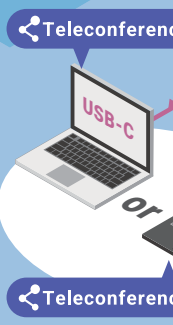
IDK AV

USB DESIGN GUIDE for UNIFIED COMMUNICATIONS

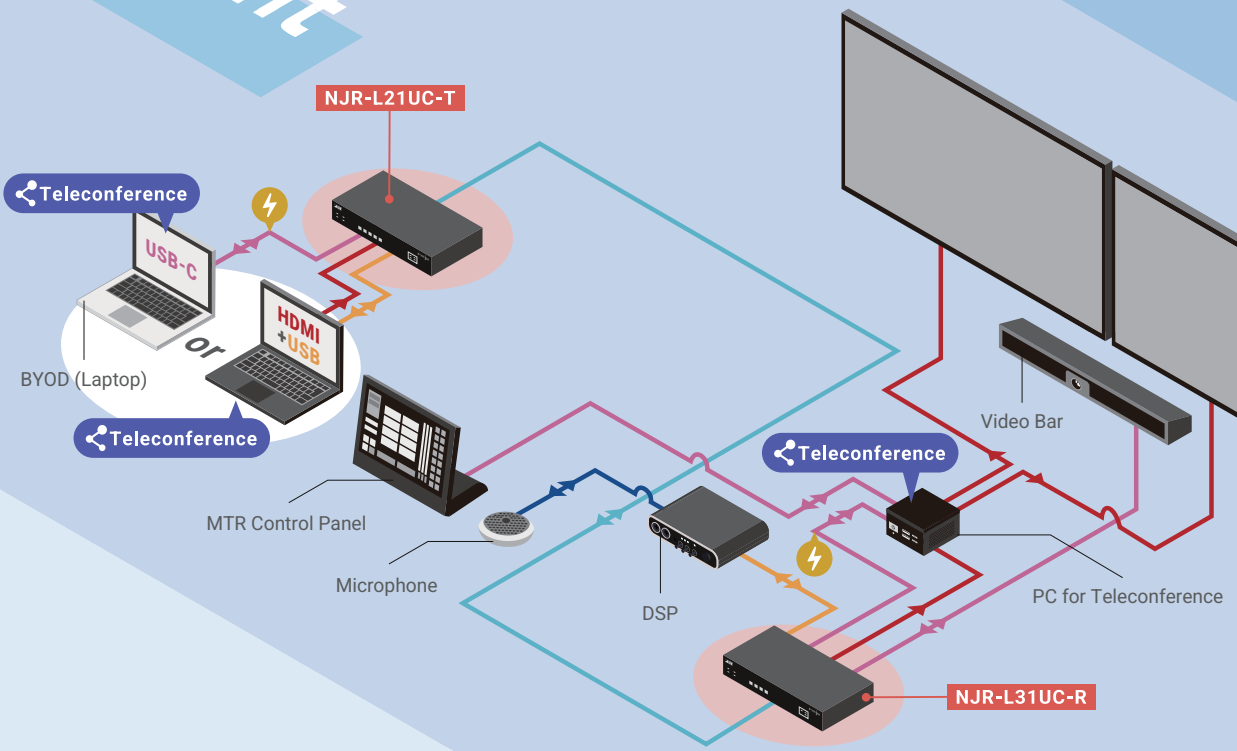
HDMI
LAN
SDVoE (CAT)
USB-C
USB
USB PD

Network Solution

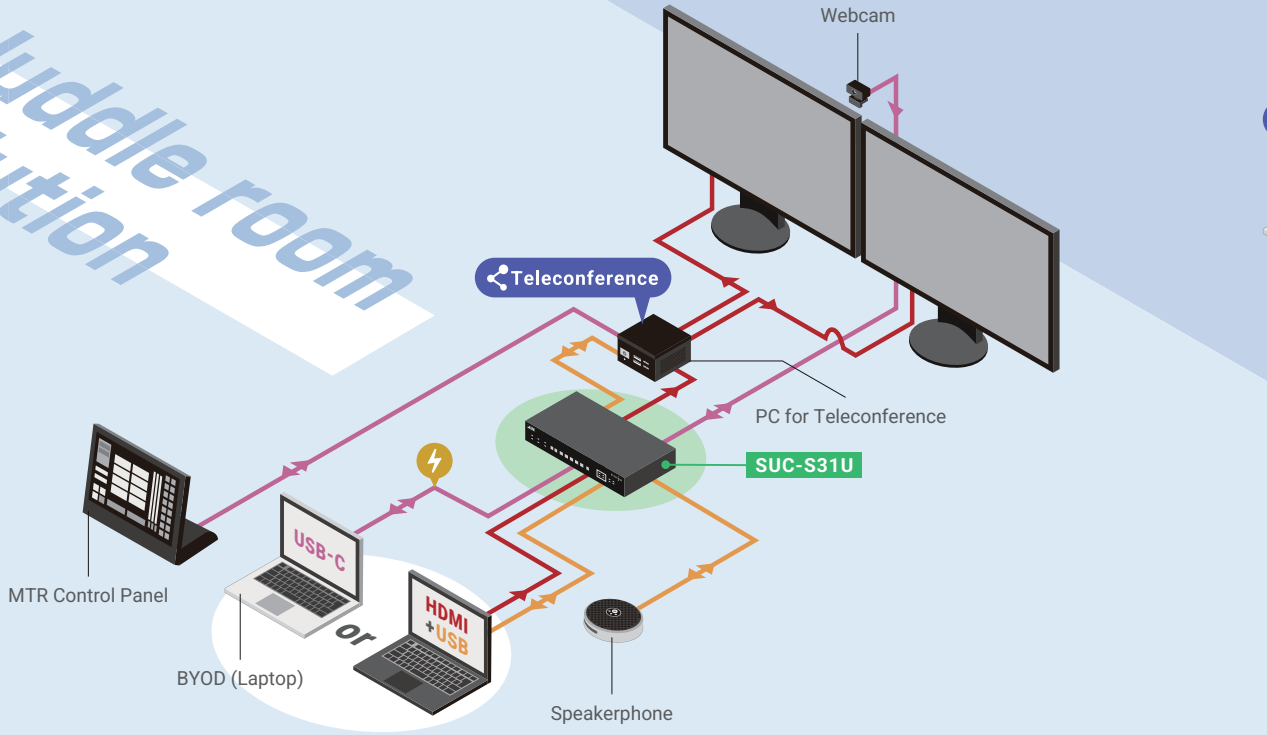


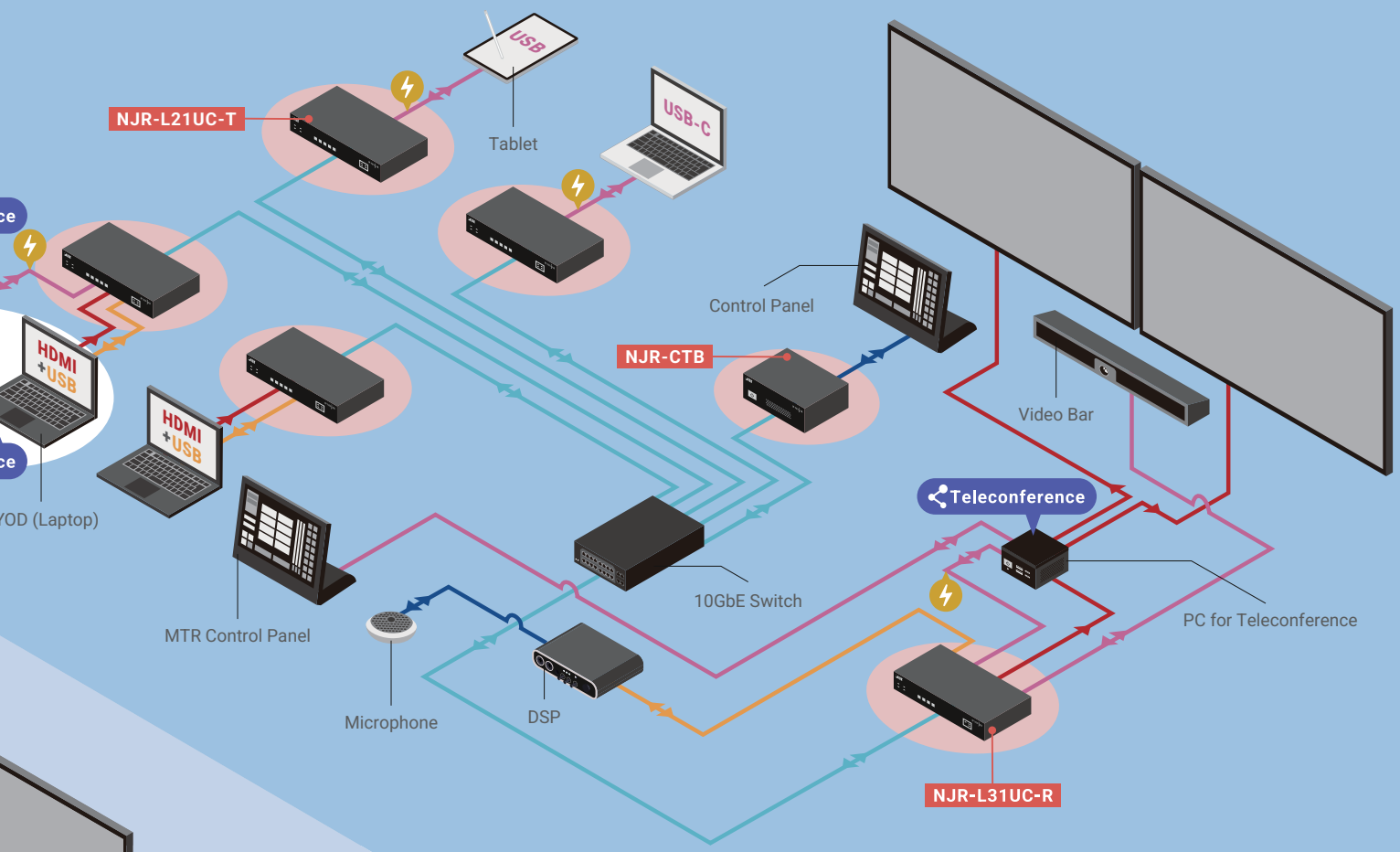
BY

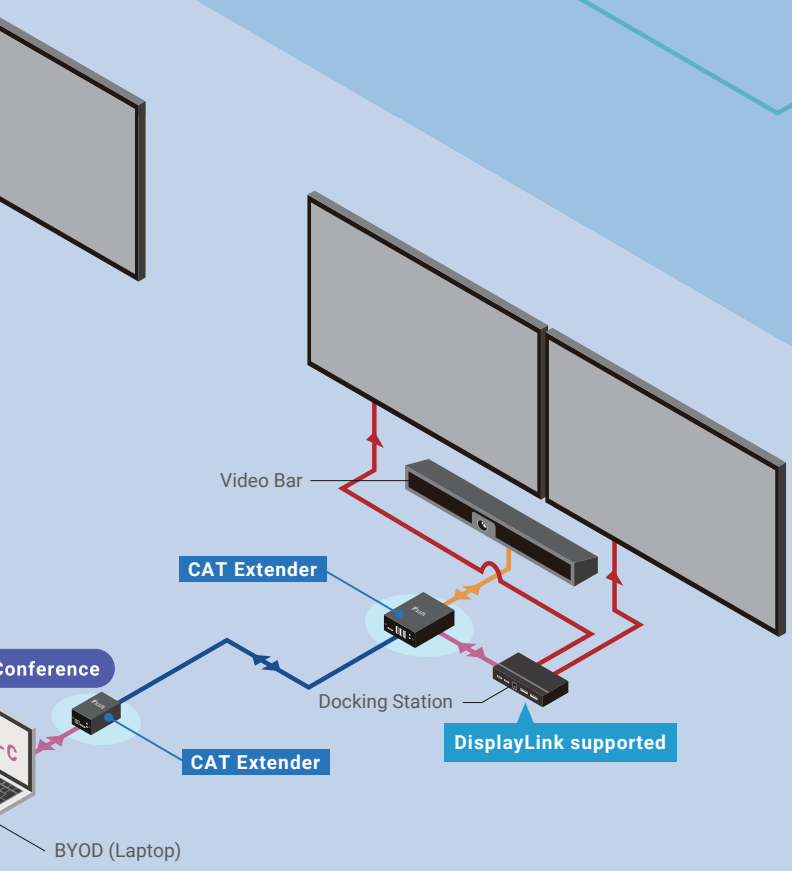
Point to Point Solution



Huddle room Solution







USB Solution for Unified Communications

About USB

USB (Universal Serial Bus) is an industry standard for connections of computers and peripheral devices.
The technology is used for PCs, smartphones, monitors, projectors, keyboards, mice, mobile cameras, etc.
USB provides a common interface not only in data throughput but also in power delivery and video/audio transmission as well.

