

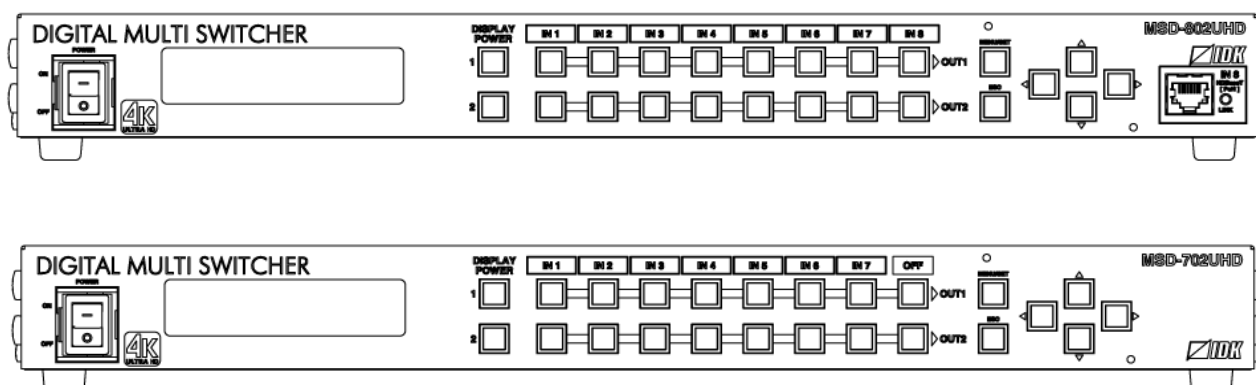
4K@60 and HDCP 2.2 supported Digital Multi Switcher

MSD-701UHD / 702UHD

MSD-801UHD / 802UHD

<User Guide>

Ver.1.4.0



- Thank you for choosing our product.
- To ensure the best performance of this product, please read this user guide fully and carefully before using it and keep this manual together with the product for future reference as needed.

Trademarks

- Blu-ray Disc and Blu-ray are trademarks of Blu-ray Disc Association.
- ETHERNET is a registered trademark of Fuji Xerox Co., Ltd.
- Google Chrome is a registered trademark or trademark of Google Inc.
- HDBaseT™ and the HDBaseT Alliance Logo are trademarks of the HDBaseT Alliance.
- The terms HDMI and HDMI High-Definition Multimedia Interface, and the HDMI Logo are trademarks or registered trademarks of HDMI Licensing Administrator, Inc. in the United States and other countries.
- Javascript® is a trademark or registered trademark of Oracle Corporation, its subsidiaries, and affiliated companies in the United States and other countries.
- Microsoft, Windows, Internet Explorer are either registered trademarks or trademarks of the Microsoft Corporation in the United States and other countries.
- The terms Mozilla and Firefox, and their logos are registered trademarks or trademarks of Mozilla Foundation in the United States and other countries.
- Oracle and Java are trademarks of Oracle Corporation its subsidiaries, and affiliated companies in the United States and other countries.
- PJLink is a trademark in Japan, the United States, and other countries/regions.
- The terms Anti-snow and Connection Reset are registered trademarks of IDK Corporation in Japan.
- All other company and product names mentioned in this manual are either registered trademarks or trademarks of their respective owners. In this manual, the “®” or “™” marks may not be specified.

Before reading this manual

- All rights reserved.
- Some information contained in this User guide such as exact product appearance, diagrams, menu operations, and so on may differ depending on the product version.
- This User guide is subject to change without notice. You can download the latest version from IDK's website at: <http://www.idkav.com>

The reference manual consists of the following two volumes:

- User guide (this document):
Provides explanations and procedures for operations, installation, connections among devices, I/O adjustment and settings.
- Command guide: Please download the command guide from the website above.
Provides explanations and procedures for external control using RS-232C and LAN communications.

FCC STATEMENT

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.

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 and understand all safety and operating instructions before using this product. Follow all instructions and heed all warnings/cautions.

| Enforcement Symbol | Description |
|--|---|
|  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 | <ul style="list-style-type: none"> ● Lifting must be done by two or more personnel. <p>To avoid injury: When lifting the product, bend your knees, keep your back straight and get close to it with two or more persons.</p> |
|---|--|


■ For installing and connecting products:

| | |
|---|--|
|  Prohibited | <ul style="list-style-type: none"> ● Do not place the product upon a surface that may give way or that may become unstable. <p>Install the product in a secure and stable place to prevent it from falling and possibly causing injury.</p> <ul style="list-style-type: none"> ● Secure the product if installing in locations prone to vibration or movement. <p>Otherwise, it may move unexpectedly or it may fall and lead to injury.</p> |
|  Instruction | <ul style="list-style-type: none"> ● Installation work must be performed by professionals. <p>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.</p> <ul style="list-style-type: none"> ● Insert the power plug into an outlet that is unobstructed. <p>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.</p> <ul style="list-style-type: none"> ● Insert the power plug into an appropriate outlet completely. <p>If the plug is partially inserted, arcing may cause the connection to overheat, increasing the risk of electrical shock or fire. Do not use a damaged plug or connect to a damaged outlet.</p> <ul style="list-style-type: none"> ● Unplug the product from the AC power source during installation or service. <p>When connecting peripheral devices to this product, unplug all involved devices from outlets. Ground potential differences may cause fire or other difficulties.</p> |

■ For operating products:

| | |
|--|---|
|  Prohibited | <ul style="list-style-type: none"> ● Keep out any foreign objects. <p>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.</p> <ul style="list-style-type: none"> ● For power cable/plug: <ul style="list-style-type: none"> ▪ 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. <p>Misuse of the power cable and plug may cause fire or electric shock. If power cables/plugs become damaged, contact your IDK representative.</p> |
|  Do not disassemble | <ul style="list-style-type: none"> ● Do not repair, modify or disassemble. <p>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.</p> |
|  Do not touch | <ul style="list-style-type: none"> ● Do not touch the product and connected cables during electrical storms. <p>Contact may cause electric shock.</p> |
|  Instruction | <ul style="list-style-type: none"> ● Clean the power plug regularly. <p>If the plug is covered in dust, it may increase the risk of fire.</p> <ul style="list-style-type: none"> ● The product must be earthed. <p>To reduce the risk of electrical shock, ensure the product is connected to a mains socket outlet with a protective earthing connection.</p> |




■ **If the following problem occurs:**

| | |
|--|---|
|  Unplug | <ul style="list-style-type: none"> ● Unplug immediately if the product smokes, makes unusual noise, or produces a burning odor. If you continue to use the product under these conditions, it may cause electric shock or fire. ● Unplug immediately if the product is damaged by falling or having been dropped. If you continue to use the product under these conditions, it may increase the risk of electrical shock or fire. For maintenance and repair, contact your IDK representative. ● 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 electrical shock or fire. For maintenance and repair, contact your IDK representative. |
|--|---|



Caution

■ **For installing and connecting products:**

| | |
|--|--|
|  Prohibited | <ul style="list-style-type: none"> ● 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. If the product is placed near humidifiers or in a dusty area, it 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 and 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 | <ul style="list-style-type: none"> ● Do not handle power plug with wet hands. Failure to observe this precaution may increase the risk of electrical shock. |
|  Instruction | <ul style="list-style-type: none"> ● Use and store the product within the specified temperature/humidity range. If the product is used outside the specified range for 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 without the rubber feet into the threaded holes on the bottom of the product. Doing so may lead to damage when the screws contact electrical circuitry or components inside the product. Reinstall the originally supplied rubber feet using only the originally supplied screws. |

■ For operating products:





| | |
|--|--|
|  <p>Hot surfaces Caution</p> | <p>For products with the hot surfaces caution label only:</p> <ul style="list-style-type: none"> ● Do not touch the product's hot surface. <p>If the product is installed without enough space, it may cause failures of other products operation. If you touch product's hot surface, it may cause burn.</p> |
|  <p>Prohibited</p> | <ul style="list-style-type: none"> ● Use only the supplied power cable and AC adapter. ● Do not use the supplied power cable and AC adapter with other products. <p>If non-compliant adapter or power cables are used, it may increase the risk of fire or electrical shock.</p> |
|  <p>Unplug</p> | <ul style="list-style-type: none"> ● If the product won't be used for an extended period of time, unplug it. <p>Failure to observe this precaution may increase the risk of fire.</p> <ul style="list-style-type: none"> ● Unplug the product before cleaning. <p>To prevent electric shock.</p> |
|  <p>Instruction</p> | <ul style="list-style-type: none"> ● If cooling fan stops, power off the product and contact us. <p>Failure to do so may rise internal temperature and increase the risk of malfunction, fire, or electric shock.</p> <ul style="list-style-type: none"> ● Keep vents clear of dust. <p>If the vent holes near the cooling fan or near the fan are covered with dust, internal temperature rises and it may increase the risk of malfunction. Clean the vent holes and near the fan as needed.</p> <p>If dust accumulates inside of the product, it may increase the risk of malfunction, fire, or electric shock. Periodic internal cleaning, especially before humid rainy season, is recommended. For internal cleaning, contact your IDK representative.</p> |

Table of Contents

| | | |
|--------|---|----|
| 1 | About this Guide | 12 |
| 2 | Included Items..... | 13 |
| 3 | Product outline | 14 |
| 4 | Features..... | 15 |
| 5 | Panels | 16 |
| 5.1 | Front panel..... | 16 |
| 5.2 | Rear panel | 17 |
| 6 | System configuration example..... | 19 |
| 7 | Precautions | 20 |
| 7.1 | Installation..... | 20 |
| 7.2 | Cabling..... | 21 |
| 7.2.1 | Cables | 22 |
| 7.2.2 | DVI-I input connector | 22 |
| 7.2.3 | Twisted pair cable for extension | 24 |
| 7.2.4 | Connecting audio cables..... | 25 |
| 7.2.5 | Connecting RS-232C cable..... | 25 |
| 7.2.6 | Contact closure | 26 |
| 7.2.7 | Command control..... | 26 |
| 8 | Basic operation | 27 |
| 8.1 | Power up period..... | 27 |
| 8.2 | Switching input channel | 27 |
| 8.2.1 | Selecting input channels | 27 |
| 8.2.2 | Turning off input signal..... | 28 |
| 8.3 | Menu operation | 29 |
| 8.4 | Menu operation | 30 |
| 8.5 | Locking and unlocking keys..... | 30 |
| 8.6 | Initialization | 31 |
| 8.7 | Web menu operation | 42 |
| 8.7.1 | Control from WEB browser | 42 |
| 8.7.2 | How to use WEB menu | 43 |
| 9 | Menu | 44 |
| 9.1 | Menu list..... | 44 |
| 9.2 | Input Signal Automatic Detection..... | 46 |
| 9.3 | Channel switching mode..... | 47 |
| 9.4 | Setting position, size, and masking | 48 |
| 9.4.1 | Output resolution | 48 |
| 9.4.2 | Aspect ratio for sink device | 50 |
| 9.4.3 | Aspect ratio | 50 |
| 9.4.4 | Aspect ratio control | 51 |
| 9.4.5 | Overscan..... | 51 |
| 9.4.6 | Display position | 51 |
| 9.4.7 | Display size | 52 |
| 9.4.8 | Masking..... | 53 |
| 9.4.9 | Automatic sizing | 53 |
| 9.4.10 | Background color | 54 |
| 9.4.11 | Test pattern | 54 |
| 9.5 | Quality settings | 55 |

| | | |
|--------|--|----|
| 9.5.1 | Sharpness | 55 |
| 9.5.2 | Brightness | 55 |
| 9.5.3 | Contrast..... | 55 |
| 9.5.4 | HUE..... | 56 |
| 9.5.5 | Saturation..... | 56 |
| 9.5.6 | Black level | 56 |
| 9.5.7 | Gamma..... | 56 |
| 9.5.8 | Default color | 57 |
| 9.6 | Input settings..... | 58 |
| 9.6.1 | No-signal input monitoring | 58 |
| 9.6.2 | Input HDCP setting | 59 |
| 9.6.3 | Analog input signal parameters | 60 |
| 9.6.4 | Automatic detection of video input interruption | 61 |
| 9.6.5 | Selecting signal of DVI input connector | 61 |
| 9.6.6 | HDBaseT input long reach mode..... | 61 |
| 9.6.7 | Fixing settings for each input signal..... | 62 |
| 9.7 | Setting input timing | 63 |
| 9.7.1 | Automatic measurement | 64 |
| 9.7.2 | The total number of horizontal dots | 66 |
| 9.7.3 | Start position | 66 |
| 9.7.4 | Active area | 67 |
| 9.7.5 | Automatic measurement of start position..... | 68 |
| 9.7.6 | Automatic setting of input timing | 68 |
| 9.7.7 | Loading device data | 69 |
| 9.7.8 | Registering device data..... | 69 |
| 9.7.9 | Tracking..... | 69 |
| 9.8 | Output settings..... | 70 |
| 9.8.1 | Output mode | 70 |
| 9.8.2 | Synchronous signal output with no input video..... | 70 |
| 9.8.3 | Output video with no input video..... | 71 |
| 9.8.4 | Window transaction effect | 71 |
| 9.8.5 | Window transaction speed | 71 |
| 9.8.6 | Wipe color | 71 |
| 9.8.7 | Video output connector | 72 |
| 9.8.8 | HDCP | 72 |
| 9.8.9 | The number of HDCP retries..... | 73 |
| 9.8.10 | Deep Color | 73 |
| 9.8.11 | CEC connection | 74 |
| 9.8.12 | HDCP re-authentication | 74 |
| 9.8.13 | Priority of input channel automatic switching..... | 75 |
| 9.8.14 | Masking time after automatic switching of input channel..... | 77 |
| 9.8.15 | Channel switching mode of automatic switching | 77 |
| 9.8.16 | HDBaseT output long reach mode..... | 77 |
| 9.9 | Audio setting | 78 |
| 9.9.1 | Output level | 79 |
| 9.9.2 | Output mute | 79 |
| 9.9.3 | Input selection | 79 |
| 9.9.4 | Input level..... | 79 |
| 9.9.5 | Lip sync | 80 |
| 9.9.6 | Sampling frequency | 80 |

| | | |
|--------|---|-----|
| 9.9.7 | Audio output connector | 81 |
| 9.9.8 | Digital audio output connector | 81 |
| 9.9.9 | Multi-channel audio output | 81 |
| 9.9.10 | Multi-channel audio output priority | 82 |
| 9.9.11 | Test tone | 83 |
| 9.10 | EDID (Extended Display Identification Data) | 84 |
| 9.10.1 | EDID | 84 |
| 9.10.2 | Resolution for PCs | 85 |
| 9.10.3 | Input resolution for AV devices | 87 |
| 9.10.4 | Deep Color | 88 |
| 9.10.5 | Audio format | 88 |
| 9.10.6 | Speaker configuration | 89 |
| 9.10.7 | Copying EDID | 90 |
| 9.11 | RS-232C | 91 |
| 9.11.1 | RS-232C communication setting | 91 |
| 9.11.2 | RS-232C operation mode | 92 |
| 9.11.3 | RS-232C HDBaseT connection | 92 |
| 9.12 | LAN | 93 |
| 9.12.1 | IP address/Subnet mask/Gateway address | 95 |
| 9.12.2 | LAN operation mode | 95 |
| 9.12.3 | TCP port number | 96 |
| 9.12.4 | MAC address | 96 |
| 9.12.5 | Setting HDBaseT LAN | 96 |
| 9.13 | Setting control command | 97 |
| 9.13.1 | Registering/editing control command | 99 |
| 9.13.2 | Registering / Editing reply command | 104 |
| 9.13.3 | Command link | 107 |
| 9.13.4 | Command execution | 108 |
| 9.13.5 | Invalid duration at control command execution | 108 |
| 9.13.6 | Initializing registered commands and link | 108 |
| 9.13.7 | Command execution key: Illuminating condition | 109 |
| 9.13.8 | Blinking at command execution key | 109 |
| 9.14 | Preset memory | 110 |
| 9.14.1 | Recalling cross point | 110 |
| 9.14.2 | Saving cross point | 110 |
| 9.14.3 | Editing cross point | 111 |
| 9.14.4 | Recalling all settings | 111 |
| 9.14.5 | Saving all settings | 112 |
| 9.14.6 | Copying output setting | 113 |
| 9.14.7 | Startup setting | 114 |
| 9.15 | Bitmap setting | 115 |
| 9.15.1 | Sending bitmap file | 115 |
| 9.15.2 | Outputting bitmap image | 117 |
| 9.15.3 | Background color | 117 |
| 9.15.4 | Aspect ratio | 117 |
| 9.15.5 | Display position | 118 |
| 9.15.6 | Assigning input channel | 118 |
| 9.15.7 | Startup bitmap output | 118 |
| 9.15.8 | Dividing memory area | 119 |
| 9.15.9 | Input image capture | 121 |

| | | |
|---------|--------------------------------------|-----|
| 9.16 | Startup setting..... | 123 |
| 9.16.1 | DISPLAY POWER keys..... | 123 |
| 9.16.2 | Key function lock..... | 124 |
| 9.17 | Other settings..... | 125 |
| 9.17.1 | Grouping key function lock..... | 125 |
| 9.17.2 | Buzzer..... | 126 |
| 9.17.3 | Power saving..... | 126 |
| 9.17.4 | DISPLAY POWER key pressing time..... | 126 |
| 9.17.5 | HDBaseT input power supply..... | 126 |
| 9.17.6 | Top page..... | 127 |
| 9.17.7 | Input signal status..... | 128 |
| 9.17.8 | Sink device status..... | 130 |
| 9.17.9 | Viewing sink device EDID..... | 132 |
| 9.17.10 | Viewing version information..... | 133 |
| 10 | Product specification..... | 134 |
| 11 | Troubleshooting..... | 142 |

1 About this Guide

This user's guide explains how to use the MSD-701UHD / 702UHD / 801UHD / 802UHD digital multi switcher (hereafter referred to as "MSD"), which have a scan converter. The MSD series is divided into four models as shown in the table below.

Since descriptions in this document are for MSD-802UHD, there may be slight differences between the model and other models.

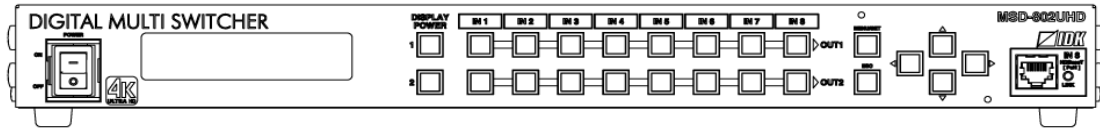
[Table 1.1] Main differences among MSD-701UHD / 702UHD / 801UHD / 802UHD

| Model | Number of I/Os | | Front panel HDBaseT input | Front panel OFF Keys |
|------------|----------------|--------|---------------------------|----------------------|
| | Input | Output | | |
| MSD-701UHD | 7 | 1 | No | Yes |
| MSD-702UHD | | 2 | | |
| MSD-801UHD | 8 | 1 | Yes | No |
| MSD-802UHD | | 2 | | |

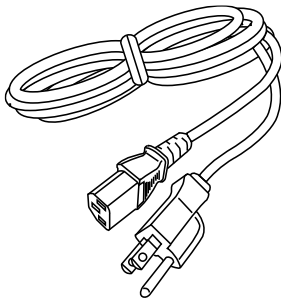
【See: 8.2.2 Turning off input signal】

2 Included Items

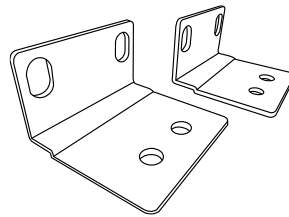
Ensure all items below are included in the package.
If any items are missing or damaged, please contact IDK.



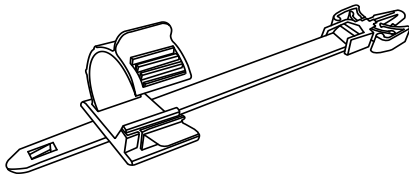
One (1) main unit (MSD-802UHD)



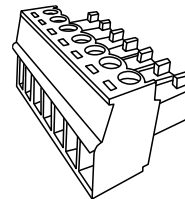
One (1) power cord (6 ft. (1.8 m))



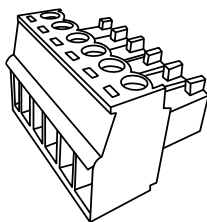
Two (2) rack mounting brackets



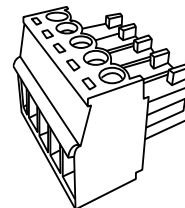
Cable clamps
Six (6) for MSD-801UHD / MSD-701UHD
Seven (7) for MSD-802UHD / MSD-702UHD



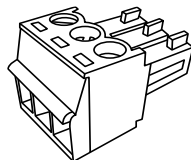
One (1) 7-pin terminal blocks



One (1) 6-pin terminal blocks



5-pin terminal blocks
Four (4) for MSD-801UHD / MSD-701UHD
Five (5) for MSD-802UHD / MSD-702UHD



One (1) 3-pin terminal blocks

[Fig. 2.1] Included items list

3 Product outline

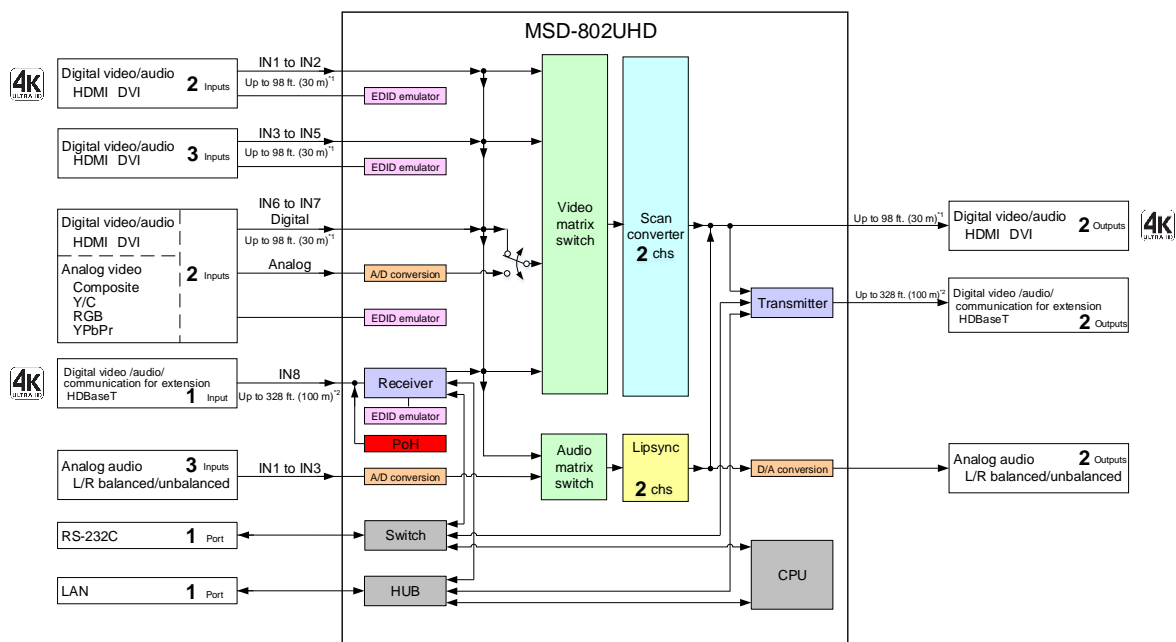
The MSD-701UHD / 702UHD / 801UHD / 802UHD are high-performance digital multi switchers with a built-in scan converter.

The following input signal formats are supported: HDMI, DVI, composite video, S video, analog RGB, and analog YPbPr signals. All input video signals are converted to HDMI signals and output at user definable resolution formats up to 4K@60.

MSD-801UHD and MSD-802UHD include front panel HDBaseT input in order to provide power to the transmitter that support PoH (Power over HDBaseT).

For audio input and output, digital audio and analog audio formats are supported, and they are cross-routable. Audio levels of each input and output can be set individually. The lip sync feature provides the user with a means to control time alignment between the video and audio.

The MSD is controlled remotely via RS-232C or LAN. Additionally, external devices connected to the MSD can be controlled through RS-232C, LAN, CEC, or contact closure by registering external control commands. The waiting function can delay the issuance of registered commands to external devices. As an example, a power down command can be delayed until after sufficient lamp cooling time for a projector has elapsed. Control commands for external devices can be executed from front panel keys or in response to commands via RS-232C or LAN. Commands can also be executed when input channel selection keys are operated or the MSD is powered ON.



¹ Maximum extension distance
 Up to 98 ft. (30 m) : 1080p@60
 Up to 39 ft. (12 m) : 4K@60 (when 18 Gbps high-speed cable is used) (IN1, IN2, OUT1 and OUT2 only)

² Maximum extension distance
 Up to 328 ft. (100 m) : Input/4K@60 (4:2:0), Output/4K@30
 Up to 492 ft. (150 m) : 1080p (24 bit) in Long reach mode with IDK's HDBaseT products supporting 328 ft. (100 m)

[Fig. 3.1] MSD-802UHD diagram

4 Features

■ Video

- Up to 4K@60 (4:4:4)
- HDCP 1.4 / 2.2
- Up to 492 ft. (150 m) over Cat6 cable (Long reach mode)^{*1}
- Motion adaptive I/P conversion
- Scan conversion (independent for each output)
- Aspect ratio control
- Seamless switching^{*2}
- A/D conversion
- Anti-snow (automatic recovery from HDCP error)

■ Audio

- A/D, D/A conversion
- Volume adjustment
- Lip sync

■ Control Input

- RS-232C
- LAN
- Command control

■ Control output

- Control command output (e.g. controlling projector)
- PLink
- Power control of sink device over CEC
- Contact closure

■ Others

- Power over HDBaseT (PoH) power feeding (HDBaseT input)^{*3}
- EDID emulation
- All functions and configuration settings accessible through browser
- Automatic input detection and switching
- Audio breakaway enables independent audio and video switching
- Cross point memory
- Preset memory
- Last memory
- Connection Reset
- Security lock

^{*1} For Long reach mode, up to 1080p (24 bit) resolutions are supported.

^{*2} Seamless switching with a black frame.

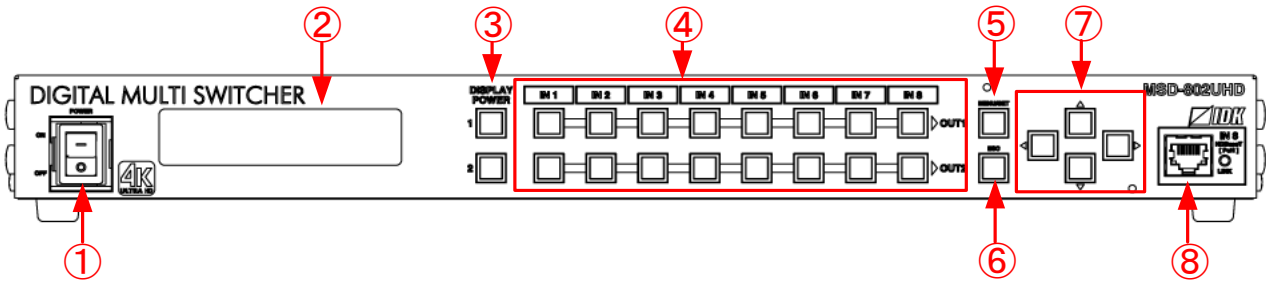
^{*3} Only for MSD-801UHD / 802UHD.

Tip:

For Long reach mode, use IDK's HDBaseT products supporting 328 ft. (100 m).

5 Panels

5.1 Front panel

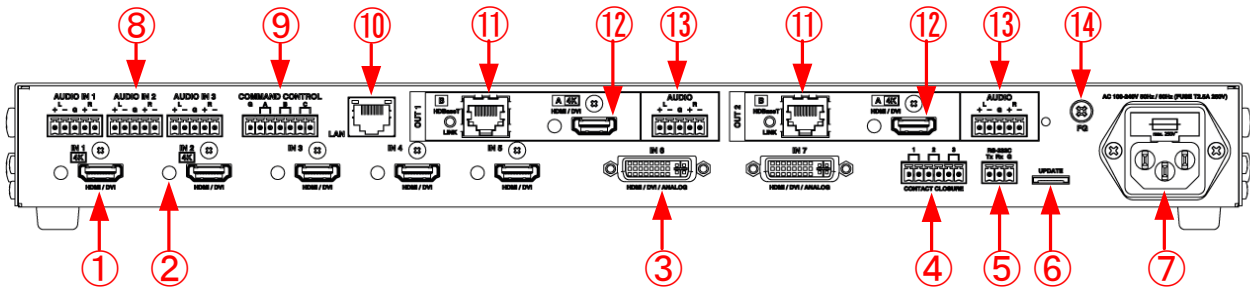


[Fig. 5.1] Front panel drawing (MSD-802UHD)

[Table 5.1] Front panel's name and description

| # | Name | Description |
|---|-----------------------------|--|
| ① | POWER switch | Powers on / off the MSD. |
| ② | VFD screen | Displays menus and settings. |
| ③ | DISPLAY POWER key | Turns on / off connected sink devices. |
| ④ | Input channel selection key | Selects input channels. 【See: 8.2 Switching input channel】 |
| ⑤ | MENU/SET key | Selects menus and edits / controls / stores settings. 【See: 8.3 Menu operation】 |
| ⑥ | ESC key | Ends the current menu setting |
| ⑦ | Arrow keys (▲, ▼, ◀, ▶) | Switches menu, moves cursor, and changes setting values |
| ⑧ | HDBaseT input connector | Input connector for HDBaseT signal Connects to a transmitter over a twisted pair cable. Provides power to HDBaseT transmitter that supports PoH. 【See: 6 System configuration example】 【See: 7.2.3 Twisted pair cable for extension】 【See: 9.6.6 HDBaseT input long reach mode】 |

5.2 Rear panel



[Fig. 5.2] Rear panel drawing (MSD-802UHD)

[Table 5.2] Rear panel's part name and description

| # | Name | Description |
|---|---------------------------|---|
| ① | HDMI input connector | Input connectors for HDMI and DVI signals to interface source devices, such as Blu-ray players. |
| ② | HDMI cable fixing hole | Retains HDMI cables by inserting cable clamps. 【See: [Fig. 7.2] Attaching a cable clamp】 |
| ③ | DVI input connector | Input connectors for DVI-I and DVI-D cables. HDMI signal can be interfaced using an HDMI-DVI conversion cable. Analog video also can be input using a DVI-analog conversion cable. <ul style="list-style-type: none"> • HDMI • Analog RGB (such as PC) • Analog YPbPr (SDTV / HDTV) • Composite video (NTSC / PAL) • S video (NTSC / PAL) 【See: 7.2.2 DVI-I input connector】 |
| ④ | Contact closure | For external device control by dry contact closure Connector type: Terminal block (6-pin). 【See: 7.2.6 Contact closure】 |
| ⑤ | RS-232C connector | For external control by communication commands Connector type: Terminal block (3-pin). 【See: 7.2.5 Connecting RS-232C cable】 |
| ⑥ | Maintenance connector | Factory use only. |
| ⑦ | AC power inlet | For use with provided power cable |
| ⑧ | Audio input connector | Input connector for analog audio signals Connector type: Terminal block (5-pin) 【See: 7.2.4 Connecting audio cables】 |
| ⑨ | COMMAND CONTROL connector | For external interface that execute commands from a switch box The connected switch box operates as control command execution keys (COMMAND A to COMMAND C). Connector type: Terminal block (7-pin) 【See: 7.2.7 Command control】 |

[Table 5.3] Rear panel's part name and description (Cont'd)

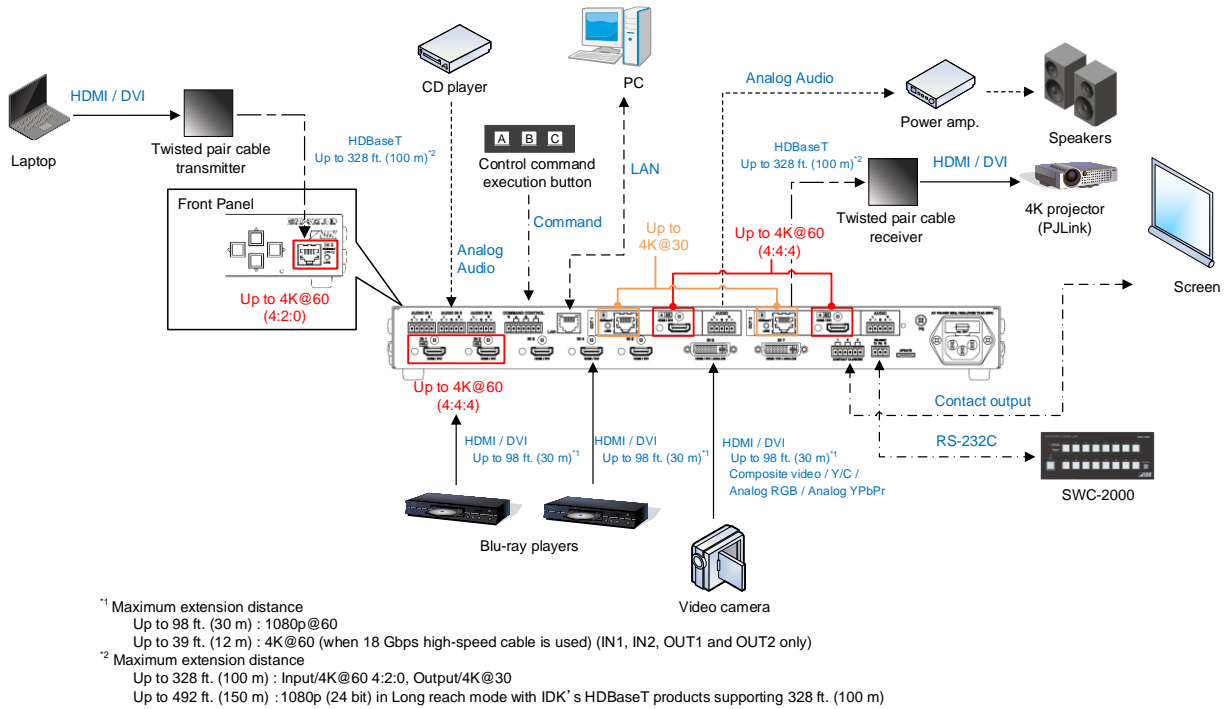
| # | Name | Description |
|---|--------------------------|---|
| ⑩ | LAN connector | For external control by communication commands or web browsers |
| ⑪ | HDBaseT output connector | Output connector for HDBaseT signal Connects to a receiver over a twisted pair cable. 【See: 7.2.3 Twisted pair cable for extension】 【See: 9.8.16 HDBaseT output long reach mode】 |
| ⑫ | HDMI output connector | Output connector for HDMI and DVI signal interfaces with sink devices such as LC monitors and projectors |
| ⑬ | Audio output connector | Analog audio output connectors interface to amplifiers, speakers, and mixers. Connector type: Terminal block (5-pin) 【See: 7.2.4 Connecting audio cables】 |
| ⑭ | Frame ground | Use for bonding chassis to local ground. An M4 screw is used. |

6 System configuration example

Configuration example: source and sink devices are connected to the MSD.

Use a transmitter that supports PoH PD (IEEE802.3af) and AWG 24 twisted pair cable or thicker cable in order to provide power from the HDBaseT input connector on the front panel to the twisted pair cable transmitter.

For long reach mode, please use the MSD with IDK's twisted pair cable transmitter or receiver.



[Fig. 6.1] Configuration example (MSD-802UHD)

7 Precautions

Before connecting to external devices, follow the precautions below.

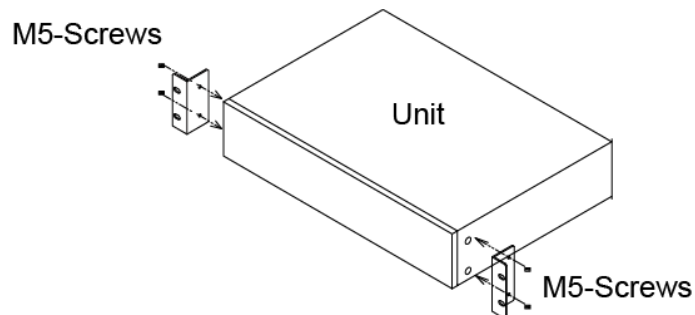
7.1 Installation

When installing the MSD, please observe the following precautions.

- Do not stack or place one MSD directly on top of another MSD.
- Do not block vent holes. To provide adequate ventilation, maintain sufficient clearances around the MSD 1.18 inches (30 mm).
- When the MSD needs to be mounted in an EIA rack, or an enclosed space, please ensure that sufficient ventilation or cooling is provided and that the ambient temperature will not exceed 104°F (40°C). If inadequately vented, the product's service life, operation and reliability may be affected.

■ Attaching rack mounting brackets

1. Remove four M5 screws from one side of the unit. Retain these screws for step 2.
2. Attach one bracket to the side of the unit using the screws removed in step 1.
3. Repeat steps 1 and 2 on the other side of the unit.



[Fig. 7.1] Attaching rack mounting brackets

Note:

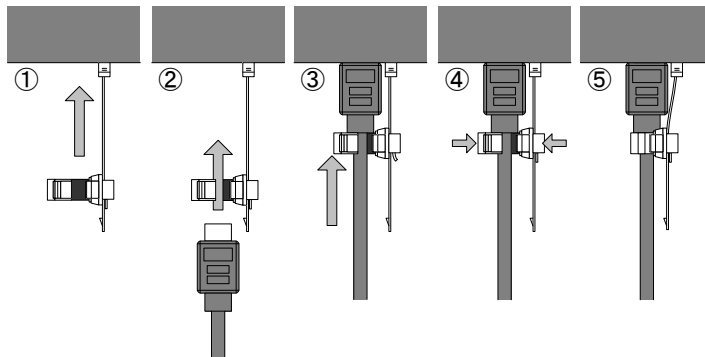
The standard screw tightening torque is 2.94 N·m (about 30 kgf·cm).

7.2 Cabling

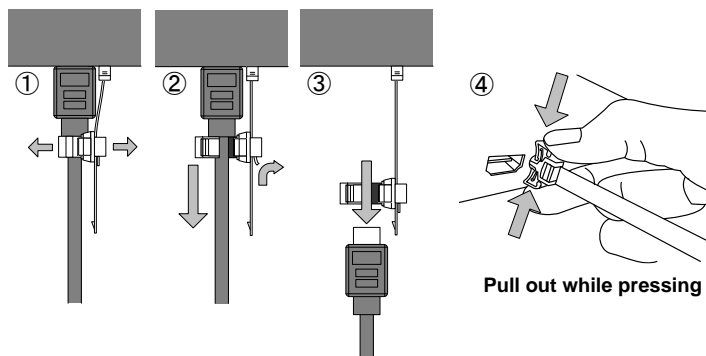
When connecting the MSD to external devices, please observe the following precautions.

- Read manuals for the external devices.
- Before you connecting cables to the MSD or an external device, dissipate static electricity by touching grounded metal such as racks before handling signal cables. Failure to observe this precaution may result in ESD (electrostatic discharge) damage.
- Power all units off before connecting cables.
- Be sure to fully seat all plugs and connections and dress cables to reduce stress on connectors.
- Secure HDMI cables using cable clamps to prevent connectors from being accidentally pulled out of ports.

Fixing HDMI cable using cable clamp



Removing HDMI cable and cable clamp



[Fig. 7.2] Attaching a cable clamp

7.2.1 Cables

IDK has a large selection of flexible HDMI cables, DVI cables, high-quality long cables, and conversion cables.

Use the correct cable depending on the system configuration.

For analog audio and RS-232C, select or fabricate cables to match the connectors as needed.

7.2.2 DVI-I input connector

29-pin DVI-I female connectors are used for DVI inputs.

