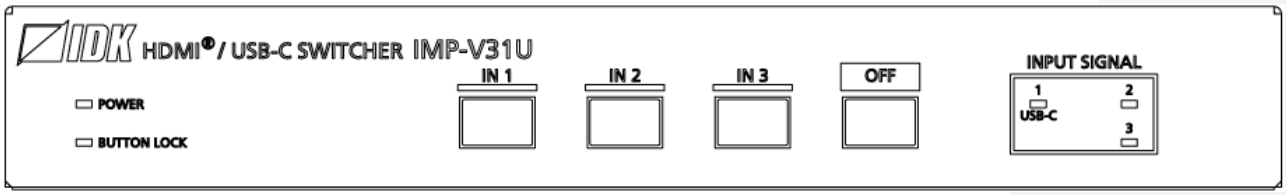
HDMI/USB-C Switcher

IMP-V31U

User Guide
Ver.1.1.0



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

IDK Corporation

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

About technical documentation

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

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

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

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

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FCC STATEMENT

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

(Class A)

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

Unique Identifier

Type of Equipment: HDMI/USB-C Switcher
Model Name: IMP-V31U

Responsible Party – U.S. Contact Information

Company Name: IDK America Inc.
Address: 72 Grays Bridge Road Suite 1-C, Brookfield, CT 06804
Telephone number: +1-203-204-2445
URL: www.idkav.com

FCC Compliance Statement

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

(FCC SDoC)

CE MARKING

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

WEEE MARKING

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

Safety Instructions

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

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

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

Warning

For lifting heavy products:

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

For installing and connecting products:

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

⚠ Warning

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

For operating products:

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

If the following problem occurs:

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

⚠ Caution

For installing and connecting products:

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

For operating products:

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

Contents

About this Guide

This guide describes features, notes, and configurations of the IMP-V31U HDMI/USB-C Switcher (hereafter referred to as IMP-V).

Conventions

- The following terms are used in this guide.
  PC : Personal computer
  OUT A : OUT A connector
  OUT B : OUT B connector
  INOFF : Input channel OFF
- The following symbols are used in this guide.
  [ ] : Menus and messages displayed on the front display and a WEB GUI.
  “ ” : Reference
- The following notification is used in this guide.
  Note : Addresses practices not related to personal injury, such as restrictions and attention.

About this Product

The IMP-V is an HDMI and USB-C switcher having three (3) inputs and two (2) distributed outputs.

This IMP switcher includes two (2) HDMI and one (1) USB-C video inputs that will support up to 4K@60 video resolution. The selected input video signal can be distributed to both HDMI and USB-C video outputs simultaneously. The video signal from the USB-C output can be fed to a PC and be used to present content in various video conferencing applications. With built-in scan converter, the resolution of the USB-C output can be selected from the connected PC.

For audio input, the IMP-V provides two (2) HDMI, one (1) USB-C, and one (1) analog audio inputs. Analog audio can be mixed with digital audio of the selected input channel. The selected input audio signals are distributed to both HDMI and USB-C outputs.

The switcher also includes RS-232C and LAN as communication ports that offer remote setting from WEB browser or control commands.

Basic menus and Advanced menus

The menu consists of basic and advanced menus.
The advanced menus are not displayed by default. To display advanced menus, set [SYSTEM SETTINGS] →[ADVANCED MENU] to [ON].
【Advanced menu display (P.34)】

〇: Basic menu
⦿: Advance menu

〇	OUTPUT SETTINGS		Output video	14
	〇	SIGNAL OUTPUT	Video signal output	14
	〇	VIDEO MUTE	Video mute	14
	⦿	DDC POWER CONTROL	DDC 5 V signal output for when no video signal is input	14
	⦿	SIGNAL FORMAT	Signal format	15
	⦿	FOLLOW SINK EDID	Automatic determining sink device EDID	16
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〇	OUTPUT AUDIO SETTINGS		Output audio	21
	〇	MUTE	Mute	22
	〇	MIXING	Mixing	22
	⦿	AUDIO ONLY OUTPUT	Output audio for when no video signal is input	22

〇	INPUT AUDIO SETTINGS		Input audio	23
	〇	AUDIO LEVEL	Audio level	23
	⦿	STABLE WAIT	Stable wait (Audio signal)	23

Menu

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

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

Output video

Video signal output

Menu	OUTPUT SETTINGS→SIGNAL OUTPUT	@GVO/@SVO
Parameter	OUT A, OUT B	
Value	ON, OFF	

[OFF] : Stops outputting video signal and DDC 5 V signal electrically.

If [OFF] is selected, some devices may switched into standby mode.

Video mute

Menu	OUTPUT SETTINGS→VIDEO MUTE	@GDB/@SDB
Parameter	OUT A, OUT B	
Value	ON, OFF	

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

DDC 5 V signal output for when no video signal is input

You can set the DDC 5 V signal output when an input channel without video signal is selected or [OFF] is selected.

Menu	OUTPUT SETTINGS→DDC POWER CONTROL	Advanced	N/A
Parameter	OUT A		
Value	ON, 0 s to 60 s		

[ON] : Outputs DDC 5 V signal at all time.
[0 s] to [60 s] : Disconnects DDC 5 V signal after the specified time passes.

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

Signal format

Menu	OUTPUT SETTINGS→SIGNAL FORMAT	Advanced	N/A
Parameter	OUT A		
Value	FOLLOW SOURCE, HDMI YCbCr 4:4:4 MODE, HDMI YCbCr 4:2:2 MODE, HDMI YCbCr 4:2:0 MODE, HDMI RGB MODE, DVI MODE		

[FOLLOW SOURCE] : The input video format has priority.
Outputs HDMI signal even if "**Mixing (P.22)**" is set to [ANALOG INPUT] or [D/A MIX] and DVI signal is input.

[HDMI YCbCr 4:4:4 MODE] : HDMI YCbCr 4:4:4 has priority.

[HDMI YCbCr 4:2:2 MODE] : HDMI YCbCr 4:2:2 has priority.

[HDMI YCbCr 4:2:0 MODE] : HDMI YCbCr 4:2:0 has priority.
Enable only for input resolutions of 4K@50/59.94/60.
If the sink device does not support HDMI YCbCr 4:2:0 or the input resolution is 4K@30 or lower, video is output at the priority of [FOLLOW SOURCE].

[HDMI RGB MODE] : HDMI RGB ha priority.

[DVI MODE] : Outputs DVI signal.
Enable only for input resolutions 4K@30 or lower.