Connectors

For connecting devices and computers There is a variety of shapes and pin assignment. The most common connector types are Type-A, Type-B, and Type-C.

Details on Page 04

Versions

The first USB specification, USB 1.0, was released in 1996. The specification has been updated several times such as USB 2.0, USB 3.2 xx, USB4 xx. Those updates include increased transmission speed and power delivery.

Details on Pages 05 and 06

Features

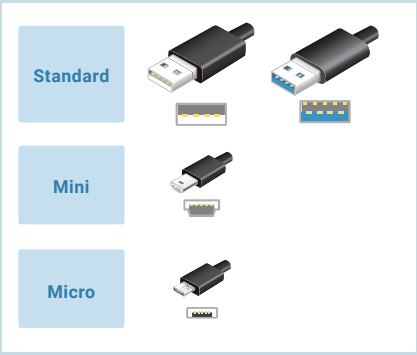
USB provides various features, such as Data transfer, audio/video output, bus powered, plug and display, Hot Plugging, On-The-go, UVC/UAC, DisplayLink, etc.

Details on Page 07 and 08

USB Connectors

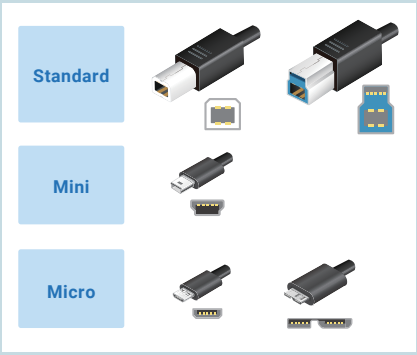
Type-A

Type-A is the most commonly known type of USB connector. The specification is for data communication between computers and peripheral devices, and power delivery.



Type-B

Type-B is usually found on peripheral devices such as printers, scanners, external hard drives, audio interfaces, etc. Type-B was designed to work in conjunction to create a link between host devices and peripheral devices.



Type-C

Type-C is a versatile and industry-standard connector for transmitting both data and power. It transfers data at high speeds, transmits video signals and delivers power to charge devices' batteries. The reversible connector is used for smartphones, tablets, laptops, monitors, and keyboards, etc.

	Type-A			Type-B			Type-C
	Standard-A	Mini-A	Micro-A	Standard-B	Mini-B	Micro-B	
USB 1.1							
USB 2.0							
USB 3.2 Gen1×1		—	—		—		
USB 3.2 Gen2×1		—	—		—		
USB 3.2 Gen1×2	—	—	—	—	—	—	
USB 3.2 Gen2×2	—	—	—	—	—	—	
USB4 Version 1.0	—	—	—	—	—	—	

USB Versions

Data Transfer Rate

Version	Marketing Name	Max Transfer Rate
USB 1.1	Low-Speed	1.5Mbps
	Full-Speed	12Mbps
USB 2.0	High-Speed	480Mbps
USB 3.2 Gen1×1	SuperSpeed	5Gbps
USB 3.2 Gen2×1	SuperSpeed+	10Gbps
USB 3.2 Gen1×2	SuperSpeed 10Gbps	10Gbps
USB 3.2 Gen2×2	SuperSpeed 20Gbps	20Gbps
USB4 Version 1.0	USB 20Gbps *	20Gbps
	USB 40Gbps *	40Gbps
USB4 Version 2.0	USB 80Gbps *	80Gbps

* "USB 20Gbps", "USB 40Gbps", and "USB 80Gbps" are used for both of transferring rate name and new marketing name (2022-), but each rate is the same.

Power Delivery

USB-C supports USB Power Delivery to charge or operate various devices like smartphones and laptops.
USB PD (USB Power Delivery) provides even higher power and power management via a USB Type-C connector.

Power Delivery Specification Name	Connector	Max Current and Power
–	Type-A Type-B	500mA (2.5W)
–	Type-A Type-B	900mA (4.5W)
USB BC 1.2	Type-A Type-B	1.5A (7.5W)
– *1	Type-C	3A (15W)
USB PD 1.0 USB PD 2.0 USB PD 3.0	Type-C	5A (45W) *2
USB PD 1.0 USB PD 2.0 USB PD 3.0	Type-C	5A (65W) *2
USB PD 1.0 USB PD 2.0 USB PD 3.0	Type-C	5A (100W) *2
USB PD 3.1	Type-C	5A (240W) *2

*1 Even if USB PD specification is not supported, the basic specification of Type-C provides 15 W power. However, some cables transmit only data. It is necessary to check the cable specification.
*2 The maximum voltage increases up to 48 V in stages to meet the device's request.

Specification Names

USB version naming conventions have often changed and become increasingly difficult to figure out what all the letters and numbers stand for. It should also be noted that names for engineerings coexist with those for marketing.

Names for Engineering

Nov. 2022	Sep. 2019	Sep. 2017	Aug. 2013	Nov. 2008	Apr. 2000
USB 1.1	USB 1.1	USB 1.1	USB 1.1	USB 1.1	USB 1.1
USB 2.0	USB 2.0	USB 2.0	USB 2.0	USB 2.0	USB 2.0
USB 3.2 Gen1×1	USB 3.2 Gen1×1	USB 3.2 Gen1×1	USB 3.1 Gen1	USB 3.0	–
USB 3.2 Gen2×1	USB 3.2 Gen2×1	USB 3.2 Gen2×1	USB 3.1 Gen2	–	–
USB 3.2 Gen1×2	USB 3.2 Gen1×2	USB 3.2 Gen1×2	–	–	–
USB 3.2 Gen2×2	USB 3.2 Gen2×2	USB 3.2 Gen2×2	–	–	–
USB4 Version 1.0	USB4 Gen 2×2	–	–	–	–
	USB4 Gen 3×2	–	–	–	–
USB4 Version 2.0					

New Marketing Names (2022-)

Marketing Name	Name for Engineering	Max Transfer Rate
USB 5Gbps	USB 3.2 Gen1×1	5 Gbps
USB 10Gbps	USB 3.2 Gen1×2	10 Gbps
	USB 3.2 Gen2×1	
USB 20Gbps	USB 3.2 Gen2×2	20 Gbps
	USB4 Version 1.0	
USB 40Gbps		40 Gbps
USB 80Gbps	USB4 Version 2.0	80 Gbps

Gen 1: 5Gbps × □ = Max Transfer Rate
Gen 2: 10Gbps × □ = Max Transfer Rate

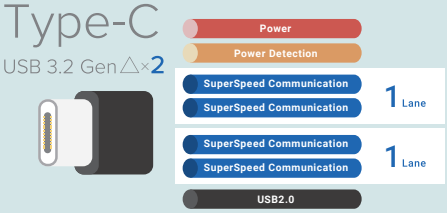
□: The number of communication lanes that can be used simultaneously

Tip

USB Type-C connector has a total of 2 lanes for SuperSpeed USB data transmission, and these lanes are configured by a pair of Transmitter line(TX+/-) and Receiver line(RX+/-).
By using both of 2 lanes for USB data transmission, USB Type-C has a capability of providing data transfer speeds faster than Type-A / Type-B connectors.

■ Type-C (3.2) has 2 SuperSpeed lanes.

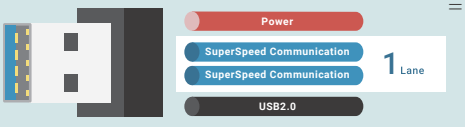
Type-C
USB 3.2 Gen△×2



Example:
USB 3.2 **Gen2**×2
＝**10Gbps**×2
＝20Gbps

■ Type-A (3.2) has 1 SuperSpeed lane.

Type-A
USB 3.2 Gen△×1



Example:
USB 3.2 **Gen2**×1
＝**10Gbps**×1
＝10Gbps

General Features

Supported features and specifications vary depending on products. It is necessary to check the product specifications to ensure which features are available.

Data Transfer

- **Control Transfer**
  For control information such as configuration and query
- **Bulk Transfer**
  For large amounts of data (one-way)
- **Interrupt Transfer**
  For small amounts of data, scheduled at fixed periodic intervals
  (Example: Mice, Keyboards)
- **Isochronous Transfer**
  For time-critical transfer, scheduled at fixed periods
  (Example: Video/Audio streaming)

Plug and Play

Enables computers or devices to automatically recognize and configure compatible hardware components without having to do manual configuration or knowledge of computer hardware.
With the advent of USB, Plug and Play has become widely supported.

Bus Power

Delivers power from a USB port to connected devices, and its power is used for operating the devices.
USB BC enables battery charging to the devices up to 15 W depending on the specifications.
USB PD provides higher power up to 240 W for powering and charging the devices. It enables USB devices more flexible and higher power charging than the bus power feature.

UVC/UAC

UVC (USB Video Class) is one of USB device classes for connecting video devices (Webcams, capture devices, etc.) to computers over USB.
For Video conference, live streaming, video capture, video recording, etc.

UAC (USB Audio Class) is for connecting audio devices over USB.
For speakers, headphones, microphones, audio interface, USB DAC (Digital Analog Converter), etc.

DisplayLink®

Technology developed by DisplayLink. It allows video to be easily output to displays by connecting to the host computer over USB without HDMI, DisplayPort, or DVI cables. The technology also enables mirroring and expanding external display.

Alternate Mode

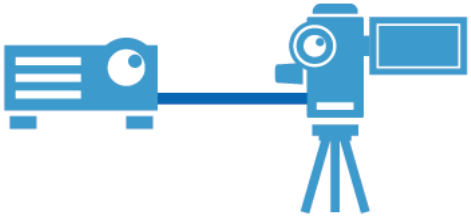
Transmits video/audio over USB, digital video/audio signals from source devices.
Connected sink devices can display/play video/audio.
Alternate Mode is available only in USB Type-C connectors.

Hot Plugging

Devices can be added or removed without shutting down or rebooting the computer or host devices. This feature is useful for systems that should always stay running.