The DVI-I input connectors can be used for HDMI/DVI digital signals and for analog signal.

■ DVI signal input

Use DVI-I or DVI-D cable.

Signal only supports single-link.

■ HDMI signal input

Use HDMI-DVI conversion cable.

■ Analog RGB signal input

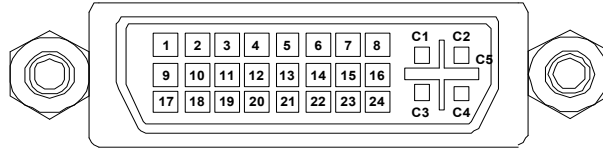
Use conversion cable which has DVI-I (male) and high-density D-sub 15 (female).

■ Other analog signal input

Analog YPbPr / composite video / Y/C signals can be input.

Use conversion cable for each signal.

Pin assignments for each signal are shown below.



[Fig. 7.3] 29-pin DVI-I female connector

[Table 7.1] Pin assignments

| Pin # | Input signal name | | | | |
|-------|-------------------|-------------|--------------|-----------------|------|
| | HDMI / DVI | Analog RGB | Analog YPbPr | Composite video | Y/C |
| 1 | TMDS Data2- | N.C. | N.C. | N.C. | N.C. |
| 2 | TMDS Data2+ | N.C. | N.C. | N.C. | N.C. |
| 3 | GND | N.C. | N.C. | N.C. | N.C. |
| 4 | N.C. | N.C. | N.C. | N.C. | N.C. |
| 5 | N.C. | N.C. | N.C. | N.C. | N.C. |
| 6 | DDC Clock | DDC Clock | N.C. | N.C. | N.C. |
| 7 | DDC Data | DDC Data | N.C. | N.C. | N.C. |
| 8 | N.C. | V-Sync | N.C. | N.C. | N.C. |
| 9 | TMDS Data1- | N.C. | N.C. | N.C. | N.C. |
| 10 | TMDS Data1+ | N.C. | N.C. | N.C. | N.C. |
| 11 | GND | N.C. | N.C. | N.C. | N.C. |
| 12 | N.C. | N.C. | N.C. | N.C. | N.C. |
| 13 | N.C. | N.C. | N.C. | N.C. | N.C. |
| 14 | +5V Power | N.C. | N.C. | N.C. | N.C. |
| 15 | GND | N.C. | N.C. | N.C. | N.C. |
| 16 | Hot Plug Detect | N.C. | N.C. | N.C. | N.C. |
| 17 | TMDS Data0- | N.C. | N.C. | N.C. | N.C. |
| 18 | TMDS Data0+ | N.C. | N.C. | N.C. | N.C. |
| 19 | GND | N.C. | N.C. | N.C. | N.C. |
| 20 | N.C. | N.C. | N.C. | N.C. | N.C. |
| 21 | N.C. | N.C. | N.C. | N.C. | N.C. |
| 22 | GND | N.C. | N.C. | N.C. | N.C. |
| 23 | TMDS Clock+ | N.C. | N.C. | N.C. | N.C. |
| 24 | TMDS Clock- | N.C. | N.C. | N.C. | N.C. |
| C1 | N.C. | Red | Pr / Cr | N.C. | N.C. |
| C2 | N.C. | Green / SOG | Y | VIDEO | Y |
| C3 | N.C. | Blue | Pb / Cb | N.C. | C |
| C4 | N.C. | H-Sync / CS | N.C. | N.C. | N.C. |
| C5 | N.C. | GND | GND | GND | GND |

N.C. : No Connection
SOG : Sync On Green
CS : Composite Sync

7.2.3 Twisted pair cable for extension

To ensure the best performance of twisted pair cables, select a correct twisted pair cable and connect it correctly.

- Cat5e UTP/STP and Cat6 UTP/STP can be used, but we recommend CAT.5E HDC cable* for optimal performance.
- If using an STP cable, connect the FG connector to a ground source. Otherwise, the shielding feature does not work correctly. When using a UTP cable, we still recommend using the ground connector.
- The shielded STP cables are less affected by interference or external noise than UTP cables.
- Connectors for long-haul extension are the same as that of eight-core modular connector used for Ethernet, but the transmission system is not the same so that it cannot be connected to Ethernet.
- The maximum extension distance of a twisted pair cables is the shorter distance of the maximum extension distances of transmitter/receiver/sink device connected to the MSD.
- Pin assignments: T568A or T568B straight
- Do not pull the cable hard. The allowable tension of the twisted pair cable is 110 N.
- Do not bend the connection cable at a sharp angle. Keep the bend radius four times of the cable diameter or larger.
- Do not tie the cable tightly; leave a space allowing the cable to move slightly.
- If you use multiple twisted pair cables, we recommended keeping a distance between the cables or not to place the cables closely in parallel.
- Keep the twisted pair cable as straight as you can. If you coil the cable, it is easily affected by noise.
- Do not place the cable in an electrically noisy environment, since high-speed signals are transmitted. Particularly when you use a high-output radio around the MSD, video or audio may be interrupted.
- If the total extension distance from the transmitter to receiver is 328 ft. (100 m) or less, up to two cable joints can be used. Products supporting Cat6A (10GBase-T) are recommended. However, the extension distance of high-resolution transmission, such as 4K, may be shortened about 10%.
- Use AWG 24 or ticker cable for PoH.
- The table below shows supported extension distance for each twisted pair cable category. Note that the distance may shorten depending on the actual environment.

[Table 7.2] Twisted pair cable and extension distance

| Noise influence | Category | | Extension distance | TMDS clock | Remarks |
|-----------------|----------|--------|--------------------|---|---|
| Easily affected | UTP | Cat5e | 164 ft. (50 m) | ≤ 225 MHz | For 164 ft. (50 m) or longer, Cat5e STP, Cat6 UTP / STP, CAT.5E HDC* are recommended. |
| | | Cat6 | 328 ft. (100 m) | | |
| | | | | 230 ft. (70 m) | |
| Less affected | STP | Cat5e* | 328 ft. (100 m) | Long reach mode ≤ 148 MHz (1080p 24 bit or less) | Cat5e STP, Cat6 STP, CAT.5E HDC cable |
| | | Cat6 | 492 ft. (150 m) | | |

*The CAT.5E HDC cable is a double-shielded twisted pair cable that optimizes video signal transmission. It is certified to 500 MHz bandwidth at distance up to 330 feet (100 m) and verified to meet requirements specified by HDBaseT Alliance. The double-shielded structure protects video signal from outside interference.

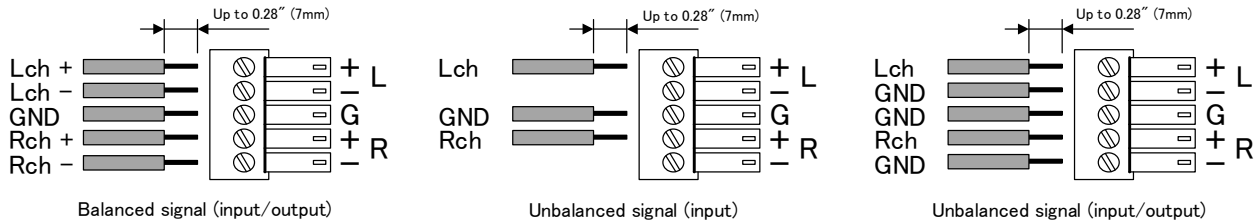
Note:

If there is a problem in the transmission path, video or audio may be interrupted. Check the precautions above. If the problem still cannot be solved, shortening the twisted pair cable may remedy the problem.

7.2.4 Connecting audio cables

Connect audio cables to the 5-pin terminal block. The MSD supports both balanced and unbalanced analog signals.

AWG28 to AWG16 conductor gauge is recommended. The recommended wire strip length is 0.28 in. (7 mm).



[Fig. 7.4] Connecting audio cable to 5-pin terminal block connector

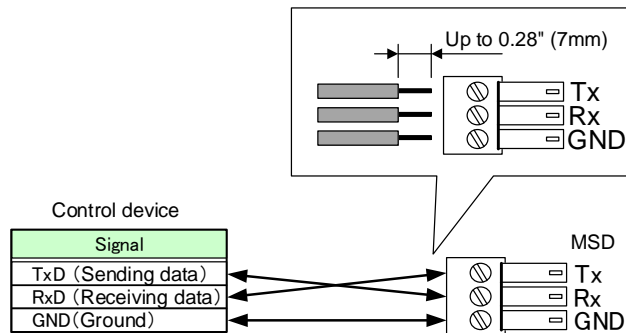
7.2.5 Connecting RS-232C cable

A 3-pin terminal block is used for the RS-232C connector.

Fix RS-232C cable to the attached 3-pin terminal block, and then connect it to the MSD.

AWG28 to AWG16 conductor gauge is recommended. The recommended wire strip length is 0.28 in. (7 mm).

Short RTS/CTS and DTR/DSR as needed.



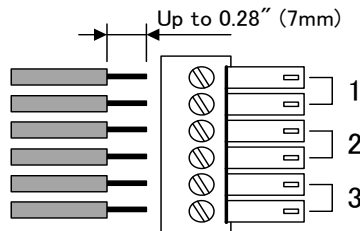
[Fig. 7.5] Connecting RS-232C cable to 3-pin terminal block connector

7.2.6 Contact closure

The MSD has a total of three (3) independently controlled contact closure channels for external control. Each connector supports three (3) channels. The maximum peak load for each contact is 24 VDC @ 500 mA.

Connect a cable to the 6-pin terminal block, and then insert into the appropriate connector on the MSD's rear panel.

AWG28 to AWG16 conductor gauge is recommended. The recommended wire strip length is 0.28 in. (7 mm).



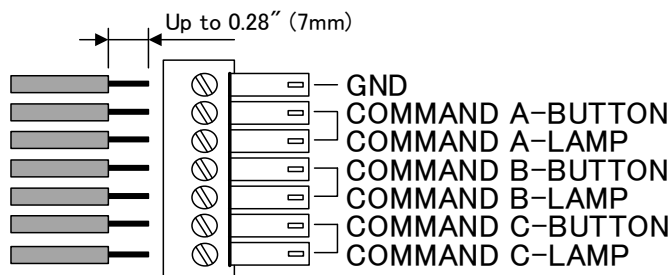
[Fig. 7.6] Connecting cable to 6-pin terminal block connector

7.2.7 Command control

Up to three command buttons (commands A to C) can be executed by connecting the provided 7-pin terminal block to the command control connector.

Connect these buttons for control commands A to C and LAMPs to the terminal block. When 0V (GND) is input to the BUTTON terminal, the command will be executed. The LAMP terminal is controlled with DC 5V/100mA. For LEDs, a current-limiting resistor has to be connected.

AWG28 to AWG16 conductor gauge is recommended. The recommended wire strip length is 0.28 in. (7 mm).



[Fig. 7.7] Connecting cable to 7-pin terminal block connector

8 Basic operation

8.1 Power up period

After powering on the MSD, there is some seconds initialization delay before the WEB browser is fully operational and before the first communication command can be received and executed.

[Table 8.1] Required time

| Operation | Required time |
|------------------------------------|----------------------|
| Receiving communication command | 11 seconds |
| Receiving WEB browser operation | 11 seconds |
| Receiving operation of front panel | 12 or longer seconds |

Note:

If "9.15.7 Startup bitmap output" is set to "ON", the required time for the front panel operation may be longer.

8.2 Switching input channel

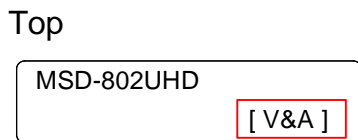
8.2.1 Selecting input channels

Video and audio signals can be switched simultaneously or independently.

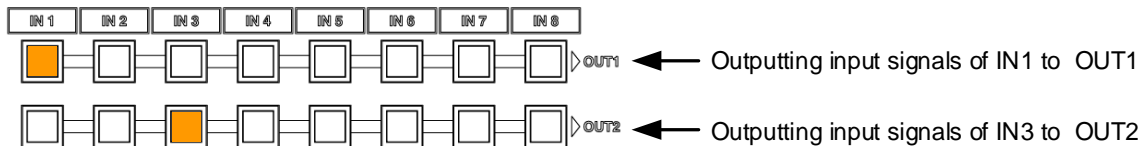
Select the desired mode and press the input channel selection key, and then select the output channel.

[Table 8.2] Switching mode

| Switching mode | Description |
|----------------|----------------------------|
| V&A | Video&Audio simultaneously |
| VIDEO | Video |
| AUDIO | Audio |



[Fig. 8.1] Switching mode

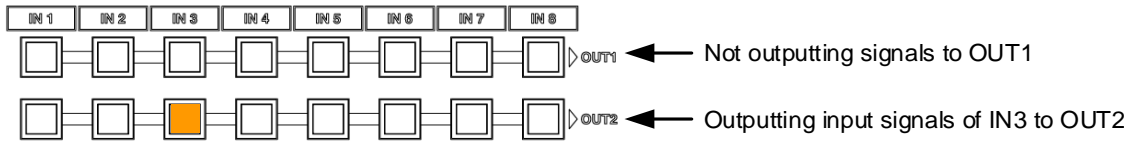


[Fig. 8.2] I/O cross point indication

8.2.2 Turning off input signal

■ MSD-802UHD / MSD-801UHD

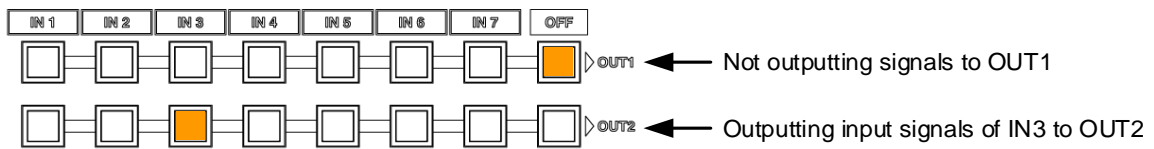
You can disable the input signal by pressing the input key that is currently selected. You can enable or disable the input signal by toggle operation.



[Fig. 8.3] Input selection: OFF (MSD-802UHD)

■ MSD-702UHD / MSD-701UHD

To stop outputting signals, press the “OFF” button of OUT1 or OUT2.



[Fig. 8.4] Input selection: OFF (MSD-702UHD)

8.3 Menu operation

You can use the VFD screen and front panel keys to view and control settings.

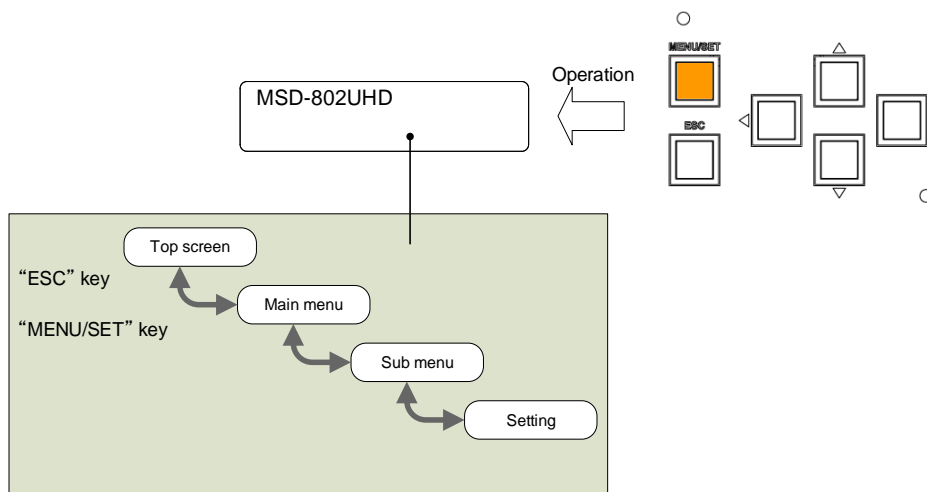
Press the “MENU/SET” key to apply settings and to change the menu level.

Press the “ESC” key to go back to the previous screen.

Use the “▲” and “▼” keys to select channels and use the “▲” and “▼” keys to select the menu item.

In the setting screen, use “▲”, “▼”, “▲” and “▼” keys to move the cursor and select the setting. The applied values are saved automatically after the session.

【See: 9.1 Menu list】



【Fig. 8.5】 Menu level

Tip:

The “MENU/SET” key LED is illuminated only for settable menu.

For some setting screens, the set value is applied from the “MENU/SET” key. When the “MENU/SET” key flashes, press the key to apply the setting value. After the setting has been applied, the key will illuminate without flashing.

We offer an optional cover for menu operation keys to prevent accidental key presses. Please contact us as needed.

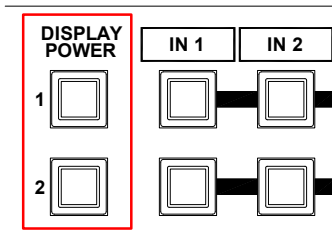
Note:

To avoid losing settings, do not interrupt power to the MSD while “NOW SAVING” is displayed; otherwise, the setting information may be lost.

8.4 Menu operation

You can register control commands to power the sink device on/off. By pressing the appropriate key, control commands are sent to the sink device.

【See: 9.13.3 Command link】



[Table 8.3] Sink device power supply key

| Sink device power status | LED |
|--------------------------|-----------------|
| Power ON | Lights (orange) |
| Power OFF | Turned off |

[Fig. 8.6] Sink device power control key

Note:

If power a ON/OFF control command is sent to a sink device and reply command of normal termination is sent from the sink device, the “DISPLAY POWER” key turns orange (when powered ON) or the key light turns off (when powered OFF).

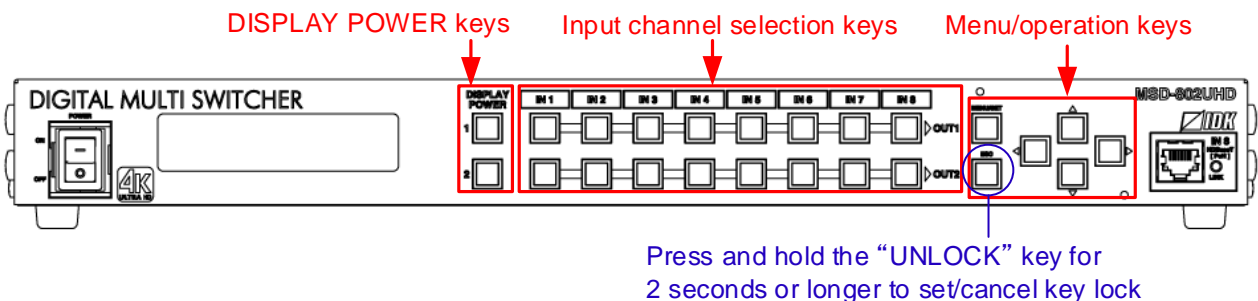
If the reply command from the sink device is not checked, the actual power status of the sink device and the LED may not match.

8.5 Locking and unlocking keys

Press and hold the “UNLOCK” key for 2 seconds or longer to set/cancel keylock function for keys below. You will hear a beep and then one of the following messages is displayed for 1 second.

【See: 9.17.1 Grouping key function lock】

- OPERATION LOCK ! (Locked)
- OP LOCK RELEASE ! (Unlocked)



[Fig. 8.7] Keys to be set/cancel operation lock (MSD-802HUD)

8.6 Initialization

All settings will be reset to factory default values by turning on the MSD while pressing the “ESC” key. Press and hold the “ESC” key until you hear a long beep sound.

Table 8.4 below, shows the Factory default values.

When settings are initialized from the WEB browser, they can be initialized without changing LAN settings. Note that after returning to factory default, the previous setting values cannot be restored. Some menus can be set for each input channel and output channel individually; see “[Table 8.14] Setting condition” for details.

[Table 8.4] Factory default

| Menu | Factory default | | See |
|-------------------|-----------------|--|------|
| SWITCHING MODE | For | --- | P.47 |
| | Default | V&A | |
| OUTPUT TIMING | | | |
| RESOLUTION | For | Each output channel | P.48 |
| | Default | AUTO-A | |
| MONITOR ASPECT | For | Each output channel | P.50 |
| | Default | RESOLUTION | |
| INPUT ASPECT | For | Each input channel, each input signal | P.50 |
| | Default | AUTO-1 | |
| ASPECT PROCESS | For | Each input channel, each input signal | P.51 |
| | Default | L-BOX / S-PANEL | |
| INPUT OVER SCAN | For | Each input channel, each input signal | P.51 |
| | Default | 105 % [NTSC / PAL / SDTV input] 100 % [HDTV / PC input] | |
| INPUT POSITION | For | Each input channel, each input signal | P.51 |
| | Default | H : 0 V : 0 | |
| INPUT SIZE | For | Each input channel, each input signal | P.52 |
| | Default | H : Horizontal output resolution V : Vertical output resolution | |
| INPUT MASKING | For | Each input channel, each input signal | P.53 |
| | Default | L : 0 R : Horizontal input size T : 0 B : Vertical input size | |
| INPUT AUTO SIZING | For | Each input channel, each input signal | P.53 |
| | Default | --- | |

[Table 8.5] Factory default (Cont'd)

| Menu | Factory default | | See: |
|----------------------|-----------------|--|------|
| OUTPUT TIMING | | | |
| OUTPUT POSITION | For | Each output channel | P.51 |
| | Default | H : 0 V : 0 | |
| OUTPUT SIZE | For | Each output channel | P.52 |
| | Default | H : Horizontal input size V : Vertical input size | |
| OUTPUT MASKING | For | Each output channel | P.53 |
| | Default | L : 0 R : Horizontal input size T : 0 B : Vertical input size | |
| OUTPUT AUTO SIZING | For | Each output channel | P.53 |
| | Default | --- | |
| BACKGROUND COLOR | For | Each output channel | P.54 |
| | Default | R : 0 G : 0 B : 0 | |
| TEST PATTERN | For | Each output channel | P.54 |
| | Default | OFF | |
| IMAGE EFFECT | | | |
| INPUT SHARPNESS | For | Each input channel, each input signal | P.55 |
| | Default | 0 | |
| INPUT BRIGHTNESS | For | Each input channel, each input signal | P.55 |
| | Default | 100 % | |
| INPUT CONTRAST | For | Each input channel, each input signal | P.55 |
| | Default | R : 100 % G : 100 % B : 100 % | |
| INPUT HUE | For | Each input channel, each input signal | P.56 |
| | Default | 0 ° | |
| INPUT SATURATION | For | Each input channel, each input signal | P.56 |
| | Default | 100 % | |
| INPUT SETUP LEVEL | For | Each input channel, each input signal | P.56 |
| | Default | 0.0 % | |
| IN DEFAULT COLOR | For | Each input channel, each input signal | P.57 |
| | Default | --- | |
| OUTPUT BRIGHTNESS | For | Each output channel | P.55 |
| | Default | 100 % | |
| OUTPUT CONTRAST | For | Each output channel | P.55 |
| | Default | R : 100 % G : 100 % B : 100 % | |
| OUTPUT GAMMA | For | Each output channel | P.56 |
| | Default | 1.0 | |
| OUT DEFAULT COLOR | For | Each output channel | P.57 |
| | Default | --- | |

[Table 8.6] Factory default (Cont'd)

| Menu | Factory default | | See: |
|----------------------|-----------------|--|------|
| INPUT SETTING | | | |
| INPUT VIDEO DETECT | For | Each input channel, digital input only | P.58 |
| | Default | 10000 ms | |
| HDCP INPUT ENABLE | For | Each input channel, digital input only | P.59 |
| | Default | HDCP 2.2 [IN1, IN2, IN8] HDCP 1.4 [IN3 to IN7] | |
| ANALOG INPUT TYPE | For | Each input channel, each input signal, analog input only | P.60 |
| | Default | AUTO | |
| INPUT OFF CHECK | For | Each input channel | P.61 |
| | Default | ON | |
| INPUT AD TYPE | For | Each input channel, DVI connector only | P.61 |
| | Default | DIGITAL | |
| LONG REACH MODE | For | HDBaseT input channel | P.61 |
| | Default | OFF | |
| INPUT TABLE FIXED | For | Each input channel | P.62 |
| | Default | [Setting mode] SELECTED [Individual setting ("SELECTED" is selected for setting mode)] ASPECT : OFF, ANALOG TYPE : ON(FIXED) AUDIO LEVEL : ON(FIXED) | |
| INPUT TIMING | | | |
| AUTO SETUP | For | Each input channel, each input signal, analog input only* ¹ | P.64 |
| | Default | NORMAL MODE | |
| H TOTAL DOTS | For | Each input channel, each input signal, analog input only* ¹ | P.66 |
| | Default | Depends on input signal | |
| H START | For | Each input channel, each input signal | P.66 |
| | Default | Depends on input signal | |
| H DISPLAY | For | Each input channel, each input signal | P.67 |
| | Default | Depends on input signal | |
| V START | For | Each input channel, each input signal | P.66 |
| | Default | Depends on input signal | |
| V DISPLAY | For | Each input channel, each input signal | P.67 |
| | Default | Depends on input signal | |
| AUTO START POS | For | Each input channel, each input signal, analog input only* ¹ | P.68 |
| | Default | ON | |
| UNKNOWN TIMING | For | --- | P.68 |
| | Default | AUTO SETUP ON | |

*¹ Can be set and executed only if an analog RGB or YPbPr signal input is active.

[Table 8.7] Factory default (Cont'd)

| Menu | Factory default | | See: |
|-----------------------|-----------------|---|------|
| INPUT TIMING | | | |
| LOAD | For | Each input channel, each input signal | P.69 |
| | Default | --- | |
| SAVE | For | each input signal, each input signal* ¹ | P.69 |
| | Default | --- | |
| TRACKING | For | Each input channel, each input signal* ¹ | P.69 |
| | Default | 0 | |
| OUTPUT SETTING | | | |
| OUTPUT MODE | For | Each output channel | P.70 |
| | Default | HDMI YCbCr 4:4:4 MODE | |
| SYNC OUTPUT | For | Each output channel | P.70 |
| | Default | ON | |
| VIDEO OUTPUT | For | Each output channel | P.71 |
| | Default | BLUE | |
| VIDEO SWITCHING | For | Each output channel | P.71 |
| | Default | FREEZE→FADE OUT-IN | |
| SWITCHING SPEED | For | Each output channel | P.71 |
| | Default | 350 ms | |
| WIPE COLOR | For | Each output channel | P.71 |
| | Default | R : 0, G : 0, B : 0 | |
| OUTPUT CONNECTOR | For | Each output channel | P.72 |
| | Default | ON | |
| HDCP OUTPUT MODE | For | Each output channel | P.72 |
| | Default | HDCP 2.2 | |
| HDCP ERROR RETRY | For | Each output channel | P.73 |
| | Default | ETERNITY | |
| DEEP COLOR OUTPUT | For | Each output channel | P.73 |
| | Default | 24-BIT COLOR | |
| CEC CONNECTION | For | Each output channel | P.74 |
| | Default | NOT CONNECTED | |
| HDCP AUTHORIZATION | For | Each output channel | P.74 |
| | Default | --- | |
| AUTO SWITCHING ON | For | Each output channel | P.75 |
| | Default | OFF | |
| AUTO SWITCHING OFF | For | Each output channel | P.75 |
| | Default | OFF | |
| AUTO SWITCHING MASK | For | Each output channel | P.77 |
| | Default | 0s000ms | |
| AUTO SWITCHING MODE | For | Each output channel | P.77 |
| | Default | V&A | |
| LONG REACH MODE | For | Each output channel | P.77 |
| | Default | OFF | |

[Table 8.8] Factory default (Cont'd)

| Menu | Factory default | | See: |
|--------------------|-----------------|--|------|
| AUDIO | | | |
| OUTPUT LEVEL | For | Each output channel | P.79 |
| | Default | 0 dB | |
| OUTPUT MUTE | For | Each output channel | P.79 |
| | Default | OFF | |
| AUDIO INPUT SELECT | For | Each input channel, digital input only | P.79 |
| | Default | DIGITAL | |
| INPUT OFFSET | For | Each input channel, each input signal | P.79 |
| | Default | 0 dB | |
| OUTPUT LIP SYNC | For | Each output channel | P.80 |
| | Default | 0 FRAME | |
| INPUT LIP SYNC | For | Each input channel, each input signal | P.80 |
| | Default | 0 FRAME | |
| SAMPLING FREQUENCY | For | Each output channel | P.80 |
| | Default | AUTO-A | |
| AUDIO OUTPUT | For | Each output channel | P.81 |
| | Default | ANALOG&DIGITAL | |
| DIGITAL OUTPUT | For | Each output channel | P.81 |
| | Default | ON | |
| MULTI AUDIO | For | Each output channel | P.81 |
| | Default | DOWN MIX | |
| OUT AUDIO PRIORITY | For | Each output channel | P.82 |
| | Default | MULTI | |
| TEST TONE | For | Each output channel | P.83 |
| | Default | TEST TONE : OFF SPEAKER : ALL | |

[Table 8.9] Factory default (Cont'd)

| Menu | Factory default | | See: |
|-------------------|-----------------|---|------|
| EDID | | | |
| EDID DATA | For | Each input channel, digital input only | P.84 |
| | Default | INTERNAL EDID | |
| PC RESOLUTION | For | Each input channel | P.85 |
| | Default | IN1 to IN2 : 2160p@60 (3840x2160) IN4 to IN7 : 1080p(1920x1080) IN8 : 2160p@30 (3840x2160) | |
| AV RESOLUTION | For | Each input channel, digital input only ^{*2} | P.87 |
| | Default | AUTO | |
| DEEP COLOR INPUT | For | Each input channel, digital input only ^{*2} | P.88 |
| | Default | 24-BIT COLOR | |
| AUDIO FORMAT | For | Each input channel, digital input only ^{*2} | P.88 |
| | Default | PCM : 48 kHz Dolby Digital : OFF AAC : OFF Dolby Digital+ : OFF DTS : OFF DTS-HD : OFF Dolby TrueHD : OFF | |
| SPEAKER | For | Each input channel, digital input only ^{*2} | P.89 |
| | Default | MODE : AUTO NUMBER : 2 FL / FR : ON LFE : OFF FC : OFF RL / RR : OFF RC : OFF FLC / FRC : OFF RLC / RRC : OFF FLW / FRW : OFF FLH / RLH : OFF TC : OFF FCH : OFF FCH : OFF | |
| MONITOR EDID COPY | For | No.1 to No.8 | P.90 |
| | Default | --- | |

^{*2} Can be set only if "INTERNAL EDID" is selected for the EDID mode.

[Table 8.10] Factory default (Cont'd)

| Menu | Factory default | | See: |
|-------------------|-----------------|---|------|
| COM PORT | | | |
| PARAMETERS | For | EACH RS-232C CHANNEL | P.91 |
| | Default | Baud rate : 9600 Data bit length : 8 Parity check : NONE Stop bit : 1 | |
| FUNCTION | For | EACH RS-232C CHANNEL | P.92 |
| | Default | RECEIVER (Receiver mode) | |
| OUT B SCI CONNECT | For | --- | P.92 |
| | Default | OFF | |
| LAN | | | |
| IP ADDRESS | For | --- | P.95 |
| | Default | 192.168.1.199 | |
| SUBNET MASK | For | --- | P.95 |
| | Default | 255.255.255.0 | |
| GATEWAY ADDRESS | For | --- | P.95 |
| | Default | 192.168.1.200 | |
| FUNCTION | For | Each connection | P.95 |
| | Default | Operation mode : RECEIVER IP address : 192.168.1.198 PJLink : OFF PORT : 1100 PASS WORD : 20 in ASCII (Space) | |
| PORT NUMBER | For | Each connection | P.96 |
| | Default | Connection1 to Connection3 : 1100 Connection4 to Connection6 : 23 Connection7 to Connection8 : 80 | |
| MAC ADDRESS | For | --- | P.96 |
| | Default | --- | |
| HDBASET LAN | For | HDBaseT input, HDBaseT output | P.96 |
| | Default | ON | |

[Table 8.11] Factory default (Cont'd)

| Menu | Factory default | | See: |
|-----------------------|-----------------|--|-------|
| PRESET COMMAND | | | |
| COMMAND EDIT | For | Each control command | P.99 |
| | Default | " [Table 9.22] Setting items of control command " | |
| RECV COMMAND EDIT | For | Each reply command | P.104 |
| | Default | " [Table 9.27] Setting items of return command " | |
| COMMAND LINK | For | Each control command execution condition | P.107 |
| | Default | OFF | |
| COMMAND EXECUTION | For | --- | P.108 |
| | Default | --- | |
| INVALID TIME | Set value | 0s000ms to 999s999ms | P.108 |
| | For | --- | |
| | Default | 0s000ms | |
| INITIALIZE | For | --- | P.108 |
| | Default | --- | |
| COMMAND TALLY | For | Each control command execution key | P.109 |
| | Default | REGISTERED | |
| FLASH TIME | For | Each control command execution key, each sink device power key | P.109 |
| | Default | EXECUTION | |
| PRESET MEMORY | | | |
| LOAD CROSS POINT | For | --- | P.110 |
| | Default | --- | |
| SAVE CROSS POINT | For | --- | P.110 |
| | Default | --- | |
| EDIT CROSS POINT | For | Each cross point memory | P.111 |
| | Default | Video input channel : --- Audio input channel : --- Memory name : 20 (space) | |
| LOAD ALL SETTING | For | --- | P.111 |
| | Default | --- | |
| SAVE ALL SETTING | For | --- | P.112 |
| | Default | --- | |
| COPY OUTPUT MEMORY | For | --- | P.113 |
| | Default | --- | |
| STARTUP | For | --- | P.114 |
| | Default | LAST CHANNEL | |

[Table 8.12] Factory default (Cont'd)

| Menu | Factory default | | See: |
|-----------------------------|-----------------|--|-------|
| BITMAP | | | |
| BITMAP OUTPUT | For | Each output channel | P.117 |
| | Default | OFF | |
| BACKGROUND COLOR | For | Each output channel, each bitmap | P.117 |
| | Default | R : 255 G : 255 B : 255 | |
| ASPECT | For | Each output channel, each bitmap | P.117 |
| | Default | AUTO | |
| POSITION | For | Each output channel, each bitmap | P.118 |
| | Default | CENTER | |
| CHANNEL ASSIGN | For | Each output channel | P.118 |
| | Default | OFF | |
| POWER ON BITMAP | For | Each output channel | P.118 |
| | Default | OFF | |
| DIVIDE MEMORY* ³ | For | --- | P.119 |
| | Default | MODE : RESIZE NUMBER : 1 DISPLAY : BLOCK SIZE : 127 | |
| VIDEO CAPTURE | For | --- | P.121 |
| | Default | --- | |
| COM PORT | | | |
| DISPLAY POWER | For | Each output channel | P.123 |
| | Default | AUTO | |
| OPERATION LOCK | For | --- | P.124 |
| | Default | AUTO | |

*³ The registered bitmaps are not initialized by the initialization.

[Table 8.13] Factory default (Cont'd)

| Menu | Factory default | | See: |
|--------------------|-----------------|---|-------|
| OTHERS | | | |
| OP LOCK MODE | For | CHANNEL CHANNEL MODE MENU COMMAND DISPLAY POW | P.125 |
| | Default | LOCK | |
| BUZZER | For | --- | P.126 |
| | Default | ON | |
| POWER SAVE | For | --- | P.126 |
| | Default | ON | |
| DISP POW BUTTON ON | For | --- | P.126 |
| | Default | 0 ms | |
| HDC POWER OUTPUT | For | --- | P.126 |
| | Default | OFF | |
| TOP DISPLAY | For | --- | P.127 |
| | Default | NORMAL | |
| INPUT STATUS | For | --- | P.128 |
| | Default | --- | |
| MONITOR STATUS | For | --- | P.130 |
| | Default | --- | |
| EDID STATUS | For | --- | P.132 |
| | Default | --- | |
| VERSION | For | --- | P.133 |
| | Default | --- | |

[Table 8.14] Setting condition

| Setting range | | Description |
|--|--|--|
| Each output channel | (Common to OUTA / OUTB ^{*4}) | Can be set for each output channel Setting is common to OUTA and OUTB |
| | (Each OUTA / OUTB) | Can be set for each output channels Can be set for OUTA and OUTB separately |
| | (only OUTA) | Can be set for OUTA |
| | (only OUTB) | Can be set for OUTB |
| Each input signal | | Can be set for each input signal |
| Each input channel | | Can be set for each input channel |
| Each input channel digital input only | | Can be set for each input channel only if input channel is digital signal |
| Each input channel analog input only | | Can be set for each input channel only if input channel is analog signal |
| Each input channel DVI connector only | | Can be set for each input channel of DVI input connector |
| EACH RS-232C CHANNEL | | Can be set for RC-232C channel |
| HDBaseT input, HDBaseT output | | Can be set for HDBaseT input or HDBaseT output. |
| Each connection | | Can be set for LAN connection |
| Each bitmap | | Can be set for each bitmap |

^{*4} OUTA: HDMI output connector, OUTB: HDBaseT output connector

8.7 Web menu operation

The MSD connected through a LAN can be controlled from a WEB browser, such as Microsoft Internet Explorer. JavaScript is used for the WEB browser screen. To do this, make sure to enable JavaScript of the WEB browser by referring to the HELP of each WEB browser.

Tip:

Compatibility has been tested and verified using the following system configuration:

OS: Windows 7 Professional

WEB browser: Microsoft Internet Explorer 11

Google Chrome 56

Mozilla Firefox 51

8.7.1 Control from WEB browser

To control the MSD from a WEB browser, enter the IP address that is programmed into the MSD in the address bar of the WEB browser to display the WEB menu. Note that the default IP address for all MSD: 192.168.1.199

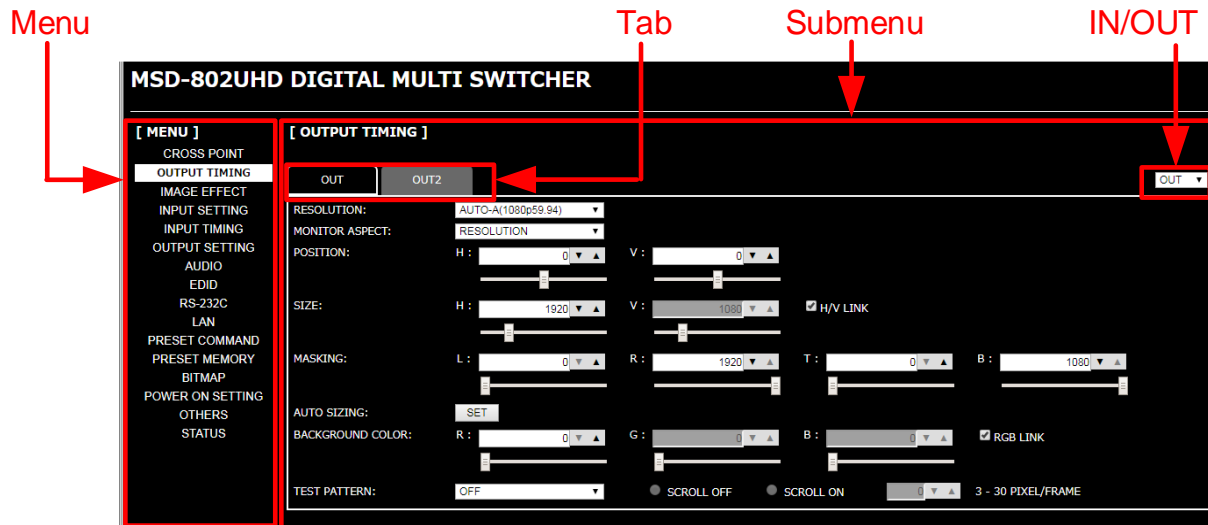
【See: 9.12.1 IP address/Subnet mask/Gateway address】

【See: 9.12.3 TCP port number】

[Table 8.15] Address input example

| Control port number of web browser | IP address (URL) |
|------------------------------------|--------------------------------------|
| 80 (Normal) | http://192.168.1.199 |
| Other than 80 (5000 to 5999) | http://192.168.1.199:5000 (ex: 5000) |

8.7.2 How to use WEB menu



[Fig. 8.8] WEB menu

- ① Select the target item from the menu.
Settings will be displayed in the sub menu.
- ② If there is a setting item that can be set for each channel, channel tab will be displayed.
- ③ Configure each setting from the submenu by following the table below.