Note

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

Automatic determining sink device EDID

The setting below is determined automatically according to the IMP-V settings and sink device EDID.
【Signal format (P.15)】

Menu	OUTPUT SETTINGS→FOLLOW SINK EDID	Advanced	N/A
Parameter	OUT A		
Value	ON, OFF		

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

Notes

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

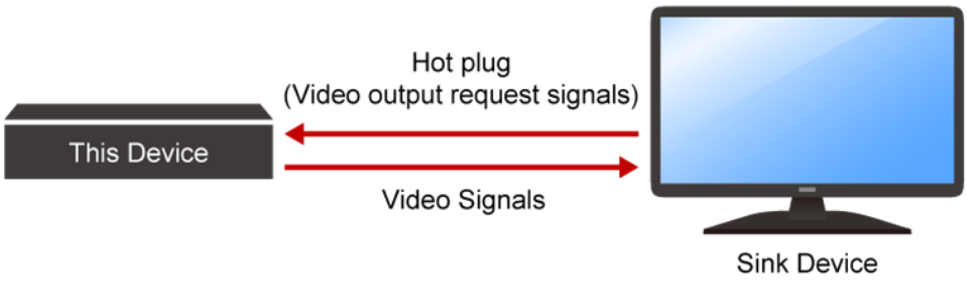
Hot plug ignoring duration

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

Menu	OUTPUT SETTINGS→HOTPLUG MASK	Advanced	N/A
Parameter	OUT A		
Value	OFF, 2s to 15s		

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

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



Input

Hot plug output for when no active video signal is input

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

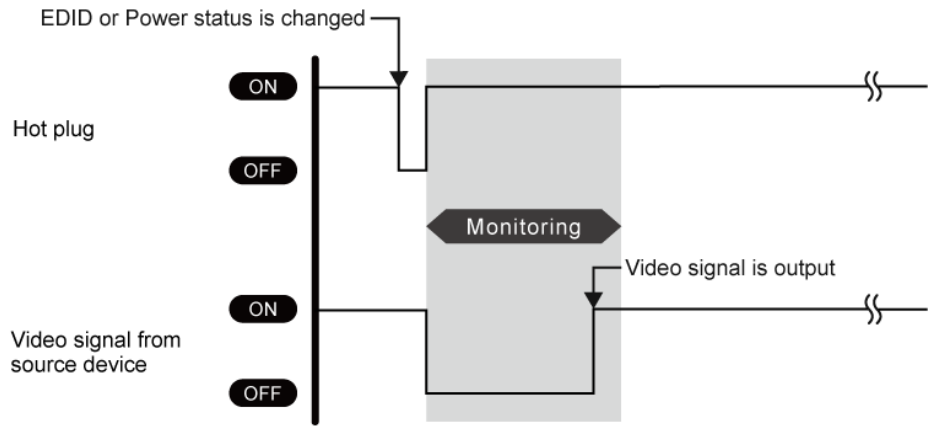
Menu	INPUT SETTINGS→NO INPUT MONITORING	Advanced	N/A
Parameter	IN1 to IN3		
Value	OFF, 2s to 15s (10s) (by 1s)		

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

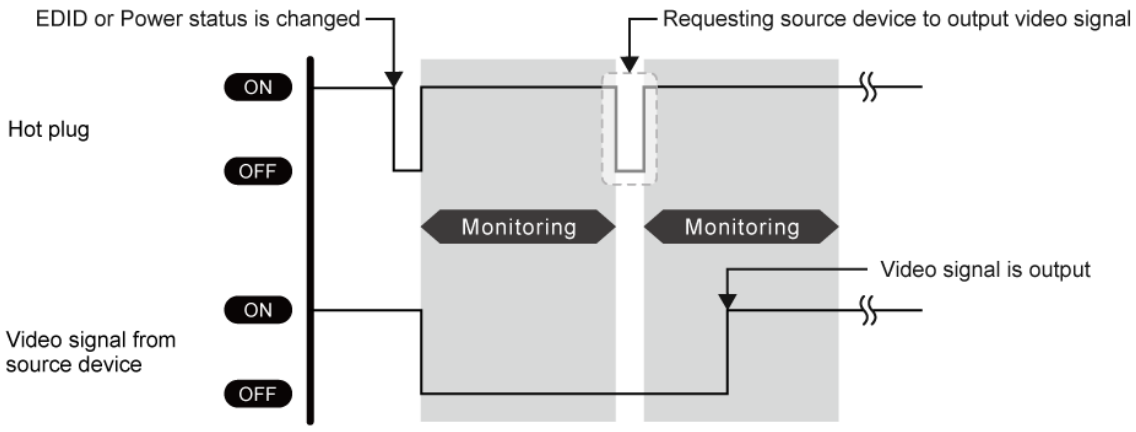
[2s] to [15s] : Requests the source device to output video signal after the specified monitoring time if there is no active input signal.

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

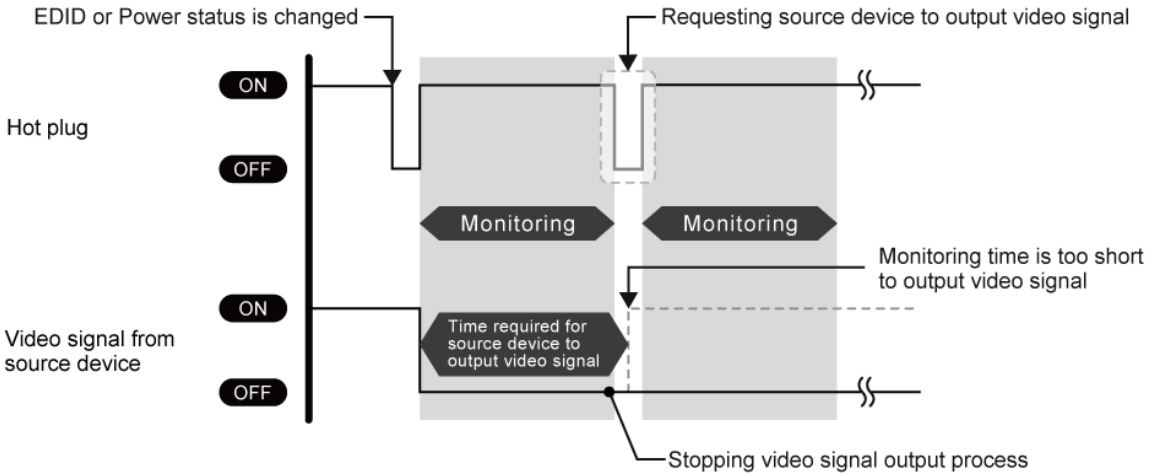
■ **Example: Video signal is output within the specified monitoring time**



