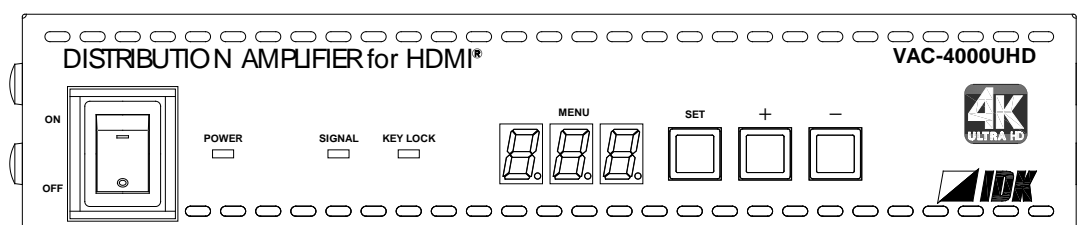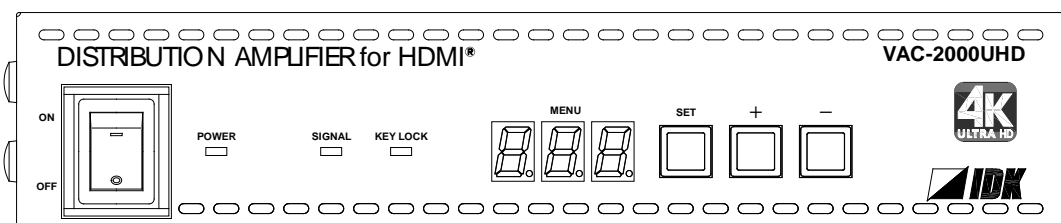**4K@60 and HDCP 2.2 supported HDMI Distribution Amplifier**

**(with Audio De-embedder)**

# VAC-2000UHD / 4000UHD

<User's Guide>

Ver.1.3.0





- Thank you for choosing this IDK product.
- To ensure the best performance of this product, please read this User's Guide fully and carefully before using it and keep this manual beside this product.

**IDK Corporation**

## Trademarks

# Before reading this manual

- All rights reserved.
- Some of the contents in this User's Guide such as appearance diagrams, menu operations, communication commands, and so on may differ depending on the version.
- This User's Guide is subject to change without notice. You can download the latest version from IDK's website at: http://www.idk.co.jp/en/index.html

**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 and the user will be required to correct that interference at their 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 2011/65/EU
(This directive is only valid in the EU.)
This equipment complies with the WEEE Directive (2011/65/EU) 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 cautions as detailed in this document.

| 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 equipment 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 equipment is handled incorrectly. |

| Symbol | Description | Example |
|---|---|---|
| **Caution** | This symbol is indicated to alert the user. (Warning and caution) | **Electrical Hazard** |
| **Prohibition** | This symbol is intended to prohibit the user from actions. | **Do not disassemble** |
| **Instruction** | This symbol is intended to instruct the user. | **Unplug** |

# ⚠️ Warning

| | |
|---|---|
| **Prohibition** | **Do not place the product in any unstable place.**<br>Install the product to a horizontal and stable place. Otherwise, it may fall/turn over and lead to injury. |
| | **Do not place the product in any environment with vibration.**<br>Otherwise, it may move/fall and lead to injury. |
| | **Keep out any foreign objects.**<br>In order to avoid fire or electric shock, do not allow foreign objects, such as metal and paper, to enter the product from the vent holes. |
| | **For power cable/plug:**<br>● **Do not scratch, heat, or modify, including extending them**<br>● **Do not pull, put heavy stuff on them, or pinch them.**<br>● **Do not bend, twist, or tie them together forcefully.**<br>If they are used in those states continuously, it may cause fire or electric shock. If power cables/plugs become damaged, contact IDK. |
| **Do not disassemble** | **Do not repair, modify or disassemble.**<br>Since the product includes high-voltage parts, those actions may cause fire or electric shock. For internal inspections or repairs, contact IDK. |
| **Do not touch** | **In the event of lighting or thunder, do not touch the main unit and cables such as power cable and LAN cable.**<br>Contact may cause electric shock |
| **Instruction** | **For installation:**<br>The product is intended to be installed by skilled technicians. For installation, please contact a system integrator or IDK. Otherwise, it may cause fire, electric shock, injury, or property damage. |
| | **Set the power plug in a convenient place to unplug easily.**<br>You can easily unplug in case of any extraordinary failure or abnormal situation, and it also helps for unplugging when you do not use it for a long period. |
| | **Plug the power plug into appropriate outlet completely.**<br>If the plug is plugged incompletely, it may overheat which causes electrical shock or fire. Do not use damaged plug or loosened outlet. |
| | **Clean the power plug regularly.**<br>If the plug is covered in dust, it may cause fire due to reduced insulating power. |
| **Unplug** | **Unplug immediately if the product smokes, makes unusual noise, or smells.**<br>If you continue to use the product under those situations, it may cause electric shock or fire. After confirming that the product stops smoking, contact IDK. |
| | **Unplug immediately if you drop the product or if the cabinet is damaged.**<br>If you continue to use the product under those situations, it may cause electrical shock or fire. For maintenance and repair, contact IDK. |
| | **Unplug immediately if water or other objects are directed inside.**<br>If you continue to use it under those situations, it may cause electrical shock or fire. For maintenance and repair, contact IDK. |
| **For connection** | |
| **Instruction** | Differences in ground potential among the product and peripheral devices may cause electric shock or damage of the devices. When using cables to connect devices, including connection of long-distance transmission, unplug the power cables of all related devices.<br>After connecting signal/control cables of each device, plug in the power cables of each device. |

# ⚠Caution

| | | |
|---|---|---|
| **Prohibition** | **Do not place the product in any place where it will be subjected to high temperatures.** | |
| | If the product is subjected to direct sunlight or high temperatures, it may cause fire. | |
| | **Do not place the product in humid, oil smoke, or dusty place.** | |
| | If the product is placed near humidifiers or dusty area, it may cause fire or electric shock. | |
| | **Do not block the vent holes.** | |
| | If ventilation slots are blocked, it may cause fire or failure due to internal heat. | |
| | **Do not put heavy items on the product.** | |
| | It may fall/turn over and lead to injury. | |
| | **Do not exceed ratings of outlet and wiring devices.** | |
| | If several plugs are put in an outlet, it may cause fire and electric shock. | |
| | **Use only the provided AC adapter and power cable.** **Do not use the provided AC adapter and power cable with other products.** | |
| | If non-compliant adapter or power cables is used, it may cause fire or electrical shock. Use the supplied AC power connection cable. | |
| **No wet hands** | **Do not plug or unplug with wet hands.** | |
| | It may cause electrical shock. | |
| **Instruction** | **Use and store the product within the specified temperature/humidity range.** | |
| | If the product is used outside the range continuously, it may cause fire or electric shock. | |
| | **Turn off devices when they are connected to another device.** | |
| | It may cause fire or electric shock. | |
| **Unplug** | **Unplug the power plug if you do not use the product for a long period.** | |
| | In case of defect, it may cause fire. | |
| | **Unplug the power plug before cleaning.** | |
| | It may cause electric shock. | |

## For installation

**For rack mount devices:**

| | |
|---|---|
| **Instruction** | Mount the product to the rack meeting EIA standards, and maintain spaces above and below for air cooling. For your safety, attach an L-shape bracket in addition to the mount bracket kit for the front panel to balance the weight. |

**For devices with rubber feet:**

| | |
|---|---|
| **Instruction** | Never insert only the screws into the holes after removing the rubber feet. It may lead to damage when the screws contact electrical circuit or parts inside of the product. To put the rubber feet back on, use only provided rubber feet and screws. |

**Altitude:**

| | |
|---|---|
| **Instruction** | Do not place the product at elevations of 2,000 meters (6562 feet) or higher above sea level. Failure to do so may shorten the life of the internal parts and result in malfunctions. |

# Table of Contents

# 1 Included items

Make sure all items below are included in the package.
If any items are missing or damaged, please contact us.
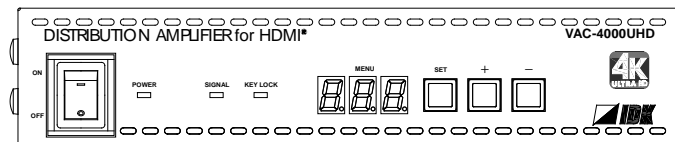


VAC main unit x 1
(Drawing: VAC-4000UHD)
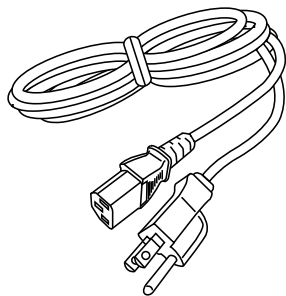


Power cable (1.8m/5.9 feet) x1
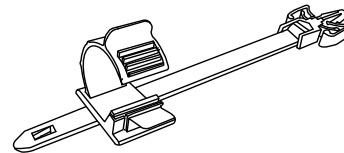


Cable clamps
VAC-2000UHD ⋯ 3 clamps
VAC-4000UHD ⋯ 5 clamps
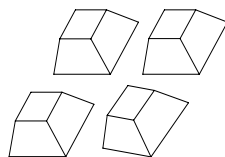


Rubber feet x 4

**[Fig. 1.1] Included items**

You can download the latest version of the User's Guide from IDK's website at:
http://www.idk.co.jp/en/index.html

# 2 Product outline

The VAC-2000UHD and VAC-4000UHD are HDMI distribution which supports 4K@60 having four times the resolution of full HD. These distributors include 1 HDMI connector for input, 2 (VAC-2000UHD) or 4 (VAC-4000UHD) HDMI connectors for output, and an analog audio output connector.
Input video signals are output from HDMI output connectors while digital audio signals are converted into analog audio signals and output from the audio output connector.
The VAC-2000UHD and VAC-4000UHD supports HDCP 2.2 for HDMI signals.
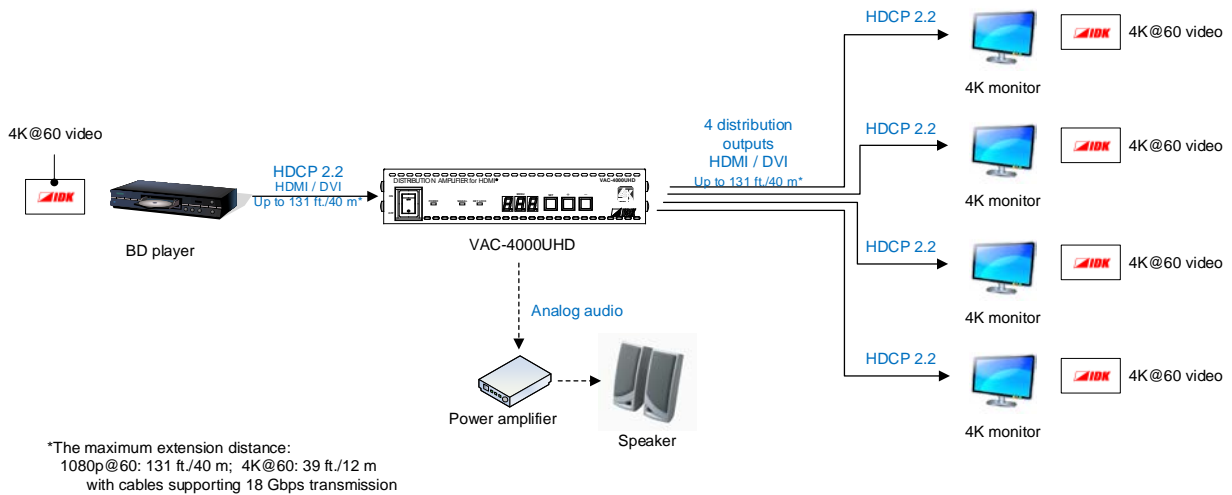