[Table 8.16] Buttons for setting

| Button name | Button | Description |
|------------------|--|---|
| Execution button | | Executes the target operation. |
| Pull-down list | | Selects the desired value. |
| Spin button | | Selects the desired value. You can type the desired value directly in the text area. |
| Slider bar | | You can move the slider to set the desired value. |
| Check box | <input checked="" type="checkbox"/> RGB LINK | Enables and disables by clicking or unclicking the box. |
| Radio button | <input type="radio"/> SCROLL OFF <input type="radio"/> SCROLL ON | Selects the desired value. |

Tip:

You can change the channel name displayed in the tab from “NAME EDIT” in the “CROSS POINT”.

9 Menu

9.1 Menu list

Menu trees for the MSD



[Fig. 9.1] Menu list (1/2)

| | |
|--|---|
| <p>/* 9.9 Audio setting */</p> <ul style="list-style-type: none"> └ AUDIO <ul style="list-style-type: none"> └ OUTPUT LEVEL └ OUTPUT MUTE └ AUDIO INPUT SELECT └ INPUT OFFSET └ OUTPUT LIP SYNC └ INPUT LIP SYNC └ SAMPLING FREQUENCY └ AUDIO OUTPUT └ DIGITAL OUTPUT └ MULTI AUDIO └ OUT AUDIO PRIORITY └ TEST TONE <p>/* 9.10 EDID (Extended Display Identification Data) */</p> <ul style="list-style-type: none"> └ EDID <ul style="list-style-type: none"> └ EDID DATA └ PC RESOLUTION └ AV RESOLUTION └ DEEP COLOR INPUT └ AUDIO FORMAT └ SPEAKER └ MONITOR EDID COPY <p>/* 9.11 RS-232C */</p> <ul style="list-style-type: none"> └ COM PORT <ul style="list-style-type: none"> └ PARAMETERS └ FUNCTION └ OUT B SCI CONNECT <p>/* 9.11.3 LAN */</p> <ul style="list-style-type: none"> └ LAN <ul style="list-style-type: none"> └ IP ADDRESS └ SUBNET MASK └ GATEWAY ADDRESS └ FUNCTION └ PORT NUMBER └ MAC ADDRESS └ HDBASET LAN <p>/* 9.13 Setting control command */</p> <ul style="list-style-type: none"> └ PRESET COMMAND <ul style="list-style-type: none"> └ COMMAND EDIT └ RECV COMMAND EDIT └ COMMAND LINK └ COMMAND EXECUTION └ INVALID TIME └ INITIALIZE └ COMMAND TALLY | <p>/* 9.14 Preset memory */</p> <ul style="list-style-type: none"> └ PRESET MEMORY <ul style="list-style-type: none"> └ LOAD CROSS POINT └ SAVE CROSS POINT └ EDIT CROSS POINT └ LOAD ALL SETTING^{*1} └ SAVE ALL SETTING └ COPY OUTPUT MEMORY^{*2} └ STARTUP <p>/* 9.15 Bitmap setting */</p> <ul style="list-style-type: none"> └ BITMAP <ul style="list-style-type: none"> └ BITMAP OUTPUT └ BACKGROUND COLOR └ ASPECT └ POSITION └ CHANNEL ASSIGN └ POWER ON BITMAP └ DIVIDE MEMORY └ VIDEO CAPTURE <p>/* 9.16 Startup setting */</p> <ul style="list-style-type: none"> └ POWER ON SETTING <ul style="list-style-type: none"> └ DISPLAY POWER └ OPERATION LOCK <p>/* 9.17 Other settings */</p> <ul style="list-style-type: none"> └ OTHERS <ul style="list-style-type: none"> └ OP LOCK MODE └ BUZZER └ POWER SAVE └ DISP POW BUTTON ON └ HDC POWER OUTPUT └ TOP DISPLAY └ INPUT STATUS └ MONITOR STATUS └ EDID STATUS └ VERSION |
|--|---|

[Fig. 9.2] Menu list (2/2)

*1 Displayed if preset memory is saved.

*2 Models having two or more outputs support this menu.

9.2 Input Signal Automatic Detection

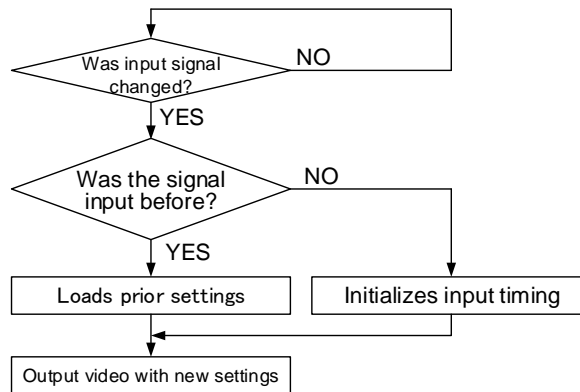
The MSD continuously monitors its input signals. If a particular signal has previously been connected to the MSD's input, the output signal will be presented in the same format as it was during the most recent session. If an input signal does not match any signal previously presented to the MSD, only the input timing settings are automatically negotiated. Other settings are not affected. The output image size and format settings can be adjusted if required.

【See: 9.4 Setting position, size, and masking】

【See: 9.5 Quality setting】

【See: 9.6.7 Fixing settings for each input signal】

【See: 9.7 Setting input timing】



[Fig. 9.3] How signals are recognized

The MSD retains data for up to 50 input devices for each input connector. The data is used to determine if a signal has been presented to that connector previously by a particular device. The input signal have been input before or not. If input data storage exceeds 50 memory locations, the oldest data that have not been input recently will be deleted, instead.

| | IN1 | IN2 | IN3 | IN4 | IN5 | IN6 | IN7 | IN8 |
|----|-------|-------|-------|------|------|------|------|-------|
| 1 | 1080i | 1080i | UXGA | UXGA | WXGA | NTSC | NTSC | 1080p |
| 2 | 720p | 480i | WXGA | VGA | SVGA | XGA | WXGA | WXGA |
| 3 | 480i | | SXGA+ | | | | | |
| 4 | XGA | | | | | | | |
| 5 | SXGA | | | | | | | |
| 6 | UXGA | | | | | | | |
| ⋮ | | | | | | | | |
| 49 | VGA | | | | | | | |
| 50 | 1080p | | | | | | | |

The MSD retains data for up to 50 devices for each input connector.

↑
If input data storage exceeds 50 memory locations, the new memory entries will replace the earliest entries.

[Fig. 9.4] Memory table per channel

The following attributes are saved for each input signal.

[Table 9.1] Attributes saved for each input signal

| Setting | Item |
|-------------------------------------|---|
| Setting position, size, and masking | Aspect ratio, Aspect ratio control, Overscan, Display position, Display size, Masking |
| Quality setting | Sharpness, Brightness, Contrast, HUE, Saturation, Black level |
| Input settings | Analog input signal parameters |
| Setting input timing | The total number of horizontal dots, Start position, Active area, Automatic measurement of start position, Tracking |
| Audio setting | Input level, Lip sync |

9.3 Channel switching mode

Menu Top→SWITCHING MODE
 Setting value V&A [Default], VIDEO, AUDIO

You can switch the channel switching mode.

9.4 Setting position, size, and masking

Position, size, and masking attributes can be set for both the input ports and output ports of the MSD. Normally, it is preferable to set them for the input ports. If edges are cut off due to enlarged display area by the sink device side or if it is desired to modify the displayed area for all inputs at once, set the desired attributes for the output ports.

9.4.1 Output resolution

Menu Top→OUTPUT TIMING→RESOLUTION

Setting for Each output channel (Common to OUTA / OUTB)

Setting values

| | | | | | |
|-------------------|-------------|--------------|-------------|--------------|-------------|
| •AUTO-A [Default] | | •1080i@59.94 | (1920x1080) | •WXGA++@60 | (1600x900) |
| •AUTO-B | | •1080i@50 | (1920x1080) | •WXGA+@60 | (1440x900) |
| •2160p@60(4096) | (4096x2160) | •720p@60 | (1280x720) | •SXGA+@60 | (1400x1050) |
| •2160p@50(4096) | (4096x2160) | •720p@59.94 | (1280x720) | •WXGA@60 | (1366x768) |
| •2160p@30(4096) | (4096x2160) | •720p@50 | (1280x720) | •WXGA@60 | (1360x768) |
| •2160p@25(4096) | (4096x2160) | •576p@50 | (720x576) | •SXGA@60 | (1280x1024) |
| •2160p@24(4096) | (4096x2160) | •576i@50 | (720x576) | •Quad-VGA@60 | (1280x960) |
| •2160p@60 | (3840x2160) | •480p@59.94 | (720x480) | •WXGA@60 | (1280x800) |
| •2160p@50 | (3840x2160) | •480i@59.94 | (720x480) | •WXGA@60 | (1280x768) |
| •2160p@30 | (3840x2160) | •WQXGA@60 | (2560x1600) | •XGA@60 | (1024x768) |
| •2160p@25 | (3840x2160) | •WQHD@60 | (2560x1440) | •SVGA@60 | (800x600) |
| •2160p@24 | (3840x2160) | •QWXGA@60 | (2048x1152) | •VGA@60 | (640x480) |
| •1080p@60 | (1920x1080) | •WUXGA@60 | (1920x1200) | | |
| •1080p@59.94 | (1920x1080) | •VESAHD@60 | (1920x1080) | | |
| •1080p@50 | (1920x1080) | •WSXGA+@60 | (1680x1050) | | |
| •1080i@60 | (1920x1080) | •UXGA@60 | (1600x1200) | | |

Normally, the optimal resolution will be selected automatically if you set this menu to “AUTO”.

Numbers following “@” represent the vertical synchronous frequency.

480i / 480p / 576i / 576p / 720p / 1080i / 1080p / 2160p are timing formats relating to the CEA-861E standard. Others are timing formats meeting either the VESA DMT standard or the VESA CVT standard. VESAHD@60, WUXGA@60, QWXGA@60, WQHD@60, and WQXGA@60 are output formats that incorporate Reduced Blanking.

The maximum format of OUTB (HDBaseT output connector) is 2160p@30. If 2160p@50 or 2160p@60 is selected, video signals cannot be output from OUTB.

If “AUTO-A” or “AUTO-B” is selected, the maximum output resolution format is set to 2160p@30 automatically. If you want to output video at 2160p@50 or 2160p@60 from OUTA (HDMI output connector), change the setting to 2160p@50 or 2160p@60. In this case, video cannot be output from OUTB (HDBaseT output connector).

■ "AUTO-A" and "AUTO-B":

"AUTO-A" (OUTA, HDMI output connector), "AUTO-B" (OUTB, HDBaseT output connector):

Automatically selects the optimal output resolution format depending on the EDID of the connected sink device. The optimal format is then provided to the connected sink device via the MSD's output connector. The actual output resolution is displayed in parentheses. In case EDID cannot be obtained from the sink device, the resolution format that was last used is selected. This condition is indicated by an asterisk "*" to the right side of the format data.

If the EDID of the connected sink device is higher than 2160p@30, an asterisk "*" is indicated to the right side of the format data.

| |
|---|
| [OUT1 RESOLUTION] ◀▶ AUTO (1080p59.94) |
|---|

Outputting at optimal resolution

| |
|--|
| [OUT1 RESOLUTION] ◀▶ AUTO (1080p59.94)* |
|--|

EDID cannot be loaded or optimal resolution cannot be output

9.4.2 Aspect ratio for sink device

| | | | |
|------------------------|---|-------|-------|
| Menu | Top→OUTPUT TIMING→MONITOR ASPECT | | |
| Setting for | Each output channel (Common to OUTA / OUTB) | | |
| Setting value | | | |
| • RESOLUTION [Default] | • 16:10 | • 5:3 | • 4:3 |
| • 256:135 | • 16:9 | • 5:4 | |

You can set the aspect ratio of the connected sink device.

If you select "RESOLUTION," the aspect ratio of the output resolution will be applied. If aspect ratios of the target sink device and the output resolution are different from each other, you can select an aspect ratio for the sink device of: "4:3," "5:4," "5:3," "16:9," "16:10," and "256:135" (4096x2160).

【See: 9.4.1 Output resolution】

9.4.3 Aspect ratio

| | | | |
|--------------------|---------------------------------------|-------------------|--|
| Menu | Top→OUTPUT TIMING→INPUT ASPECT | | |
| Setting for | Each input channel, each input signal | | |
| Setting value | | | |
| • AUTO-1 [Default] | • 4:3 | • 14:9 SIDE PANEL | |
| • AUTO-2 | • 16:9 LETTER BOX | • FULL | |
| • 16:9 | • 14:9 LETTER BOX | • THROUGH | |
| • 14:9 | • 4:3 SIDE PANEL | | |

You can set the aspect ratio for each video input.

If you select "AUTO-1" or "AUTO-2," the aspect ratio is restored automatically to the original ratio according to the settings of sink device aspect ratio and the MSD's aspect ratio control.

"AUTO-1" and "AUTO-2" work differently only when letter box signals are presented to the input. "AUTO-1" processes them as 16:9 or 14:9 video signals, while "AUTO-2" sets them as 4:3.

Normally, no problem occurs if you set the aspect ratio to "AUTO-1", but some DVD players and other devices display subtitles or setup menus in the un-displayed area. In such case, set the aspect to "AUTO-2" to display the entire area of the video signals.

【See: 9.4.2 Aspect ratio for sink device】

【See: 9.4.4 Aspect ratio control】

Setting options of "16:9", "14:9", "4:3", "16:9 / 14:9 LETTER BOX", and "4:3 / 14:9 SIDE PANEL" are accessible only when TV signals are input. When PC signals are input, the aspect ratio will be restored automatically according to the aspect ratio of the input signal regardless of the settings: "AUTO-1", "AUTO-2", "16:9", "14:9", "4:3", "16:9/14:9 LETTER BOX", and "4:3/14:9 SIDE PANEL".

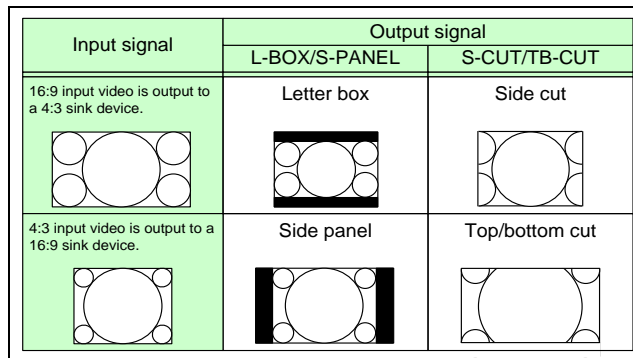
"FULL": video signals are displayed always in full screen mode regardless of input video signal and settings of "9.4.2 Aspect ratio for sink device" and "9.4.4 Aspect ratio control".

"THROUGH": video signals are displayed always in pixel 1:1 regardless of settings of "9.4.2 Aspect ratio for sink device" and "9.4.4 Aspect ratio control".

9.4.4 Aspect ratio control

| | |
|---------------|---|
| Menu | Top→OUTPUT TIMING→ASPECT PROCESS |
| Setting for | Each input channel, each input signal |
| Setting value | L-BOX/S-PANEL : letter box/side panel [Default] S-CUT/TB-CUT : Side cut/top bottom cut |

Below is a visual description of restoring aspect ratio:



[Fig. 9.5] Restoring aspect ratio

9.4.5 Overscan

| | |
|---------------|--|
| Menu | Top→OUTPUT TIMING→INPUT OVER SCAN |
| Setting for | Each input channel, each input signal |
| Setting value | 100% to 115% [Default] NTSC / PAL / SDTV: 105 %, HDTV / PC: 100 % |

You can create an enlarged display of input video.

9.4.6 Display position

| | |
|---------------|---|
| Menu | Top→OUTPUT TIMING→INPUT POSITION (input side) / OUTPUT POSITION (output side) |
| Setting for | Input side : Each input channel, each input signal Output side : Each output channel |
| Setting value | |

Input side:

Horizontal position (-Horizontal input size to +Horizontal output resolution [Default] 0)

Vertical position (-Vertical input size to +Vertical output resolution [Default] 0)

Output side:

Horizontal position (-Horizontal output size to +Horizontal output resolution [Default] 0)

Vertical position (-Vertical output size to +Vertical output resolution [Default] 0)

You can set the position where input video is displayed.

Note:

If the resolutions of each output are not the same, the resolution of OUT1 will be the standard.

9.4.7 Display size

| | |
|----------------------|--|
| Menu | Top→OUTPUT TIMING→INPUT SIZE (input side) / OUTPUT SIZE (output side) |
| Setting for | Input side : Each input channel, each input signal Output side : Each output channel (Common to OUTA / OUTB) |
| Setting value | |
| Input side: | Horizontal size (Horizontal output resolution ÷ 4 to Horizontal output resolution x 4 [Default] Horizontal output resolution) Vertical size (Vertical output resolution ÷ 4 to Vertical output resolution x 4 [Default] Vertical output resolution) |
| Output side: | Horizontal size (Horizontal output resolution ÷ 4 to Horizontal output resolution x 4 [Default] Horizontal output resolution) Vertical size (Vertical output resolution ÷ 4 to Vertical output resolution x 4 [Default] Vertical output resolution) |

You can set the display size of input video.

The video size is scaled based on the upper left quadrant of the input video.

If you set "LINK" to "ON", only settings of "H"(Horizontal) can be set and "V" is set automatically while retaining the current aspect ratio.

【See: 9.4.6 Display position】

Notes:

- If the resolutions for each output are not the same, the output resolution of OUT1 will be the standard.
- Numbers following "/" show the output resolution.

9.4.8 Masking

| | | |
|----------------------|---|--|
| Menu | Top→OUTPUT TIMING→INPUT MASKING (Input side) / OUTPUT MASKING (Output side) | |
| Setting for | Input side | : Each input channel, each input signal |
| | Output side | : Each output channel (Common to OUTA / OUTB) |
| Setting value | | |
| Input side: | Left side masking | (Horizontal input position to Right side masking [Default] 0) |
| | Right side masking | (Left side masking to Horizontal input position + Horizontal input size [Default] Horizontal input size) |
| | Top side masking | (Vertical input position to Bottom side masking [Default] 0) |
| | Bottom side masking | (Top side masking to Vertical input position + Vertical input size [Default] Vertical input size) |
| Output side: | Left side masking | (Horizontal output position (0 or more) to Right side masking [Default] 0) |
| | Right side masking | (Left side masking to Horizontal output position + Horizontal output size (Horizontal output resolution or less) [Default] Horizontal output resolution) |
| | Top side masking | (Vertical output position (0 or more) to Bottom side masking [Default] 0) |
| | Bottom side masking | (Top side masking to Vertical output position + Vertical output size (Vertical output resolution or less) [Default] Vertical output resolution) |

You can set the masking of video inputs to hide unnecessary portions of the displayed area (top/bottom and right/left).

9.4.9 Automatic sizing

| | | |
|--------------------|--|---|
| Menu | Top→OUTPUT TIMING→INPUT AUTO SIZING (Input side) / OUTPUT AUTO SIZING (Output side) | |
| Setting for | Input side | : Each input channel, each input signal |
| | Output side | : Each output channel (Common to OUTA / OUTB) |

This function adjusts output signal optimally, and as a result, the following settings will be initialized automatically.

A long buzzer tone will sound when the initialization is completed by pressing the MENU/SET key.

[Table 9.2] Items to be initialized

| Items to be initialized | Input side | Output side |
|---|-------------|-------------|
| Aspect ratio, overscan | Initialized | - |
| Display position, display size, masking | Initialized | Initialized |

9.4.10 Background color

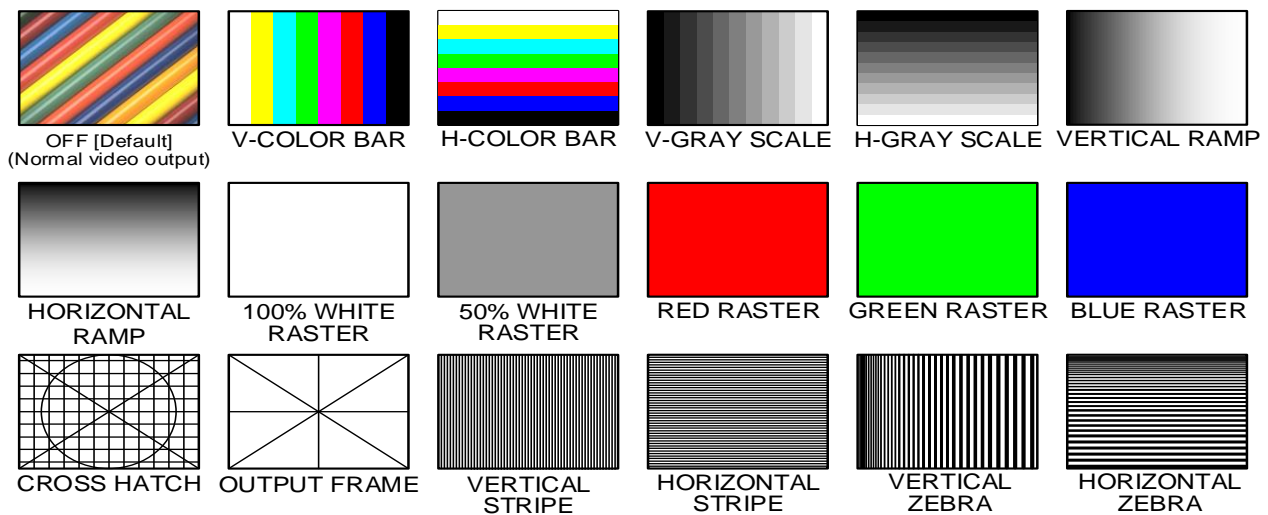
| | |
|---------------|--|
| Menu | Top→OUTPUT TIMING→BACKGROUND COLOR |
| Setting for | Each output channel (Common to OUTA / OUTB) |
| Setting value | R / G / B: 0 to 255 [Default] R / G / B: 0 (black) |

You can set the background color of output video.

If you set "LINK" to "ON", only the setting for "R" can be set, and "G" and "B" track the setting of "R".

9.4.11 Test pattern

| | |
|---------------|---|
| Menu | Top→OUTPUT TIMING→TEST PATTERN |
| Setting for | Each output channel (Common to OUTA / OUTB) |
| Setting value | [Fig. 9.6] Test pattern |



[Fig. 9.6] Test pattern

You can activate the MSD's internal test pattern generator and direct its signal to each output connector. While active, the test pattern will override any other signal that has been switched to that particular output connector.

All settings of "9.5 Quality setting" will be invalid while a test pattern is displayed.

"OUTPUT FRAME": Select this pattern if part of image is not displayed on the sink device.

Settings of "9.4.6 Display position" and "9.4.7 Display size" in the output side will be adjusted in order to display the test pattern on full screen.

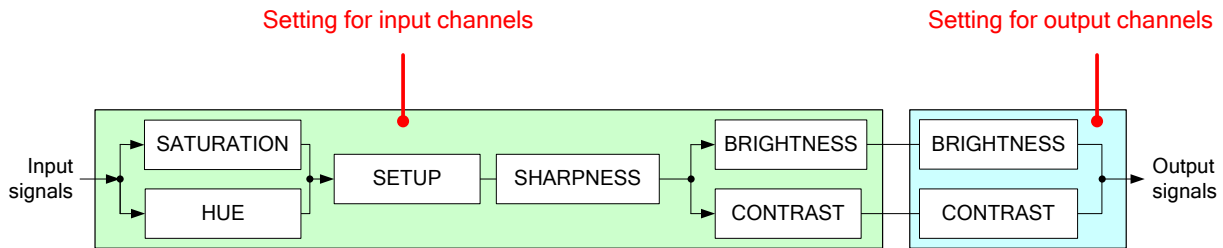
For test patterns other than "OUTPUT FRAME": video is output on full screen with the resolution set in "9.4.1 Output resolution" and the settings of "9.4.6 Display position", "9.4.7 Display size" and "9.4.8 Masking" will be invalid.

You can use the arrow keys (▶, ▲, ▼) to scroll through the available patterns "COLOR BAR", "GRAY SCALE", "RAMP", and "ZEBRA" by using. The scroll speed can be set by 3 pixels per frame up to 30 pixels per frame with ▲ and ▼ keys. You can check the residual image (resolution of moving picture) by displaying and scrolling the "ZEBRA" pattern.

9.5 Quality settings

Setting items for input channels are for correcting color bias.

Image quality to be output can be set for each input side (input channels) and output side (output channels) as follows.



[Fig. 9.7] Video correction

9.5.1 Sharpness

Menu Top→IMAGE EFFECT→INPUT SHARPNESS

Setting for Each input channel, each input signal

Setting value -5 to 15 [Default] 0

You can set the desired level of sharpness for each input signal.

9.5.2 Brightness

Menu Top→IMAGE EFFECT→INPUT BRIGHTNESS (Input side) /
OUTPUT BRIGHTNESS (Output side)

Setting for Input side : Each input channel, each input signal
Output side : Each output channel (Common to OUTA / OUTB)

Setting value 80% to 120% [Default] 100%

You can set the brightness level for each input/output signal.

9.5.3 Contrast

Menu Top→IMAGE EFFECT→INPUT CONTRAST (Input side) /
OUTPUT CONTRAST (Output side)

Setting for Input side : Each input channel, each input signal
Output side : Each output channel (Common to OUTA / OUTB)

Setting value R / G / B : 0% to 200% [Default]: R / G / B: 100%

You can set the contrast of video image.

If you set "LINK" to "ON", only the setting for "R" can be set, and "G" and "B" track the setting of "R".

9.5.4 HUE

| | |
|---------------|---------------------------------------|
| Menu | Top→IMAGE EFFECT→INPUT HUE |
| Setting for | Each input channel, each input signal |
| Setting value | 0° to 359° [Default] 0° |

You can set the color HUE for each input signal.

9.5.5 Saturation

| | |
|---------------|---------------------------------------|
| Menu | Top→IMAGE EFFECT→INPUT SATURATION |
| Setting for | Each input channel, each input signal |
| Setting value | 0% to 200% [Default] 100% |

You can set the color saturation for each input signal.

9.5.6 Black level

| | |
|---------------|--|
| Menu | Top→IMAGE EFFECT→INPUT SETUP LEVEL |
| Setting for | Each input channel, each input signal |
| Setting value | -10.0% to 10.0% (by 0.5%) [Default] 0.0% |

You can adjust the black level for each input signal.

9.5.7 Gamma

| | |
|---------------|---|
| Menu | Top→IMAGE EFFECT→OUTPUT GAMMA |
| Setting for | Each output channel (Common to OUTA / OUTB) |
| Setting value | 0.1 to 3.0 (by 0.1) [Default] 1.0 |

You can adjust the gamma curve of each output signal.

9.5.8 Default color

Menu Top→IMAGE EFFECT→IN DEFAULT COLOR (Input side) /
OUT DEFAULT COLOR (Output side)

Setting for Input side : Each input channel, each input signal
Output side : Each output channel (Common to OUTA / OUTB)

You can initialize settings of the following items.

A long buzzer tone will sound when the initialization is completed by pressing the MENU/SET key.

[Table 9.3] Items to be initialized

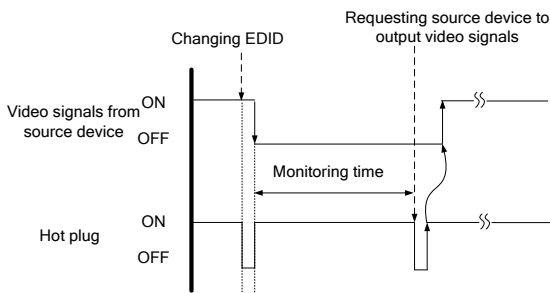
| Items to be initialized | Input side | Output side |
|---|-------------|-------------|
| Brightness, contrast | Initialized | Initialized |
| Sharpness, hue, saturation, black level | Initialized | - |
| Gamma | - | Initialized |

9.6 Input settings

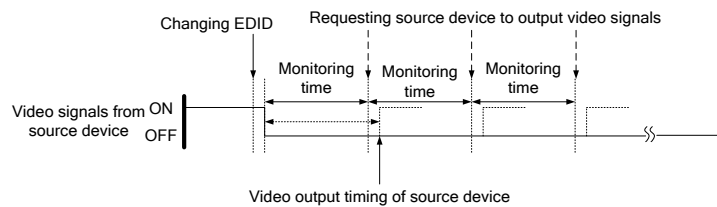
9.6.1 No-signal input monitoring

| | |
|---------------|---|
| Menu | Top→INPUT SETTING→INPUT VIDEO DETECT |
| Setting for | Each input channel (only digital input signal) |
| Setting value | OFF, 2000ms to 15000ms (100 ms steps) [Default] 10000ms |

If you change the EDID settings of the MSD or power the MSD off/on, the source device may not output a video signal. Use this menu to set the monitoring time which is from when a source device stops outputting signal to when the MSD requests the source device to output video signal.



[Fig. 9.8] Monitoring absence of input



[Fig. 9.9] Repeating reset

Note:

If you are using the monitor power-saving or dual monitor features on your PC, set this feature to “OFF”. This will avoid unpredictable operation.

When using this feature, ensure that the “monitoring time” is set for a value greater than the amount of time needed for the source to provide an output signal.

9.6.2 Input HDCP setting

Menu Top→INPUT SETTING→HDCP INPUT ENABLE

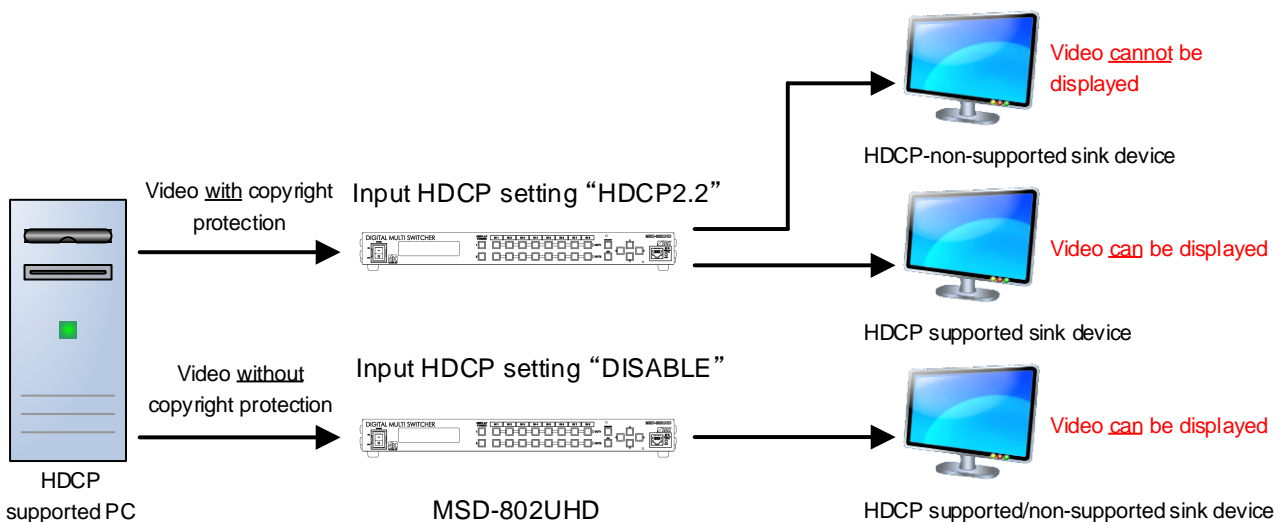
Setting for Each input channel (only digital input signal)

Setting value

- HDCP 2.2 : Supports HDCP 2.2 and HDCP 1.4 [Default]: [IN1, IN2, IN8]
- HDCP 1.4 : Supports HDCP 1.4 [Default]: [IN3 to IN7]
- DISABLE : Not support HDCP

Some source devices negotiates with the connected device to determine if it supports HDCP encryption. After this negotiation, the source device controls whether or not a signal may be sent to the device. This process takes place with some source device, even if the content being presented is not copyright protected. The MSD is HDCP compliant, if it is connected to a display device that does not support HDCP, video may not be displayed. Under these circumstances and if the content is not protected, the problem can be solved by setting this menu to “DISABLE.”

[See: 9.6.5 Selecting signal of DVI input connector]



[Fig. 9.10] HDCP-supported and HDCP-non-supported display devices

Notes:

- HDCP2.2 (stream type 0) contents can be displayed on sink devices supporting HDCP1.4.
- HDCP2.2 (stream type 1) contents can be displayed on sink devices supporting HDCP2.2 but cannot be displayed on sink devices supporting HDCP1.4.

9.6.3 Analog input signal parameters

| | | |
|---------------|--|--|
| Menu | Top→INPUT SETTING→ANALOG INPUT TYPE | |
| Setting for | Each input channel, each input signal (only analog input) | |
| Setting value | <ul style="list-style-type: none"> ▪ AUTO : Automatic [Default] ▪ RGB : Analog RGB ▪ YPbPr : Analog YPbPr ▪ VIDEO AUTO : Video automatic ▪ VIDEO : Composite video ▪ Y/C : S video | |

You can set the signal type that is being presented to the DVI-I input connector.

If you select “AUTO”, the type of input signals are detected automatically. In cases where the detection fails and video is not output correctly, set the input type manually. With “AUTO”, the automatic detection of S-Video may fail. If both composite video and S-Video are input at the same time, select “VIDEO AUTO”; if only S-Video is input, select “Y/C”.

This menu is available only if an analog signals are present on input ports 6 or 7.

【See: 9.6.5 Selecting signal of DVI input connector】

Note:

For video from a monochrome camera or VHS tape with in poor condition or the like, automatic detection may fail. Under these circumstances, select “VIDEO AUTO”, “VIDEO” or “Y/C”.

9.6.4 Automatic detection of video input interruption

| | |
|---------------|-----------------------------------|
| Menu | Top→INPUT SETTING→INPUT OFF CHECK |
| Setting for | Each input channel |
| Setting value | ON [Default], OFF |

The MSD can stop outputting video immediately after input video signals are disconnected for a moment. Use this feature to minimize switching artifacts produced by an external device connected to the MSD's input connector. The effect of this function is similar to switching the MSD's input.

- **9.8.4 Window transaction effect**
- **9.8.5 Window transaction speed**
- **9.8.6 Wipe color**

Notes:

- If you select "ON" and are using a video input (VHS tapes or the like) with a poor quality signal, it's possible that the output will flash on and off. This is due to sync signal distortion that can be interpreted as periods of time without signal presence. In this case, set this menu to "OFF".
- Even if you set this feature to "ON", distorted video cannot be corrected completely when input video signals are lost. Especially if you set "**9.8.4 Window transaction effect**" to an option other than "CUT", noises or black bars may be output at the time of fading out or wiping out.

9.6.5 Selecting signal of DVI input connector

| | |
|---------------|---|
| Menu | Top→INPUT SETTING→INPUT AD TYPE |
| Setting for | Each input channel (only DVI input connector) |
| Setting value | DIGITAL [Default], ANALOG |

You can select either digital or analog formats.

9.6.6 HDBaseT input long reach mode

| | |
|---------------|--|
| Menu | Top→INPUT SETTING→LONG REACH MODE |
| Setting for | HDBaseT input channel |
| Setting value | <ul style="list-style-type: none"> • OFF : Long reach mode disabled. Up to 328 ft. (100 m) [Default] • ON : Long reach mode enabled. Up to 492 ft. (150 m) |

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

In long reach mode, up to 1080p (24 bit)/ dot clock 148 MHz is supported when using with IDK's HDBaseT product. Set the MSD's EDID to 1080p or less or set the connected device's output to a supported signal format.

【See: 9.10 EDID (Extended Display Identification Data)】

9.6.7 Fixing settings for each input signal

Menu Top→INPUT SETTING→INPUT TABLE FIXED

Setting for Each input channel

Setting value

Setting mode:

- SELECTED : Sets for each item [Default]
- ALL FIXED : Does not load settings saved for each input signal but fixes the current settings

Individual setting (if “SELECTED” is selected for the setting mode):

- ASPECT : OFF [Default], ON(FIXED) 【See: 9.4.3 Aspect ratio】
- ANALOG TYPE : OFF, ON(FIXED) [Default] 【See: 9.6.3 Analog input signal parameters】
- AUDIO LEVEL : OFF, ON(FIXED) [Default] 【See: 9.9.4 Input level】

The MSD continuously monitors the input signals. If a particular input signal that has been presented to the MSD before is input again, the MSD will output the signal at the same size and quality as its previous use.

【See: 9.2 Input Signal Automatic Detection】

You can select the setting saved for each signal or the current setting.

“ALL FIXED”: Does not load all settings saved for each input signal but outputs the video with the current setting.

“SELECTED”: Aspect ratio, analog input signal type and audio input level can be set individually. For setting items other than settings in [Table 9.1], settings saved for each input signal are used.

“OFF”: Settings saved for each input signal are used to format the video output.

“ON (FIXED)”: Current settings are used to format the video output.

[Table 9.4] Individual settings for each digital or analog signal

| Individual setting | Digital signal (IN1 to IN8*) | Analog signal (IN6 and IN7*) |
|--------------------|---------------------------------|---------------------------------|
| ASPECT | Can be set | Can be set |
| ANALOG TYPE | Cannot be set | Can be set |
| AUDIO LEVEL | Can be set | Cannot be set |

*IN6 and IN7: Digital and analog input signals can be accommodated.

For signal selection, see “9.6.5 Selecting signal of DVI input connector”.

9.7 Setting input timing

You can set the timing parameters for analog signal inputs.

The MSD loads the optimal table from its embedded library of tables and adjusts the input timing automatically, you typically will not need to change settings in this menu. However, if signals which are not registered in the MSD tables are input or if part of the video image is cut off while relying on the standard table registered in the MSD, you may optimize the input timing parameters manually.

For digital inputs, you typically do not need to manually set timing parameters, but if part of the video image is cut off, you may make fine adjustments as required.

[Table 9.5] Settable items

| Function | Analog input | Digital input |
|---|--------------------|---------------|
| Automatic measurement | Partly 1 | Cannot be set |
| The total number of horizontal dots | Partly 1, Partly 2 | Partly 2 |
| Start position | Can be set | Can be set |
| Active area | Can be set | Can be set |
| Automatic measurement of start position | Can be set | Cannot be set |
| Automatic setting of input timing | Can be set | Cannot be set |
| Loading device data | Partly 3 | Can be set |
| Registering device data | Partly 1 | Cannot be set |
| Tracking | Partly 1 | Cannot be set |

Partly 1: can be set only if analog RGB / analog YPbPr signals are input.

Partly 2: only displayed if analog video signals are input or for digital input.

