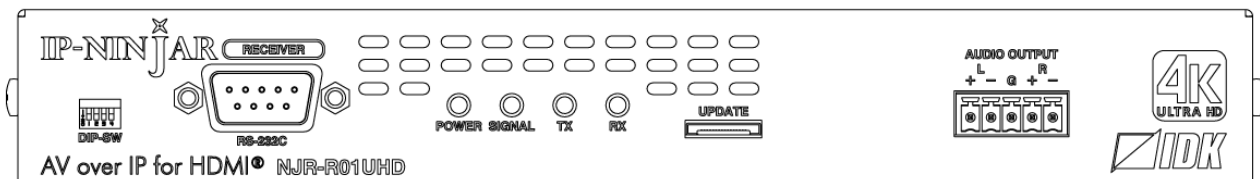
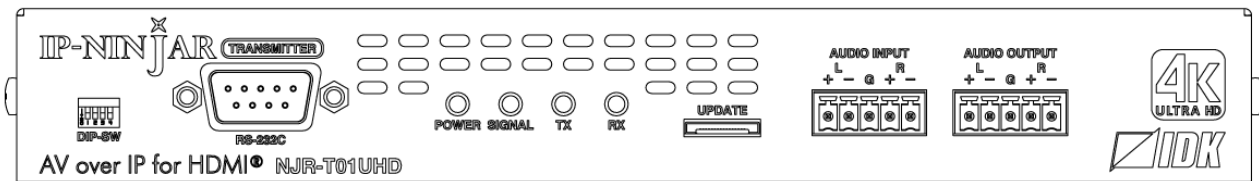


4K@60 and HDCP2.2 supported HDMI Network Extender

NJR-T01UHD / NJR-R01UHD

<User's Guide>

Ver. 2.0.0



- 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.

Trademarks

- Blu-ray Disc and Blu-ray are trademarks of Blu-ray Disc Association.
- The terms HDMI and HDMI High-Definition Multimedia Interface, and the HDMI Logo are trademarks or registered trademarks of HDMI Licensing Administrator, Inc. in the United States and other countries.
- Connection Reset and IP NINJAR are registered trademarks of IDK Corporation in Japan.
- All other company and product names mentioned in this manual are either registered trademarks or trademarks of their respective owners. In this manual, the “®” or “™” marks may not be specified.

Before reading this manual

- All rights reserved.
- Some 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 of the product.
- This User's Guide is subject to change without notice. You can download the latest version from IDK's website at: <http://www.idkav.com>

The reference manual consists of the following two volumes:

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



The lasers in this product meet Class 1 Laser Safety per FDA/CDRH and EN (IEC) 60825 laser safety standards which specifies design safety.

FCC STATEMENT

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

CE MARKING

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

WEEE MARKING











Waste Electrical and Electronic Equipment (WEEE), Directive 2002/96/EC
(This directive is only valid in the EU.)








This equipment complies with the WEEE Directive (2002/96/EC) marking requirement.
The left marking indicates that you must not discard this electrical/electronic equipment in domestic household waste.

Safety Instructions

Read and understand all safety and operating instructions before using this product. Follow all instructions and 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 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)	 Electrical Hazard
 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	
 Prohibited	Do not place the product in any unstable place. Install the product in 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. Otherwise, it may move/fall and lead to injury.
	Keep out any foreign objects. 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: <ul style="list-style-type: none"> • Do not scratch, heat, or modify, including lengthening them. • Do not pull, place heavy objects on them, or pinch them. • Do not bend, twist, or tie 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	In the event of electrical storms, keep away from the main unit and cables such as power cable and LAN cable. Contact may cause electric shock
 Instruction	For installation: 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.
	Set the power plug in a convenient place to unplug easily. 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, arcing may cause the connection to overheat, increasing the risk of electrical shock or fire. Do not use a damaged plug or connect to a damaged outlet.
	Clean the power plug regularly. If the plug is covered in dust, it may increase the risk of fire.
 Unplug	Unplug immediately if the product smokes, makes unusual noise, or produces a burning odor. If you continue to use the product under these conditions, it may cause electric shock or fire. After confirming that the product stops smoking, contact your IDK representative.
	Unplug immediately if the product falls and/or if the cabinet is damaged. If you continue to use the product under these conditions, it may increase the risk of electrical shock or fire. For maintenance and repair, contact your IDK representative.
	Unplug immediately if water or other objects are directed inside. If you continue to use the product under these conditions, it may increase the risk of electrical shock or fire. For maintenance and repair, contact your IDK representative.
For connection	
 Instruction	Differences in ground potential among product population of interconnected products and other external devices may increase the risk of electric shock to personnel or cause damage to the devices or cabling infrastructure. When using cables to connect devices, including connection of long-distance transmission cables, unplug the power cables of all interconnected devices. Power may be restored after all signal/control cables are connected to each device.

Caution









 Prohibition	<p>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 while under operation, it may affect the product's performance and reliability and may increase the risk of fire.</p>
	<p>Do not place the product in humid, oil smoke filled, or dusty place. If the product is placed near humidifiers or in a dusty area, it may increase the risk of fire or electric shock.</p>
	<p>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.</p>
	<p>Do not place or stack heavy objects on the product. Failure to observe this precaution may result in damage to the product and other property and may lead to the risk of personal injury.</p>
	<p>Do not exceed ratings of outlet and wiring devices. Exceeding the rating of an outlet may increase the risk of fire and electric shock.</p>
	<p>Use only the supplied AC adapter and power cable. Do not use the supplied AC adapter and power cable with other products. If non-compliant adapter or power cables are used, it may increase the risk of fire or electrical shock. Always use the supplied AC power connection cable for this product.</p>
 No wet hands	<p>Do not plug or unplug with wet hands. Failure to observe this precaution may increase the risk of electrical shock.</p>
 Instruction	<p>Use and store the product within the specified temperature/humidity range. If the product is used outside the specified range for temperature and humidity continuously, it may increase the risk of fire or electric shock.</p>
 Unplug	<p>Turn off devices while making connections to another device. Failure to observe this precaution may increase the risk of fire or electric shock.</p>
	<p>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.</p>
 Unplug	<p>Unplug the product before cleaning. To prevent electric shock.</p>
For installation	
For rack mount devices:	
 Instruction	<p>Mount the product in a the rack meeting EIA standards, and maintain spaces above and below for air circulation. For your safety, attach an L-shaped bracket in addition to the panel mount bracket kit to improve mechanical stability.</p>
For devices with rubber feet:	
 Instruction	<p>Never insert screws without the rubber feet into the threaded holes on the bottom of the product. Doing so may lead to damage when the screws contact electrical circuitry or components inside the product. Reinstall the originally supplied rubber feet using only the originally supplied screws.</p>
Altitude:	
 Instruction	<p>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.</p>

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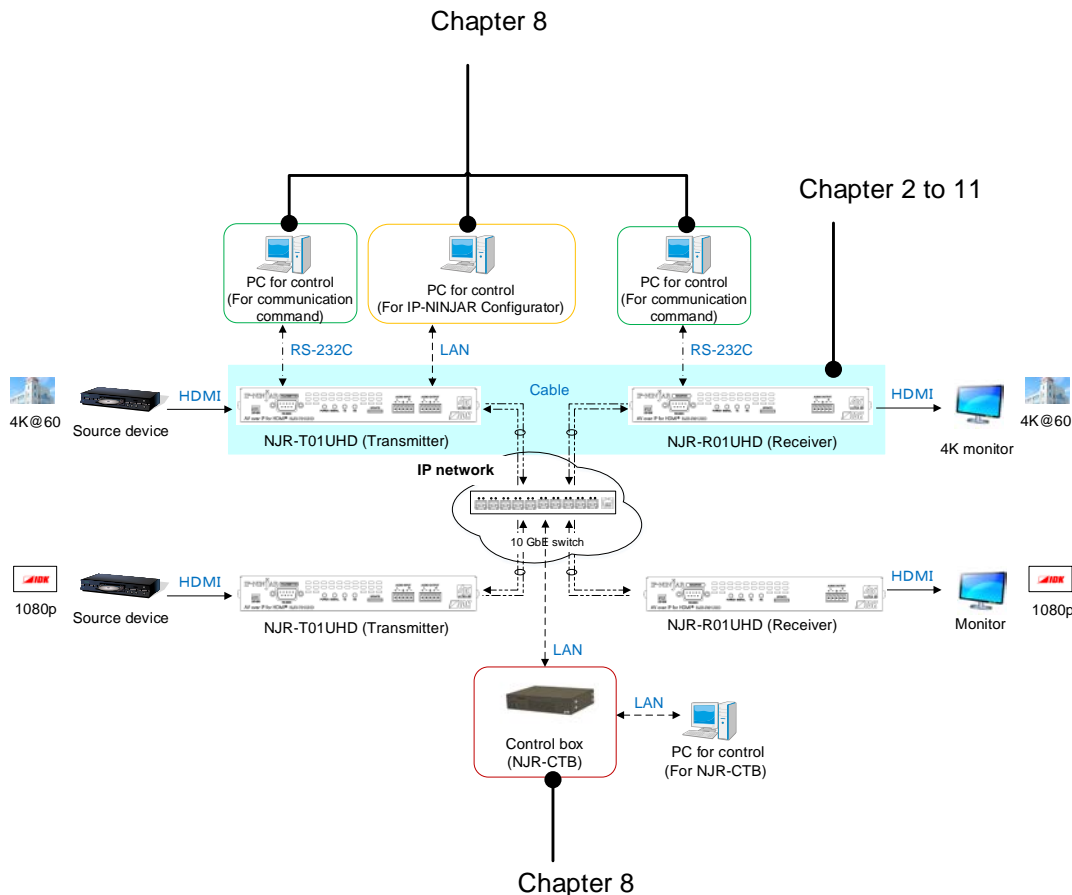
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1 How to read this manual

This User's Guide explains HDMI network extender, NJR-T01UHD (transmitter) and NJR-R01UHD (receiver), supporting 4K@60 and HDCP2.2. This document also describes basic operations from external devices for controlling the transmitter and receiver.

For other products of IP-NINJAR series, see [Table 1.1] User's Guide of IP-NINJAR series.



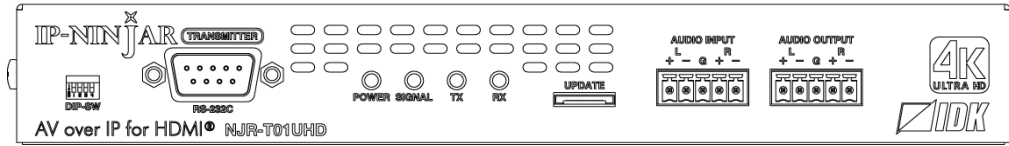
[Fig. 1.1] User's Guide

[Table 1.1] User's Guide of IP-NINJAR series

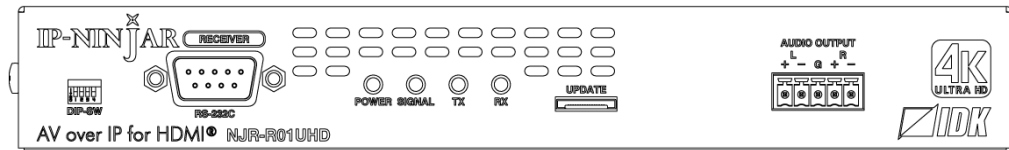
Model	User's Guide	Command Guide
NJR-T01UHD / NJR-R01UHD	NJR-T01UHD / NJR-R01UHD User's Guide	NJR-T01UHD / NJR-R01UHD Command Guide
NJR-CTB	NJR- CTB User's Guide	NJR- CTB Command Guide
IP-NINJAR Configurator	IP-NINJAR Configurator User's Guide	

2 Included Items

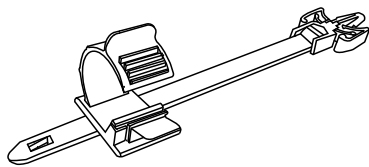
Ensure all items below are included in the package.
If any items are missing or damaged, please contact IDK.



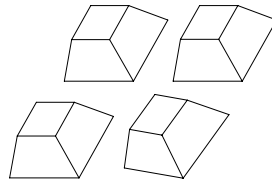
NJR-T01UHD (Transmitter)



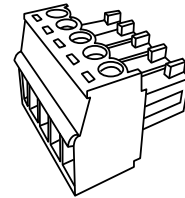
NJR-R01UHD (Receiver)



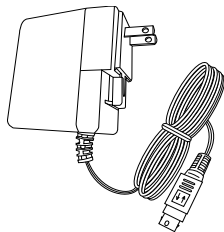
Cable clamp



Rubber feet



5-pin terminal block



DIN plug AC adapter with locking mechanism (3.9 ft. (1.2 m))

Item	NJR-T01UHD (Transmitter)	NJR-R01UHD (Receiver)
HDMI network extender	1	1
DIN plug AC adapter with locking mechanism (3.9 ft. (1.2 m))	1	1
Cable clamp	2	1
Rubber feet	4	4
Terminal block (5 pins)	2	1

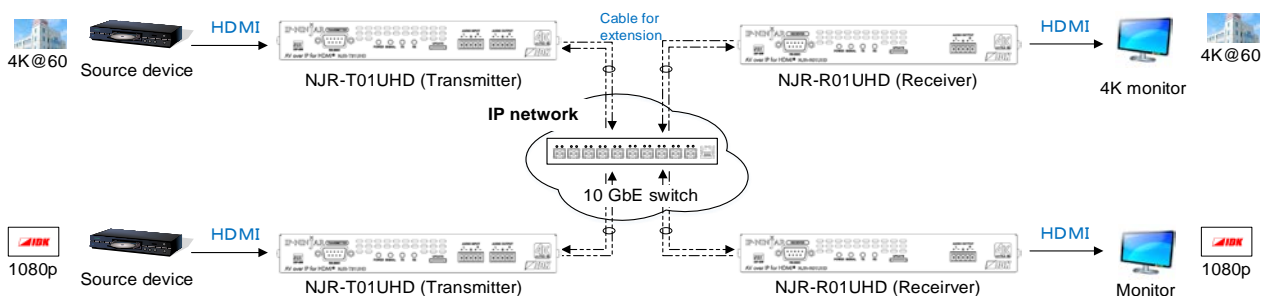
[Fig. 2.1] The number of items

3 Product Outline

The NJR-01UHD is an AV over IP solution for high definition signal extension, switching and manipulation. This 4K solution leverages 10 Gb Ethernet switches and enables signal management of 4K/UHD 4:4:4 at 60 Hz signals with zero latency.

4K 4:4:4 at 60Hz signal can be transmitted over fiber optic cables or twisted pair cables. Additionally, extend and switch your standard 1GB LAN connection, RS-232, and analog audio output.

Combined with the control box, the NJR-CTB, the NJR-01UHD is fully configurable and controllable over the LAN with a web browser.



[Fig. 3.1] HDMI signals transmission

Note:

The NJR-T01UHD / NJR-R01UHD have to be used with IP-NINJAR series products. The NJR-T01UHD / NJR-R01UHD cannot be connected to FDX's optic slot boards or OPF series products.

Six models are available depending on the cable you use.