**[Fig. 2.1] Distributing video and audio (VAC-4000UHD)**

# 3  Features

■ **Video**
- ・ 1 HDMI input; 2 / 4 outputs (VAC-2000UHD / VAC-4000UHD)
- ・ Up to 4K@60 (4:4:4) resolution
- ・ HDCP 1.4 / 2.2
- ・ HDR
- ・ 3D
- ・ xvYCC
- ・ Maximum input/output cable distance:
  - - 1080p@60: up to 131 ft. (40 m)
  - - 4K@60: up to 39 ft. (12 m) (using 18 Gbps supported High-Speed HDMI cable)
- ・ Cascade connection
- ・ Anti-snow

■ **Audio**
- ・ Analog audio de-embedded

■ **Others**
- ・ EDID emulation
- ・ DDC buffering
- ・ CEC: Pass-Through between IN and OUT1
- ・ Displaying statues of Input/Output signals
- ・ Connection Reset
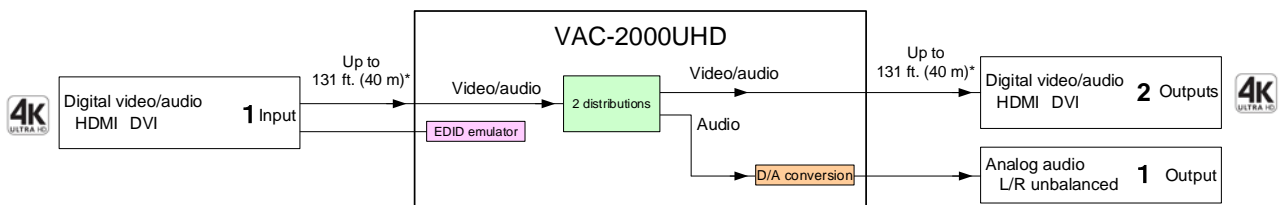
Video/audio ┆ 2 distributions ┆ Video/audio ┆ EDID emulator ┆ Audio ┆ D/A conversion

VAC-2000UHD

Digital video/audio HDMI DVI **1** Input  — Up to 131 ft. (40 m)*

Digital video/audio HDMI DVI **2** Outputs — Up to 131 ft. (40 m)*

Analog audio L/R unbalanced **1** Output

\* The maximum extension distance:
   1080p@60: 131 ft. (40 m);  4K@60: 39 ft. (12 m) (with cables supporting 18 Gbps transmission)

**[Fig. 3.1] VAC-2000UHD diagram**
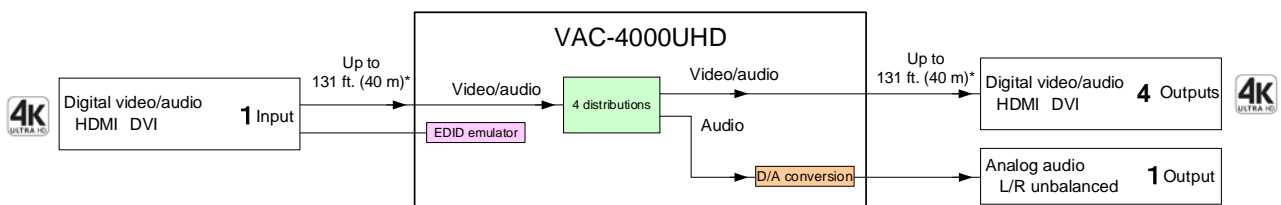
VAC-4000UHD

Digital video/audio HDMI DVI **1** Input — Up to 131 ft. (40 m)*

Video/audio ┆ 4 distributions ┆ Video/audio ┆ EDID emulator ┆ Audio ┆ D/A conversion

Digital video/audio HDMI DVI **4** Outputs — Up to 131 ft. (40 m)*

Analog audio L/R unbalanced **1** Output

\* The maximum extension distance:
   1080p@60: 131 ft. (40 m);  4K@60: 39 ft. (12 m) (with cables supporting 18 Gbps transmission)

**[Fig. 3.2] VAC-4000UHD diagram**

# 4 Part names and descriptions

## 4.1 Front panel
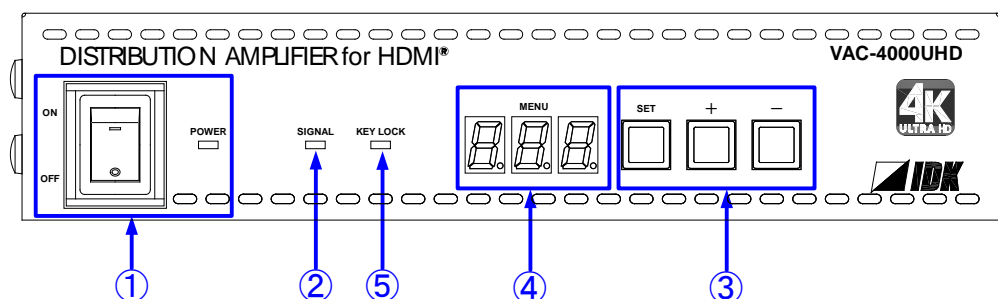


**[Fig. 4.1] Panel drawing (VAC-4000UHD)**

**[Table 4.1] Part names and descriptions**

| # | Part name | Description |
|---|---|---|
| ① | POWER key | Turns on/off the VAC.<br>The POWER LED lights green when the VAC is turned on. |
| ② | SIGNAL LED | The LED lights yellow when video input signals are detected. |
| ③ | Menu operation keys | Selects and sets each menu. |
| ④ | Segment display | Displays menu number, setting number, and setting status. |
| ⑤ | KEY LOCK LED | Turns green when the menu operation keys are locked.<br>【7.2 Locking menu operation keys】 |

## 4.2 Rear panel
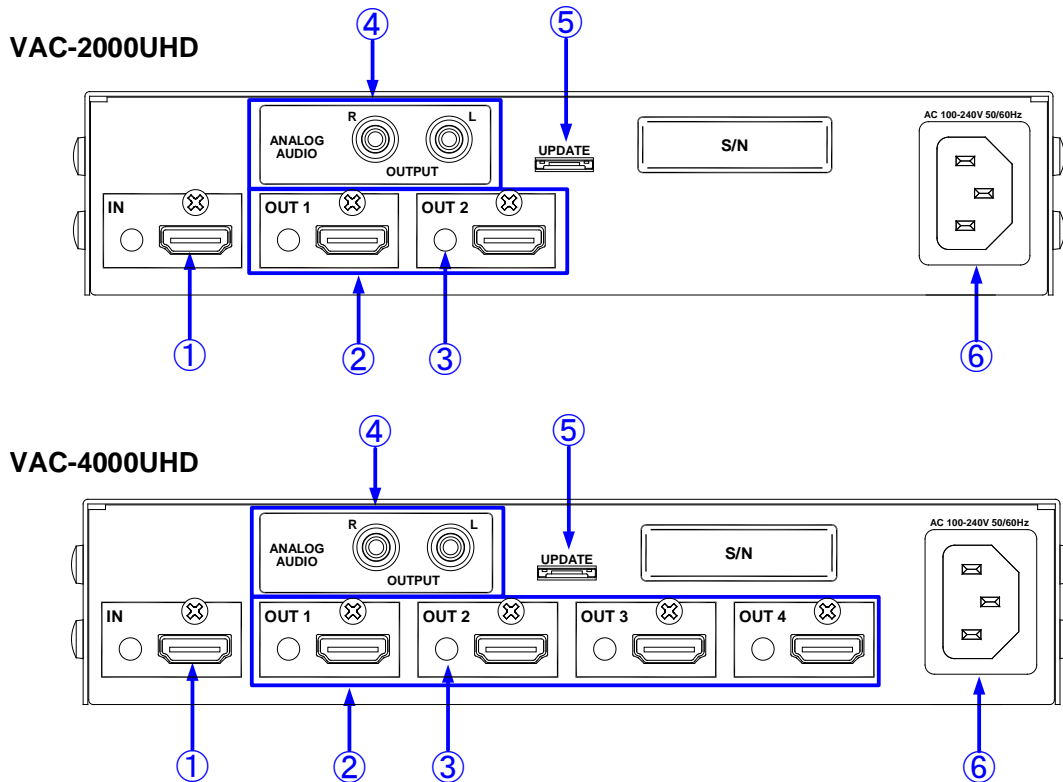


**[Fig. 4.2] Panel drawing**

**[Table 4.2] Part names and descriptions**

| # | Part name | Description |
|---|---|---|
| ① | HDMI input connector | Input connector for HDMI signals. Connector for a source device such as a DVD/Blu-ray disc player. |
| ② | HDMI output connector | Output connector for HDMI signals. Connector for sink devices such as LCD monitors and projectors. |
| ③ | HDMI cable fixing hole | Holes for the supplied cable clamps to fix the HDMI cables. 【6 Precautions before connection】 |
| ④ | Audio output connector | Analog output for audio of HDMI input signals. Connector for an amplifier, speaker, mixer, or the like. |
| ⑤ | Connector for maintenance | Not used. Please do not connect anything; this connector is for maintenance only. |
| ⑥ | AC adapter connector | Connector for the supplied AC adapter. |

# 5 Sample application
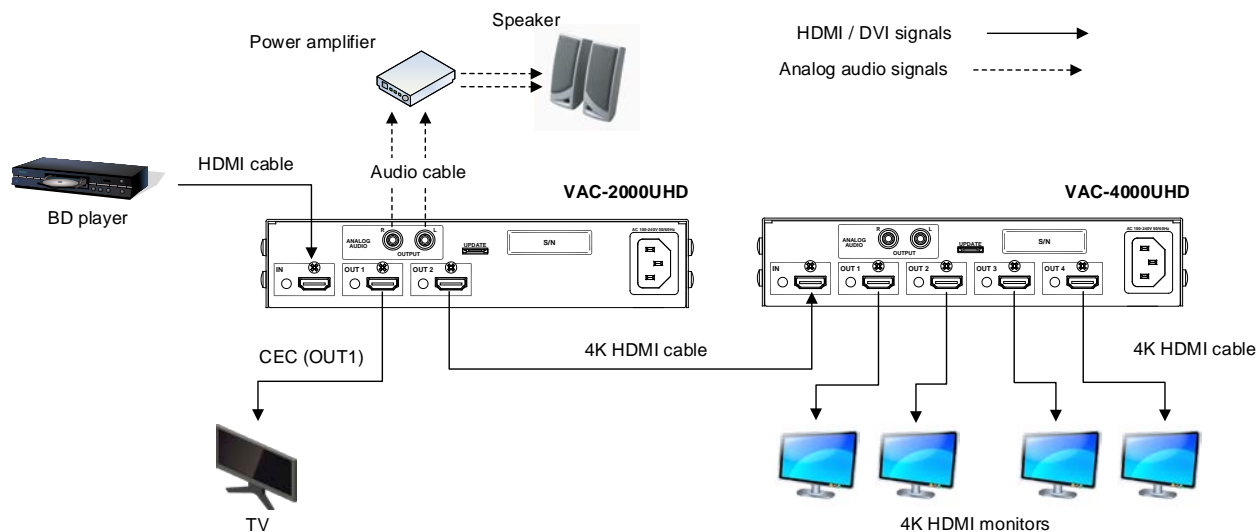


**[Fig. 5.1] Cascade connection**

At IDK, various cables, such as flexible HDMI cable, DVI cable, high-quality long cables and conversion cables, are available. Please contact us for details as needed.
Use correct HDMI cable /HDMI-DVI conversion cable according to the system configuration. For analog audio, use a commercial audio cable.

For 4K format video, the maximum TMDS data rate (transmission rate) is 18 Gbps. If you use a high-speed HDMI cable, the rate becomes 10.2 Gbps and video cannot be displayed stably.
Use a cable supporting 18 Gbps high-speed transmission according to the 4K format. Since extension distance depends on the cable type and characteristics of source and sink devices, we recommend that you use a high-quality cable.

