front Right High
TC	Top Center

RS-232C

RS-232C communication via the RS-232C connector is enabled if the MSD-V4 switches into standby mode or powered on status.
RS-232C communication via OUT1B or OUT2B connector is enabled if MSD-V4 is in powered on status.

Communication setting

Menu	RS-232C SETTINGS→PARAMETERS			@GCT/@SCT
Parameter	RS1 (RS-232C), OUT1B, OUT2B			
	Baud rate [bps]	Data bit length [bit]	Parity check	Stop bit [bit]
Value	4800, 9600, 14400, 19200, 38400, 57600, 115200	7, 8	NONE, ODD, EVEN	1, 2

Press the MENU/ENTER button to accept the set value.

Operation mode

Menu	RS-232C SETTINGS→COMMUNICATION MODE	Advanced	@GCF/@SCF
Parameter	RS1 (RS-232C)	OUT1B, OUT2B	
Value	RECEIVER, TRANSMITTER	RECEIVER, TRANSMITTER	

Press the MENU/ENTER button to accept the set value.

[RECEIVER] : Receiver mode (Controlling the MSD-V4 from an external device)
[TRANSMITTER] : Transmitter mode (Controlling an external device from the MSD-V4)

LAN

LAN communication via the LAN connector is enabled if the MSD-V4 switches into standby mode or powered on status.
LAN communication via OUT1B or OUT2B connector is enabled if MSD-V4 is in powered on status.

Network

Menu	LAN SETTINGS→IP ADDRESS	@GIP/@SIP
Value	0.0.0.0 to 255.255.255.255 (192.168.1.199)	

Menu	LAN SETTINGS→SUBNET MASK	@GSB/@SSB
Value	0.0.0.0 to 255.255.255.254 (255.255.255.0)	

Menu	LAN SETTINGS→GATEWAY ADDRESS	@GGW/@SGW
Value	0.0.0.0 to 255.255.255.255 (192.168.1.200)	

Press the MENU/ENTER button to accept the set value.

MAC address

Menu	LAN SETTINGS→MAC ADDRESS	@GMC
Value	Specific values of the device	

Control command destination

Menu	LAN SETTINGS→COMMAND DESTINATION			@GLG/@SLG
Parameter	DESTINATION 1 to DESTINATION 12			
	Destination IP address	PJLink protocol connection	Destination connection number*1	PJLink protocol password*2
Value	192.168.1.198	ON, OFF	1 to 65535 (1100)	ASCII 20,30 to 39, 41 to 5A,61 to 7A (Up to 32 characters)

*1 Cannot be set for PJLink protocol connection. The port number is fixed at 4352.

*2 If password authentication is not needed, you can skip this setting.

Press the MENU/ENTER button to accept the set value.

Up to 12 connections for control command destination can be set.

If a control command is set [ON] for [LAN DESTINATION 1] to [LAN DESTINATION 12] in "**Registering/Editing control command (P.60)**" and it is executed, the command data is sent to the destination.

Automatic disconnection time (Timeout)

You can set the time to disconnect LAN communication automatically.

Menu	LAN SETTINGS→AUTO DISCONNECT	Advanced	@GLD/@SLD
Parameter	SERVER (Receiving commands)	CLIENT (Sending commands)	
Value	NOT DISCONNECT, 1 s to 180 s (30 s)	NOT DISCONNECT, 1 s to 180 s (3 s)	

[NOT DISCONNECT] : Does not disconnect LAN communication.
[1 s] to [180 s] : Disconnect LAN communication when the set time passes.

■ SERVER (Receiving commands)

Up to eight connections from an external device to the MSD-V4 can be set.

The MSD-V4 disconnects the LAN communication if the MSD-V4 does not receive a command for the specified time.

■ CLIENT (Sending commands)

Up to 12 connections from the MSD-V4 to an external device can be set.

The MSD-V4 disconnects LAN communication when the specified time passes after sending a command.

If selecting [NOT DISCONNECT], the MSD-V4 does not disconnect the communication from its side. Communication may not be disabled if exceeding the connection limit.

Communication of extension connector

You can enable/disable the LAN communication of extension connector.

Menu	LAN SETTINGS→LAN THROUGH	Advanced	N/A
Parameter	OUT1B, OUT2B		
Value	ON, OFF (HDBaseT output connector: ON, 10GbE output connector: OFF)		

*Only for device having 10GbE/HDBaseT output.

Set to [ON] if controlling an external device via LAN communication of a 10GbE/HDBaseT output connector.

■ LAN loop problem

The MSD-V4 includes switching hub function. If two or more LAN communication connectors of the MSD-V4 are connected to the same network, the network may be down due to a loop problem. In this case, set the LAN communication to [OFF].

SDVoE device detection

You can enable/disable a function for sending device detection packets of 10GbE output.

Menu	LAN SETTINGS→SDVoE DETECTION	Advanced	N/A
Parameter	OUT1B, OUT2B		
Value	ON, OFF		

Only for device having 10GbE output.

[ON] : Sends device detection packets.
[OFF] : Stops sending device detection packets.

The MSD sends device detection packets to the LAN in order to enable the IP-NINJAR Configurator or NJR-CTB detect the MSD. If you do not want the MSD to send unnecessary packets to the LAN, set this setting to [OFF]. In this case, the IP-NINJAR Configurator or NJR-CTB cannot detect the MSD and the MSD settings cannot be changed.

Control commands

The MSD-V4 can control external devices by using the registered control commands that are lined to function button operation, video/audio switching, and so on.

- **Controlling external devices via RS-232C/LAN communication**
  Example: Powering on/off
  To control external devices via RS-232C communication, set “**Operation mode (P.55)**” of the connector to [TRANSMITTER].
  To control external devices via LAN communication, set the command destination in “**Control command destination (P.56)**”.
  To control external devices via LAN communication of a 10GbE/HDBaseT output connector, set “**Communication of extension connector (P.57)**” to [ON].
- **Controlling external devices via contact closure (Contact closure)**
  Example: Pulling up/down a screen
- **Controlling external devices via CEC**
- **Controlling the MSD-V4 using Loop Back**
- **Controlling external devices using PJLink via a connector supporting LAN communication**
  For controlling a projector
  The MSD-V4 supports PJLink Class1.
  To enable PJLink, set [PJLINK] of the LAN communication connector to [ON] in “**Control command destination (P.56)**”, and set the password as needed.

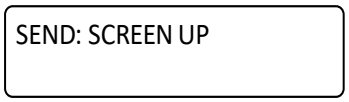
■ **Screen display during control command execution**

- When control command is executed, the MEMO (Note) saved to the control command will be displayed.
- When reply command is received, the MEMO (Note) saved to the return command will be displayed.
- When a control command with displaying received data from the external device is executed, the received data will be displayed.
- If full received data cannot be displayed on the front display, it will be scrolling displayed.

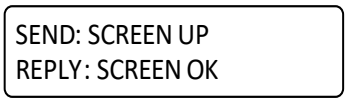
Examples:

(1) Control command: Saved as [SCREEN UP] in MEMO and displayed when control command is executed.
(2) Reply command: Saved as [SCREEN OK] in MEMO and displayed when the reply command is received.
(3) Control command with displays received data from an external device is executed and [%1LAMP=1000 1↵] is received.
(4) Reply command could not be received and retry over error occurs.

(1) Control command only

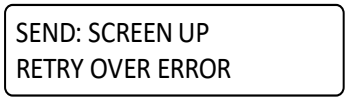


(2) Control command (Upper)
Reply command (Lower)



(3) Received data is displayed.

(4) Reply command could not be received and a retry over error occurs.



Registering/Editing control command

The MSD-V4 can control external devices by using the following controlling:

- I/F:RS-232C/LAN
- I/F:CONTACT CLOSURE
- I/F:CEC (For powering ON/OFF sink device only)

Menu	CONTROL COMMAND→COMMAND REGISTER/EDIT	@GEC/@SEC
Parameter	CMD 1 to CMD 64	
Value	I/F: RS-232C/LAN, CONTACT CLOSURE, CEC Varies depending on controlling. See the table below.	

■ **[RS-232C/LAN]**

Value		
DELAY	0s000ms to 999s999ms	Waiting time for execution of control commands.
RS1(RS-232C)*1 OUT1B RS(RS-232C)*1 OUT2B RS(RS-232C)*1 LOOP BACK LAN DESTINATION1 to LAN DESTINATION12*2	ON (Sending command), OFF (Not sending command)	Communication port for sending command data (RS-232C, LOOP BACK, LAN) Command data can be sent to multiple communication ports simultaneously.
INPUT MODE	ASCII, HEX	Inputting command data format
DATA	Up to 30 bytes ASCII (0A, 0D, 20 to 7D), HEX (00 to FF)	Command data
DATA SIZE	0 to 30 BYTE	Command data size to be sent
REPLY DISPLAY	OFF (Received data is not displayed. Checking if it matches the reply command), ASCII (Received data is displayed in ASCII), HEX (Received data is displayed in hex)	Checking if it matches the reply command Received data display mode ([ASCII]/[HEX]) on front display
DELIMITER*3	NONE*4 (Not check), 00 to FF (Hex)	Received data delimiter Received data until delimiter is reached as active data
REPLY1 to REPLY32*5	CHECK (Enabled), NOT CHECK (Disabled)	Checking if the received data matches the reply command
TIME OUT*6 *7	0s000ms to 99s999ms	Time from sending command data to receiving data
RETRY*6 *7	0 to 99 (times)	The number of retries to resend the command again if there is no valid reply command.
INTERVAL*6 *7	0s000ms to 99s999ms	The interval of retries to resend the command again if there is no valid reply command.
ERROR	EXEC (Executing next control command), STOP (Stopping executing control command)	The process if no valid replay command is replied after executing command for the set number of [RETRY].
MEMO	ASCII 20 to 7D (Up to 14 characters) (values other than 2C (,))	Characters displayed in the front display at the time of control command execution.

*1 If setting to [ON], set "**Operation mode (P.55)**" to [TRANSMITTER].

*2 If setting to [ON], set "**Control command destination (P.56)**".

*3 Available if setting [REPLY DISPLAY] to a value other than [OFF].

*4 If setting to [NONE], all data within the set time in [TIME OUT] will be valid data.

*5 Available if setting [REPLY DISPLAY] to [OFF].

*6 You can skip this setting, if setting only [LOOP BACK] to [ON].

*7 You can skip this setting, if setting all [REPLY1] to [REPLY32] to [NOT CHECK].