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



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



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

Note

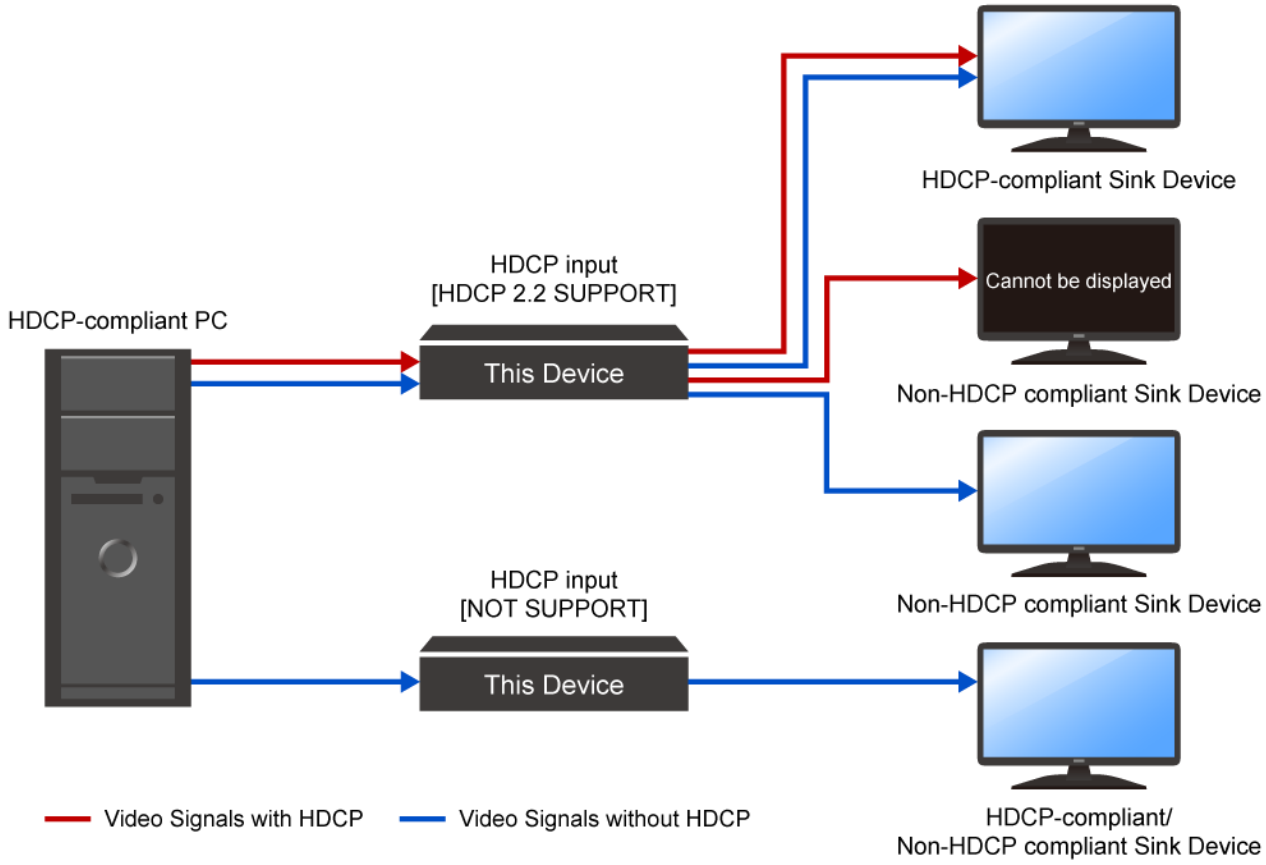
If the source device, such as a PC, disables the monitor power-saving or dual monitor features, set this setting to [OFF].

HDCP input

Menu	INPUT SETTINGS→HDCP INPUT	Advanced	@GHE/@SHE
Parameter	IN2, IN3		
Value	HDCP 2.2 SUPPORT, HDCP 1.4 SUPPORT, NOT SUPPORT		

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

Some source devices negotiate with the connected device to determine if HDCP encryption is supported. After this negotiation, the source device determines whether HDCP signal encryption is enforced or not. This process takes place with some source device, even if the content being presented is not copyright protected. The IMP-V31U is HDCP compliant, if it is connected to a display device that does not support HDCP, unprotected AV content may not be successfully displayed. Under these circumstances and if the content is indeed not protected, the problem can be solved by setting this menu to [NOT SUPPORT].



Note

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

Input channel automatic switching

When video input signal is detected/disconnected, the IMP-V31U automatically switches input channel to the one having highest priority of input channel that has active video input signal.

Automatic switching priority for when a video input signal is detected

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

Menu	AUTO SWITCHING→SIGNAL ON PRIORITY	Advanced	@GAU/@SAU
Parameter	IN1 to IN3		
Value	OFF (Disabled), 1 (Highest) to 3 (Lowest)		

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

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

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

Automatic switching priority for when no active video signal is input

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

Menu	AUTO SWITCHING→SIGNAL OFF PRIORITY	Advanced	@GOF/@SOF
Parameter	IN1 to IN3, INOFF		
Value	OFF (Disabled), 1 (Highest) to 4 (Lowest)		

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

Ignoring duration after automatic switching

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

Menu	AUTO SWITCHING→IGNORING DURATION	Advanced	N/A
Parameter	—		
Value	0s to 10s		

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

Output audio

The following audio formats are supported:

Digital audio input/output of HDMI connectors : Multi-channel audio and bitstream audio
Digital audio input/output of USB connector : 2-channel LPCM

■ Inputting and outputting LPCM signal

If digital audio input is LPCM, input analog audio can be mixed.

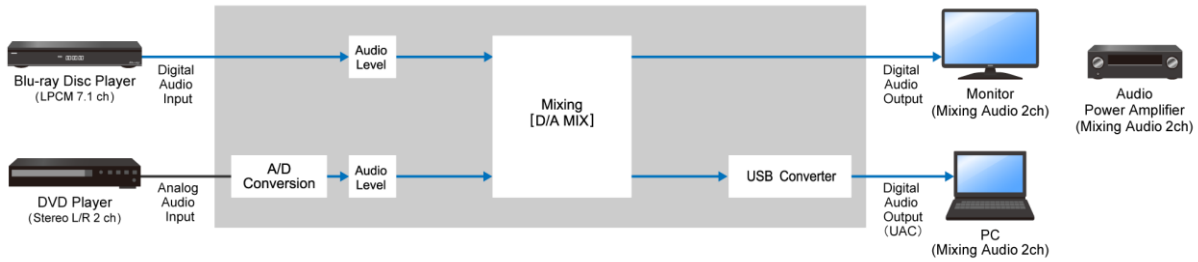
Output audio can be set in "**Mixing (P.22)**". If [DIGITAL INPUT] is selected, only digital audio input can be output and the setting of "**Audio level (P.23)**" will be disabled.