Optic fiber type	Model number	
	Transmitter	Receiver
Multimode	NJR-T01UHD-MM	NJR-R01UHD-MM
Singlemode	NJR-T01UHD-SM	NJR-R01UHD-SM
Cat6A	NJR-T01UHD-CAT	NJR-R01UHD-CAT

4 Features

■ Video

- Up to 4K@60 (4:4:4)
- HDCP 1.4 / 2.2
- HDR
- Local monitor output
- Maximum extension distance
 - Fiber optic cable (NJR-T01UHD-MM / SM, NJR-R01UHD-MM / SM)
 - Multimode fiber (OM3): 984 ft. (300 m)
 - Singlemode fiber (OS1): 6.21 mi. (10 km), 24.85 mi. (40 km, optional)
 - Twisted pair cable (NJR-T01UHD-CAT, NJR-R01UHD-CAT)
 - Cat6A: 328 ft. (100 m)

■ Audio

- Embedding (TX) / De-embedding

■ Communication

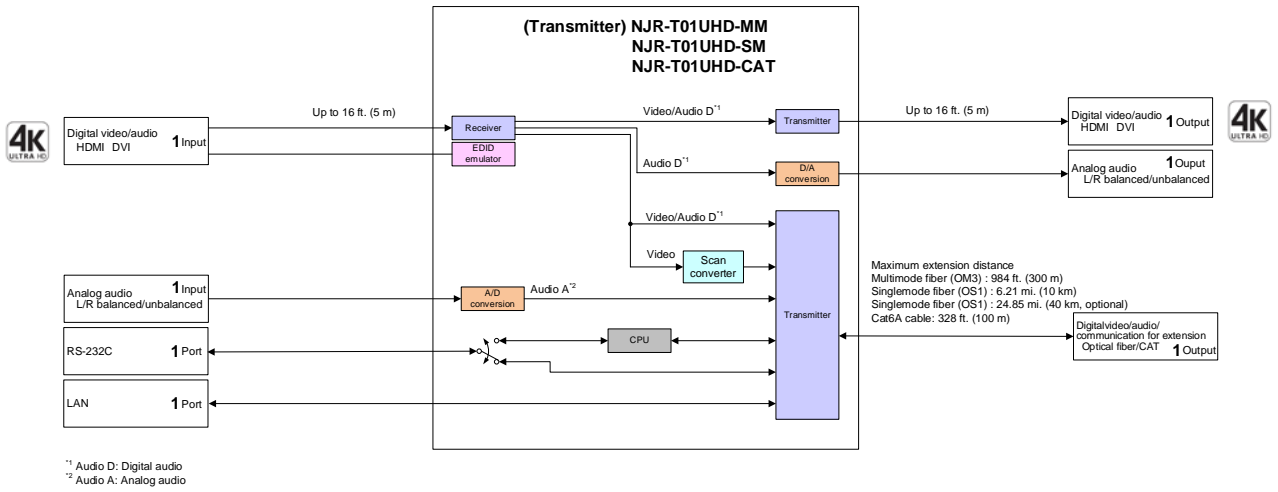
- RS-232C bidirectional communication
- LAN transmission

■ Network

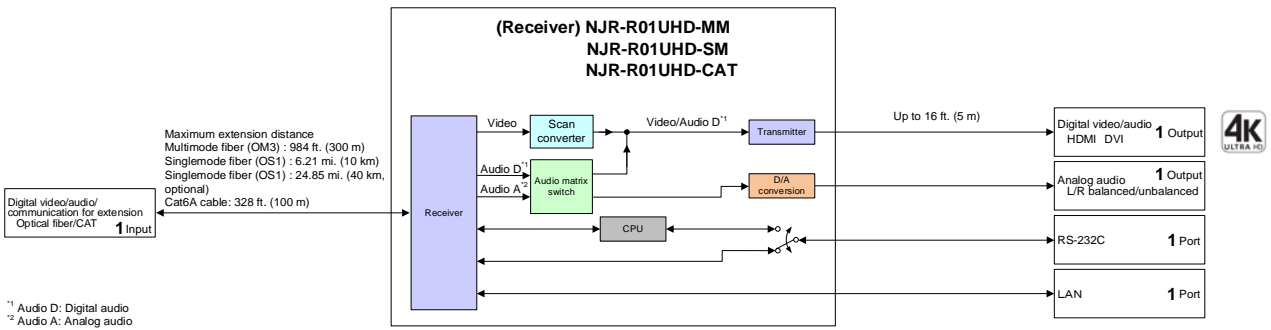
- Matrix switching, Videowall, Multiview, distribution, and extension via 10GbE switch
- All transmitters and receivers in network can be set and controlled by NJR-CTB.
- Easy expanding and replacing IP NINJAR transmitters and receivers

■ Others

- EDID emulation
- DDC buffering
- Connection reset
- AC adapter with locking mechanism



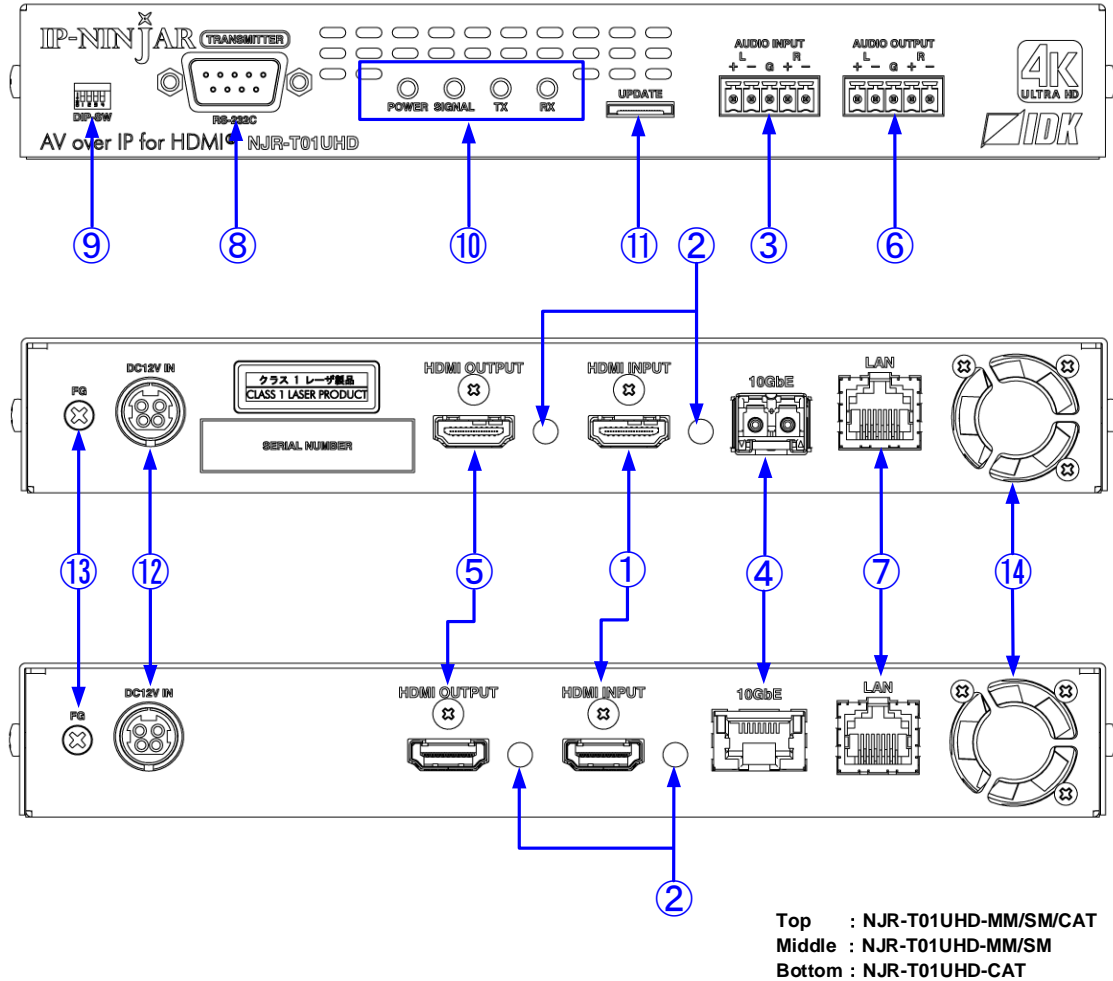
[Fig. 4.1] NJR-T01UHD Connection Diagram



[Fig. 4.2] NJR-R01UHD Connection Diagram

5 Front and Rear Panels

5.1 NJR-T01UHD (Transmitter)



[Fig. 5.1] NJR-T01UHD drawing

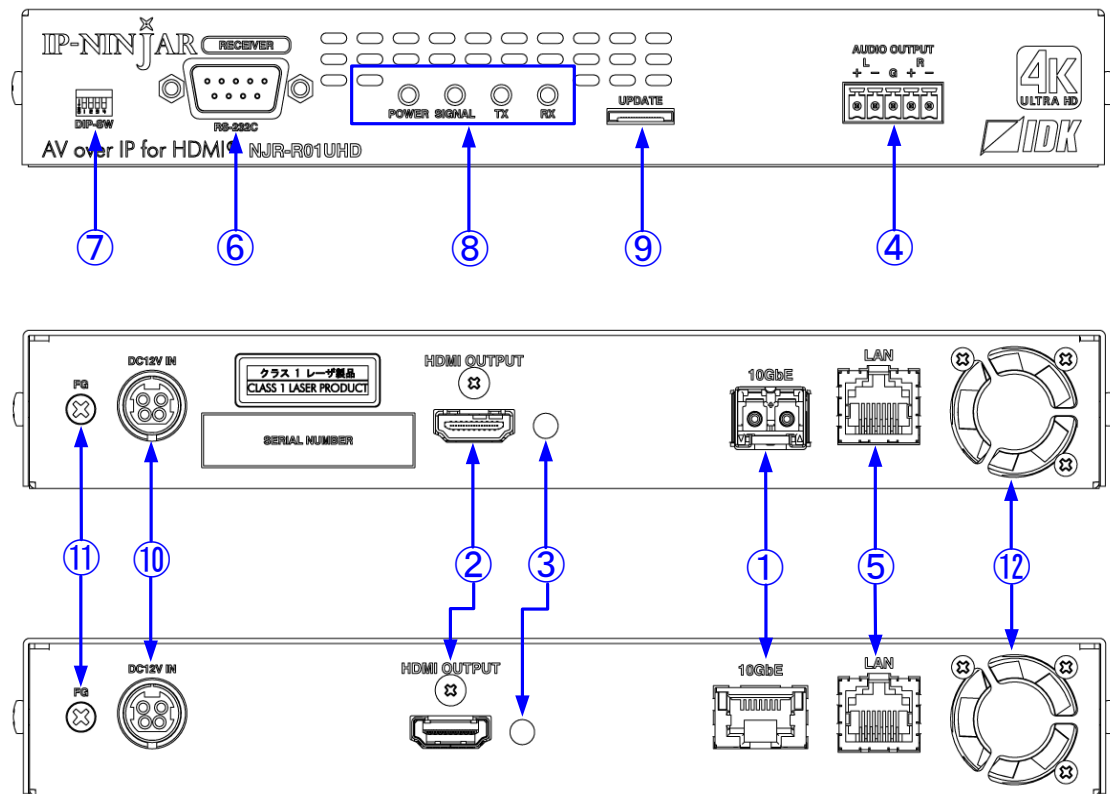
[Table 5.1] Part names and descriptions of NJR-T01UHD

Number	Name	Description
①	HDMI input connector	Input connectors for HDMI signal to connect to a source devices, such as Blu-ray players.
②	HDMI cable fixing hole	Fixes HDMI cables by inserting provided cable clamps.
③	Audio input connectors	Input connector for analog audio signal.
④	I/O connector for extension	I/O connector for digital signal extension A fiber optic cable or twisted pair cable is used; connects to an NJR receiver or 10 GbE switch.
⑤	HDMI output connector	Outputs HDMI signal that is input from HDMI input connector. Connecting a sink device, such as a LCD monitor, enables monitoring input signals.

[Table 5.2] Part names and descriptions of NJR-T01UHD

Number	Name	Description
⑥	Audio output connectors	Converts digital audio signals input from HDMI input connector to analog audio signals and outputs these signals. Connects to amplifiers, speakers, and mixers.
⑦	LAN port	For LAN signals
⑧	RS-232C port	For RS-232C signals
⑨	DIP switch	Switches internal connections of RS-232C signals. 【See: 7.4 Setting DIP switch】
⑩	LEDs (green)	<ul style="list-style-type: none"> • POWER : Illuminates when power is supplied from the AC adapter. • SIGNAL : Illuminates when video signals are valid; blinks when video signals cannot be transmit correctly. • TX (blinking) : Blinks when a valid code is being sent to NJR-R01UHD, other IP-NINJAR's receiver, or 10 GbE switch. • RX (blinking) : Blinks when a valid code is being received from NJR-R01UHD, other IP-NINJAR's receiver, or 10 GbE switch.
⑪	MAINTENANCE port	Not used. Keep this connector free
⑫	AC power connector	For the provided AC adapter
⑬	Frame ground	For indoor ground terminal. M3 screws are used.
⑭	Cooling fan	Releases heat from the unit.

5.2 NJR-R01UHD (Receiver)



Top : NJR-R01UHD-MM/SM/CAT
 Middle : NJR-R01UHD-MM/SM
 Bottom : NJR-R01UHD-CAT

[Fig. 5.2] NJR-R01UHD drawing

[Table 5.3] Part names and descriptions of NJR-R01UHD

Number	Name	Description
①	I/O connector for extension	I/O connector for digital signal extension A fiber optic cable or twisted pair cable is used; connects to an NJR transmitter or 10 GbE switch.
②	HDMI output connector	Output connector for HDMI signals Connects to a sink device, such as a LCD monitor.
③	HDMI cable fixing hole	Fixes HDMI cables by inserting provided cable clamps.
④	Audio output connectors	Outputs digital or analog audio signals received from NJR-T01UHD as analog audio signals. Connects to amplifiers, speakers, and mixers. The output audio signals are converted by using NJR-CTB (control box for IP-NINJAR) or IP-NINJAR Configurator. 【See: 9.3.2 Selecting output audio】

[Table 5.4] Part names and descriptions of NJR-R01UHD

Number	Name	Description
⑤	LAN port	For LAN signals
⑥	RS-232C port	For RS-232C signals
⑦	DIP switch	Switches internal connections of RS-232C signals. 【See: 7.4 Setting DIP switch】
⑧	LED (green)	<ul style="list-style-type: none"> • POWER : Illuminates when power is supplied from the AC adapter. • SIGNAL : Illuminates when video signals are valid; blinks when video signals cannot be transmit correctly. • TX (blinking) : Blinks when a valid code is being sent to NJR-R01UHD, other IP-NINJAR's transmitter, or 10 GbE switch. • RX (blinking): Blinks when a valid code is being received from NJR-R01UHD, other IP-NINJAR's transmitter, or 10 GbE switch.
⑩	Maintenance port	Not used. Keep this connector free
⑪	AC power connector	For the provided AC adapter
⑫	Frame ground	For indoor ground terminal. M3 screws are used.
⑬	Cooling fan	Releases heat from the unit.

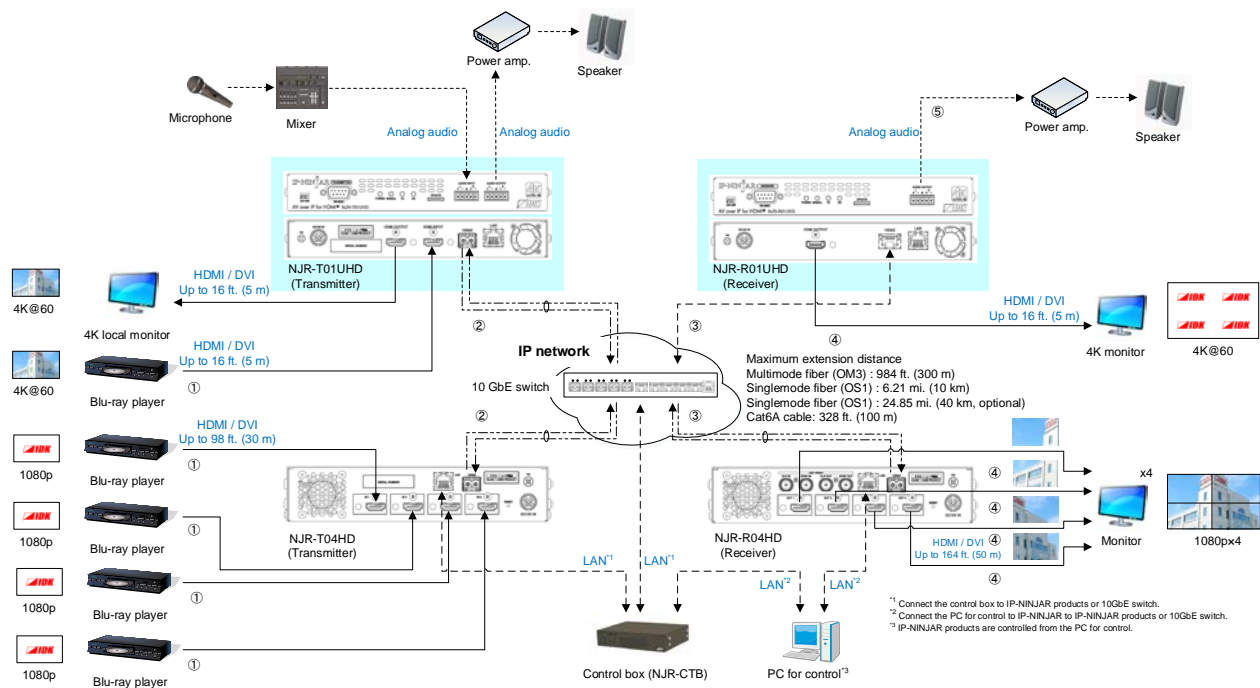
6 System configuration example

This chapter cites two system configuration examples.