Press the MENU/ENTER button to accept the set value.

To check loop back execution

The MSD-V4 sends a communication command back to the MSD-V4 itself using the loop back function. It replies [OK] if processed normally while replying [NG] if parameter or command is incorrect. To check if control is proceeded normally, set [REPLY31] and [REPLY32] to [CHECK] (enabled).

■ **[CONTACT CLOSURE]**

Value		
DELAY	0s000ms to 999s999ms	Waiting time from execution to the contact closure control.
CONTACT CLOSURE1 CH1 to CH3	― (Not controlling contact closure), ON (Contact closure ON), OFF (Contact closure OFF), TGL (Toggle)	Contact closure ON/OFF state Toggle operation: Reverses the contact closure state
PULSE	NONE (Keeping state), 100ms to 9990ms (by 10ms)	Time to restore the contact closure after control.
MEMO	ASCII 20 to 7D (Up to 14 characters) (values other than 2C (,))	Characters displayed in the front display at the time of control command execution.

Press the MENU/ENTER button to accept the set value.

■ **[CEC]**

Value		
DELAY	0s000ms to 999s999ms	Waiting time from execution to CEC control of control commands.
OUT1A CEC OUT1B CEC* OUT2A CEC OUT2B CEC*	― (Not controlling CEC), POWER ON, POWER OFF	Power of the sink device controlled via CEC
ERROR	EXEC (Executing next control command), STOP (Stopping executing control command)	When no reply from the connected sink device
MEMO	ASCII 20 to 7D (Up to 14 characters) (values other than 2C (,))	Characters displayed in the front display at the time of control command execution.

*Only for device having HDBaseT output.

Press the MENU/ENTER button to accept the set value.

■ **[PJLink]**

Register the following commands for [DATA] in "**[RS-232C/LAN] (P.61)**".

PJLink command (Class1)										Description
%	1	P	O	W	R	(SP)	0	(CR)		Power off (Standby)
%	1	P	O	W	R	(SP)	1	(CR)		Power on (Lamp on)
%	1	P	O	W	R	(SP)	?	(CR)		Get power status
%	1	I	N	P	T	(SP)	1	●*	(CR)	Switch input to RGB
%	1	I	N	P	T	(SP)	2	●*	(CR)	Switch input to VIDEO
%	1	I	N	P	T	(SP)	3	●*	(CR)	Switch input to DIGITAL
%	1	I	N	P	T	(SP)	4	●*	(CR)	Switch input to STORAGE
%	1	I	N	P	T	(SP)	5	●*	(CR)	Switch input to NETWORK
%	1	I	N	P	T	(SP)	?	(CR)		Get input selection settings
%	1	A	V	M	T	(SP)	1	0	(CR)	Switch off video mute
%	1	A	V	M	T	(SP)	1	1	(CR)	Switch on video mute
%	1	A	V	M	T	(SP)	2	0	(CR)	Switch off audio mute
%	1	A	V	M	T	(SP)	2	1	(CR)	Switch on audio mute
%	1	A	V	M	T	(SP)	3	0	(CR)	Video + audio mute off
%	1	A	V	M	T	(SP)	3	1	(CR)	Video + audio mute on
%	1	A	V	M	T	(SP)	?	(CR)		Get mute settings
%	1	E	R	S	T	(SP)	?	(CR)		Get error status
%	1	L	A	M	P	(SP)	?	(CR)		Get time and status of lamp
%	1	I	N	S	T	(SP)	?	(CR)		Get list of switching input
%	1	N	A	M	E	(SP)	?	(CR)		Get projector name
%	1	I	N	F	1	(SP)	?	(CR)		Get manufacture name
%	1	I	N	F	2	(SP)	?	(CR)		Get product name
%	1	I	N	F	O	(SP)	?	(CR)		Get other information (optional of manufacturer)

(SP): space, (CR): delimiter, ●: Command characters

*Input number (1 to 9) of the projector to be controlled. Selectable number depends on the controlled projector.

PJLink specifications regulate that projectors are required to reply the reply commands within two seconds after receiving the PJLink command. However, some projectors have different specifications. Check the manual of your projector and apply the response time indicated in the manual if there is one listed.

Registering/Editing reply command

You can register the expected value to be received data as a reply command data, and you also can set the MSD-V4 operation when the received data from external device and reply command data are matched.

Menu	CONTROL COMMAND→REPLY REGISTER/EDIT	@GRC/@SRC
Parameter	REPLY1 to REPLY32	
Value		
PROCESS	EXEC (Continuing execution), RETRY (Resending reply commands), STOP (Stopping execution)	Operation when the received data and reply command data are matched.
PJLink	ON, OFF	PJLink command preset for reply command data
INPUT MODE	ASCII, HEX	Reply command data input mode ([ASCII]/[HEX])
DATA	Up to 30 bytes ASCII (0A, 0D, 20 to 7D), HEX (00 to FF)	Reply command data
DATA SIZE	0 to 30 BYTE	Size of reply command data
MASK	00 to FF Available if [INPUT MODE] is set to [HEX] Available if [INPUT MODE] is set to [ASCII] (FF fixed)	Mask data Each bit of the received data is ANDed to each bit of mask data, and the result will be compared with the reply command data.
MEMO	ASCII 20 to 7D (Up to 14 characters) (values other than 2C (,))	Characters to be displayed on the front display when received data and reply data are matched.

Press the MENU/ENTER button to accept the set value.

If using a reply command, set the reply command number to [CHECK] in "**[RS-232C/LAN] (P.61)**".

To check loop back execution

The MSD-V4 sends a communication command back to the MSD-V4 itself using the loop back function. It replies [OK] if processed normally while replying [NG] if parameter or command is incorrect. To check if control is proceeded normally, the following [REPLY31: OK] and [REPLY32: NG] are used. Do not edit or delete them.

Reply command	REPLY31	REPLY32
PROCESS	EXEC	STOP
PJLink	OFF	OFF
INPUT MODE	ASCII	ASCII
DATA	OK	NG
DATA SIZE	2BYTE	2BYTE
MASK	FF	FF
MEMO	OK	NG

■ **[PJLink]**

To check the received data from a projector, register the following commands for [DATA].

Received data from a projector is replies as follows:

First six bytes : Sent command data
Seventh byte : [=]
Eighth byte or later bytes : Result

PJLink reply command (Class1)														Description
%	1	●	●	●	●	=	O	K	(CR)					Terminated normally
%	1	●	●	●	●	=	E	R	R	1	(CR)			Undefined command
%	1	●	●	●	●	=	E	R	R	2	(CR)			Invalid parameter
%	1	●	●	●	●	=	E	R	R	3	(CR)			Not acceptable
%	1	●	●	●	●	=	E	R	R	4	(CR)			Malfunction of projector

(CR): delimiter, ●: Command characters

Reply command for status														Description
Reply command to power status commands														
%	1	P	O	W	R	=	0	(CR)						Standby
%	1	P	O	W	R	=	1	(CR)						Power ON
%	1	P	O	W	R	=	2	(CR)						Cooling
%	1	P	O	W	R	=	3	(CR)						Warming up
Reply command to input status commands														
%	1	I	N	P	T	=	1	●*1	(CR)					RGB selected
%	1	I	N	P	T	=	2	●*1	(CR)					VIDEO selected
%	1	I	N	P	T	=	3	●*1	(CR)					DIGITAL selected
%	1	I	N	P	T	=	4	●*1	(CR)					STORAGE selected
%	1	I	N	P	T	=	5	●*1	(CR)					NETWORK selected
Get mute settings														
%	1	A	V	M	T	=	3	0	(CR)					Video + audio mute OFF
%	1	A	V	M	T	=	1	1	(CR)					Video mute ON
%	1	A	V	M	T	=	2	1	(CR)					Audio mute ON
%	1	A	V	M	T	=	3	1	(CR)					Video + audio mute ON
Get error status														
%	1	E	R	S	T	=	●*2	●*3	●*4	●*5	●*6	●*7	(CR)	See the annotation below.
Get time and status of lamp														
%	1	L	A	M	P	=	●*8	(SP)	●*9	(CR)				See the annotation below.
Get list of input switching														
%	1	I	N	S	T	=	●*10	(CR)						See the annotation below.
Get projector name														
%	1	N	A	M	E	=	●*11	(CR)						See the annotation below.
Get manufacturer name														
%	1	I	N	F	1	=	●*12	(CR)						See the annotation below.
Get product name														
%	1	I	N	F	2	=	●*12	(CR)						See the annotation below.
Get other information (optional)														
%	1	I	N	F	O	=	●*12	(CR)						See the annotation below.

(SP): space, (CR): delimiter, ●: Command characters

*1 Input number: 1 to 9
The selectable input numbers vary depending on connected projectors.
*2 Fan error (0: Error not detected or no detect error function, 1: Warning, 2: Error)
*3 Lamp error (0: Error not detected or no detect error function, 1: Warning, 2: Error)
*4 Temperature error (0: Error not detected or no detect error function, 1: Warning, 2: Error)
*5 Cover open error (0: Error not detected or no detect error function, 1: Warning, 2: Error)
*6 Filter error (0: Error not detected or no detect error function, 1: Warning, 2: Error)
*7 Other errors (0: Error not detected or no detect error function, 1: Warning, 2: Error)
*8 Accumulated time of lamp: 0 to 99999
For projectors that do not count the accumulated time, the value is 0 at all times.
*9 Whether the lamp illuminates or not (0 or 1).
0: Not illuminated, 1: Illuminated
For devices containing multiple lamps, accumulated time and lightning state for each device are replied in sequence. For example, if a device contains three lamps, the following command is replied: %1LAMP=accumulated time 1(SP) lightning state 1(SP) accumulated time 2(SP) lightning state 2(SP) accumulated time 3(SP) lightning state 3 CR
*10 Input switchable source number: 11 to 59 (same as that of %INPT command).
For devices containing multiple inputs, multiple statuses separated with a (SP) are sent.
For example, for a device having two inputs, %1INST= source number 1(SP) source number 2CR is sent.
*11 20 to FF in hex: Up to 64 characters
*12 20 to 7F in hex: Up to 32 characters

■ **Mask data**

The received data from external device and mask data are compared by a bit with AND to determine the match.

If comparing them by all bits, set the mask data to [FF].
If [INPUT MODE] is set to [ASCII] at the time of reply command registration, the mask data is fixed at [FF] automatically.