**[Table 5.1] Cables for 4K format**

| 4K format | TMDS data rate (Gbps) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | RGB, YCbCr 4:4:4 | | | YCbCr 4:2:2 | | | YCbCr 4:2:0 | | |
| | 24 bit | 30 bit | 36 bit | 24 bit | 30 bit | 36 bit | 24 bit | 30 bit | 36 bit |
| 3840x2160p (24 / 25 / 30) | HS | UH | UH | HS | HS | HS | NA | NA | NA |
| 4096x2160 (24 / 25 / 30) | HS | UH | UH | HS | HS | HS | NA | NA | NA |
| 3840x2160p (50 / 59.94 / 60) | UH | NA | NA | UH | UH | UH | HS | UH | UH |
| 4096x2160 (50 / 59.94 / 60) | UH | NA | NA | UH | UH | UH | HS | UH | UH |

UH: 18 Gbps ultra-high-speed cable    HS: 10.2 Gbps transmission cable    NA: Not available

*Note:*
If cables are extended using a cable joint (JJ), video may be interrupted or not be output.

# 6 Precautions before connection

Follow the precautions below before connecting to external devices.

■ **Attaching rubber feet**
1. Turn the VAC upside down and place it on a flat place.
2. Wipe the dirt off joint area.
3. Peal the release papers from rubber feet and place them on each corner of the VAC.

■ **Installation**
・Eliminate static electricity from your body before connecting cables.
・Do not place another VAC on the VAC.
・Do not block vent holes. Keep enough space (1.2 in. (30 mm) or more) around the product.
・Do not install the VAC in a closed space.
　If you have to install the product to an EIA rack mount in closed space, add a ventilation to keep the ambient temperature of 40 degrees C/104 degrees F or less. If inadequately vented, the life of parts may be shortened and operations may be affected.

■ **Cabling**
・Read the manuals of external devices carefully
・Turn off the transmitter/receiver before connection.
・Insert the cable into the connector firmly and do not give the connector stress.
・Secure the HDMI cable using a cable clamp to prevent it from falling out of the device.
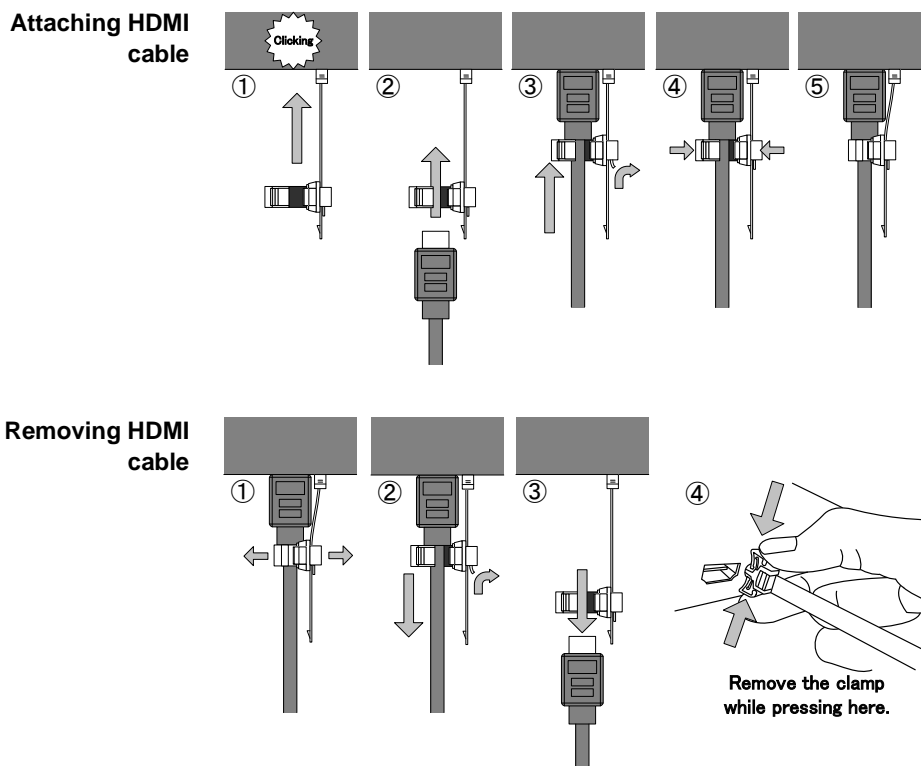


[Fig. 6.1] Attaching/Removing cable clamp

# 7  Basic operation

## 7.1  Menu operations

You can set all input/output settings of video and audio signals from menu operation keys.

Menu operation keys
Select the menu number first and then select the setting number.
If you do not operate for 60 seconds in each step, the light of the segment display will be turned off.

Selecting menu
number

Segment display

2

1, 3

Selecting set
number

4

5

**[Fig. 7.1] Menu key operation**

Setting procedure

| | |
|---|---|
| 1 | Press the "SET" key. The segment display lights. |
| 2 | Select the menu number using the "+" and "-" keys. |
| 3 | Press the "SET" key to apply the menu number. The set number is displayed. |
| 4 | Select the set number value using the "+" and "-" keys. |
| 5 | Press the "SET" key to apply the setting. After that, the segment display of Step 2 menu number above is displayed. If you do not press the "SET" key for 10 seconds, the number is not applied and the segment display of the step 2 is displayed. You have to do the same operation from Step 2 again. |

## 7.2 Locking menu operation keys

Press and hold the "SET" key for 3 seconds or longer to set/cancel key lock.

If the VAC is powered off with keys locked, the key are still locked at the time of reboot
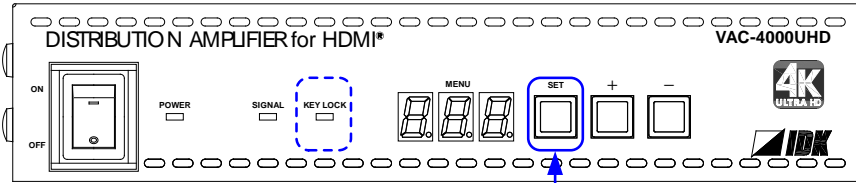


Menu operation keys will be locked by pressing the "SET" key for three seconds.

**KEY LOCK**    **KEY LOCK**

LED turns off    LED lights

**[Fig. 7.2] Locking menu operation keys**

## 7.3 Initialization

All input and output settings will be initialized by powering on while pressing the "SET" key.
*Note:*
Once settings are initialized, they cannot be restored to the previous settings.
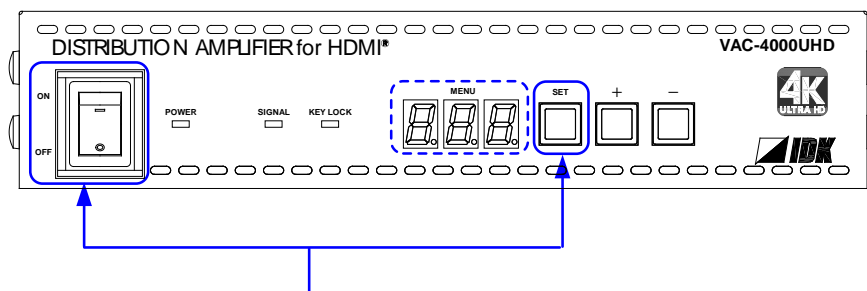


All input and output settings will be initialized by powering on while pressing the "SET" key.

**[Fig. 7.3] Initialization**

# 8  Menus

- Setup menus: setting video and audio signals in normal use
- Maintenance menus: checking operation
- Status display menus: displaying statuses of input signals and connection with sink devices

*Note:*

Normally, the maintenance menu and status display menu are not displayed as a default.

To display them, use the setting menu number [F99].

【8.2.19 [ F99 ] Setting maintenance/status display menu】

## 8.1  Menu list

■ **Setup menu**

**[Table 8.1] Setup menus**

| Menu number | Function | Setting | |
|---|---|---|---|
| | | Set value | Default |
| F01 to F03 | Copying EDID | OUT1 to OUT2 / OUT4[*1] | OUT1 |
| F10 | Setting EDID resolution (default) | SVGA to UHDTV | 1080p |
| F12 | Setting external EDID | OUT1 to OUT2 / OUT4[*1] | OUT1 |
| F14 | [ F14 ] Setting copied EDID | Copy data 1 to 3 | Copy data 1 |
| F16 | [ F16 ] No-signal input monitoring | OFF / 2 to 15 [sec.] | 10 [sec.] |
| F20 | Setting Deep Color | 24 / 30 / 36 [bit] | 24 [bit] |
| F22 | Setting PCM Audio | 32 / 44.1 / 48 / 88.2 / 96 / 192 [kHz] | 48 [kHz] |
| F24 | Setting AC-3 Dolby Digital Audio | OFF / ON | OFF |
| F26 | Setting AAC Audio | OFF / ON | OFF |
| F28 | Setting Dolby Digital Plus Audio | OFF / ON | OFF |
| F30 | Setting DTS Audio | OFF / ON | OFF |
| F32 | Setting DTS-HD Audio | OFF / ON | OFF |
| F34 | Setting Dolby TrueHD Audio | OFF / ON | OFF |
| F36 | Setting Audio channel | 2 channels / 3 (2.1) channels / 6 (5.1) channels / 8 (7.1) channels | 2 channels |

[*1] VAC-2000UHD:OUT2, VAC-4000UHD:OUT4

| Menu number | Function | Setting | |
|---|---|---|---|
| | | Set value | Default |
| F38 | Copying CEC physical address copy of EDID | Copy/No copy | No copy |
| F42 | Setting EDID WXGA | 1366 × 768 / 1360 × 768 | 1360 × 768 |
| F70 to F7n[*2] | Setting audio output | ON / OFF | ON |
| F90 | Displaying firmware version | — | — |
| F99 | Setting maintenance/status display menu | No display/Display/Always display | No display |

[*2]VAC-2000UHD: n=1, VAC-4000UHD: n=3

■ **Maintenance menu**

**[Table 8.2] Maintenance menus**

| Menu number | Function | Setting | |
|---|---|---|---|
| | | Set value | Default |
| C01 | Setting HDCP input | Enable HDCP 2.2 encryption/ Enable HDCP 1.4 encryption/ Disable HDCP encryption | Enable HDCP 2.2 encryption |
| C10 to C1n[*] | Setting how long Hot plug is ignored | OFF/2 to15 [sec.] | OFF |
| C20 to C2n[*] | Setting forced HDMI output mod | oFF: DVI when reading EDID error. Er1: HDMI (without SCDC) when reading EDID error. AL1: Always HDMI (without SCDC). Er2:　HDMI (with SCDC) when reading EDID error. AL2: Always HDMI (with SCDC). | DVI when reading EDID error. |
| C30 to C3n[*] | Setting output mode | Automatic / DVI / RGB / YCbCr 4:2:0 / YCbCr 4:2:2 / YCbCr 4:4:4 | Automatic |

[*]VAC-2000UHD: n=1, VAC-4000UHD: n=3

■ **Status display menu**

**[Table 8.3] Status display menus**

| Menu number | Function | Setting | |
|---|---|---|---|
| | | Set value | Default |
| L01 to L22 | [ L01 to L22 ] Displaying input information | — | — |
| L30 to Lbn* | Displaying output information | — | — |

*VAC-2000UHD: n=1, VAC-4000UHD: n=3

## 8.2  Setting input and output (Setting menu)

### 8.2.1  [ F01 to F03 ] Copying EDID

*Note:*

"[ ]" shows each menu number in this chapter.

EDID of sink devices can be read and stored, and the copied EDID can apply in the same way of internal EDID.

Registering EDID:
   1. Save the sink device EDID to a Copy Data (1 to 3): Menu number [F01 to F03]
   2. Select the copy data you want to use: Menu number [F14]
   3. Select the Copy EDID: Menu number [F10]
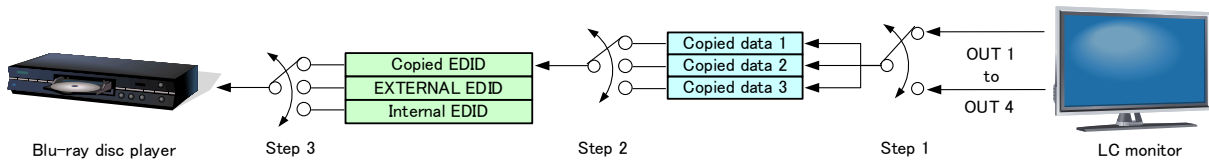


**[Fig. 8.1] Copying EDID (VAC-4000UHD)**

**Menu numbers**

   F01 to F03: Copied data 1 to 3

**Setting values**

   01 to 02:OUT1 to OUT2 (VAC-2000UHD)   [Default]  OUT1
   01 to 04:OUT1 to OUT4 (VAC-4000UHD)   [Default]  OUT1

*Note:*

If cascade connection is employed, the source device will read the EDID of the source-device-side VAC. If two or more distributors are connected between a sink device and source device, follow the procedure below to read EDID data.