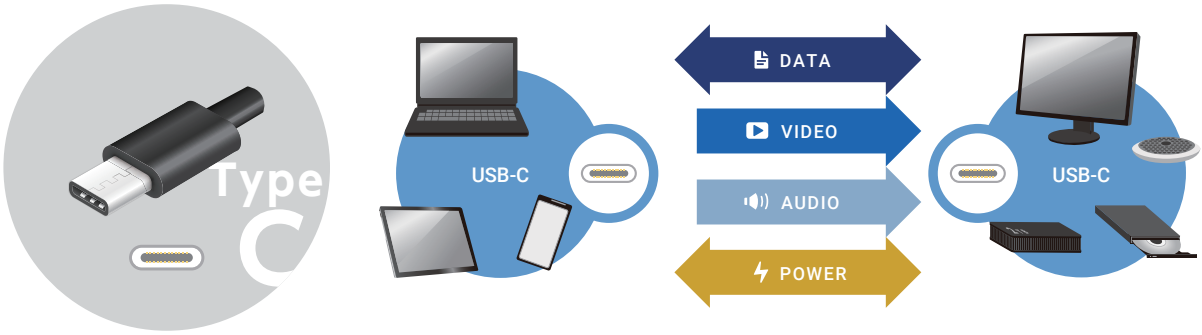
On-The-Go

Enables direct communication between USB devices without the need of connecting the host device (PC) or peripheral devices.
Devices having USB On-The-Go can operate as the host and communicate other USB devices directly.



USB Type-C

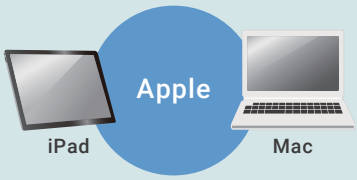
USB Type-C (hereafter referred to as USB-C) is versatile connector supporting all versions. The small reversible connector transmits video and audio signals quickly and additionally can deliver power charge devices.



Users' Simple Requests

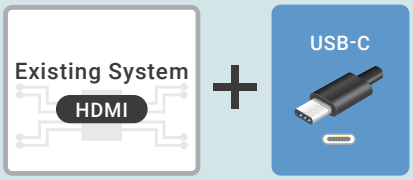
1 Using Apple devices

USB-C connector is used for Apple devices, such as Mac and iPad.



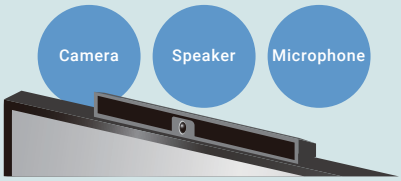
2 Compatibility with existing systems

USB-C can be converted to HDMI signals.



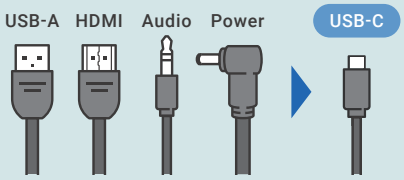
3 Video conference using only a Video bar

Video bar is a compact, all-in-one USB video conference device including camera, speaker, and microphone functions.



4 Simplified cabling

Video/Audio transmission and power delivery to the host device can be performed over a single cable.



Tip

USB Type-C Standardization in EU

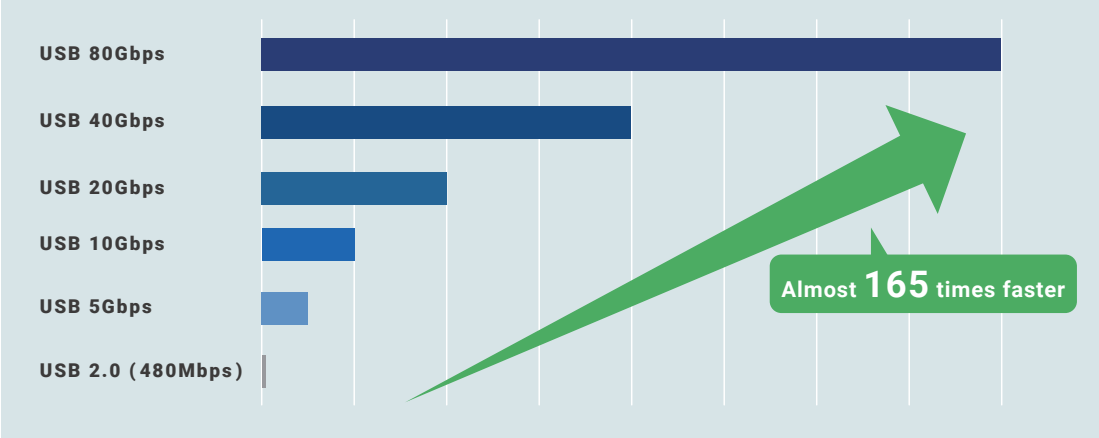
The EU is mandating USB-C as the universal charging standard for environment impact and other compelling reasons. From December 28, 2024, all mobile devices sold in the EU must be equipped with a USB Type-C charging port and comply with USB Power Delivery (PD) specifications. This ruling will then extend to laptops from April 28, 2026. USB-C mandatory is applying to manufacturers of the following "small and medium-sized" portable devices:

- Smartphones
- Tablets
- Digital Cameras
- Headphones
- Earbuds
- Portable Loudspeakers
- Video Game Consoles
- E-Readers
- Keyboards
- Mice
- Laptops(From April 28, 2026)

Transmission Rate

80Gbps at maximum

The latest USB version enables faster data transfer rates and higher power delivery compared to traditional USB connectors.
The available performances of USB-C vary depending on versions.



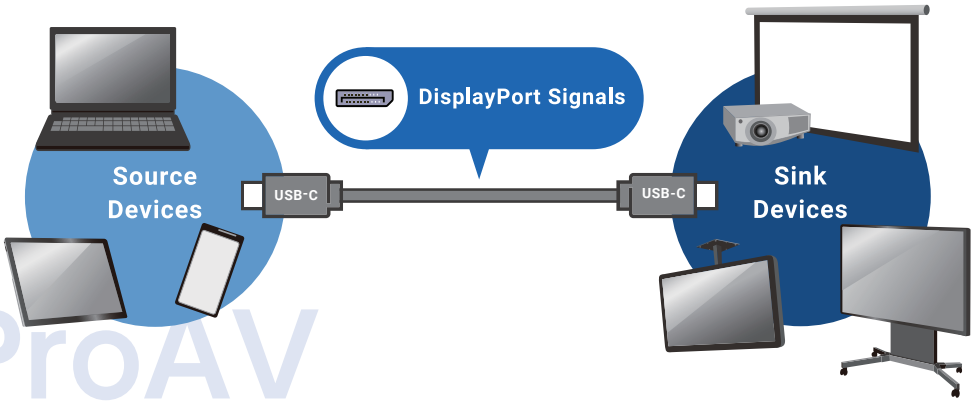
Alternate Mode

Data transfer/Video Output Extension

Alternate Mode (hereafter referred to as ALT Mode) is a data transmission mode which allows USB-C ports to transfer video and features via multiple interfaces, including the DisplayPort and HDMI interfaces.
The following four ALT Modes are available, and the DisplayPort ALT Mode is used in the most ProAV industry.

DisplayPort ALT Mode

For transferring DisplayPort signals via a USB-C cable. DisplayPort can transmit video at super-high resolution/refresh that are not supported by HDMI or DVI.



HDMI ALT Mode

For transmitting HDMI signals via a USB-C cable. HDMI is communication specification for sending video and audio simultaneously to home entertainment devices such as TVs and video games.

Thunderbolt ALT Mode

For transmitting Thunderbolt signals via a USB-C cable. Thunderbolt is communication specification for sending bulk data, such as video editing data and music production data.

MHL ALT Mode

For transmitting MHL signals at a high speed via a USB-C cable. MHL is communication specification for mobile devices, such as smartphones and tablets.

Note

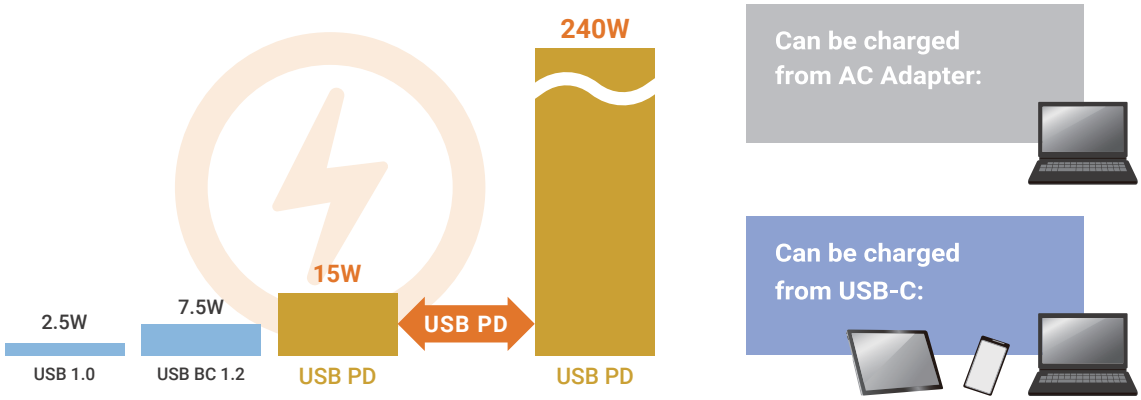
Not all USB-C products support ALT Mode.

Since not all USB-C cables support ALT Mode, it is necessary to check the following specifications:

- **Whether host, devices, and cables support ALT Mode.**
- **Whether the bandwidth and transmission speed are within the valid range.**
- **Presence of restrictions with ALT Mode (e.g. power charging or data transfer)**

USB Power Delivery

USB Power Delivery (hereafter referred to as USB PD) is a common fast charging standard that can supply up to 240 W power via a USB-C connector. It provides much higher performance than standard charging methods. Video transmission in ALT Mode and USB PD can be performed at the same time.
USB PD is used for various devices, such as laptops, smartphones, tablets, and mobile battery.



Note

Not all USB-C products support USB PD.

Not all USB-C products supports USB PD, and the supply power varies depending on products.
It is necessary to check the followings:

- **Whether host, devices, and cables support USB PD.**
- **Whether the supply power and supply capacity meet requests of the host and devices.**
- **Specifications of cable PD (Restriction example: PD should be from Both/either host and/or device.)**

Tip

What is Thuderbolt™?

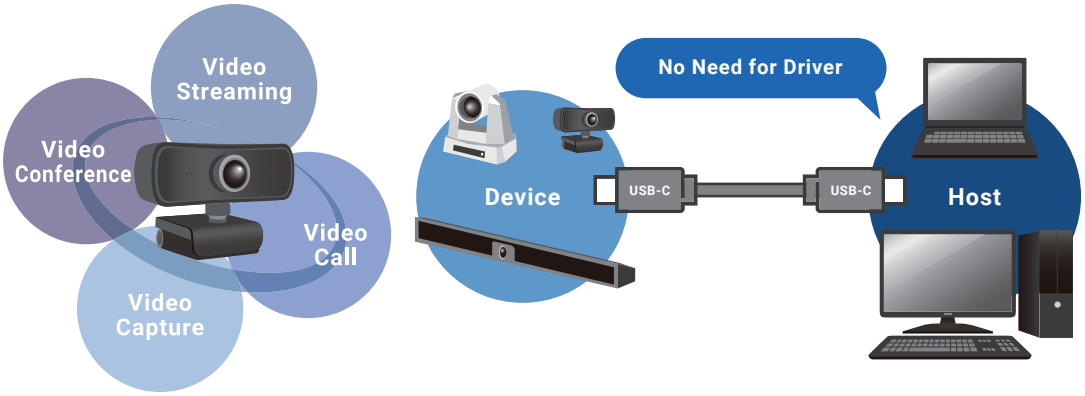
Thunderbolt™ is more than USB although Thunderbolt™ employs the USB-C connector type.
It includes the following features:

- **Data transmission speeds up to 40GbpsTablets**
- **Power delivery up to 100 W**
- **Daisy Chains connection**

* IDK does not provide Thunderbolt™ supported products.
* The transmission speed varies depending on products. Refer to the product specifications for details.