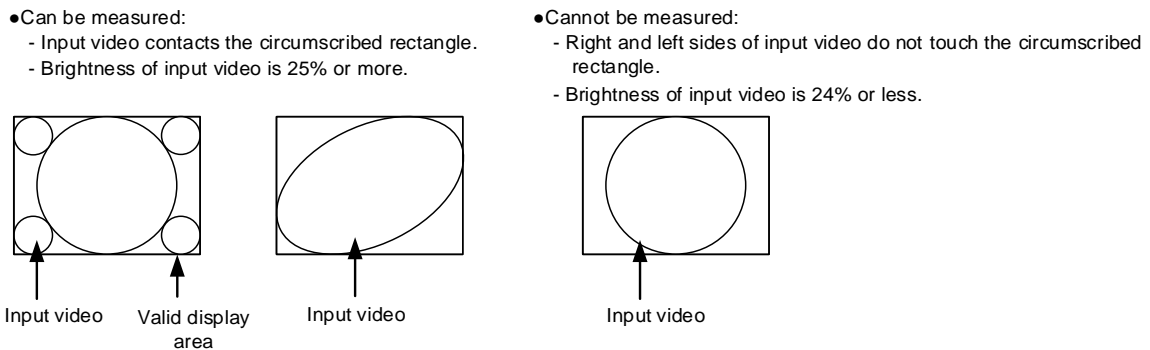
Partly 3: can be set only if the device data of input signals are registered in the MSD.

9.7.1 Automatic measurement

| | |
|---------------|--|
| Menu | Top→INPUT TIMING→AUTO SETUP |
| Setting for | Each input channel, each input signal (only analog input signal) |
| Setting value | |

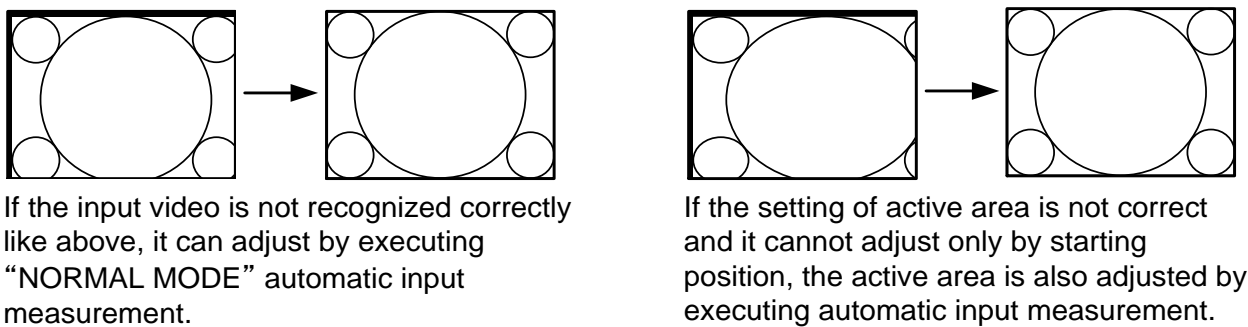
- | | | | |
|-------------------------|-------|--------|---------|
| • NORMAL MODE [Default] | • 4:3 | • 5:3 | • 16:10 |
| • NEXT ASPECT | • 5:4 | • 16:9 | |

Analog RGB/analog YPbPr input video is measured to set “9.7.2 The total number of horizontal dots”, “9.7.3 Start position”, “9.7.4 Active area”, and “9.7.9 Tracking” automatically.



[Fig. 9.11] Conditions of automatic measurement

By selecting “NORMAL MODE”, the MSD performs automatic measurement of the start position and active area. If edges of video are not displayed correctly, use this mode to set the start position and active area automatically.



If the input video is not recognized correctly like above, it can adjust by executing “NORMAL MODE” automatic input measurement.

If the setting of active area is not correct and it cannot adjust only by starting position, the active area is also adjusted by executing automatic input measurement.

[Fig. 9.12] Automatic measurement by “NORMAL MODE”

If the total number of horizontal dots is not correct, the aspect ratio is not matched even though automatic measurement is set to “NORMAL MODE”. In this case, select “NEXT ASPECT” (Auto measurement taking into account aspect ratio) for the measurement function. If the aspect ratio of the input signal is known, you can directly specify the aspect ratio to correctly perform automatic measurement.

If the input signals are not registered in the MSD, it is recommended to use this function.

[IN7 AUTO SETUP]
1024x 768 60.00Hz

If there is no input signal on the input channel it shows “NOT AVAILABLE NOW” on the front VFD screen.

Press the “MENU/SET” key to perform automatic measurement.

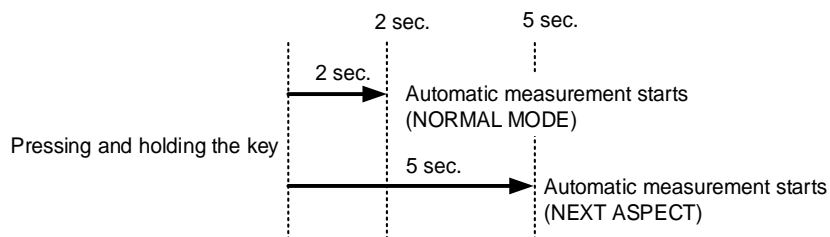
Note:

In case the aspect ratio does not match or video is displayed on the position far from the correct position, set the input timing in, “9.7.2 The total number of horizontal dots”, “9.7.3 Start position”, and “9.7.4 Active area”.

■ **Operation from front keys**

You can execute the automatic measurement in “NORMAL MODE” by pressing an IN6 or IN7 key (analog input only) for 2 seconds or longer. If you want to execute the automatic measurement in “NEXT ASPECT”, press the same key for 5 seconds or longer.

【See: 9.6.5 Selecting signal of DVI input connector】



[Fig. 9.13] Automatic measurement using front key

9.7.2 The total number of horizontal dots

| | |
|---------------|--|
| Menu | Top→INPUT TIMING→H TOTAL DOTS |
| Setting for | Each input channel, each input signal (only analog input signal) |
| Setting value | 400DOT to 4125DOT [Default] varies depending on the input signal |

You can set the total number of horizontal dots of analog RGB/analog YPbPr input video.

The settable values vary depending on the input signal. If interlace signal are input, the sampling clock (Horizontal synchronized frequency x the total number of horizontal dots) must be within 13 MHz to 81 MHz. If non-interlace signal are input, the sampling clock must be within 13 MHz to 162 MHz.

If other signals are input, the total number only can be displayed but not set.

If there is no input signal on the input channel it shows "NOT AVAILABLE NOW" on the front VFD screen.

9.7.3 Start position

| | |
|---------------|--|
| Menu | Top→INPUT TIMING→H START (Horizontal) / V START (Vertical) |
| Setting for | Each input channel, each input signal |
| Setting value | [Table 9.6] Settings of start position |

[Table 9.6] Settings of start position

| Function | Setting value |
|---------------------------|--|
| Horizontal start position | 64DOT to 2900DOT (The total number of horizontal dots – Horizontal active area or less) |
| Vertical start position | 10LINE to 2048LINE (The total number of vertical lines – Vertical active area or less) |

[Default] varies depending on the input signal.

You can set the horizontal/vertical starting position.

Setting value must be as follows. If the set value exceeds the value, the starting position will be set the limit value within the settable range automatically.

Horizontal : The total number of horizontal dots > Horizontal active area > Horizontal starting position

Vertical : The total number of vertical lines > Vertical active area > Vertical starting position

If 4K video signals are input, only the display start position will be displayed; the value cannot be set.

If there is no input signal on the input channel it shows "NOT AVAILABLE NOW" on the front VFD screen.

9.7.4 Active area

Menu Top→INPUT TIMING→H DISPLAY (Horizontal) / V DISPLAY (Vertical)

Setting for Each input channel, each input signal

Setting value [Table 9.7] Settings of active area

[Table 9.7] Settings of active area

| Function | Setting value |
|------------------------|--|
| Horizontal active area | 64DOT to 2900DOT (The total number of horizontal dots – 64 or less) |
| Vertical active area | 10LINE to 2048LINE (The total number of vertical lines – 10 or less) |

[Default] varies depending on the input signal.

You can set the horizontal/vertical active area of input video.

The horizontal setting value must be [The total number of horizontal dots > Horizontal active area]. If the set value exceeds the limit value by changing the total number of horizontal dots, the horizontal active area will be set to the limit value within the set range automatically.

If 4K video signals are input, only the active area will be displayed; the value cannot be set.

If there is no input signal on the input channel it shows “NOT AVAILABLE NOW” on the front VFD screen.

9.7.5 Automatic measurement of start position

| | |
|---------------|--|
| Menu | Top→INPUT TIMING→AUTO START POS |
| Setting for | Each input channel, each input signal (only analog input signal) |
| Setting value | ALL OFF : not measuring all inputs from the input automatically OFF : not measuring the current input signal automatically ON : measuring the current input signal automatically [Default] |

The MSD monitors continuously the upper left of analog input video signal and it automatically matches the upper left of the input video and the upper left of the screen.

Notes:

- For motion images, some content may not be displayed on the full screen, and the display position may be moved every time the setting of the automatic measurement is applied. In such a case, set this menu to “OFF”. As “OFF” and “ON” are saved for each input signal, it can be set according to the input signal. If you do not want to perform this function for all resolution, select “ALL OFF”.
- Only the start position is set by automatic measurement of this menu. If “**9.7.2 The total number of horizontal dots**” and “**9.7.4 Active area**” do not match, the lower right may be cut off or blackout may be output. In this case, adjust the whole screen by following “**9.7.1 Automatic measurement**”. As the set value must not exceed the value set in “**9.7.3 Start position**”, some input videos are displayed with blackout at the left or top side.
- This menu is valid only if “[**Fig. 9.11**] **Conditions of automatic measurement**” is satisfactory.
- Even if you set this menu to “ON”, the manual setting will be applied and the automatic measurement is not executed if you set any of the following menus: “**9.7.2 The total number of horizontal dots**”, “**9.7.3 Start position**”, and “**9.7.4 Active area**”. If you set “**9.7.9 Tracking**”, the manual setting is applied, and tracing is not set automatically when the automatic measurement is executed. When you execute “**9.7.1 Automatic measurement**”, settings of this menu will be valid again.

9.7.6 Automatic setting of input timing

| | |
|---------------|---|
| Menu | Top→INPUT TIMING→UNKNOWN TIMING |
| Setting for | None |
| Setting value | AUTO SETUP ON [Default], AUTO SETUP OFF |

The MSD loads the optimal table from the built-in tables and sets the input timing automatically. However, if unregistered signals are input, the input timing must be set. By setting this menu to “AUTO SETUP ON”, “**9.7.1 Automatic measurement**” is executed and the input timing is set automatically if signal that cannot be detected by the MSD are input for the first time.

Note:

If automatic measurement finds inconsistency of aspect ratio, please perform “**9.7.1 Automatic measurement**” manually or set the input timing in “**9.7.2 The total number of horizontal dots**”, “**9.7.3 Start position**” and/or “**9.7.4 Active area**”.

9.7.7 Loading device data

| | |
|-------------|---------------------------------------|
| Menu | Top→INPUT TIMING→LOAD |
| Setting for | Each input channel, each input signal |

Device data whose input timing is registered can be loaded according to the input signal.

The setting of this menu is not updated until the MENU/SET key is pressed. Make sure to press the MENU/SET key to update the setting.

If there is no input signal on the input channel it shows “NOT AVAILABLE NOW” on the front VFD screen.

[Table 9.8] Items to be loaded

| Input signal | Item |
|--------------|---|
| Analog | Registered device data will be loaded. Use this menu in the following cases: <ul style="list-style-type: none"> • Several device data with the same frequency of synchronous signal and different input timings is registered. • You want to set the input timing again. |
| Digital | The value that is automatically detected by the MSD will be set. Use this menu to restore the input timing to the original value. |

9.7.8 Registering device data

| | |
|---------------|--|
| Menu | Top→INPUT TIMING→SAVE |
| Setting for | Each input channel, each input signal (only analog input signal) |
| Setting value | No. 1 to No.99 |

You can save up to 99 analog RGB/analog YPbPr input timing settings.

The device data can be named up to 14 characters using ASCII code 20 to 7D. The device table name is optional. If a device table name is not registered and press MENU/SET key without device table name, the input resolution is registered as the device table name automatically. If a device table name is already registered and press MENU/SET key without device table name, the input timing is saved to the device table name without changing the device table name.

From the next time, when the same signal is input to other channel, video will be displayed with the registered timing.

The setting of this menu is not updated until the MENU/SET key is pressed. Make sure to press the MENU/SET key to update the setting.

If there is no input signal on the input channel it shows “NOT AVAILABLE NOW” on the front VFD screen.

9.7.9 Tracking

| | |
|---------------|--|
| Menu | Top→INPUT TIMING→TRACKING |
| Setting for | Each input channel, each input signal (only analog input signal) |
| Setting value | 0 to 63 [Default]: 0 |

You can adjust the tracking of analog RGB/analog YPbPr input video.

If there is no input signal on the input channel it shows “NOT AVAILABLE NOW” on the front VFD screen.

9.8 Output settings

9.8.1 Output mode

| | |
|---------------|---|
| Menu | Top→OUTPUT SETTING→OUTPUT MODE |
| Setting for | Each output channel (Each OUTA / OUTB) |
| Setting value | <ul style="list-style-type: none"> • HDMI YCbCr 4:4:4 MODE [Default] • HDMI YCbCr 4:2:2 MODE • HDMI YCbCr 4:2:0 MODE *only OUTA • HDMI RGB MODE • DVI MODE |

You can select an output signal mode and color space of the output video. The MSD outputs selected mode, however, if the connected sink device has optimal output mode and color space, the MSD outputs optimal output mode signal for the connected sink device.

“HDMI YCbCr 4:2:0 MODE”: YCbCr 4:2:0 has priority if the resolution is 4K@60 / 59.94 / 50 while YCbCr 4:4:4 has priority for other resolutions.

| | |
|-----------------|-----------------------|
| Higher priority | HDMI YCbCr 4:4:4 MODE |
| | HDMI YCbCr 4:2:2 MODE |
| | HDMI YCbCr 4:2:0 MODE |
| | HDMI RGB MODE |
| Lower priority | DVI MODE |

Notes:

- If “DVI MODE” is selected and the output resolution is 2160p@30 or lower, the MSD outputs DVI signals. For other resolutions, it outputs signals at the appropriate mode of the connected sink device.
- Only TV resolutions (480i, 576i, 720p, 1080i, 1080p, and 2160p) can be output in “HDMI YCbCr 4:4:4 MODE” or “HDMI YCbCr 4:2:2 MODE”. PC resolutions are output in “HDMI RGB MODE” or “DVI MODE”.
- Since OUTB (HDBaseT output connector) does not support YCbCr 4:2:0, “HDMI YCbCr 4:2:0 MODE” cannot be selected.

9.8.2 Synchronous signal output with no input video

| | |
|---------------|---|
| Menu | Top→OUTPUT SETTING→SYNC OUTPUT |
| Setting for | Each output channel (Common to OUTA / OUTB) |
| Setting value | ON [Default], OFF |

You can set whether synchronous signals are output when no video signals are input from the selected input, or when “OFF” is selected for the input. If you set this menu to “ON”, you can prevent the sink device from being switched to the standby mode.

9.8.3 Output video with no input video

| | |
|---------------|---|
| Menu | Top→OUTPUT SETTING→VIDEO OUTPUT |
| Setting for | Each output channel (Common to OUTA / OUTB) |
| Setting value | <ul style="list-style-type: none"> · BLUE [Default] · BACKGROUND COLOR · BLACK |

You can set the color of the video to be output when no video signal is input from the selected input. The setting will be valid when “**9.8.2 Synchronous signal output with no input video**” is set to “ON”

9.8.4 Window transaction effect

| | |
|---------------|--|
| Menu | Top→OUTPUT SETTING→VIDEO SWITCHING |
| Setting for | Each output channel (Common to OUTA / OUTB) |
| Setting value | <ul style="list-style-type: none"> · FREEZE→FADE OUT-IN [Default] · FADE OUT-IN · CUT · BOTTOM→TOP WIPE · TOP→BOTTOM WIPE · RIGHT→LEFT WIPE · LEFT→RIGHT WIPE |

You can select a window transition effect for when the video inputs is switched.

The setting will be valid also when “**9.6.4 Automatic detection of video input interruption**” is set to “ON”

9.8.5 Window transaction speed

| | |
|---------------|--|
| Menu | Top→OUTPUT SETTING→SWITCHING SPEED |
| Setting for | Each output channel (Common to OUTA / OUTB) |
| Setting value | 100ms to 2000ms (per 10ms) [Default]: 350 ms |

You can set the window transition speed for FADE OUT/IN or WIPE OUT/IN when the input channel is switched.

The setting will be valid also when “**9.6.4 Automatic detection of video input interruption**” is set to “ON”.

9.8.6 Wipe color

| | |
|---------------|--|
| Menu | Top→OUTPUT SETTING→WIPE COLOR |
| Setting for | Each output channel (Common to OUTA / OUTB) |
| Setting value | R / G / B: 0 to 255 [Default] R / G / B: 0 (black) |

You can set the wipe color while switching video input when the input channel is switched.

If you set “LINK” to “ON”, you can set only Red (R). Settings of Green (G) and Blue (B) will also be changed according to the settings of the Red (R).

9.8.7 Video output connector

| | |
|---------------|-------------------------------------|
| Menu | Top→OUTPUT SETTING→OUTPUT CONNECTOR |
| Setting for | Each output channel (OUTA / OUTB) |
| Setting value | ON [Default], OFF |

The MSD distributes the same video to the HDMI output connector and HDBaseT output connector. You can set the each connector to output the video or not.

This feature can be used for previewing video. You can check the one of video in one output while the other output is set to "OFF".

9.8.8 HDCP

| | |
|---------------|---|
| Menu | Top→OUTPUT SETTING→HDCP OUTPUT MODE |
| Setting for | Each output channel (OUTA / OUTB) |
| Setting value | <p>HDCP 2.2 : Encrypts HDCP via HDCP 2.2 [Default]</p> <p>HDCP 1.4 : Encrypts HDCP via HDCP 1.4</p> <p>HDCP INPUT ONLY : Encrypts HDPC only if input signal has HDCP</p> <p>DISABLE : Do not encrypt HDCP</p> |

You can set the HDCP output for when a sink device supporting HDCP is connected.

Normally set this menu to "HDCP 2.2". The MSD encrypts optimal HDCP which HDCP 2.2 has priority.

If you select "HDCP 1.4", the MSD encrypts HDCP via HDCP 1.4 regardless which HDCP version the sink devices have.

If you select "HDCP INPUT ONLY", the MSD encrypts HDCP only if the input signal has HDCP. However, if input channel is changed to others and HDCP authentication status is changed, the MSD starts HDCP authentication again. This action may take time to output video and audio.

If you select "DISABLE", the MSD never encrypts HDCP. Only the input signal which does not have HDCP can be output.

If the sink device which does not support HDCP is connected, the MSD can output only the video and audio which do not have HDCP regardless this menu.

Notes:

- HDCP2.2 (stream type 0) contents can be displayed on sink devices supporting HDCP1.4.
- HDCP2.2 (stream type 1) contents can be displayed on sink devices supporting HDCP2.2 but cannot be displayed on sink devices supporting HDCP1.4.

9.8.9 The number of HDCP retries

| | |
|---------------|--|
| Menu | Top→OUTPUT SETTING→HDCP ERROR RETRY |
| Setting for | Each output channel (OUTA / OUTB) |
| Setting value | ETERNITY: retry until succeeded [Default] 0 to 100: 0 to 100times |

You can set the number of HDCP retries.

If a sink device with HDCP is connected and you set “**9.8.7 HDCP**” to “HDCP 2.2”, “HDCP 1.4”, or “HDCP INPUT ONLY”, HDCP is authorized regardless of the status of input signal. Normally, set this menu to “ETERNITY” to retry the authentication automatically after the first authentication fails. However, you can set the number of retries manually. (If retry is not succeeded even after the MSD retries for the set number of retry times, video and audio with HDCP are not output.)

The setting of this menu is not updated until the MENU/SET key is pressed. Make sure to press the MENU/SET key to update the setting.

9.8.10 Deep Color

| | |
|---------------|--------------------------------------|
| Menu | Top→OUTPUT SETTING→DEEP COLOR OUTPUT |
| Setting for | Each output channel (OUTA / OUTB) |
| Setting value | 24-BIT COLOR [Default], 30-BIT COLOR |

You can select the color depth of HDMI signal.

“30-BIT COLOR”: signals are output with “30-BIT COLOR” only if a sink device supporting Deep Color is connected. If a sink device that does not support Deep Color is connected, signals are output with “24-BIT COLOR” automatically. However, since the transmission clock of “30-BIT COLOR” is faster than that of “24-BIT COLOR”, noise may occur if a bad-quality cable or long cable is connected. In those cases, the noise may be removed by selecting “24-BIT COLOR”.

When the MSD outputs at WQHD (2560 x 1440) / WQXGA (2560x1600) / 4K (3840 x 2160) / 4K (4096 x 2160), the color depth is “24-BIT COLOR”.

9.8.11 CEC connection

Menu Top→OUTPUT SETTING→CEC CONNECTION

Setting for Each output channel (OUTA / OUTB)

Setting value

- NOT CONNECTED [Default]
- SELECTED CHANNEL
- IN1 to IN8

You can set the CEC connection for when CEC-supported device is connected to HDMI input connector, HDBaseT input connector, HDMI output connector, or HDBaseT output connector.

The setting of this menu is not updated until the MENU/SET key is pressed. Make sure to press the MENU/SET key to update the setting.

Notes:

- Using CEC may cause negative effects. If you do not use CEC, set this menu to “NOT CONNECTED”. If the status of the sink devices connected to the HDMI output connector changes (such as being turned OFF→ON) or if the CEC connection changes, the EDID may also need to be changed (the MSD changes it automatically) in order to update the address of the connected device. When the EDID is changed, the source device stops outputting video temporarily.
- IN6 and IN7: CEC is not supported.
- CEC connection is a one-on-one basis; it cannot connect multiple inputs and outputs. If you set multiple outputs to connect to the same input, only a smaller output number is connected preferentially and other outputs are not connected.

9.8.12 HDCP re-authentication

Menu Top→OUTPUT SETTING→HDCP AUTHORIZATION

Setting for Each output channel (OUTA / OUTB)

If a sink device supporting HDCP is connected, HDCP is authorized automatically. You can re-authorize HDCP manually using this menu (Connection Reset is performed automatically, but it can be performed manually using this menu). Press the MENU/SET key to perform the re-authentication.

9.8.13 Priority of input channel automatic switching

| | |
|---------------|--|
| Menu | Top→OUTPUT SETTING→AUTO SWITCHING ON / AUTO SWITCHING OFF |
| Setting for | Each output channel (Common to OUTA / OUTB) |
| Setting value | [Table 9.9] Setting of priority of input channel automatic switching |

[Table 9.9] Setting of priority of input channel automatic switching

| Item | Set value | Default |
|----------------------|-------------------------|---------|
| Output channel (OUT) | 1 to 2 | -* |
| Input channel (IN) | 1 to 8 | -* |
| Priority (PRI) | 1 (high) to 8(low), OFF | OFF |

*Setting each input channel priority to each output channel

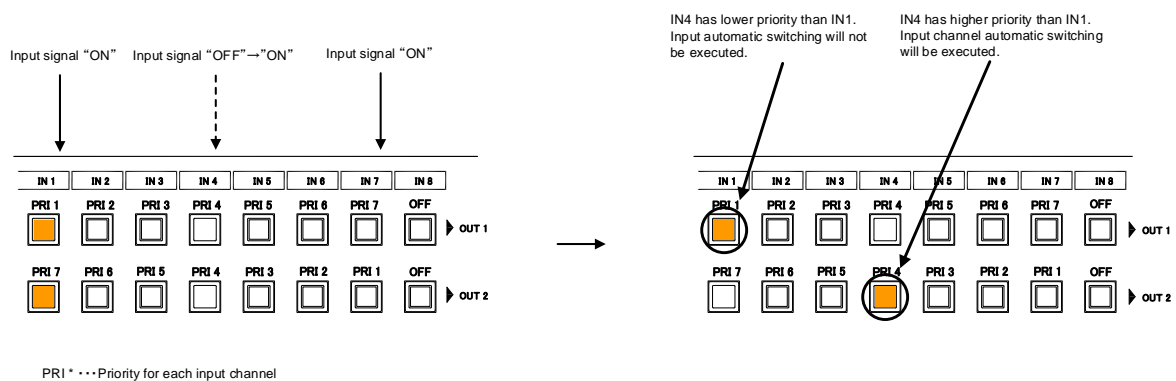
■ AUTO SWITCHING ON

AUTO SWITCHING ON menu switches input signal when the input signal changes from “OFF” to “ON”. The MSD switches input signal automatically as follows:

- When the input signal become from “OFF” to “ON” and that input channel has higher priority than currently-selected channel or same priority level.

or

- When the input signal become from “OFF” to “ON” and the currently- selected channel that have higher priority than the input signal, but it does not have input signal.



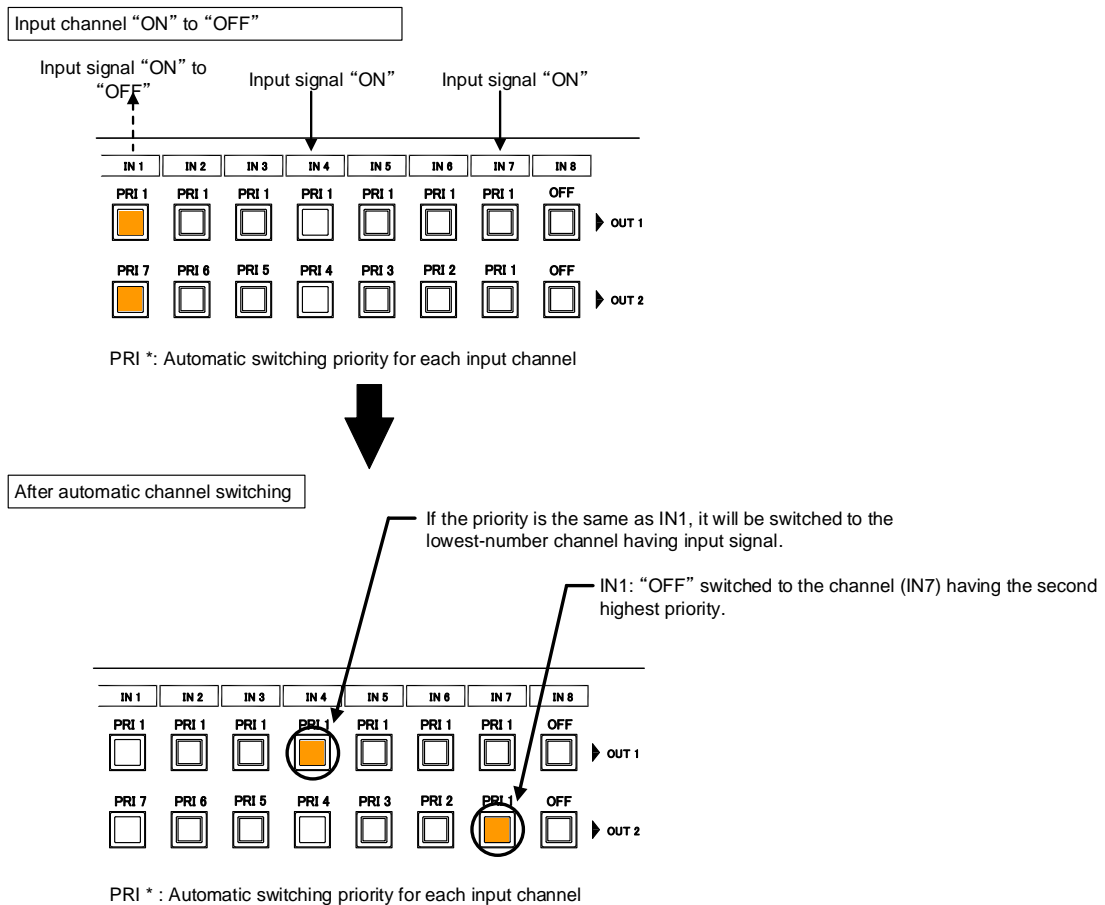
[Fig. 9.14] Input channel automatic switching “OFF” to “ON”

■ AUTO SWITCHING OFF

AUTO SWITCHING OFF menu switches input signal when the input signal changes from “ON” to “OFF”.

The MSD switches input signal automatically based on following conditions;

- Switches to the input channel having input signal and highest priority.
- If some channels have the same priority, the MSD switches to the lower input channel having input signal.



[Fig. 9.15] Input channel automatic switching “ON” to “OFF”

If the priority setting of the input channel is “OFF”, input channel automatic switching is not executed.

You can set channel switching mode for input channel automatic switching from **“9.8.15 Channel switching mode of automatic switching”**.

Make sure to press the “MENU/SET” key to apply the settings; otherwise, they are not changed.

9.8.14 Masking time after automatic switching of input channel

| | |
|---------------|---|
| Menu | Top→OUTPUT SETTING→AUTO SWITCHING MASK |
| Setting for | Each output channel (Common to OUTA / OUTB) |
| Setting value | 0s000ms to 999s999ms [Default] 0s000ms |

You can set the time from when input channel is switched automatically until when the next automatic switching is performed. The automatic switching is not performed during the set time.

【See: 9.8.13 Priority of input channel automatic switching】

9.8.15 Channel switching mode of automatic switching

| | |
|---------------|---|
| Menu | Top→OUTPUT SETTING→AUTO SWITCHING MODE |
| Setting for | Each output channel (Common to OUTA / OUTB) |
| Setting value | V&A (Video & Audio) [Default], VIDEO (Video), AUDIO (Audio) |

You can set the channel switching mode when automatic switching is executed for when the input channel is switched automatically. This setting has priority regardless of setting of “**8.2 Switching input channel**”.

【See: 9.8.13 Priority of input channel automatic switching】

9.8.16 HDBaseT output long reach mode

| | |
|---------------|--|
| Menu | Top→OUTPUT SETTING→LONG REACH MODE |
| Setting for | Each output channel (only OUTB) |
| Setting value | <ul style="list-style-type: none"> • OFF : Long reach mode OFF Up to 328 ft. (100 m) [Default] • ON : Long reach mode ON Up to 492 ft. (150 m) . |

You can enable / disable HDBaseT output long reach mode.

In long reach mode, up to 1080p (24 bit)/ dot clock 148 MHz is supported when using with IDK's HDBaseT product. Select a supported output format.

【See: 9.4.1 Output resolution】

【See: 9.8.10 Deep Color】

9.9 Audio setting

HDMI digital audio supports the following formats. Set audio depending on device connected to the HDMI output connector.

Only “2 channel linear PCM” can be input by Factory default. If you want to use “Multi channel linear PCM” or bit stream signal (compressed audio), set “Audio format” and “Speaker configuration”.

【See: 9.10.5 Audio format】

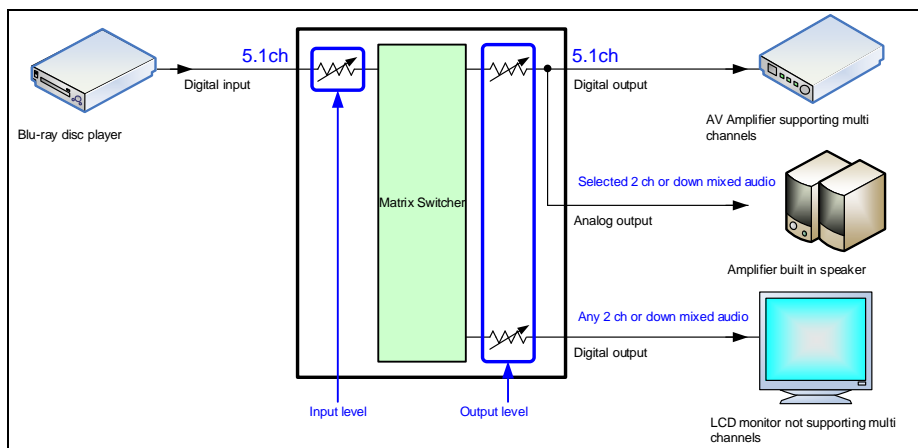
【See: 9.10.6 Speaker configuration】

[Table 9.10] Audio format

| Audio format | Description |
|---|--|
| 2 channel linear PCM | 2ch, 32 kHz to 192 kHz, 16 / 20 / 24 bit |
| Multi-channel linear PCM | 8ch, 32 kHz to 192 kHz, 16 / 20 / 24 bit |
| AC-3, Dolby Digital, DTS, Dolby Digital+, DTS-HD, Dolby TrueHD, AAC | Bit stream |

■ If multi-channel linear PCM signal input to digital audio:

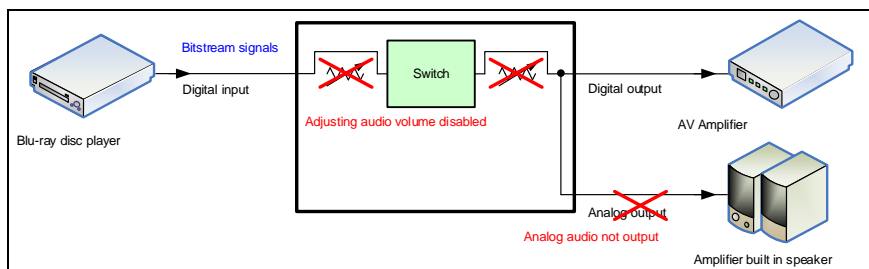
If Multi channel linear PCM signal are input to digital audio, two channels set in “9.9.9 Multi-channel audio output” or down-mixed audio is output to analog audio and sink devices that do not support multi linear PCM.



[Fig. 9.16] Multi channel linear PCM input

■ If bit stream signal input to digital audio:

If bit stream signal (compressed audio) such as Dolby Digital is input to HDMI digital audio, these input audio signals are output to digital audio as they are. They are not output to analog audio, and audio volume cannot be adjusted.



[Fig. 9.17] Bit stream signal input

9.9.1 Output level

| | |
|---------------|---|
| Menu | Top→AUDIO→OUTPUT LEVEL |
| Setting for | Each output channel (Common to OUTA / OUTB) |
| Setting value | -60dB to 10dB [Default] 0dB |

You can set the audio output level.

If you change the output level while audio output mute is set to “ON”, mute is canceled.

If you set top display of front VFD screen to audio volume adjustment from “**9.17.6 Top page**”, you can change and set audio output level from top display.

9.9.2 Output mute

| | |
|---------------|---|
| Menu | Top→AUDIO→OUTPUT MUTE |
| Setting for | Each output channel (Common to OUTA / OUTB) |
| Setting value | OFF [Default], ON |

You can enable or disable the audio output mute.

If you set top display of front VFD screen to audio volume adjustment from “**9.17.6 Top page**”, you can change and set mute ON/OFF from top display.

9.9.3 Input selection

| | |
|---------------|--|
| Menu | Top→AUDIO→AUDIO INPUT SELECT |
| Setting for | Each input channel |
| Setting value | DIGITAL [Default], ANALOG1, ANALOG2, ANALOG3 |

You can select digital or analog audio input to be output.

DIGITAL: Outputs HDMI audio. IN6 and IN7 do not output audio if “**9.6.5 Selecting signal of DVI input connector**” is set to “ANALOG”.

ANALOG1, ANALOG2, and ANALOG3: Output audio that is input to each connector.

9.9.4 Input level

| | |
|---------------|---------------------------------------|
| Menu | Top→AUDIO→INPUT OFFSET |
| Setting for | Each input channel, each input signal |
| Setting value | -60dB to 0dB [Default] 0dB |

You can set the audio input level.

You can correct the gap in audio input levels of each input signal, because audio input level can be set for each input connector.

9.9.5 Lip sync

| | | |
|---------------|---|---|
| Menu | Top→AUDIO→OUTPUT LIP SYNC (Output side) / INPUT LIP SYNC (Input side) | |
| Setting for | Output side | : Each output channel (Common to OUTA / OUTB) |
| | Input side | : Each input channel, each input signal |
| Setting value | 0FRAME to 8FRAME [Default] 0FRAME | |

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

Up to eight frames can be set for each input/output channel.

If sampling frequency is 192 kHz and vertical synchronous frequency is 24 Hz / 25 Hz / 30 Hz, the total maximum value of lip sync input / output channel.

[Table 9.11] Lip sync maximum value

| Sampling frequency | Vertical synchronous frequency | Lip sync maximum value |
|--------------------|--------------------------------|------------------------|
| 192 kHz | 24 Hz | Up to 8 frames* |
| | 25 Hz | Up to 8 frames* |
| | 30 Hz | Up to 10 frames* |
| Other conditions | | Up to 16 frames |

*Up to 8 frames can be set for input / output channel lip sync, but lip sync is limited to the maximum value.

9.9.6 Sampling frequency

| | | | | |
|---------------|---|--|--|--|
| Menu | Top→AUDIO→SAMPLING FREQUENCY | | | |
| Setting for | Each output channel (Common to OUTA / OUTB) | | | |
| Setting value | <ul style="list-style-type: none"> • AUTO-A [Default] • 192kHz • 88.2kHz • 44.1kHz • AUTO-B • 96kHz • 48kHz • 32kHz | | | |

You can set the sampling frequency of digital audio output.

■“AUTO-A” or “AUTO-B”:

Outputting digital audio at the maximum sampling frequency supported by the sink device that is connected to OUTA (HDMI for AUTO-A) or OUTB (HDBaseT for AUTO-B).

At this time, the sampling frequency that is actually output is displayed in parentheses. In case EDID cannot be read from the sink device, the sampling frequency that was used the last time is selected with “*” on its right side.

| |
|-------------------------------------|
| [OUT1 FREQUENCY] AUTO-A(48kHz) ↔ |
|-------------------------------------|

Maximum sampling frequency

| |
|--------------------------------------|
| [OUT1 FREQUENCY] AUTO-A(48kHz)* ↔ |
|--------------------------------------|

Sampling frequency used last time

9.9.7 Audio output connector

| | |
|---------------|---|
| Menu | Top→AUDIO→AUDIO OUTPUT |
| Setting for | Each output channel (OUTA / OUTB) |
| Setting value | [Table 9.12] Settings of audio output control |

You can control the audio outputs of the audio output connector, HDMI output connector, and HDBaseT output connector.

[Table 9.12] Settings of audio output control

| Setting value | Analog audio output connector | HDMI output connector | HDBaseT output connector |
|--------------------------|-------------------------------|-----------------------|--------------------------|
| ANALOG&DIGITAL [Default] | Can be output | Partly* | Partly* |
| ANALOG | Can be output | Cannot be output | Cannot be output |
| DIGITAL | Cannot be output | Partly* | Partly* |

*If "DVI MODE" is selected for "9.8.1 Output mode", audio is not output to the HDMI output connector regardless of the setting of this menu.

9.9.8 Digital audio output connector

| | |
|---------------|-----------------------------------|
| Menu | Top→AUDIO→DIGITAL OUTPUT |
| Setting for | Each output channel (OUTA / OUTB) |
| Setting value | ON [Default] OFF |

You can control the audio outputs of the HDMI output connector and HDBaseT output connector. The MSD distributes the same audio to the HDMI output connector and HDBaseT output connector. You can enable /disable the audio output for each connector.

9.9.9 Multi-channel audio output

| | |
|---------------|---|
| Menu | Top→AUDIO→MULTI AUDIO |
| Setting for | Each output channel (Common to OUTA / OUTB) |
| Setting value | |

- | | | |
|----------------------|------------------|----------------|
| • DOWN MIX [Default] | • CH5/CH6 STEREO | • CH3/CH4 MONO |
| • CH1/CH2 STEREO | • CH7/CH8 STEREO | • CH5/CH6 MONO |
| • CH3/CH4 STEREO | • CH1/CH2 MONO | • CH7/CH8 MONO |

You can select audio to be output to a sink device that does not support multi-channel linear PCM or analog audio for when multi-channel linear PCM audio is input from an HDMI input connector.

You can select audio from "DOWN MIX" (multi-channel audio is down mixed), "STEREO" (stereo audio), or "MONO" (monaural audio).