Digital output audio of HDMI connectors supports multi-channel audio while that of the USB connector supports 2-channel audio. If digital input audio is multi-channel audio, the audio of the USB output connector is 2-channel downmixed audio.

If [ANALOG INPUT] is selected for "**Mixing (P.22)**", only analog audio input is output.
Digital audio output of HDMI connector and the USB connector are 2-channel audio.

If [D/A MIX] is selected for "**Mixing (P.22)**", analog input audio can be mixed to digital input audio.
Digital output audio of HDMI connectors and the USB connector are 2-channel audio.
If digital audio input is multi-channel audio, mixed audio of 2-channel downmixed audio and analog input audio is output.

The sampling frequency of digital output audio for analog input audio only or mixed audio is 48 KHz.



■ Inputting and outputting bitstream audio

If bitstream audio is input, analog input audio cannot be mixed.
If [D/A MIX] is selected for "**Mixing (P.22)**", only digital audio can be output and the setting of "**Audio level (P.23)**" will be disable.
Bitstream audio cannot be output to the digital audio to the USB connector.

Mute

You can mute/unmute the output audio.

Menu	OUTPUT AUDIO SETTINGS→MUTE	@GAM/SAM
Parameter	OUT A, OUT B	
Value	ON (Muted), OFF	

Mixing

You can set the audio to be output.

Menu	OUTPUT AUDIO SETTINGS→MIXING	N/A
Parameter	—	
Value	DIGITAL INPUT, ANALOG INPUT, D/A MIX	

[DIGITAL INPUT] : Outputs digital input audio of the selected input channel.
[ANALOG INPUT] : Outputs analog input audio
[D/A MIX] : Outputs mixed audio of digital input audio of the selected input channel and analog input audio

Output audio for when no video signal is input

You can set the output audio for when an input channel without video signal is selected or [INOFF]

Menu	OUTPUT AUDIO SETTINGS→AUDIO ONLY OUTPUT	Advanced	N/A
Parameter	—		
Value	ON, OFF		

[ON] : Outputs audio.
[OFF] : Does not output audio or video.

If [ON] is selected, the audio output depends on the setting of “**Mixing (P.22)**”. For the video signal, black is output at the optimal resolution from the EDID of the sink device connected to OUT A. In this case, the setting of “**DDC 5 V signal output for when no video signal is input (P.14)”** will be disabled.

Input audio

To enable multi-channel LPCM or bitstream audio, set audio format and speaker configuration in “**EDID (P.24)**”.
If bitstream audio is input, the following setting of “**Audio level (P.23)**” will be disabled:
【Audio level (P.23)】

Audio level

Menu	INPUT AUDIO SETTINGS→AUDIO LEVEL	@GSO/@SSO
Parameter	IN1 to IN3, ANALOG	
Value	-100dB to +10dB (0dB)	

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

Stable wait (Audio signal)

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

Menu	INPUT AUDIO SETTINGS→STABLE WAIT	Advanced	@GAW/@SAW
Parameter	IN1 to IN3		
Value	ON, OFF		

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

EDID

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

EDID selection

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

Menu	EDID SETTINGS→EDID SELECTION	@GED/@SED
Parameter	IN1 to IN3	
Value	BUILT-IN EDID, EXTERNAL EDID OUT A COPY DATA	

[BUILT-IN EDID] : Uses built-in EDID. You can change the following EDID information:
【Resolution (P.25)】
【Signal format (P.26)】
【Frame rate (P.27)】
【Deep Color (P.27)】
【LPCM audio (P.27)】
【Bitstream audio (P.28)】
【Speaker configuration (P.29)】

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

[COPY DATA] : Uses EDID that is saved to the IMP-V31U in “**Copying EDID (P.26)**”.
Available only if there is effective data, the saved name is displayed.

Resolution

You can set the resolution of the IMP-V31U for if "**EDID selection (P.24)**" is set to [BUILT-IN EDID].

Menu	EDID SETTINGS→RESOLUTION	@GVF/@SVF
Parameter	IN1 to IN3	
Value	See the table below. 3840x2160@60Hz 4:4:4	

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

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

*Not available for the IN1 USB input connector.

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

Copying EDID

EDID of sink device is read and saved to the IMP-V31U.

Menu	EDID SETTINGS→SINK DEVICE EDID COPY	N/A
Parameter	—	
Value	OUT A	

EDID of the sink device connected to OUT A is read and saved.
To use the saved EDID, set "**EDID selection (P.24)**".

If no sink device is connected to OUT A, a message, [UNCONNECTED], appears and data cannot be saved.

Signal format

You can set the signal format of the IMP-V31U for if "**EDID selection (P.24)**" is set to [BUILT-IN EDID].

Menu	EDID SETTINGS→SIGNAL FORMAT	Advanced	N/A
Parameter	IN1 to IN3		
Value	HDMI, DVI		

[HDMI] : Sets the IMP-V31U as an HDMI device.
[DVI] : Sets the IMP-V31U as an DVI device. Audio signal is not supported.

If selecting [DVI], the following settings will be disabled:
【Deep Color (P.27)】
【LPCM audio (P.27)】
【Bitstream audio (P.28)】
【Speaker configuration (P.29)】

Frame rate

You can set the vertical synchronous frequency (frame rate) of the IMP-V31U for if "**EDID selection (P.24)**" is set to [BUILT-IN EDID].

Menu	EDID SETTINGS→FRAME RATE	Advanced	N/A
Parameter	IN1 to IN3		
Value	60Hz, 50Hz		

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

Deep Color

You can set the color depth of the IMP-V31U for if "**EDID selection (P.24)**" is set to [BUILT-IN EDID] and "**Signal format (P.26)**" is set to [HDMI].

Menu	EDID SETTINGS→DEEP COLOR	Advanced	N/A
Parameter	IN1 to IN3		
Value	24-BIT COLOR, 30-BIT COLOR, 36-BIT COLOR		

If selecting [30-BIT COLOR] or [36-BIT COLOR] and the source device outputs video at 30 bit or 36 bit, it may cause noise on the video or signal may not be transmitted. In such a case, the problem may be solved by setting the color to [24-BIT COLOR].

LPCM audio

You can set the IMP-V31U's maximum sampling frequency of the LPCM audio for if "**EDID selection (P.24)**" is set to [BUILT-IN EDID] and "**Signal format (P.26)**" is set to [HDMI].

Menu	EDID SETTINGS→Linear PCM	Advanced	N/A
Parameter	IN1 to IN3		
Value	192kHz, 176.4kHz*, 96kHz, 88.2kHz, 48kHz, 44.1kHz, 32kHz		

* Not available for the IN1 USB input connector.