6.1 NJR-T01UHD and NJR-R01UHD are used as Network Extender

Using NJR-T01UHD / NJR-R01UHD or IP-NINJAR transmitters/receivers with a 10 GbE switch enables extending, distributing, matrix switching, videowall, and multiview.

- ① Video and audio signals are input from the Blu-ray disc player to the HDMI input connector of NJR-T01UHD / NJR-T04HD.
- ② NJR-T01UHD / NJR-T04HD sends these signals to the 10 Gbe switch over a fiber optic cable or twisted pair cable.
- ③ 10 GbE switch sends video and audio signals to the/several NJR-T01UHD / NJR-T04HD according to the setting of NJR-CTB (control box for IP-NINJAR).
- ④ NJR-T01UHD/NJR-T04HD outputs received video and audio signals from the HDMI output connector to the monitor.
- ⑤ Digital or analog audio of NJR-T01UHD / NJR-T04HD can be selected and output from the analog audio output connector of NJR-R01UHD.

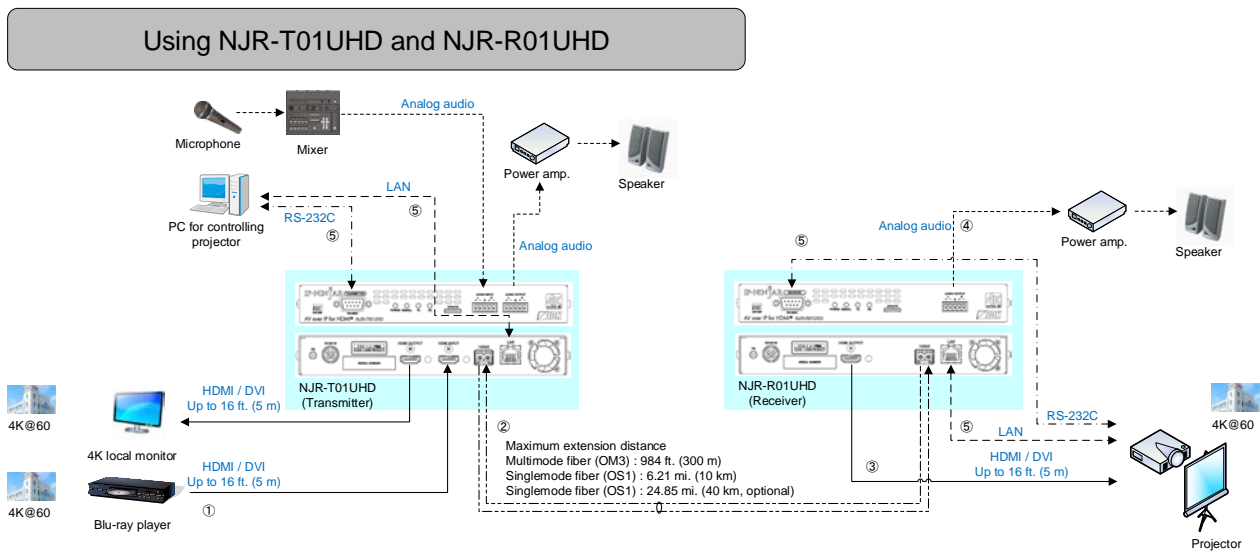


[Fig. 6.1] Used as Network extender

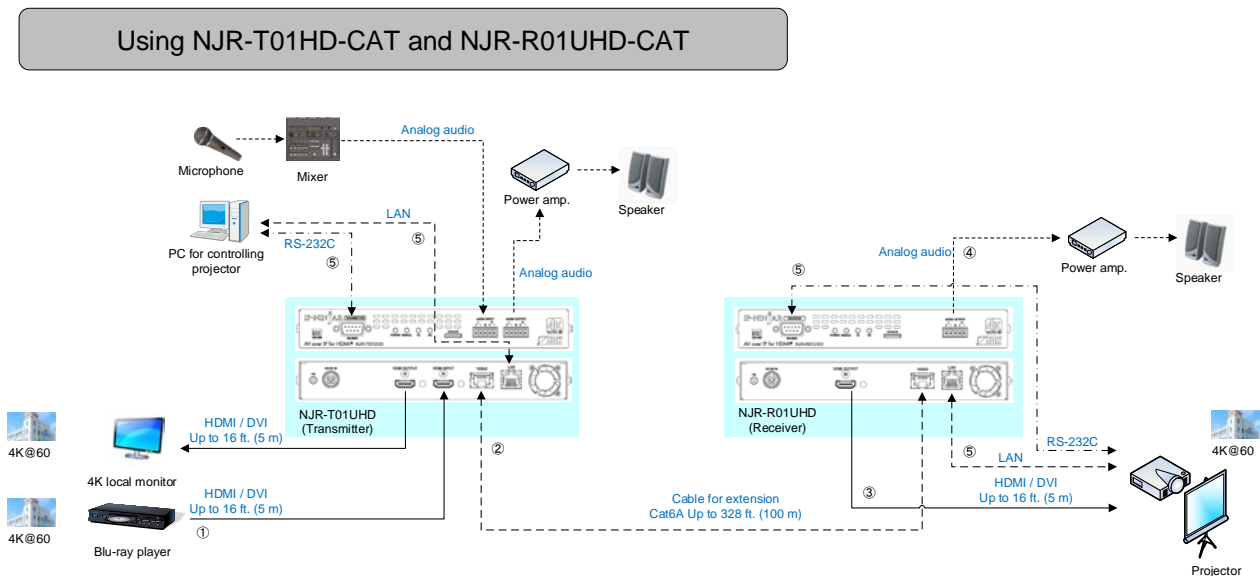
6.2 NJR-T01UHD and NJR-R01UHD are used as Extender

An IP-NINJAR transmitter and receiver are connected as Point To Point.

- ① Video and audio signals are input from the Blu-ray disc player to the HDMI input connector of NJR-T01UHD / NJR-T04HD.
- ② NJR-T01UHD / NJR-T04HD sends these signals to NJR-R01UHD / NJR-R04HD over a fiber optic cable or twisted pair cable.
- ③ NJR-R01UHD/NJR-R04HD outputs received video and audio signals from the HDMI output connector to the monitor.
- ④ Digital or analog audio of NJR-T01UHD / NJR-T04HD can be selected and output from the analog audio output connector of NJR-R01UHD.
- ⑤ NJR-T01UHD/NJR-T04HD and NJR-R01UHD / NJR-R04HD enables RS-232C communication, LAN communication, and peripheral device control (such as projectors) by using a control device (such as PCs).

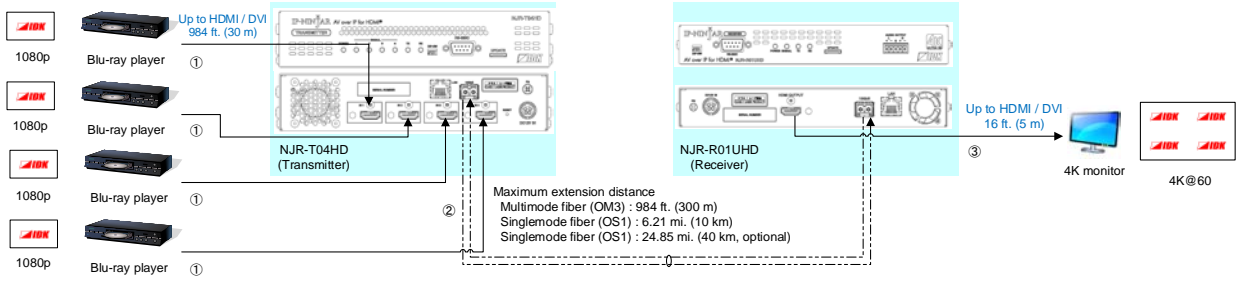


[Fig. 6.2] NJR-T01UHD and NJR-R01UHD (MM/SM)



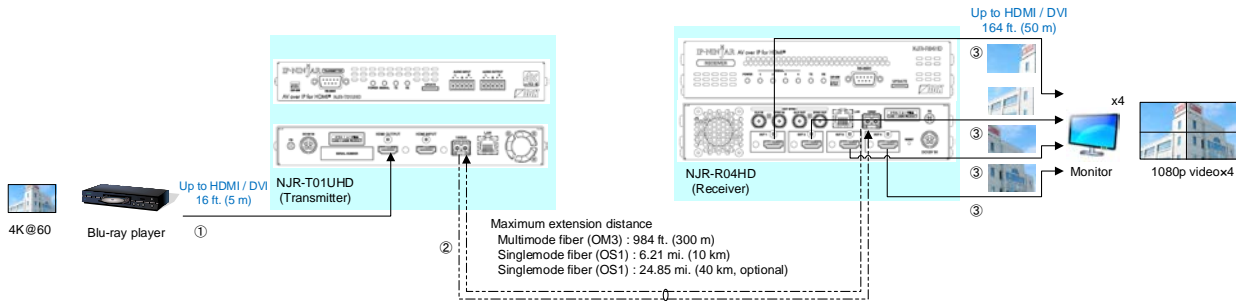
[Fig. 6.3] NJR-T01UHD and NJR-R01UHD (CAT)

Multiview using NJR-T04HD and NJR-R01UHD



[Fig. 6.4] NJR-T04HD and NJR-R01UHD: Multiview

Videowall using NJR-T01UHD and NJR-R04HD



[Fig. 6.5] NJR-T01UHD and NJR-R04HD: Videowall

7 Precautions and preparations

Before using NJR-T01UHD / NJR-R01UHD, follow the precautions and instructions below.

7.1 Attaching Rubber feet

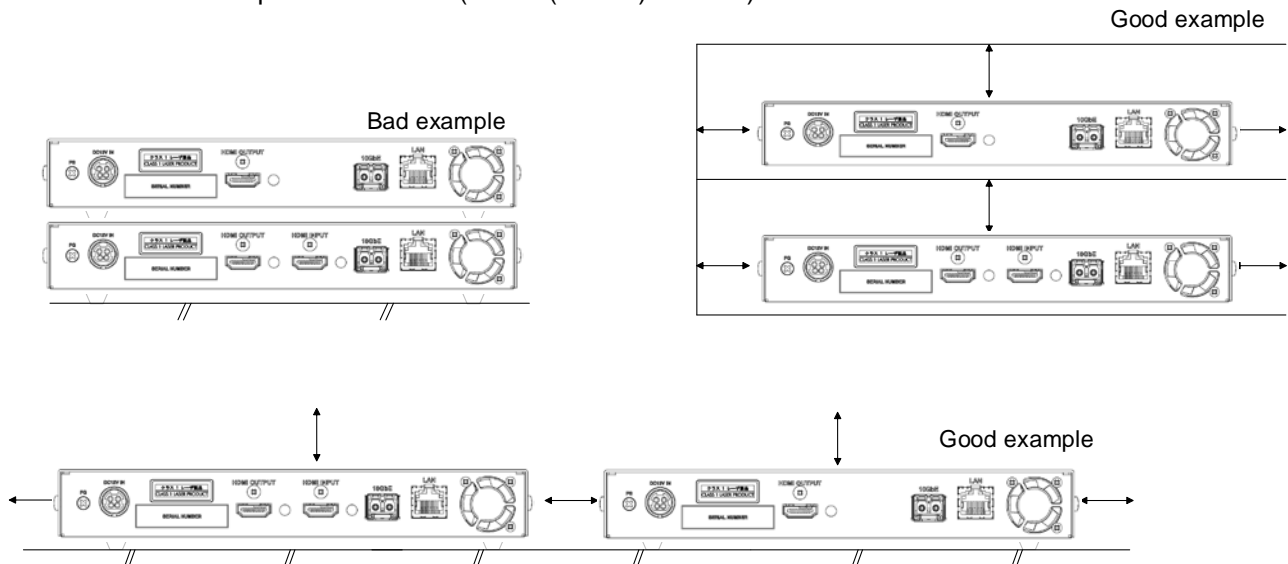
First, clean the bottom surface of the NJR-T01UHD / NJR-R01UHD as needed, and then peel the release papers from the rubber feet and place them in each of the four corners.

7.2 Installation

Follow the instructions below when installing NJR-T01UHD / NJR-R01UHD.

- Do not place the NJR-T01UHD / NJR-R01UHD on another device directly.
- Do not block vent holes. To provide adequate ventilation, maintain sufficient clearances around the NJR-T01UHD / NJR-R01UHD (1.2 in. (30 mm) or more).
- Do not install NJR-T01UHD / NJR-R01UHD in a closed space.
When placing them in an EIA rack-mount unit, prepare ventilating equipment to keep the ambient temperature at 40 degrees C/104 degrees F or less. If inadequately vented, the life of parts may be shortened and operation may be affected.
(Exception: Installing to IDK's rack mounting RM-42HQ, RM-4442)
- When you do not use an EIA rack-mount unit, maintain adequate clearances (1.2 in. (30 mm) or more) as shown below.

Maintain adequate clearances (1.2 in. (30 mm) or more) as shown below.



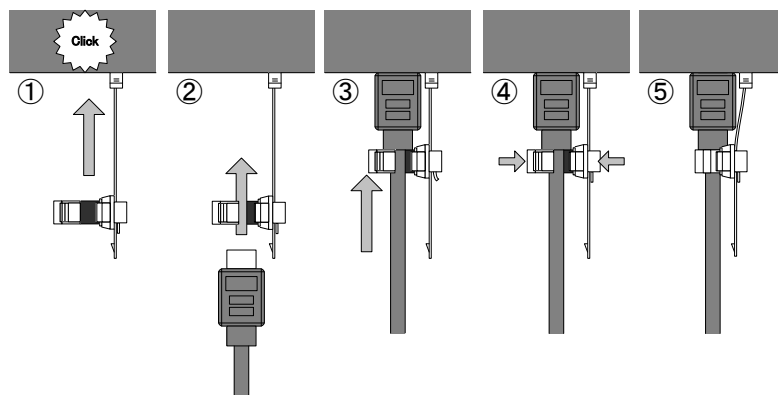
[Fig. 7.1] Necessary clearances

7.3 Cabling

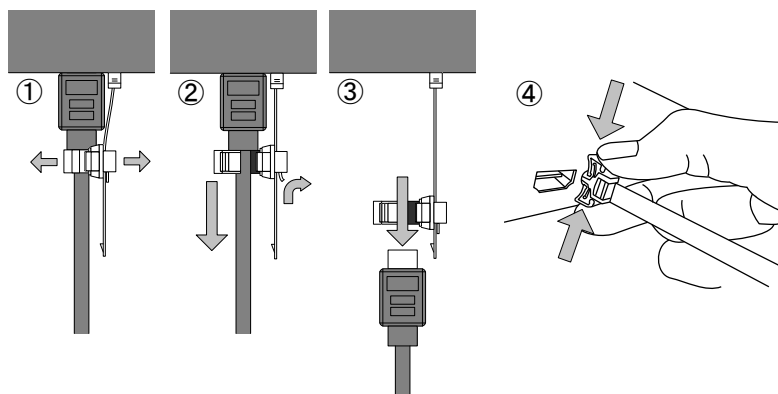
Follow the precautions below when connecting the NJR-T01UHD / NJR-R01UHD to target devices.