9.9.10 Multi-channel audio output priority

| | |
|---------------|---|
| Menu | Top→AUDIO→OUT AUDIO PRIORITY |
| Setting for | Each output channel (Common to OUTA / OUTB) |
| Setting value | DOWN MIX, MULTI [Default] |

If outputting multi-channel linear PCM to a sink device, the MSD checks whether the sink device supports multi-channel linear PCM. If the sink device supports multi-channel linear PCM, the MSD outputs audio with the format. If the sink device does not support the format, the MSD outputs audio according to the setting of “9.9.9 Multi-channel audio output”.

You can set the priority as shown below for if some sink devices that are connected to OUTA or OUTB support multi linear PCM while others do not.

[Table 9.13] Audio output

| Setting value | Multi-channel linear PCM audio | | Output audio |
|-----------------|--------------------------------|------------------|--------------|
| | OUTA sink device | OUTB sink device | |
| DOWN MIX | Not supported | Not supported | DOWN MIX |
| | Supported | Not supported | DOWN MIX |
| | Not supported | Supported | DOWN MIX |
| MULTI [Default] | Not supported | Not supported | DOWN MIX |
| | Supported | Not supported | MULTI |
| | Not supported | Supported | MULTI |

If no sink device is connected, it is treated as a sink device that does not support multi-channel linear PCM.

9.9.11 Test tone

| | |
|---------------|---|
| Menu | Top→AUDIO→TEST TONE |
| Setting for | Each output channel (Common to OUTA / OUTB) |
| Setting value | |

Test tone:

OFF [Default], 1kHz, 400Hz

Speaker:

- ALL [Default]
- FRONT L/R
- REAR L/R
- REAR L/R CENTER
- FRONT LEFT
- FRONT RIGHT
- LOW FREQUENCY EFFECT
- FRONT CENTER
- REAR LEFT
- REAR RIGHT
- REAR LEFT CENTER
- REAR RIGHT CENTER

Since test tone can be output only to specific speakers, you can check the position of the speakers.
For "LOW FREQUENCY EFFECT", only test tone of 30 Hz is output.

【See: 9.10.6 Speaker configuration】

9.10 EDID (Extended Display Identification Data)

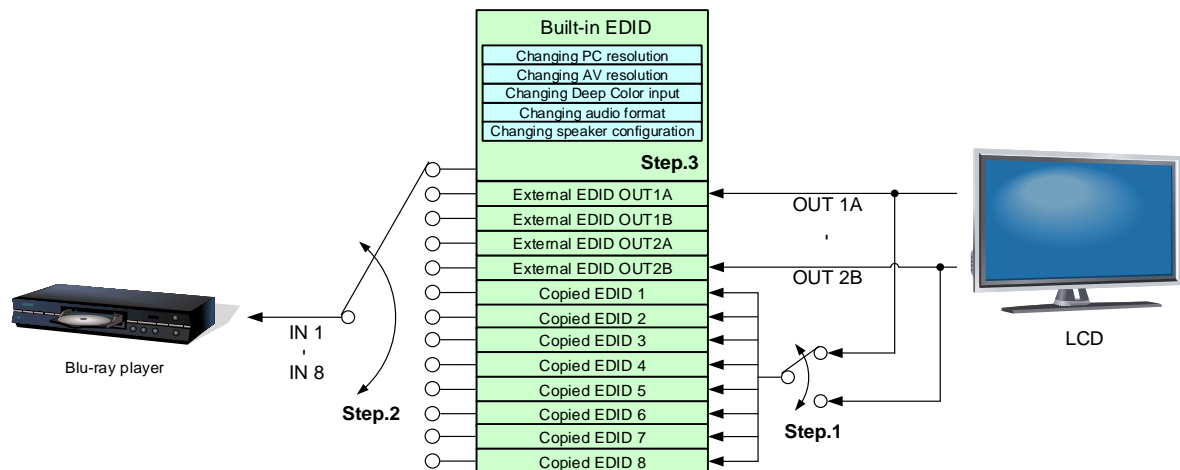
You can set or customize EDID to be sent to the source device. Change the setting as needed.

■ Setting EDID

Step 1 If you use copied EDID, copy the target EDID from the sink device.

Step 2 Set the EDID that will be sent to the source device.

Step 3 If you use built-in EDID, customize the data as usage.



[Fig. 9.18] Setting EDID (MSD-802UHD)

9.10.1 EDID

Menu Top→EDID→EDID DATA
Setting for Each input channel (only digital input)
Setting value

- INTERNAL EDID [Default]
- OUT1A MONITOR
- OUT1B MONITOR
- OUT2A MONITOR
- OUT2B MONITOR
- COPY DATA1 to COPY DATA8

You can set the EDID to be sent to the source device from built-in EDID (“INTERNAL EDID”), connected sink device’s EDID (“MONITOR”) and copied EDID (“COPY DATA”).

EDID copied from a sink device will be displayed if any.

The setting of this menu is not updated until the MENU/SET key is pressed. Make sure to press the MENU/SET key to update the setting.

【See: 9.10.7 Copying EDID】

9.10.2 Resolution for PCs

Menu Top→EDID→PC RESOLUTION

Setting for Each input channel

Setting value

- SVGA (800x600)
- XGA (1024x768)
- 720p (1280x720)
- WXGA (1280x768)
- WXGA (1280x800)
- Quad-VGA (1280x960)
- SXGA (1280x1024)
- WXGA (1360x768)
- WXGA (1366x768)
- SXGA+ (1400x1050)
- WXGA+ (1440x900)
- WXGA++ (1600x900)
- UXGA (1600x1200)
- WSXGA+ (1680x1050)
- 1080i (1920x1080)
- 1080p (1920x1080)
- WUXGA (1920x1200)
- QWXGA (2048x1152)
- WQHD (2560x1440)^{*1}
- WQXGA (2560x1600)^{*1}
- 2160p@30 (3840x2160)^{*1}
- 2160p@60 (3840x2160)^{*2}

[Default] IN1, IN2 : 2160p@60 (3840x2160)

IN3 to IN7 : 1080p (1920x1080)

IN8 : 2160p@30 (3840x2160)

^{*1} IN1, IN2, IN8

^{*2} IN1, IN2

You can set the resolution requested to be output from source devices.

This setting will also be applied for controlling output resolution when AV devices (such as Blu-ray players) are connected via HDMI. For digital input, this setting will be valid only if "INTERNAL EDID" is selected for "9.10.1 EDID".

The setting of this menu is not updated until the MENU/SET key is pressed. Make sure to press the MENU/SET key to update the setting.

Timing of 720p, 1080i, 1080p, and 2160p is the same as that of HD signal meeting the CEA-861D standard. For other resolutions, timings meet the VESA DMT or VESA CVT standards.

Set the maximum available resolution for EDID, but the lower resolutions are also supported. Select the resolution supported by the connected PC.

You can select 2160p (4096x2160) resolution from "9.10.3 Input resolution for AV devices".

If a source device that does not support 4K is connected to the input connector with 4K EDID settings, the source device may output DVI signal meaning audio is not output. In order to output HDMI signal from the source device, change the settings of this menu and "9.10.3 Input resolution for AV devices" to a value other than 4K.

[Table 9.14] Supported resolution

| Input resolution settings | Supported resolution | | | | | | | | | | | | | | | | | | | | | | | |
|---------------------------|----------------------|---------|----------|----------|----------|----------|----------|-----------|----------|----------|-----------|----------|----------|-----------|-----------|------------|------------|-----------|-----------|-----------|-----------|-------------|-------------|---|
| | 640x480 | 800x600 | 1024x768 | 1280x720 | 1280x768 | 1280x800 | 1280x960 | 1280x1024 | 1360x768 | 1366x768 | 1400x1050 | 1440x900 | 1600x900 | 1600x1200 | 1680x1050 | 1920x1080i | 1920x1080p | 1920x1200 | 2048x1152 | 2560x1440 | 2560x1600 | 2160p (30p) | 2160p (60p) | |
| 800x600 | 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 | 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[D4] | Y | Y | Y | Y | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N |
| 1280x768 | 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 | 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 | 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 | 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 | Y | Y | Y | Y | Y | Y | Y | Y | Y | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N |
| 1366x768 | Y | Y | Y | Y | Y | Y | Y | Y | N | Y | N | N | N | N | N | N | N | N | N | N | N | N | N | N |
| 1400x1050 | Y | Y | Y | Y | N | Y | Y | Y | N | Y | Y | N | N | N | N | N | N | N | N | N | N | N | N | N |
| 1440x900 | Y | Y | Y | Y | N | Y | Y | Y | N | Y | Y | Y | N | N | N | N | N | N | N | N | N | N | N | N |
| 1600x900 | Y | Y | Y | Y | N | Y | Y | Y | N | Y | Y | Y | Y | N | N | N | N | N | N | N | N | N | N | N |
| 1600x1200 | Y | Y | Y | Y | N | Y | Y | Y | N | Y | Y | Y | Y | Y | N | N | N | N | N | N | N | N | N | N |
| 1680x1050 | Y | Y | Y | Y | N | Y | Y | Y | N | Y | Y | Y | Y | Y | Y | N | N | N | N | N | N | N | N | N |
| 1920x1080i[D3] | Y | Y | Y | Y | N | N | N | N | N | N | N | N | N | N | N | Y | N | N | N | N | N | N | N | N |
| 1920x1080p[D5] | Y | Y | Y | Y | N | N | Y | Y | N | Y | Y | Y | Y | Y | Y | N | Y | N | N | N | N | N | N | N |
| 1920x1200 | Y | Y | Y | N | N | Y | Y | Y | N | N | Y | Y | Y | Y | Y | N | Y | Y | N | N | N | N | N | N |
| 2048x1152 | Y | Y | Y | N | N | N | Y | Y | N | N | Y | Y | Y | Y | Y | N | Y | Y | Y | N | N | N | N | N |
| 2560x1440 | Y | Y | Y | N | N | N | Y | Y | N | N | Y | Y | Y | Y | Y | N | Y | N | Y | Y | N | N | N | N |
| 2560x1600 | Y | Y | Y | N | N | N | N | Y | N | N | Y | Y | Y | Y | Y | N | Y | N | Y | Y | Y | Y | N | N |
| 2160p (30p) | Y | Y | Y | N | N | N | N | Y | N | N | Y | Y | Y | Y | Y | N | Y | N | Y | N | Y | Y | Y | N |
| 2160p (60p) | Y | Y | Y | N | N | N | N | Y | N | N | Y | Y | Y | Y | Y | N | Y | N | Y | N | N | Y | Y | Y |

Y: Supported , N: Not supported

9.10.3 Input resolution for AV devices

Menu Top→EDID→AV RESOLUTION

Setting for Each input channel (only digital input)

Setting value

- AUTO [Default] • 1080i • 2160p@60 4:4:4^{*2}
- UNUSED • 1080p • 4096x2160@30^{*1}
- 480p • 2160p@30^{*1} • 4096x2160@60 4:2:0^{*1}
- 720p • 2160p@60 4:2:0^{*1} • 4096x2160@60 4:4:4^{*2}

^{*1} N1, IN2, IN8

^{*2} IN1, IN2

You can set the resolution requested to be output from AV devices (such as Blu-ray players).

This setting will be valid if “INTERNAL EDID” is selected for “**9.10.1 EDID**”.

Normally, set this menu to “AUTO” to set resolution for AV devices according to “**9.10.2 Resolution for PCs**” automatically.

“UNUSED” disables the EDID for AV devices. If you select “AUTO” and the resolution output from the PC is different from the resolution set in Properties, the problem may be solved by selecting “UNUSED”.

If there is a potential to connect both PCs and AV devices with different resolutions (for example, PC with WXGA (1366x768), Blu-ray disc player with 1080p), set the PC resolution in “**9.10.2 Resolution for PCs**” and select the AV resolution in this menu. However, some PCs and AV devices may select the higher resolution of the resolutions set in “**9.10.2 Resolution for PCs**” or this menu.

If a source device that does not support 4K is connected to the input connector with 4K EDID settings, the source device may output DVI signal meaning audio is not output. In order to output HDMI signal from the source device, change the settings of this menu and “**9.10.2 Resolution for PCs**” to a value other than 4K.

The setting of this menu is not updated until the MENU/SET key is pressed. Make sure to press the MENU/SET key to update the setting.

[Table 9.15] Input resolutions when “AUTO” is selected

| | | | | | | | | | | | | | | | | | | | | | | | |
|---------------|---------|---------|----------|----------|----------|----------|----------|-----------|----------|----------|-----------|----------|----------|-----------|-----------|------------|------------|-----------|-----------|-------------|----------------|----------------|---------------|
| PC Resolution | 640x480 | 800x600 | 1024x768 | 1280x720 | 1280x768 | 1280x800 | 1280x960 | 1280x1024 | 1360x768 | 1366x768 | 1400x1050 | 1440x900 | 1600x900 | 1600x1200 | 1680x1050 | 1920x1080i | 1920x1080p | 1920x1200 | 2048x1152 | 2560 x 1440 | 2560 x 1600 | 2160@30 | 2160@60 4:4:4 |
| AV Resolution | 480p | | | 720p | | | | | | | | | | | | 1080i | 1080p | | | | 2160p@60 4:2:0 | 2160p@60 4:4:4 | |

Note:

If you select “UNUSED”, the settings of “**9.10.4 Deep Color**”, “**9.10.5 Audio format**”, “**9.10.6 Speaker configuration**” will be disabled and audio is not output because the source device outputs signal through DVI mode.

9.10.4 Deep Color

| | |
|---------------|---|
| Menu | Top→EDID→DEEP COLOR INPUT |
| Setting for | Each input channel (only digital input) |
| Setting value | 24-BIT COLOR [Default], 30-BIT COLOR |

You can set the color depth to be output from the source device.

This menu is valid only if you select "INTERNAL EDID" for "9.10.1 EDID" and you select a resolution other than "UNUSED" for "9.10.3 Input resolution for AV devices".

If you select "30-BIT COLOR", compared to "24-BIT COLOR", "30-BIT COLOR" is transmitted using a higher clock frequency, which may cause noise if a cable with a bad quality or a long cable is connected. In such a case, the noise may be removed by setting the color to "24-BIT COLOR".

The setting of this menu is not updated until the MENU/SET key is pressed. Make sure to press the MENU/SET key to update the setting.

9.10.5 Audio format

| | |
|---------------|---|
| Menu | Top→EDID→AUDIO FORMAT |
| Setting for | Each input channel (only digital input) |
| Setting value | [Table 9.16] Audio format |

[Table 9.16] Audio format

| Audio format | ON / OFF | Maximum sampling frequency (kHz) |
|----------------|------------------|---|
| PCM | Cannot be set | 32 / 44.1 / 48 / 88.2 / 96 / 176.4 / 192 (48) |
| Dolby Digital | Can be set (OFF) | ON: 32 / 44.1 / 48 (48) |
| AAC | Can be set (OFF) | ON: 32 / 44.1 / 48 / 88.2 / 96 (48) |
| Dolby Digital+ | Can be set (OFF) | ON: 32 / 44.1 / 48 (48) |
| DTS | Can be set (OFF) | ON: 32 / 44.1 / 48 / 96 (48) |
| DTS-HD | Can be set (OFF) | ON: 44.1 / 48 / 88.2 / 96 / 176.4 / 192 (192) |
| Dolby TrueHD | Can be set (OFF) | ON: 44.1 / 48 / 88.2 / 96 / 176.4 / 192 (96) |

Default values are shown in parentheses.

You can set the audio format and maximum sampling frequency to be output from a source device.

This menu will be valid only if you select "INTERNAL EDID" for "9.10.1 EDID" and you select a resolution other than "UNUSED" for "9.10.3 Input resolution for AV devices".

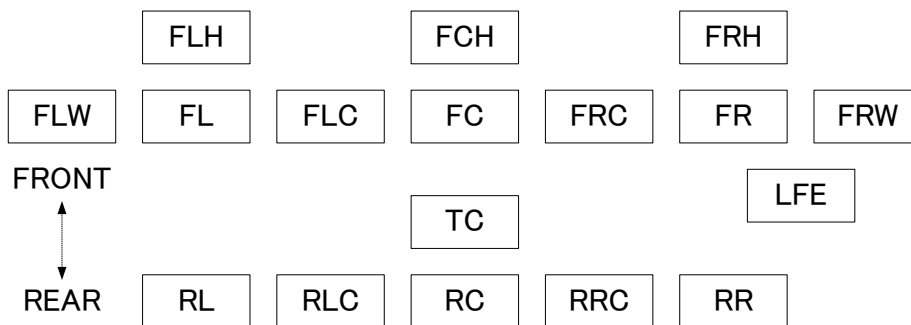
The setting of this menu is not updated until the MENU/SET key is pressed. Make sure to press the MENU/SET key to update the setting.

9.10.6 Speaker configuration

| | |
|---------------|---|
| Menu | Top→EDID→SPEAKER |
| Setting for | Each input channel (only digital input) |
| Setting value | Setting mode : AUTO [Default], MANUAL Each speaker : ON, OFF The number of speakers: 1 to 8 |

[Table 9.17] Default speaker configuration

| The 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 [Default] | 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 | RRC | Rear Right Center |
| FC | Front Center | LFE | Low Frequency Effect |
| FR | Front Right | FLW | Front Left Wide |
| FLC | Front Left Center | FRW | Front Right Wide |
| FRC | Front Right Center | FLH | Front Left High |
| RL | Rear Left | FCH | Front Center High |
| RC | Rear Center | FRH | Front Right High |
| RR | Rear Right | TC | Top Center |
| RLC | Rear Left Center | | |

[Fig. 9.19] Speaker configuration

You can set the speaker configuration of multi-channel audio.

This menu is valid only if you select “INTERNAL EDID” for “**9.10.1 EDID**“, you select a resolution other than “UNUSED” for “**9.10.3 Input resolution for AV devices**”.

If you select “AUTO” for the setting mode and set the number of speakers, the speaker configuration will be set to the default setting that is shown in “[Table 9.17] Default speaker configuration”.

To change the default configuration, set the mode to “MANUAL” and set each speaker to ON/OFF individually.

If the number of speakers exceeds the available value, the “DATA INVALID” message is displayed and the settings will not be applied.

The setting of this menu is not updated until the MENU/SET key is pressed. Make sure to press the MENU/SET key to update the setting.

9.10.7 Copying EDID

| | |
|---------------|----------------------------|
| Menu | Top→EDID→MONITOR EDID COPY |
| Setting for | COPY EDID No.1 to No.8 |
| Setting value | OUT1A, OUT1B, OUT2A, OUT2B |

EDID of the sink device is loaded and registered to the MSD.

Up to eight EDID can be registered.

■ Copying EDID (Ex: MSD-802UHD)

Step.1: Select output channel (OUT1A to OUT2B) which is connected to sink device

Step.2: Select the number of COPY EDID (No.1 to No.8)

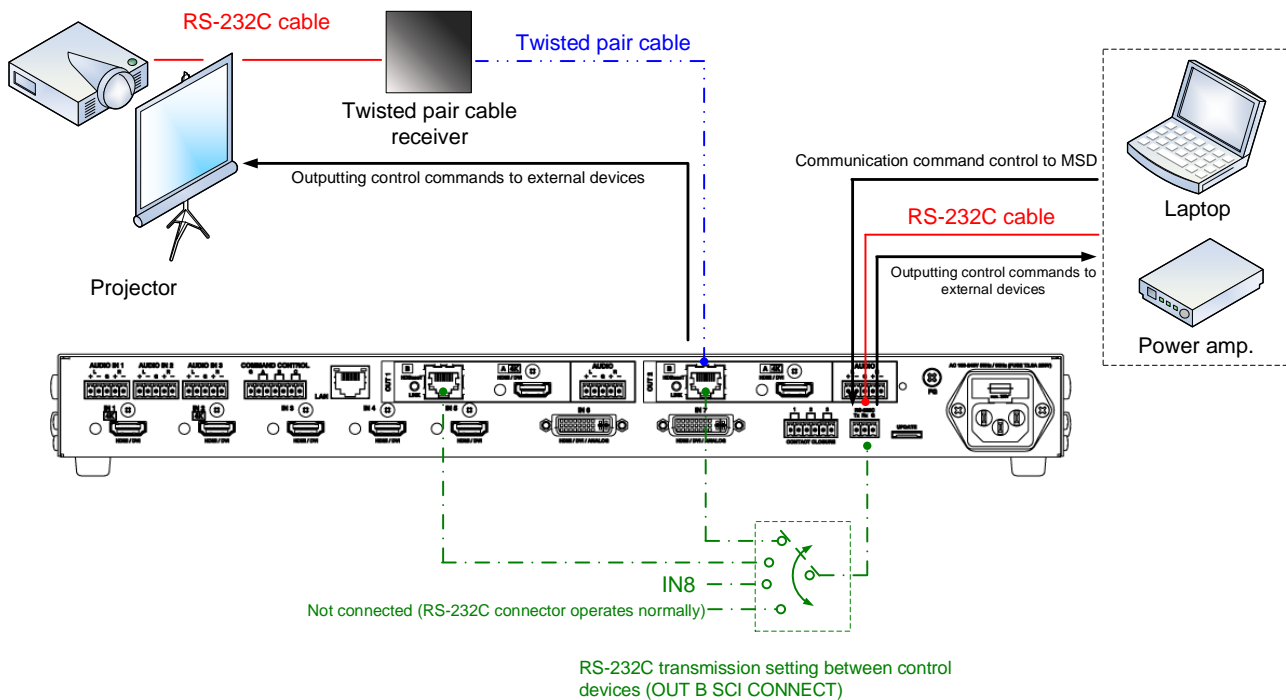
Step.3: Set the name of the EDID using ASCII code 20 to 7D (up to 10 characters)

Step.4: Press the “MENU/SET” key to register an EDID

9.11 RS-232C

The RS-232C connector of the MSD can output communication command control from PCs and can output control command to external devices from the MSD. The operation mode will be switched according to “9.11.2 RS-232C operation mode”.

【See: 9.13 Setting control command】



【Fig. 9.20】 RS-232C communication

9.11.1 RS-232C communication setting

Menu Top→COM PORT→PARAMETERS

Setting for RS-232C connector, OUT1B connector, OUT2B connector, IN8 connector

Setting value [Table 9.18] RS-232C setting items

【Table 9.18】 RS-232C setting items

| Setting item | Setting value | Default |
|-----------------------|--------------------------|---------|
| Baud rate [bps] | 4800, 9600, 19200, 38400 | 9600 |
| Data bit length [bit] | 8, 7 | 8 |
| Parity check | NONE, EVEN, ODD | NONE |
| Stop bit [bit] | 1, 2 | 1 |

You can set RS-232C communication.

The setting of this menu is not updated until the MENU/SET key is pressed. Make sure to press the MENU/SET key to update the setting.

9.11.2 RS-232C operation mode

| | |
|---------------|--|
| Menu | Top→COM PORT→FUNCTION |
| Setting for | RS-232C connector, OUT1B connector, OUT2B connector, IN8 connector |
| Setting value | RECEIVER,TRANSMITTER |
| | [Default] |
| | RS-232C connector, IN8 connector: RECEIVER |
| | OUT1B connector, OUT2B connector: TRANSMITTER |

You can set the operation mode to “RECEIVER” mode in which the MSD is controlled externally or “TRANSMITTER” mode in which the MSD controls peripheral devices.

The setting of this menu is not updated until the MENU/SET key is pressed. Make sure to press the MENU/SET key to update the setting.

9.11.3 RS-232C HDBaseT connection

| | |
|---------------|--------------------------------|
| Menu | Top→COM PORT→OUT B SCI CONNECT |
| Setting value | [Table 9.19] RS-232C operation |

You can set the communication between MSD’s RS-232C connector and an RS-232C connector of twisted pair cable transmitter or receiver that is connected to HDBaseT I/O connector.

[Table 9.19] RS-232C operation

| Setting value | Operation |
|---------------|--|
| OFF [Default] | MSD’s RS-232C connector operates in the mode that is set in “ 9.11.2 RS-232C operation mode ”. |
| OUT1B | Communication between MSD’s RS-232C connector and an RS-232C connector of twisted pair cable transmitter or receiver that is connected to HDBaseT I/O connector. The MSD’s RS-232C connector cannot be used for communication command control from PC to MSD or control command output from MSD to external devices. |
| OUT2B | |
| IN8 | |

【See: 9.11 RS-232C】

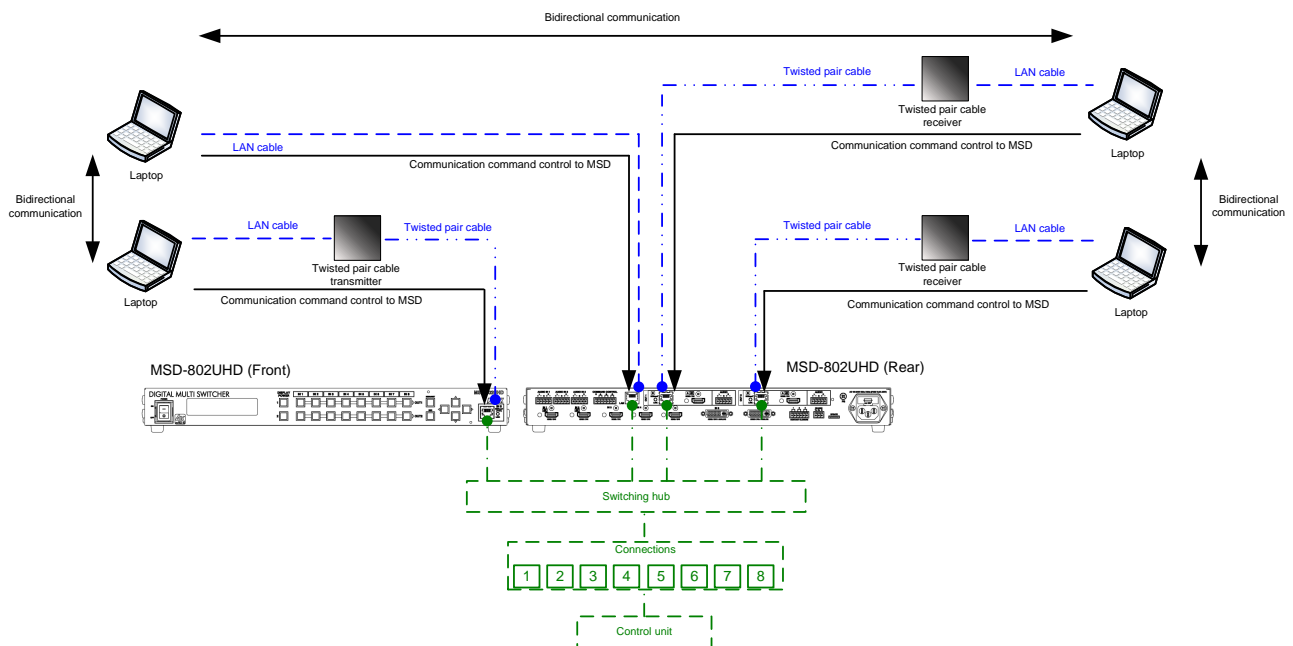
9.12 LAN

■ LAN communication

The internal switching hub enables connections between the MSD's LAN connector and LAN connectors of twisted pair cable transmitter and receiver that are connected to HDBaseT I/O connectors. Bidirectional communication is also available.

Communication command control from PC to the MSD and control command output from the MSD to external devices can be executed from all LAN ports. Operation mode will be switched according to the setting of "9.12.2 LAN operation mode". The MSD has eight connections that can be set individually.

【See: 9.13 Setting control command】



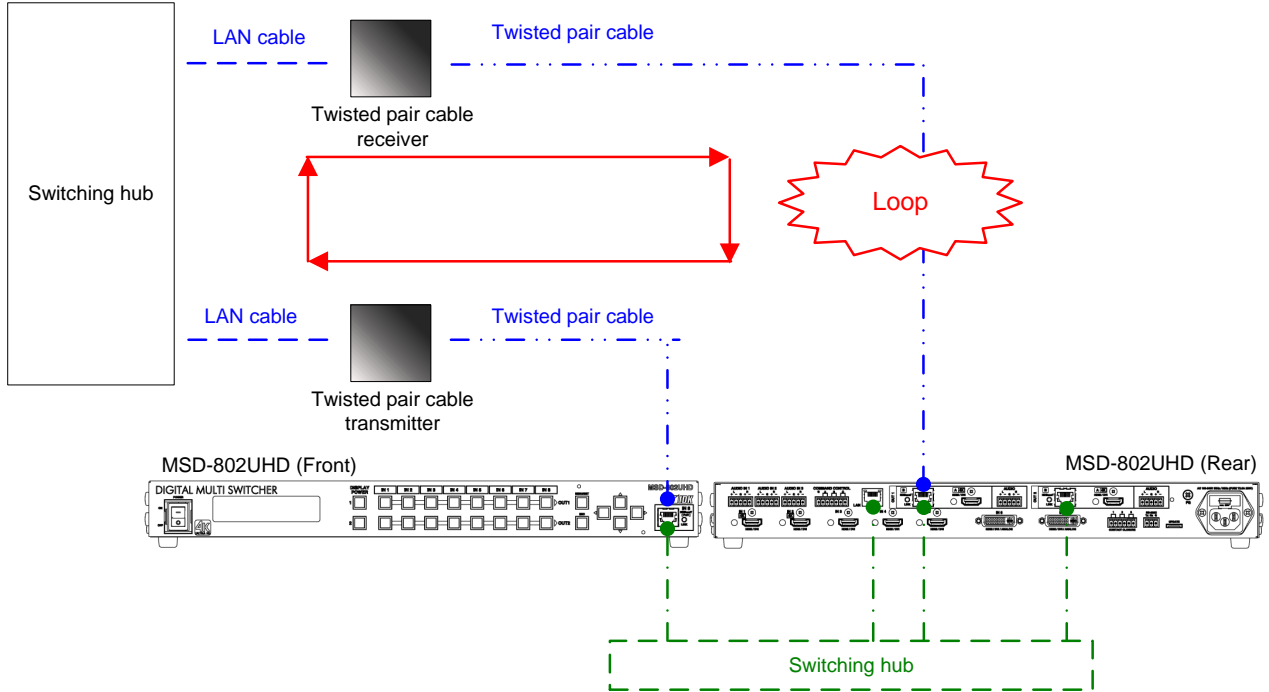
【Fig. 9.21】 LAN operation

The MSD does not support automatic acquisition of IP address using DHCP (Dynamic Host Configuration Protocol). If you use the MSD in a network with DHCP, keep a fixed IP address. If controlling peripheral devices connected over LAN from the MSD, keep several fixed IP addresses.

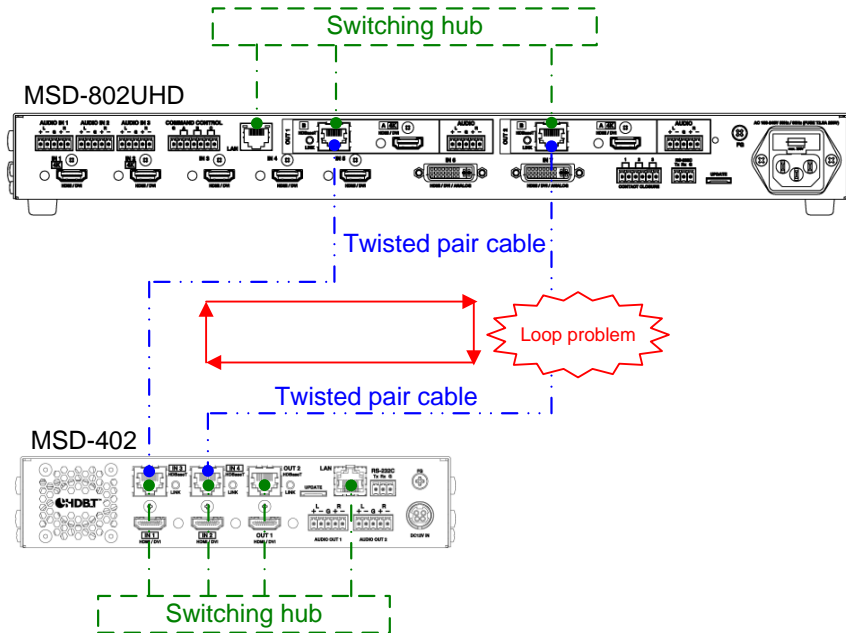
■ LAN loop problem

The MSD includes 3-port switching hub function. The network may be down due to loop problem. If the loop problem occurs, set “9.12.5 Setting HDBaseT LAN” to “OFF”.

Other manufacturer's device



[Fig. 9.22] Loop problem with other manufacture's device



[Fig. 9.23] Loop problem with IDK's device

9.12.1 IP address/Subnet mask/Gateway address

| | |
|----------------------|--|
| Menu | IP address: Top→LAN→IP ADDRESS Subnet mask: Top→LAN→SUBNET MASK Gateway address: Top→LAN→GATEWAY ADDRESS |
| Setting value | [Default] IP address: 192.168.1.199 Subnet mask: 255.255.255.0 Gateway address: 192.168.1.200 |

You can set IP address, subnet mask, and gateway address.

The setting of this menu is not updated until the MENU/SET key is pressed. Make sure to press the MENU/SET key to update the setting.

9.12.2 LAN operation mode

| | |
|----------------------|--|
| Menu | Top→LAN→FUNCTION |
| Setting for | Each connection |
| Setting value | [Table 9.20] Setting items of LAN operation mode |

[Table 9.20] Setting items of LAN operation mode

| Setting | Operation mode | |
|---|--------------------|---|
| | Receiver mode | Transmitter |
| Operation mode | RECEIVER [Default] | TRANSMITTER |
| Destination IP address | — | 0.0.0.0 to 255.255.255.255 [Default] 192.168.1.198 |
| PJLink protocol connection | — | ON: Use OFF: Not use [Default] |
| Destination connection number ^{*1} | — | 1 to 65535 [Default] 1100 |
| PJLink protocol password ^{*2} | — | 20, 30 to 39, 41 to 5A, 61 to 7A in ASCII code (in hex) [Default] 20 (space) |

^{*1} If selecting “ON” for PJLink protocol, the target port number is fixed at “4352”.

^{*2} Up to 32 characters. If you do not want the password authentication, you do not need to set the item.

You can set the LAN operation mode consisting of “RECEIVER” mode that controls the MSD externally and “TRANSMITTER” mode that controls peripheral devices from the MSD.

If you select “TRANSMITTER” mode, you need to set the information of connecting device.

The setting of this menu is not updated until the MENU/SET key is pressed. Make sure to press the MENU/SET key to update the setting.

9.12.3 TCP port number

| | |
|---------------|--|
| Menu | Top→LAN→PORT NUMBER |
| Setting for | Each connection |
| Setting value | [Table 9.21] Settings of TCP port number |

[Table 9.21] Settings of TCP port number

| For | Setting value |
|-------------------------------|------------------------|
| Communication command control | 23, 1100, 6000 to 6999 |
| WEB browser control | 80, 5000 to 5999 |

[Default] Connections 1 to 3 = 1100; Connections 4 to 6 = 23;
Connections 7, 8 = 80

You can set the TCP port number to control the MSD externally.

This setting will valid if "RECEIVER" is selected for "**9.12.2 LAN operation mode**".

Each connection will be divided into connections for communication command control and WEB browser depending on the set port numbers.

The setting of this menu is not updated until the MENU/SET key is pressed. Make sure to press the MENU/SET key to update the setting.

9.12.4 MAC address

| | |
|------|---------------------|
| Menu | Top→LAN→MAC ADDRESS |
|------|---------------------|

You can display the MAC address.

9.12.5 Setting HDBaseT LAN

| | |
|---------------|-------------------------------|
| Menu | Top→LAN→HDBASET LAN |
| Setting for | HDBaseT input, HDBaseT output |
| Setting value | ON [Default], OFF |

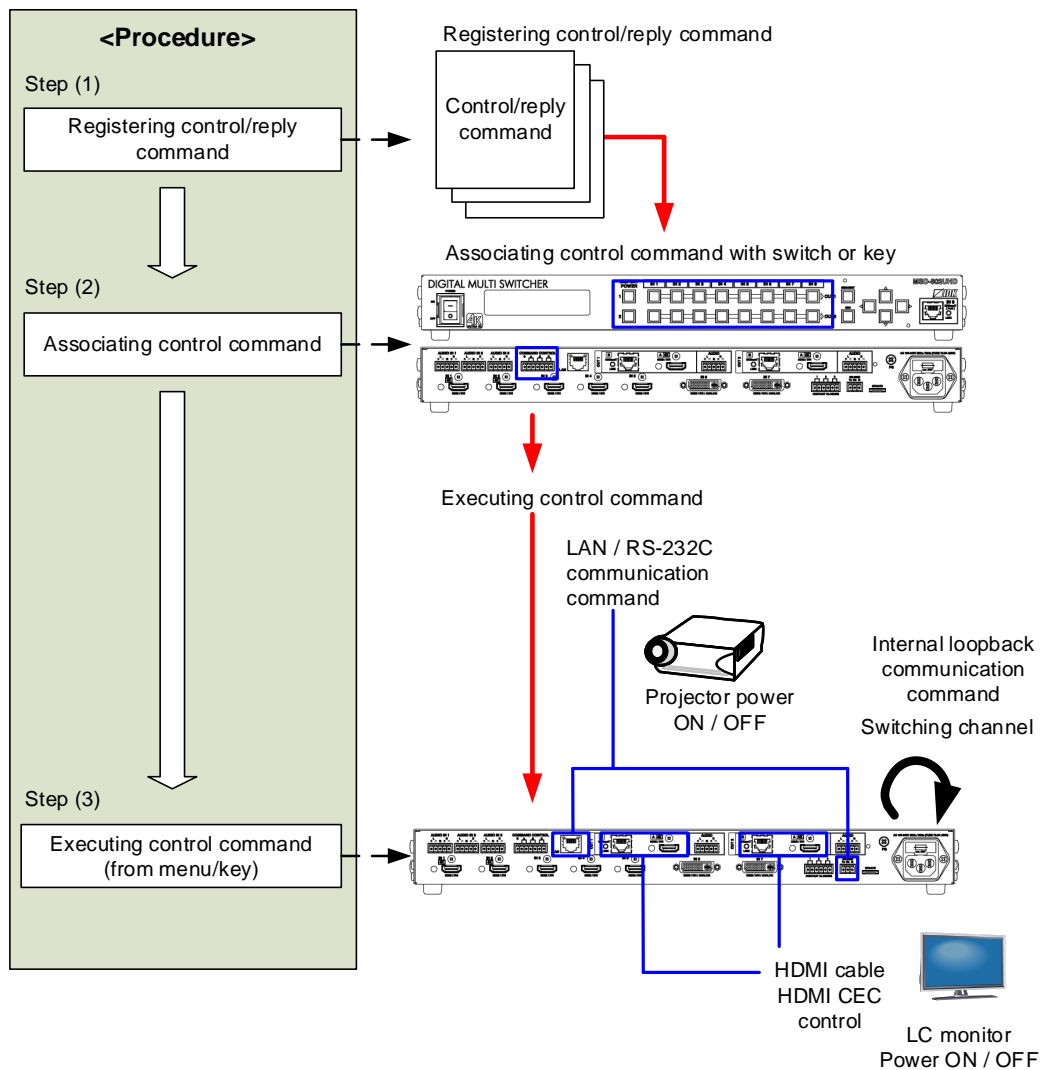
You can enable/ disable the LAN of HDBaseT output connector.

【See: 9.12 LAN】

9.13 Setting control command

You can control external devices (for example, turning ON/OFF projectors) via RS-232C, LAN, contact closure, or CEC. You can register up to 32 commands in the MSD. Registered control commands will be associated with control command execution keys (COMMAND A to COMMAND I) or execution conditions such as switching video or audio.

When execution conditions are met, those commands will be performed in the order. The loop back function allows you to control the MSD itself.



[Fig. 9.24] Executing control command

■ **Control command via RS-232C / LAN communication**

Control commands can be sent from MSD's RS-232C connector, LAN connector, or HDBaseT output connector.