UVC — USB Video Class —

USB Video Class (hereafter referred to as UVC) standardizes video streaming functionality on USB. It provides a common protocol and formats for sharing video data between video devices (e.g. webcams, video captures) and host computers (e.g. laptops, smartphones). For devices using UVC, it is not necessary to install a UVC driver. Instead, the device works automatically by connecting a compatible host computer. It eliminates the need for an external driver. Not only USB-C but also USB Type-A / USB Type-B support UVC.



Note

Not all USB-C products support UVC.

Not all USB-C products supports UVC, it is necessary to check the following specifications:

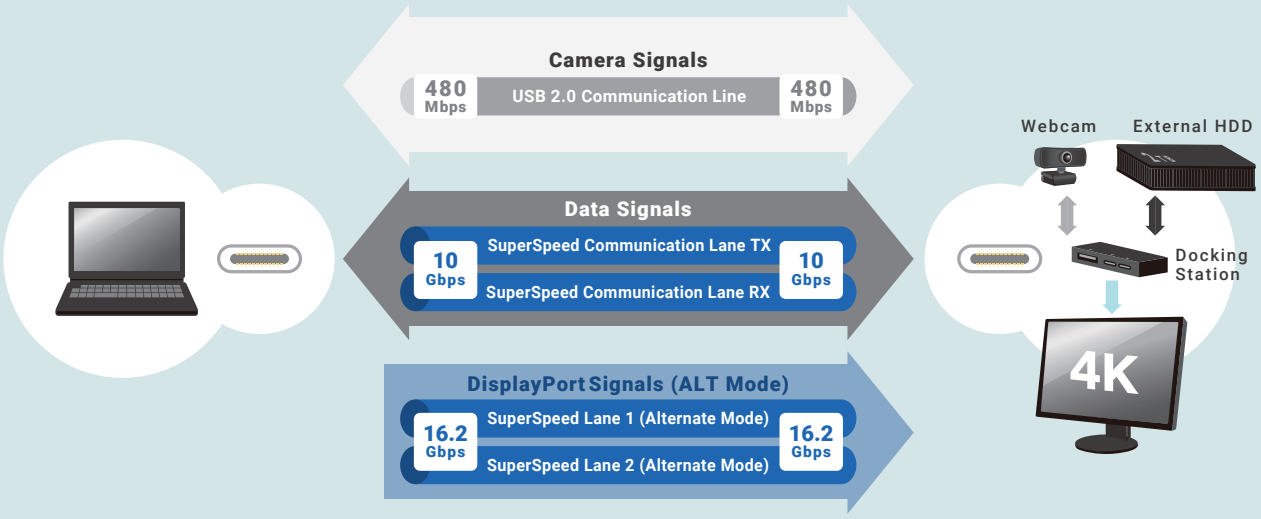
- **Whether devices and cables support UVC.**
- **Presence of security setting of devices and applications.**
- **Whether cables support the bandwidth of devices.**

Tip

Lane Usage of DisplayPort ALT Mode

With DisplayPort ALT Mode, four high speed lanes are used for transmitting DisplayPort signals via a USB-C connector. These lanes can be used partially or fully. This flexibility may simplify system connectivity.

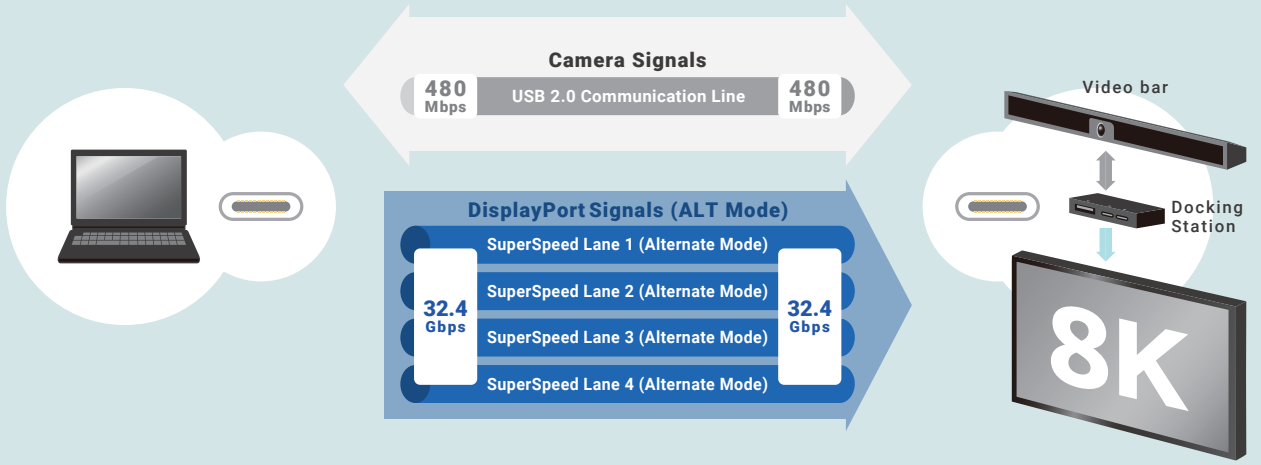
Example: 2 Lanes (DisplayPort Signals) + SuperSpeed USB Data



DisplayPort	Transmission Bandwidth/1 Lane	Maximum Transmission Bandwidth/2 Lanes	Theoretical Maximum Resolution*
HBR (DP1.0)	2.7 Gbps	5.4 Gbps	2560×1440@60
HBR2 (DP1.2)	5.4 Gbps	10.8 Gbps	4K@30
HBR3 (DP1.3/1.4)	8.1 Gbps	16.2 Gbps	4K@60 or 5K@30

* The theoretical maximum resolutions may differ from actual resolutions affected by environment or products. Refer to the product specifications for details.

Example: 4 Lanes (DisplayPort Signals)



DisplayPort	Transmission Bandwidth/1 Lane	Maximum Transmission Bandwidth/4 Lanes	Theoretical Maximum Resolution*
HBR (DP1.0)	2.7 Gbps	10.8 Gbps	4K@30
HBR2 (DP1.2)	5.4 Gbps	21.6 Gbps	5K@30 or 4K@60
HBR3 (DP1.3/1.4)	8.1 Gbps	32.4 Gbps	8K@30 or 5K@60

* The theoretical maximum resolutions may differ from actual resolutions affected by environment or products. Refer to the product specifications for details.

Notes: USB for Pro AV

Limitation of Data Transmission Speed

Some USB products may not support USB 1.1 even if the specification on those products support USB 3.2 / 2.0. For example, peripheral devices, such as keyboards, mice, and USB speakers, may encounter compatibility issues as they are using USB 1.1.

USB Tiers

There are limitations to the number of tiers which can be used. Up to seven tiers (including host) can be connected from a host device and up to five tiers can be supported via a USB hub.
UP to 127 devices can be connected.

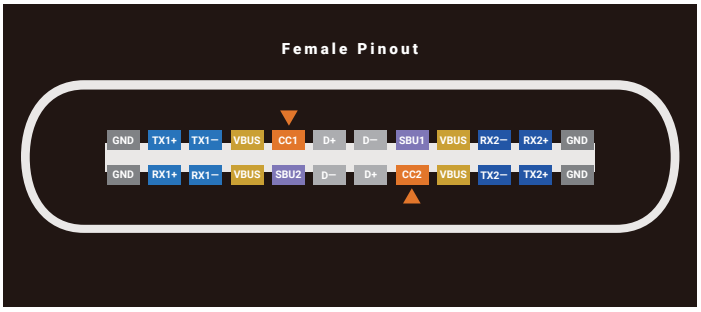
- **Host**
  Controls all devices in the USB system.
- **Hub**
  Used for adding connections.
- **Device**
  Connected to a destination hub or host directly.

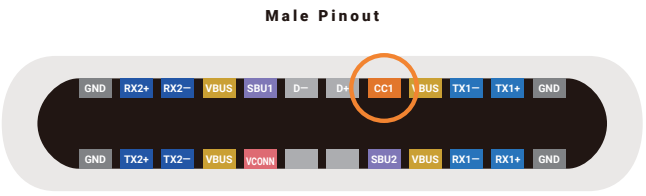
Restrictions

- **Power Delivery**
  Some USB specification limits power delivery for each tier.
- **Data transmission speed**
  If multiple devices are connected, the transmission speed may decrease.

USB-C Pin Assignment

Technically, a USB connector can only be inserted one way. However, users do not have worry about this as USB-C can detect and automatically detect directionality.





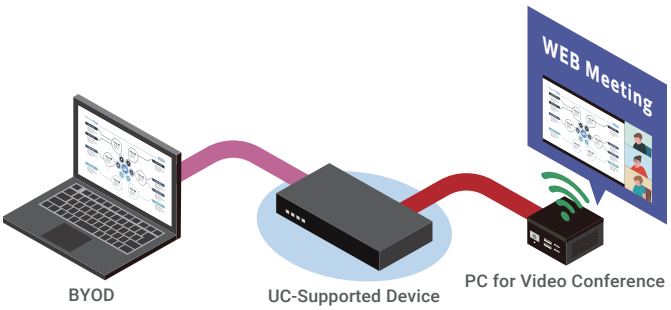
Automatically detected that male CC1 is connected to either female CC1 or female CC2.

Unified Communication with IDK Products

Unified Communication (hereafter referred to as UC) system refers to a conference room solution which may include video bars, cameras, microphones, and ceiling speakers and usually contains a dedicated conferencing platform, such as Microsoft Teams, Zoom, WebEx, etc. IDK products improve the solution as follows:

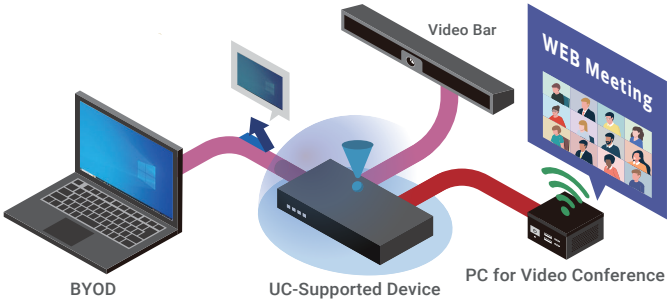
BYOD Content Injection

Shares meeting contents saved in BYOD over a conference platform, such as Microsoft Teams, Zoom, WebEx, etc..