Example: [0] of ASCII codes ([30] in hex) is replied:

	Binary			Binary	Hexadecimal
Received data from an external device	00110000	&	MASK	11111111	= 30
Reply command data registered in the MSD-V4	00110000				= 30 matched

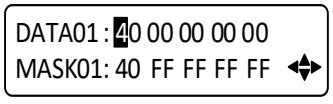
Front display

If using bits that specify the matching condition, set the bit to [1] and set other bits to [0].
Example: the seventh bit of the received data is used:

	Binary			Binary	Hexadecimal
Received data from an external device	11111111	&	(MASK)	01000000	= 40
Reply command data registered in the MSD-V4	01000000				= 40 matched

	Binary			Binary	Hexadecimal
Received data from an external device	10111111	&	(MASK)	01000000	= 00
Reply command data registered in the MSD-V4	01000000				= 40 not matched

Front display



Command link

You can link registered control commands to execution conditions.

Menu	CONTROL COMMAND→COMMAND LINK		@GCC/@SCC
Parameter	F1 to F9		POWER ON, STANDBY, VIDEO:MAIN1-IN1 to VIDEO:MAIN1-IN4 VIDEO:MAIN1-OFF, AUDIO:MAIN1-IN1 to AUDIO:MAIN1-IN4 AUDIO:MAIN1-OFF, VIDEO:MAIN2-IN1 to VIDEO:MAIN2-IN4 VIDEO:MAIN2-OFF, AUDIO:MAIN2-IN1 to AUDIO:MAIN2-IN4 AUDIO:MAIN2-OFF
	TOGGLE	STARTUP	—
Value	ON	AUTO, A (Plane A), B (Plane B)	—
	OFF	—	
Parameter	[TOGGLE] is set to [OFF]: 1st to 10th [TOGGLE] is set to [ON] : A-1st to A-10th B-1st to B-10th		1st to 10th
Value	OFF, CMD 1 to CMD 64		

Press the MENU/ENTER button to accept the set value.

[F1] to [F9] : Execution condition: The function button
Executed only if "**Function button assignment (P.82)**" is set to [COMMAND] or [DISPLAY POWER].
[POWER ON] : Execution condition: The MSD-V4 is powered on.
[STANDBY] : Execution condition: The MSD-V4 switches into standby mode.
[VIDEO] : Execution condition: Video input channel is selected.
[AUDIO] : Execution condition: Audio input channel is selected.
[TOGGLE] : Set to [ON] to execute another plane.
[STARTUP] : Set the plane to be executed at the time of MSD-V4 starts up. Available only if [TOGGLE] is set to [ON].
If setting to [AUTO], the last plane is used at the next start-up.

Up to 10 control commands can be linked to an execution condition, such as pressing a function button, powering ON the MSD-V4, selecting input channel, and so on.
Function buttons can be toggled (Planes A and B), and you can specify which plane is executed at start-up.

Command execution

Menu	CONTROL COMMAND→EXECUTE CTRL COMMAND	@EXC
Value	CMD 1 to CMD 64, F1 to F9	

Press the MENU/ENTER button to execute control commands.

Only executable command can be selected.
Commands cannot be executed in the following conditions:

- Function button to which no control command is linked
- The control command is set to [RS-232C/LAN], but [DATA SIZE] is set to [0].
- The control command is set to [RS-232C/LAN] , but all the communication ports are set to [OFF].
- The control command is set to [RS-232C/LAN], but the communication RS-232C "**Operation mode (P.55)**" is set to [RECEIVER].
- The control command is set to [CONTACT CLOSURE] and they are all set to [－] (Not controlled).
- The control command is set to [CEC] and they are all set to [－] (Not controlled).

Registered control commands can be executed from communication commands or WEB browser.
Commands assigned to F1 to F4 can also be executed from front buttons.

Initializing registered command data, reply command, and link

Menu	CONTROL COMMAND→INITIALIZATION	@DEC
Parameter	CMD 1 to CMD 64 (Control command), REPLY1 to REPLY32 (Reply command), F1 to AUDIO: MAIN2-OFF (Control command association)	
Value	YES, NO	

Select [YES] and press the MENU/ENTER button to initialize the settings.
【Registering/Editing control command (P.60)】
【Registering/Editing reply command (P.64)】
【Command link (P.68)】

Note

To restore settings, make a backup copy.

Ignoring duration after control command execution

Menu	CONTROL COMMAND→INVALID DURATION	N/A
Value	0s000ms to 999s999ms	

Right after control command execution is completed, the next command can be executed. Use this feature to prevent repeated execution caused by pressing the control command execution button twice.

During invalid operation time, all button operations are disabled.
The next operation will be executed after the previous control command is completed and the set ignoring duration time passed.

Illuminating function buttons

You can set the illuminating function for function buttons on the WEB browser and on the front panel.

Menu	CONTROL COMMAND→ILLUMINATE FN. BUTTON	N/A
Parameter	F1 to F9	
Value	REGISTERED, EXECUTION	

Two planes (A and B, toggled) can be linked to a button.

Value	If you register a command for one plane	If you register commands for both two planes
REGISTERED	Illuminates if a control command is registered.	Illuminates if A will be executed at the next press; blinks if B will be executed at the next press.
EXECUTION	Illuminates while a control command is being executed. (If execution duration is 500 ms. or shorter, the button LED illuminates for 500 ms. (0.5 sec.)	Illuminates if A will be executed at the next press; turned off if B will be executed at the next press.

Enabled if "**Function button assignment (P.82)**" is set to [COMMAND] or [DISPLAY POWER].

Function button blinking duration

The function buttons blink for the specified duration while the linked command are being executed.

Menu	CONTROL COMMAND→BLINKING DURATION	N/A
Parameter	F1 to F4	
Value	EXECUTION (Blinks while a control command is being executed), OFF (Not blink), 1s to 1000s	

If setting to [1s] to [1000s], the button continues to blink if the command execution is not completed even after the specified duration.

Enabled if "**Function button assignment (P.82)**" is set to [COMMAND] or [DISPLAY POWER].

User preset

You can save, edit, and recall the three following user presets:

- Crosspoint memory : Input channel selection of video/audio
- Preset memory : Input channel selection of video/audio and output video settings and the like
- Pattern memory : Window position, size settings and the like

Crosspoint memory

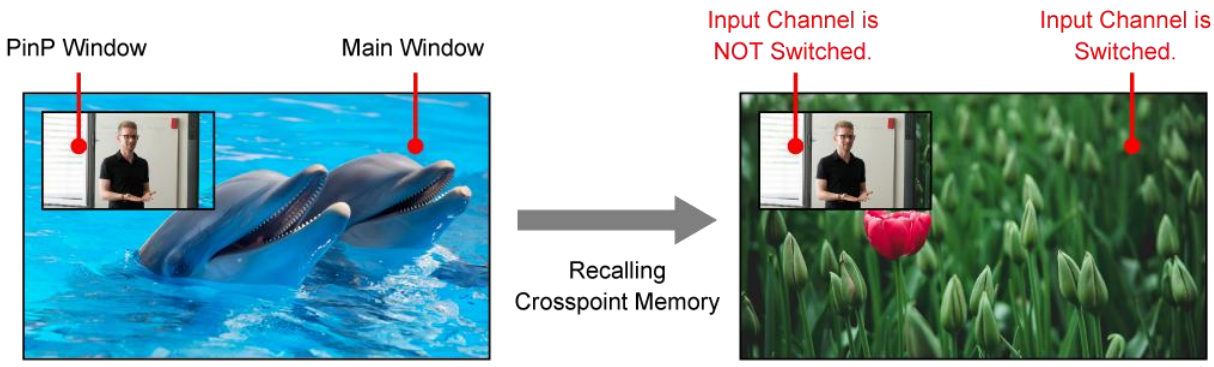
You can save and recall the input channel selection of video and audio.

Once crosspoint memory is recalled, input channels of video and audio are switched according to the saved input channel selection.

The default values is [N/A] (No input channel selection information) for all.
An output channel with [N/A] (No input channel selection information) setting keeps the current input channel selection.

You can recall the crosspoint memory with the current input channel selection kept for specified output channels by setting "**Editing crosspoint memory (P.72)**" to [N/A].

■ **Example: PinP is set to [N/A](No input channel selection information)**



Saving crosspoint memory

Menu	USER PRESET→STORE CROSSPOINT	@SCM
Parameter	Crosspoint memory number	Crosspoint memory name
Value	No.1 to No.9	ASCII 20 to 7D (Up to 10 characters)

Press the MENU/ENTER button to save the crosspoint memory.

Editing crosspoint memory

Menu	USER PRESET→EDIT CROSSPOINT	Advanced	@GCM/@ECM
Parameter	No.1 to No.9		
	MAIN1, MAIN2	PinP1, PinP2	NAME
	VIDEO, AUDIO	VIDEO	
Value	N/A, 1 to 4, OFF	N/A, 1 to 4, OFF	ASCII 20 to 7D (Up to 10 characters)

Press the MENU/ENTER button to save the crosspoint memory.

[N/A]: Keeps the current input channel selection.
The input channel is not switched even after recalling the crosspoint memory.

Recalling crosspoint memory

Menu	USER PRESET→RECALL CROSSPOINT	@RCM
Parameter	Crosspoint memory number	
Value	No.1 to No.9	

Press the MENU/ENTER button to recall the crosspoint memory.

Preset memory

You can save and recall the settings and input channel selection information of video and audio.

Nothing is saved to the preset memory by default.

The output settings that saved in the preset memory can be recalled with the current input channel selections kept or recalled together with a saved crosspoint memory.

Saving preset memory

Menu	USER PRESET→STORE PRESET SETTINGS	@SPM
Parameter	Preset memory number	Preset memory name
Value	No.1 to No.9	ASCII 20 to 7D (Up to 10 characters)

Press the MENU/ENTER button to save the preset memory.

The following settings and input channel selection information are saved to the preset memory:

【Output video (P.17)】 (Image position, Image size, Cropping, Background color, PinP window output)
【Output (P.24)】 (Video output for when no signal is input)
【Picture adjustment (P.41)】 (Output brightness/contrast/gamma)
【Output audio (P.43)】 (Audio output, Audio level, Mute)
【Bitmap (P.76)】 (Bitmap output, Background color, Aspect ratio, Image position)

Recalling preset memory

Menu	USER PRESET→RECALL PRESET SETTINGS	@RPM
Parameter	Preset memory number	Input channel selection information
Value	No.1 to No.9	N/A, PRESET, CP_MEMORY1 to CP_MEMORY9

Press the MENU/ENTER button to recall the preset memory.