Bitstream audio

You can set the IMP-V31U's maximum sampling frequency of the Bitstream audio for if "**EDID selection (P.24)**" is set to [BUILT-IN EDID] and "**Signal format (P.26)**" is set to [HDMI].

Menu	EDID SETTINGS→AAC	Advanced	N/A
Parameter	IN2, IN3		
Value	OFF, 96kHz, 88.2kHz, 48kHz, 44.1kHz, 32kHz		

Menu	EDID SETTINGS→Dolby Digital	Advanced	N/A
Parameter	IN2, IN3		
Value	OFF, 48kHz, 44.1kHz, 32kHz		

Menu	EDID SETTINGS→Dolby Digital Plus	Advanced	N/A
Parameter	IN2, IN3		
Value	OFF, 48kHz, 44.1kHz, 32kHz		

Menu	EDID SETTINGS→Dolby TrueHD	Advanced	N/A
Parameter	IN2, IN3		
Value	OFF, 192kHz, 176.4kHz, 96kHz, 88.2kHz, 48kHz, 44.1kHz		

Menu	EDID SETTINGS→DTS	Advanced	N/A
Parameter	IN2, IN3		
Value	OFF, 96kHz, 48kHz, 44.1kHz, 32kHz		

Menu	EDID SETTINGS→DTS-HD	Advanced	N/A
Parameter	IN2, IN3		
Value	OFF, 192kHz, 176.4kHz, 96kHz, 88.2kHz, 48kHz, 44.1kHz		

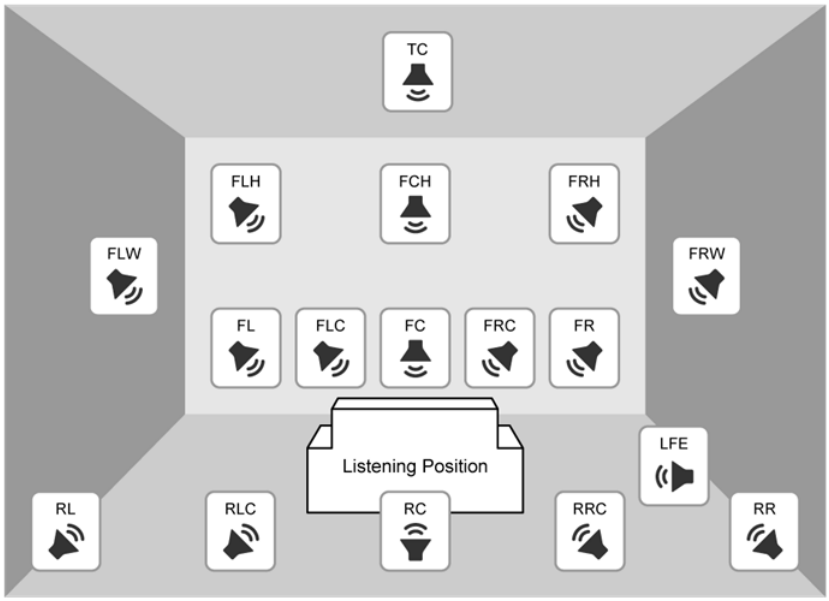
Speaker configuration

You can set the IMP-V31U's speaker configuration of multi-channel audio for if "**EDID selection (P.24)**" is set to [BUILT-IN EDID] and "**Signal format (P.26)**" is set to [HDMI].

Menu	EDID SETTINGS→SPEAKER CONFIGURATION		Advanced	N/A
Parameter	IN2, IN3			
	Mode	Number of speakers	Speaker configuration	
Value	AUTO	1 to 8 (2)	See the table below	
	MANUAL	1 to 8	ON, OFF* *Ony FL/FRare ON	

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

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



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

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

RS-232C

Communication setting

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

LAN

Network

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

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

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

MAC address

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

Automatic disconnection time (Timeout)

You can set the time to disconnect LAN communication automatically.

Menu	LAN SETTINGS→AUTO DISCONNECT	Advanced	@GLD/@SLD
Value	NOT DISCONNECT, 1 s to 180 s (30 s)		

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

Up to eight connections from an external device to the IMP-V31U can be set. The IMP-V31U disconnects the LAN communication if the IMP-V31U does not receive a command for the specified time.

Start-up settings

You can specify the settings for when the IMP-V31U is powered ON or starts up.

Input channel

You can set the input channel status for when the IMP-V31U is powered ON.

Menu	POWER ON SETTINGS→INPUT CHANNEL	Advanced	N/A
Value	IN1, to IN3, INOFF, LAST CHANNEL		

[INOFF] : Starts up with input channel OFF.
[LAST CHANNEL]: Starts up with the channel before the IMP-V31U is powered OFF.

Button security lockout

You can set the button security lockout when the IMP-V31U starts up.

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

[AUTO] : Starts up with the status before the IMP-V31U is powered OFF or switched into standby mode.
[LOCK] : Buttons are locked.
[UNLOCK] : Buttons are unlocked.

Configuring IMP-V31U

Advanced menu display

You can enable/disable the advanced menus.

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

For details of advanced menus, see “**Basic menus and Advanced menus (P.12)**”.

Initialization of all settings

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

Menu	SYSTEM SETTINGS→INITIALIZATION	Advanced	@CLR
Value	ALL, NORMAL		

[ALL] : Initializes all settings.
[NORMAL] : Initializes settings except for RS-232C and LAN communication settings.
【RS-232C (P.31)】 (Communication setting)
【LAN (P.32)】 (Network, Automatic disconnection time (Timeout))

Note

To restore settings, make a backup copy.

Status

You can view the statuses of I/O channel and the IMP-V31U.

Output signal status

Menu	VIEW STATUS→OUTPUT STATUS	@GSS

Available only for the HDMI output connector of OUT A.

■ **Resolution of output video signals ad HDCP authentication status**

[RESOLUTION] : Output resolution
(Horizontal resolution x Vertical resolution, Vertical synchronous frequency)
[HDMI/DVI] : HDMI/DVI signal
[HDCP AUTHENTICATION] : HDCP authentication status
[COLOR SPACE]
[DEEP COLOR]
[COLOR RANGE]

■ **Output video signal format**

[FORMAT] : Audio type
[SAMPLING FREQUENCY]
[CHANNEL] : The number of channels
[BIT LENGTH]

■ **Error status**

[VIDEO ERROR] : Error status of video output
[DIGITAL AUDIO ERROR] : error status of digital audio output

Video output error

Error message	Description
Video Mute	Video mute is set to [ON]. 【Video mute (P.14)】
Not DDC Power	DDC 5 V signal is not input or no source device is connected.
No Signal	No video signal is input. ・ May be solved by changing "**Hot plug output for when no active video signal is input (P.17)**" to longer. ・ Signal quality may be decreased due to cable length or cabling. ・ May be solved by limiting source device video output of EDID. 【Resolution (P.25)】 【Deep Color (P.27)】
AV Mute Received	Video output of source device is in mute status.
HDCP Video Mute	Signal with HDCP is input, but the sink device does not support HDCP. May be solved by setting "**HDCP (P.19)**" to [NOT SUPPORT].
Not AVIInfoFrame	The source device does not output required information (packets) for outputting video.
Dot Clock Over	Video signal that is not supported, such as out of dot clock range, is input. ・ May be solved by limiting source device video output of EDID. 【EDID selection (P.24)】
Channel OFF	Input selection is set to [OFF].