- Read the user's guides of connected devices carefully.
- When connecting a cable to the NJR-T01UHD / NJR-R01UHD or a compatible product, dissipate static electricity by touching grounded metal such as racks before handling single cables. Failure to observe this precaution may result in ESD (electrostatic discharge) damage.
- Turn off all devices.
- Be sure to fully seat all plugs and connections and dress cables to reduce stress on connectors.
- Fix HDMI cables using cable clamps to prevent those cables from falling off.

Fixing HDMI cable with cable clamp



Removing HDMI cable and cable clamp



[Fig. 7.2] Attaching cable clamp

7.3.1 HDMI cable

When the video is 4K format, the maximum TMDS data rate (transmission speed) is 18 Gbps. If a high-speed HDMI cable is used, the maximum TMDS data rate of 10.2 Gbps can be transferred, and the video cannot be displayed stably.

Please select an 18 Gbps high-speed cable depending on the 4K format. The maximum extension distance depends on the cable type, source and sink devices. You are recommended to use high quality cables.

[Table 7.1] 18 Gbps high-speed cable for 4K format

	TMDS data rate (Gbps)								
	RGB, YCbCr 4:4:4			YCbCr 4:2:2			YCbCr 4:2:0		
4K format	24 bit	30 bit	36 bit	24 bit	30 bit	36 bit	24 bit	30 bit	36 bit
3840x2160 (24 / 25 / 30)	10.2 Gbps	18 Gbps	18 Gbps	10.2 Gbps	10.2 Gbps	10.2 Gbps	—	—	—
4096x2160 (24 / 25 / 30)	10.2 Gbps	18 Gbps	18 Gbps	10.2 Gbps	10.2 Gbps	10.2 Gbps	—	—	—
3840x2160 (50 / 59.94 / 60)	18 Gbps	—	—	18 Gbps	18 Gbps	18 Gbps	10.2 Gbps	18 Gbps	18 Gbps
4096x2160 (50 / 59.94 / 60)	18 Gbps	—	—	18 Gbps	18 Gbps	18 Gbps	10.2 Gbps	18 Gbps	18 Gbps

18 Gbps: 18 Gbps high-speed cable, 10.2 Gbps: 10.2 Gbps transmission cable, —:N/A

Note:

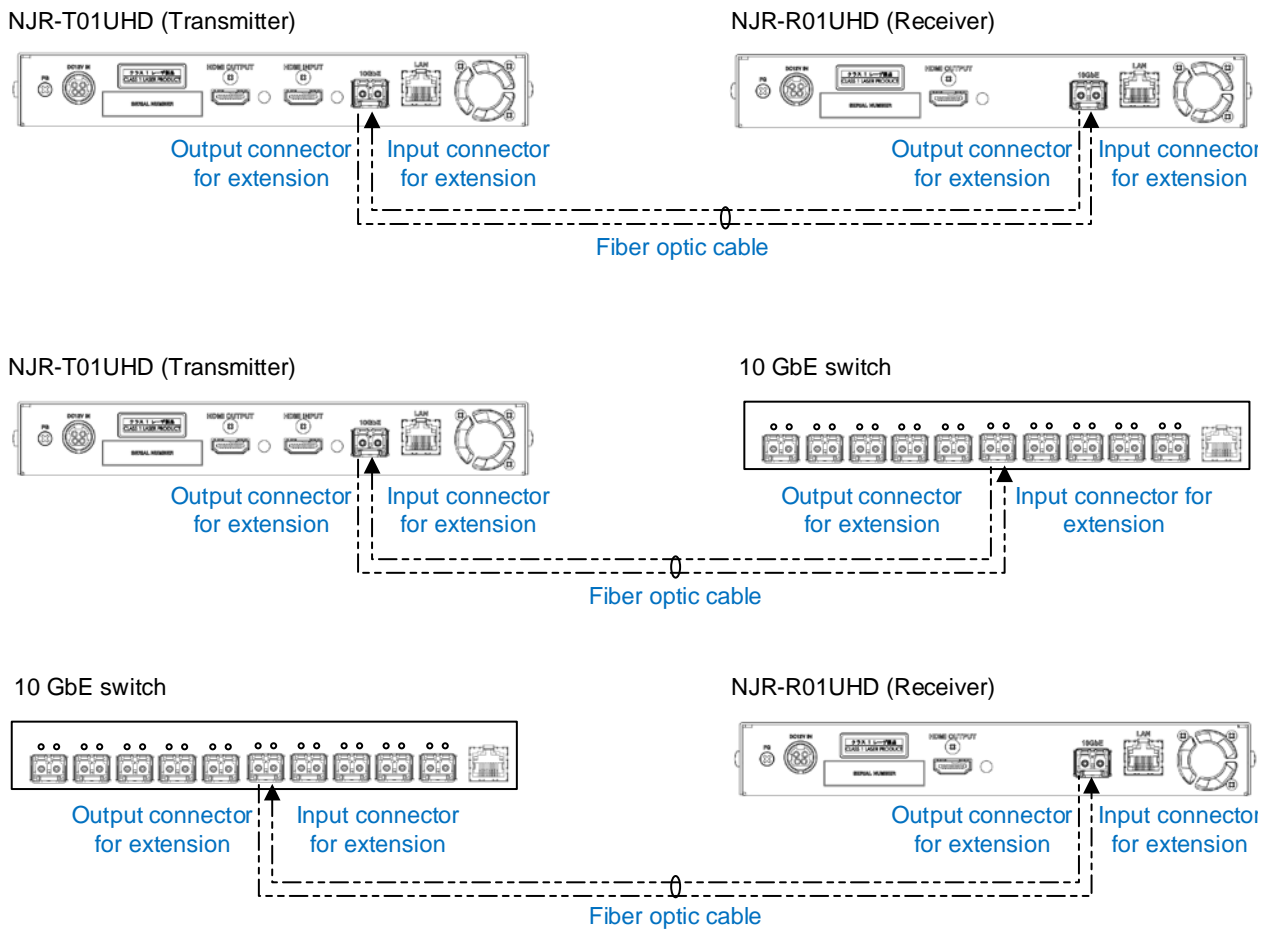
If a cable joint (JJ) or the like is used to extend the distance, the video may not be displayed correctly.

IDK supplies various cables, such as flexible HDMI cables, 18 Gbps high-speed cables, and conversion cables. See our web site for details. Please use needed HDMI cable, HDMI-DVI conversion cable depending on the system configuration.

7.3.2 Fiber optic cable for extension

NJR-T01UHD / NJR-R01UHD can reach their full potential by selecting appropriate fiber optic cables for long-haul extension and installing the cable correctly.

- Connect the output connector of this device to the input connector of the target device.
Connect the input connector of this device to the output connector of the target device.
 NJR-T01UHD: The target device should be NJR-R01UHD, receiver of other IP-NINJAR product, or 10 GbE switch.
 NJR-R01UHD: The target device should be NJR-T01UHD, transmitter of other IP-NINJAR product, or 10 GbE switch.



[Fig. 7.3] Connecting fiber optic cable

Note:

For the connectors of 10 GbE switch, refer to its manual.

Tip:

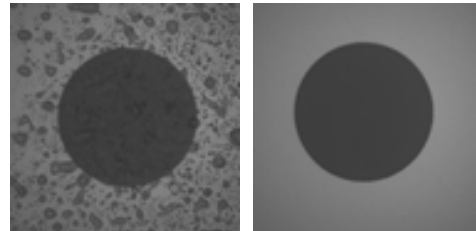
IDK supplies various optical cables, such as high-performance optical cables and non-strip fiber optic cables. See our web site for details.

- To polish connectors:
 For SFP module for multimode: PC polishing is recommended.
 For SFP module for singlemode: UPC polishing is recommended.
Note: APC polishing is not supported.
- Extension distance varies depending on attenuation of the fiber, connector and other contact portions.
- Make sure not to exceed the allowable tension and bend radius of fiber optic cable or the performance of the product and the life of the fiber optic cable may be affected.
- Plug the dust caps to both faces of the fiber optic cable when connecting the fiber optic cable and when not in use.
- Before inserting a fiber optic cable, make sure there is no damage or dirt on the end-face of the optical connector. Clean up it or NJR-T01UHD / NJR-R01UHD may not operate correctly.



Left: without dust cap
 Right: with dust cap

[Fig. 7.4] Dust caps



Before cleaning After cleaning

[Fig. 7.5] Cleaning connector

7.3.3 SFP+ Module

The fiber type and transmission distance vary depending on the SFP+ module.

[Table 7.2] Specification of standard SFP+modules

Item	10G-MM-SFP	10G-SM-SFP	10G-SM40-SFP (optional)
Cable	Multimode fiber	Singlemode fiber	Singlemode fiber
Wave length	850 nm (VCSEL laser*)	1310 nm (DFB laser*)	1550 nm (EML laser*)
Max. extension distance	OM3: 984ft. (300 m)	OS1: 6.21 mi. (10 km)	OS1: 24.85 mi. (40 km)
Receiver sensitivity (OMA) @10.3Gbps	-11.1 dBm or higher	-12.6 dBm or higher	-16 dBm or higher
Average Launch Power	-5 dBm to -1 dBm	-8.2 dBm to +0.5 dBm	-1 dBm to +2 dBm
Max. input power	+0.5 dBm	+0.5 dBm	-1 dBm
Connector		LC (Duplex)	

* The lasers in these models meet class1.

- When no fiber optic cable is connected, plug dust caps.
- Do not use the SFP+module for other products. Also, do not connect fiber optic cables that is connected to other products to the SFP+ module or the module may be damaged.
- If you need to replace the SFP+module, please contact us.

7.3.4 Twisted pair cable for extension

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

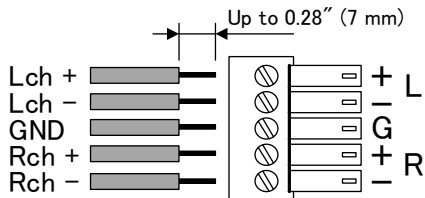
- CAT6A is recommended for optimal performance.
- If using an STP cable, connect the FG connector to a ground source. Otherwise, the shielding feature does not work correctly. When using a UTP cable, we still recommend using the ground connector.
- The shielded STP cables are less affected by interference or external noise than UTP cables.
- Pin assignments: T568A or T568B straight
- Do not pull the cable hard. The allowable tension of the twisted pair cable is 110 N.
- Do not bend the connection cable at a sharp angle. Keep the bend radius four times of the cable diameter or larger.
- Do not tie the cable tightly; leave a space allowing the cable to move slightly.
- If you use multiple twisted pair cables, we recommended keeping a distance between the cables or not to place the cables closely in parallel.
- Keep the twisted pair cable as straight as you can. If you coil the cable, it is easily affected by noise.
- Do not place the cable in an electrically noisy environment, since high-speed signals are transmitted. Particularly when you use a high-output radio around the device, video or audio may be interrupted.
- If the total extension distance from the transmitter to receiver is 328 ft. (100 m) or less, up to two cable joints can be used. Products supporting Cat6A (10GBase-T) are recommended.

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

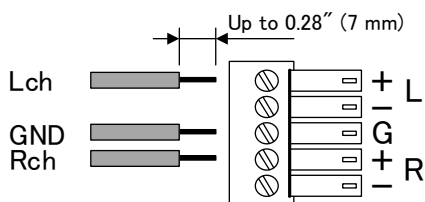
7.3.5 Connecting audio cable

In order to input or output audio signals, connect the audio cables to the provided 5-pin terminal block and connect to NJR-T01UHD or NJR-R01UHD. NJR-T01UHD / NJR-R01UHD support balanced and unbalanced signals.

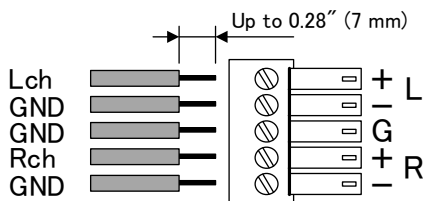
AWG 28 to AWG16 is recommended for the cable. The maximum length of stripped ends is 0.28 in. (7 mm).



Connecting balanced signal (I/O)

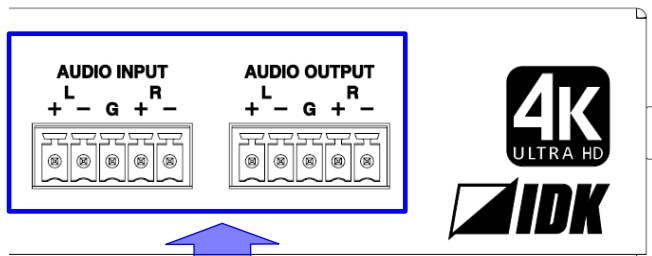


Connecting unbalanced signal (Input)

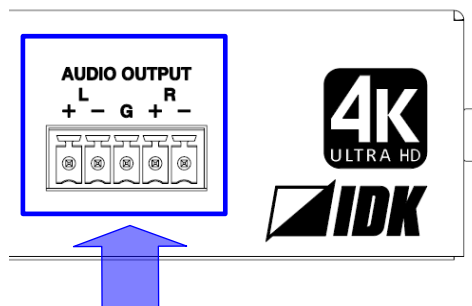


Connecting unbalanced signal (Output)

● NJR-T01UHD (Transmitter)



● NJR-R01UHD (Receiver)

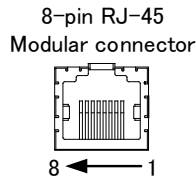


[Fig. 7.6] Connecting audio cable

7.3.6 Connecting LAN cable

Pin assignment of the LAN port is as follows.

Auto MDI/MDI-X that detecting and switching straight cable/cross cable is supported.



Pin number	Signal name			
	MDI		MDI-X	
	1000BASE-T	100BASE-TX/10BASE-T	1000BASE-T	100BASE-TX/10BASE-T
1	TRX+ (Transmitted & Received data+)	TX+ (Transmitted data+)	TRX+ (Transmitted & Received data+)	RX+ (Received data+)
2	TRX- (Transmitted & Received data)	TX- (Transmitted data)	TRX- (Transmitted & Received data)	RX- (Received data)
3	TRX+ (Transmitted & Received data+)	RX+ (Received data+)	TRX+ (Transmitted & Received data+)	TX+ (Transmitted data+)
4	TRX+ (Transmitted & Received data+)	N.C. (No connection)	TRX+ (Transmitted & Received data+)	N.C. (No connection)
5	TRX- (Transmitted & Received data)	N.C. (No connection)	TRX- (Transmitted & Received data)	N.C. (No connection)
6	TRX- (Transmitted & Received data)	RX- (Received data)	TRX- (Transmitted & Received data)	TX- (Transmitted data)
7	TRX+ (Transmitted & Received data+)	N.C. (No connection)	TRX+ (Transmitted & Received data+)	N.C. (No connection)
8	TRX- (Transmitted & Received data)	N.C. (No connection)	TRX- (Transmitted & Received data)	N.C. (No connection)

* N.C.: No Connection

[Fig. 7.7] Specification of LAN port

Make sure not to form a loop by NJR-T01UHD / NJR-R01UHD when connecting a LAN cable to NJR-T01UHD / NJR-R01UHD.

NJR-T01UHD / NJR-R01UHD constantly send broadcast packet in order to notify status.

If adding the LAN cable to the existing network, avoid problems, such as broadcast storm caused by broadcast traffic.

Broadcast storm: This problem occurs when a network system is overwhelmed by continuous broadcast traffic or the like.