Before executing control command, set the operation mode of the connector to "TRANSMITTER".

【See: 9.11.2 RS-232C operation mode】

【See: 9.12.2 LAN operation mode】

■ **Screen display during control command execution**

When a control command is executed, the user setting for the text of "MEMO" is displayed (1), and if the reply command is received, the "MEMO" text registered for the reply command is also displayed (2) for one second (when the control command that is used for checking the reply command is executed).

The received data is displayed (3) for two seconds (when the control command that is used for displaying the received data is executed).

Examples:

- (1) "SCREEN UP" is registered in MEMO and the control command is executed.
- (2) A reply command, "SCREEN OK", is displayed.
- (3) "PROJECTOR LAMP" is registered in the MEMO and "%1LAMP=1000 1↵" is received.
- (4) Reply command could not be received and retry over occurs.

(1) Only control command

```
SEND: SCREEN UP
```

(2) Control command (upper)
Reply command (lower)

```
SEND: SCREEN UP
RECV: SCREEN OK
```

(3) Received data is displayed.

```
SEND: PROJECTOR LAMP
RECV: %1LAMP=1000 1↵
```

(4) Reply command cannot be received and a retry error occurs.

```
SEND: SCREEN UP
RETRY OVER ERROR
```

[Fig. 9.25] Screen display

If you configure several control commands, or if you display data received from several com ports, the display time may be shortened by one to two seconds while control commands are being successively executed. If the received data does not fit in the full screen, the displayed data is scrolled.

9.13.1 Registering/editing control command

Menu Top→PRESET COMMAND→COMMAND EDIT

Setting for Each command

Setting value [Table 9.22] Setting items of control command

You can create and edit up to 32 control commands.

The setting of this menu is not updated until the MENU/SET key is pressed. Make sure to press the MENU/SET key to update the setting.

[Table 9.22] Setting items of control command

| Item | Setting | | | Description | Range |
|--------------------|---------|-----|-----|---|--|
| | COM | CC | CEC | | |
| PORT | yes | yes | yes | Select "COM", "CC" or "CEC". | COM: Communication command [Default] CC: Contact closure CEC: HDMI CEC control |
| COM SIZE | yes | no | no | Set the number of bytes to be sent starting with the first byte. | 0BYTE to 30BYTE [Default] 0BYTE |
| DELAY | yes | yes | yes | Set the waiting time of the control command. Use this item for devices such as projectors that requires time to cool down after powering off. | 0ms to 999s999ms [Default] 0ms |
| Communication port | yes | no | no | Set the following communication ports to "OFF" (not sending communication commands) or "ON" (sending communication commands). Those ports can be set separately, and communication commands can be sent to multiple communication ports at the same time. <ul style="list-style-type: none"> • RS : RS-232C⁵ • OUT1B RS: RS-232C of OUT1B • OUT2B RS: RS-232C of OUT2B • LOOP BACK: Internal loop back • LAN1 to LAN8: LAN connection 1 to 8⁶ | OFF [Default] ON |
| COMMAND INPUT MODE | yes | no | no | Set the input mode of send command data. Select "ASCII" if "DATA" of "COMMAND" consists of only 0A, 0D, and 20 to 7D of ASCII codes. Select "HEX" if "DATA" of "COMMAND" includes other codes. | ASCII [Default] HEX |
| Send command data | yes | no | no | Set the command from the first byte according to the number of bytes set in "COM SIZE" (up to 30 bytes). | 0A, 0D, 20 to 7D in ASCII, 00 to FF in hex [Default] 20 (space) |

[Table 9.23] Setting items of control command (Cont'd)

| Item | Setting | | | Description | Range |
|--------------------------------|---------|-----|-----|--|---|
| | COM | CC | CEC | | |
| RECV DISPLAY | yes | no | no | Set whether received data is displayed or not. | OFF [Default] ASCII HEX |
| DELIMITER ^{*1} | yes | no | no | Set the delimiter to be sent at the end of the received data. “NONE”: delimiter is not checked and all received data within the set timeout will be valid. Value other than “NONE”: delimiter is checked and data received before delimiter will be valid. | NONE [Default] 00 to FF (Hex) |
| RCV CHECK ^{*2} | yes | no | no | Set whether reply command that may be returned is checked or not. | CHECK NOT CHECK [Default] |
| TIME OUT ^{*3 *4} | yes | no | no | Set the timeout time for reply command to a sent command. | 0ms to 99s999ms [Default] 0ms |
| RETRY ^{*3 *4} | yes | no | no | Set the number of retries to resend the same command again if no valid response is replied. | 0 to 99 (times) [Default] 0 |
| INTERVAL ^{*3 *4} | yes | no | no | Set the retry interval to resend the command. | 0ms to 99s999ms [Default] 0ms |
| ERROR ^{*3 *4} | yes | no | no | Set whether the next command is to be executed or not if no valid response is replied, even after completing retry for the set number of retries. | STOP [Default] EXEC: continue |
| Contact closure control | no | yes | no | Set the contact closure control. If you select “toggle operation”, it can invert the condition of contact (open/close). | -: not control [Default] OFF: contact open ON: contact close TGL: toggle |
| Pulse width | no | yes | no | Set the time of returning its original condition when you control the contact closure. | NONE: eternity [Default] 100ms to 9990ms (by 10ms) |
| HDMI CEC control ^{*7} | no | no | yes | Set the CEC control for the sink devices connected to OUT1A / OUT2A / OUT1B / OUT2B. | -: not control [Default] POWER OFF POWER ON |
| Process for CEC error | no | no | yes | Set whether the next command is executed or not if no response is replied from the sink device that is controlled with CEC. | STOP [Default] EXEC: continue |
| MEMO | yes | yes | yes | Register a note up to 14 characters. The registered note is displayed when the control command is executed. | 20 to 7D in ASCII codes except for 2C (.) [Default] 20 (space) |

- *1 If you set "RECV DISPLAY" to "OFF", you cannot set this item.
- *2 If you set "RECV DISPLAY" to "ASCII" or "HEX", you cannot set this item.
- *3 If you set only "LOOP BACK" of communication ports to "ON", you do not need to set this item.
- *4 If you set all "RCV CHECK" to "NOT CHECK", you do not need to set this item.
- *5 If you set "RS: RS-232C" to "ON", set "**9.11.2 RS-232C operation mode**" to "TRANSMITTER".
- *6 If you set any LAN connections for "LAN1" to "LAN8" to "ON", set "**9.12.2 LAN operation mode**" to "TRANSMITTER".
- *7 CEC: only power ON/OFF of the sink device can be controlled.

■ Setting loop back function

The MSD sends a communication command back to the MSD itself using the loop back function. It replies "OK" if processed normally while replying "NG" if parameter or command is incorrect. To check the reply command, set reply command 31 and 32 to "CHECK".

■ Setting PJLink

The MSD supports PJLink, which is a standard protocol to control projectors.

To use PJLink, select the LAN connector for "COM port" so that you can select PJLink command when entering the send command data.

【See: 9.12.2 LAN operation mode】

[Table 9.24] PJLink command (class1) list

| No. | Command | | | | | | | | | | | Description |
|-----|---------|---|---|---|---|---|------|---|------|------|--|--|
| 1 | % | 1 | P | O | W | R | (SP) | 0 | (CR) | | | Power off (Standby) |
| 2 | % | 1 | P | O | W | R | (SP) | 1 | (CR) | | | Power on (Lamp on) |
| 3 | % | 1 | P | O | W | R | (SP) | ? | (CR) | | | Get power status |
| 4 | % | 1 | I | N | P | T | (SP) | 1 | * | (CR) | | Switch input to RGB |
| 5 | % | 1 | I | N | P | T | (SP) | 2 | * | (CR) | | Switch input to VIDEO |
| 6 | % | 1 | I | N | P | T | (SP) | 3 | * | (CR) | | Switch input to DIGITAL |
| 7 | % | 1 | I | N | P | T | (SP) | 4 | * | (CR) | | Switch input to STORAGE |
| 8 | % | 1 | I | N | P | T | (SP) | 5 | * | (CR) | | Switch input to NETWORK |
| 9 | % | 1 | I | N | P | T | (SP) | ? | CR | | | Get input selection settings |
| 10 | % | 1 | A | V | M | T | (SP) | 1 | 0 | (CR) | | Switch off video mute |
| 11 | % | 1 | A | V | M | T | (SP) | 1 | 1 | (CR) | | Switch on video mute |
| 12 | % | 1 | A | V | M | T | (SP) | 2 | 0 | (CR) | | Switch off audio mute |
| 13 | % | 1 | A | V | M | T | (SP) | 2 | 1 | (CR) | | Switch on audio mute |
| 14 | % | 1 | A | V | M | T | (SP) | 3 | 0 | (CR) | | Video+audio mute off |
| 15 | % | 1 | A | V | M | T | (SP) | 3 | 1 | (CR) | | Video+audio mute on |
| 16 | % | 1 | A | V | M | T | (SP) | ? | (CR) | | | Get mute settings |
| 17 | % | 1 | E | R | S | T | (SP) | ? | (CR) | | | Get error status |
| 18 | % | 1 | L | A | M | P | (SP) | ? | (CR) | | | Get time and status of lamp |
| 19 | % | 1 | I | N | S | T | (SP) | ? | (CR) | | | Get list of switching input |
| 20 | % | 1 | N | A | M | E | (SP) | ? | (CR) | | | Get projector name |
| 21 | % | 1 | I | N | F | 1 | (SP) | ? | (CR) | | | Get manufacture name |
| 22 | % | 1 | I | N | F | 2 | (SP) | ? | (CR) | | | Get product name |
| 23 | % | 1 | I | N | F | O | (SP) | ? | (CR) | | | Get other information (optional of manufacturer) |

(SP): space, (CR): delimiter

* You can specify the input number from 1 to 9, but types and the number of selectable input connectors differ depending on the projector. "1" is displayed by default.

Reply command structure for PJLink commands:

The first 6 byte: the sent command data without change; the 7th bytes: "="; after the 8th byte: processing result

For example, if a command, "%1POWR 1CR", is processed normally, the reply command, "%1POWR=OK CR" will be replied.

PJLink specifications regulate that projectors are required to reply the reply commands within 2 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.

[Table 9.25] Reply commands to PJLink command (class1) (ASCII codes)

| No. | Command | | | | | | | | | | | Description | |
|-----|---------|---|---|---|---|---|---|---|---|------|---|---------------------|---|
| 1 | % | 1 | x | x | x | x | = | O | K | (CR) | | Terminated normally | |
| 2 | % | 1 | x | x | x | x | = | E | R | R | 1 | (CR) | Mistake in command itself (Undefined command) |
| 3 | % | 1 | x | x | x | x | = | E | R | R | 2 | (CR) | Invalid parameter |
| 4 | % | 1 | x | x | x | x | = | E | R | R | 3 | (CR) | Currently not acceptable |
| 5 | % | 1 | x | x | x | x | = | E | R | R | 4 | (CR) | Malfunction of projector |

9.13.2 Registering / Editing reply command

Menu Top→PRESET COMMAND→RECV COMMAND EDIT

Setting for Each command

Setting value [Table 9.27] Setting items of return command

You can create and edit up to 32 reply commands.

The setting of this menu is not updated until the MENU/SET key is pressed. Make sure to press the MENU/SET key to update the setting.

[Table 9.27] Setting items of return command

| Item | Description | Range |
|--------------------|---|--|
| SIZE | Set the number of bytes from the first byte to be compared. | 0 to 30 bytes [Default] 0 byte |
| PROCESS | Select "STOP" (to stop the next operation), "EXEC" (to execute it), or "RETRY" (to send the command again) for when received data and reply command data match. | STOP EXEC [Default] RETRY: Resend commands |
| PJLink | Select whether PJLink commands are set or not for when input reply command data is input. | OFF [Default] ON |
| COMMAND INPUT MODE | Select the input mode of reply command data. "ASCII": For data consisting of only 0A, 0D, 20 to 7D (text) "HEX": For data including other codes | ASCII [Default] HEX |
| DATA | Set the command to be compared with the received data from the first byte to the byte count set in "SIZE". If using alphabets (A to Z, a to z), make sure to distinguish capital and lower case letters. (Up to 30 bytes) | 0A, 0D, and 20 to 7D of ASCII code or 00 to FF (Hex) [Default] 20 (Space) (Values described above all with hex) |
| MASK | Received data is compared with MASK DATA without "AND" of each bit and reply command data. (Use this item to determine the state using the received data bit. Settable if "COMMAND INPUT MODE" is set to "HEX"; if "ASCII" is selected, "FF" is set automatically.) | 00 to FF (Hex) [Default] All: "FF" |
| MEMO | Register a note up to 14 characters. When reply command is received, the registered note is displayed. | 20 to 7D of ASCII code except for 2C (,) [Default] All: Spaces |

Those default values do not apply to reply commands 31 and 32.

■ Setting loop back function

If the MSD sends a communication command back to the MSD itself using the loop back function, the MSD replies “OK” if processed normally while it replies “NG” if parameter or command is incorrect. (This differs from reply commands to communication commands received externally; not loop back.) Since “OK” and “NG” are registered to reply commands 31 and 32 by factory default, respectively, do not edit or delete those commands if you use the loop back function and check reply commands.

[Table 9.28] Default value of reply command

| Number | SIZE | PROCESS | DATA | MASK | MEMO |
|--------|---------|---------|---------|---------|-----------------|
| 1 | 0 byte | EXEC | All: 00 | All: FF | All: 20 (space) |
| 2 | 0 byte | EXEC | All: 00 | All: FF | All: 20 (space) |
| : | : | : | : | : | : |
| 30 | 0 byte | EXEC | All: 00 | All: FF | All: 20 (space) |
| 31 | 2 bytes | EXEC | OK | All: FF | OK |
| 32 | 2 bytes | STOP | NG | All: FF | NG |

■ Setting PJLink:

See “Setting PJLink”.

■ **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. Since “FF” is set by factory default, you do not need to change the mask data normally. Only to determine the status using bits of the received data, change the setting.

[If ASCII codes (text) are replied from an external device]

Since the received data and “Reply command data” are compared without any changes, set “MASK” to “FF”. (If you set “COMMAND INPUT MODE” of reply command to “ASCII”, it is automatically set to “FF”.)

For example, if “0” of ASCII codes (“30” in hex) is replied:

| | Binary | | Binary | Hexadecimal |
|----------------------|----------|----------|----------|-------------|
| (Received data) | 00110000 | & (MASK) | 11111111 | =30 |
| (Reply command data) | 00110000 | | | =30 matched |

```
DATA1 : 30 00 00 00 00
MASK1 : FF FF FF FF FF
```

[If status is determined using bits of the received data]

Set only bits that determine the Mask data to “1” and set other bits to “0”.

For example, if determining status using the second bit from the left:

| | Binary | | Binary | Hexadecimal |
|----------------------|----------|----------|----------|-------------|
| (Received data) | 11111111 | & (MASK) | 01000000 | =40 |
| (Reply command data) | 01000000 | | | =40 matched |

| | Binary | | Binary | Hexadecimal |
|----------------------|----------|----------|----------|-----------------|
| (Received data) | 10111111 | & (MASK) | 01000000 | =00 |
| (Reply command data) | 01000000 | | | =40 not matched |

```
DATA1 : 40 00 00 00 00
MASK1 : 40 FF FF FF FF
```

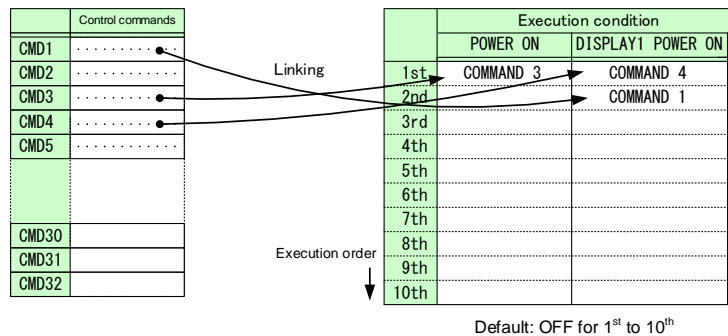
9.13.3 Command link

Menu Top→PRESET COMMAND→COMMAND LINK
Setting for [Table 9.29] Control command execution condition (Example: MSD-802UHD)
Setting value OFF [Default], COMMAND 1 to COMMAND 32

The MSD has 59 command execution conditions as shown below. If these execution conditions are met, control commands which are associated beforehand will be executed. One execution condition can be associated to up to 10 commands. If several commands are associated, commands are executed in order of registration. If the same command is associated several times, it is repeatedly executed.

Control command execution button can be toggled (COMMAND A to COMMAND I). Set “TOGGLE” to “ON” to enable PLANE-B, and then you can select execution plane (“AUTO”, “A(PLANE-A)”, or “B(PLANE-B)”) at the time of power ON from “STARTUP”. If you select “AUTO”, the condition at the time of power OFF will be maintained.

The setting of this menu is not updated until the MENU/SET key is pressed. Make sure to press the MENU/SET key to update the setting.



[Fig. 9.26] Command link

[Table 9.29] Control command execution condition (Example: MSD-802UHD)

| Execution condition | Function | Execution condition | Function |
|--|---------------------------------------|--|---------------------------------------|
| POWER ON | Controlling power switch | - | - |
| DISPLAY1 POWER ON | Controlling sink device power of OUT1 | DISPLAY2 POWER ON | Controlling sink device power of OUT2 |
| DISPLAY1 POWER OFF | | DISPLAY2 POWER OFF | |
| VIDEO:OUT1-IN1 to VIDEO:OUT1-IN8, VIDEO:OUT1-OFF | Selecting video input channel of OUT1 | VIDEO:OUT2-IN1 to VIDEO:OUT2-IN8, VIDEO:OUT2-OFF | Selecting video input channel of OUT2 |
| AUDIO:OUT1-IN1 to AUDIO:OUT1-IN8, AUDIO:OUT1-OFF | Selecting audio input channel of OUT1 | AUDIO:OUT2-IN1 to AUDIO:OUT2-IN8, AUDIO:OUT2-OFF | Selecting audio input channel of OUT2 |
| COMMAND A to COMMAND I, PLANE-A | Command control | COMMAND A to COMMAND I, PLANE-B | Command control |

9.13.4 Command execution

Menu Top→PRESET COMMAND→COMMAND EXECUTION
Setting value CMD 1 to CMD 32,COMMAND A to COMMAND I

You can execute the registered control commands.

Only registered control command numbers are displayed as settable values. To execute the control command, press the "MENU/SET" key.

【See: 9.13.1 Registering/editing control command】

9.13.5 Invalid duration at control command execution

Menu Top→PRESET COMMAND→INVALID TIME
Setting value 0s000ms to 999s999ms [Default] 0s000ms

You can set the waiting time from starting control command execution to receiving the next command. Use this menu to prevent repeated execution caused by pressing the control command execution key twice.

The longer time either of control command execution time or the time set in this menu will be applied as the invalid operation time. Only operations from ports that execute control commands will be invalid; operations from other ports can be performed. For example, if you execute a control command from the front panel, you cannot perform all operations from the front panel until the control command execution time or time set in this menu passes. However, even during invalid operation time, DISPLAY POWER and CHANNEL SELECT commands for different outputs can be executed consecutively.

9.13.6 Initializing registered commands and link

Menu Top→PRESET COMMAND→INITIALIZE
Setting value
 CMD 1 to CMD 32: Control command
 RCV 1 to RCV 32 : Reply command
 POWER ON : Control command association

You can initialize the following commands and associations:

- Control commands registered in **"9.13.1 Registering/editing control command"**
- Reply commands registered in **"9.13.2 Registering / Editing reply command"**
- Control command link **"9.13.3 Command link"**

Use this menu to delete or set them from the first step again.

A long buzzer will sound when the initialization is completed by pressing the MENU/SET key.

9.13.7 Command execution key: Illuminating condition

| | |
|---------------|---|
| Menu | Top→PRESET COMMAND→COMMAND TALLY |
| Setting for | Each control command execution key |
| Setting value | REGISTERED : Lights if a control command is registered [Default] ^{*1} EXECUTION : Lights while a control command is executed ^{*1 *2} |

If you set "LINK" to "ON", you can change all lighting conditions at once.

^{*1} There are two planes (PLANE A and B) for each execution condition of COMMANDs 1 to 32. If you register control commands for both planes, the control commands are executed alternatively every time you press the command key as follows.

[Table 9.30] Illuminating condition

| Illuminating condition | If you register a command only for one plane | If you register commands for both two planes |
|------------------------|---|--|
| REGISTERED | Illuminates if a control command is registered | Illuminates if PLANE A will be executed at the next press; blinks if PLANE B will be executed at the next press. |
| EXECUTION | Illuminates while a control command is executed | Illuminates if PLANE A will be executed at the next press; turned off if PLANE B will be executed at the next press. |

^{*2} If execution duration is 500 ms or shorter, it illuminates for 500 ms. It can be set blinking in "9.13.7 Command execution key: Illuminating condition".

9.13.8 Blinking at command execution key

| | |
|---------------|---|
| Menu | Top→PRESET COMMAND→FLASH TIME |
| Setting for | Each control command execution key, each display power key |
| Setting value | EXECUTION : Blinks while a control command is being executed [Default] OFF : Not blink 1sec. to 1000sec. : Blinks for the specified time (1 to 1000 sec.) |

You can set the blinking duration of command execution keys and power switch of sink devices during command execution.

9.14 Preset memory

9.14.1 Recalling cross point

Menu Top→PRESET MEMORY→LOAD CROSS POINT

Setting value No.1 to No.9

You can recall the I/O channel settings of video and audio saved in the cross point memory. The setting of this menu is not updated until the MENU/SET key is pressed. Make sure to press the MENU/SET key to update the setting.

【See: 9.14.2 Saving cross point】

9.14.2 Saving cross point

Menu Top→PRESET MEMORY→SAVE CROSS POINT

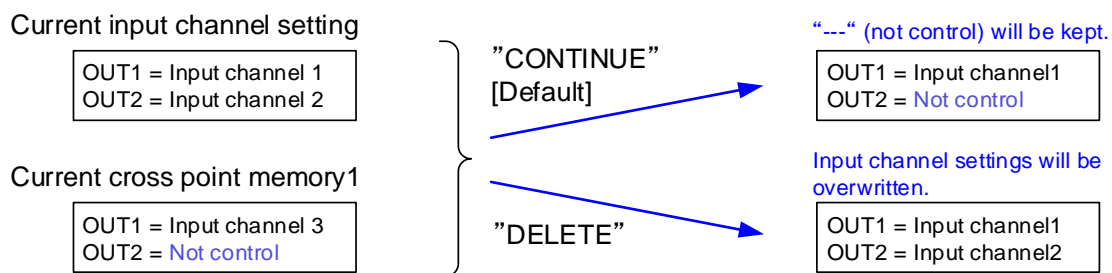
Setting value No.1 to No.9

You can save the I/O channel settings of video and audio into the cross point memory. Up to 9 cross point memories can be saved with their name (up to 10 characters). If you set "---" (not control) for "9.14.3 Editing cross point", a writing method (CONTINUE or DELETE) can be selected. The setting of this menu is not updated until the MENU/SET key is pressed. Make sure to press the MENU/SET key to update the setting.

■ For writing

"CONTINUE": "---" (not control) will be kept in the cross point memory.

"DELETE": the current input channel settings will be overwritten.



【Fig. 9.27】 Saving cross point

9.14.3 Editing cross point

| | |
|---------------|---------------------------------------|
| Menu | Top→PRESET MEMORY→EDIT CROSS POINT |
| Setting for | Each cross point memory |
| Setting value | [Table 9.31] Editing cross point item |

[Table 9.31] Editing cross point item

| Setting item | Setting value | Default |
|-------------------------|--------------------------------|------------|
| Output channel (OUT) | 1 to 2 | -* |
| Video input channel (V) | --- (Not control), 1 to 8, OFF | --- |
| Audio input channel (A) | --- (Not control), 1 to 8, OFF | --- |
| Memory name (NAME) | 20 to 7D of ASCII code | 20 (space) |

*Setting input channels of video and audio for each output channel

You can edit the cross point memory setting.

First, select the memory number and press the MENU/SET key, and then edit the desired setting. The setting of this menu is not updated until the MENU/SET key is pressed. Make sure to press the MENU/SET key to update the setting.

■ Not controlling channel

If you select "---" when setting input channel of V or A, channels are not controlled.

Outputs that are set not to be controlled are not switched when cross point memory is loaded.

Current input setting

OUT1 = Input channel1
OUT2 = Input channel2

Loading →

Setting is not changed.

Current setting of cross point memory1

OUT1 = Input channel3
OUT2 = Not control (---)

OUT1 = Input channel3
OUT2 = Input channel2

Input setting after loading cross point memory

[Fig. 9.28] Loading edited cross point memory

9.14.4 Recalling all settings

| | |
|---------------|------------------------------------|
| Menu | Top→PRESET MEMORY→LOAD ALL SETTING |
| Setting value | No.1 to No.8 |

You can recall all settings saved in the preset memory.

Once you perform this operation, all settings related to video and audio I/O except for some environmental settings will be updated. Operate this menu with great attention.

This menu is not displayed if setting is not saved in memory. Since no setting is saved in any memories by factory default, this menu is not displayed.

The setting of this menu is not updated until the MENU/SET key is pressed. Make sure to press the MENU/SET key to update the setting.

9.14.5 Saving all settings

Menu Top→PRESET MEMORY→SAVE ALL SETTING

Setting value No.1 to No.8

You can save up to 8 preset memories and name these memories up to 10 characters from ASCII 20 to 7D. You can skip the naming procedure.

The setting of this menu is not updated until the MENU/SET key is pressed. Make sure to press the MENU/SET key to update the setting.

[Table 9.32] Settings can be saved in preset memory

| Menu | Description |
|---|--|
| Switching input channel | Selecting input channels |
| Setting position, size, and masking | Output resolution, Aspect ratio for sink device, Aspect ratio, Aspect ratio control, Overscan, Display position, Display size, Masking, Background color, Test pattern |
| Quality setting | Sharpness, Brightness, Contrast, HUE, Saturation, Black level, Gamma |
| Input settings | No-signal input monitoring, Input HDCP setting, Analog input signal parameters, Automatic detection of video input interruption, Selecting signal of DVI input connector, HDBaseT input long reach mode |
| Setting input timing | The total number of horizontal dots, Start position, Active area, Automatic measurement of start position, Automatic setting of input timing, Tracking |
| Output settings | Output mode, Synchronous signal output with no input video, Output video with no input video, Window transaction effect, Window transaction speed, Wipe color, Video output connector, HDCP, Deep Color, CEC connection, Priority of input channel automatic switching, Masking time after automatic switching of input channel, Channel switching mode of automatic switching, HDBaseT output long reach mode |
| Audio setting | Output level, Output mute, Input selection, Input level, Lip sync, Sampling frequency, Audio output connector, Digital audio output connector, Multi-channel audio output, Multi-channel audio output priority, Test tone |
| EDID (Extended Display Identification Data) | EDID, Resolution for PCs, Input resolution for AV devices, Deep Color, Audio format, Speaker configuration |

9.14.6 Copying output setting

Menu Top→PRESET MEMORY→COPY OUTPUT MEMORY

Setting value OUT1 → OUT2,OUT2 → OUT1

You can copy the setting data of the selected output channel to other output channels. The setting of this menu is not updated until the MENU/SET key is pressed. Make sure to press the MENU/SET key to update the setting.

[Table 9.33] Settings to be copied

| Menu | Description |
|-------------------------------------|--|
| Switching input channel | Selecting input channels |
| Setting position, size, and masking | Output resolution, Aspect ratio for sink device, Aspect ratio, Aspect ratio control, Overscan, Display position, Display size, Masking, Background color, Test pattern |
| Quality setting | Brightness, Contrast, Gamma |
| Output settings | Output mode, Synchronous signal output with no input video, Output video with no input video, Window transaction effect, Video output connector, HDCP, The number of HDCP retries, Deep Color, CEC connection, Priority of input channel automatic switching, Masking time after automatic switching of input channel, Channel switching mode of automatic switching, HDBaseT output long reach mode |
| Audio setting | Output level, Output mute, Lip sync, Sampling frequency, Audio output connector, Digital audio output connector, Multi-channel audio output, Multi-channel audio output priority, Test tone |
| Bitmap setting | Outputting bitmap image, Background color, Aspect ratio, Display position, Assigning input channel, Startup bitmap output |

Note:

Please note that only one CEC connection is available, multiple input and outputs cannot be connected. For example, CEC connection is copied from this menu, the lowest output (OUT1) is connected preferentially and the sink device connected to OUT2 cannot output video with CEC.

9.14.7 Startup setting

Menu Top→PRESET MEMORY→STARTUP

Setting value [Table 9.34] Startup setting

You can set the memory loading at startup.

[Table 9.34] Startup setting

| Item | Setting value | Startup operation |
|--------------------|-------------------------------------|---|
| Last channel | LAST CHANNEL [Default] | Starts with the setting last time the MSD powered off. |
| Preset memory | PRESET MEMORY 1 to PRESET MEMORY 8* | Starts with the settings saved in the preset memory. For settings that are not saved in the preset memory, it starts up with the settings of the last MSD power off. |
| Cross point memory | CROSS POINT 1 to CROSS POINT 9 | Starts with the channel settings saved in the selected cross point memory. For settings other than channel settings, starts up with the settings of the last MSD power off. |
| Channel OFF | CHANNEL OFF | Channel setting will be OFF. For settings other than channel setting, starts up with the settings of the last MSD power off. |

*Only registered preset memory numbers are displayed.

9.15 Bitmap setting

9.15.1 Sending bitmap file

You can set the bitmap image to be displayed on the sink device. Up to four bitmaps can be registered. IDK's logo is displayed by Factory default.

Bitmaps can be enlarged but cannot be reduced. The larger the resolution is, the longer the output time will be, and it may take a maximum of approximately six seconds to output a bitmap. Register a bitmap having smaller resolution than that of the sink device.

■ Conditions of bitmap file

The MSD supports DIB (Device Independent Bitmap) with a header generally used for Windows, and those files have to meet the following requirements:

[Table 9.35] Conditions of bitmap file

| Item | Condition |
|----------------------|--|
| 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) |
| Resolution | The maximum resolution: [Horizontal resolution x Vertical resolution x The number of bytes per pixel] = 8,388,608 bytes or less. If you register several bitmaps, the total bytes of all bitmaps should be 8,388,608 bytes or less. (Aspect ratio does not matter as long as it is within the maximum resolution). Bytes per pixel: 1 byte per pixel for 2 colors (monochrome, 1 bit), 16 colors (4 bits), and 256 colors (8 bits); 3 bytes per pixel for 16.77 million colors (TRUE COLOR, 24 bits). |
| Compression format | No compression (BI_RGB), 8 bit-run-length compression (BI_RLE8), 4 bit-run-length compression (BI_RLE4) |

■ Transferring bitmap file

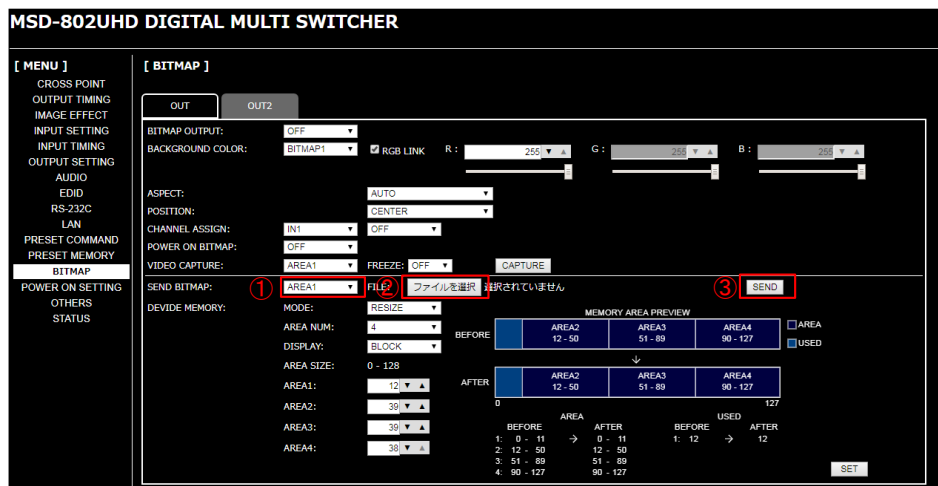
Use the WEB menu to transfer bitmap files.

Step (1) If the memory area is divided, select the registered area of the bitmap file.

Step (2) Select the target bitmap file using the “FILE” button.

Step (3) Click the “SEND” button to display the dialog box and click the “OK” button to transfer the bitmap file.

【See: 8.7 Web menu operation】



- ①Select the registered area. (for memory area division)
- ②Select the bitmap file.
- ③Click the “SEND” button to send the bitmap file.

[Fig. 9.29] Transferring bitmap

Once bitmap file is transferred correctly, the message is displayed. Click the “OK” button of the dialog box to register bitmap file.

Do not operate the WEB menu or turn off the MSD until the registration completes.

[Table 9.36] Bitmap transfer error message

| Error message | Description |
|--------------------------------------|---|
| File Name is invalid. | The specified file name is not correct. |
| File Format Error is happened. | The MSD does not support this file. |
| File Size exceeds the capacity. | The file exceeds the maximum resolution. |
| Memory Allocation Error is happened. | The memory for temporarily saving bitmap file could not be reserved. The error may possibly be solved by rebooting the MSD and sending the bitmap file again. |

9.15.2 Outputting bitmap image

| | |
|---------------|---|
| Menu | Top→BITMAP→BITMAP OUTPUT |
| Setting for | Each output channel (Common to OUTA and OUTB) |
| Setting value | OFF [Default], ON (BITMAP1 ON to BITMAP4 ON) |

You can enable/disable the bitmap image output.

If several bitmaps are registered, select the bitmap number you want to output.

9.15.3 Background color

| | |
|---------------|--|
| Menu | Top→BITMAP→BACKGROUND COLOR |
| Setting for | Each output channel, each bitmap |
| Setting value | R / G / B: 0 to 255 [Default] R / G / B: 255 (white) |

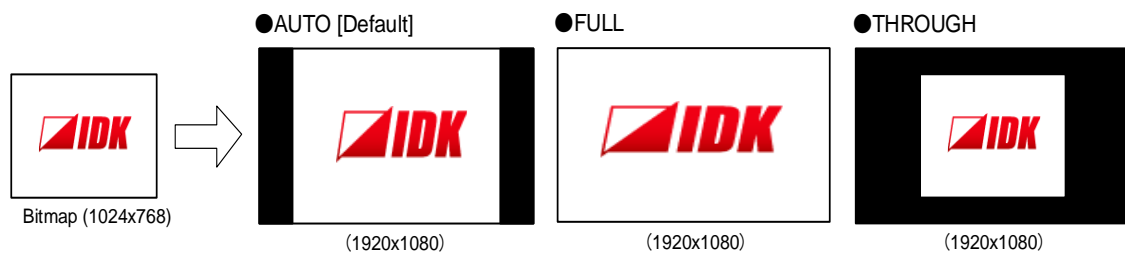
You can set the background color of the bitmap.

If you set "LINK" to "ON", you can set only Red (R). Settings of Green (G) and Blue (B) are also changed according to the setting of the Red (R).

If more than one bitmap is registered to the MSD, you can confirm the bitmap number at left of the second line on the VFD screen.

9.15.4 Aspect ratio

| | |
|---------------|----------------------------------|
| Menu | Top→BITMAP→ASPECT |
| Setting for | Each output channel, each bitmap |
| Setting value | [Fig. 9.30] Setting aspect ratio |



[Fig. 9.30] Setting aspect ratio

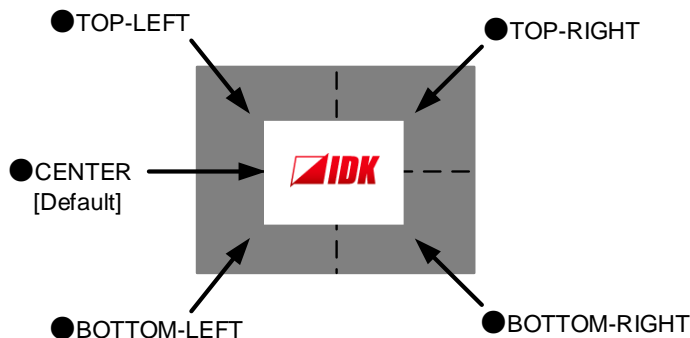
You can set the aspect ratio of bitmap.

If you select "AUTO", the aspect ratio is kept. However, if bitmap is larger than output resolution, only a portion of the bitmap is displayed.

9.15.5 Display position

| | |
|---------------|----------------------------------|
| Menu | Top→BITMAP→POSITION |
| Setting for | Each output channel, each bitmap |
| Setting value | [Fig. 9.31] Position |

You can set the display position of the bitmap.



[Fig. 9.31] Position

9.15.6 Assigning input channel

| | |
|---------------|---|
| Menu | Top→BITMAP→CHANNEL ASSIGN |
| Setting for | Each input channel, each output channel (Common to OUTA and OUTB) |
| Setting value | OFF [Default], ON (BITMAP1 ON to BITMAP4 ON) |

A bitmap can be treated as an input video source by assigning the bitmap to any input that is not currently being used. Set “**9.15.2 Outputting bitmap image**” to “OFF”.

If multiple bitmaps are registered, select the bitmap number to be output.

If you switch a normal image to a bitmap image, it takes longer time to output the image, and you cannot perform other operations while the bitmap is being written and displayed.

The setting of this menu is not updated until the MENU/SET key is pressed. Make sure to press the MENU/SET key to update the setting.

9.15.7 Startup bitmap output

| | |
|---------------|---|
| Menu | Top→BITMAP→POWER ON BITMAP |
| Setting for | Each output channel (Common to OUTA and OUTB) |
| Setting value | OFF [Default], ON (BITMAP1 ON to BITMAP4 ON) |

You can enable or disable bitmap output at the time of the MSD startup.

9.15.8 Dividing memory area

Menu Top→BITMAP→DIVIDE MEMORY

Setting value [Table 9.37] Dividing memory area

You can register up to four bitmaps within the available memory area by dividing the memory. You can select one of three dividing modes or specify the size you want to divide manually.