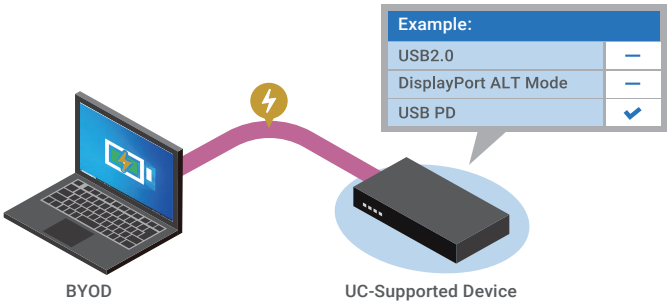
Call Status for Windows/Android

Prevents unintended USB device switching by installing the dedicated application to the host.



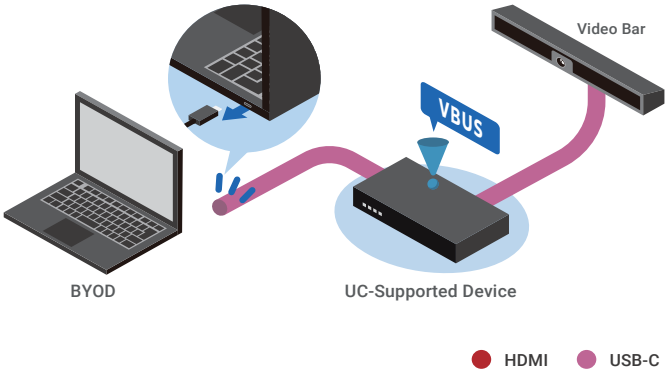
USB-C Function Control

USB-C interfaces are multifunctional, but careful consideration is needed when they are used in AV systems. For instance, connecting a cable intended only for charging a USB-C device may unintentionally switch the video output on a video bar. To prevent such problems, ProAV systems need to control USB-C function.



VBUS Control

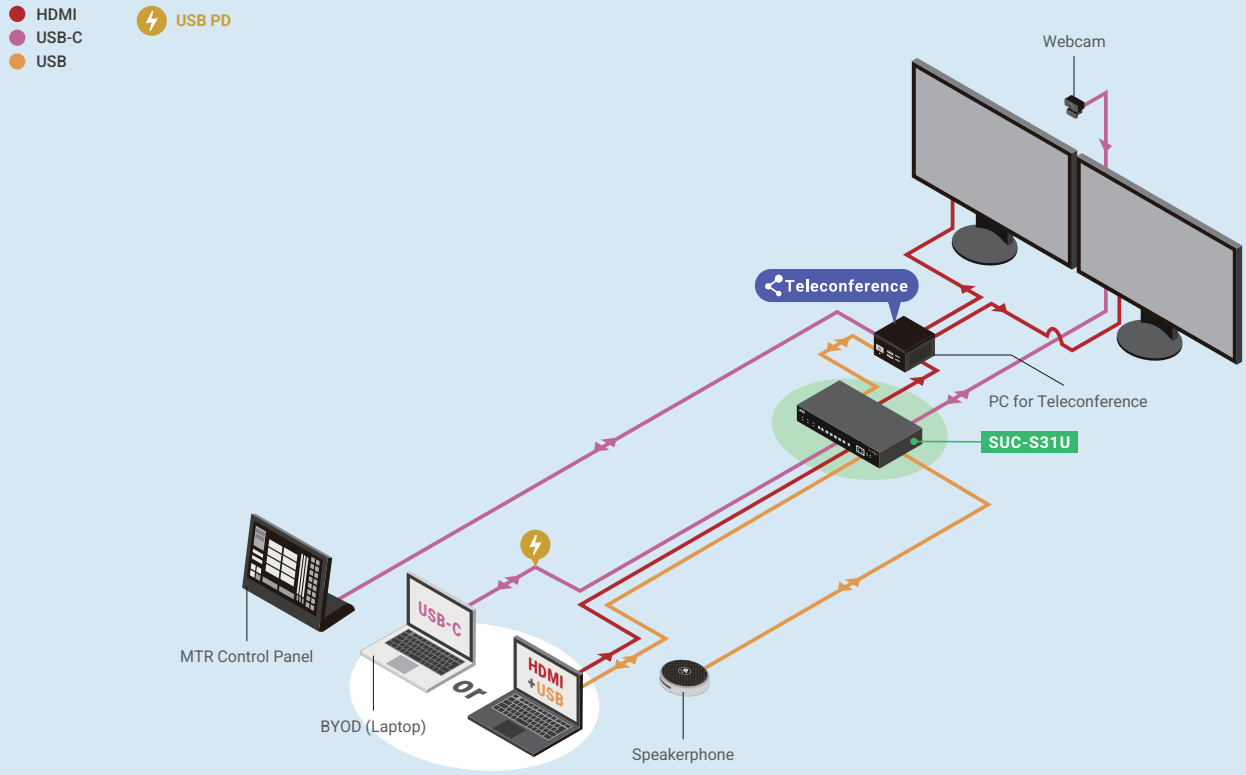
When the BYOD host device is disconnected, this feature transmits the VBUS voltage information to the USB devices correctly. Then, the USB devices can detect the newly connected host device.
Not only when a host device is disconnected but also when channels are switched, VBUS voltage is controlled.



Huddle Space with MTR* or Zoom NUC

*Microsoft Teams Rooms

CASE Small huddle space, No extension needed

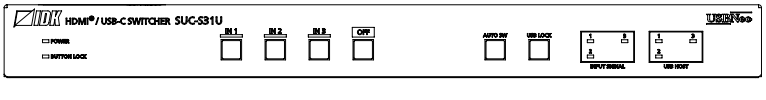


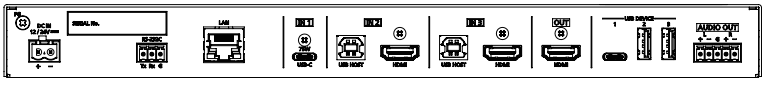
BYOD Content Injection	Call Status	USB-C Function Control	VBUS Control

4K@60 HDMI/USB-C Switcher

SUC-S31U

- 3 inputs (USB-C/HDMI)
- 1 output (HDMI)
- Up to 4K@60 (4:4:4)
- HDCP1.4 / 2.2
- USB Type-C DisplayPort Alternate Mode input
- USB Power Delivery (60W)

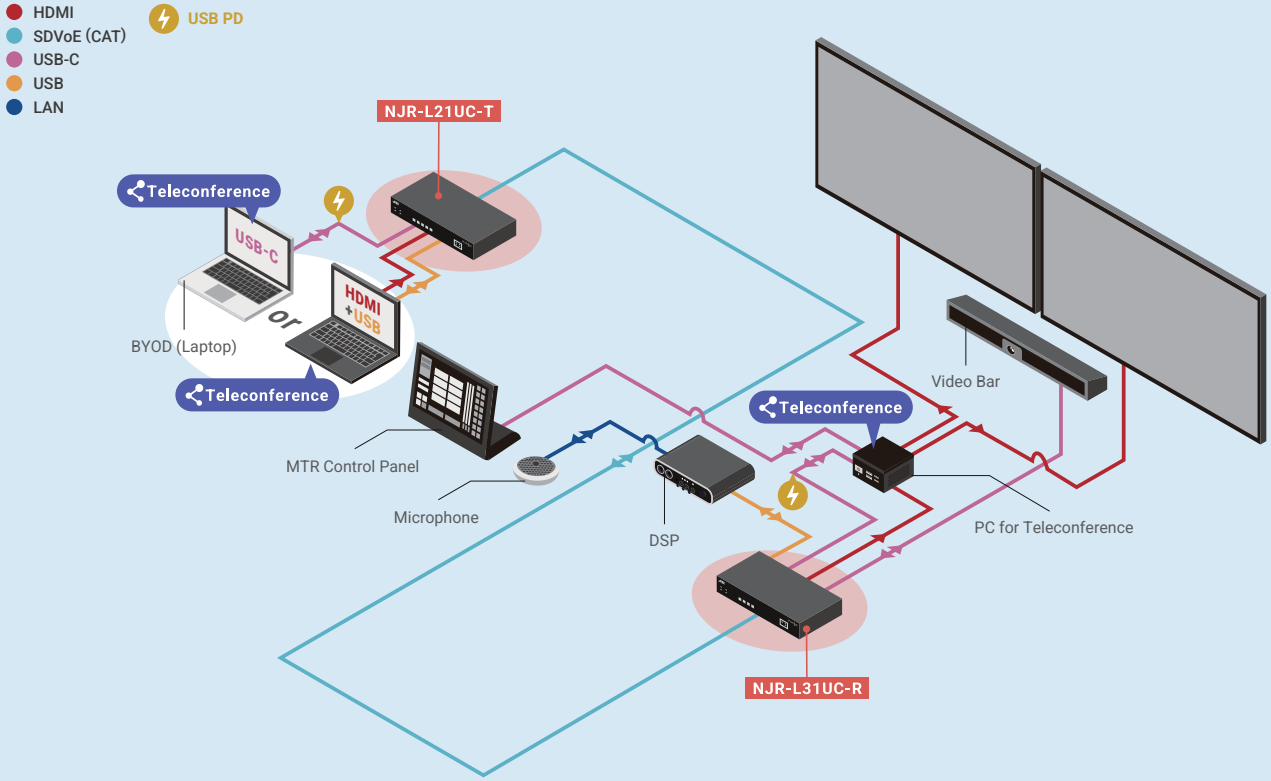




Mid-size Meeting Room with MTR* or Zoom NUC

*Microsoft Teams Rooms

CASE Extension from the user location to equipment location

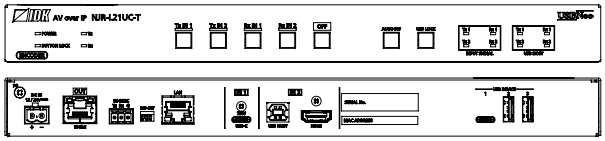


BYOD Content Injection	Call Status	USB-C Function Control	VBUS Control

HDMI and USB-C Encoder

NJR-L21UC-T

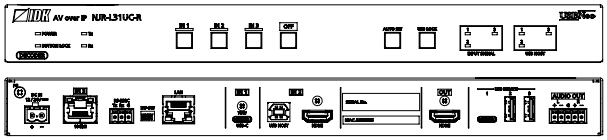
- 2 inputs (USB-C/HDMI)
- 1 output (10GbE CAT)
- Up to 4K@60 (4:4:4)
- HDCP1.4 / 2.2
- USB Type-C DisplayPort Alternate Mode input
- USB Power Delivery (60W)