7.3.7 DIN plug AC adapter with lock

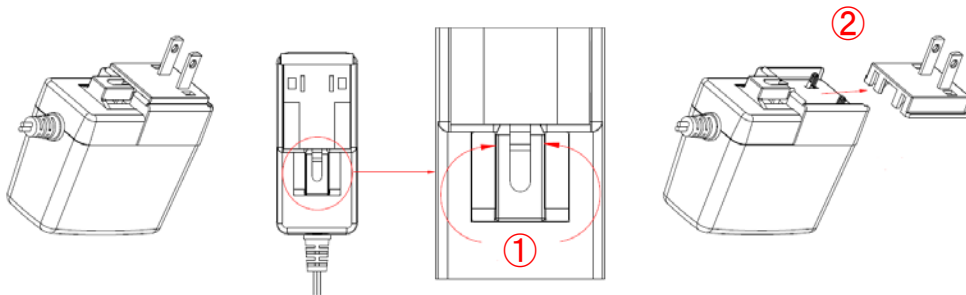
■ Attaching and removing AC plug

AC plug shapes of the AC adapter with screw type lock mechanism differ from one country to another; use an appropriate AC plug.

For inquiries for the AC plug, contact us directly.

Removing:

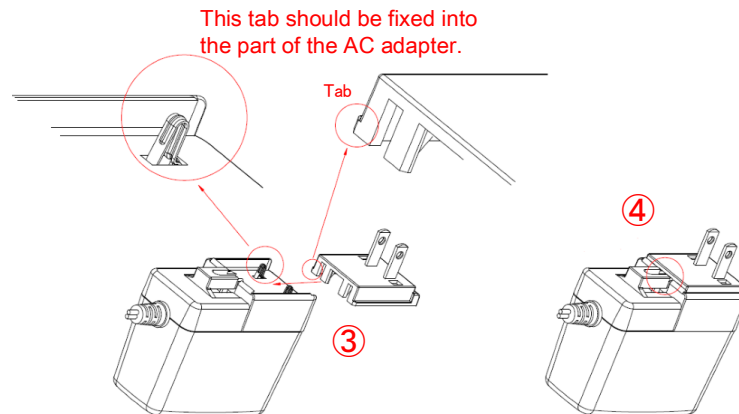
Hold the joint of the AC adapter (①) and slide the AC plug from the AC adapter (②).



[Fig. 7.8] Removing AC plug

Attaching:

Attach the AC plug to the AC adapter (③) until it clicks (④).

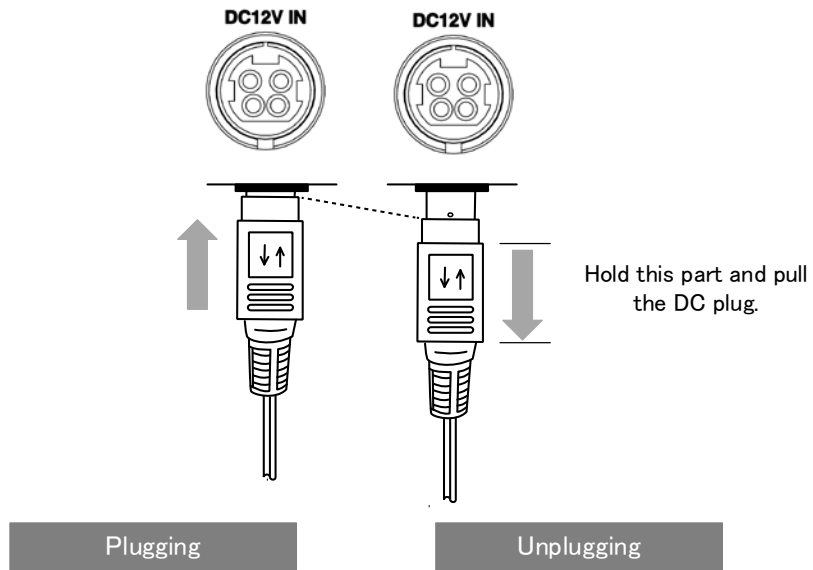


[Fig. 7.9] Attaching AC plug

■ **Plugging and unplugging DC plug**

Plug the DC plug to the power supply connector of the unit until it clicks.

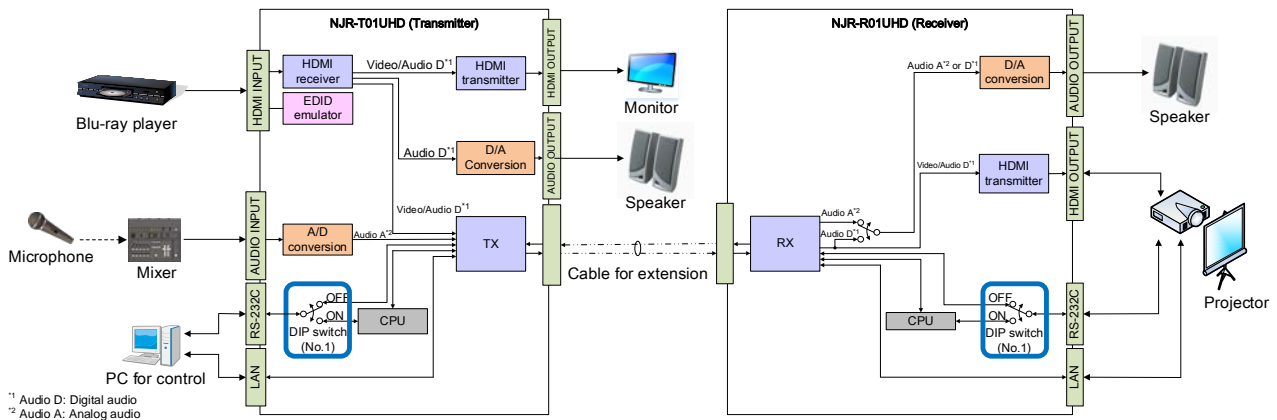
Hold the portion mentioned below when unplugging the DC plug.



[Fig. 7.10] Plugging and unplugging DC plug

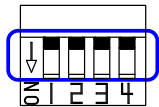
7.4 Setting DIP switch

Use the DIP switch to change settings of NJR-T01UHD / NJR-R01UHD.



[Fig. 7.11] Block Diagram of DIP switch function

■ Settings for NJR-T01UHD

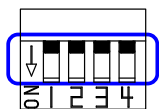


Default: OFF (SW1 to SW4)

No.	Description
1	Selects internal connection of the RS-232C port. OFF : Connects to NJR-R01UHD. ON : Connects to the CPU and sets settings of NJR-T01UHD.
2	No connection
3	No connection
4	No connection

[Fig. 7.12] Functions of DIP switch (NJR-T01UHD)

■ Settings for NJR-R01UHD



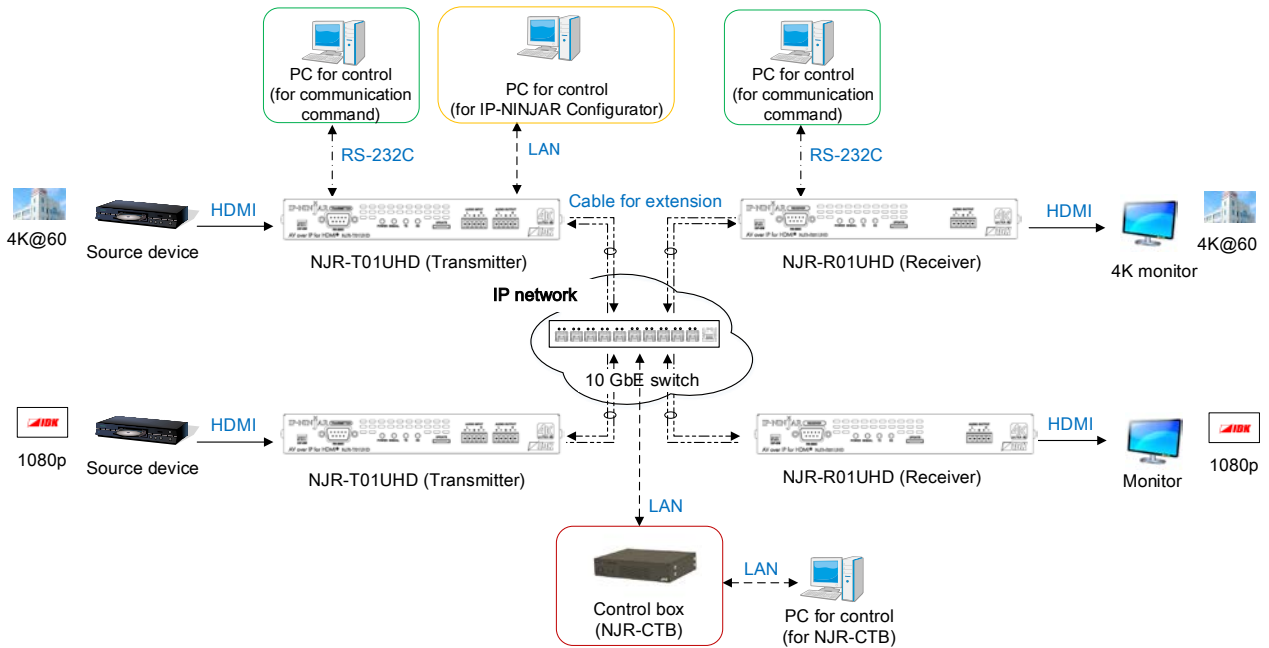
Default: OFF (SW1 to SW4)

No.	Description
1	Selects internal connection of the RS-232C port. OFF : Connects to NJR-T01UHD. ON : Connects to the CPU and sets settings of NJR-R01UHD.
2	No connection.
3	No connection.
4	No connection.

[Fig. 7.13] Functions of DIP switch (NJR-R01UHD)

8 Basic Operation

NJR-T01UHD / NJR-R01UHD can be set from commands over RS-232C communication and NJR-CTB (control box for IP-NINJAR) or IP-NINJAR Configurator.



[Fig. 8.1] Setting NJR-T01UHD / NJR-R01UHD

8.1 Control over RS-232C communication

NJR-T01UHD / NJR-R01UHD can be controlled over RS-232C communication.

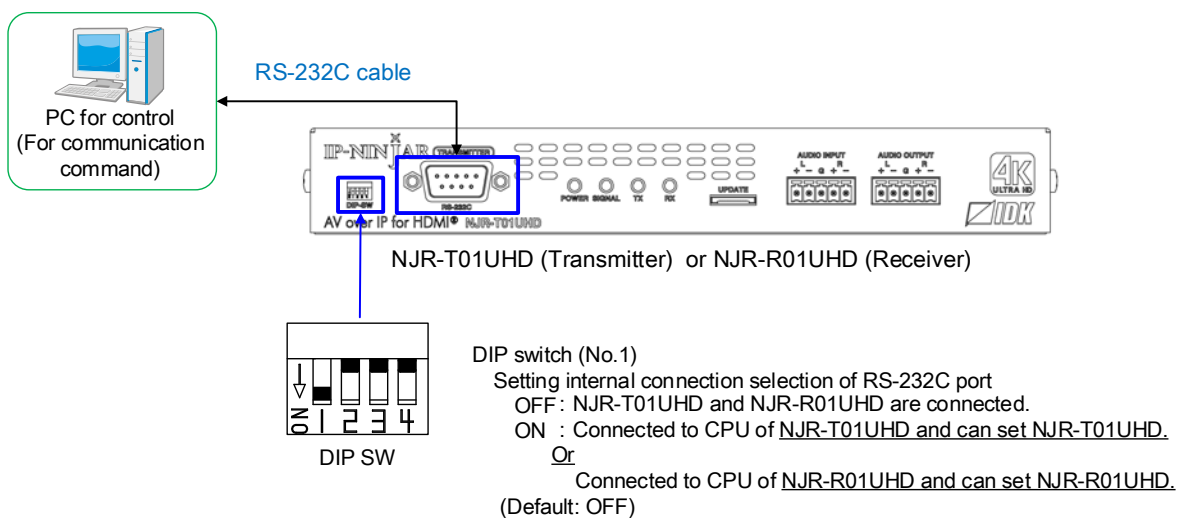
You can control NJR-T01UHD or NJR-R01UHD and get its status by connecting a control unit, such as PCs, to NJR-T01UHD or NJR-R01UHD over an RS-232C cable.

The RS-232C port has two modes: one is controlling NJR-T01UHD or NJR-R01UHD and another is communicating between peripheral devices connected to NJR-T01UHD or NJR-R01UHD.

Turn the DIP switch No.1 to ON to control NJR-T01UHD or NJR-R01UHD.

For details of communication commands, refer to the Command Guide for the NJR-T01UHD / NJR-R01UHD.

【See: 7.4 Setting DIP switch】



[Fig. 8.2] Control over communication command

Note:

Settings of NJR-R01UHD or NJR-T01UHD cannot be set from NJR-T01UHD or NJR-R01UHD, respectively.

8.2 IP-NINJAR Configurator (Setting software for IP-NINJAR)

NJR-T01UHD / NJR-R01UHD connected to LAN can be set from the IP-NINJAR Configurator remotely over LAN communication.

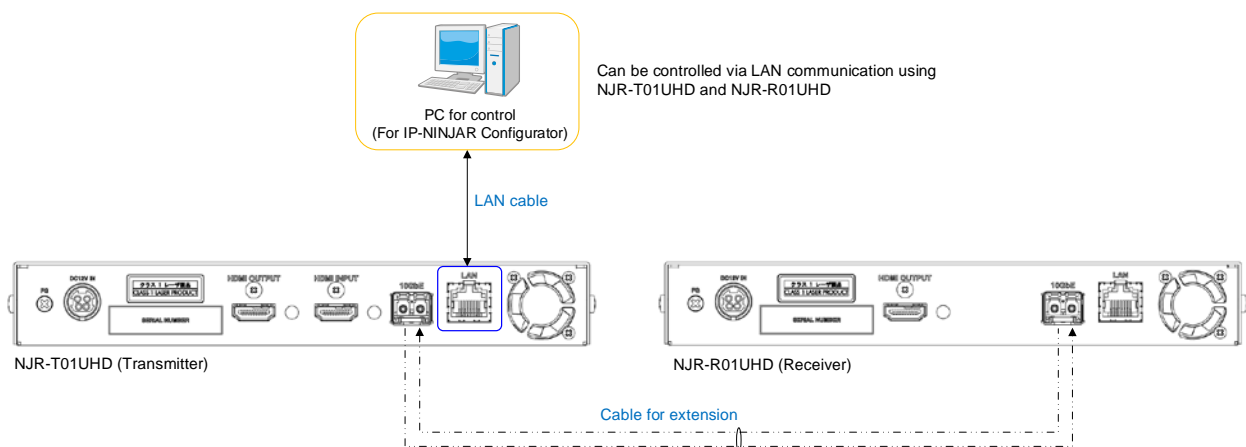
The following settings can be set from the GUI: selecting output audio, setting RS-232C, setting LAN, resetting settings, and rebooting NJR-T01UHD / NJR-R01UHD. For other settings, communication commands can be input from the command line.

Refer to the IP-NINJAR Configurator User's Guide for operations from the IP-NINJAR Configurator.

Refer to the Command Guide for NJR-T01UHD / NJR-R01UHD for details of communication commands.