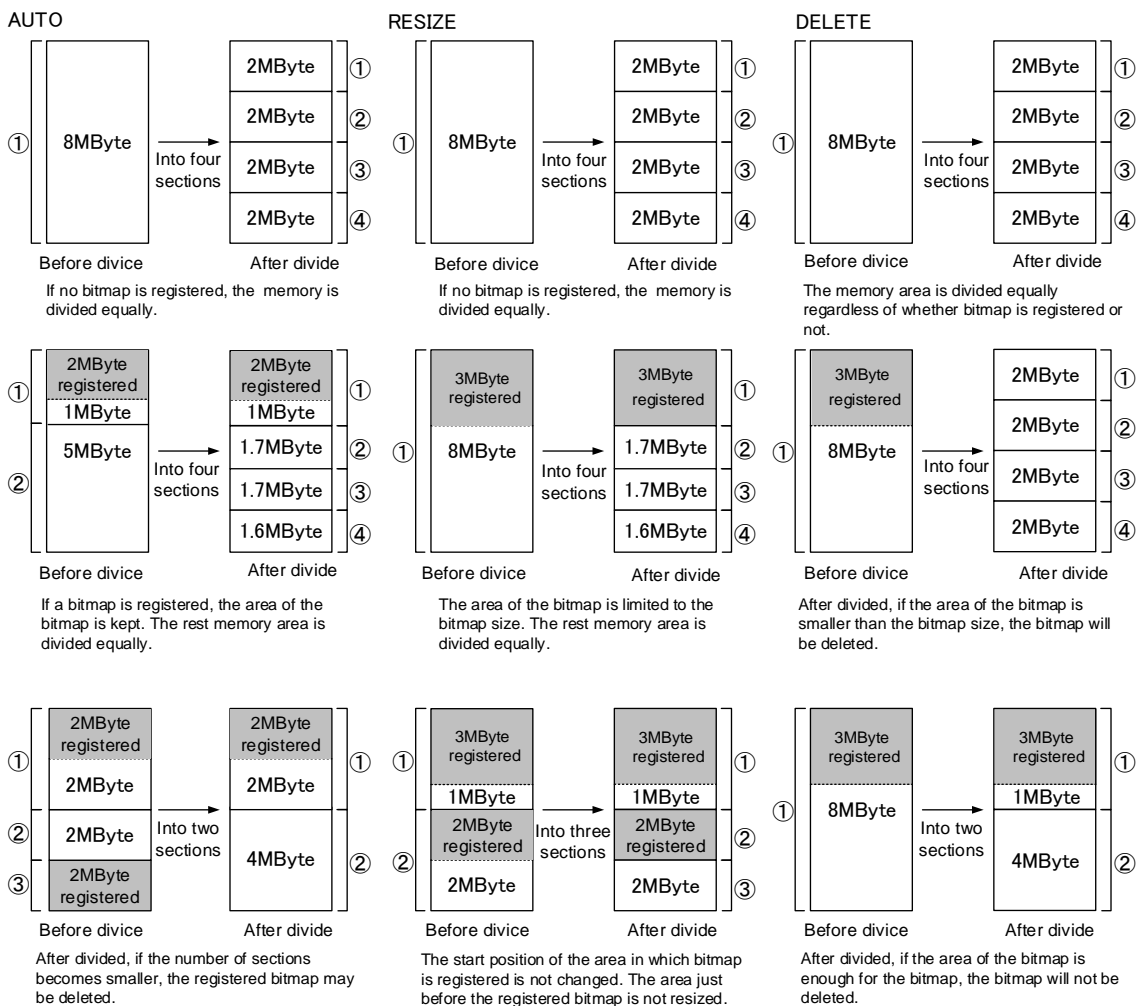
Memory areas are controlled by blocks. 1 block = 64K bytes; 128 blocks = 8M bytes in total

The setting of this menu is not updated until the MENU/SET key is pressed. Make sure to press the MENU/SET key to update the setting.

[Table 9.37] Dividing memory area

| Setting item | Setting value | Default |
|-----------------------------------|--------------------|---------|
| MODE (dividing mode) | RESIZE,DELETE,AUTO | RESIZE |
| NUMBER (the number of partitions) | 1 to 4 | 1 |
| DISPLAY (displaying method) | BLOCK,BYTE | BLOCK |
| End block position | 0 to 127 | 127 |

■ Dividing mode



[Fig. 9.32] Dividing mode

■ **Displaying method**

“BLOCK”

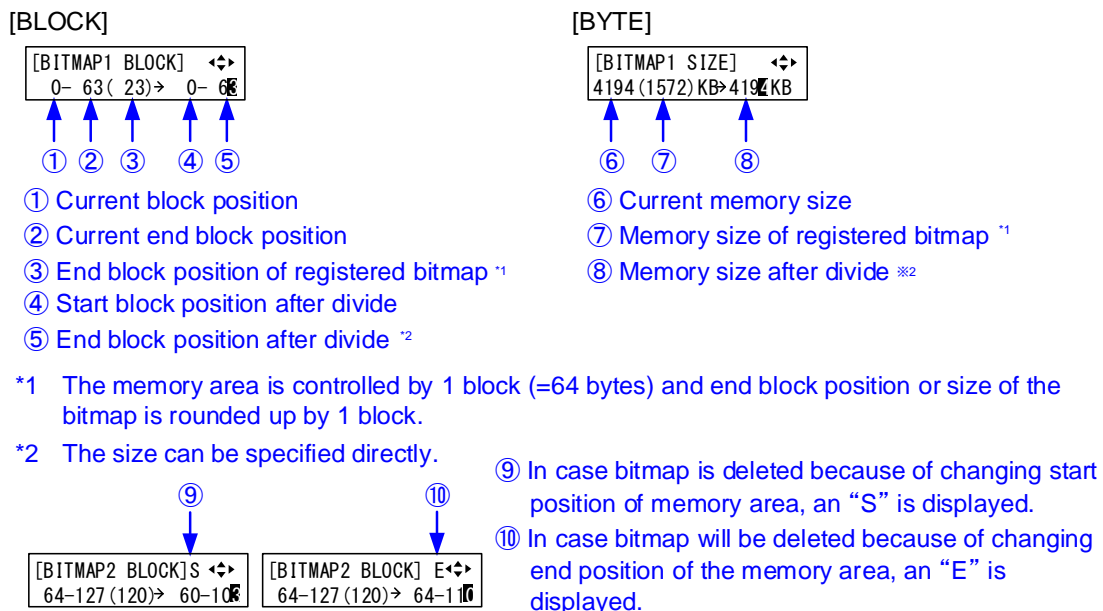
If you select “BLOCK” for “DISPLAY”, the current start and end block positions are displayed on the left of the VFD screen. If a bitmap is registered, the final block position is displayed in parentheses. The start and end block positions after divide are displayed on the right. If you want to specify the after-divide size directly, change the end block position.

If the currently-registered bitmap is deleted because of specifying the size directly, an “S” or “E” is displayed in the upper right.

“BYTE”

The currently-reserved memory size is displayed on the left. If a bitmap is registered, the number of bytes is displayed in parentheses. The memory size after divide is displayed on the right so that you can specify directly the after-division memory size.

If the currently-registered bitmap is deleted because of specifying the size directly, an “S” or “E” is displayed in the upper right.



[Fig. 9.33] “BLOCK” and “BYTE”

9.15.9 Input image capture

Menu Top→BITMAP→VIDEO CAPTURE

Setting value [Table 9.38] Input image capture setting

[Table 9.38] Input image capture setting

| Setting item | Setting value | Default |
|-----------------|---------------|---------|
| Output channel | OUT1,OUT2 | OUT1 |
| Register number | No.1 to No.4* | No.1 |

* Settable if memory area is divided

An input video can be treated as a bitmap by capturing and registering it. The maximum resolution is [Horizontal resolution x Vertical resolution x 3 (the number of bytes per pixel; "3" fixed)] 8,388,608 bytes or less. In order to register multiple bitmaps and captured images, the total resolution of all bitmaps and captured images should be 8,388,608 bytes or less (aspect ratio does not matter).

Captured images can be displayed in the same size or enlarged size but not in the reduced size. Larger resolutions require a longer loading time; it may take approximately six seconds at a maximum. Register images having a lower resolution than that of the sink device.

If an input image is larger than the output resolution, capture it with a reduced image size. If an input image is the same size or smaller, capture it without changing its size. You can register any images having a lower resolution by setting "**9.4.1 Output resolution**" to smaller resolution and capturing the video.

To freeze the input video temporarily, press the "MENU/SET" key. To register the frozen image, select "YES" and then press the "MENU/SET" key again. To release freeze, press the "ESC" key. It can be released automatically when an input channel is switched or input signal changes.

If resolution of input video is too large against the reserved memory area and it causes a significant memory shortage, a message "MEMORY SIZE OVER" will be displayed after you press the "MENU/SET" key. In such a case, registration cannot be executed.

■ From browser

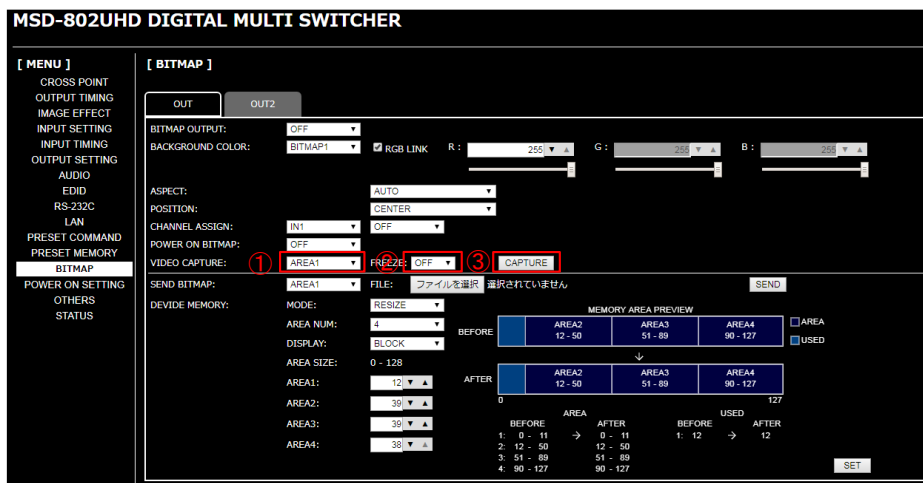
You can capture and save an input video through a WEB browser as well.

Step1) If the memory area is divided, select the registered area of the captured image.

Step2) Set “FREEZE” to “ON”. You can skip this step. This freeze is only temporary. If input channel is switched or input signal changes, the freeze is released and the input video will be output.

Step3) Click the “CAPTURE” button to display the dialog box. Click the “OK” button of the dialog box to capture the video. If you skip the Step2, the video freezes automatically just after clicking the “OK” button.

【See: 8.7 Web menu operation】



- ① Select the registered area of the captured video (for memory area division).
- ② Select the freeze of input video. (You can skip this step)
- ③ Start the capture by clicking the “CAPTURE” button.

[Fig. 9.34] WEB menu

When capture completes correctly, the message is displayed. Click the “OK” button of the dialog box to complete

Do not operate the WEB menu or turn off the MSD until the registration completes.

If capture does not start correctly or failed, an error message below will be displayed.

[Table 9.39] Capture error message

| Error message | Description |
|--|--|
| Video Capture is not available because there is no input signal. | Since input video is not displayed, the video cannot be captured. |
| Memory Size Error is happened. | Since this input video data is larger than reserved memory area, it cannot be saved. |

9.16 Startup setting

9.16.1 DISPLAY POWER keys

| | |
|---------------|---|
| Menu | TOP→POWER ON SETTING→DISPLAY POWER |
| Setting for | Each output channel (Common to OUTA and OUTB) |
| Setting value | OFF [Default], ON |

You can set the DISPLAY POWER key state for when MSD is powered on.

“OFF” : The power switch of the sink device does not operate.

“ON” : If any command is registered, the command will be executed.

【See: 9.13.3 Command link】

[Table 9.40] Startup sink device power status

| Setting value | The DISPLAY POWER key state before it is tuned “OFF”. | The DISPLAY POWER key state after it is tuned “ON”. |
|---------------|---|---|
| OFF | OFF | OFF |
| | ON | |
| ON | OFF | ON |
| | ON | |

9.16.2 Key function lock

Menu Top→POWER ON SETTING→OPERATION LOCK

Setting value AUTO [Default], UNLOCK, LOCK

You can set the key function lock for when the MSD is powered on.

“AUTO” : The same state as it was before powering off the MSD.

“UNLOCK” : Key function is unlocked.

“LOCK” : Key function is locked.

【See: 9.17.1 Grouping key function lock】

[Table 9.41] Startup key function lock

| | Condition | Status |
|---------------|--|---|
| Setting value | The lock state before the MSD is powered off or standby. | The lock state after the MSD is powered on. |
| AUTO | UNLOCK | UNLOCK |
| | LOCK | LOCK |
| UNLOCK | UNLOCK | UNLOCK |
| | LOCK | |
| LOCK | UNLOCK | LOCK |
| | LOCK | |

9.17 Other settings

9.17.1 Grouping key function lock

| | |
|---------------|---|
| Menu | Top→OTHERS→OP LOCK MODE |
| Setting for | CHANNEL, CHANNEL MODE, MENU, COMMAND, DISPLAY POW |
| Setting value | LOCK [Default], UNLOCK |

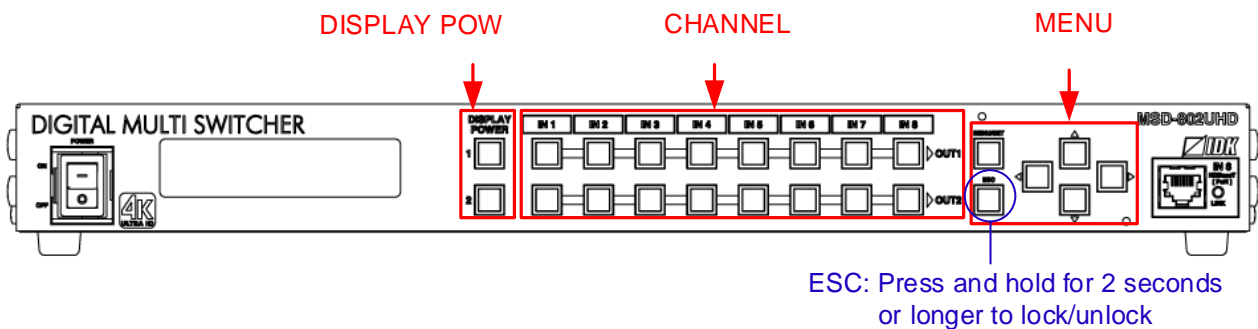
You can group front keys for key function lock.

【See: 8.5 Locking and unlocking key】

【See: 8.2 Switching input channel】

[Table 9.42] Grouping front keys

| Setting value | Target keys |
|---------------|---|
| CHANNEL | Input channel selection keys |
| CHANNEL MODE | Locks channel switching mode selection <ul style="list-style-type: none"> • SWITCHING MODE menu • TOP menu |
| MENU | Menu operation keys |
| COMMAND | Locks control command execution <ul style="list-style-type: none"> • Command keys that connect to command control connectors |
| DISPLAY POW | Power key of sink device (DISPLAY POWER) |



[Fig. 9.35] Grouping front keys (MSD-802UHD)

9.17.2 Buzzer

Menu Top→OTHERS→BUZZER

Setting value ON [Default], OFF

You can enable / disable the buzzer function (sounding every time you press a front panel key).

9.17.3 Power saving

Menu Top→OTHERS→POWER SAVE

Setting value ON [Default], OFF

If you select “ON” and no key function is operated for 30 seconds, the display brightness is reduced to approximately 25%. When you operate any key, the luminance returns to 100%.

9.17.4 DISPLAY POWER key pressing time

Menu Top→OTHERS→DISP POW BUTTON ON

Setting value 0ms to 5000ms (by 10ms) [Default] 0ms

You can set the pressing time of the target DISPLAY POWER key to prevent the sink device from being powered off when the key is pressed accidentally.

9.17.5 HDBaseT input power supply

Menu Top→OTHERS→HDC POWER OUTPUT

Setting value ON, OFF [Default]

You can set the power supply function from the HDBaseT input connector.

“ON”: Power will be supplied to an HDBaseT transmitter supporting PoH (IEEE802.3af).

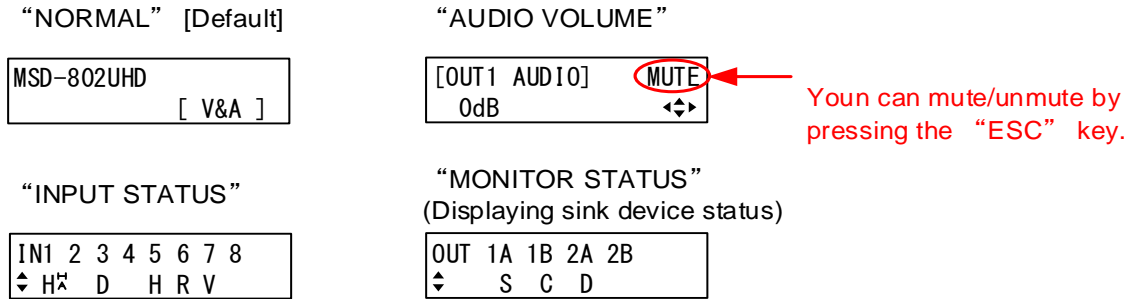
The setting of this menu is not updated until the MENU/SET key is pressed. Make sure to press the MENU/SET key to update the setting.

Note:

If you connect a device that does not support PoH (IEEE802.3af) while HDC POWER OUTPUT is enabled, the MSD and the connected device may be damaged.

9.17.6 Top page

Menu TOP→OTHERS→TOP DISPLAY
 Setting value [Fig. 9.36] Top page of VFD screen



[Fig. 9.36] Top page of VFD screen

For the top page, you can select one of four types above.

With input signal status and sink device status pages, the details of each signal can be displayed using “▲” and “▼” keys.

【See: 9.17.7Input signal status】

【See: 9.17.8Sink device status】

The “ALERT” page will appear when the one or more of the following problems occurs.

```
***** ALERT *****
Fan Temp CmdLED
```

Fan : Fan problem
 Temp : Temperature problem
 CmdLED : Output problem in command control connector

[Fig. 9.37] Alert page

9.17.7 Input signal status

Menu Top→OTHERS→INPUT STATUS

Values to be displayed [Table 9.43] Input signal status

You can view the input signal status that is input from HDMI and DVI input connectors.

[Table 9.43] Input signal status

| | All input channels | Video status of each input channel | Audio status of each input channel |
|-----------|--|---|--|
| Screen | <div style="border: 1px solid black; padding: 5px; width: fit-content;"> IN1 2 3 4 5 6 7 8 9 ↕ H[Ⓜ] D H R V </div> | <div style="border: 1px solid black; padding: 5px; width: fit-content;"> [IN1 FORMAT] Type0 2160p 59.94Hz H[Ⓜ] </div> | <div style="border: 1px solid black; padding: 5px; width: fit-content;"> [IN1 AUDIO] M↕ LINEAR PCM 48kHz </div> |
| Upper row | Input channel | Input channel, Stream type | Input channel, multi-channel audio information |
| Lower row | Input signal type, other information | Video signal format, input signal type, other information | Audio signal type |

■ Input signal type

[Table 9.44] Input signal type

| Alphabet | Signal | Alphabet | Signal |
|-------------|---------------------|----------|-------------------------------|
| H | HDMI signal | R | Analog RGB signal |
| D | DVI signal | Y | Analog YPbPr signal |
| No alphabet | No signal is input. | V | Analog composite video signal |
| | | S | Analog S video signal |

■ Other information

Only for digital input

Upper: "H": signal is protected by HDCP.

Lower: "A": audio is embedded.

■ Stream type

Type0: HDCP 2.2 stream type0

Type1: HDCP 2.2 stream type1

Nothing is displayed: If "H" of other information is displayed, the signal is HDCP 1.4.

If "H" of other information is not displayed, the signal is not protected by HDCP.

■ Input video signal format

[Table 9.45] Input video signal format

| Example | Signal type | Items to be displayed |
|-------------------|--|--|
| 1080p 59.94Hz | SDTV / HDTV signal | Format type, vertical synchronous frequency |
| 800 x 600 60.00Hz | RGB signal | Horizontal / Vertical resolution, vertical synchronous frequency |
| NTSC | Composite video signal or S video signal | Format type |
| 56.83kHz 60.02Hz | Signal that cannot be recognized | Horizontal / Vertical synchronous frequency |
| NO SIGNAL | No video signal is input. | |

■ Multi-channel audio information

If multi-channel audio signal is input, an “M” is displayed on the upper right.

■ Input audio signal type

[Table 9.46] Input audio signal type

| Example | Signal type |
|------------------|---|
| LINEAR PCM 48kHz | Linear PCM, sampling frequency |
| COMPRESSED AUDIO | Compressed audio (such as Dolby Digital, DTS) |
| NO SIGNAL | No audio signal is input. |

9.17.8 Sink device status

Menu Top→OTHERS→MONITOR STATUS

Values to be displayed [Table 9.47] Sink device status

You can view the status of sink device connected to video output connectors.

[Table 9.47] Sink device status

| | All video output connector | Each video output connector |
|---------|-----------------------------------|--|
| Display | OUT 1A 1B 2A 2B ↕ S N E | [OUT1A MONITOR] H24↕ HDCP 2.2 SUPPORT AAA |
| Upper | Video output channel | Output channel, output signal, color depth |
| Lower | HDCP status | HDCP status, error code |

■ HDCP authorization status

[Table 9.48] HDCP authorization status

| Character | HDCP status | Description |
|-----------|--------------------|--|
| S | HDCP 2.2 SUPPORT | HDCP 2.2-compliant sink device is connected. |
| S | HDCP 1.4 SUPPORT | HDCP 1.4-compliant sink device is connected. |
| N | HDCP NOT SUPPORT | Non-HDCP-compliant sink device is connected. |
| E | HDCP ERROR | HDCP-compliant sink device is connected, but the authorization failed. |
| C | HDCP CHECK NOW | Sink device status is being checked. |
| D | MONITOR DISCONNECT | Monitor was disconnected (displayed only for 1 second). |
| | UNCONNECTED | No sink device is connected. |

■ Output signal and color depth

H24 : HDMI, 24-BIT COLOR

H30 : HDMI, 30-BIT COLOR

D : DVI

■ Error code

From the left, statuses of video output, digital audio output, and analog audio output are displayed.
(Example: AAA)

[Table 9.49] Error code

| Code | Video output | Audio output |
|------|---|---|
| | If any number or character is not displayed, video or audio is output correctly. | |
| 1 | — | “9.9.2 Output mute” is set to “ON”. |
| 2 | Displayed only for digital input. DDC power supply is not input. (If no source device is connected, this error code is displayed). | |
| 3 | No video signal is input. | No video signal is input. |
| 4 | Displayed only for digital input. Video or audio output of source device is in a Mute status. | |
| 5 | Displayed only for digital input. Signal with HDCP are input, but the sink device does not support HDCP. (This error code may also be displayed while authenticating HDCP). | |
| 6 | Displayed only for digital input. The source device does not output required information (packets) for outputting video or audio. | |
| 7 | Signal that are not supported by the MSD are input. (Sampling clock is out of the range) | Signal that are not supported by the MSD are input. (Sampling clock is out of the range). |
| 8 | — | “9.9.7 Audio output connector” is not enabled. |
| 9 | — | “9.8.1 Output mode” is set to “DVI MODE” or a sink device that does not support audio is connected.*2 |
| A | Input channel is set to “OFF”. | |
| B | — | “9.9.8 Digital audio output connector” is not enabled.*2 |
| C | No sink device is connected. | |
| D | HDCP is being authorized. | |
| E | HDCP authorization failed. | |

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

*2 This status is only for HDMI output connectors or HDBaseT output connector.

9.17.9 Viewing sink device EDID

Menu Top→OTHERS→EDID STATUS

Values to be displayed [Table 9.50] Sink device EDID

You can display EDID information of the sink device that is connected to the video output connector.

- HDMI supported sink device : No.1 to No.6
- Non-HDMI-supported sink device : No.1 and No.2

If no sink device is connected, the VFD screen shows “UNCONNECTED”. If the MSD cannot read EDID from connected sink devices, the VFD screen shows “EDID READ ERROR”.

[Table 9.50] Sink device EDID

| No. | 1 | 2 | 3 |
|---------|-------------------------------------|---|--------------------------|
| Display | [OUT1A]xxxx 1920x1080 148.50MHz↕ | [OUT1A]HDMI RGB/422/444/420 ↕ [OUT1A] DVI ↕ | [OUT1A] 24BIT COLOR ↕ |
| Upper | Monitor name | HDMI or nothing is displayed | — |
| Lower | Resolution, dot clock | Sampling structure RGB : RGB 422 : YCbCr 4:2:2 444 : YCbCr 4:4:4 420 : YCbCr 4:2:0 or Non-HDMI-supported sink device DVI : DVI device | Color depth |

| No. | 4 | 5 | 6 |
|---------|-------------------------------|--|---|
| Display | [OUT1A] 32/44.1/48/96kHz ↕ | [OUT1A] 16/20/24BIT 8CHANNEL COMPRESSED | [OUT1A] HDR:-- / SCDC:ON ↕ |
| Upper | — | Audio bit length | — |
| Lower | Audio sampling frequency | Number of audio channels, compressed audio supported/not supported ("COMPRESSED") | HDR and SCDC supported/not supported |

9.17.10 Viewing version information

Menu Top→OTHERS→VERSION

Values to be displayed Model name and firmware version

You can view the model name and firmware version.

10 Product specification

■ MSD-701UHD

| Item | | Description |
|-------|---|---|
| Input | Video | HDMI / DVI 2 inputs HDMI Deep Color (*1) / DVI 1.0 TMDS single link, HDCP 1.4 / 2.2 TMDS clocks: 25 MHz to 300 MHz, TMDS data rate: 0.75 Gbps to 18 Gbps EDID emulation Connector: Female HDMI Type A (19-pin) |
| | | HDMI / DVI 5 inputs *DVI connectors: Switch-selectable between digital and analog HDMI Deep Color (*1) / DVI 1.0 TMDS single link, HDCP 1.4 TMDS clocks: 25 MHz to 225 MHz, TMDS data rate: 0.75 Gbps to 6.75 Gbps EDID emulation Connector: 3 female HDMI Type A (19-pin), 2 female DVI-I (29-pin) |
| | Universal Analog 2 inputs *Switch-selectable between digital and analog Composite video / Y/C / Analog RGB / Analog YPbPr (auto-recognition) Composite video (VBS Signal): 1.0 V[p-p] / 75 Ω Y/C: 1.0 V[p-p](Y) / 0.286 V[p-p](C) / 75 Ω Analog RGB: 0.7 V[p-p](1.0 V[p-p] Sync on Green) / 75 Ω HS/VS TTL level, CS TTL level, Sync on Green Analog YPbPr: 1.0 V[p-p](Y) / 0.7 V[p-p](Pb/Pr) / 75 Ω EDID emulation Connector: Female DVI-I (29-pin) | |
| | Format | HDMI / DVI 2 inputs VGA to WQXGA (Dot clock: 25 MHz to 300 MHz) 480i / 480p / 576i / 576p / 720p / 1080i / 1080p / 4K (up to 4K@60 (4:4:4)) (*2) |
| | | |
| | | Universal Analog VGA to QWXGA (Dot clock: 25 MHz to 165 MHz) * For WUXGA / QWXGA, only Reduced Blanking is supported. NTSC / PAL 480i / 480p / 576i / 576p / 720p / 1080i / 1080p |
| | Audio | Digital 7 inputs *Switch-selectable between analog audio Multi-channel LPCM up to 8 channels Sampling frequency: 32 kHz to 192 kHz, Sample size: 16 bit to 24 bit Reference level: -20 dBFS, Max. input level: 0 dBFS Connector: 5 female HDMI Type A (19-pin), 2 female DVI-I (29-pin) |
| | | Analog 3 inputs *Switch-selectable between digital audio Stereo L/R balanced / unbalanced Input impedance: 48k Ω Balanced / 24 kΩ Unbalanced Reference level: -10 dBu, Max. input level: +10 dBu Connector: 5-pin terminal block |

| Item | | Description |
|----------------------------|------------------------------|---|
| Output | Video | HDMI / DVI 1 output Output video can be distributed to an HDMI / DVI and HDBaseT simultaneously. HDMI Deep Color (*1) / DVI 1.0 TMDS single link, HDCP 1.4 / 2.2 TMDS clocks: 25.175 MHz to 297 MHz, TMDS data rate: 0.755 Gbps to 17.82 Gbps Connector: Female HDMI Type A (19-pin) |
| | | HDBaseT 1 output Output video can be distributed to an HDMI / DVI and HDBaseT simultaneously. HDBaseT (*1) HDCP 1.4 / 2.2 (*3) Connector: RJ-45 (*4) Cable: CAT.5E HDC, Cat5e UTP / STP, Cat6 UTP / STP (*5) |
| | | Format VGA / SVGA / XGA / WXGA (1280x768) / WXGA (1280x800) / Quad-VGA / SXGA / WXGA (1360x768) / WXGA (1366x768) / SXGA+ / WXGA+ / WXGA++ / UXGA / WSXGA+ / VESAHD / WUXGA / QWXGA / WQHD / WQXGA * For VESAHD / WUXGA / QWXGA / WQHD / WQXGA, only Reduced Blanking is supported. 480i / 480p / 576i / 576p / 720p / 1080i / 1080p / 4K (3840 x 2160) (*6) / 4K (4096 x 2160) (*6) |
| | Audio | Digital 1 output Audio can be distributed to an HDMI output and an HDBaseT output simultaneously. Multi-channel LPCM up to 8 channels Sampling frequency: 32 kHz to 192 kHz, Sample size: 16 bit to 24 bit Reference level: -20 dBFS, Max. output level: 0 dBFS Connector: Female HDMI Type A (19-pin), RJ-45 |
| | | Analog 1 output Stereo L/R balanced / unbalanced Output impedance: 100 Ω balanced / 50 Ω unbalanced Reference level: -10 dBu, Max. output level: +10 dBu Connector: 5-pin terminal block |
| Maximum extension distance | Digital Input | HDMI / DVI: up to 98 ft. (30m) (1080p@60), up to 39 ft. (12 m) (4K@60) (*7) |
| | Digital output | HDMI / DVI: up to 98 ft. (30m) (1080p@60), up to 39 ft. (12 m) (4K@60) (*7) HDBaseT: up to 328 ft. (100 m), up to 492 ft. (150 m) (Long Reach Mode) (*8) |
| Functions | Analog video processing unit | 3D Y/C separation |
| | Scan Converter | Motion adaptive I/P conversion, Aspect Ratio Control, Picture adjustment (brightness, contrast, display position, display size, etc.), Seamless Switching (*9) |
| | Others | All function setting through browser, Automatic input detection and switching, Volume adjustment (volumes of input and output ports can be set separately), Lip Sync (Max. 16 frames), Audio breakaway enables independent audio and video switching, Cross-point memory (9 settings), Preset memory (8 settings), Last memory, Anti-Snow (*10), Connection Reset (*11), External control commands (32 commands), Security lock |
| External control | RS-232C | 1 port / 3-pin terminal block |
| | LAN | 1 port / RJ-45 10Base-T / 100Base-TX (Auto Negotiation), Auto MDI / MDI-X |
| | Contact closure | 3 ports / 6-pin terminal block Non-voltage contact input up to DC 24 V 500 mA |
| | Command control | 3 ports / 7-pin terminal block Controlling keys and LED |
| | External control | RS-232C, LAN, contact closure, PJLink (class1), CEC (power control of sink device) (*12) |
| General | Power | 100 - 240 VAC ± 10%, 50 Hz / 60 Hz ± 3 Hz |
| | Power consumption | About 47 Watts |
| | Dimensions | 16.9 (W) × 1.7 (H) × 13.8 (D)" (430 (W) × 44 (H) × 350 (D) mm) (EIA 1U high, full rack wide) (Excluding connectors and the like) |
| | Weight | 10.6 lbs. (4.8 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 | Operating / Storage: 20% to 90% (Non Condensing) |

*1 30 bit / pixel (10 bit / component) Deep Color is supported while x.v.Color, 3D, ARC and HEC are not supported.
WQHD, WQXGA, and 4K format: 24 bit / pixel (8 bit / component) is supported.

*2 4K format: Only CEA-861 timing is supported.

*3 HDBaseT input/output: DVI signals protected by HDCP are not supported. To transmit those signals, use an IDK's twisted pair cable extender supporting DVI signals.

*4 RJ-45 (HDBaseT connector) is only for extending digital video and audio signals over a Cat5e / Cat6 twisted pair cable. Use it with IDK's twisted pair cable receiver. Do not use for LAN devices.

*5 T568A or T568B straight. The CAT.5E HDC cable is developed by IDK and recommended by HDBaseT alliance.

*6 4K format: Only CEA-861 timing is supported.

*7 The maximum cable distance varies depending on the connected devices and was measured under following conditions:

• 1080p@60: when IDK's AWG 24 cable was used and signals of 1080p@60 24 bit / pixel (8 bit / component) was input or output.

• 4K@60: when IDK's 18 Gbps supported cable was used and signals of 4K@60 24 bit / pixel (8 bit / component) was input or output.

The maximum cable distance depends on the connected devices. The distance may not be extended with some device combinations, cabling method, or other manufacturer's cable. Video may be disturbed or may not be output even if signals are within the range mentioned above.

*8 The maximum extension distance was obtained when IDK's CAT.5E HDC cable was used. The distance may not be extended with some device combinations, cabling method, or other manufacturer's cable. Video may be disturbed or may not be output even if signals are within the range mentioned above. Operations may not be stable with some LCD devices; please check the operation beforehand or contact us.

The maximum extension distance is the shorter distance of connected HDBaseT product or sink device's maximum extension distance.

Up to 492 ft. (150 m): 1080p (24 bit) in Long reach mode. For Long reach mode, use IDK's twisted pair cable products that supports 328 ft. (100 m) or longer.

*9 Seamless switching with a black frame.

*10 The anti-snow feature automatically fixes snow noise that is a specific symptom of HDCP-compliant signals and mainly occurs at start-up. This feature does not work when snow noise has already occurred during startup or when it occurs due to a bad condition of the transmission line.

*11 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 fix 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's output. If other devices are connected between the MSD's output and sink device, this feature may be invalid.

*12 The sink device must support CEC. Some sink devices cannot be controlled from the MSD through CEC.

■ MSD-702UHD

| Item | | Description |
|-------|---|---|
| Input | Video | HDMI / DVI 2 inputs HDMI Deep Color (*1) / DVI 1.0 TMDS single link, HDCP 1.4 / 2.2 TMDS clocks: 25 MHz to 300 MHz, TMDS data rate: 0.75 Gbps to 18 Gbps EDID emulation Connector: Female HDMI Type A (19-pin) |
| | | HDMI / DVI 5 inputs *DVI connectors: Switch-selectable between digital and analog HDMI Deep Color (*1) / DVI 1.0 TMDS single link, HDCP 1.4 TMDS clocks: 25 MHz to 225 MHz, TMDS data rate: 0.75 Gbps to 6.75 Gbps EDID emulation Connector: 3 female HDMI Type A (19-pin), 2 female DVI-I (29-pin) |
| | Universal Analog 2 inputs *Switch-selectable between digital and analog Composite video / Y/C / Analog RGB / Analog YPbPr (auto-recognition) Composite video (VBS Signal): 1.0 V[p-p] / 75 Ω Y/C: 1.0 V[p-p](Y) / 0.286 V[p-p](C) / 75 Ω Analog RGB: 0.7 V[p-p](1.0 V[p-p] Sync on Green) / 75 Ω HS/VS TTL level, CS TTL level, Sync on Green Analog YPbPr: 1.0 V[p-p](Y) / 0.7 V[p-p](Pb/Pr) / 75 Ω EDID emulation Connector: Female DVI-I (29-pin) | |
| | Format | HDMI / DVI 2 inputs VGA to WQXGA (Dot clock: 25 MHz to 300 MHz) 480i / 480p / 576i / 576p / 720p / 1080i / 1080p / 4K (up to 4K@60 (4:4:4)) (*2) |
| | | |
| | | Universal Analog VGA to QWXGA (Dot clock: 25 MHz to 165 MHz) * For WUXGA / QWXGA, only Reduced Blanking is supported. NTSC / PAL 480i / 480p / 576i / 576p / 720p / 1080i / 1080p |
| | Audio | Digital 7 inputs *Switch-selectable between analog audio Multi-channel LPCM up to 8 channels Sampling frequency: 32 kHz to 192 kHz, Sample size: 16 bit to 24 bit Reference level: -20 dBFS, Max. input level: 0 dBFS Connector: 5 female HDMI Type A (19-pin), 2 female DVI-I (29-pin) |
| | | Analog 3 inputs *Switch-selectable between digital audio Stereo L/R balanced / unbalanced Input impedance: 48k Ω Balanced / 24 kΩ Unbalanced Reference level: -10 dBu, Max. input level: +10 dBu Connector: 5-pin terminal block |

| Item | | Description |
|----------------------------|------------------------------|---|
| Output | Video | HDMI / DVI 2 outputs Output video can be distributed to an HDMI / DVI and HDBaseT simultaneously. HDMI Deep Color (*1) / DVI 1.0 TMDS single link, HDCP 1.4 / 2.2 TMDS clocks: 25.175 MHz to 297 MHz, TMDS data rate: 0.755 Gbps to 17.82 Gbps Connector: Female HDMI Type A (19-pin) |
| | | HDBaseT 2 outputs Output video can be distributed to an HDMI / DVI and HDBaseT simultaneously. HDBaseT (*1) HDCP 1.4 / 2.2 (*3) Connector: RJ-45 (*4) Cable: CAT.5E HDC, Cat5e UTP / STP, Cat6 UTP / STP (*5) |
| | | Format VGA / SVGA / XGA / WXGA (1280x768) / WXGA (1280x800) / Quad-VGA / SXGA / WXGA (1360x768) / WXGA (1366x768) / SXGA+ / WXGA+ / WXGA++ / UXGA / WSXGA+ / VESAHD / WUXGA / QWXGA / WQHD / WQXGA * For VESAHD / WUXGA / QWXGA / WQHD / WQXGA, only Reduced Blanking is supported. 480i / 480p / 576i / 576p / 720p / 1080i / 1080p / 4K (3840 x 2160) (*6) / 4K (4096 x 2160) (*6) |
| | Audio | Digital 2 outputs Audio can be distributed to an HDMI output and an HDBaseT output simultaneously. Multi-channel LPCM up to 8 channels Sampling frequency: 32 kHz to 192 kHz, Sample size: 16 bit to 24 bit Reference level: -20 dBFS, Max. output level: 0 dBFS Connector: 2 female HDMI Type A (19-pin), 2 RJ-45 |
| | | Analog 2 outputs Stereo L/R balanced / unbalanced Output impedance: 100 Ω balanced / 50 Ω unbalanced Reference level: -10 dBu, Max. output level: +10 dBu Connector: 5-pin terminal block |
| Maximum extension distance | Digital Input | HDMI / DVI: up to 98 ft. (30m) (1080p@60), up to 39 ft. (12 m) (4K@60) (*7) |
| | Digital output | HDMI / DVI: up to 98 ft. (30m) (1080p@60), up to 39 ft. (12 m) (4K@60) (*7) HDBaseT: up to 328 ft. (100 m), up to 492 ft. (150 m) (Long Reach Mode) (*8) |
| Functions | Analog video processing unit | 3D Y/C separation |
| | Scan Converter | Motion adaptive I/P conversion, Aspect Ratio Control, Picture adjustment (brightness, contrast, display position, display size, etc.), Seamless Switching (*9) |
| | Others | All function setting through browser, Automatic input detection and switching, Volume adjustment (volumes of input and output ports can be set separately), Lip Sync (Max. 16 frames), Audio breakaway enables independent audio and video switching, Cross-point memory (9 settings), Preset memory (8 settings), Last memory, Anti-Snow (*10), Connection Reset (*11), External control commands (32 commands), Security lock |
| External control | RS-232C | 1 port / 3-pin terminal block |
| | LAN | 1 port / RJ-45 10Base-T / 100Base-TX (Auto Negotiation), Auto MDI / MDI-X |
| | Contact closure | 3 ports / 6-pin terminal block Non-voltage contact input up to DC 24 V 500 mA |
| | Command control | 3 ports / 7-pin terminal block Controlling keys and LED |
| | External control | RS-232C, LAN, contact closure, PJLink (class1), CEC (power control of sink device) (*12) |
| General | Power | 100 - 240 VAC ± 10%, 50 Hz / 60 Hz ± 3 Hz |
| | Power consumption | About 66 Watts |
| | Dimensions | 16.9 (W) × 1.7 (H) × 13.8 (D)" (430 (W) × 44 (H) × 350 (D) mm) (EIA 1U high, full rack wide) (Excluding connectors and the like) |
| | Weight | 10.8 lbs. (4.9 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 | Operating / Storage: 20% to 90% (Non Condensing) |

*1 30 bit / pixel (10 bit / component) Deep Color is supported while x.v.Color, 3D, ARC and HEC are not supported.
WQHD, WQXGA, and 4K format: 24 bit / pixel (8 bit / component) is supported.