Only saved preset memory number is available.

[N/A] : Does not recall input channel selection information, keeps the current input channel selection information.
[PRESET] : Recalls the input channel selection information saved in the preset memory
[CP_MEMORY]: Recalls the input channel selection information saved in the crosspoint memory

Pattern memory

The following preset patterns are saved by default:

No.1

Main window only

No.2

PinP window is displayed.
(Upper-left)

No.3

PinP window is displayed.
(Upper-right)

No.4

PinP window is displayed.
(Lower-right)

No.5

PinP window is displayed.
(Side-by-Side)

Saving pattern memory

Menu	USER PRESET→STORE PATTERN		@SWM
Parameter	Pattern memory number	Output channel	Pattern memory name
Value	No.1 to No.5	OUT1, OUT2	ASCII 20 to 7D (Up to 10 characters)

Press the MENU/ENTER button to save the pattern memory.

The following output video settings are saved to the pattern memory:
【Image position (P.19)】
【Image size (P.20)】
【Cropping (P.21)】
【PinP window output (P.23)】

Recalling pattern memory

Menu	USER PRESET→RECALL PATTERN		@RWM
Parameter	Pattern memory number	Output channel	
Value	No.1 to No.5	OUT1, OUT2	

Press the MENU/ENTER button to recall the pattern memory.

Settings saved in the pattern memory are recalled to the selected output channel.

Copying output settings

You can copy the settings of the selected output channel to other output channels.

Menu	USER PRESET→COPY OUTPUT SETTINGS	Advanced	N/A
Value	OUT1→OUT2, OUT2→OUT1		

Press the MENU/ENTER button to copy the settings.
Available only for devices having two outputs.

The following setting and input channel selection information are copied:

【Output video (P.17)】 (Output resolution, Aspect ratio for sink device, Image position, Image size, Cropping, Background color, Test pattern, PinP window output)
【Output (P.24)】 (Video synchronous signal output, Video mute, Video synchronous signal output for when no video signal input, Video output for when no signal is input, HDCP authentication, HDCP retries, Signal format, HDBaseT long reach mode, Deep Color, Window transition effect, Window transition speed, Automatic determining sink device EDID, Hot plug ignoring duration, CEC connection)
【Picture adjustment (P.41)】 (Output brightness/contrast/gamma)
【Output audio (P.43)】 (Audio output, Audio level, Mute, Lip Sync, Sampling frequency, Multi-channel audio output, Downmix, Test tone)
【Bitmap (P.76)】 (Bitmap output, Background color, Aspect ratio, Image position, Assigning input channel, Start-up bitmap output)

Start-up memory

You can set the user preset that is recalled when the MSD-V4 is powered ON.

Menu	USER PRESET→START-UP MEMORY	N/A
Value	LAST MEMORY, CROSS POINT 1 to CROSS POINT 9, PRESET MEMORY 1 to PRESET MEMORY 9	

[LAST MEMORY] : Recalls settings of that before the MSD-V4 switches into standby mode or powered off status.
[CROSS POINT] : Recalls the selected crosspoint memory. For settings other than input channel selection information, the last settings before powered OFF are recalled.
[PRESET MEMORY] : Recalls the selected preset memory (including input channel selection information). For settings that are not saved in preset memory, last settings before the MSD-V4 switches into standby mode or powered off status are recalled. Only saved preset memory numbers are available.

Bitmap

Up to four bitmap files can be saved to the MSD-V4, and one of the saved files can be output on the start-up screen, main window, and PinP window separately.

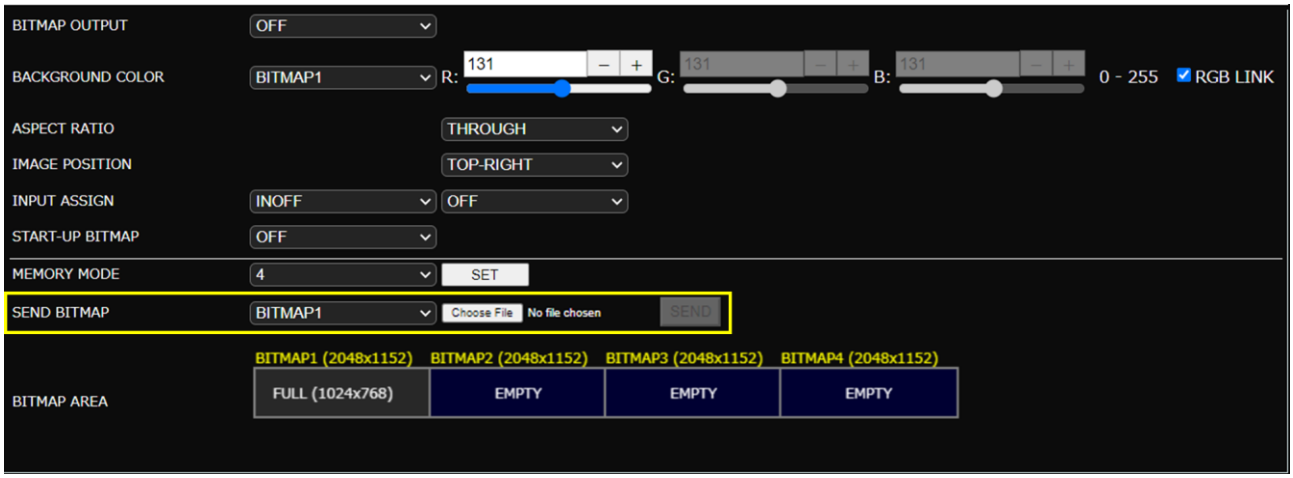
Features:

- Image can be displayed at the same size.
- Image size can be increased while keeping the aspect ratio.
- Image size can be increased to full-window size.
- Background color can be set for each bitmap.
- Bitmap can be assigned to input channels and displayed as an input video.

Bitmap size cannot be decreased. If a bitmap is bigger than window, only part of the bitmap is displayed.

■ Saving bitmap file

A bitmap file selected from an WEB browser can be saved to the MSD-V4.
IDK's logo is saved by **factory** default.



Notes

- Do not power off the MSD-V4 while the message, [Writing Bitmap Please Wait...] appears on the front panel display. The settings may be deleted.
- The stored bitmap file is not deleted even after initialization or it cannot be backed up.

■ Supported bitmap file

To store bitmap files, the MSD-V4 supports DIB (Device Independent Bitmap) with a header generally used for Windows. These files need to meet the following requirements:

File header : BITMAPFILEHEADER
Information header : BITMAPCOREHEADER (for OS/2), BITMAPINFOHEADER (for Windows)
The number of colors : 2 colors (monochrome, 1 bit), 16 colors (4 bits), 256 colors (8 bits), 16.77 million colors (TRUE COLOR, 24 bits)
Size of an image: : [MEMORY MODE] [2K (4 BITMAPS)] : 2048x1152 or smaller
[MEMORY MODE] [4K (1 BITMAP)] : 4096x2160 or smaller
Compression format : No compression (BI_RGB), 8 bit-run-length compression (BI_RLE8), 4 bit-run-length compression (BI_RLE4)

Bitmap output

Menu	BITMAP→BITMAP OUTPUT	@GBM/@SBM
Parameter	MAIN1, MAIN2, PinP1, PinP2	
Value	OFF, BITMAP 1 ON, BITMAP 2 ON, BITMAP 3 ON, BITMAP 4 ON	

Only numbers to which bitmap is saved can be selected.

Background color

Menu	BITMAP→BACKGROUND COLOR	Advanced	N/A
Parameter	OUT1, OUT2		
	Bitmap number 1 to 4		
	R (Red), G (Green), B (Blue), RGB (Red/Green/Blue)		
Value	0 to 255		

Only numbers to which bitmap is saved can be selected.

If the bitmap is smaller than PinP window, the lower-layer video is displayed.

Aspect ratio

Menu	BITMAP→ASPECT RATIO	Advanced	N/A
Parameter	MAIN1, MAIN2, PinP1, PinP2		
	Bitmap number 1 to 4		
Value	AUTO, THROUGH, FULL		

Only numbers to which bitmap is saved can be selected.

[AUTO] : Keeps the aspect ratio of the bitmap.
[THROUGH]: Does not increase the bitmap size.
[FULL] : Increases the image to full-window size.

For no image area, the lower-layer video is displayed.

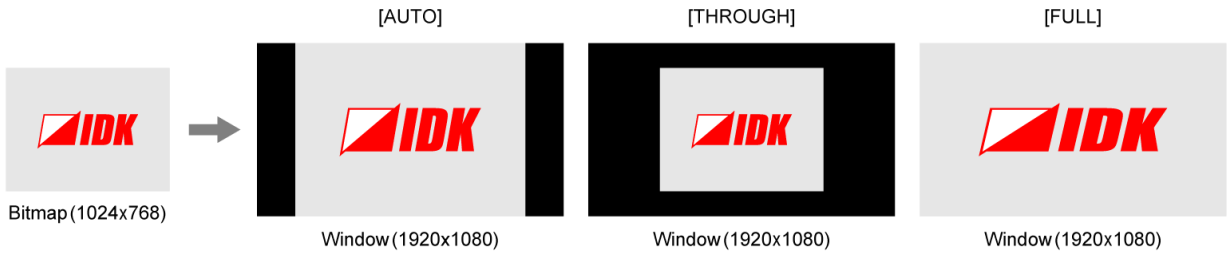


Image position

Menu	BITMAP→IMAGE POSITION	Advanced	N/A
Parameter	MAIN1, MAIN2, PinP1, PinP2		
	Bitmap1 to 4		
Value	CENTER, TOP-LEFT, BOTTOM-LEFT, TOP-RIGHT, BOTTOM-RIGHT		

Only numbers to which bitmap is saved can be selected.

[CENTER]

[TOP-LEFT]

[BOTTOM-LEFT]

[TOP-RIGHT]

[BOTTOM-RIGHT]

Assigning input channel

You can set which bitmap is output for when input channel is selected.

Menu	BITMAP→INPUT ASSIGN	Advanced	N/A
Parameter	MAIN1, MAIN2, PinP1, PinP2		
	IN1 to IN4, INOFF		
Value	OFF, BITMAP 1 ON, BITMAP 2 ON, BITMAP 3 ON, BITMAP 4 ON		

Press the MENU/ENTER button to accept the set value.
Only numbers to which bitmap is saved can be selected.

Start-up bitmap output

You can set which bitmap is output at the time of MSD-V4 start-up.