You can download the IP-NINJAR Configurator from our Web site below:

<http://www.idkav.com>



[Fig. 8.3] Control from IP-NINJAR Configurator



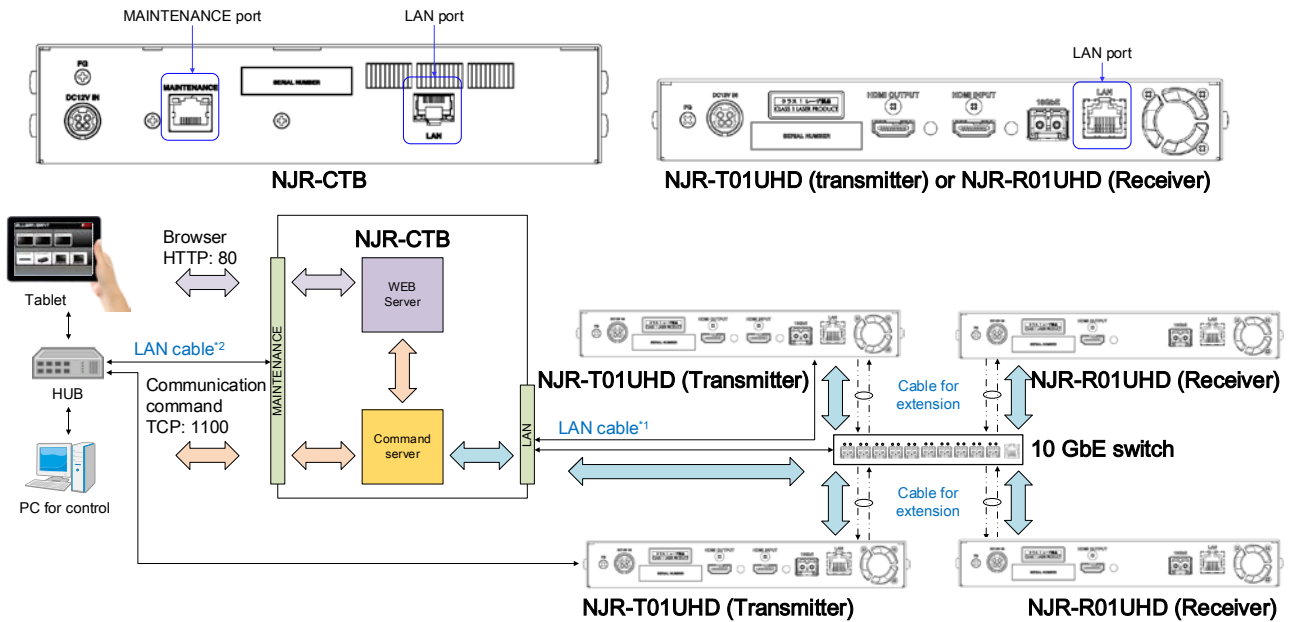
[Fig. 8.4] IP-NINJAR Configurator's GUI

8.3 Control over NJR-CTB (Control box for IP-NINJAR)

The NJR-CTB is the integrated control unit for NP-NINJARs connected to a network over a 10 GbE switch. The control box can control all devices and acquire their statuses using communication commands through WEB browser or LAN by connecting to NJR-T01UHD / NJR-R01UHD or 10 GbE switch.

Refer to NJR-CTB User's Guide for operations via a web browser.

Refer to the Command Guide for NJR-T01UHD / NJR-R01UHD or the Command Guide for NJR-CTB for details of communication commands.



¹ LAN port on NJR-CTB should be connected to the LAN port on NJR-T01UHD/NJR-R01UHD or 10 GbE switch.

² PC for control should be connected to the MAINTENANCE port on NJR-CTB or the LAN port on NJR-T01UHD/NJR-R01UHD.

[Fig. 8.5] Control over NJR-CTB

8.4 Setting Items

Some setting items can be controlled through commands / GUI operation; the others cannot be controlled.

[Table 8.1] Setting items

C: Command input, G: GUI, W: WEB browser and command input, No: Not supported

Setting item	NJR-T01UHD / NJR-R01UHD		NJR-CTB	Page
	RS-232C	LAN (IP-NINJAR Configurator)	LAN	
Non-signal input monitoring	C	C	W	39
HDCP input Enabled/Disabled	C	C	W	40
Setting output mode	C	C	W	41
Setting HDCP output	C	C	W	41
Setting hot plug masking	C	C	W	42
Muting digital audio	C	C	W	43
Selecting output audio	No	G	W	44
Setting EDID resolution	C	C	W	45
Copying EDID	C	C	W	47
Selecting WXGA mode	C	C	W	47
Deep Color	C	C	W	48
Audio format	C	C	W	48
Speaker configuration	C	C	W	49
RS-232C	No	G	W	50
LAN	No	G	W	52
MAC	No	G	W	52
Input status	C	C	W	53
Output status	C	C	W	54
Monitor EDID	C	C	W	55
Displaying version	C	C	W	56
Initialization	No	G	W	37
Reboot	No	G	W	37
Setting channel information*	No	No	W	-
Selecting I/O channel*	No	No	W	-
Operating preset memory*	No	No	W	-
Setting video wall*	No	No	W	-
Setting RS-232C cross point*	No	No	W	-
Setting NJR-CTB LAN*	No	No	W	-

*: In this manual, only settings of NJR-T01UHD / NJR-R01UHD are explained. Refer to NJR-CTB User's Guide for the following operations: Using as Network Extender base on 10GbE Switcher, setting channel information, selecting input/output channel, operating preset memory, setting video wall, setting cross point, and setting NJR-CTB LAN.

8.5 Initialization

You can initialize settings to factory defaults using IP-NINJAR Configurator or NJR-CTB via LAN communication.

When initialization completes, NJR-T01UHD / NJR-R01UHD reboots with new settings automatically.

Note:

Once values are initialized, they cannot be restored.

Communication command

@CLRC Initialization

【See: 8.2 IP-NINJAR Configurator (Setting software for IP-NINJAR)】

【See: 8.3 Control over NJR-CTB (Control box for IP-NINJAR)】

8.6 Reboot

You can reboot NJR-T01UHD / NJR-R01UHD using IP-NINJAR Configurator or NJR-CTB over LAN communication.

Communication command

@RBTC Reboot

【See: 8.2 IP-NINJAR Configurator (Setting software for IP-NINJAR)】

【See: 8.3 Control over NJR-CTB (Control box for IP-NINJAR)】

9 Setting

The following items of NJR-T01UHD / NJR-R01UHD can be set using the RS-232C communication, IP-NINJAR Configurator, or NJR-CTB.

In this manual, only settings of NJR-T01UHD / NJR-R01UHD are explained. Refer to NJR-CTB User's Guide for the following operations: Using as Network Extender base on 10GbE Switcher, setting channel information, selecting input/output channel, operating preset memory, setting video wall, setting cross point, and setting NJR-CTB LAN.

[Table 9.1] Setting items

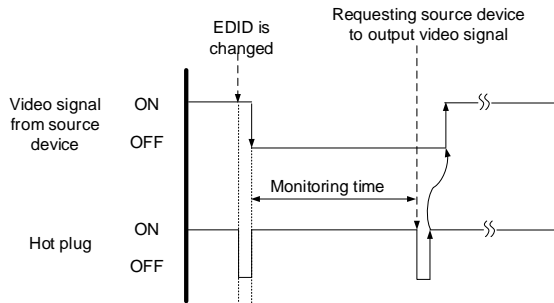
Item	Setting value		Related pages
	Value	Default	
Non-signal input monitoring	OFF / 2 to 15 [second]	10 [second]	39
HDCP input Enabled/Disabled	HDCP enabled / HDCP disabled	HDCP enabled	40
Setting output mode	AUTO / DVI / RGB / YCbCr 4:2:2 / YCbCr 4:4:4 / YCbCr 4:2:0	AUTO	41
Setting HDCP output	ALWAYS / HDCP INPUT ONLY / HDCP 2.2	ALWAYS	41
Setting hot plug masking	OFF / 2 to 15 [second]	OFF (no masking)	42
Muting digital audio	Mute OFF / Mute ON	Mute OFF	43
Selecting output audio	Analog input audio / Digital input audio	Analog input audio	44
Setting EDID resolution	SVGA to UHDTV	2160p 50 / 59.94 / 60 4:4:4	45
Selecting WXGA mode	1360 x 768 / 1366 x 768	1360 x 768	47
Deep Color	24 / 30 / 36-BIT COLOR	24-BIT COLOR	48
Audio format	PCM / Dolby Digital / AAC / Dolby Digital+ / DTS / DTS-HD / Dolby TrueHD 32 / 44.1 / 48 / 88.2 / 96 / 176.4 / 192 [kHz]	PCM 48 [kHz]	48
Speaker configuration	1 to 8	2	49
RS-232C	4800 / 9600 / 19200 / 38400 / 57600 / 115200 [bps] 7 / 8 [bit] 1 / 2 [bit] NONE / EVEN / ODD	9600 [bps] 8 [bit] 1 [bit] NONE	50
LAN	Automatic / Fix	Automatic	52

9.1 Input setting

9.1.1 Non-signal input monitoring

NJR-T01UHD

If EDID of the NJR-T01UHD is changed or it is turned ON / OFF, the source device may not output video signal. In this case, you can set the time length which is from when a source device stops outputting signal to when the NJR-T01UHD requests the source device to output video signal.



[Fig. 9.1] Monitoring absence of input

Setting value

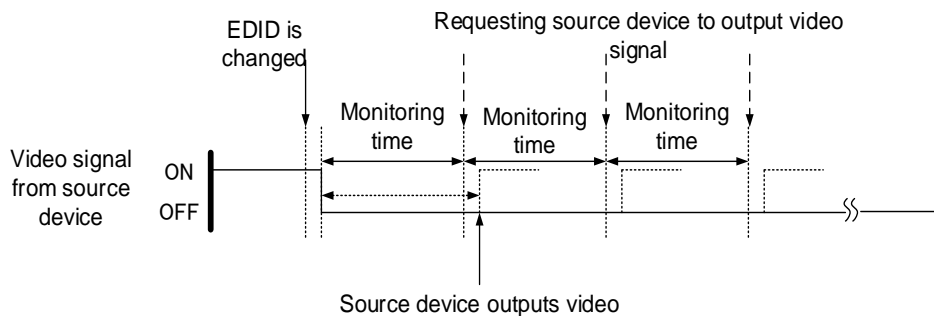
OFF

2 to 15 seconds [Default] 10 second

Note:

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

If you set shorter time than the time the source device outputs video, the source device may not output video. In such case, set the longer time.



[Fig. 9.2] Repeating output signal setting

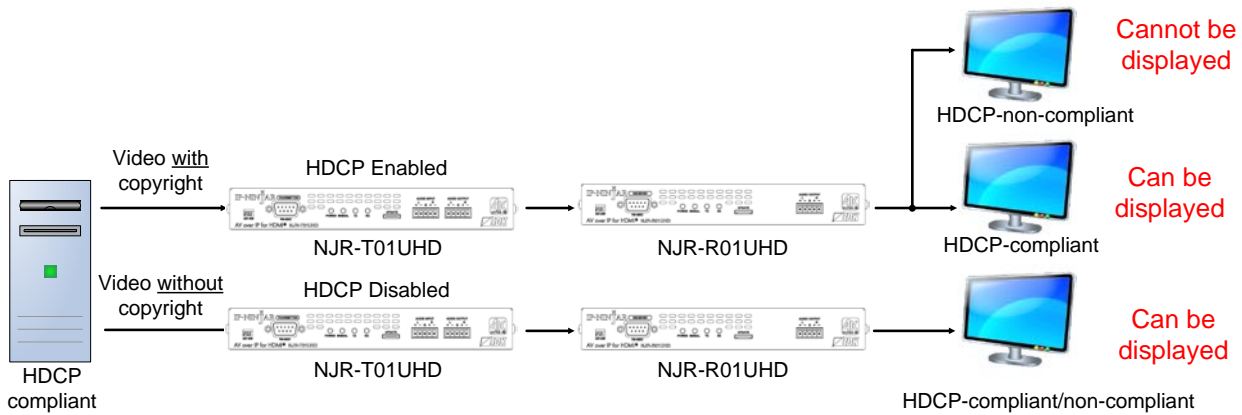
Communication command

@SDT Set monitoring time of video

@GDT Get monitoring time of video

9.1.2 HDCP input Enabled/Disabled

You can set whether NJR-T01UHD encrypts HDCP to the source device. Some source devices check whether the connected device supports HDCP and then determine whether they encrypt HDCP signal or not. Since NJR-T01UHD is HDCP compliant, if it is connected to a sink device that is not HDCP compliant, the sink device may not display video. In such a case, select "DISABLE" to display video.



[Fig. 9.3] PC and HDCP-compliant/HDCP-non-compliant sink device

Setting value

- HDCP enabled [Default]
- HDCP disabled

Note:

Set this setting to HDCP enabled in order to display video with copyright protection.

HDCP 2.2 (stream type 0) can be displayed on a sink device supported HDCP 1.4.

HDCP 2.2 (stream type1) can be displayed on a sink device supported HDCP 2.2 but not on a sink device supported HDCP 1.4.

Communication command

- @SHE Setting HDCP input enabled/disabled
- @GHE Getting HDCP input enabled/disabled

9.2 Output setting

9.2.1 Setting output mode

NJR-T01UHD / NJR-R01UHD

You can set the color space to be sent to the sink device.

The sink device selects the best color space for the color space of the input video automatically, but if for some reason the sink device cannot select the color space, set the desired color space in NJR-T01UHD or NJR-R01UHD.

For NJR-T01UHD, output mode can individually be set to the output from the HDMI OUTPUT connector (local output) and output connector for extension.

Setting value

- AUTO [Default]
- DVI output
- RGB output
- YCbCr 4:2:2 output
- YCbCr 4:4:4 output
- YCbCr 4:2:0 output

Note:

This setting is enabled when HDMI signal is input.

Communication command

- @SDM Setting output mode
- @GDM Getting output mode

9.2.2 Setting HDCP output

NJR-R01UHD

You can set the HDCP output for when a HDCP-compliant device is connected.

Normally select "ALWAYS" to output HDCP at all times regardless of input signal status.

If you select "HDCP INPUT ONLY", HDCP will be output only if the input signal has HDCP. However, some sink devices fails HDCP authentication when HDCP is switched from OFF to ON; this results in that video and audio may not be output temporarily.

Setting value

- ALWAYS [Default]
- HDCP INPUT ONLY
- HDCP 2.2

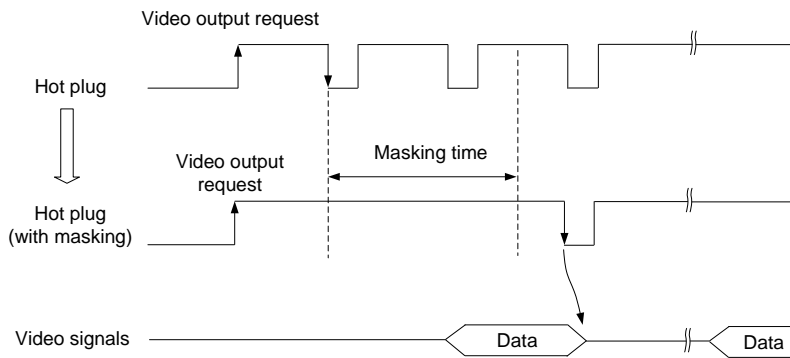
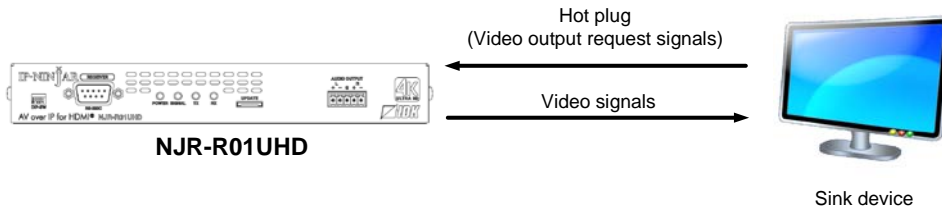
Communication command

- @SEN Setting HDCP output
- @GEN Getting HDCP output

9.2.3 Setting hot plug masking

You can set how long hot plug (signals for requesting video output) that is sent from a sink device will be ignored.

If a sink device repeatedly sends requests to output video at short intervals, the NJR-T01UHD / NJR-R01UHD may not output video, because it sets output video every time receiving the signals. This problem can be fixed by setting how long the request will be ignored (Hot plug masking).