*2 4K format: Only CEA-861 timing is supported.

*3 HDBaseT input/output: DVI signals protected by HDCP are not supported. To transmit those signals, use an IDK's twisted pair cable extender supporting DVI signals.

*4 RJ-45 (HDBaseT connector) is only for extending digital video and audio signals over a Cat5e / Cat6 twisted pair cable. Use it with IDK's twisted pair cable receiver. Do not use for LAN devices.

*5 T568A or T568B straight. The CAT.5E HDC cable is developed by IDK and recommended by HDBaseT alliance.

*6 4K format of HDBaseT output: Up to 4K@30 is supported.

*7 The maximum cable distance varies depending on the connected devices and was measured under following conditions:

• 1080p@60: when IDK's AWG 24 cable was used and signals of 1080p@60 24 bit / pixel (8 bit / component) was input or output.

• 4K@60: when IDK's 18 Gbps supported cable was used and signals of 4K@60 24 bit / pixel (8 bit / component) was input or output.

The maximum cable distance depends on the connected devices. The distance may not be extended with some device combinations, cabling method, or other manufacturer's cable. Video may be disturbed or may not be output even if signals are within the range mentioned above.

*8 The maximum extension distance was obtained when IDK's CAT.5E HDC cable was used. The distance may not be extended with some device combinations, cabling method, or other manufacturer's cable. Video may be disturbed or may not be output even if signals are within the range mentioned above. Operations may not be stable with some LCD devices; please check the operation beforehand or contact us.

The maximum extension distance is the shorter distance of connected HDBaseT product or sink device's maximum extension distance.

Up to 492 ft. (150 m): 1080p (24 bit) in Long reach mode. For Long reach mode, use IDK's twisted pair cable products that supports 328 ft. (100 m) or longer.

*9 Seamless switching with a black frame.

*10 The anti-snow feature automatically fixes snow noise that is a specific symptom of HDCP-compliant signals and mainly occurs at start-up. This feature does not work when snow noise has already occurred during startup or when it occurs due to a bad condition of the transmission line.

*11 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 fix 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's output. If other devices are connected between the MSD's output and sink device, this feature may be invalid.

*12 The sink device must support CEC. Some sink devices cannot be controlled from the MSD through CEC.

■ MSD-801UHD

| Item | | Description |
|-------|---|---|
| Input | Video | HDMI / DVI 2 inputs HDMI Deep Color (*1) / DVI 1.0 TMDS single link, HDCP 1.4 / 2.2 TMDS clocks: 25 MHz to 300 MHz, TMDS data rate: 0.75 Gbps to 18 Gbps EDID emulation Connector: Female HDMI Type A (19-pin) |
| | | HDMI / DVI 5 inputs *DVI connectors: Switch-selectable between digital and analog HDMI Deep Color (*1) / DVI 1.0 TMDS single link, HDCP 1.4 TMDS clocks: 25 MHz to 225 MHz, TMDS data rate: 0.75 Gbps to 6.75 Gbps EDID emulation Connector: 3 female HDMI Type A (19-pin), 2 female DVI-I (29-pin) |
| | | HDBaseT 1 input HDBaseT (*1) HDCP 1.4 / 2.2 (*2) EDID emulation, PoH power supply (IEEE 802.3af) (*3) Connector: RJ-45 (*4) Cable: CAT.5E HDC, Cat5e UTP / STP, Cat6 UTP / STP (*5) |
| | | Universal Analog 2 inputs *Switch-selectable between digital and analog Composite video / Y/C / Analog RGB / Analog YPbPr (auto-recognition) Composite video (VBS Signal): 1.0 V[p-p] / 75 Ω Y/C: 1.0 V[p-p](Y) / 0.286 V[p-p](C) / 75 Ω Analog RGB: 0.7 V[p-p](1.0 V[p-p] Sync on Green) / 75 Ω HS/VS TTL level, CS TTL level, Sync on Green Analog YPbPr: 1.0 V[p-p](Y) / 0.7 V[p-p](Pb/Pr) / 75 Ω EDID emulation Connector: Female DVI-I (29-pin) |
| | | Format |
| | HDMI / DVI 5 inputs VGA to QWXGA (Dot clock: 25 MHz to 165 MHz) * For WUXGA / QWXGA, only Reduced Blanking is supported. 480i / 480p / 576i / 576p / 720p / 1080i / 1080p | |
| | HDBaseT VGA to WQXGA (Dot clock: 25 MHz to 300 MHz) 480i / 480p / 576i / 576p / 720p / 1080i / 1080p / 4K (up to 4K@60 (4:2:0)) (*6) | |
| | Audio | Universal Analog VGA to QWXGA (Dot clock: 25 MHz to 165 MHz) * For WUXGA / QWXGA, only Reduced Blanking is supported. NTSC / PAL 480i / 480p / 576i / 576p / 720p / 1080i / 1080p |
| | | Digital 8 inputs *Switch-selectable between analog audio Multi-channel LPCM up to 8 channels Sampling frequency: 32 kHz to 192 kHz, Sample size: 16 bit to 24 bit Reference level: -20 dBFS, Max. input level: 0 dBFS Connector: 5 female HDMI Type A (19-pin), 2 female DVI-I (29-pin), 1 RJ-45 |
| | Analog 3 inputs *Switch-selectable between digital audio Stereo L/R balanced / unbalanced Input impedance: 48k Ω Balanced / 24 kΩ Unbalanced Reference level: -10 dBu, Max. input level: +10 dBu Connector: 5-pin terminal block | |

| Item | | Description |
|----------------------------|---|---|
| Output | Video | HDMI / DVI 1 output Output video can be distributed to an HDMI / DVI and HDBaseT simultaneously. HDMI Deep Color (*1) / DVI 1.0 TMDS single link, HDCP 1.4 / 2.2 TMDS clocks: 25.175 MHz to 297 MHz, TMDS data rate: 0.755 Gbps to 17.82 Gbps Connector: Female HDMI Type A (19-pin) |
| | | HDBaseT 1 output Output video can be distributed to an HDMI / DVI and HDBaseT simultaneously. HDBaseT (*1) HDCP 1.4 / 2.2 (*2) Connector: RJ-45 (*4) Cable: CAT.5E HDC , Cat5e UTP / STP, Cat6 UTP / STP (*5) |
| | | Format VGA / SVGA / XGA / WXGA (1280x768) / WXGA (1280x800) / Quad-VGA / SXGA / WXGA (1360x768) / WXGA (1366x768) / SXGA+ / WXGA+ / WXGA++ / UXGA / WSXGA+ / VESAHD / WUXGA / QWXGA / WQHD / WQXGA * For VESAHD / WUXGA / QWXGA / WQHD / WQXGA, only Reduced Blanking is supported. 480i / 480p / 576i / 576p / 720p / 1080i / 1080p / 4K (3840 x 2160) (*7) / 4K (4096 x 2160) (*7) |
| | Audio | Digital 1 output Audio can be distributed to an HDMI output and an HDBaseT output simultaneously. Multi-channel LPCM up to 8 channels Sampling frequency: 32 kHz to 192 kHz, Sample size: 16 bit to 24 bit Reference level: -20 dBFS, Max. output level: 0 dBFS Connector: 2 female HDMI Type A (19-pin), 2 RJ-45 |
| | | Analog 1 output Stereo L/R balanced / unbalanced Output impedance: 100 Ω balanced / 50 Ω unbalanced Reference level: -10 dBu, Max. output level: +10 dBu Connector: 5-pin terminal block |
| Maximum extension distance | Digital Input HDMI / DVI: up to 98 ft. (30m) (1080p@60), up to 39 ft. (12 m) (4K@60) (*8) HDBaseT: up to 328 ft. (100 m), up to 492 ft. (150 m) (Long Reach Mode) (*9) | |
| | Digital output HDMI / DVI: up to 98 ft. (30m) (1080p@60), up to 39 ft. (12 m) (4K@60) (*8) HDBaseT: up to 328 ft. (100 m), up to 492 ft. (150 m) (Long Reach Mode) (*9) | |
| Functions | Analog video processing unit 3D Y/C separation | |
| | Scan Converter Motion adaptive I/P conversion, Aspect Ratio Control, Picture adjustment (brightness, contrast, display position, display size, etc.), Seamless Switching (*10) | |
| | Others All function setting through browser, Automatic input detection and switching, Volume adjustment (volumes of input and output ports can be set separately), Lip Sync (Max. 16 frames), Audio breakaway enables independent audio and video switching, Cross-point memory (9 settings), Preset memory (8 settings), Last memory, Anti-Snow (*11), Connection Reset (*12), External control commands (32 commands), Security lock | |
| External control | RS-232C 1 port / 3-pin terminal block | |
| | LAN 1 port / RJ-45 10Base-T / 100Base-TX (Auto Negotiation), Auto MDI / MDI-X | |
| | Contact closure 3 ports / 6-pin terminal block Non-voltage contact input up to DC 24 V 500 mA | |
| | Command control 3 ports / 7-pin terminal block Controlling keys and LED | |
| | External control RS-232C, LAN, contact closure, PLink (class1), CEC (power control of sink device) (*13) | |
| General | Power 100 - 240 VAC ± 10%, 50 Hz / 60 Hz ± 3 Hz | |
| | Power consumption About 77 Watts | |
| | Dimensions 16.9 (W) × 1.7 (H) × 13.8 (D)" (430 (W) × 44 (H) × 350 (D) mm) (EIA 1U high, full rack wide) (Excluding connectors and the like) | |
| | Weight 11 lbs. (5.0 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 Operating / Storage: 20% to 90% (Non Condensing) | |

- *1 30 bit / pixel (10 bit / component) Deep Color is supported while x.v.Color, 3D, ARC and HEC are not supported.
WQHD, WQXGA, and 4K format: 24 bit / pixel (8 bit / component) is supported.
- *2 HDBaseT input/output: DVI signals protected by HDCP are not supported. To transmit those signals, use an IDK's twisted pair cable extender supporting DVI signals.
- *3 For PoH power feeding, please use an HDBaseT transmitter supporting IEEE 802.3af and AWG 24 twisted pair cable or thicker cable.
- *4 RJ-45 (HDBaseT connector) is only for extending digital video and audio signals over a Cat5e / Cat6 twisted pair cable. Use it with IDK's twisted pair cable transmitter or receiver. Do not use for LAN devices.
- *5 T568A or T568B straight. The CAT.5E HDC cable is developed by IDK and recommended by HDBaseT alliance.
- *6 4K format: Only CEA-861 timing is supported.
- *7 4K format of HDBaseT output: Up to 4K@30 is supported.
- *8 The maximum cable distance varies depending on the connected devices and was measured under following conditions:
• 1080p@60: when IDK's AWG 24 cable was used and signals of 1080p@60 24 bit / pixel (8 bit / component) was input or output.
• 4K@60: when IDK's 18 Gbps supported cable was used and signals of 4K@60 24 bit / pixel (8 bit / component) was input or output.
The maximum cable distance depends on the connected devices. The distance may not be extended with some device combinations, cabling method, or other manufacturer's cable. Video may be disturbed or may not be output even if signals are within the range mentioned above.
- *9 The maximum extension distance was obtained when IDK's CAT.5E HDC cable was used. The distance may not be extended with some device combinations, cabling method, or other manufacturer's cable. Video may be disturbed or may not be output even if signals are within the range mentioned above. Operations may not be stable with some LCD devices; please check the operation beforehand or contact us.
The maximum extension distance is the shorter distance of connected HDBaseT product or sink device's maximum extension distance.
Up to 492 ft. (150 m): 1080p (24 bit) in Long reach mode. For Long reach mode, use IDK's twisted pair cable products that supports 328 ft. (100 m) or longer.
- *10 Seamless switching with a black frame.
- *11 The anti-snow feature automatically fixes snow noise that is a specific symptom of HDCP-compliant signals and mainly occurs at start-up. This feature does not work when snow noise has already occurred during startup or when it occurs due to a bad condition of the transmission line.
- *12 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 fix 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's output. If other devices are connected between the MSD's output and sink device, this feature may be invalid.
- *13 The sink device must support CEC. Some sink devices cannot be controlled from the MSD through CEC.

■ MSD-802UHD

| Item | | Description |
|-------|---|---|
| Input | Video | HDMI / DVI <p>2 inputs HDMI Deep Color (*1) / DVI 1.0 TMDS single link, HDCP 1.4 / 2.2 TMDS clocks: 25 MHz to 300 MHz, TMDS data rate: 0.75 Gbps to 18 Gbps EDID emulation Connector: Female HDMI Type A (19-pin)</p> |
| | | HDMI / DVI <p>5 inputs *DVI connectors: Switch-selectable between digital and analog HDMI Deep Color (*1) / DVI 1.0 TMDS single link, HDCP 1.4 TMDS clocks: 25 MHz to 225 MHz, TMDS data rate: 0.75 Gbps to 6.75 Gbps EDID emulation Connector: 3 female HDMI Type A (19-pin), 2 female DVI-I (29-pin)</p> |
| | | HDBaseT <p>1 input HDBaseT (*1) HDCP 1.4 / 2.2 (*2) EDID emulation, PoH power supply (IEEE 802.3af) (*3) Connector: RJ-45 (*4) Cable: CAT.5E HDC , Cat5e UTP / STP, Cat6 UTP / STP (*5)</p> |
| | | Universal Analog <p>2 inputs *Switch-selectable between digital and analog Composite video / Y/C / Analog RGB / Analog YPbPr (auto-recognition) Composite video (VBS Signal): 1.0 V[p-p] / 75 Ω Y/C: 1.0 V[p-p](Y) / 0.286 V[p-p](C) / 75 Ω Analog RGB: 0.7 V[p-p](1.0 V[p-p] Sync on Green) / 75 Ω HS/VS TTL level, CS TTL level, Sync on Green Analog YPbPr: 1.0 V[p-p](Y) / 0.7 V[p-p](Pb/Pr) / 75 Ω EDID emulation Connector: Female DVI-I (29-pin)</p> |
| | Format | HDMI / DVI <p>2 inputs VGA to WQXGA (Dot clock: 25 MHz to 300 MHz) 480i / 480p / 576i / 576p / 720p / 1080i / 1080p / 4K (up to 4K@60 (4:4:4)) (*6)</p> |
| | | HDMI / DVI <p>5 inputs VGA to QWXGA (Dot clock: 25 MHz to 165 MHz) * For WUXGA / QWXGA, only Reduced Blanking is supported. 480i / 480p / 576i / 576p / 720p / 1080i / 1080p</p> |
| | | HDBaseT <p>VGA to WQXGA (Dot clock: 25 MHz to 300 MHz) 480i / 480p / 576i / 576p / 720p / 1080i / 1080p / 4K (up to 4K@60 (4:2:0)) (*6)</p> |
| | Audio | Universal Analog <p>VGA to QWXGA (Dot clock: 25 MHz to 165 MHz) * For WUXGA / QWXGA, only Reduced Blanking is supported. NTSC / PAL 480i / 480p / 576i / 576p / 720p / 1080i / 1080p</p> |
| | | Digital <p>8 inputs *Switch-selectable between analog audio Multi-channel LPCM up to 8 channels Sampling frequency: 32 kHz to 192 kHz, Sample size: 16 bit to 24 bit Reference level: -20 dBFS, Max. input level: 0 dBFS Connector: 5 female HDMI Type A (19-pin), 2 female DVI-I (29-pin), 1 RJ-45</p> |
| | Analog <p>3 inputs *Switch-selectable between digital audio Stereo L/R balanced / unbalanced Input impedance: 48k Ω Balanced / 24 kΩ Unbalanced Reference level: -10 dBu, Max. input level: +10 dBu Connector: 5-pin terminal block</p> | |

| Item | | Description |
|----------------------------|---|---|
| Output | Video | HDMI / DVI 2 outputs Output video can be distributed to an HDMI / DVI and HDBaseT simultaneously. HDMI Deep Color (*1) / DVI 1.0 TMDS single link, HDCP 1.4 / 2.2 TMDS clocks: 25.175 MHz to 297 MHz, TMDS data rate: 0.755 Gbps to 17.82 Gbps Connector: Female HDMI Type A (19-pin) |
| | | HDBaseT 2 outputs Output video can be distributed to an HDMI / DVI and HDBaseT simultaneously. HDBaseT (*1) HDCP 1.4 / 2.2 (*2) Connector: RJ-45 (*4) Cable: CAT.5E HDC, Cat5e UTP / STP, Cat6 UTP / STP (*5) |
| | | Format VGA / SVGA / XGA / WXGA (1280x768) / WXGA (1280x800) / Quad-VGA / SXGA / WXGA (1360x768) / WXGA (1366x768) / SXGA+ / WXGA+ / WXGA++ / UXGA / WSXGA+ / VESAHD / WUXGA / QWXGA / WQHD / WQXGA * For VESAHD / WUXGA / QWXGA / WQHD / WQXGA, only Reduced Blanking is supported. 480i / 480p / 576i / 576p / 720p / 1080i / 1080p / 4K (3840 x 2160) (*7) / 4K (4096 x 2160) (*7) |
| | Audio | Digital 2 outputs Audio can be distributed to an HDMI output and an HDBaseT output simultaneously. Multi-channel LPCM up to 8 channels Sampling frequency: 32 kHz to 192 kHz, Sample size: 16 bit to 24 bit Reference level: -20 dBFS, Max. output level: 0 dBFS Connector: 2 female HDMI Type A (19-pin), 2 RJ-45 |
| | | Analog 2 outputs Stereo L/R balanced / unbalanced Output impedance: 100 Ω balanced / 50 Ω unbalanced Reference level: -10 dBu, Max. output level: +10 dBu Connector: 5-pin terminal block |
| Maximum extension distance | Digital Input HDMI / DVI: up to 98 ft. (30m) (1080p@60), up to 39 ft. (12 m) (4K@60) (*8) HDBaseT: up to 328 ft. (100 m), up to 492 ft. (150 m) (Long Reach Mode) (*9) | |
| | Digital output HDMI / DVI: up to 98 ft. (30m) (1080p@60), up to 39 ft. (12 m) (4K@60) (*8) HDBaseT: up to 328 ft. (100 m), up to 492 ft. (150 m) (Long Reach Mode) (*9) | |
| Functions | Analog video processing unit 3D Y/C separation | |
| | Scan Converter Motion adaptive I/P conversion, Aspect Ratio Control, Picture adjustment (brightness, contrast, display position, display size, etc.), Seamless Switching (*10) | |
| | Others All function setting through browser, Automatic input detection and switching, Volume adjustment (volumes of input and output ports can be set separately), Lip Sync (Max. 16 frames), Audio breakaway enables independent audio and video switching, Cross-point memory (9 settings), Preset memory (8 settings), Last memory, Anti-Snow (*11), Connection Reset (*12), External control commands (32 commands), Security lock | |
| External control | RS-232C 1 port / 3-pin terminal block | |
| | LAN 1 port / RJ-45 10Base-T / 100Base-TX (Auto Negotiation), Auto MDI / MDI-X | |
| | Contact closure 3 ports / 6-pin terminal block Non-voltage contact input up to DC 24 V 500 mA | |
| | Command control 3 ports / 7-pin terminal block Controlling keys and LED | |
| | External control RS-232C, LAN, contact closure, PLink (class1), CEC (power control of sink device) (*13) | |
| General | Power 100 - 240 VAC ± 10%, 50 Hz / 60 Hz ± 3 Hz | |
| | Power consumption About 96 Watts | |
| | Dimensions 16.9 (W) × 1.7 (H) × 13.8 (D)" (430 (W) × 44 (H) × 350 (D) mm) (EIA 1U high, full rack wide) (Excluding connectors and the like) | |
| | Weight 11.2 lbs. (5.1 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 Operating / Storage: 20% to 90% (Non Condensing) | |

*1 30 bit / pixel (10 bit / component) Deep Color is supported while x.v.Color, 3D, ARC and HEC are not supported.
WQHD, WQXGA, and 4K format: 24 bit / pixel (8 bit / component) is supported.

*2 HDBaseT input/output: DVI signals protected by HDCP are not supported. To transmit those signals, use an IDK's twisted pair cable extender supporting DVI signals.

*3 For PoH power feeding, please use an HDBaseT transmitter supporting IEEE 802.3af and AWG 24 twisted pair cable or thicker cable.

*4 RJ-45 (HDBaseT connector) is only for extending digital video and audio signals over a Cat5e / Cat6 twisted pair cable. Use it with IDK's twisted pair cable transmitter or receiver. Do not use for LAN devices.

*5 T568A or T568B straight. The CAT.5E HDC cable is developed by IDK and recommended by HDBaseT alliance.

*6 4K format: Only CEA-861 timing is supported.

*7 4K format of HDBaseT output: Up to 4K@30 is supported.

*8 The maximum cable distance varies depending on the connected devices and was measured under following conditions:

• 1080p@60: when IDK's AWG 24 cable was used and signals of 1080p@60 24 bit / pixel (8 bit / component) was input or output.

• 4K@60: when IDK's 18 Gbps supported cable was used and signals of 4K@60 24 bit / pixel (8 bit / component) was input or output.

The maximum cable distance depends on the connected devices. The distance may not be extended with some device combinations, cabling method, or other manufacturer's cable. Video may be disturbed or may not be output even if signals are within the range mentioned above.

*9 The maximum extension distance was obtained when IDK's CAT.5E HDC cable was used. The distance may not be extended with some device combinations, cabling method, or other manufacturer's cable. Video may be disturbed or may not be output even if signals are within the range mentioned above. Operations may not be stable with some LCD devices; please check the operation beforehand or contact us.

The maximum extension distance is the shorter distance of connected HDBaseT product or sink device's maximum extension distance.

Up to 492 ft. (150 m): 1080p (24 bit) in Long reach mode. For Long reach mode, use IDK's twisted pair cable products that supports 328 ft. (100 m) or longer.

*10 Seamless switching with a black frame.

*11 The anti-snow feature automatically fixes snow noise that is a specific symptom of HDCP-compliant signals and mainly occurs at start-up. This feature does not work when snow noise has already occurred during startup or when it occurs due to a bad condition of the transmission line.

*12 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 fix 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's output. If other devices are connected between the MSD's output and sink device, this feature may be invalid.

*13 The sink device must support CEC. Some sink devices cannot be controlled from the MSD through CEC.

11 Troubleshooting

This chapter recommends what to do if you have problems operating the MSD.

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

- Are the MSD and all devices plugged in and powered on normally?
- Are cables connected correctly?
- Are there no loose connections?
- Are correct cables supported by devices being used?
- Are specifications of connected devices matched to each other?
- Are settings of the sink device correct?
- Are there any nearby objects that may cause noise?

If the problem still cannot be solved, perform the following actions. Refer to manuals of connected devices as well, since they may possibly be the cause of the problem.

| Problem | Cause/Check item/Solution | Page |
|----------------------|---|------|
| ● Video output | | |
| Video is not output. | <p>Check the error code in “9.17.8 Sink device status”. (Since the MSD has multiple output connectors, check the error code of the output connector that does not output video.)</p> <ul style="list-style-type: none"> · Error code 2: Check if the source device is connected and turned on. · Error code 3: Signal is not input. Check [1] to [6] on the next page. · Error code 4: A problem may occur in the source device or HDCP authentication. Check [2], [5] and [6]. · Error code 5: If a sink device that is not HDCP compliant is connected: <ul style="list-style-type: none"> - only video without content protection (such as analog input and test pattern) can be output - black is output when signal with content protection is input. - the MSD does not display video, because it supports HDCP. In that case, you can disable HDCP input from the source device in “9.6.2 Input HDCP setting” in order to display the video. Some source devices check whether the sink device is HDCP compliant or not and they output video depending on the result. · Error code 6 and 7: A problem occurs in the source device. · Error code A: Set “8.2 Switching input channel” to a value other than “OFF”. · If no error code is displayed: Set “9.4.11 Test pattern” to a pattern other than “OFF”. <ul style="list-style-type: none"> - If any test pattern is not output, check [5] to [7]. - If a test pattern is output, the source device may not output video. | — |

| Problem | Cause/Check item/Solution | Page |
|---|--|----------------------|
| Digital input video is not output. | [1] The set time for monitoring no-signal input may be too short. | 58 |
| Analog input video is not output. | [3] Change the input signal type. | 60 |
| Video is not output | [4] If the source device has multiple output connectors, check the video output settings of the source device. | — |
| Video is disappeared, interrupted, or has noise. | [5] If using a long cable for input or output, replace it with a 5 m/16.4 ft. or shorter cable. Since the MSD has the equalizing function, long cables can be connected, but the MSD may not provide its full performance depending on the cable quality and the connected device. If the problem is solved by replacing the cable, signal may have been degraded due to the long haul transmission. We have high-quality cables, cable boosters and extenders. Please contact us as needed. | — |
| | [6] When high-speed signal (high resolution: such as UXGA, WUXGA, QWXGA, WQHD, WQXGA, 1080p, 4K; DEEP COLOR signal) is input or output, video may not be displayed or noise may appear depending on the cable quality and the connected device. If the problem occurs only when a specific input is selected, the problem was caused by the input side. If it occurs for all inputs or only when a test pattern is displayed, the problem was caused by the output side. Change the resolution to a lower level and/or disable Deep color. You can check the resolution and color depth of the input signal in “9.17.7 Input signal status” and you can also limit resolution and color depth of input signal according to the EDID setting. You can specify the output resolution and check the color depth of the output signal in “9.17.8 Sink device status” and you can also limit the output signal color depth. | 85,87,88 48 73 |
| Input video and test pattern are not output. | [7] If you set the output resolution other than “AUTO-A” and “AUTO-B”, check if the selected resolution is supported by the sink device. If you select 480i, 576i, or 1080i, video may not be output to sink devices that do not support interlaced signal. For TV output resolutions (480i to 4K (4096 x 2160)), check the vertical synchronous frequency. PC output resolutions (VGA to WQXGA) may not be output to LCD TVs. | 48 |
| Video is interrupted. | If you set “9.6.4 Automatic.... ” to “ON”, false detection may occur. Change the setting to “OFF”. | 61 |
| Video from HDMI/DVI output is interrupted or has noise. | If the problem occurs in all input channels or when a test pattern is displayed, replace the cable with a shorter one. | — |

| Problem | Cause/Check item/Solution | Page |
|---|--|--------------|
| Video from analog input is displayed in black-and-white or green. | Change the input signal type. | 60 |
| VHS reproduction or fast-forward is interrupted when analog composite video or analog S-Video is input. | Automatic detection of input signal failed. Set the input signal type manually to "VIDEO AUTO", "VIDEO", or "Y/C". | 60 |
| The left, right, top and bottom sides are cut off. | If the problem occurs only when "CROSS HATCH" (a test pattern) is output, the sink device enlarges and displays the video. Adjust the sink device. If the sink device does not have the adjusting function, set the video size and position of the output. If the problem occurs even if "CROSS HATCH" is output to all outputs, check [8] to [13]. | 54 51, 52 |
| Part of video is cut off or black is displayed at edge(s). | [8] Check the overscan setting. | 51 |
| | [9] Settings of the display position or size are not changed? Note: Display position and size can be set for each input or output. | 51, 52 47 |
| | [10] If aspect ratios of the input signal and output resolution do not match, video may be cut off automatically or black may be displayed at edge(s) depending on settings. If the video is displayed on the full screen by setting the aspect ratio to "FULL", there is no problem. If the aspect ratios are not the same, you can select a) or b) below: a) video is cut off b) black is displayed at edge(s) | 50 51 |
| | [11] If vertical and horizontal frequencies are displayed in " 9.17.7 Input signal status ", signal that is not registered in the built-in data of the MSD is input. If " 9.7.6 Automatic setting of input timing " is set to "AUTO SETUP ON", input timing is measured when new signal is input. However, if correct video is not input, the measurement may fail. In this case, measure the input timing manually and register the device data. | 64, 69 |
| | [12] For analog input, set the automatic measurement of input timing in "9.7.1 Automatic measurement". If the result of the automatic measurement shows that video is cut off or black is displayed at edges, set the total number of the horizontal dots, scanning start position, and the active area. For digital input, the start position and active area do not have to be set. Only when video edges are cut off 1 to 2 dots, set these items. (For digital input, the total number of horizontal dots cannot be set). | 66, 67 |

| Problem | Cause/Check item/Solution | Page |
|---|--|--------|
| Black is displayed at top, bottom, right and left on PC video or only part of the PC video is displayed, and the rest is displayed by scrolling with the mouse. | [13] Does the PC resolution (you can check it in "Properties" of the PC) match the resolution that is output from the PC (you can check it in " 9.17.7 Input signal status "). If not, set the EDID and PC resolutions. If the copy of the built-in LCD screen is output in the laptop, the output to an output monitor is limited to the resolution of the LCD screen. As a result, black may be displayed at edges. The problem can be solved by enlarging the display or displaying only to the external monitor. | 84, 85 |
| Video is reduced vertically or horizontally. | Does the selected aspect ratio of the output resolution match that of the connected sink device? If not, set the aspect ratio of the sink device. | 50 |
| | Check the set aspect ratio of the input signal. | 50 |
| | Check the monitor setting of the source device (such as 4:3, 16:9, letter box and the like). | — |
| | For analog input, signal that cannot be recognized by the MSD and wrong aspect ratio may be applied. Perform the automatic measurement in the "NEXT ASPECT" mode. | 64 |
| Video flickers | If interlace signal is input to a sink device that does not support interlace signal, the video may flicker. Check the output resolution of the sink device. | 48 |
| PC's dual monitor cannot be set or the setting is canceled. | If the monitoring function for no-signal input works, the dual monitor function may not work correctly. In this case, disable the monitoring function. | 58 |
| It takes a long time to output video after video input is switched. | If you set the HDCP output to "HDCP INPUT ONLY", some sink devices may fail HDCP authentication. In this case, it may temporarily not output video and audio when a channel signal without HDCP support is input and then is switched to a channel signal with HDCP support is input. In this case, set the HDCP output setting to "HDCP 2.2" or "HDCP 1.4". | 72 |
| Video from a PC of analog input is displayed with bright- and- dark vertical stripes | Set the total number of horizontal dots. If you change the total number of horizontal dots, you may sometimes have to set the start position of scanning and the active area. | 66 |
| Light shadows appear on a few video lines from an analog input PC. | Adjust the tracking. | 69 |
| Fluctuation appears on the analog input video. | Adjust the tracking. | 69 |
| Automatic measurement of input timing fails. | In order to execute the automatic measurement of the input timing, the input video must have 25% or more brightness and its edges (all sides) need to be in contact with the circumscribed rectangle in the effective display area. | 64 |

| Problem | Cause/Check item/Solution | Page |
|---|---|------|
| Display position of analog input video changes on its own. | If the function that automatically adjusts the display position (upper left of the screen) works while the automatic measurement is executed, the video may move on its own. In this case, disable the adjusting position function. | 68 |
| Part of the bitmap is cut off, or bitmap is not displayed on the full screen. | If the bitmap resolution does not match the output resolution, the bitmap may be partially cut off or may not be displayed on the full screen, depending on settings of the aspect ratio and display position. In this case, set the aspect ratio and display position as needed. | 117 |
| ●Audio output | | |
| Audio is not output. | <p>If audio is not output, first check the error code in “9.17.8 Sink device status”. (The MSD has multiple output connectors. Find the error code of the output connector that does not output audio.)</p> <ul style="list-style-type: none"> ▪ Error code 1: Set “9.9.2 Output mute” to “OFF”. ▪ Error code 2: Ensure that the source device is connected and powered on. ▪ Error code 3: Signal is not input. Check [14], [15], [17] and [18]. ▪ Error code 4: There may be problems in the source device side or HDCP authentication. Check [14]. ▪ Error code 5: If the display device or AV amplifier does not support HDCP, only audio without content protection (such as analog input) is output; audio is not output when signal with content protection is input. Some HDMI/DVI devices check if the connected device is HDCP compliant and determines whether to output HDCP signal or not. Since the MSD is HDCP compliant, audio may not be output if the MSD is connected to a sink device or AV amplifier that does not support HDCP. In this case, disable HDCP input from the input device in “9.6.2 Input HDCP setting”. ▪ Error code 6: There are problems in the source device. ▪ Error code 7: LCD monitors may not output compressed audio, such as Dolby Digital, DTS, and so on. If playing contents with compressed audio (such as Blu-ray disc), check the audio output setting. Audio signal that is output from the source device can be controlled by setting EDID. ▪ Error code 8: Enable the target audio output connector by setting “9.9.7 Audio output connector”. | 88 |

| Problem | Cause/Check item/Solution | Page |
|---|---|----------------|
| Audio is not output. (Cont'd) | <ul style="list-style-type: none"> ▪ Error code 9: Set "9.8.1 Output mode" to a mode other than "DVI MODE". If the sink device does not support HDMI signal, the MSD outputs DVI signal automatically. Check which signal type is supported by the sink device. ▪ Error code A: Set "8.2 Switching input channel" to "OFF". ▪ If any error code is not displayed: Check [14] to [18]. The source device may not be outputting audio. | — |
| Audio is not output from digital input. | [14] Is video being output correctly? If not, check [1], [2], [5] and [6]. | — |
| | [15] Is DVI signal output from the source device? You can check the input signal type in "9.17.7 Input signal status" . DVI signal may be output depending on EDID settings. If a source device that does not support 4K is connected to the input connector to which 4K EDID is set, DVI signal may be output. Change the setting of "9.10.2 Resolution for PCs" and "9.10.3 Input resolution for AV devices" . | 87 85 87 |
| | [16] Is the input audio format supported by the connected sink device or AV amplifier input? LCD monitors, especially, may not output 88.2 kHz or higher sampling frequency of linear PCM and compressed audio (such as Dolby Digital, DTS, and so on). Audio signal output from the source device can be controlled by setting EDID. | 128 88 |
| Audio of input connectors is not output. | [17] Is "9.9.3 Input selection" set to "AUTO"? If not, change the setting to "AUTO" in order to switch the audio automatically. | 79 |
| Audio is not output. | [18] If the source device has multiple output connectors, check the audio output settings of the selected output device. | — |
| Audio is output from digital output connectors but not from analog output connectors. | If compressed audio (such as Dolby Digital, DTS, and so on) is input, analog audio is not output. You can check the input audio type in "9.17.7 Input signal status" . | 75 88 |
| Audio is output from analog output connectors but not from digital output connectors. | If the output resolution is set to a value other than "AUTO-A" and "AUTO-B", make sure that the sink device or AV amplifier supports the selected output resolution. If a PC output resolution (VGA to 4K) is selected, some sink devices and AV amplifiers cannot output audio. | 48 |
| | If the sampling frequency is set to a value other than "AUTO" and "AUTO-B", make sure that the sampling frequency is supported by the sink device or AV amplifier. Some LCD monitors may not output audio whose sampling frequency is high (88.2 kHz or higher). | 80 |

| Problem | Cause/Check item/Solution | Page |
|---|--|--------------|
| Compressed audio (such as Dolby Digital, DTS) is not output from the source device. | Compressed audio input is set to OFF (EDID settings) by factory default. If using compressed audio, change the EDID setting. | 88 |
| | In order to output compressed audio of multi-channel, set the number of speakers. | 89 |
| Multi-channel audio is not output. | In order to output multi-channel audio, set the number of speakers. | 89 |
| Audio of only a specific scene is not output from digital input | Is "DOWN MIX" is set for multi-channel audio output? For multi-channel audio, since channels changes depending on scenes, audio may not output if audio is not included in the set channel. | 81 |
| ●Key operation | | |
| Keys do not operate. | Ensure that keys are not locked. | 30 |
| | Since no control command is registered by Factory default, "DISPLAY POWER" keys do not work. Register and associate control commands in order to enable these keys. | 99, 107 |
| | When a control command is executed using a front panel key, all keys are disabled until the command is executed or "INVALID TIME" passes. | 108 |
| | Check the set time of "POWER SWITCH ON" that prevent accidental operation. | 126 |
| | Immediately after start-up, all keys are disabled until the connection of the sink device is confirmed. | 27 |
| Settings are not saved or reflected to the actual operation. | Settings of some menus may not be saved if the "MENU/SET" key is not pressed after setting. | 27 |
| ●Communication command control | | |
| Communication command control from the PC to the MSD cannot be performed. | Are the following items set correctly? For RS-232C: baud rate and data length For LAN: IP address and subnet mask | 91 95, 96 |
| | Is COM PORT's FUNCTION set to "RECIEVER" mode? If it is set to "TRANSMITTER" mode, the communication command of the MSD cannot be controlled externally. | 92, 95 |
| "@ERR,6" is returned. | If control commands are executed by communication commands, the communication command controls are disabled until control commands executed or "INVALID TIME" passes. | 108 |
| | Immediately after start-up, the communication command control function is disabled until the connection of the sink device is confirmed. | 27 |

| Problem | Cause/Check item/Solution | Page |
|---|--|--------|
| ● Sending control command function | | |
| Control command is not sent. | Ensure that the registered control command and the number of bytes are correct. Devices requiring delimiters may not execute commands if the delimiters are not sent. If the set number of bytes is not correct, the control command is not sent completely or unnecessary data is sent after the control command. | 99 |
| | Is the registered control command linked to the desired control command execution condition? | 107 |
| | Is COM PORT's FUNCTION set to "RECIEVER" mode? In order to send the control command, set the communication port to "TRANSMITTER" mode. If using LAN, set the IP address and other settings of the connected device. | 92, 95 |
| "RETRY OVER ERROR" is displayed and control command is not sent completely. | Is the registered reply command correct? | 104 |
| | Ensure that the setting of "TIME OUT" for checking control commands is not too short. | 99 |
| Control through CEC cannot be performed. | Does the cable support CEC? In order to use CEC, use an HDMI cable that supports CEC. | — |
| | Does the sink device support CEC? Is the HDMI link function of the sink device set to be enabled? Enable the HDMI link control of the sink device and the function which turns on the sink device from external devices of the sink device. | |
| ● Others | | |
| Input signal temporarily disappear when input channel is switched. | When the CEC connection changes, EDID may change. In this case, input signal is interrupted. Check the CEC connection settings. | 74 |
| Devices cannot be controlled through CEC. | Are HDMI cables supporting CEC being used? | 74 |
| | To use CEC, enable HDMI link control of the connected devices (such as LCD TVs, Blu-ray recorder, and so on). | |

If additional assistance is required, please perform the following tests and then contact us.

1. The problem occurs at all connectors?
2. Connect the devices using genuine cables without connecting the MSD.
The problem still cannot be solved? Please contact us for assistance.

User Guide of MSD-701UHD / 702UHD / 801UHD / 802UHD

Ver.1.4.0

Issued on: 16 February 2021



Headquarters

IDK Corporation
7-9-1 Chuo, Yamato-shi, Kanagawa-pref.
242-0021 JAPAN
TEL: +81-46-200-0764 FAX: +81-46-200-0765

Email: idk_eng@idk.co.jp

URL: <http://www.idkav.com>

USA

IDK America Inc.
72 Grays Bridge Road Suite 1-C, Brookfield, CT 06804
TEL: +1-203-204-2445

Email: sales@idkav.com

URL: <http://www.idkav.com>

Europe

IDK Europe GmbH
Lise-Meitner-Str. 6, D-40878 Ratingen
TEL: +49-2102-578-301-0

Email: info@idkav.eu

URL: <http://www.idkav.com>



Product information Support

Arvanics Corporation
7-9-1 Chuo, Yamato-shi, Kanagawa-pref.
242-0021 JAPAN
TEL: +81-46-259-6920 FAX: +81-46-259-6930

Email: info@arvanics.com

URL: <http://www.arvanics.com>

Information in this document is subject to change without notice.

All rights reserved. All trademarks mentioned are the property of their respective owners.