Digital audio output error

Error message	Description
Audio Mute	Audio mute is set to [ON]. 【Mute (P.22)】
Not DDC Power	DDC 5 V signal is not input or no source device is connected.
No Signal	No audio signal is input. ・ DVI signal does not include audio. ・ Limited to DVI signal input in EDID setting. 【Signal format (P.26)】
AV Mute Received	Audio output of source device is in mute status.
Not AUDInfoFrame	The source device does not input required information (packets) for outputting audio.
Compressed Audio	Bitstream audio is input, but the sink device does not support the format. ・Can be solved by limiting audio output of the source device EDID. 【EDID selection (P.24)】 【Bitstream audio (P.28)】
DVI Mode	DVI signal is output. DVI signal does not include audio. ・ “**Signal format (P.15)**” is set to [DVI MODE]. ・ The sink device may not support audio. ・ EDID reading may be failed. Can be solved by setting “**Automatic determining sink device EDID (P.16)**” to [ON].
Channel OFF	Input channel selection is set to [INOFF].

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

Viewing sink device EDID

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

Menu	VIEW STATUS→SINK DEVICE EDID	@GES

Available only for the HDMI output connector of OUT A.

For a sink device that does not support HDMI, only sink device name, recommended resolution, and supported video signal format are displayed.
If no sink device is connected, [UNCONNECTED] is displayed. If the IMP-V31U cannot read EDID or the data is invalid, [EDID READ ERROR] is displayed. If EDID check sum error causes, [CHECKSUM ERROR] is displayed.

■ **Sink device EDID**

[MONITOR NAME]	: Sink device name
[RESOLUTION]	: Recommended resolution (Horizontal resolution x Vertical resolution, Vertical synchronous frequency)
[HDMI/DVI]	: HDMI/DVI signal
[COLOR SPACE]	: Supported color space
[DEEP COLOR]	: Supported color depth
[PCM FREQUENCY]	: Supported audio sampling frequency
[PCM BIT LENGTH]	: Supported audio bit length
[PCM CHANNEL]	: The number of audio channels
[COMPRESSED AUDIO]	: Bitstream supported/not supported

Viewing input signal status

You can view the input signal statuses.

Menu	VIEW STATUS→INPUT STATUS	@GSS

Available only for selected input channel. For input channels other than selected channel, [UNSELECTED] is displayed.

■ **Input video signal**

[RESOLUTION] : Input resolution
(Horizontal resolution x Vertical resolution, Vertical synchronous frequency)
[HDMI/DVI] : HDMI/DVI signal
[HDCP AUTHENTICATION]: HDCP authentication status
[COLOR SPACE]
[DEEP COLOR]
[COLOR RANGE]

■ **Input audio signal**

[FORMAT] : Audio type
[SAMPLING FREQUENCY]
[CHANNEL] : The number of channels
[SPEAKER] : Speaker configuration
[BIT LENGTH]

System check

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

Menu	VIEW STATUS→HARDWARE CHECK RESULT	@GHC

[VOLTAGE] : Abnormality in internal supply voltage
[TEMPERATURE] : Abnormality in internal temperature

Device information

You can view the FPGA and firmware version.

Menu	VIEW STATUS→VERSION	@GIV

Factory default list

Menu		Default
OUTPUT SETTINGS	SIGNAL OUTPUT	ON
	VIDEO MUTE	OFF
	DDC POWER CONTROL	ON
	SIGNAL FORMAT	FOLLOW SOURCE
	FOLLOW SINK EDID	ON
	HOTPLUG MASK	OFF
INPUT SETTINGS	NO INPUT MONITORING	10s
	HDCP INPUT	HDCP 2.2 SUPPORT
AUTO SWITCHING	SIGNAL ON PRIORITY	OFF
	SIGNAL OFF PRIORITY	OFF
	IGNORING DURATION	0s
OUTPUT AUDIO SETTINGS	MUTE	OFF
	MIXING	D/A MIX
	AUDIO ONLY OUTPUT	OFF
INPUT AUDIO SETTINGS	AUDIO LEVEL	0dB
	STABLE WAIT	ON
EDID SETTINGS	EDID SELECTION	BUILT-IN EDID
	RESOLUTION	3840x2160@60 4:4:4
	SINK DEVICE EDID COPY	All: Not saved
	SIGNAL FORMAT	HDMI
	FRAME RATE	60Hz
	DEEP COLOR	24-BIT COLOR
	Linear PCM	48kHz
	AAC	OFF
	Dolby Digital	OFF
	Dolby Digital Plus	OFF
	Dolby TrueHD	OFF
	DTS	OFF
	DTS-HD	OFF
	SPEAKER CONFIGURATION	AUTO、2
RS-232C SETTINGS	PARAMETERS	BPS: 9600, LENGTH: 8, PARITY: NONE, STOP: 1
LAN SETTINGS	IP ADDRESS	192.168.1.199
	SUBNET MASK	255.255.255.0
	GATEWAY ADDRESS	192.168.1.200
	MAC ADDRESS	---
	AUTO DISCONNECT	30s
POWER ON SETTINGS	INPUT CHANNEL	LAST CHANNEL
	BUTTON LOCK	AUTO
SYSTEM SETTINGS	ADVANCED MENU	OFF
	INITIALIZATION	---
VIEW STATUS	OUTPUT STATUS	---
	SINK DEVICE EDID	---
	INPUT STATUS	---
	HARDWARE CHECK RESULT	---
	VERSION	---