   1. Copy the EDID of the sink device into the sink-device-side VAC and set it as "Copied EDID" or "EXTERNAL (External EDID)".
   2. Copy the EDID of the sink-device-side VAC into the source-device-side VAC and set it as "Copied EDID" or "EXTERNAL (External EDID)".
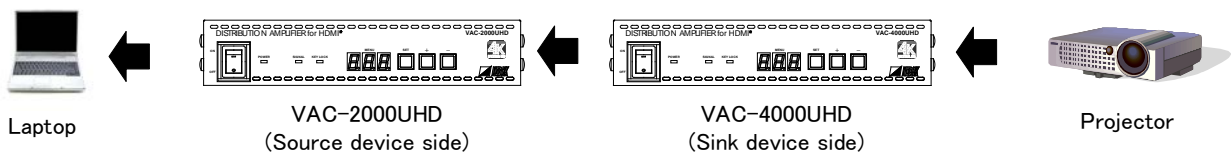


**[Fig. 8.2] Reading EDID in cascade connection**

## 8.2.2 [ F10 ] Setting EDID resolution

You can set the EDID to be sent to the source device:
In order to use a built-in EDID (setting values "03" to "28"), set the maximum resolution supported by the sink device using setting values "03" to "28".

**Setting values**

**[Table 8.4] The maximum resolution of EDID**

| Setting values | Maximum resolution | Pixel | Standard | Remarks |
|---|---|---|---|---|
| 01 | EXTERNAL (External EDID) | — | — | If no sink device is connected, the previous setting will be applied. |
| 02 | Copy EDID | — | — | If no collected data, its default is 03. |
| 03 | 1080p(59.94 / 60) | 1920×1080 | HDTV | Default |
| 04 | 720p | 1280×720 | | |
| 05 | 1080i | 1920×1080 | | |
| 06 | 1080p (24 / 25 / 30 / 50) | 1920×1080 | | |
| 07 | SVGA | 800×600 | VESA | |
| 08 | XGA | 1024×768 | | |
| 09 | VESA720 | 1280×720 | | For DVI device input |
| 10 | WXGA | 1280×768 | | |
| 11 | WXGA | 1280×800 | | |
| 12 | Quad-VGA | 1280×960 | | |
| 13 | SXGA | 1280×1024 | | |
| 14 | WXGA | 1360×768、1366×768 | | The number of pixels can be set in "8.2.16 Selecting EDID WXGA". |
| 15 | SXGA+ | 1400×1050 | | |
| 16 | WXGA+ | 1440×900 | | |
| 17 | WXGA++ | 1600×900 | | (RB) |
| 18 | UXGA | 1600×1200 | | |
| 19 | WSXGA | 1680×1050 | | |
| 20 | VESA1080 | 1920×1080 | | (RB), For DVI device input |
| 21 | WUXGA | 1920×1200 | | (RB) |
| 22 | QWXGA | 2048×1152 | | (RB) |
| 23 | WQHD | 2560×1440 | | (RB) |
| 24 | WQXGA | 2560×1600 | | (RB) |

(RB)：Reduced Blanking

**[Table 8.5] The maximum resolution of EDID**

| Setting values | Maximum resolution | Pixel | Standard | Remarks |
|---|---|---|---|---|
| 41 | 2160p (24 / 25 / 30) | 3840 × 2160 | UHDTV | |
| 42 | 4096x2160 (24 / 25 / 30) | 4096 × 2160 | DCI | |
| 43 | 2160p (50 / 59.94 / 60, 4:2:0) | 3840 × 2160 | UHDTV | YCbCr 4:2:0 supported |
| 44 | 4096x2160 (50 / 59.94 / 60, 4:2:0) | 4096 × 2160 | DCI | YCbCr 4:2:0 supported |
| 45 | 2160p (50 / 59.94 / 60, 4:4:4) | 3840 × 2160 | UHDTV | YCbCr 4:2:0, YCbCr 4:2:2, YCbCr 4:4:4 supported |
| 46 | 4096x2160 (50 / 59.94 / 60, 4:4:4) | 4096 × 2160 | DCI | YCbCr 4:2:0, YCbCr 4:2:2, YCbCr 4:4:4 supported |

*Notes:*

● For 4096x2160 (Setting values, 42, 44, and 46)
The source device may first select 3840x2160 (30p, YCbCr 4:4:4) depending on the EDID definition. Set the built-in EDID first and then select a resolution of 4096x2160 for the source device.

● For YCbCr4:2:0 (Setting values, 43 and 44)
The source device may first select 3840x2160 (30p、YCbCr 4:4:4) depending on the EDID definition. Set the built-in EDID first and then select a Color depth of YCbCr 4:2:0 for the source device.

【8.2.3 [ F12 ] Setting external EDID】
【8.2.4 [ F14 ] Setting copied EDID】
【8.2.16 [ F42 ] Setting EDID WXGA】

**[Table 8.6] The maximum resolution and EDID supported pixels**

| Max. resolution (Setting values) | | 640×480 | 800×600 | 1024×768 | 1280×720 | 1280×768 | 1280×800 | 1280×960 | 1280×1024 | 1360×768※ | 1366×768※ | 1400×1050 | 1440×900 | 1600×900 | 1600×1200 | 1680×1050 | 1920×1080 | 1920×1200 | 2048×1152 | 2560×1440 | 2560×1600 | 3840×2160 (30p) | 4096×2160 (30p) | 3840×2160 (60p) | 4096×2160 (60p) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 01 | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – |
| 02 | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – |
| 03 | 1080p (59.94 / 60) | ○ | ○ | ○ | × | × | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | × | × | × | × | × | × | × | × |
| 04 | 720p | ○ | ○ | × | ○ | × | × | × | × | × | × | × | × | × | × | × | × | × | × | × | × | × | × | × | × |
| 05 | 1080i | ○ | ○ | ○ | × | × | × | × | × | × | × | × | × | × | × | × | × | × | × | × | × | × | × | × | × |
| 06 | 1080p (24 / 25 / 30 / 50) | ○ | ○ | ○ | × | × | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | × | × | × | × | × | × | × | × |
| 07 | 800x600 | ○ | ○ | × | × | × | × | × | × | × | × | × | × | × | × | × | × | × | × | × | × | × | × | × | × |
| 08 | 1024x768 | ○ | ○ | ○ | × | × | × | × | × | × | × | × | × | × | × | × | × | × | × | × | × | × | × | × | × |
| 09 | 1280x720 | ○ | ○ | ○ | ○ | × | × | × | × | × | × | × | × | × | × | × | × | × | × | × | × | × | × | × | × |
| 10 | 1280x768 | ○ | ○ | ○ | ○ | ○ | × | × | × | × | × | × | × | × | × | × | × | × | × | × | × | × | × | × | × |
| 11 | 1280x800 | ○ | ○ | ○ | ○ | ○ | ○ | × | × | × | × | × | × | × | × | × | × | × | × | × | × | × | × | × | × |
| 12 | 1280x960 | ○ | ○ | ○ | ○ | ○ | ○ | ○ | × | × | × | × | × | × | × | × | × | × | × | × | × | × | × | × | × |
| 13 | 1280x1024 | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | × | × | × | × | × | × | × | × | × | × | × | × | × | × | × | × |
| 14 | 1360x768 | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | × | × | × | × | × | × | × | × | × | × | × | × | × | × |
| 15 | 1400x1050 | ○ | ○ | ○ | ○ | × | ○ | ○ | ○ | ○ | ○ | ○ | × | × | × | × | × | × | × | × | × | × | × | × | × |
| 16 | 1440x900 | ○ | ○ | ○ | ○ | × | ○ | ○ | ○ | ○ | ○ | × | ○ | × | × | × | × | × | × | × | × | × | × | × | × |
| 17 | 1600x900 | ○ | ○ | ○ | ○ | × | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | × | × | × | × | × | × | × | × | × | × | × |

| | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 18 | 1600x1200 | O | O | O | O | × | O | O | O | O | O | O | O | O | O | × | × | × | × | × | × | × | × | × | × |
| 19 | 1680x1050 | O | O | O | O | × | O | O | O | O | O | O | O | O | O | O | × | × | × | × | × | × | × | × | × |
| 20 | 1920x1080 | O | O | O | × | × | O | O | O | O | O | O | O | O | O | O | O | × | × | × | × | × | × | × | × |
| 21 | 1920x1200 | O | O | O | × | × | O | O | O | × | × | O | O | O | O | O | O | O | × | × | × | × | × | × | × |
| 22 | 2048x1152 | O | O | O | × | × | × | O | O | × | × | O | O | O | O | O | O | O | O | × | × | × | × | × | × |
| 23 | 2560x1440 | O | O | O | × | × | × | × | O | × | × | O | O | O | O | O | O | O | O | O | × | × | × | × | × |
| 24 | 2560x1600 | O | O | O | × | × | × | × | O | × | × | O | O | O | O | O | O | O | O | O | O | × | × | × | × |
| 41 | 2160p<br>(24 / 25 / 30) | O | O | O | × | × | × | × | O | × | × | O | O | O | O | O | O | O | O | O | O | O | × | × | × |
| 42 | 4096x2160<br>(24 / 25 / 30) | O | O | O | × | × | × | × | O | × | × | O | O | O | O | O | O | O | O | O | O | O | O | × | × |
| 43 | 2160p<br>(50 / 59.94 / 60、4:2:0) | O | O | O | × | × | × | × | O | × | × | O | O | O | O | O | O | O | O | O | O | O | O | × | △ | × |
| 44 | 4096x2160<br>(50 / 59.94 / 60、4:2:0) | O | O | O | × | × | × | × | O | × | × | O | O | O | O | O | O | O | O | O | O | O | O | △ | △ |
| 45 | 2160p<br>(50 / 59.94 / 60、4:4:4) | O | O | O | × | × | × | × | O | × | × | O | O | O | O | O | O | O | O | O | O | O | O | × | O | × |
| 46 | 4096x2160<br>(50 / 59.94 / 60、4:4:4) | O | O | O | × | × | × | × | O | × | × | O | O | O | O | O | O | O | O | O | O | O | O | O | O |

O: supported,　△: only YCbCr 4:2:0 supported;　×: Not supported;　－: Not used

* The number of pixels for 1360×768 and 1366×768 can be set in "8.2.16 Selecting EDID WXGA". The default value is 1360×768.

【8.2.16 ［ F42 ］ Setting EDID WXGA】

## 8.2.3 [ F12 ] Setting external EDID

You can set the HDMI output connector that will be read if EDID type is set to "EXTERNAL (External EDID)" in "8.2.2 [ F10 ] Setting EDID resolution".