Menu	BITMAP→START-UP BITMAP	Advanced	N/A
Parameter	OUT1, OUT2		
Value	OFF, BITMAP 1 ON, BITMAP 2 ON, BITMAP 3 ON, BITMAP 4 ON		

Only numbers to which bitmap is saved can be selected.

If selecting a value other than [OFF], the bitmap is displayed for seven seconds.

Bitmap memory mode

Menu	BITMAP→MEMORY MODE	Advanced	N/A
Value	2K (4 BITMAPS), 4K (1 BITMAP)		

Press the MENU/ENTER button to accept the set value.

[2K (4 BITMAPS)] : Up to four 2048x1152 or smaller bitmaps
[4K (1 BITMAP)] : Up to one 4096x2160 or smaller bitmap

Once the memory mode is switched, the registered bitmap is deleted, and the following settings will be initialized:
【Bitmap output (P.77)】
【Assigning input channel (P.78)】
【Start-up bitmap output (P.78)】
【Video output for when no signal is input (P.25)】

Notes

- Bitmap data cannot be backed up. Save the bitmap again after switching the memory mode.
- Settings of "**Video output for when no signal is input (P.25)**" are initialized only if BITMAP1, BITMAP2, BITMAP3, or BITMAP4 is selected.

Start-up settings

You can specify the settings for when the MSD-V4 is powered ON or starts up.

Start-up status

You can set the status for when the MSD-V4 is powered ON.

Menu	POWER ON SETTINGS→SYSTEM START-UP	Advanced	N/A
Value	AUTO, ON, OFF		

[AUTO] : Becomes last status before powered OFF.
[ON] : Starts up the MSD-V4.
[OFF] : Becomes standby status.

Control command execution

Control command liked to function buttons can be executed when the MSD-V4 starts up.

Menu	POWER ON SETTINGS→FUNCTION CMD.EXE.	Advanced	N/A
Parameter	F1 to F9		
Value	ON, OFF		

You can specify which plane (A/B) to be executed in “**Command link (P.68)**” [STARTUP].

Button security lockout

You can set the button security lockout when the MSD-V4 starts up.

Menu	POWER ON SETTINGS→BUTTON LOCK	Advanced	N/A
Value	AUTO, LOCK, UNLOCK		

[AUTO] : Starts up with the status before the MSD-V4 is powered OFF or switched into standby mode.
[LOCK] : Buttons are locked.
[UNLOCK] : Buttons are unlocked.

You can set the target buttons in “**Grouping button security lockout (P.82)**”.

Configuring MSD-V4

Input switching target

You can set input channel of which window is switched when an input channel selection button on the front panel is pressed.

Menu	SYSTEM SETTINGS→WINDOW SELECT	N/A
Value	MAIN, PinP	

[MAIN] : Switches the main window input channel.
[PinP] : Switches the PinP window input channel.

Channel switching mode

You can set which signal is switched when an input channel selection button on the front panel is pressed.

Menu	SYSTEM SETTINGS→SWITCHING MODE	N/A
Value	V&A (Video and Audio), VIDEO, AUDIO	

You can view which signal is selected by the following colors:
Amber : Video signal and audio signal
Green : Video signal only
Red : Audio signal only

Function button assignment

You can set the function to be executed when a function button is pressed.

Menu	SYSTEM SETTINGS→FUNCTION ASSIGNMENT	@GFA/@SFA
Parameter	F1 to F9	
Value	COMMAND, DISPLAY POWER, OUT1 PATTERN, OUT2 PATTERN, WINDOW SELECT, CROSSPOINT No.1 to CROSSPOINT No.9, PRESETMEMORY No.1 to PRESETMEMORY No.9	

[COMMAND] : Executes the control command that is set in "**Command link (P.68)**".
Front button operation is not available during command execution.
"**Illuminating function buttons (P.70)**" is set to [REGISTERD] and "**Function button blinking duration (P.70)**" is set to [OFF].

[DISPLAY POWER] : Executes the linked control command.
If the function of [DISPLAY POWER] is linked, another function button to which [DISPLAY POWER] is linked can be executed even during command.
"**Illuminating function buttons (P.70)**" is set to [EXECUTION] and "**Function button blinking duration (P.70)**" is set to [EXECUTION].

[PATTERN] : Recalls saved pattern memories.

[WINDOW SELECT] : Switches operation of input channel selection buttons.
Amber : Switches the main window input channel.
Green : Switches the PinP window input channel.

[CROSSPOINT] : Recalls saved crosspoint memories.

[PRESETMEMORY] : Recalls saved preset memories.
Available buttons blinks in amber.

Grouping button security lockout

Menu	SYSTEM SETTINGS→BUTTON LOCK TARGET	N/A
Parameter	CHANNEL, MENU, F BUTTON, STANDBY	
Value	LOCK, UNLOCK	

[CHANNEL] : Input selection buttons

[MENU] : MENU/ENTER button, BACK button, Navigation buttons (△▽◁▷)

[F BUTTON] : Function buttons

[STANDBY] : Power button

Abnormality detection alarm

You can enable/disable the alarm display feature on the front panel.

Menu	SYSTEM SETTINGS→ALARM	N/A
Value	ON (Enabled), OFF (Disabled)	

If setting to [ON] and an abnormality is detected, an alarm is displayed and the front display blinks.

```
******** ALARM ********
VOLTAGE  TEMP
```

[VOLTAGE]: Abnormality in internal power voltage is detected.
[TEMP] : Abnormality in internal temperature is detected.

WARNING

If an alarm is displayed on the front display, stop using the MSD-V4 immediately and contact us for support options. If you do not stop using, it may damage the MSD-V4 or result in fire.

Advanced menu display

You can enable/disable the advanced menus.

Menu	SYSTEM SETTINGS→ADVANCED MENU	N/A
Value	ON (Enabled), OFF (Disabled)	

For details of advanced menus, see “**Basic menus and Advanced menus (P.13)**”.

Automatic brightness adjustment of front display

Menu	SYSTEM SETTINGS→LUMINANCE CONTROL	Advanced	N/A
Value	ON, OFF		

If setting to [ON], the brightness is reduced after 10 seconds of inactivity. Once any front panel operation is performed the brightness returns to the high brightness.

Button press and hold time

You can set how long the function button is pressed and held for executing the linked command.

Menu	SYSTEM SETTINGS→BUTTON HOLD TIME	Advanced	N/A
Parameter	F1 BUTTON to F4 BUTTON		
Value	0ms to 5000ms (by 100ms)		

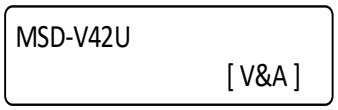
This feature prevents undesired operation by touching a button.

Top page

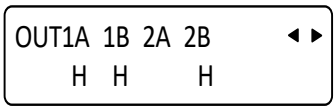
You can set the information to be displayed on the front display.

Menu	SYSTEM SETTINGS→TOP PAGE	Advanced	N/A
Value	NORMAL, OUTPUT STATUS, INPUT STATUS, AUDIO LEVEL		

[NORMAL]
Model name

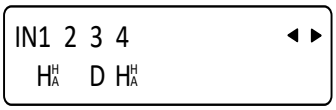


[OUTPUT STATUS]
Output signal status



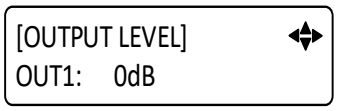
Up/Down buttons : Detailed information
Right/Left buttons : Output

[INPUT STATUS]
Input signal status



Up/Down buttons : Detailed information
Right/Left buttons : Input

[AUDIO LEVEL]
Output audio level



Up/Down buttons : Audio level
Right/Left buttons : Output

Initialization of all settings

You can initialize all settings or settings except for RS-232C and LAN communication settings.

Menu	SYSTEM SETTINGS→INITIALIZATION	Advanced	@CLR
Parameter	ALL, NORMAL		
Value	YES, NO		

Select [YES] and press the MENU/ENTER button to initialize the settings and reboot the MSD-V6.

[ALL] : Initializes all settings.
[NORMAL] : Initializes settings except for RS-232C and LAN communication settings.
【RS-232C (P.55)】(Communication setting)
【LAN (P.56)】 (Network, Automatic disconnection time (Timeout), Communication of extension connector, SDVoE device detection)

Note

To restore settings, make a backup copy.

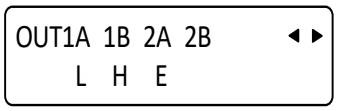
Status

You can view the statuses of I/O channel and the MSD-V4.

Output signal status

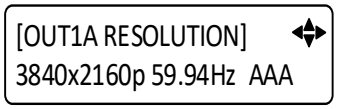
Menu	VIEW STATUS→OUTPUT STATUS	@GSS

■ Statuses of all output connectors



[H] : With HDCP output
[L] : Without HDCP output
[E] : HDCP authentication failed
[C] : HDCP being authorized
[X] : Video synchronous signal output stopped
[D] : Sink device disconnected (Displayed for one second)
(No character) : No sink device is connected.

■ Resolution of output video signals and error code



[3840x2160p 59.94Hz] : Horizontal resolution x Vertical resolution, Vertical synchronous frequency
[SIGNAL STOPPED] : Video synchronous signal output stopped
[UNCONNECTED] : No sink device connected
Error code : From left, video output, digital audio output, analog audio output
If there is no error for output, no error code is displayed.
If “**PinP window output (P.23)**” is set to [ON] and the main window has no error, errors for the PinP window are displayed.

Error code for video output

Code	Description
1	Video mute is set to [ON]. 【Video mute (P.24)】
2	DDC 5 V signal is not input or no source device is connected.
3	No video signal is input. ・ May be solved by changing "**Hot plug output for when there is no active video input signal (P.36)**" to longer. ・ Signal quality may be decreased due to cable length or cabling. ・ May be solved by limiting source device video output of EDID. 【Resolution (P.49)】 【Deep Color (P.51)】
4	Video output of source device is in a Mute status.
5	Signal with HDCP is input, but the sink device does not support HDCP. ・ May be solved by setting "**HDCP input (P.38)**" to [NOT SUPPORT].
6	The source device does not output required information (packets) for outputting video.
7	Video signal that is not supported, such as out of dot clock range, is input. ・ May be solved by limiting source device video output of EDID. 【EDID selection (P.48)】
A	Input selection is set to [OFF].