HDMI and USB-C Decoder

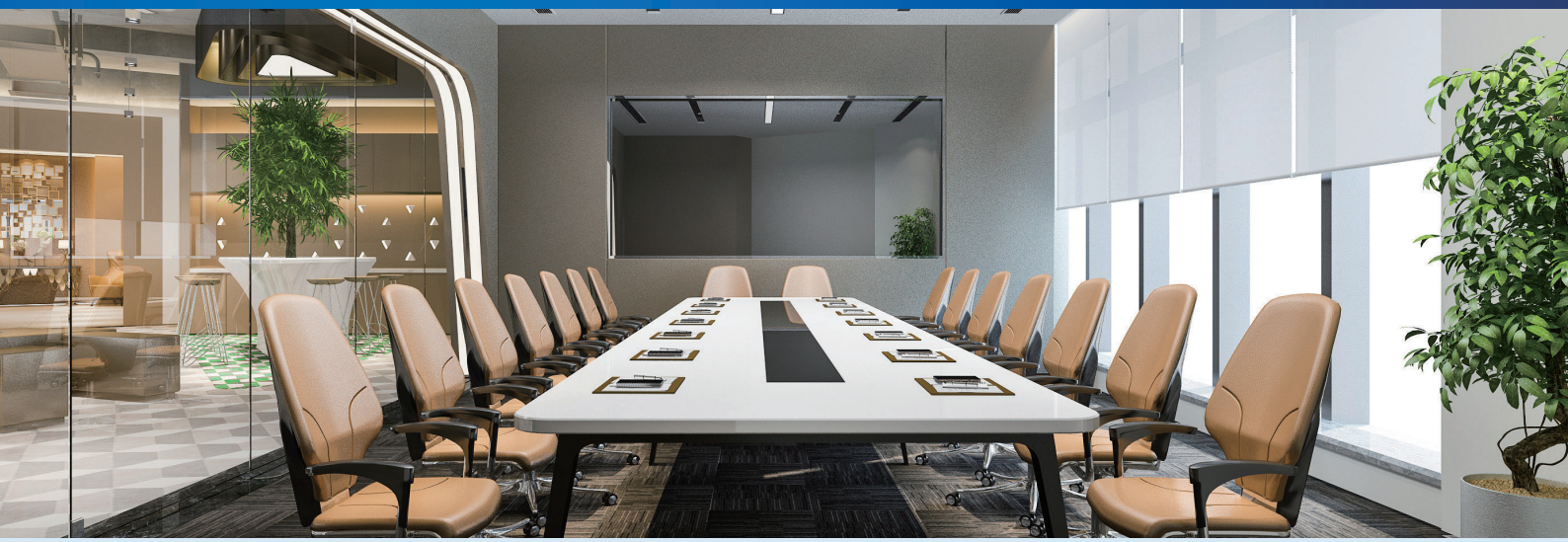
NJR-L31UC-R

- 3 inputs (USB-C/HDMI/10GbE CAT)
- 1 output (HDMI)
- Up to 4K@60 (4:4:4)
- HDCP1.4 / 2.2
- USB Type-C DisplayPort Alternate Mode input
- USB Power Delivery (60W)

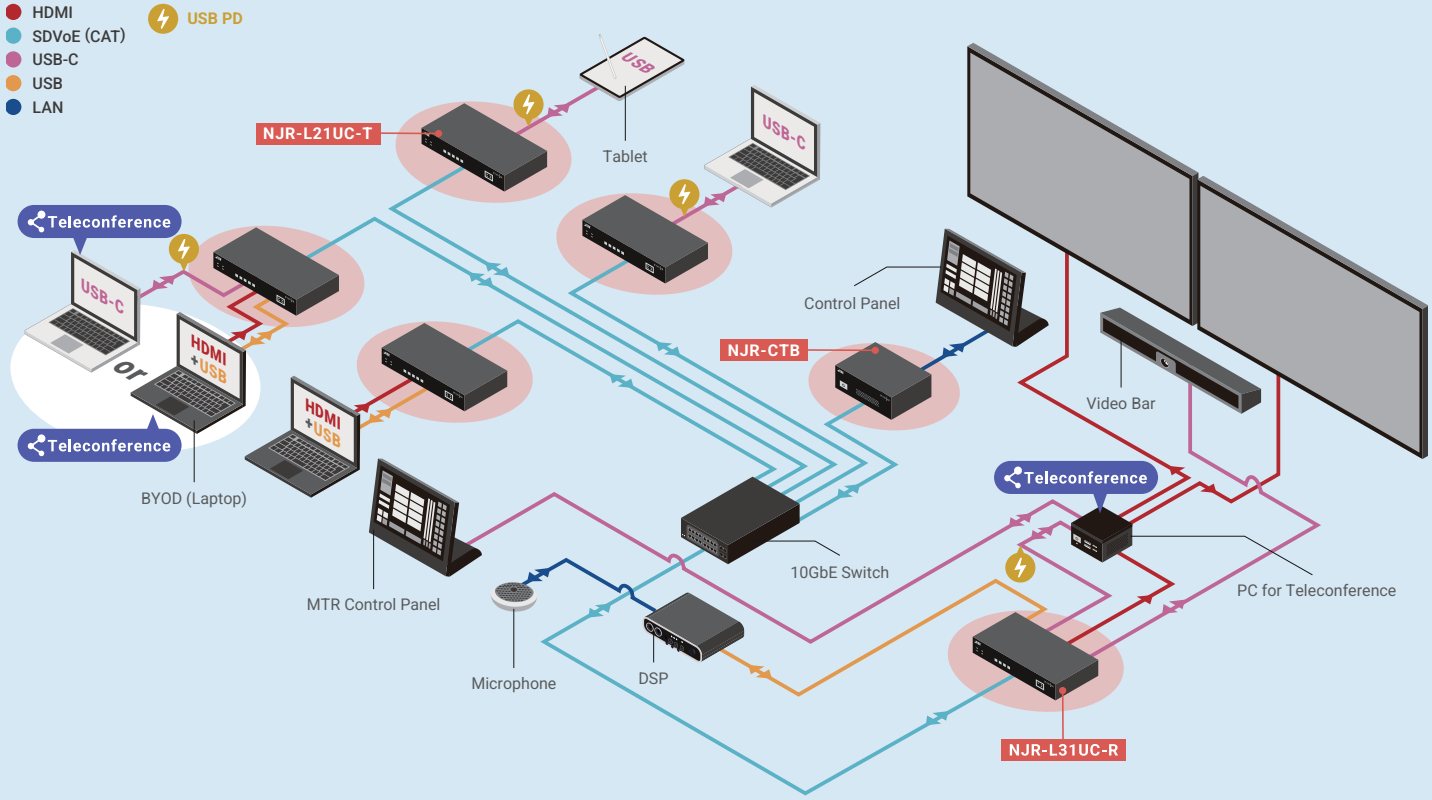


Conference Room with MTR* or Zoom NUC

*Microsoft Teams Rooms



CASE BYOD Connection points expanded

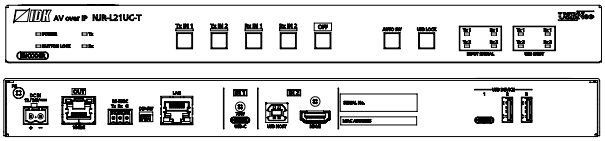


AV over IP	BYOD Content Injection	Call Status	USB-C Function Control	VBUS Control

HDMI and USB-C Encoder

NJR-L21UC-T

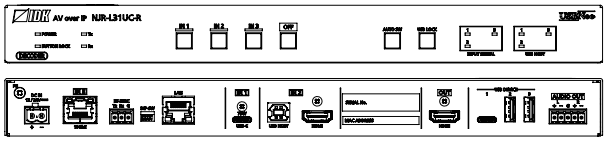
- 2 inputs (USB-C/HDMI)
- 1 output (10GbE CAT)
- Up to 4K@60 (4:4:4)
- HDCP1.4 / 2.2
- USB Type-C DisplayPort Alternate Mode input
- USB-Power Delivery (60W)



HDMI and USB-C Decoder

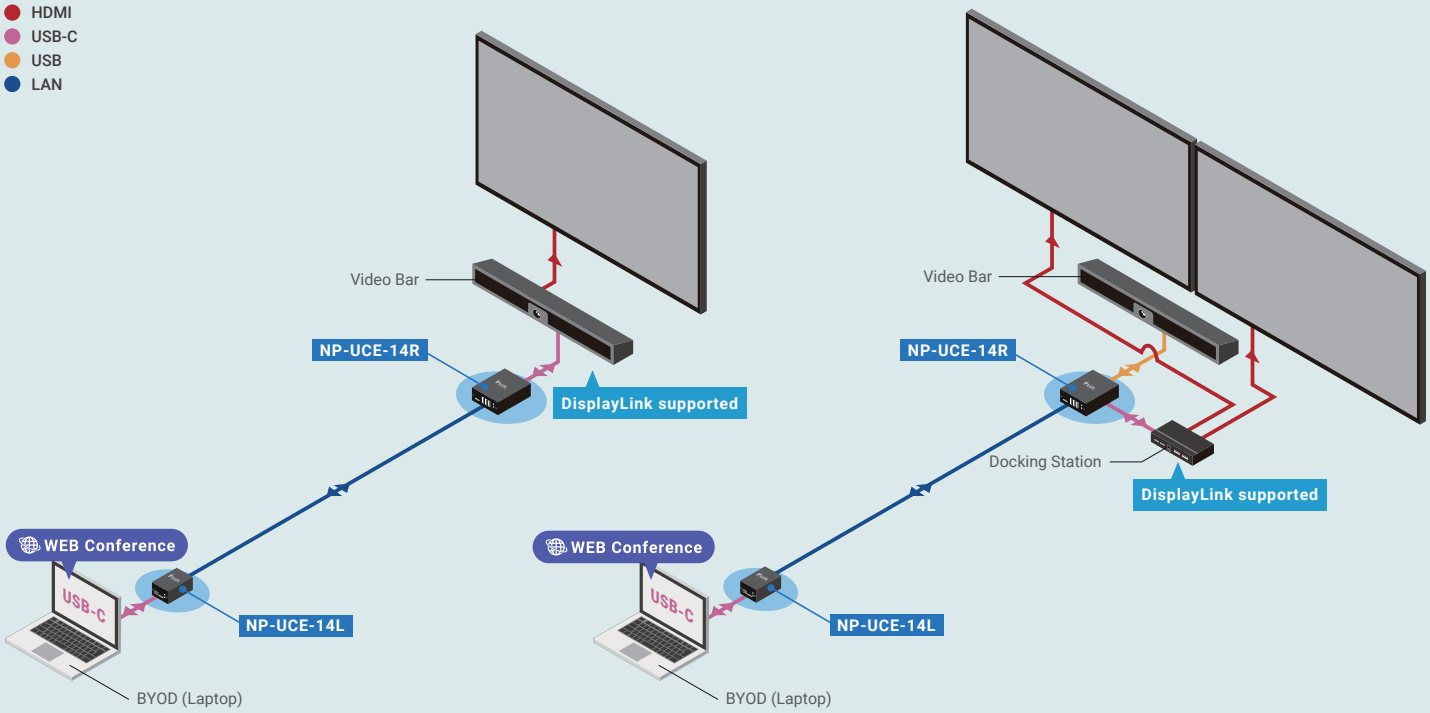
NJR-L31UC-R

- 3 inputs (USB-C/HDMI/10GbE CAT)
- 1 output (HDMI)
- Up to 4K@60 (4:4:4)
- HDCP1.4 / 2.2
- USB Type-C DisplayPort Alternate Mode input
- USB Power Delivery (60W)



Small/Mid-sized Meeting Room for Zoom or Teams

CASE USB-C Extension from BYOM Connector to Video bar



DisplayLink-supported Soundbar

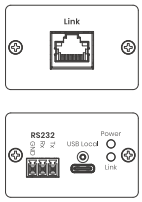
Docking Station with DisplayLink

USB 3.2/2.0/1.1 USB CAT Extender

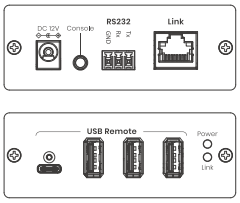
NP-UCE-14LR

- USB 3.2/2.0/1.1
- Up to 70 m (CAT6A)
- Power supplied from each USB port (Remote Unit)
- Operate only using power supply from PC (Local Unit)