1. Select the HDMI output connector: Menu numbers:[ F12 ]
2. Select "EXTERNAL (External EDID)": Menu numbers:[ F10 ] (P.20)
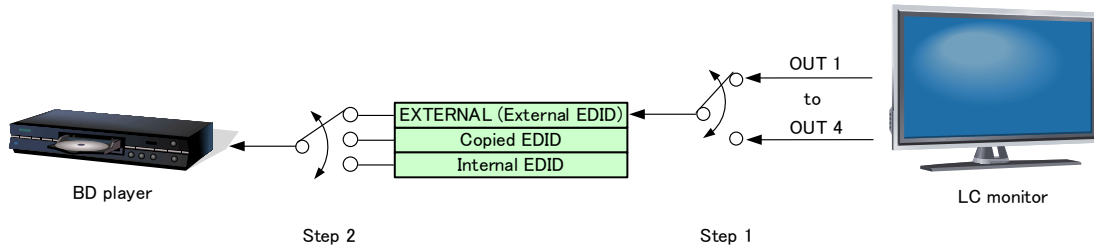


**[Fig. 8.3] Registering external EDID (VAC-4000UHD)**

**Setting values**

01 to 02:OUT1 to OUT2 (VAC-2000UHD)     [Default]   OUT1
01 to 04:OUT1 to OUT4 (VAC-4000UHD)     [Default]   OUT1

*Notes:*
● Set this menu before setting the EDID resolution to "01 EXTERNAL (External EDID)" in "8.2.2 [ F10 ] Setting EDID resolution".
● Set the external EDID again if
   - replacing the sink device with the VAC powered on or
   - changing the setting of the sink device with the VAC powered on.

## 8.2.4   [ F14 ] Setting copied EDID

You can select the copied EDID data.
EDID copied (in 8.2.1 [ F01 to F03 ] Copying EDID) from sink devices are saved in three areas.
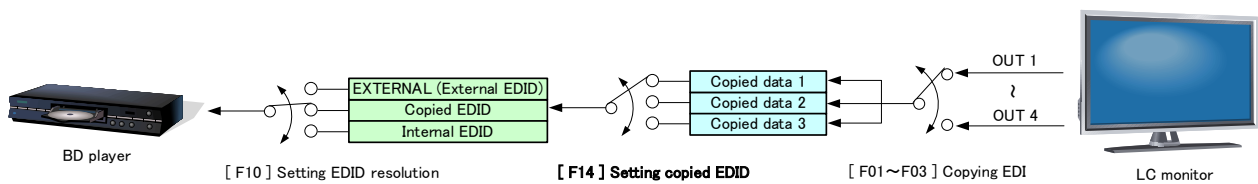


**[Fig. 8.4] Setting copied EDID (VAC-4000UHD)**

**Setting values**

01 to 03: Copied data 1 to 3   [Default] Copied data 1

*Note:*
Set this menu before setting the EDID resolution to "02 Copied EDID" in "8.2.2 [ F10 ] Setting EDID resolution".

## 8.2.5 [ F16 ] No-signal input monitoring

If you change EDID of the VAC or turn on/off the VAC, the source devices may not output video signals. In this menu, you can set the monitoring time.
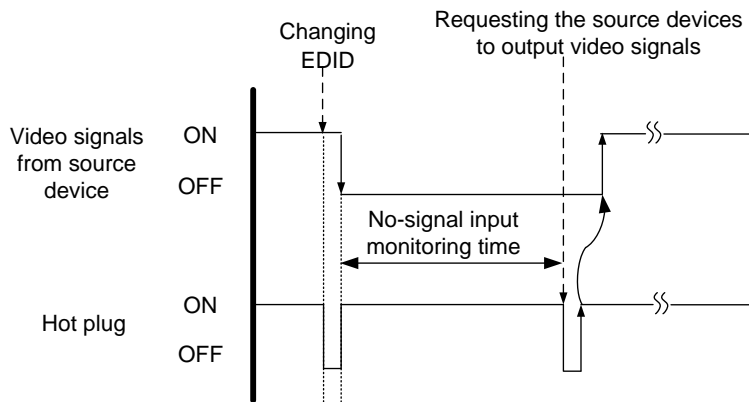


**[Fig. 8.5] No-signal input monitoring time**

**Setting values**

      oFF: OFF

      02 to 15: 2 to15 seconds   [Default]: 10 seconds

*Notes:*

● If you use the power saving or Dual monitor function of the PC (Source device), set this menu to "OFF". The PC that receives output request may cancel those functions.

● If you set the time that is shorter than the output timing, the source device repeats reprocessing of output video signals. In this case, change the time to longer.
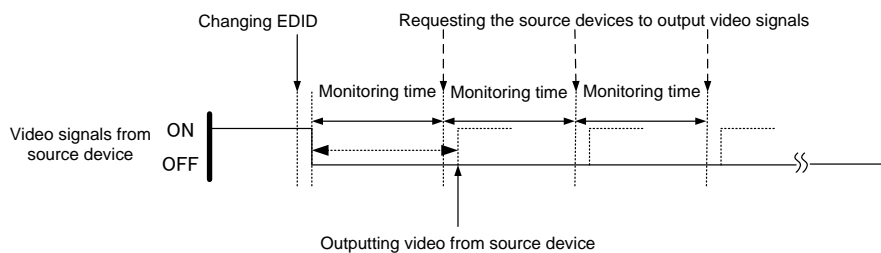


**[Fig. 8.6] Repeating output signal setting**

## 8.2.6 [ F20 ] Setting Deep Color

You can set the Deep Color (color depth) that is output from the source device.
The setting will be applied only if one of 03 to 46 is selected for "8.2.2 [ F10 ] Setting EDID resolution".

**Setting values**
> 08: 24 bit / pixel (8 bit / component)    [Default]
> 10: 30 bit / pixel (10 bit / component)
> 12: 36 bit / pixel (12 bit / component)

*Notes:*
● If you select "30bit/pixel (10bit/component)" or "36bit/pixel (12bit/component)", the transmission clock will be faster resulting in noise on video when a poor-quality cable or long cable is connected. In this case, change the setting to "24bit/pixel (8bit/component)".
For the resolution of 4K@50 / 59.94 / 60 (YCbCr 4:4:4), the deep color will be 8 bit regardless of the setting of this menu.

## 8.2.7   [ F22 ] Setting PCM Audio

You can set the maximum sampling frequency of PCM Audio that is output from the source device.
The setting will be applied only if one of 03 to 46 is selected for "8.2.2 [ F10 ] Setting EDID resolution".

**Setting values**
>  32  : 32 kHz
>  44  : 44.1 kHz
>  48  : 48 kHz
>  88  : 88.2 kHz
>  96  : 96 kHz
> 192  : 192 kHz

*Note:*
Some LCD monitors do not support several audio formats. Select the audio format and sampling frequency supported by your devices.

## 8.2.8   [ F24 ] Setting AC-3 Dolby Digital Audio

You can set the maximum sampling frequency of AC-3 Dolby Digital Audio that is output from the source device.
The setting will be applied only if one of 03 to 46 is selected for "8.2.2 [ F10 ] Setting EDID resolution".

**Setting values**
> on  : ON (The maximum sampling frequency: 48 kHz)
> oFF  : OFF [Default]

*Note:*
Some LCD monitors do not support several audio formats. Select the audio format supported by your devices.

## 8.2.9  [ F26 ] Setting AAC Audio

You can set the AAC Audio that is output from the source device.
The setting will be applied only if one of 03 to 46 is selected for "8.2.2 [ F10 ] Setting EDID resolution".

**Setting values**

      on  : ON (The maximum sampling frequency: 96 kHz)

    oFF  : OFF [Default]

***Note:***

Some LCD monitors do not support several audio formats. Select the audio format supported by your devices.

## 8.2.10   [ F28 ] Setting Dolby Digital Plus Audio

You can set the Dolby Digital Plus Audio that is output from the source device.
The setting will be applied only if one of 03 to 46 is selected for "8.2.2 [ F10 ] Setting EDID resolution".

**Setting values**

      on  : ON (The maximum sampling frequency: 48 kHz)

    oFF  : OFF [Default]

***Note:***

Some LCD monitors do not support several audio formats. Select the audio format supported by your devices.

## 8.2.11  [ F30 ] Setting DTS Audio

You can set the DTS Audio that is output from the source device.
The setting will be applied only if one of 03 to 46 is selected for "8.2.2 [ F10 ] Setting EDID resolution".

**Setting values**

      on  : ON (The maximum sampling frequency: 96 kHz)

    oFF  : OFF [Default]

***Note:***

Some LCD monitors do not support several audio formats. Select the audio format supported by your devices.

## 8.2.12 [ F32 ] Setting DTS-HD Audio

You can set the DTS-HD Audio that is output from the source device.
The setting will be applied only if one of 03 to 46 is selected for "8.2.2 [ F10 ] Setting EDID resolution".

**Setting values**

  on : ON (The maximum sampling frequency: 192 kHz)
  oFF : OFF [Default]

*Note:*
Some LCD monitors do not support several audio formats. Select the audio format supported by your devices.

## 8.2.13   [ F34 ] Setting Dolby TrueHD Audio

You can set the Dolby TrueHD Audio that is output from the source device.
The setting will be applied only if one of 03 to 46 is selected for "8.2.2 [ F10 ] Setting EDID resolution".

**Setting values**

  on : ON (The maximum sampling frequency: 192 kHz)
  oFF : OFF [Default]

*Note:*
Some LCD monitors do not support several audio formats. Select the audio format supported by your devices.

## 8.2.14 [ F36 ] Setting Audio channel

You can set the number of channels for the multiple-channel audio that is output from the source device.
The setting will be applied only if one of 03 to 46 is selected for "8.2.2 [ F10 ] Setting EDID resolution".

**Setting values**

02 : 2 channels   [Default]
03 : 3 channels (2.1 channels)
06 : 6 channels (5.1 channels)
08 : 8 channels (7.1 channels)

■  The number of channels and speaker configuration

FL : Front Left
FC : Front Center
FR : Front Right
RL : Rear Left
RR : Rear Right
RLC : Rear Left Center
RRC : Rear Right Center
LFE : Low Frequency Effect
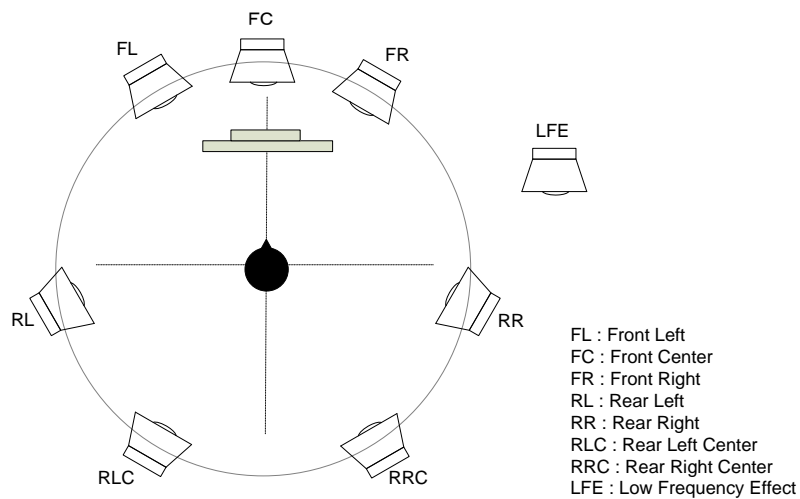
| Speakers | FL / FR | LFE | FC | RL / RR | RLC / RRC |
|---|---|---|---|---|---|
| 2 (2 channels) | ON | OFF | OFF | OFF | OFF |
| 3 (2.1 channels) | ON | ON | OFF | OFF | OFF |
| 6 (5.1 channels) | ON | ON | ON | ON | OFF |
| 8 (7.1 channels) | ON | ON | ON | ON | ON |

**[Table 8.7] The number of channels and speaker configuration**

## 8.2.15 [ F38 ] Copying CEC physical address copy of EDID

CEC: Pass through between IN and OUT1
The CEC physical address of the sink device that is connected to OUT1 can be copied into the EDID of the VAC.

If the CEC physical address of the connected sink device and the VAC's address are not the same, the CEC functions, such as input switching in the sink device at start-up, may not work correctly. The problem can be solved by using the CEC physical address that is copied into the VAC.

The setting will be applied only if CEC-supported source and sink devices are connected and one of 03 to 46 is selected for "8.2.2 [ F10 ] Setting EDID resolution".

### Setting values
on   : Copy physical address
oFF  : Not copy physical address   [Default]

***Note:***
CEC system link functions supported by other companies are not guaranteed to work correctly by this setting. Check the actual configuration.

## 8.2.16  [ F42 ] Setting EDID WXGA

You can set the number of WXGA pixels based on the resolution setting of EDID.