[Fig. 9.4] Setting hot plug masking

Setting value

OFF(no masking) [Default]
 2 to 15 [second]

Communication command

@SHM Setting hot plug masking
 @GHM Getting hot plug masking

9.3 Audio setting

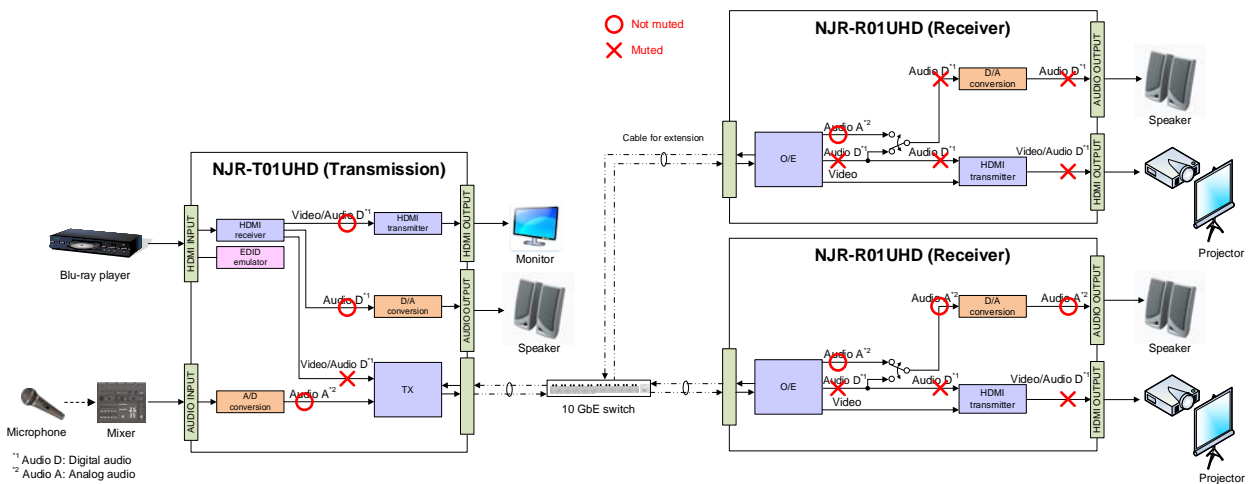
9.3.1 Muting digital audio

NJR-T01UHD / NJR-R01UHD

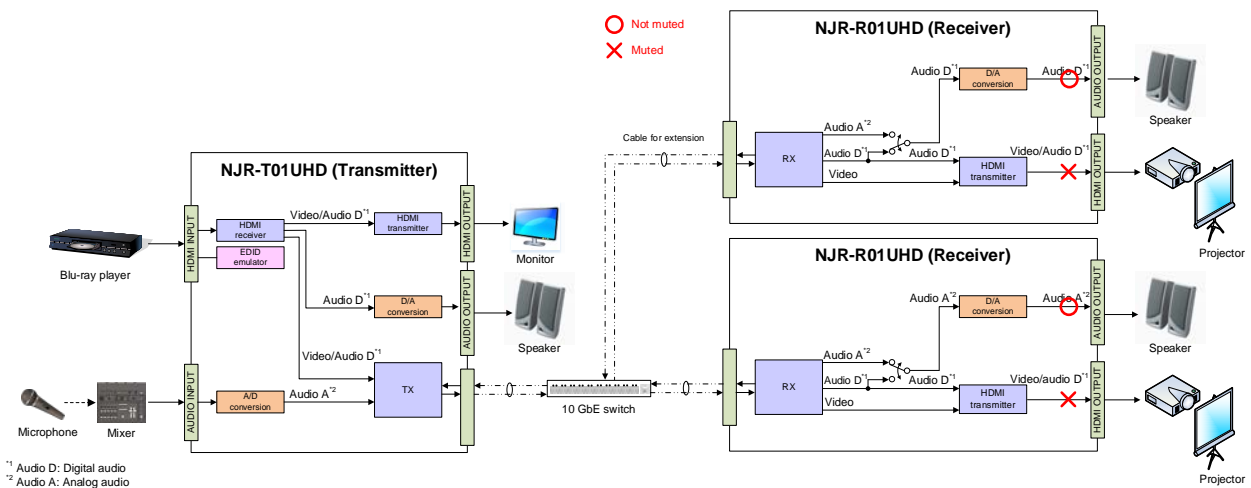
You can enable or disable the audio output mute.

Once you mute NJR-T01UHD, all audio of NJR-R01UHD connected through the 10 GbE switch can be muted. If digital audio is output from the analog audio output connector of NJR-R01UHD, these output audio is also muted.

When you mute NJR-R01UHD, output audio from the HDMI output connector of NJR-R01UHD is muted.



[Fig. 9.5] Muting NJR-T01UHD (Transmitter)



[Fig. 9.6] Muting NJR-R01UHD (Receiver)

Setting value

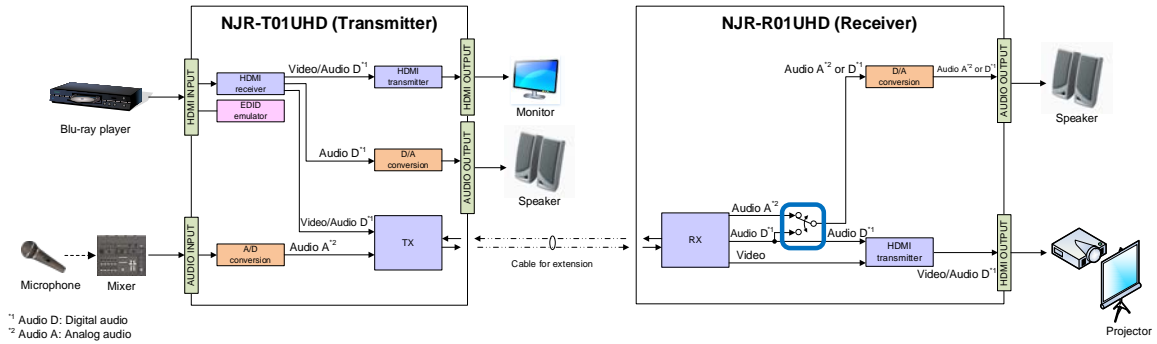
- Mute OFF [Default]
- Mute ON

Communication command

- @SAM Setting digital audio output mute
- @GAM Getting digital audio output mute

9.3.2 Selecting output audio

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



[Fig. 9.7] Selecting output audio

Setting value

- Analog input audio [Default]
- Digital input audio

Communication command

- @SAAS Setting output audio
- @GAAS Getting output audio

9.4 EDID setting

9.4.1 Setting EDID resolution

NJR-T01UHD

You can set the desired resolution that is output from the source device.

Setting value

[Table 9.2] EDID maximum resolution

Max. resolution	Pixel	Standard	Remarks
Copied EDID	—	—	If no data, "2160p (50 / 59.94 / 60, 4:4:4)".
1080p (50 / 59.94 / 60)	1920 x 1080	HDTV	
720p	1280 x 720		
1080i	1920 x 1080		
SVGA	800 x 600	VESA	
XGA	1024 x 768		
VESA720	1280 x 720		For DVI device input
WXGA	1280 x 768		
WXGA	1280 x 800		
Quad-VGA	1280 x 960		
SXGA	1280 x 1024		
WXGA	1360 x 768, 1366 x 768		Pixel can be set in "Selecting @GWX / @SWX WXGA mode"
SXGA+	1400 x 1050		
WXGA+	1440 x 900		
WXGA++	1600 x 900		(RB)
UXGA	1600 x 1200		
WSXGA	1680 x 1050		
VESA1080	1920 x 1080		(RB), For DVI device input
WUXGA	1920 x 1200		(RB)
QWXGA	2048 x 1152		(RB)
WQHD	2560 x 1440	(RB)	
WQXGA	2560 x 1600	(RB)	
2160p (50 / 59.94 / 60, 4:2:0)	3840 x 2160	UHDTV	YCbCr 4:2:0 supported
4096x2160 (50 / 59.94 / 60, 4:2:0)	4096 x 2160	DCI	YCbCr 4:2:0 supported
2160p (50 / 59.94 / 60, 4:4:4)	3840 x 2160	UHDTV	Default YCbCr 4:2:0, YCbCr 4:2:2, YCbCr 4:4:4 supported
4096x2160 (50 / 59.94 / 60, 4:4:4)	4096 x 2160	DCI	YCbCr 4:2:0, YCbCr 4:2:2, YCbCr 4:4:4 supported

(RB): Reduced Blanking

Notes:

- For resolution of 4096 x 2160

According to the EDID definition, the source device may select 3840 x 2160 (30p,YCbCr 4:4:4) for the first resolution. If using the resolution of 4096 x 2160, set the internal EDID and then select the resolution of 4096 x 2160 in the source device.

- For resolution of YCbCr4:2:0

According to the EDID definition, the source device may select 3840 x 2160 (30p,YCbCr 4:4:4) for the first resolution. If using the color depth of YCbCr 4:2:0, set the internal EDID and then select the color depth of YCbCr 4:2:0 in the source device.

[Table 9.3] Maximum resolution and EDID supported pixel

Max. resolution	Pixel																											
	640 x 480	800 x 600	1024 x 768	1280 x 720	1280 x 768	1280 x 800	1280 x 960	1280 x 1024	1360 x 768*	1366 x 768*	1400 x 1050	1440 x 900	1600 x 900	1600 x 1200	1680 x 1050	1920 x 1080	1920 x 1200	2048 x 1152	2560 x 1440	2560 x 1600	3840 x 2160 (30p)	4096 x 2160 (30p)	3840 x 2160 (60p)	4096 x 2160 (60p)				
1080p (50 / 59.94 / 60)	Y	Y	Y	N	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	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	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	N	N		
800x600	Y	Y	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N		
1024x768	Y	Y	Y	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N		
1280x720	Y	Y	Y	Y	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N		
1280x768	Y	Y	Y	Y	Y	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N		
1280x800	Y	Y	Y	Y	Y	Y	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N		
1280x960	Y	Y	Y	Y	Y	Y	Y	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N		
1280x1024	Y	Y	Y	Y	Y	Y	Y	Y	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N		
1360x768	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N		
1400x1050	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N		
1440x900	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	N	N	N	N	N	N	N	N	N	N	N	N	N	N		
1600x900	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	N	N	N	N	N	N	N	N	N	N	N	N	N		
1600x1200	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N	N	N	N	N	N	N	N	N	N	N		
1680x1050	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N	N	N	N	N	N	N	N	N	N		
1920x1080	Y	Y	Y	N	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N	N	N	N	N	N	N	N		
1920x1200	Y	Y	Y	N	N	Y	Y	Y	N	N	Y	Y	Y	Y	Y	Y	Y	Y	N	N	N	N	N	N	N	N		
2048x1152	Y	Y	Y	N	N	N	Y	Y	N	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N	N	N	N	N	N		
2560x1440	Y	Y	Y	N	N	N	N	Y	N	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N	N	N	N	N		
2560x1600	Y	Y	Y	N	N	N	N	Y	N	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N	N	N	N		
2160p (50 / 59.94 / 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	N	P	N	N		
4096x2160 (50 / 59.94 / 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	Y	P	P	N		
2160p (50 / 59.94 / 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	N	Y	N	N		
4096x2160 (50 / 59.94 / 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	Y		

Y: Supported, P: Only YCbCr 4:2:0 supported, N: Not supported

* EDID supported pixel of 1360 x 768 and 1366 x 768 can be set in “**9.4.3 Selecting WXGA mode**”.

The default value is 1360 x 768.

Communication command

@SVF Setting EDID resolution

@GVF Getting EDID resolution

9.4.2 Copying EDID

NJR-T01UHD

EDID of the sink device connected to NJR-T01UHD or NJR-R01UHD can be loaded and registered, and the copied EDID can be treated in the same way as the internal EDID.

In order to copy the EDID of the sink device connected to NJR-R01UHD, set this item from the IP-NINJAR Configurator or NJR-CTB.

Communication command

@RME Copying EDID

【See: 8.2 IP-NINJAR Configurator (Setting software for IP-NINJAR)】

【See: 8.3 Control over NJR-CTB (Control box for IP-NINJAR)】

Note:

To use a registered EDID, set “**9.4.1 Setting EDID resolution**” to Copied EDID.

9.4.3 Selecting WXGA mode

NJR-T01UHD

You can set the WXGA pixel (1360x768 or 1366x768) depending on the resolution of EDID.

This setting is enabled if selecting an item other than copied EDID.

Setting value

1360x768 [Default]

1366x768

Communication command

@SWX Setting WXGA mode

@GWX Getting WXGA mode

9.4.4 Deep Color

NJR-T01UHD

You can set the color depth that is output from the source device.

Setting value

24-BIT COLOR [Default]
 30-BIT COLOR
 36-BIT COLOR

Note:

If you select "30-BIT COLOR" or "36-BIT COLOR", the transmission clock speed increases. Noise may occur if a bad-quality cable or long cable is connected. In these cases, the noise may be removed by selecting "24-BIT COLOR".

For 4K@50 / 59.94 / 60 (YCbCr 4:4:4), "24-BIT COLOR" is selected automatically regardless of this menu's setting.

Communication command

@SDI Setting Deep Color input
 @GDI Getting Deep Color input

9.4.5 Audio format

NJR-T01UHD

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

Note:

Some formats are not supported; select an audio format and sampling frequency that are supported by the device you use.

Setting value

[Table 9.4] Audio formats

Audio format	Max. sampling frequency (kHz)
PCM	32 / 44.1 / 48* / 88.2 / 96 / 176.4 / 192
Dolby Digital	OFF* / 32 / 44.1 / 48
AAC	OFF* / 32 / 44.1 / 48 / 88.2 / 96
Dolby Digital+	OFF* / 32 / 44.1 / 48
DTS	OFF* / 32 / 44.1 / 48 / 96
DTS-HD	OFF* / 44.1 / 48 / 88.2 / 96 / 176.4 / 192
Dolby TrueHD	OFF* / 44.1 / 48 / 88.2 / 96 / 176.4 / 192

* Default value

Communication command

@SAF Setting audio format
 @GAF Getting audio format

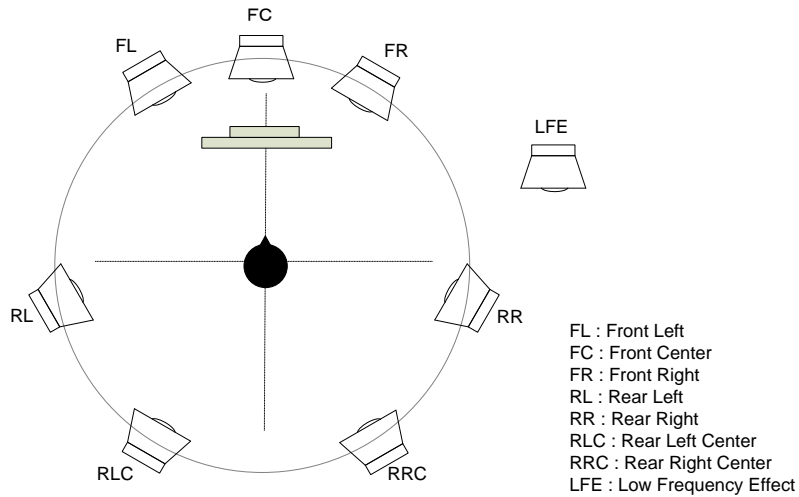
9.4.6 Speaker configuration

You can set the speaker configuration of multi-channel audio.
 Once changing the number of speaker, the configuration is automatically set as follows.
 You can change the default configuration, and you can also set each speaker individually.