NP-UCE-14L

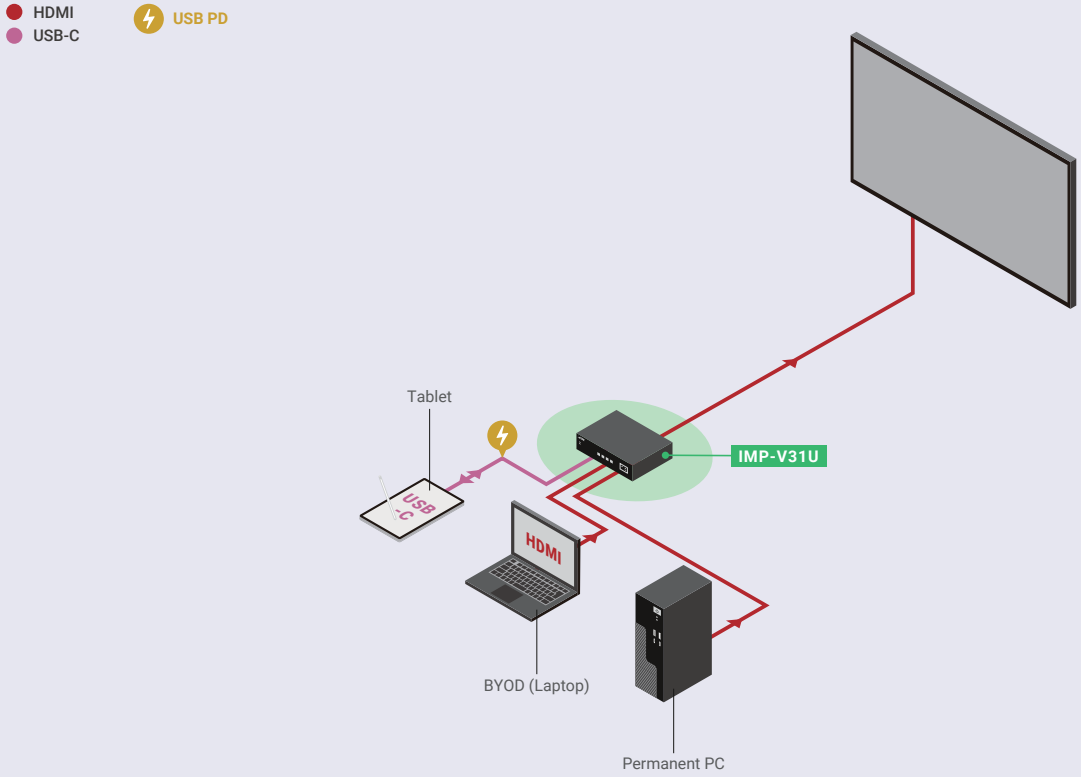


NP-UCE-14R



Huddle Space with USB-C Device

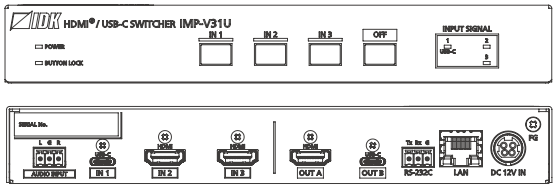
CASE HDMI and USB-C supported Huddle room



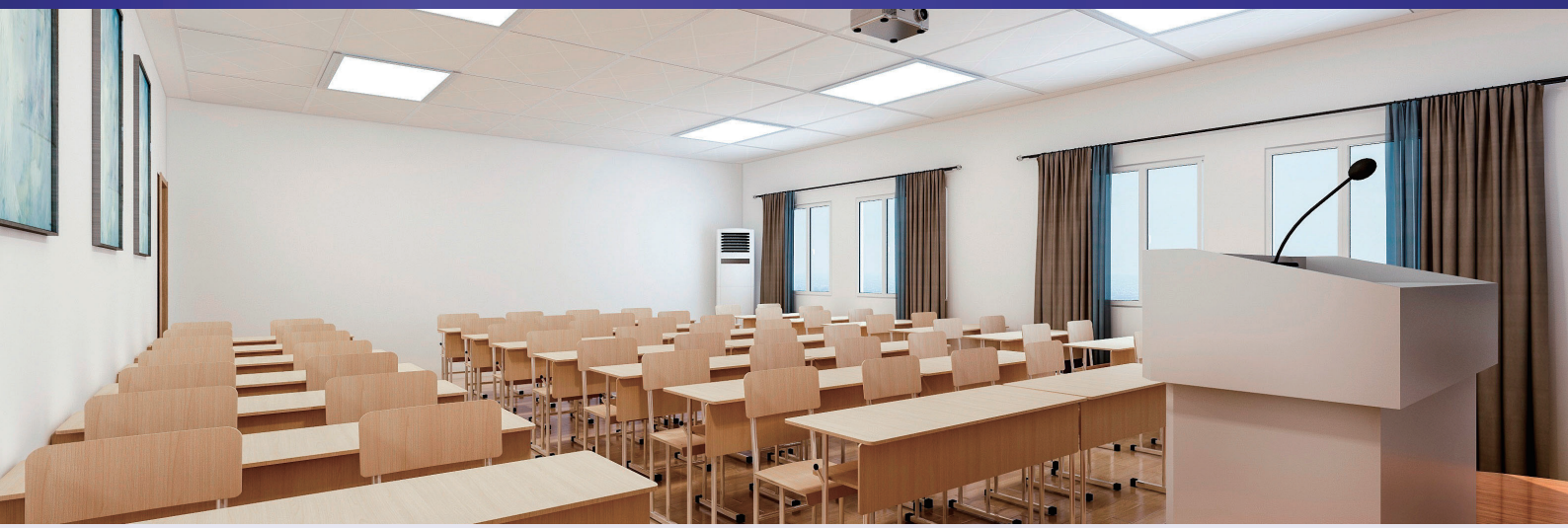
4K@60 HDMI/USB-C Switcher

IMP-V31U

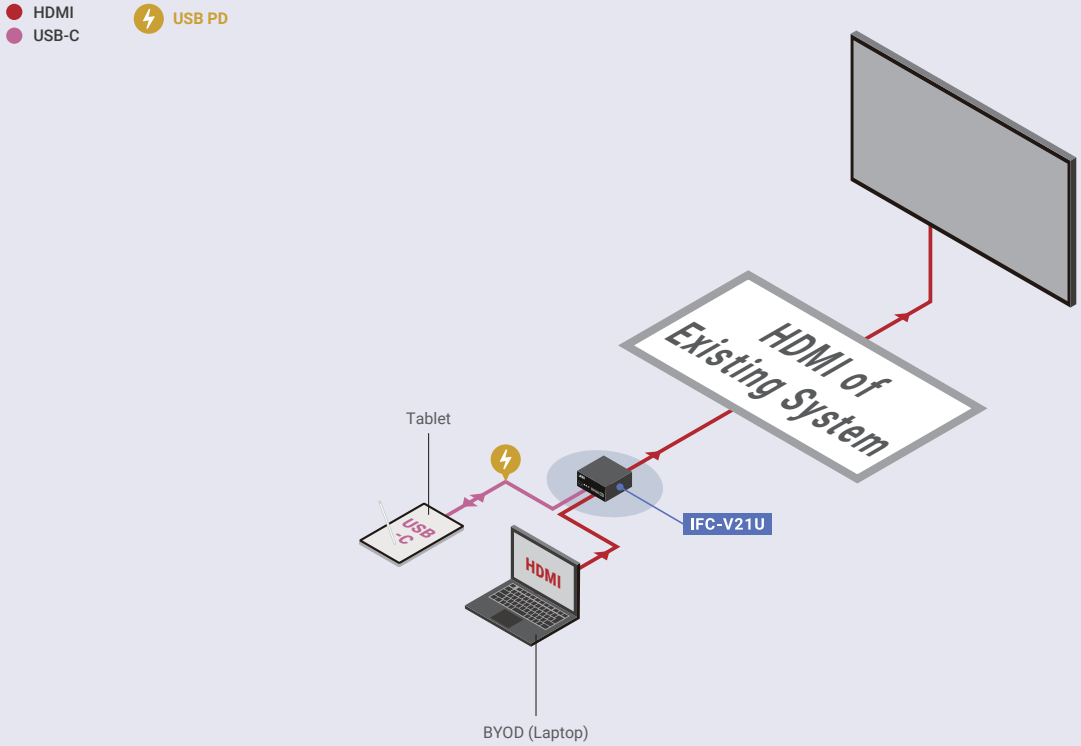
- 3×1 switching (1×USB-C/2×HDMI)
- 1×2 DA (USB-C and HDMI)
- Up to 4K@60 (4:4:4)
- USB Type-C DisplayPort Alternate Mode input
- USB Type-C USB Video Class output
- USB Power Delivery (15W)
- Embedding analog audio



Classroom/Lectern with USB-C Device



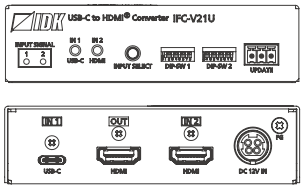
CASE USB-C I/F Added to Existing AV system



4K@60 USB-C to HDMI Converter

IFC-V21U

- USB Type-C to HDMI conversion
- USB Type-C DisplayPort Alternate Mode
- USB Power Delivery (15W)
- Up to 4K@60 (4:4:4)
- EDID Emulation
- CEC



SWITCHER

4K@60 HDMI/USB-C Switcher

SUC-S31U

NEW

USBNeo

4K ULTRA HD

- 3 inputs (USB-C/HDMI)
- 1 output (HDMI)
- Up to 4K@60 (4:4:4)
- HDCP1.4 / 2.2
- USB Type-C DisplayPort Alternate Mode input
- USB Power Delivery (60W)

Video/ Audio input	USB-C	1 input DisplayPort Alternate Mode on USB Type-C, DisplayPort 1.2 Connector: USB Type-C
		USB PD (Power Delivery) Up to 60 W (5V 3A, 9V 3A, 15V 3A, 20V 3A)
	HDMI	2 inputs HDMI/DVI 1.0 Connector: HDMI Type A
Video/ Audio output	HDMI	1 output HDMI/DVI 1.0 Connector: HDMI Type A
	Analog audio	1 output Stereo L/R Connector: Captive screw (5-pin)
Control I/F	RS-232C	1 port/Connector: Captive screw (3-pin)
	LAN	1 port/Connector: RJ-45
Functions	USB HOST	3 ports, USB 2.0, Connector: Type-C × 1, Type-B × 2
	USB DEVICE	3 ports, USB 2.0, Connector: Type-C × 1, Type-A × 2
Dimensions		12.2 (W) × 1.2 (H) × 6.3 (D)" (310 (W) × 30 (H) × 160 (D) mm) (Excluding connectors and the like)

4K@60 HDMI/USB-C Switcher

IMP-V31U

4K ULTRA HD

- 3×1 switching (1×USB-C/2×HDMI)
- 1×2 DA (USB-C and HDMI)
- Up to 4K@60 (4:4:4)
- USB Type-C DisplayPort Alternate Mode input
- USB Type-C USB Video Class output
- USB Power Delivery (15W)
- Embedding analog audio