Error code for digital and analog audio output

Code	Description
1	Audio mute is set to [ON]. 【Mute (P.44)】
2	DDC 5 V signal is not input or no source device is connected.
3	No audio signal is input. ・ DVI signal does not include audio. ・ Limited to DVI signal input in EDID setting. 【Signal format (P.50)】
4	Audio output of source device is in a Mute status.
6	The source device does not output required information (packets) for outputting video or audio.
7	Bitstream audio is input, but the sink device does not support the format. ・ Can be solved by limiting audio output of the source device EDID. 【EDID selection (P.48)】 【Bitstream audio (P.52)】
8	Audio signal output is set to [OFF]. 【Audio output (P.44)】
9	DVI signal is output. DVI signal does not include audio. ・ "**Signal format (P.27)**" is set to [DVI MODE]. ・ The sink device may not support audio. ・ EDID reading may be failed. Can be solved by setting "**Automatic determining sink device EDID (P.30)**" to [ON].
A	Input selection is set to [OFF].

*Input status of analog audio signal cannot be detected. Even if any error code is not displayed, audio may sometimes not be output when analog input is selected.

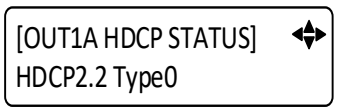
■ **Output video signal format**

[HDMI] : HDMI signal
[DVI] : DVI signal
[444] : YCbCr 4:4:4
[422] : YCbCr 4:2:2
[420] : YCbCr 4:2:0
[RGB] : RGB
[8bpc] : 24 bit/pixel (8 bit/component)
[10bpc] : 30 bit/pixel (10 bit/component)
[12bpc] : 36 bit/pixel (12 bit/component)
[LIMITED] : Limited range
[FULL] : Full range
[SIGNAL STOPPED] : Video synchronous signal output stopped
[UNCONNECTED] : No sink device is connected.

■ **Output audio signal format**

[L-PCM 48kHz 24bit] : LPCM, Sampling frequency, Bit length
[M] : Multi-channel audio
[COMPRESSED AUDIO] : Bitstream audio (Such as Dolby Digital, DTS)
[NO SIGNAL] : No audio is output.
[SIGNAL STOPPED] : Video synchronous signal output stopped
[UNCONNECTED] : No sink device is connected.

■ **HDCP output, authentication status**



[HDCP2.2] : With HDCP 2.2 output
[HDCP2.2 Type1] : With HDCP 2.2 Type 1 output
[HDCP2.2 Type0] : With HDCP 2.2 Type 0 output
[HDCP1.4] : With HDCP 1.4 output
[NOT ENCRYPTED] : Without HDCP output
[DURING AUTHENTICATION] : HDCP authentication
[HDCP RETRY] : HDCP authentication being retried
[HDCP RETRY OVER] : HDCP authentication retry over
[SIGNAL STOPPED] : Video synchronous signal output stopped
[UNCONNECTED] : No sink device is connected.

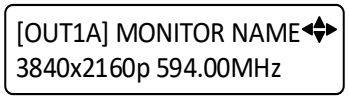
Viewing sink device EDID

You can view EDID of the sink device that is connected to an output connector.

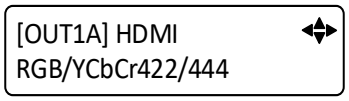
Menu	VIEW STATUS→SINK DEVICE EDID	@GES

For a sink device that does not support HDMI, only sink device name, recommended resolution, and supported video signal format are displayed.
If video synchronous signal output is stopped, [UNCONNECTED] is displayed on the front display. If the MSD-V4 cannot read EDID from connected sink devices or the data is invalid, [EDID READ ERROR] is displayed. If EDID check sum error causes, [E] is displayed for the sink device name and recommended resolution.

■ Sink device name and recommended resolution

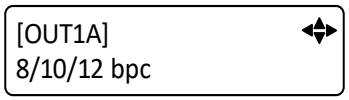


■ Supported video signal format

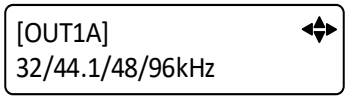


[HDMI] : HDMI supported
[RGB] : RGB supported
[YCbCr 420] : YCbCr 4:2:0 supported
[422] : YCbCr 4:2:2 supported
[444] : YCbCr 4:4:4 supported
[DVI] : DVI supported (Only RGB supported)

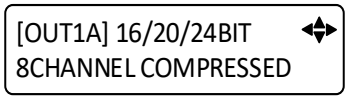
■ Supported color depth



■ Supported audio sampling frequency



■ Supported audio signal format



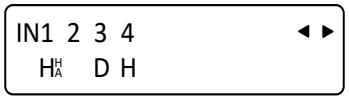
Audio bit length, Number of audio channels, Bitstream audio supported/not supported
[COMPRESSED]: Bitstream audio supported

Input signal status

You can view the input signal statuses.

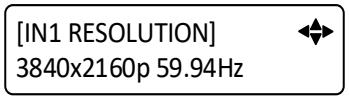
Menu	VIEW STATUS→INPUT STATUS	@GSS

■ Statuses of all input connectors



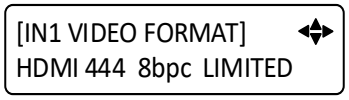
[H] : HDMI signal
[D] : DVI signal
No character : No signal is input.
Upper right [H] : HDCP protected
Lower right [A] : Audio is embedded.

■ Resolution of input video signal



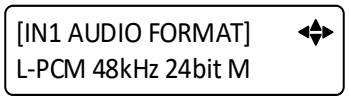
[3840x2160p 59.94Hz] : Horizontal resolution x Vertical resolution, Vertical synchronous frequency
[NO SIGNAL] : No signal is input.

■ Signal format of input video



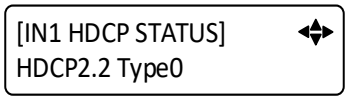
[HDMI] : HDMI signal
[DVI] : DVI signal
[NO SIGNAL] : No signal is input.
[444] : YCbCr 4:4:4
[422] : YCbCr 4:2:2
[420] : YCbCr 4:2:0
[RGB] : RGB
[8bpc] : 24 bit/pixel (8 bit/component)
[10bpc] : 30 bit/pixel (10 bit/component)
[12bpc] : 36 bit/pixel (12 bit/component)
[LIMITED] : Limited range
[FULL] : Full range
--- : No information

■ Signal format of input audio



[L-PCM 48kHz 24bit] : LPCM, Sampling frequency, Bit length
[M] : Multi-channel audio
[COMPRESSED] : Bitstream audio (Such as Dolby Digital, DTS)
[NO SIGNAL] : No audio is input.

■ **HDCP status**



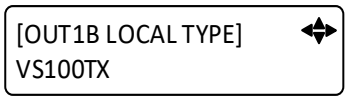
[HDCP2.2 Type1] : HDCP 2.2 Type 1 input
[HDCP2.2 Type0] : HDCP 2.2 Type 0 input
[HDCP1.4] : HDCP 1.4 input
[NOT ENCRYPTED] : Without HDCP input
[NO SIGNAL] : No signal is input.

HDBaseT status

You can view the HDBaseT signal status.

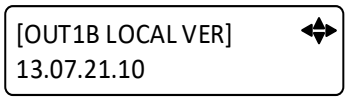
Menu	VIEW STATUS→HDBaseT STATUS	Advanced	N/A

■ **Device type**



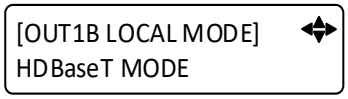
[VS100TX]: Device type

■ **Version ID**



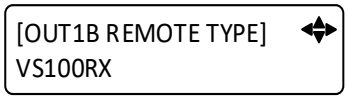
[13.07.21.10]: Version ID

■ **Operation mode**



[HDBaseT MODE] : HDBaseT mode
[LONG REACH MODE] : Long reach mode
[LPPF1 MODE] : LOWPOWER mode 1
[LPPF2 MODE] : LOWPOWER mode 2
[HDBaseT NO LINK] : Not connected

■ **Connected device type**

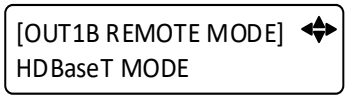


[VS100RX] : Device type
[HDBaseT NO LINK] : Not connected

■ **Connected version ID**

[13.07.21.10] : Connected version ID
[HDBaseT NO LINK] : Not connected

■ **Operation mode of remote device**



[HDBaseT MODE] : HDBaseT mode
[LONG REACH MODE] : Long reach mode
[LPPF1 MODE] : LOWPOWER mode 1
[LPPF2 MODE] : LOWPOWER mode 2
[HDBaseT NO LINK] : Not connected

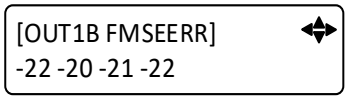
■ **Twisted pair cable length**

[85m] : Twisted pair cable
[UNDER 20m] : 66 ft. (20 m) or shorter
[OVER 100m] : 328 ft. (100 m) or longer
[HDBaseT NO LINK] : Not connected

■ **Bit error rate**

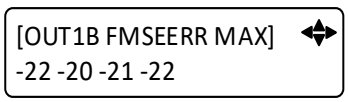
[10e-10] : Signal bit error rate
[HDBaseT NO LINK] : Not connected

■ **Signal quality**



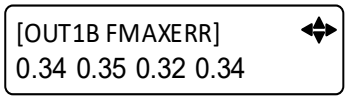
[-22 -20 -21 -22] : Signal quality
[HDBaseT NO LINK] : Not connected

■ **Maximum signal quality**



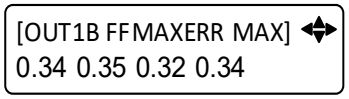
[-22 -20 -21 -22] : Maximum signal quality
[--- --- --- ---] : Not connected

■ **Residual gap**



[0.34 0.35 0.32 0.34] : Residual gap
[HDBaseT NO LINK] : Not connected

■ **Maximum residual gap**

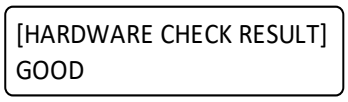


[0.34 0.35 0.32 0.34] : Maximum residual gap
[--- --- --- ---] : Not connected

System check

You can view the statuses of the internal supply voltage and internal temperature can be displayed.

Menu	VIEW STATUS→HARDWARE CHECK RESULT	@GHC



[GOOD] : No abnormality is detected.
[VOLTAGE] : Abnormality in internal supply voltage is detected.
[TEMP] : Abnormality in internal temperature is detected.

Note

If "**Abnormality detection alarm (P.83)**" is set to [ON] and abnormality is detected, an alarm is displayed on the front display.