Setting value

[Table 9.5] Default speaker configuration

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



[Fig. 9.8] Speaker configuration

Communication command

- @SSP Setting speaker configuration
- @GSP Getting speaker configuration

9.5 RS-232C setting

9.5.1 RS-232C communication

NJR-T01UHD / NJR-R01UHD

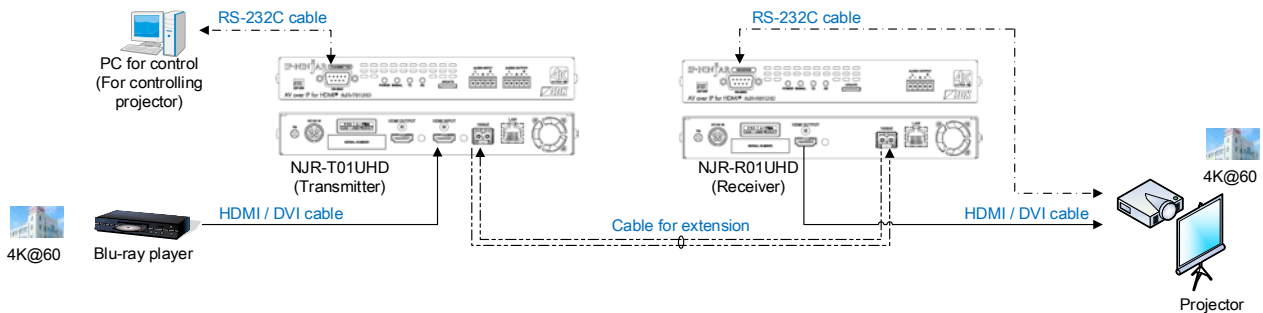
You can set the RS-232C communication between devices that connected to NJR-T01UHD / NJR-R01UHD. The same setting should be set for NJR-T01UHD / NJR-R01UHD.

Notes:

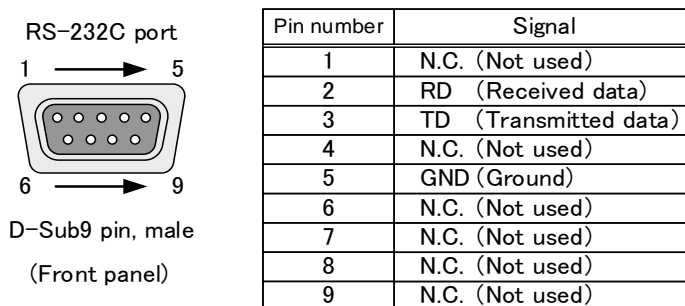
The RS-232C port is used for two modes: controlling NJR-T01UHD or NJR-R01UHD and communicating between devices that connected to NJR-T01UHD / NJR-R01UHD. For the latter mode, set the DIP switch (No.1) to "OFF".

【See: 7.4 Setting DIP switch】

There are two RS-232C modes: control mode (setting NJR) and communication mode (controlling peripheral devices). Values for the former mode are fixed and cannot be changed; values for the latter mode are settable. Refer to the Command Guide for details.



[Fig. 9.9] Communication over RS-232C



*N.C.: No Connection

[Fig. 9.10] Specification of RS-232C port

Note:

For communicating between NJR-T01UHD / NJR-R01UHD and connected device, only RD (Received data) and TD (Transmitted data) are sent.

Setting value**[Table 9.6] Setting items of RS-232C communication**

Setting item	Setting value	Default value
Baud rate [bps]	4800,9600,19200,38400,57600,115200	9600
Data bit length [bit]	7,8	8
Stop bit [bit]	1,2	1
Parity check	NONE, EVEN, ODD	NONE

Communication command

@SCTB Setting RS-232C communication

@GCTB Getting RS-232C communication

9.6 LAN setting

9.6.1 LAN

NJR-T01UHD / NJR-R01UHD

The IP address can be obtained automatically by DHCP (Dynamic Host Configuration Protocol). Static IP address, subnet mask, and default gateway can also be configured manually.

Setting value

[Table 9.7] Setting items of LAN communication

Setting item	Setting value	Default
IP address	0.0.0.0 to 255.255.255.255	Automatic
Subnet mask	0.0.0.0 to 255.255.255.254	
Default gateway	0.0.0.0 to 255.255.255.255	

Communication command

@SIP Setting LAN

@GIP Getting LAN settings

9.6.2 MAC address

NJR-T01UHD / NJR-R01UHD

You can display the MAC address.

Displaying information

[Table 9.8] MAC address

Item to be displayed	Example
MAC address	0008E5690000

Communication command

@GMC Getting MAC address

9.7 Information

9.7.1 Input status

NJR-T01UHD

You can display the signal status that is input from the HDMI input connector.

Information to be displayed

[Table 9.9] Input signals

Value to be displayed	Description
Hxx	HDMI signal is input. xx: color depth(24, 30, or 36)
D	DVI signal is input.
N	No signal is input.

[Table 9.10] Format of video input signal

Value to be displayed	Description
1920 x 1080i 59.94Hz	SDTV / HDTV / UHDTV signal is input. Format type and vertical synchronizing frequency
800 x 600p 60.32Hz	VESA resolution signal is input. Horizontal resolution x Vertical resolution and synchronizing frequency
NO SIGNAL	No signal is input.

[Table 9.11] Format of audio input signal

Value to be displayed	Description
LINEAR PCM 48kHz	Linear PCM signal is input. Sampling frequency
COMPRESSED AUDIO	Compressed audio signal (e.g. Dolby Digital, DTS) is input. (Since NJR-T01UHD does not determine detailed format, the same value is displayed for all compressed audio.)
NO AUDIO	No signal is input.

[Table 9.12] HDCP

Value to be displayed	Description
HDCP 1.4 ON	Signal with HDCP 1.4 is input.
HDCP 2.2 ON	Signal with HDCP 2.2 is input.
HDCP OFF	Signal without HDCP is input.
NO SIGNAL	No signal is input.

Communication command

@GSS Getting I/O status

9.7.2 Output status

You can display the status of the sink device connected to the HDMI output connector.

Displaying information

[Table 9.13] HDCP authentication

Value to be displayed	Description
HDCP 1.4 SUPPORT	HDCP 1.4 authorized.
HDCP 2.2 SUPPORT	HDCP 2.2 authorized.
HDCP NOT SUPPORT	Not authorized because sink device that does not support HDCP is connected or input signal does not have HDCP.
HDCP ERROR	The sink device that supports HDCP is connected, but authentication failed.
HDCP CHECK NOW	The sink device status is checking. e.g. When sink device status is changed, this message is displayed.
UNCONNECTED	A sink device is not connected.

[Table 9.14] Output signal

Value to be displayed	Description
Hxx	HDMI signal is output. xx: color depth(24, 30, or 36)
D	DVI signal is output.
N	A sink device is not connected.

[Table 9.15] Error code

HDMI output connector status of video output is displayed and then the status of audio output is displayed.

Value to be displayed	Video output	Audio output
0	Video is output correctly.	Audio is output correctly.
1	—	“9.3.1 Muting digital audio ” is set to “ON”.
2	No source device is connected.	
3	Video signal is not input.	Audio signal is not input.
4	Video or audio output of the source device is muted.	
5	Signal with HDCP is input, but the sink device does not support HDCP.	
6	The source device does not output necessary data (packet) for video or audio output.	
7	Signal that is not supported by NJR-T01UHD / NJR-R01UHD is input.	Audio cannot be output, because compressed audio is input.
9	—	A sink device that is not supported by audio is connected.
B	No sink device is connected.	
C	HDCP is being authorized.	
D	HDCP authentication failed.	

Communication command

@GSS Getting input/output status

9.7.3 Monitor EDID

NJR-T01UHD / NJR-R01UHD

You can display the EDID of the sink device connected to the HDMI output connector.

Information to be displayed**[Table 9.16] Monitor's EDID**

Displayed value	Displayed value	Example	Remarks
Monitor name	—	MSD-5402	If no monitor is connected, "UNCONNECTED" is displayed and parameter is not displayed any more.
Resolution and pixel clock	—	1920x1080 148.50MHz	—
Supported HDMI	HDMI / DVI	HDMI	If the sink device does not support HDMI, "DVI" is displayed.
Sampling configuration* ¹	RGB / YCbCr422 / YCbCr444 / YCbCr420	YCbCr444	All supported sampling configurations are displayed. If the sink device resolution is 4K@50 / 59.94 / 60 and only up to YCbCr 4:2:0 is supported, "YCbCr420" is displayed.
Color depth* ¹	24 / 30 / 36 BIT COLOR	24BIT COLOR	All supported color depths are displayed.
Supported audio	LINEAR PCM / AUDIO NOT SUPPORT	LINEAR PCM	If the sink device is not support audio, "AUDIO NOT SUPPORT" is displayed.
Sampling frequency* ²	32 / 44.1 / 48 / 88.2 / 96 / 176.4 / 192 kHz	32/44.1/48kHz	All supported sampling frequencies are displayed.
Bit length* ²	16 / 20 / 24 BIT	16/20/24BIT	All supported bit lengths are displayed.
Number of channels* ²	1 to 8 CHANNEL	2CHANNEL	—
Supported compressed audio* ²	COMPRESSED AUDIO SUPPORT	COMPRESSED AUDIO SUPPORT	If only compressed audio is supported, "COMPRESSED AUDIO SUPPORT" is displayed.

*¹ Displayed only if a sink device supporting HDMI is connected.

*² Displayed only if a sink device supporting audio is connected.

Communication command

@GES Getting monitor EDID

9.7.4 Displaying version

NJR-T01UHD / NJR-R01UHD

You can display the model number (NJR-T01UHD or NJR-R01UHD) and firmware version.

Displaying information

[Table 9.17] Version

Item	Example
Model number	NJR-T01UHD
Firmware version	1.00

Communication command

@GIV Getting version

10 Product Specification

Item	NJR-T01UHD (Transmitter)		NJR-R01UHD (Receiver)		
	Model	MM / SM	CAT	MM / SM	CAT
Input	1 input HDMI (*1) / DVI 1.0 TMDS single link HDCP 1.4 / 2.2 HDR (*2) EDID emulation Connector: Female HDMI Type A (19-pin) (*3)		1 input Digital signal for extension Connector: 2 LCs		1 input Digital signal for extension Connector: RJ-45
Output	1 input Digital signal for extension Connector: 2 LCs		1 input Digital signal for extension Connector: RJ-45		1 input HDMI (*1) / DVI 1.0 TMDS single link HDCP 1.4 / 2.2 HDR (*2) Connector: Female HDMI Type A (19-pin) (*3)
	1 input HDMI (*1) / DVI 1.0 *For monitoring input signals TMDS single link HDCP 1.4 / 2.2 HDR (*2) Connector: Female HDMI Type A (19-pin) (*3)				
Format	VGA / SVGA / XGA / WXGA (1280x768) / WXGA (1280x800) / Quad-VGA / SXGA / WXGA (1360x768) / WXGA (1366x768) / SXGA+ / WXGA+ / WXGA++ / UXGA / WSXGA+ / VESAHD / WUXGA / QWXGA / 4K (*4) 480i / 480p / 576i / 576p / 720p / 1080i / 1080p / 4K (*4)				
Color depth	24 bit, 30 bi, 36 bit Deep Color (*5)				
Dot clock	25 MHz to 600 MHz				
TMDS clock	25 MHz to 300 MHz				
TMDS data rate	0.75 Gbps to 18 Gbps				
Digital audio input	Multi-channel linear PCM up to 8 channels Sampling frequency: 32 kHz to 192 kHz Sample size: 16 bit to 24 bit Reference level: -20 dBFS Max. input level: 0 dBFS		-		
Digital audio output	Multi-channel linear PCM up to 8 channels Sampling frequency: 32 kHz to 192 kHz Sample size: 16 bit to 24 bit Reference level: -20 dBFS Max. output level: 0 dBFS		Multi-channel linear PCM up to 8 channels Sampling frequency: 32 kHz to 192 kHz Sample size: 16 bit to 24 bit Reference level: -20 dBFS Max. output level: 0 dBFS		
Analog audio input	1 input Stereo L/R balanced / unbalanced Input impedance: 48 kΩ balanced / 24 kΩ unbalanced Reference level: -10 dBu Max. input level: +10 dBu Connector: 5-pin terminal block		-		
Analog audio output	1 input Stereo L/R balanced / unbalanced Output impedance: 100 Ω balanced / 50 Ω unbalanced Reference level: -10 dBu Max. output level: +10 dBu Connector: 5-pin terminal block		1 input Stereo L/R balanced / unbalanced Output impedance: 100 Ω balanced / 50 Ω unbalanced Reference level: -10 dBu Max. output level: +10 dBu Connector: 5-pin terminal block		

NJR-T01UHD / NJR-R01UHD User's Guide

Item		NJR-T01UHD (Transmitter)		NJR-R01UHD (Receiver)	
Model		MM / SM	CAT	Model	MM / SM
Cable for extension	Cable	Duplex fiber cable, SFP+ module	Cat6A STP cable	Duplex fiber cable, SFP+ module	Cat6A STP cable
	Polishing (*6)	SFP+ for Multimode: PC polishing (recommended) SFP+ for Singlemode: UPC polishing (recommended), SPC supported * APC is not supported	—	SFP+ for Multimode: PC polishing (recommended) SFP+ for Singlemode: UPC polishing (recommended), SPC supported * APC is not supported	—
	Maximum extension distance (*7)	Multimode fiber (OM3): 984 ft. (300 m) Singlemode fiber (OS1): 6.21 mi. (10 km) Singlemode fiber (OS1): 24.85 mi. (40 km, optional)	Cat6A STP: 328 ft. (100 m)	Multimode fiber (OM3): 984 ft. (300 m) Singlemode fiber (OS1): 6.21 mi. (10 km) Singlemode fiber (OS1): 24.85 mi. (40 km, optional)	Cat6A STP: 328 ft. (100 m)
Control	RS-232C	1 port / male D-sub (9 pin), full duplex, up to 115.2 kbps			
	LAN	1 port / RJ-45 10Base-T / 100Base-TX / 1000Base-T (Auto Negotiation), Auto MDI / MDI-X			
General	AC adapter	Input: 100 - 240 VAC ± 10%, 50 Hz / 60 Hz ± 3 Hz Output: DC 12 V 3 A (A dedicated AC adapter is provided)			
	Power consumption	About 18 Watts	About 21 Watts	About 17 Watts	About 20 Watts
	Dimensions	8.3 (W) × 1.2 (H) × 5.5 (D)" (210 (W) × 30 (H) × 140 (D) mm) (EIA thin high, half rack wide) (Excluding connectors and the like)			
	Weight	2.2 lbs (1.0 kg)	2.2 lbs (1.0 kg)	2.2 lbs (1.0 kg)	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	Operating / Storage: 20% to 90% (Non Condensing)			

*1 x.v.Color,3D,ARC,HEC, and CEC are not supported.

*2 HDR is supported if the connected sink device supports HDR and its copied EDID is set for EDID setting.

*3 Use 16.4 ft. (5 m) or shorter HDMI cables.

*4 Supported 4K formats: 24 Hz / 25 Hz / 30 Hz / 50 Hz (4:4:4) / 59.94 Hz (4:4:4) / 60 Hz (4:4:4)

*5 Supported 4K format: only 24 bit

*6 We do not recommend other polishing methods, because it increases the return loss.

*7 The maximum extension distance is measured under the following conditions: Fiber that is polished by a recommended method is used, there is no interconnection, and the allowable bending radius is not exceeded.

11 Troubleshooting

In case the NJR-T01UHD / NJR-R01UHD does not work correctly, please check the following items first. Also refer to manuals for connected devices as well, since they may possibly be the cause of the problem.

- Are the NJR-T01UHD / NJR-R01UHD and all devices plugged in and powered on normally?
- Are cables connected correctly?
- Are there no loose connections?
- Are correct cables for NJR-T01UHD / NJR-R01UHD being used?
- Are signal specifications of connected devices matched to each other?
- Are settings of the sink device correct?
- Are there any nearby objects that may cause noise?

If additional assistance is required, please check the following items and then contact us.

No.	Checking items	Result
1	The same problem occurs at all connectors?	Yes or No
2	Operates correctly when connect devices using genuine cables without connecting of NJR-T01UHD / NJR-R01UHD?	Yes or No

User's Guide of NJR-T01UHD / NJR-R01UHD

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