Video/ Audio input	USB-C	1 input DisplayPort Alternate Mode on USB Type-C, DisplayPort 1.2 Connector: USB Type-C (24-pin)
		USB PD (Power Delivery) DC 5 V 3 A 15 W
	HDMI	2 inputs HDMI/DVI 1.0 Connector: HDMI Type A (19-pin)
Video/ Audio output	HDMI	1 output HDMI/DVI 1.0 Connector: HDMI Type A (19-pin)
	USB-C	1 output USB 3.2 Gen1/USB 2.0, UVC, UAC Connector: USB Type-C (24-pin)
Control I/F	RS-232C	1 port/Connector: Captive screw (3-pin)
	LAN	1 port/Connector: RJ-45
Dimensions		8.3 (W) × 1.2 (H) × 5.9 (D)" (210 (W) × 30 (H) × 150 (D) mm) (Excluding connectors and the like)

SDVoE CAT EXTENDER

HDMI and USB-C Encoder

NJR-L21UC-T

NEW

USBNeo

4K ULTRA HD

- 2 inputs (USB-C/HDMI)
- 1 output (10GbE CAT)
- Up to 4K@60 (4:4:4)
- HDCP1.4 / 2.2
- USB Type-C DisplayPort Alternate Mode input
- USB Power Delivery (60W)

Video/ Audio input	USB-C	1 input DisplayPort Alternate Mode on USB Type-C, DisplayPort 1.2 Connector: USB Type-C
		USB PD (Power Delivery) Up to 60 W (5V 3A, 9V 3A, 15V 3A, 20V 3A)
	HDMI	1input HDMI/DVI 1.0 Connector: HDMI Type A
Video/ Audio output	10GbE	1 output SDVoE, AES-128 Connector: RJ-45
Control I/F	RS-232C	1 port, Connector: Captive screw (3-pin)
	LAN	1 port, Connector: RJ-45
	USB HID	1 port, HID class, Connector: Type-A
	USB HOST	2 ports, USB 2.0, Connector: Type-C × 1, Type-B × 1
	USB DEVICE	3 ports, USB 2.0, Connector: Type-C × 1, Type-A × 2
Dimensions		12.2 (W) × 1.2 (H) × 6.3 (D)" (310 (W) × 30 (H) × 160 (D) mm) (Excluding connectors and the like)

HDMI and USB-C Decoder

NJR-L31UC-R

NEW

USBNeo

4K ULTRA HD

- 3 inputs (USB-C/HDMI/10GbE CAT)
- 1 output (HDMI)
- Up to 4K@60 (4:4:4)
- HDCP1.4 / 2.2
- USB Type-C DisplayPort Alternate Mode input
- USB Power Delivery (60W)

Video/ Audio input	USB-C	1 input DisplayPort Alternate Mode on USB Type-C, DisplayPort 1.2 Connector: USB Type-C
		USB PD (Power Delivery) Up to 60 W (5V 3A, 9V 3A, 15V 3A, 20V 3A)
	HDMI	1 input HDMI/DVI 1.0 Connector: HDMI Type A
	10GbE	1 input SDVoE, AES-128 Connector: RJ-45
Video/ Audio output	HDMI	1 output HDMI/DVI 1.0 Connector: HDMI Type A
	Analog audio	1 output Stereo L/R Connector: Captive screw (5-pin)
Control I/F	RS-232C	1 port, Connector: Captive screw (3-pin)
	LAN	1 port, Connector: RJ-45
	USB HID	1 port, HID class, Connector: Type-A
	USB HOST	2 ports, USB 2.0, Connector: Type-C × 1, Type-B × 1
	USB DEVICE	3 ports, USB 2.0, Connector: Type-C × 1, Type-A × 2
Dimensions		12.2 (W) × 1.2 (H) × 6.3 (D)" (310 (W) × 30 (H) × 160 (D) mm) (Excluding connectors and the like)

CAT EXTENDER

USB 3.2/2.0/1.1
USB CAT Extender

NP-UCE-14LR

- USB 3.2/2.0/1.1
- Up to 230 ft. (70 m) (CAT6A)
- Power supplied from each USB port (Remote Unit)
- Operate only using power supply from PC (Local Unit)

		NP-UCE-14L (Loccal Unit)	NP-UCE-14R (Remote Unit)
USB		1 Host Port USB 3.2 Gen1x1/USB 2.0/USB 1.1 Connector: USB Type-C	4 Device Ports USB 3.2 Gen1x1/USB 2.0/USB 1.1 Connector: USB Type-C ×1 USB Type-A ×3
CAT		1 Port Connector: RJ-45 (CAT6A/CAT7)	1 Port Connector: RJ-45 (CAT6A/CAT7)
Control I/F	RS-232C	1 Port Connector: Captive screw (3-pin)	
Dimensions		2.0 (W) × 1.3 (H) × 3.7 (D)" (50 (W) × 32 (H) × 93 (D) mm)	3.4 (W) × 1.3 (H) × 4.8 (D)" (87.3 (W) × 32 (H) × 123 (D) mm)

USB2.0/1.1 USB CAT Extender Network transmission model

NP-USB2GBE-LR

- USB 2.0/1.1
- Up to 328 ft. (100 m)
- Transmit/receive USB over network
- Power supplied from each USB port (Remote Unit)
- Operate only using power supply from PC (Local Unit)

		NP-USB2GBE-L (Loccal Unit)	NP-USB2GBE-R (Remote Unit)
Max Transmission Distances	Direct Connect	100 m (CAT5e / CAT6 / CAT7)	
	Network Connect	100 m (CAT5e / CAT6 / CAT7) between switches	
USB		1 Host Port Connector: USB Type-B	4 Device Ports Connector: USB Type-A
CAT		1 Port Connector: RJ-45	
Dimensions		3.9 (W) × 1.0 (H) × 3.0 (D)" (100 (W) × 26 (H) × 76 (D) mm)	

CONVERTER

4K@60 USB-C to HDMI Converter

IFC-V21U

- USB Type-C to HDMI conversion
- USB Type-C DisplayPort Alternate Mode
- USB Power Delivery (15W)
- Up to 4K@60 (4:4:4)
- EDID Emulation
- CEC

Video/ Audio input	USB-C	1 input DisplayPort Alternate Mode on USB Type-C, DisplayPort 1.2 Connector: USB Type-C (24-pin)
		USB PD (Power Delivery) DC 5 V 3 A 15 W
	HDMI	1 input HDMI/DVI 1.0 Connector: HDMI Type A (19-pin)
Video/ Audio output	HDMI	1 output HDMI/DVI 1.0 Connector: HDMI Type A (19-pin)
Dimensions		4.2 (W) × 1.1 (H) × 3.9 (D)" (106 (W) × 28 (H) × 100 (D) mm) (Excluding connectors and the like)

4K@60 HDMI to USB Converter

NP-CPHD2

- HDMI to USB conversion
- USB Video Class
- Up to 4K@60 (4:4:4) (Input)
- Embedding analog audio
- Operate only using power supply from PC
- No software installation required

Video/ Audio input	HDMI	1 input Connector: HDMI Type-A (19-pin)
	Digital audio	1 input HDMI Embedded audio
	Analog audio	1 input 3.5 mm Analog Stereo audio
Output	I/F	USB 3.2 Gen1×1/USB 2.0 Connector: USB Type-C
	USB Device Class	UVC (USB Video Class) UAC (USB Audio Class) Stereo / 16-bit / 48000Hz
Dimensions		3.4 (W) × 0.7 (H) × 1.4 (D)" (87.3 (W) × 17 (H) × 36.3 (D) mm)

» LINE UP

USB Type-C Active Optical Cable with Full Functionalities

NP-AOC-SUSC

Length
10 / 16 / 23 / 33 / 49 ft.
(3 / 5 / 7 / 10 / 15 m)

- Up to 4K@60 (4:4:4)
- Up to 49 ft. (15 m)
- USB Type-C Alternate Mode
- USB 3.2/2.0/1.1
- USB-Power Delivery
- USB Video Class
- Operate only using power supply from USB Host

USB Type-C/USB Type-A Active Optical Cable for USB3.2/2.0/1.1

NP-AOC-SA2C

Length
16 / 23 / 33 / 49 ft.
(5 / 7 / 10 / 15 m)

- USB 3.2/2.0/1.1
- Up to 49 ft. (15 m)
- USB Video Class
- Bend radius: 0.7" (18 mm)/cable diameter: 0.2" (4.5 mm)
- Tensile strength: about 33 lb. (15 kg)
- Operate only using power supply from PC

USB Type-C (Alternate Mode with Power Delivery) to HDMI 2.0 Conversion Cable

UTC-UHDF0015-PD

Length
0.5 ft. (0.15 m)

- USB Type-C to HDMI conversion
- Up to 4K@60 (4:4:4)
- USB Type-C Alternate Mode
- USB-Power Delivery

CABLES SELECTION GUIDE

		Extension	
		NP-AOC-SUSC	NP-AOC-SA2C
			
Connector		Type-C male	Type-A male (Host Side)
		Type-C male	Type-C male (Device Side)
Purpose of use		For Extending Alternate Mode, Power Delivery, and USB Data signals	For Extending USB 3.2 Data signals
Functions	ALT Mode (Alternate Mode)	DisplayPort 1.4	—
	UVC (USB Video Class)	✓	✓
	USB PD (USB Power Delivery)	Up to 60 W	—
Specification	USB 1.1	✓	✓
	USB 2.0	✓	✓
	USB 3.2 Gen1×1	✓	✓
	USB 3.2 Gen2×1	✓	✓
	USB 3.2 Gen1×2	—	—
	USB 3.2 Gen2×2	—	—
	USB4 Version 1.0	—	—
	USB4 Version 2.0	—	—
Alternate Mode Data Rate		32.4 Gbps (8.1 Gbps per lane)	—
USB Data Rate		10 Gbps	10 Gbps
Resolution *		4K@60 (4:4:4)	4K@30
Max Transmission Distance		49 ft. (15 m)	49 ft. (15 m)
Power Supply		Operate only using power supply from USB Host	Operate only using power supply from USB Host

* The maximum resolution when connected to IDK products

USB Type-C Cable – 7 ft. (2 m)

USBC-04G2-02

Length
7 ft. (2 m)

- USB Type-C Alternate Mode
- USB-Power Delivery
- USB4 Version 1.0 (20 Gbps)

USB Type-C Cable – 3 ft. (1 m)

USBC-31G2-01

Length
3 ft. (1 m)

- USB Type-C Alternate Mode
- USB-Power Delivery
- USB 3.2 Gen2x1

Cables		Conversion Cable
USBC-04G2-02	USBC-31G2-01	UTC-UHDF0015-PD
		
Type-C male	Type-C male	HDMI female
Type-C male	Type-C male	Type-C male
For Sending Alternate Mode, Power Delivery, and USB Data signals	For Sending Alternate Mode, Power Delivery, and USB Data signals	For Converting Video signal from USB Type-C to HDMI
DisplayPort 1.4	DisplayPort 1.4	DisplayPort 1.4
✓	✓	—
Up to 100 W	Up to 100 W	Up to 60 W
✓	✓	—
✓	✓	—
✓	✓	—
✓	✓	—
✓	—	—
✓	—	—
✓	—	—
—	—	—
32.4 Gbps	32.4 Gbps	18 Gbps
20 Gbps	10 Gbps	—
4K@60 (4:4:4)	4K@60 (4:4:4)	4K@60 (4:4:4)
7 ft. (2 m)	3 ft. (1 m)	HDMI: 16 ft. (5 m)
—	—	Operate only using power supply from USB Host

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01-2026 Ver.1.1.1