License

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

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

Specification

Product specification

		IMP-V31U
Video/Audio input	USB-C	1 input
		DisplayPort Alternate Mode on USB Type-C*1, DisplayPort 1.2 *HDCP is not supported.
		640x480@60 to 2560x1600@60 Reduced Blanking 480p, 576p to 3840x2160@24/25/30/50/59.94/60 (4:4:4), 4096x2160@24/25/30/50/59.94/60 (4:4:4) Color depth: 24/30/36 bits *For all supported video signals, see the table below.
		LPCM: Up to 2 channels Sampling frequency: 32/44.1/48/88.2/96/192 kHz Reference level: -20 dBFS, Max. input level: 0 dBFS
		USB PD (Power Delivery) DC 5 V 3 A 15 W
		Connector: USB Type-C (24-pin) Maximum distance*2: 6.5 ft (2 m)
	HDMI	2 inputs
		HDMI/DVI 1.0 TMDS single link, HDCP 1.4/2.2 TMDS clock: Up to 300 MHz, TMDS data rate: Up to 18 Gbps Deep color/x.v.Color/3D/HDR*3
		640x480@60 to 2560x1600@60 Reduced Blanking 480i, 576i to 3840x2160@24/25/30/50/59.94/60 (4:4:4), 3840x2160@50/59.94/60 (4:2:0), 4096x2160@24/25/30/50/59.94/60 (4:4:4), 4096x2160@50/59.94/60 (4:2:0) Color depth: 24/30/36 bits *For all supported video signals, see the table below.
		LPCM: Up to 8 channels Sampling frequency: 32/44.1/48/88.2/96/176.4/192 kHz Reference level: -20 dBFS, Max. input level: 0 dBFS
		CEC
		Connector: HDMI Type A (19-pin) Maximum distances*2: 98 ft. (30 m) (1080p@60), 39 ft. (12 m) (4K@60)
	Analog audio	1 input
		Stereo L/R Input impedance: 24 kΩ unbalanced Reference level: -10 dBu, Max. input level: +10 dBu
		Connector: Captive screw (3-pin)
Video/Audio output	HDMI	1 output
		Distribute HDMI/USB-C simultaneously
		HDMI/DVI 1.0 TMDS single link, HDCP 1.4/2.2 TMDS clock: Up to 300 MHz, TMDS data rate: Up to 18 Gbps Deep color/x.v.Color/3D/HDR*3
		640x480@60 to 2560x1600@60 Reduced Blanking 480i, 576i to 3840x2160@24/25/30/50/59.94/60 (4:4:4), 3840x2160@50/59.94/60 (4:2:0), 4096x2160@24/25/30/50/59.94/60 (4:4:4), 4096x2160@50/59.94/60 (4:2:0) Color depth: 24/30/36 bits *For all supported video signals, see the table below.
		LPCM: Up to 8 channels Sampling frequency: 32/44.1/48/88.2/96/176.4/192 kHz Reference level: -20 dBFS, Max. output level: 0 dBFS
		CEC
		Connector: HDMI Type A (19-pin) Maximum distances*2: 98 ft. (30 m) (1080p@60), 39 ft. (12 m) (4K@60)
	USB-C	1 output
		Distribute HDMI/USB-C simultaneously
		USB 3.2 Gen1/USB 2.0, UVC, UAC *HDCP is not supported.
		640x480@60 to 2560x1440@50 (YUY2), 2560x1440@60 (NV12) 480p, 576p to 3840x2160@30 (NV12) Color depth: 24 bits *For all supported video signals, see the table below.
		LPCM: Up to 2 channels Sampling frequency: 48 kHz Reference level: -20 dBFS, Max. output level: 0 dBFS
		Connector: USB Type-C (24-pin) Maximum distance*2: 13 ft. (4 m) (USB 2.0), 6.5 ft. (2 m) (USB 3.2 Gen1)

		IMP-V31U
Control I/F	RS-232C	1 port/Connector: Captive screw (3-pin)
	LAN	1 port/10Base-T/100Base-TX/1000Base-T (Auto Negotiation), Auto MDI/MDI-X, Connector: RJ-45
Functions	Video	Resolution conversion (Connector: USB-C output), Frame rate conversion (Connector: USB-C output)
	Audio	De-embedding, Audio mixing, Audio Downmix
	Control	WEB browser, CEC through (Connector: HDMI input/output), Unsolicited notification
	Others	Automatic input switching, EDID emulation, Last memory, Anti-Snow, Connection Reset (Connector: HDMI output)*4, Button security lockout
General	Power	DC 12 V 2.2 A
		AC adapter: 100 - 240 VAC ±10%, 50 Hz/60 Hz ±3 Hz, DC 12 V 3 A 36.0 W
	Power consumption	30 W
	Dimensions	8.3 (W) × 1.2 (H) × 5.9 (D)" (210 (W) × 30 (H) × 150 (D) mm) (Excluding connectors and the like)
	Weight	2.2 lbs. (1.0 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	20% to 90% (Non Condensing)

*1 DisplayPort to USB-C cable or HDMI to USB-C cable are not supported.
Active cables that need to be powered from a sink device via VCONN are not supported.

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

- USB-C DisplayPort Alternate Mode (4K@60) : When USB3.2 Gen1 Type-C cable was used and signal of 3840x2160@60 24 bits was transmitted.
- HDMI (1080p@60) : When IDK's 24 AWG cable was used and signal of 1080p@60 24 bits was transmitted.
- HDMI (4K@60) : When IDK's 18 Gbps supported cable was used and signal of 3840x2160@60 24 bits was transmitted.
- USB-C UVC (1080p@15) : When USB 2.0 Type-C cable was used, connected to USB 2.0 supported connector, and signal of 1920x1080@15 YUY2 was transmitted.
- USB-C UVC (4K@30) : When USB 3.2 Gen1 Type-C cable was used, connected to USB 3.2 Gen1 supported connector, and signal of 3840x2160@30 NV12 was transmitted.

*3 ARC/HEC are not supported.