The setting will be applied only if one of 03 to 46 is selected for "8.2.2 [ F10 ] Setting EDID resolution".

### Setting values
on   : 1366×768
oFF  : 1360×768   [Default]

## 8.2.17 [ F70 to F7n ] Setting audio output

You can set audio ON/OFF that is output from the HDMI output connectors.

### Menu numbers
F70 to F71 : OUT1 to OUT2 (VAC-2000UHD)
F70 to F73 : OUT1 to OUT4 (VAC-4000UHD)

### Setting values
on   : ON   [Default]
oFF  : OFF

## 8.2.18 [ F90 ] Displaying firmware version

You can display the firmware version.

## 8.2.19 [ F99 ] Setting maintenance/status display menu

You can set the display setting of the maintenance menu and status display menu.

【8.1 Menu list】

**Setting values**

oFF  : [Default]
  on  : At the next start-up, settings of "oFF" will be applied.
ALL  : Always displays

**[Table 8.7] Displaying menu**

| Setting | Menu | | |
|---------|---------------|---------------|----------------|
|         | Setting value | Maintenance   | Status display |
| oFF     | Displayed     | Not displayed | Not displayed  |
| on      | *             | *             | *              |
| ALL     | Displayed     | Displayed     | Displayed      |

\* At the time of the next start-up, settings of "oFF" will be applied.

## 8.3   Checking operation (Maintenance menu)

You can set necessary items for operation verification.
This menu is enabled and displayed by setting [F99] to "on" or "ALL".
To finish the operation, set the "SET" key.

## 8.3.1   [ C01 ] Setting HDCP input

Some source devices check whether the connected device supports HDCP and then those source devices decide whether they encrypt HDCP signals or not.
Since the VAC is HDCP compliant, if it is connected to a display device that does not support HDCP, video may not be displayed. In these cases, the problem can be solved by setting this menu to "oFF".
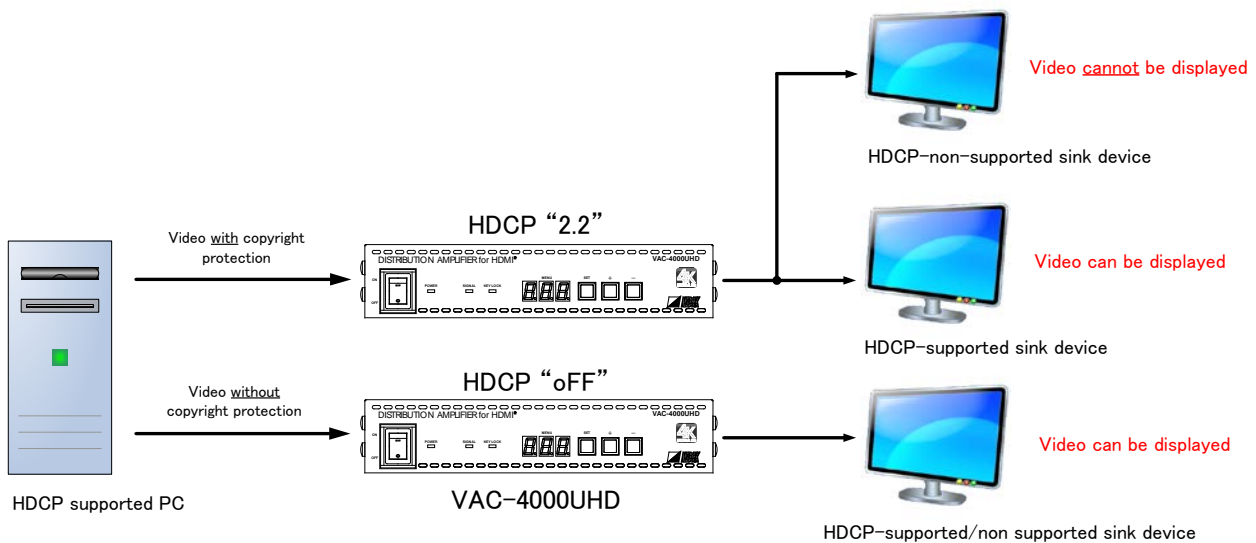


**[Fig. 8.8] HDCP-supported and HDCP-non-supported display devices**

**Setting values**

    2.2  : Enable HDCP 2.2 encryption   [Default]
    1.4  : Enable HDCP 1.4 encryption
    oFF  : Disable HDCP encryption

*Notes:*

● In order to display video whose copyright is protected, set this menu to "on".

● HDCP2.2 (stream type 0) contents can be displayed on sink devices supporting HDCP 2.2 / HDCP 1.4.

● 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.

## 8.3.2 [ C10 to C1n ] Setting how long Hot plug is ignored

You can set the masking time to ignore video output requests that are sent from the sink device.
If those signals are repeatedly sent from the sink device within a short cycle, the VAC tries to set the video output every time. As a result, video may not be output. In this case, video can be output correctly by setting this menu.
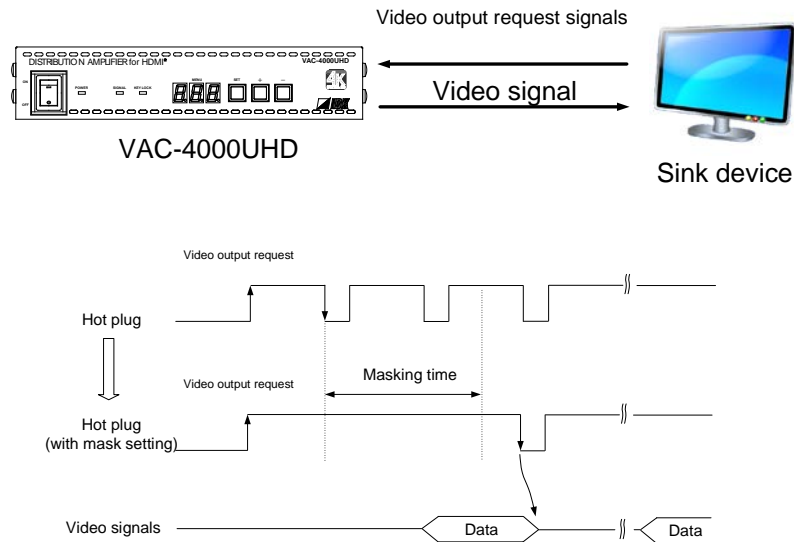


**[Fig. 8.9] Hot plug ignorance time**

**Menu numbers**

C10 to C11   : OUT1 to OUT2 (VAC-2000UHD)
C10 to C13   : OUT1 to OUT4 (VAC-4000UHD)

**Setting values**

oFF   : No masking   [Default]
02 to 15   : 2 to 15 [second]

## 8.3.3 [ C20 to C2n ] Setting forced HDMI output mode

You can set how to check sink device EDID.

The VAC finds whether the sink device supports HDMI or DVI according to EDID acquired from the sink device and output appropriate video signals. However, if EDID cannot be acquired for some reason, the sink device type cannot be determined. In such a case, audio may not be output. To prevent or solve the problem, you can output the desired signals by setting this menu.

**Menu numbers**

    C20 to C21: OUT1 to OUT2 (VAC-2000UHD)
    C20 to C23: OUT1 to OUT4 (VAC-4000UHD)

**Setting values**

    oFF : Determines the sink device is DVI when EDID cannot be read   [Default]
    Er1  : Determines the sink device is HDMI (without SCDC) when EDID cannot be read
    AL1 : Always determines the sink device is HDMI (without SCDC)
    Er2  : Determines the sink device is HDMI (with SCDC) when EDID cannot be read
    AL2 : Always determines the sink device is HDMI (with SCDC)

***Notes:***

- If you want to use this menu other than default setting, set "8.2.2 [ F10 ] Setting EDID resolution" to a value other than "01" (EXTERNAL) and set the resolution supported by the sink device.
- This menu is enabled when HDMI signals are input and the output mode is set to the value other than "DVI".

<div align="right">【8.3.4 [ C30 to C3n ] Setting output mode】</div>

## 8.3.4 [ C30 to C3n ] Setting output mode

You can set the color space that will be sent to the sink device
The sink device automatically selects the appropriate color space according to the color space of the input video. If the sink device cannot do it for some reason, you can select the color space manually.

**Menu numbers**

C30 to C31　: OUT1 to OUT2 (VAC-2000UHD)
C30 to C33　: OUT1 to OUT4 (VAC-4000UHD)

**Setting values**

rgb : RGB output
422 : YCbCr 4:2:2 output
444 : YCbCr 4:4:4 output
　d : DVI output
420 : YCbCr 4:2:0 output (Enabled only video is output at 4K@50 / 59.94 / 60. For other resolution, this menu is set to "oFF")
oFF : Automatic　[Default]

***Notes:***

● This setting is applied only HDMI signals are input.
● If 4K format YCbCr 4:4:4 signals are input, the VAC automatically outputs signals at YCbCr 4:2:0 to YCbCr 4:2:0-supported (YCbCr 4:4:4 not supported) sink device.

## 8.4 Displaying input/output statuses (Status display menu)

Input and output statuses of the VAC can be displayed.
The status display menus can be operated by setting "8.2.19 [ F99 ] Setting maintenance/status display menu" to "on" (Display) or "ALL" (Always display).
Press the "SET" key to exit the operation.

### 8.4.1 [ L01 to L22 ] Displaying input information

**[Table 8.8] Input information**

| Menu number | Displayed value | Description |
|---|---|---|
| ● HDMI / DVI mode and color depth of input video | | |
| L01 | H08 | HDMI 24 bit / pixel (8bit / component) |
| | H10 | HDMI 30 bit / pixel (10bit / component) |
| | H12 | HDMI 36 bit / pixel (12bit / component) |
| | d08 | DVI 24 bit / pixel (8bit / component) |
| | - - - | No input |
| ● HDCP of input video | | |
| L02 | on | with HDCP |
| | oFF | without HDCP |
| | - - - | No input |
| ● HDCP authorization of input video (from the source device side) | | |
| L03 | 1.4 | with authorization (HDCP 1.4) |
| | 2.2 | with authorization (HDCP 2.2) |
| | oFF | without authorization |
| | - - - | No input |
| ● Color space of input video | | |
| L04 | rgb | RGB |
| | 422 | YCbCr 4:2:2 |
| | 420 | YCbCr 4:2:0 |
| | 444 | YCbCr 4:4:4 |
| | - - - | Unknown or no input |
| ● Input video frequency | | |
| L05 | 59.9 | Input vertical synchronization frequency (with 59.9 Hz) |
| | - - - | No input |
| ● DDC power supply | | |
| L06 | on | DDC powered on |
| | oFF | DDC powered off |
| ● Input resolution | | |
| L07 | 1920_1080P 60 | Scroll display of input resolution (For 1920x1080p 60 Hz) |
| | - - - | No input |

| Menu number | Displayed value | Description |
|---|---|---|
| The segment display is three digits. The first (left) two digits show the audio format, and third digit (X) shows the number of audio channels (1 = 2 channels, 2 = 2.1 channels, 5 = 5.1 channels, 7 = 7.1 channels). | | |
| L10 | - - - | Unknown or no input |
| | 00n | Unknown |
| | 01n | PCM Audio |
| | 02n | AC-3 Audio |
| | 03n | MPEG-1 Audio |
| | 04n | MP3 Audio |
| | 05n | MPEG-2 Audio |
| | 06n | AACLC Audio |
| | 07n | DTS Audio |
| | 08n | ATRAC Audio |
| | 09n | DSD Audio |
| | 10n | Dolby Digital Plus Audio |
| | 11n | DTS-HD Audio |
| | 12n | Dolby TrueHD Audio |
| | 13n | DST Audio |
| | 14n | WMA Audio |
| | 15n | HE-AAC / HE-AACv2 / MPEG Surround Audio |
| ● Audio input sampling frequency | | |
| L11 | 22 | 22.05 kHz |
| | 24 | 24 kHz |
| | 32 | 32 kHz |
| | 44 | 44.1 kHz |
| | 48 | 48 kHz |
| | 88 | 88.2 kHz |
| | 96 | 96 kHz |
| | 176 | 176.4 kHz |
| | 192 | 192 kHz |
| | 768 | 768 kHz |
| | _01 | Unknown |
| | _05 | |
| | _07 | |
| | _11 | |
| | _13 | |
| | _15 | |
| | - - - | No input |

| Menu number | Displayed value | Description |
|---|---|---|
| ● Audio input bits, HBR (High Bit-Rate Audio) | | |
| L12 | H16 | 16 bit, HBR |
| | P16 | 16 bit, PCM |
| | _16 | 16 bit, Compressed audio other than HBR and PCM mode |
| | H20 | 20 bit, HBR |
| | P20 | 20 bit, PCM |
| | _20 | 20 bit, Compressed audio other than HBR and PCM mode |
| | H24 | 24 bit, HBR |
| | P24 | 24 bit, PCM |
| | _24 | 24 bit, Compressed audio other than HBR and PCM mode |
| | - - - | No input |
| ● Audio input status (Digital audio) | | |
| L13 | 000 | No audio input |
| | 001 | Being input detecting |
| | 002 | Normal input |
| | - - - | No input |
| ● Scrambling status of input signal | | |
| L20 | on | With scrambling (4K format except for YCbCr 4:2:0) |
| | oFF | No scrambling |
| | - - - | No input |
| ● TMDS clock ratio of input signal | | |
| L21 | 1_1 | 1/1 |
| | 1_4 | 1/4 (4K format except for YCbCr 4:2:0) |
| | - - - | No input |
| ● Stream type of input signal (with HDCP 2.2) | | |
| L22 | 000 | Type 0 |
| | 001 | Type 1 |
| | non | HDCP1.4, or no HDCP signal |
| | - - - | No input |