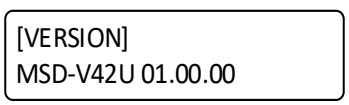
WARNING

If an alarm is displayed on the front display, stop using the MSD-V4 immediately and contact us for support options. If you do not stop using, it may damage the MSD-V4 or result in fire.

Device information

You can view the model name and firmware version.

Menu	VIEW STATUS→VERSION	@GIV



Factory default list

Menu		Default
OUTPUT IMAGE	RESOLUTION	A (AUTO-A)
	ASPECT RATIO	RESOLUTION
	IMAGE POSITION	H: 0.0%, V: 0.0%
	IMAGE SIZE	MAIN: H 100.0%, V 100.0%, PinP: H 20.0%, V 20.0%
	IMAGE CROP	L: 0.0%, R: 0.0%, T: 0.0%, B: 0.0%
	BACKGROUND COLOR	R: 0, G: 0, B: 0
	TEST PATTERN	TEST PATTERN: OFF, PATTERN SCROLL: OFF
	PinP OUTPUT	OFF
	IMAGE INITIALIZATION	---
OUTPUT SETTINGS	SIGNAL OUTPUT	ON
	VIDEO MUTE	OFF
	NO SIGNAL OUTPUT	ON
	NO SIGNAL IMAGE	BLUE
	HDCP AUTHENTICATION	HDCP 2.2
	HDCP RETRY	ETERNITY
	CONNECTION RESET	---
	SIGNAL FORMAT	HDMI YCbCr 4:4:4 MODE
	RGB RANGE	AUTO
	HDBT LONG REACH MODE	OFF
	DEEP COLOR	24-BIT COLOR
	SWITCHING EFFECT	FREEZE→FADE OUT-IN
	SWITCHING EFFECT SPEED	350ms
	FOLLOW SINK EDID	ON
	HOTPLUG MASK	OFF
	CEC CONNECTION	NOT CONNECTED
INPUT IMAGE	ASPECT RATIO	AUTO-1
	ASPECT RATIO CONTROL	L-BOX/S-PANEL
	IMAGE POSITION	H: 0.0%, V: 0.0%
	IMAGE SIZE	H 100.0%, V 100.0%
	IMAGE CROP	L: 0.0%, R: 0.0%, T: 0.0%, B: 0.0%
	IMAGE INITIALIZATION	---
INPUT SETTINGS	NO INPUT MONITORING	10000ms
	HDCP INPUT	HDCP 2.2 SUPPORT
AUTO SWITCHING	SIGNAL ON PRIORITY	OFF
	SIGNAL OFF PRIORITY	OFF
	IGNORING DURATION	0s000ms
	SWITCHING MODE	V&A
PICTURE ADJUSTMENT	OUTPUT BRIGHTNESS	100%
	OUTPUT CONTRAST	R: 100%, G: 100%, B: 100%
	OUTPUT GAMMA	1.0
	OUTPUT SETTING INIT.	---
	INPUT SHARPNESS	0
	INPUT BRIGHTNESS	100%
	INPUT CONTRAST	R: 100%, G: 100%, B: 100%
	INPUT SATURATION	100%
	INPUT SETTING INIT.	---
OUTPUT AUDIO SETTINGS	SIGNAL OUTPUT	ON
	AUDIO LEVEL	0dB
	MUTE	OFF
	LIP SYNC	0ms
	SAMPLING FREQUENCY	AUTO-A
	ANALOG OUTPUT	OUT1
	MULTI AUDIO	OFF
	DOWNMIX	DOWNMIX
	TEST TONE	TEST TONE: OFF, SPEAKER: ALL
INPUT AUDIO SETTINGS	SOURCE SELECTION	DIGITAL
	AUDIO LEVEL	0dB
	LIP SYNC	0ms
	STABLE WAIT	ON

Menu		Default
EDID SETTINGS	EDID SELECTION	BUILT-IN EDID
	RESOLUTION	3840x2160@60 4:4:4
	SINK DEVICE EDID COPY	All: Not saved
	SIGNAL FORMAT	HDMI
	FRAME RATE	60Hz
	DEEP COLOR	24-BIT COLOR
	Linear PCM	48kHz
	AAC	OFF
	Dolby Digital	OFF
	Dolby Digital Plus	OFF
	Dolby TrueHD	OFF
	DTS	OFF
	DTS-HD	OFF
	SPEAKER CONFIGURATION	AUTO, 2
RS-232C SETTINGS	PARAMETERS	BPS: 9600, LENGTH: 8, PARITY: NONE, STOP: 1
	COMMUNICATION MODE	RS1: RECEIVER, OUT1B/OUT2B: TRANSMITTER
LAN SETTINGS	IP ADDRESS	192.168.1.199
	SUBNET MASK	255.255.255.0
	GATEWAY ADDRESS	192.168.1.200
	MAC ADDRESS	---
	COMMAND DESTINATION	IP: 192.168.1.198, PJLink: OFF, PORT: 1100, PASSWORD: 20 (spaces)
	AUTO DISCONNECT	SERVER: 30s, CLIENT: 3s
	LAN THROUGH	HDBaseT output connector: ON, 10GbE output connector: OFF
	SDVoE DETECTION	ON
CONTROL COMMAND	COMMAND REGISTER/EDIT	All: Not registered
	REPLY REGISTER/EDIT	REPLY1 to REPLY30: Not registered, REPLY31: OK, REPLY32: NG
	COMMAND LINK	All: Not registered
	EXECUTE CTRL COMMAND	---
	INITIALIZATION	---
	INVALID DURATION	0s000ms
	ILLUMINATE FN. BUTTON	REGISTERED
	BLINKING DURATION	OFF
USER PRESET	STORE CROSSPOINT	All: N/A
	EDIT CROSSPOINT	---
	RECALL CROSSPOINT	---
	STORE PRESET SETTINGS	All: Not saved
	RECALL PRESET SETTINGS	---
	STORE PATTERN	No.1 to No.5: Test pattern
	RECALL PATTERN	---
	COPY OUTPUT SETTINGS	---
	START-UP MEMORY	LAST MEMORY
BITMAP	BITMAP OUTPUT	OFF
	BACKGROUND COLOR	R: 0, G: 0, B: 0
	ASPECT RATIO	AUTO
	IMAGE POSITION	CENTER
	INPUT ASSIGN	OFF
	START-UP BITMAP	OFF
	MEMORY MODE	4K (1 BITMAP)
POWER ON SETTINGS	SYSTEM START-UP	AUTO
	FUNCTION CMD.EXE.	OFF
	BUTTON LOCK	AUTO
SYSTEM SETTINGS	WINDOW SELECT	MAIN
	SWITCHING MODE	V&A
	FUNCTION ASSIGNMENT	COMMAND
	BUTTON LOCK TARGET	LOCK
	ALARM	ON
	ADVANCED MENU	OFF
	LUMINANCE CONTROL	ON
	BUTTON HOLD TIME	0ms
	TOP PAGE	NORMAL
	INITIALIZATION	---

Menu		Default
VIEW STATUS	OUTPUT STATUS	---
	SINK DEVICE EDID	---
	INPUT STATUS	---
	HDBaseT STATUS	---
	HARDWARE CHECK RESULT	---
	VERSION	---

License

The following table shows the licensed third-party software packages used by the MSD-V.
Transferring, copying, disassembling, decompiling, or reverse-engineering the included software other than open source software that is licensed by GPL, LGPL, or other licenses are prohibited.

OSS	License	URL
FreeRTOS	MIT	https://github.com/aws/amazon-freertos/blob/main/LICENSE
lwIP	Modified BSD	https://savannah.nongnu.org/projects/lwip/
jQuery	MIT	https://jquery.com/license/

Specification

Product specification

		MSD-V41U	MSD-V42U	MSD-V41UC	MSD-V42UC	MSD-V41UT	MSD-V42UT
Video/Audio input	HDMI	4 inputs					
		HDMI/DVI 1.0 TMDS single link, HDCP 1.4/2.2 TMDS clock: Up to 300 MHz, TMDS data rate: Up to 18 Gbps Deep Color[*1]					
		640x480@60 to 2560x1600@60 Reduced Blanking 480p, 576p to 3840x2160@24/25/30/50/59.94/60 (4:4:4), 3840x2160@50/59.94/60 (4:2:0), 4096x2160@24/25/30/50/59.94/60 (4:4:4), 4096x2160@50/59.94/60 (4:2:0) Color depth: 24/30 bits *For all supported video signals, see the table below.					
		LPCM: Up to 8 channels Sampling frequency: 32/44.1/48/88.2/96/176.4/192 kHz Reference level: -20 dBFS, Max. input level: 0 dBFS					
		CEC					
		Connector: HDMI Type A (19-pin) Maximum distances[*2]: 98 ft. (30 m) (1080p@60), 39 ft. (12 m) (4K@60)					
	Analog audio	1 input					
		Stereo LR Input impedance: 24 kΩ unbalanced Reference level: -10 dBu, Max. input level: +10 dBu					
		Connector: Captive screw (3-pin)					
Video/Audio output	HDMI	1 output	2 outputs	1 output	2 outputs	1 output	2 outputs
		—	—	Distribute HDMI/10GbE simultaneously		Distribute HDMI/HDBaseT simultaneously	
		HDMI/DVI 1.0 TMDS single link, HDCP 1.4/2.2 TMDS clock: Up to 297 MHz, TMDS data rate: Up to 17.82 Gbps Deep Color[*1]					
		1024x768@60 to 2560x1600@60 Reduced Blanking 480p, 576p to 3840x2160@24/25/30/50/59.94/60 (4:4:4), 3840x2160@50/59.94/60 (4:2:0), 4096x2160@24/25/30/50/59.94/60 (4:4:4), 4096x2160@50/59.94/60 (4:2:0) Color depth: 24/30 bits *For all supported video signals, see the table below.					
		LPCM: Up to 8 channels Sampling frequency: 32/44.1/48/88.2/96/192 kHz Reference level: -20 dBFS, Max. output level: 0 dBFS					
		CEC					
		Connector: HDMI Type A (19-pin) Maximum distances[*2]: 98 ft. (30 m) (1080p@60), 39 ft. (12 m) (4K@60)					
	10GbE[*3]	—	—	1 output	2 outputs	—	—
		—	—	Distribute HDMI/10GbE simultaneously		—	—
		SDVoE, AES-128 Deep Color[*1]					
		*Supported video signals are the same as those of HDMI.					
		RS-232C/LAN					
		Connector: RJ-45 Maximum distance[*2]: 328 ft. (100 m) Cable: CAT6A (STP)					
	HDBaseT	—	—	—	—	1 output	2 outputs
		—	—	—	—	Distribute HDMI/HDBaseT simultaneously	
		HDBaseT, HDCP 1.4/2.2 Deep Color[*1]					
		1024x768@60 to 2560x1600@60 Reduced Blanking 480p, 576p to 3840x2160@24/25/30 (4:4:4), 3840x2160@50/59.94/60 (4:2:0), 4096x2160@24/25/30 (4:4:4), 4096x2160@50/59.94/60 (4:2:0) Color depth: 24/30 bits *For all supported video signals, see the table below. *Supported audio signals are the same as those of HDMI.					
		RS-232C/LAN/CEC					
		Connector: RJ-45 Maximum distance[*2]: 328 ft. (100 m)/492 ft. (150 m) (Long reach mode is used) Cable: CAT.5E HDC, CAT5e (UTP/STP), CAT6 (UTP/STP)					
	Analog audio	1 output					
		Stereo L/R Output impedance: 50 Ω unbalanced Reference level: -10 dBu, Max. output level: +10 dBu					
		Connector: Captive screw (3-pin)					