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

Supported video signals

Signal	Resolution	Frame Rate [Hz]	Pixel Clock [MHz]	Color Depth [bits]	INPUT		OUTPUT
					USB-C[*1]	HDMI	HDMI
640x480@ 60	640x480	59.94	25.18	24/30/36	○	○	○
800x600@ 60	800x600	60.32	40.00	24/30/36	○	○	○
1024x768@ 60	1024x768	60.00	65.00	24/30/36	○	○	○
1280x768@ 60	1280x768	59.87	79.50	24/30/36	○	○	○
1280x800@ 60	1280x800	59.81	83.50	24/30/36	○	○	○
1280x960@ 60	1280x960	60.00	108.00	24/30/36	○	○	○
1280x1024@ 60	1280x1024	60.02	108.00	24/30/36	○	○	○
1360x768@ 60	1360x768	60.02	85.50	24/30/36	○	○	○
1366x768@ 60	1366x768	59.79	85.50	24/30/36	○	○	○
1400x1050@ 60	1400x1050	59.98	121.75	24/30/36	○	○	○
1440x900@ 60	1440x900	59.89	106.50	24/30/36	○	○	○
1600x900@ 60	1600x900	59.95	118.25	24/30/36	○	○	○
1600x1200@ 60	1600x1200	60.00	162.00	24/30/36	○	○	○
1680x1050@ 60	1680x1050	59.95	146.25	24/30/36	○	○	○
1920x1080@ 60 RB	1920x1080	59.93	138.50	24/30/36	○	○	○
1920x1200@ 60 RB	1920x1200	59.95	154.00	24/30/36	○	○	○
2048x1152@ 60 RB	2048x1152	60.00	162.00	24/30/36	○	○	○
2560x1440@ 60 RB	2560x1440	59.95	241.50	24/30/36	○	○	○
2560x1600@ 60 RB	2560x1600	59.97	268.50	24/30/36	○	○	○
480i	720x480	59.94	27.00	24/30/36	—[*2]	○	○
480p	720x480	59.94	27.00	24/30/36	○	○	○
576i	720x576	50.00	27.00	24/30/36	—[*2]	○	○
576p	720x576	50.00	27.00	24/30/36	○	○	○
720p@ 50	1280x720	50.00	74.25	24/30/36	○	○	○
720p@ 59.94	1280x720	59.94	74.18	24/30/36	○	○	○
720p@ 60	1280x720	60.00	74.25	24/30/36	○	○	○
1080i@ 50	1920x1080	25.00	74.25	24/30/36	—[*2]	○	○
1080i@ 59.94	1920x1080	29.97	74.18	24/30/36	—[*2]	○	○
1080i@ 60	1920x1080	30.00	74.25	24/30/36	—[*2]	○	○
1080p@ 50	1920x1080	50.00	148.50	24/30/36	○	○	○
1080p@ 59.94	1920x1080	59.94	148.35	24/30/36	○	○	○
1080p@ 60	1920x1080	60.00	148.50	24/30/36	○	○	○
3840x2160@ 23.98	3840x2160	23.98	296.70	24/30/36	○	○	○
3840x2160@ 24	3840x2160	24.00	297.00	24/30/36	○	○	○
3840x2160@ 25	3840x2160	25.00	297.00	24/30/36	○	○	○
3840x2160@ 29.97	3840x2160	29.97	296.70	24/30/36	○	○	○
3840x2160@ 30	3840x2160	30.00	297.00	24/30/36	○	○	○
3840x2160@ 50	3840x2160	50.00	594.00	24/30/36[*3]	○	○	○
3840x2160@ 59.94	3840x2160	59.94	593.41	24/30/36[*3]	○	○	○
3840x2160@ 60	3840x2160	60.00	594.00	24/30/36[*3]	○	○	○
4096x2160@ 23.98	4096x2160	23.98	296.70	24/30/36	○	○	○
4096x2160@ 24	4096x2160	24.00	297.00	24/30/36	○	○	○
4096x2160@ 25	4096x2160	25.00	297.00	24/30/36	○	○	○
4096x2160@ 29.97	4096x2160	29.97	296.70	24/30/36	○	○	○
4096x2160@ 30	4096x2160	30.00	297.00	24/30/36	○	○	○
4096x2160@ 50	4096x2160	50.00	594.00	24/30/36[*3]	○	○	○
4096x2160@ 59.94	4096x2160	59.94	593.41	24/30/36[*3]	○	○	○
4096x2160@ 60	4096x2160	60.00	594.00	24/30/36[*3]	○	○	○

RB: Reduced Blanking

[*1] YCbCr 4:2:0 is not supported.
[*2] Interlaced signal is not supported.
[*3] For RGB/YCbCr 4:4:4, only 24 bit is supported.

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

Resolution[*1]	Frame Rate[*1] [Hz]	Color Depth[*1] [bits]	Color Format[*1]	OUTPUT	
				USB-C	
				USB 3.2 Gen1[*2]	USB 2.0[*3]
640x480	60	24	YUY2/NV12	○	○
720x480	60	24	YUY2/NV12	○	○
720x576	50	24	YUY2/NV12	○	○
1280x720	30	24	YUY2/NV12	–	○
1280x720	60	24	YUY2/NV12	○	–
1920x1080	15	24	YUY2/NV12	–	○
1920x1080	25/29.97/30	24	YUY2/NV12	○	–
1920x1080	40/48	24	YUY2/NV12	○	–
1920x1080	50/59.94/60	24	YUY2/NV12	○	–
1920x1080	100/119.88/120	24	NV12	○	–
2560x1440[*4]	50	24	YUY2	○	–
2560x1440[*4]	60	24	NV12	○	–
3840x2160[*5]	30	24	NV12	○	–

YUY2/NV12: Color formats meeting the UVC specification; equivalent to YCbCr 4:2:2/4:2:0, respectively.

[*1] Part of contents may not be displayed depending on the capture software.

[*2] Video signal that can be output if the USB-C output is connected to a USB 3.2 Gen1 connector.

[*3] Video signal that can be output if the USB-C output is connected to a USB 2.0 connector.

[*4] 2560x1440 or 3840x2160 input video is needed.

[*5] 3840x2160 input video is needed.

Troubleshooting

This chapter provides recommendations in case difficulties are encountered during IMP-V31U setup and operation.

In case the IMP-V31U does not work correctly, please check the following items first.

- Are the IMP-V31U and all devices connected to an active power source and are they powered on?
- Are signal cables connected correctly?
- Are there any loose or partially mated connections?
- Are the interconnecting cables specified correctly to support adequate bandwidth?
- Are specifications of connected devices matched to each other?
- Are configuration settings for the connected devices correct?
- Is there any nearby equipment that may cause electrical noise/RF interference?

Use the IMP-V31U built-in status display features to check for input signal presence and format. Also use the status display features to check for the presence of connected sink devices as well as for EDID and HDCP compatibility.

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

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

- Does the problem occur with all the signal connectors?
- Does the problem occur when you connect the source and display devices directly, bypassing the IMP-V31U?

HDMI/USB-C Switcher

IMP-V31U

User Guide

www.idkav.com

Headquarters

IDK Corporation

7-9-1 Chuo, Yamato, Kanagawa, 242-0021, JAPAN

TEL: +81-46-200-0764 FAX: +81-46-200-0765

Email: idk_eng@idk.co.jp

USA

IDK America Inc.

72 Grays Bridge Road Suite 1-C, Brookfield, CT 06804, United States

TEL: +1-203-204-2445

Email: sales@idkav.com

Europe

IDK Europe GmbH

Lise-Meitner-Str. 6, D-40878 Ratingen, Germany

TEL: +49-2102-578-301-0

Email: info@idkav.eu

Vietnam

IDK Corporation Vietnam

Hanoi Representative Office

TEL: +84-247-108-8866

Email: info_en@idk.co.jp

IDK Corporation Vietnam

Ho Chi Minh Representative Office

TEL: +84-28-7108-8954

Email: info_en@idk.co.jp