## 8.4.2 [ L30 to Lbn ] Displaying output information

**[Table 8.9] Output information**

| Menu number | Displayed value | Description |
|---|---|---|
| ● Deep Color: sink device status | | |
| L30 to L3n[*] | 08 | 24 bit / pixel (8 bit / component) supported |
| | 10 | 30 bit / pixel (10 bit / component) supported |
| | 12 | 36 bit / pixel (12 bit / component) supported |
| | - - - | Not connected |
| ● Color space: sink device status | | |
| L40 to L4n[*] | rgb | RGB supported |
| | 422 | YCbCr 4:2:2 supported |
| | 444 | YCbCr 4:4:4 supported (4K@50 / 59.94 / 60 (YCbCr 4:2:0) included) |
| | 444_420 | Scroll display Up to YCbCr 4:2:0 if the sink device resolution is 4K@50 / 59.94 / 60. |
| | - - - | Not connected |
| ● Color space: output status | | |
| L50 to L5n[*] | rgb | RGB output |
| | 422 | YCbCr 4:2:2 output |
| | 420 | YCbCr 4:2:0 output |
| | 444 | YCbCr 4:4:4 output |
| | - - - | Not connected |
| ● Hot plug detection status | | |
| L60 to L6n[*] | on | With Hot plug detection |
| | oFF | Without Hot plug detection |
| ● HDMI / DVI sink device status | | |
| L70 to L7n[*] | HC | HDMI (Compressed audio supported) |
| | HP | HDMI (PCM audio supported) |
| | d | DVI (Audio not supported) |
| | - - - | Not connected |
| ● HDCP authorization | | |
| L80 to L8n[*] | 000 | None |
| | 001 | Being authorized |
| | 002 | |
| | 003 | |
| | 004 | Authorization ended normally |
| | 005 | Authorization ended abnormally |
| ● HDCP status | | |
| L90 to L9n[*] | 1.4 | HDCP supported (HDCP 1.4) |
| | 2.2 | HDCP supported (HDCP 2.2) |
| | oFF | HDCP not supported or no HDCP signals |
| | - - - | Not connected |

[*] VAC-2000UHD : n = 1,VAC-4000UHD : n = 3

| Menu number | Displayed value | Description |
|---|---|---|
| ● SCDC sink device | | |
| LA0 to LAn[*] | on | SCDC supported |
| | oFF | SCDC not supported |
| | - - - | Not connected |
| ● Scrambling output status | | |
| Lb0 to Lbn[*] | on | With scrambling |
| | oFF | Without scrambling |
| | - - - | Not connected |
| ● HDR sink device status | | |
| Lc0 to Lcn* | on | HDR supported |
| | oFF | HDR not supported |
| | - - - | Not connected |
| ● 3D sink device status | | |
| Ld0 to Ldn* | on | 3D supported |
| | oFF | 3D not supported |
| | - - - | Not connected |

[*] VAC-2000UHD : n = 1,VAC-4000UHD : n = 3

# 9 Specifications

## 9.1 Pin assignments

### 9.1.1 HDMI TypeA connector
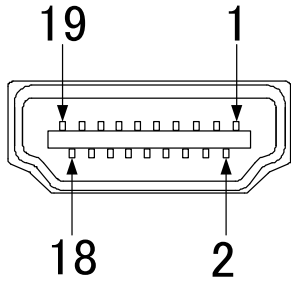
| Pin # | Signal | Pin # | Signal |
|---|---|---|---|
| 1 | TMDS data2+ | 10 | TMDS clock+ |
| 2 | TMDS data2shield | 11 | TMDS clock shield |
| 3 | TMDS data2- | 12 | TMDS clock |
| 4 | TMDS data1+ | 13 | CEC |
| 5 | TMDS data1shield | 14 | Backup (N.C.) |
| 6 | TMDS data1- | 15 | SCL |
| 7 | TMDS data0+ | 16 | SDA |
| 8 | TMDS data0shield | 17 | DDC / CEC ground |
| 9 | TMDS data0- | 18 | +5 power supply |
|  |  | 19 | Hot plug Detect |

N.C.:No Connection

**[Fig. 9.1] HDMI Type A pin assignments**

# 9.2  Product specification

## ■  VAC-2000UHD

| Item | | | | Description |
|---|---|---|---|---|
| Input | Video | Digital | Number / Signal | 1 input / HDMI, DVI 1.0 (HDCP 1.4 / 2.2) (*1) / HDR (*2) / 3D (*3) / x.v.Color<br>- TMDS single link<br>- TMDS clocks: 25 MHz to 300 MHz<br>- Dot clocks: 25 MHz to 600 MHz<br>- TMDS data rate: 0.75 Gbps to 18 Gbps |
| | | | Connector | 1 female HDMI Type A |
| | | Others | | Color depth : 24 bit, 30 bit, 36 bit    Deep Color (*5) |
| | | Formats | | VGA to 4K (*4)<br>480i / 480p / 576i / 576p / 720p / 1080i / 1080p / 4K (*4) |
| | Audio | Digital | Number / Signal | 1 input / Multi-channel LPCM up to 8 channels<br>- Sampling frequency: 32kHz to 192kHz<br>- Sample Size: 16bit to 24bit<br>- Reference level: -20 dBFS<br>- Max. input level: 0 dBFS |
| | | | Connector | 1 female HDMI Type A |
| Output | Video | Digital | Number / Signal | 2 outputs / HDMI, DVI 1.0 (HDCP 1.4 / 2.2) (*1) / HDR (*2) / 3D (*3) / x.v.Color<br>- TMDS single link<br>- TMDS clocks: 25 MHz to 300 MHz<br>- Dot clocks: 25 MHz to 600 MHz<br>- TMDS data rate: 0.75 Gbps to 18 Gbps |
| | | | Connector | 2 female HDMI Type A |
| | | Others | | Color depth : 24 bit, 30 bit, 36 bit    Deep Color (*5) |
| | | Formats | | VGA to 4K (*4)<br>480i / 480p / 576i / 576p / 720p / 1080i / 1080p / 4K (*4) |
| | Audio | Digital | Number / Signal | 2 outputs / Multi-channel LPCM up to 8 channels<br>- Sampling frequency: 32kHz to 192kHz<br>- Sample Size: 16bit to 24bit<br>- Reference level: -20 dBFS<br>- Max. output level: 0 dBFS |
| | | | Connector | 2 female HDMI Type A |
| | | Analog | Number / Signal | 1 output / Stereo L/R unbalanced signals (*6)<br>- Output impedance: 75 Ω,<br>- Reference level: -10 dBu<br>- Max. output level: +10 dBu |
| | | | Connector | 1 RCA jack |
| Plug & Play | | | | DDC2B<br>(built-in EDID / EDID copied from monitors / can be selected from EDID of connected monitors)<br>Built-in EDID: the maximum resolution can be selected. |
| Max. Cable distance | | Input | | 1080p@60: 131 ft. (40 m), 4K@60: 39 ft. (12 m) (*7) |
| | | Output | | 1080p@60: 131 ft. (40 m), 4K@60: 39 ft. (12 m) (*7) |
| Functions | Contents | | | Audio A/D and D/A conversion, Anti-snow (*8), De-embedded audio from HDMI signal,<br>DDC buffer, 7 segment LED signal status check, Connection Reset (*9), Key lock |
| Others | Power | | | 100 - 240 VAC ± 10 %, 50 Hz/60 Hz ± 3 Hz |
| | Power consumption | | | About 8 Watts |
| | Dimensions | | | 8.3 x 1.7 x 7.9' (210 (W) x 44 (H) x 200 (D) mm)<br>(EIA 1U high, half rack wide) (Excluding connectors and the like) |
| | Weight | | | 3.3 lbs. (1.5kg) |
| | Temperature | | | Operating: 32°F to 104°F / 0°C to +40°C<br>Storage: -4°F to 176°F / -20°C to +80°C |
| | Humidity | | | Operating / Storage humidity: 20 % to 90 % (Non Condensing) |

*1   ARC and HEC are not supported. CEC: Pass through between IN and OUT1
*2   HDR will be supported when you connect HDR supported corresponding sink device and select external EDID setting, or when you copy EDID of HDR supported sink device by selecting EDID copy setting. If the unit supports HRD, all output signals from the unit are HDR supported signals.
*3   3D will be supported when you connect 3D supported corresponding sink device and select external EDID setting, or when you copy EDID of 3D supported sink device by selecting EDID copy setting. If the unit supports 3D, all output signals from the unit are 3D supported signals.
*4   4K format: 24 Hz / 25 Hz / 30 Hz / 50 Hz (4:4:4) / 59.94 Hz (4:4:4) / 60 Hz (4:4:4) are supported.
*5   4K format: following color depth are supported.
      ・24 Hz / 25 Hz / 30 Hz: 24 bit, 30 bit, 36 bit (RGB, YCbCr 4:4:4, YCbCr 4:2:2)
      ・50 Hz / 59.94 Hz / 60 Hz : 24 bit, 30 bit, 36 bit (YCbCr 4:2:2, YCbCr 4:2:0)
                                : 24 bit (RGB, YCbCr 4:4:4)
*6   Analog audio output supports only 2 channel linear PCM.
*7   The maximum cable distance varies depending on the connected devices and was measured under following conditions:
      ・1080p@60: when IDK's AWG24 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 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.
*9   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.