		MSD-V41U	MSD-V42U	MSD-V41UC	MSD-V42UC	MSD-V41UT	MSD-V42UT
Control I/F	RS-232C	1 port/Connector: Captive screw (3-pin)					
	LAN	1 port/10Base-T/100Base-TX (Auto Negotiation), Auto MDI/MDI-X, Connector: RJ-45					
	Contact closure	3 ports/Dry-contact closure input up to DC 24 V 1 A, Connector: Captive screw (6-pin)					
Functions	Video	Resolution conversion, Frame rate conversion, Seamless switching with one black frame, Picture adjustment, Image quality adjustment, Two video combinations, User provided bitmap image display, Bitmap display, Each video output OFF, Built-in library of test patterns					
	Audio	Volume level adjustment (Input/Output), Embedding, De-embedding, Audio Downmix, Lip Sync, Test tone					
	Control	WEB browser, External command execution (64 individual commands), PJLink controller (Class1), CEC (Power control of sink device)*4, LAN through (Connector: LAN/10GbE/HDBaseT), CEC through (Connector: HDMI/HDBaseT), Unsolicited notification					
	Others	Audio breakaway for independent audio and video switching, Automatic input switching, EDID emulation, Audio input enable/disable, HDCP input enabling/disabling, Status display, System check, Crosspoint memory (9 settings), Preset memory (9 settings), Pattern memory (5 settings), Last memory, Anti-Snow, Connection Reset*5, Button security lockout, Standby switch					
General	Power	DC 12 V 2.0 A	DC 12 V 2.6 A	DC 12 V 2.6 A	DC 12 V 3.8 A	DC 12 V 2.4 A	DC 12 V 3.3 A
		AC adapter: 100 - 240 VAC ±10%, 50 Hz/60 Hz ±3 Hz, DC 12 V 5 A 60.0 W					
	Power consumption	28 W	35 W	36 W	51 W	33 W	44 W
	Dimensions	8.3 (W) × 1.7 (H) × 9.8 (D)" (210 (W) × 42 (H) × 250 (D) mm) (Excluding connectors and the like)					
	Weight	3.7 lbs. (1.7 kg)	4 lbs. (1.8 kg)	4 lbs. (1.8 kg)	4.2 lbs. (1.9 kg)	3.7 lbs. (1.7 kg)	4 lbs. (1.8 kg)
	Temperature	Operating: 32°F to 104°F (0°C to +40°C), Storage: -4°F to +176°F (-20°C to +80°C)					
	Humidity	20% to 90% (Non Condensing)					

*1 x.v.Color/3D/HDR/ARC/HEC are not supported.

*2 The maximum specified distances may not be achievable with some device combinations, cabling method, or other manufacturer's cable. For the same reasons, video signal disturbances or interruptions may occur, even if signals are within the specified distance (cable length) parameters.
The maximum cable length varies depending on the connected devices. The specifications have been qualified under following conditions:

- HDMI (1080p@60) : When IDK's 24 AWG cable was used and signal of 1080p@60 24 bits was transmitted.
- HDMI (4K@60) : When IDK's 18 Gbps supported cable was used and signal of 3840x2160@60 24 bits was transmitted.
- 10GbE : When a CAT6A (STP) cable is used.
- HDBaseT : When IDK's CAT.5E HDC cable is used.
- HDBaseT Long reach mode : When a device supporting Long reach mode is connected and the video is transmitted at a resolution 1080p@60 24 bits or less.

*3 For 10GbE extension, use this product in combination with IDK's other SDVoE supported products.

*4 Sink device needs to support CEC. Some sink devices cannot be controlled from the MSD-V4 through CEC.

*5 For digital systems, some problems, such as an HDCP authentication error, can often be recovered by physically disconnecting and reconnecting the digital cables. However, the Connection Reset feature will correct these problems automatically without the need to physically plug and unplug the cables. It creates the same condition as if the cable were physically disconnected and reconnected. This feature only works for the MSD-V4's output. Connecting other devices between the MSD-V4's outputs and sink devices, may interfere with the operation of this feature.

Supported video signals

Signal	Resolution	Frame Rate [Hz]	Pixel Clock [MHz]	Color Depth [bits]	INPUT	OUTPUT	
					HDMI	HDMI 10GbE	HDBaseT
640x480@60	640x480	59.94	25.18	24/30	○	–	–
800x600@60	800x600	60.32	40.00	24/30	○	–	–
1024x768@60	1024x768	60.00	65.00	24/30	○	○	○
1280x768@60	1280x768	59.87	79.50	24/30	○	○	○
1280x800@60	1280x800	59.81	83.50	24/30	○	○	○
1280x960@60	1280x960	60.00	108.00	24/30	○	○	○
1280x1024@60	1280x1024	60.02	108.00	24/30	○	○	○
1360x768@60	1360x768	60.02	85.50	24/30	○	○	○
1366x768@60	1366x768	59.79	85.50	24/30	○	○	○
1400x1050@60	1400x1050	59.98	121.75	24/30	○	○	○
1440x900@60	1440x900	59.89	106.50	24/30	○	○	○
1600x900@60	1600x900	59.95	118.25	24/30	○	○	○
1600x1200@60	1600x1200	60.00	162.00	24/30	○	○	○
1680x1050@60	1680x1050	59.95	146.25	24/30	○	○	○
1920x1080@60 RB	1920x1080	59.93	138.50	24/30	○	○	○
1920x1200@60 RB	1920x1200	59.95	154.00	24/30	○	○	○
2048x1152@60 RB	2048x1152	60.00	162.00	24/30	○	○	○
2560x1440@60 RB	2560x1440	59.95	241.50	24/30	○	○	○*1
2560x1600@60 RB	2560x1600	59.97	268.50	24/30	○	○	○*1
480p	720x480	59.94	27.00	24/30	○	○	○
576p	720x576	50.00	27.00	24/30	○	○	○
720p@50	1280x720	50.00	74.25	24/30	○	○	○
720p@59.94	1280x720	59.94	74.18	24/30	○	○	○
720p@60	1280x720	60.00	74.25	24/30	○	○	○
1080i@50	1920x1080	25.00	74.25	24/30	○	○	○
1080i@59.94	1920x1080	29.97	74.18	24/30	○	○	○
1080i@60	1920x1080	30.00	74.25	24/30	○	○	○
1080p@50	1920x1080	50.00	148.50	24/30	○	○	○
1080p@59.94	1920x1080	59.94	148.35	24/30	○	○	○
1080p@60	1920x1080	60.00	148.50	24/30	○	○	○
3840x2160@23.98	3840x2160	23.98	296.70	24/30	○	○	○*1
3840x2160@24	3840x2160	24.00	297.00	24/30	○	○	○*1
3840x2160@25	3840x2160	25.00	297.00	24/30	○	○	○*1
3840x2160@29.97	3840x2160	29.97	296.70	24/30	○	○	○*1
3840x2160@30	3840x2160	30.00	297.00	24/30	○	○	○*1
3840x2160@50	3840x2160	50.00	594.00	24/30*1	○	○	○*2
3840x2160@59.94	3840x2160	59.94	593.41	24/30*1	○	○	○*2
3840x2160@60	3840x2160	60.00	594.00	24/30*1	○	○	○*2
4096x2160@23.98	4096x2160	23.98	296.70	24/30	○	○	○*1
4096x2160@24	4096x2160	24.00	297.00	24/30	○	○	○*1
4096x2160@25	4096x2160	25.00	297.00	24/30	○	○	○*1
4096x2160@29.97	4096x2160	29.97	296.70	24/30	○	○	○*1
4096x2160@30	4096x2160	30.00	297.00	24/30	○	○	○*1
4096x2160@50	4096x2160	50.00	594.00	24/30*1	○	○	○*2
4096x2160@59.94	4096x2160	59.94	593.41	24/30*1	○	○	○*2
4096x2160@60	4096x2160	60.00	594.00	24/30*1	○	○	○*2

RB: Reduced Blanking
*1 For RGB/YCbCr 4:4:4, only 24 bit is supported.
*2 YCbCr 4:2:0 24 bit is supported.

For best results, please confirm that the source device(s) video output can be configured to match the listed formats above. For questions regarding other input video signals, please contact your IDK representative.

Troubleshooting

This chapter provides recommendations in case difficulties are encountered during MSD-V4 setup and operation.

In case the MSD-V4 does not work correctly, please check the following items first.

- Are the MSD-V4 and all devices connected to an active power source and are they powered on?
- Are signal cables connected correctly?
- Are there any loose or partially mated connections?
- Are the interconnecting cables specified correctly to support adequate bandwidth?
- Are specifications of connected devices matched to each other?
- Are configuration settings for the connected devices correct?
- Is there any nearby equipment that may cause electrical noise/RF interference?

Use the MSD-V4 built-in status display features to check for input signal presence and format. Also use the status display features to check for the presence of connected sink devices as well as for EDID and HDCP compatibility.

If difficulties persist, please refer to the peripheral device manuals as well, since connected equipment may be the cause of the trouble.

If the trouble persists, please contact us after checking the following items.

- Does the problem occur with all the signal connectors?
- Does the problem occur when you connect the source and display devices directly, bypassing the MSD-V4?

Digital Multi Switcher

MSD-V4 Series

User Guide

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