■    **VAC-4000UHD**

| Item | | | Description |
|---|---|---|---|
| Input | Video | Digital — Number / Signal | 1 input / HDMI, DVI 1.0 (HDCP 1.4 / 2.2) (*1) / HDR (*2) / 3D (*3) / x.v.Color<br>- TMDS single link<br>- TMDS clocks: 25 MHz to 300 MHz<br>- Dot clocks: 25 MHz to 600 MHz<br>- TMDS data rate: 0.75 Gbps to 18 Gbps |
| | | Digital — Connector | 1 female HDMI Type A |
| | | Others | Color depth : 24 bit, 30 bit, 36 bit    Deep Color (*5) |
| | | Formats | VGA to 4K (*4)<br>480i / 480p / 576i / 576p / 720p / 1080i / 1080p / 4K (*4) |
| | Audio | Digital — Number / Signal | 1 input / Multi-channel LPCM up to 8 channels<br>- Sampling frequency: 32kHz to 192kHz<br>- Sample Size: 16bit to 24bit<br>- Reference level: -20 dBFS<br>- Max. input level: 0 dBFS |
| | | Digital — Connector | 1 female HDMI Type A |
| Output | Video | Digital — Number / Signal | 4 outputs / HDMI, DVI 1.0 (HDCP 1.4 / 2.2) (*1) / HDR (*2) / 3D (*3) / x.v.Color<br>- TMDS single link<br>- TMDS clocks: 25 MHz to 300 MHz<br>- Dot clocks: 25 MHz to 600 MHz<br>- TMDS data rate: 0.75 Gbps to 18 Gbps |
| | | Digital — Connector | 4 female HDMI Type A |
| | | Others | Color depth : 24 bit, 30 bit, 36 bit    Deep Color (*5) |
| | | Formats | VGA to 4K (*4)<br>480i / 480p / 576i / 576p / 720p / 1080i / 1080p / 4K (*4) |
| | Audio | Digital — Number / Signal | 4 outputs / Multi-channel LPCM up to 8 channels<br>- Sampling frequency: 32kHz to 192kHz<br>- Sample Size: 16bit to 24bit<br>- Reference level: -20 dBFS<br>- Max. output level: 0 dBFS |
| | | Digital — Connector | 4 female HDMI Type A |
| | | Analog — Number / Signal | 1 output / Stereo L/R unbalanced signals (*6)<br>- Output impedance: 75 Ω,<br>- Reference level: -10 dBu<br>- Max. output level: +10 dBu |
| | | Analog — Connector | 1 RCA jack |
| Plug & Play | | | DDC2B<br>(built-in EDID / EDID copied from monitors / can be selected from EDID of connected monitors)<br>Built-in EDID: the maximum resolution can be selected. |
| Max. Cable distance | | Input | 1080p@60: 131 ft. (40 m), 4K@60: 39 ft. (12 m) (*7) |
| | | Output | 1080p@60: 131 ft. (40 m), 4K@60: 39 ft. (12 m) (*7) |
| Functions | Contents | | Audio A/D and D/A conversion, Anti-snow (*8), De-embedded audio from HDMI signal<br>DDC buffer, 7 segment LED signal status check, Connection Reset (*9), Key lock |
| Others | Power | | 100 - 240 VAC ± 10 %, 50 Hz/60 Hz ± 3 Hz |
| | Power consumption | | About 12 Watts |
| | Dimensions | | 8.3 x 1.7 x 7.9' (210 (W) x 44 (H) x 200 (D) mm)<br>(EIA 1U high, half rack wide) (Excluding connectors and the like) |
| | Weight | | 3.3 lbs. (1.5kg) |
| | Temperature | | Operating: 32°F to 104°F / 0°C to +40°C<br>Storage: -4°F to 176°F / -20°C to +80°C |
| | Humidity | | Operating / Storage humidity: 20 % to 90 % (Non Condensing) |

*1    ARC and HEC are not supported. CEC: Pass through between IN and OUT1
*2    HDR will be supported when you connect HDR supported corresponding sink device and select external EDID setting, or when you copy EDID of HDR supported sink device by
        selecting EDID copy setting. If the unit supports HRD, all output signals from the unit are HDR supported signals.
*3    3D will be supported when you connect 3D supported corresponding sink device and select external EDID setting, or when you copy EDID of 3D supported sink device by
        selecting EDID copy setting. If the unit supports 3D, all output signals from the unit are 3D supported signals.
*4    4K format: 24 Hz / 25 Hz / 30 Hz / 50 Hz (4:4:4) / 59.94 Hz (4:4:4) / 60 Hz (4:4:4) are supported.
*5    4K format: following color depth are supported.
        ・24 Hz / 25 Hz / 30 Hz: 24 bit, 30 bit, 36 bit (RGB, YCbCr 4:4:4, YCbCr 4:2:2)
        ・50 Hz / 59.94 Hz / 60 Hz : 24 bit, 30 bit, 36 bit (YCbCr 4:2:2, YCbCr 4:2:0)
                                        : 24 bit (RGB, YCbCr 4:4:4)
*6    Analog audio output supports only 2 channel linear PCM.
*7    The maximum cable distance varies depending on the connected devices and was measured under following conditions:
        ・1080p@60: when IDK's AWG24 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 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.
*9    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.

# 10 Troubleshooting

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

- Are this device and the connected devices turned on normally?
- Are cables connected correctly?
- Are there no loose connections?
- Are cables that are appropriate to this device being used?
- For 4K format, is an 18 Gbps ultra-high-speed cable used?
- Are signal specifications of connected devices matched to each other?
- Are settings of the sink device correct?
- Are there any close objects that may cause noise?

If the problem still cannot be solved, check the items in the table below. Please refer to manuals of connected devices as well, since they may possibly cause the problem.

| Problem | Check item | Page |
|---|---|---|
| ● Video output | | |
| Video is not output | [1]  Verify that the EDID resolution setting of the VAC is set to the input resolution supported by the display device.<br>・The EDID resolution is set to 1080p by default, but some TVs do not support that resolution.<br>・If the EDID resolution is set to 1080i, the video may not be output to the display device that does not support the interlaced signals.<br>・Some monitors for PCs do not support the resolutions for TVs. Some<br>LCD TVs do not support PC resolutions (VGA to QWXGA). | 20 [ F10 ] |
| | [2]  Does "SIGNAL LED" of the front panel light?<br>If the "SIGNAL" LED lights, check [3] to [8]; if the LED turns off, check [9] and [11]. | 11 |
| | [3]  Does the input signals authenticate HDCP?<br>Check the input HDCP authentication.<br>    1.4: Signals protected by HDCP 1.4.<br>    2.2: Signals protected by HDCP 2.2.<br>    oFF: Signals whose copyright is not protected. | 35 [ L03 ] |
| | [4]  Does the sink device support HDCP?<br>Check the HDCP supporting status.<br>If the check result is different from that of [3], video is not displayed. Please note the HDCP supporting status depends on each connecter of the sink device.<br>"oFF" or "- - -": The resolution of the sink device may not be supported; check the specification of the sink device.<br>If the video does not required HDCP, you can also disable HDCP output to the source device by setting the VAC. | 38 [ L90 ]<br><br><br><br><br><br><br>31 [ C01 ] |

| Problem | Check item | Page |
|---|---|---|
| | [5]　Is an unsupported resolution is input to the sink device?<br>Check the resolution and video frequency.<br>Some resolutions of sink device are not supported; check the specification of the sink device. | 35 [ L07 ] |
| | [6]　Does the sink device support SCDC?<br>①Check the TMDS clock ratio of input signals.<br>・1_4: SCDC signals<br>・1_1: Not SCDC signals → This problem occurs due to another problem<br>②Check the SCDC supported status of the sink device.<br>・　on: SCDC is supported.<br>・oFF: SCDC is not supported → video is not displayed. | 37 [L21]<br><br>39 [LAn] |
| | [7]　①Check the stream type of input signals.<br>・000: Video is authorized to be displayed to all devices supporting HDCP 1.4,HDCP 2.2.<br>・001: Video is authorized to be displayed only to devices supporting HDCP 2.2.<br>②Check the HDCP supported status. | 37 [L22]<br><br>38 [ L90 ] |
| | [8]　Change the setting of Hot plug ignoring time. | 32 [ C1n ] |
| | [9]　If a long cable is connected for input or output, replace it with a 5 meter/16.4 feet or shorter cable. A 5 meter/16.4 feet or longer cable can be connected for digital input/output for the VAC, but some cables fail HDCP authorization or EDID acquisition depending on the quality of the cable and connected devices.<br>For 4K format, see "5 Sample application". | 13 |
| | [10]　Verify that No-signal input monitoring time ([F16]) is not short. | 24 [ F16 ] |
| | [11]　Check the video output setting of the source device. | － |

| Problem | Check item | Page |
|---|---|---|
| Interference or noise appears on video. | If a long cable is connected for input or output, replace it with a 16.4 ft./5 m or shorter cable.<br>Even though a 5 m/16.4 feet cable can be connected since the VAC has compensation circuit for digital input and output, it cannot deliver its full performance depending on the cable quality and connected devices. If the problem is solved by the replacement with a shorter cable, the signals may have been deteriorated because of the long-distance transmission. IDK provides high-quality cables, boosters, and cable extenders. Please contact us as needed.<br>For 4K format, see "5 Sample application". | 13 |
| | The transmission clock of Deep Color signals are faster than normal signals. If a poor-quality or long cable is connected when signals are input or output, noise may appear on the video.<br>Deep Color can be controlled by the EDID setting. | 25 [ F20 ] |
| Video blinks. | If interlace signals are input to a sink device that does not support interlace signals, the video blinks. Check the supported resolution of the sink device. | 20 [ F10 ] |
| Video edges (up/down/right/left) are cut out. | Some sink devices display input video in overscan, and the video may be cut out. Check the display setting of the sink device. | — |
| Video is distorted horizontally or vertically. | Some sink devices display input video on full screen, and the aspect ratio cannot be kept. Check the display setting of the sink device.<br>With some resolutions, full-screen display cannot be avoided. In that case, change the output resolution of the source device. | — |
| Black bars appear on PC images.<br>Only part of the PC image is displayed, and the rest of the image is displayed by moving the mouse. | If the PC has the Panel Fit function, select "Scale Full Screen".<br>If the resolution that is set for the PC and the resolution that is actually output from the PC are not matched, those problems may occur. Check the resolution of the PC and the EDID resolution setting. | 20 [ F10 ] |
| The dual monitor function cannot be set or it is canceled automatically. | When the No-signal input monitoring function works, the dual monitor function may not be enabled correctly. In this case, turn off this monitoring function. | 24 [ F16 ] |

| Problem | Check item | Page |
|---|---|---|
| ● Audio output | | |
| Video is displayed, but audio is not output. | Verify that audio output is turned on. | 29 [ F7n ] |
| | If there are multiple output connectors in the source device, check the audio output setting of the source device. | ― |
| | Verify that audio whose format is supported by the connected sink device is input. Especially, LCD monitors may not output 88.2 kHz or higher linear PCM and compressed audio (such as Dolby Digital and DTS). In order to play a Blu-ray disc having compressed audio, check the audio output setting of the source device. You can also control audio signals that will be output from the source device by setting EDID. | 25 [ F22 ] to 27 [ F34 ] |
| | Verify that DVI signals are not being output from the source device. | ― |
| Even though multi-channel audio is played, only audio signals of 2 channels are output. | For multiple channel play, change the EDID setting which is set to 2 channels by default. | 28 [ F36 ] |
| Audio is output from HDMI output, but it is not output from analog audio output. | If compressed audio (such as Dolby Digital and DTS) is input, analog audio is not output. Only 2-channel linear PCM is supported for analog audio output. | 25 [ F22 ] to 27 [ F34 ] |
| Audio is output from analog audio output, but it is not output from HDMI output. | Verify that audio output is set to ON. | 29 [ F7n ] |
| | Verify that audio can be output by the connected sink device with the selected resolution. If an output resolution for PCs (VGA to WQXGA is selected, the sink device may not output audio. | 20 [ F10 ] |
| | Verify that the selected sampling frequency is supported by the connected sink device. Some LCD monitors cannot output high-sampling frequency audio (88.2kHz or higher). Audio signals output from the source device can be controlled by setting EDID. | 25 [ F22 ] to 27 [ F34 ] |
| Compressed audio (such as Dolby Digital and DTS) is not output from the source device. | Inputting compressed audio is limited by the EDID setting(factory default). In order to use compressed audio, change the EDID setting. | 25 [ F22 ] to 27 [ F34 ] |
| | Check the audio output setting of the source device. | ― |
| ● Others | | |
| Devices cannot be controlled by CEC. | If you use CEC, enable the HDMI link control function of devices to be connected to the VAC, such as LCD TVs and Blu-ray disk recorders. | ― |
| | Connect the desired sink device to OUT1. If connecting to another connector, the device cannot be controlled. | ― |

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

1. The problem occurs in all connectors?

2. Connect devices using genuine cables without connecting the VAC
   (no VAC between the source and display devices).

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