



USB-C FOR PRO AV

DESIGN GUIDE



Extron

TABLE OF CONTENTS

USB Standards	1
USB Connectors	2
USB-C for Pro AV.	3
Beyond USB 3	5
Extron Technology Logos	6
Thunderbolt	7
Design Considerations	8

SYSTEM DESIGNS

Esports Center with USB Extension	10
Single-Input BYOM Zoom Conference Room	12
Dual-Input BYOM Teams Meeting Room	14
Enhanced UC Space	16

EXTRON USB SOLUTIONS

AV to USB Bridges	20
USB Collaboration Switchers	21
USB Interfaces	22
USB Extenders	23
USB Switchers	24
Architectural Products	25
USB-C Cable	26
Additional Resources	27

USB Standards

Introduction

USB – Universal Serial Bus – was originally developed in the mid-1990s as a cable, connector, and communications protocol standard for local connections between computers and electronic devices. It replaced serial, parallel, and other port technologies used by computing devices to connect peripheral equipment such as a keyboard, mouse, printer, etc.

The first USB specification was released in January 1996. Over the years, the USB specification has been updated multiple times. These updates improved performance, not only in data throughput but also in power delivery, as well as audio and video transport.

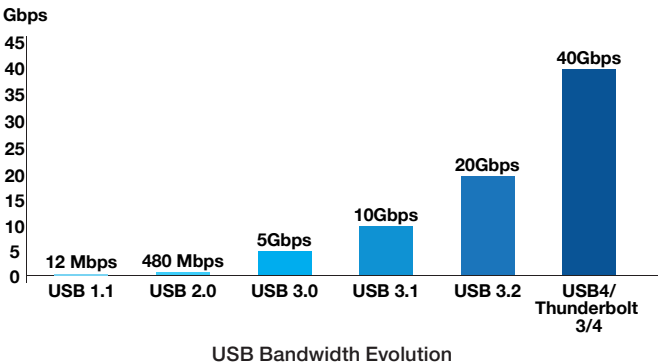
The chart below shows revision dates for the USB specification.

USB Specification Release Dates	
Specification	Release Date
USB 1.0	January 1996
USB 2.0	April 2000
USB 3.0	November 2008
USB 3.1	July 2013
USB 3.2	September 2017
USB4	August 2019

Bandwidth Evolution

For data delivery, the USB standard has evolved to meet industry performance needs. USB 1.1 allowed for data transfer rates up to 12 Mbps. USB 2.0 extended this to 480 Mbps. USB 3.x specifications provide USB data transfer speeds up to 40 times faster than USB 2.0, offering speeds up to 20 Gbps, depending on implementation. USB4 expands this even further, reaching transfer rates of 40 Gbps.

The USB 3.x specifications provide USB data transfer speeds up to 40 times faster than USB 2.0, offering speeds up to 20 Gbps, depending on implementation. USB4 expands this even further, reaching transfer rates of 40 Gbps.



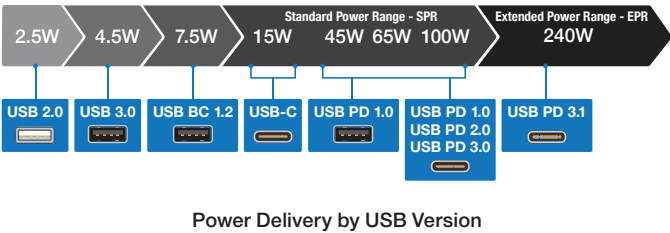
Power Delivery Evolution

In addition to being a common connector for device communications, USB has become a convenient method to deliver power. It provides power to computing devices without the need for a bulky AC power supply. Also, it can charge portable or mobile devices, such as tablets and smartphones. As of 2024, Europe has mandated that all mobile phones be equipped with a USB-C connection for charging.

For USB 2.0, a standard downstream port delivers up to 2.5 watts of power. USB 3.0 and 3.1 extend this to 4.5 watts. Up to 7.5 watts can be delivered with USB Battery Charging, a port specification that prioritizes power delivery, including providing dedicated charge ports.

As the USB specification has evolved, the capability to deliver increased power to far-end devices has continued to grow. In 2012, the first USB Power Delivery (USB-PD) specification increased power delivery up to 100 watts. This is now called Standard Power Range (SPR).

Current charging technology provides up to 240 watts of bidirectional power, enabling either the host or the peripheral device to deliver power to equipment.



USB Connectors

Background

Throughout the history of USB, a variety of connectors have been developed to meet emerging data delivery, power delivery, and form factor requirements. The most common connector types are described below.

USB-A

USB Type-A, also referred to as Standard-A or simply USB-A, is the most common type of USB connector. It can be found on host devices, such as PCs, and on cables designed to connect to a host. A USB-A cable typically has a USB Type-B or USB Type-C connector at the opposite end.

USB 1.0 and USB 2.0 Type-A connections support three data rates: Low Speed (1.5 Mbps), Full Speed (12 Mbps), and High Speed (480 Mbps), and are usually black or white inside. USB 3.0 Type-A connections support data speeds up to 10 Gbps, and are generally blue or teal inside. One reason for the USB 3.0 data bus speed increase over USB 2.0 is the addition of full duplex communication lanes. It uses two differential signal lanes for the data bus. In comparison, the USB 2.0 bus uses a single differential signal that provides only half duplex operation.



USB 2 Type-A

USB 3 Type-A

USB-B

USB Type-B, or USB-B, connectors are found on peripherals such as external storage devices, printers, document cameras, and scanners. Most USB-B connectors are at one end of a USB-B to USB-A cable, which are designed to link a peripheral to a host, such as a PC. Data flow is bidirectional, but power may only flow from the host to the peripheral. The differing form factor of the USB-A and USB-B connectors ensure correct orientation of the cable when installing. Black and white connectors traditionally indicate USB 2.0 and earlier versions. Blue and teal connectors indicate USB 3.x support. A USB 3.x USB-B connector also has a slightly different form factor than the USB 1.0/USB 2.0 Type-B connector to accommodate the additional USB 3.x pins while still making the USB 2 plug backward compatible with the USB 3 connector.



USB 2 Type-B



USB 3 Type-B

USB Mini and Micro Connectors

USB Mini-A, Mini-B, Micro-A, and Micro-B connectors were created for use on smaller peripherals where a “Standard” receptacle was too bulky. Mini connectors were developed first. The Micro connectors followed and are slightly slimmer for use on even smaller peripheral devices like smartphones and external storage devices.

USB Type-C

The USB Type-C®, or USB-C, connector is a 24-pin reversible connector. It is used for USB 3.1 and later applications, although it can support earlier USB standards in most instances. USB-C can be used with hosts and peripherals, eliminating the need to have a unique connector for each device type. A Type-C to Type-C cable can be oriented in either direction, with the host device determining host and peripheral identification. The small form factor and wide acceptance of USB-C connections have made the USB-C receptacle a popular choice for manufacturers to use on mobile devices.



USB Type-C

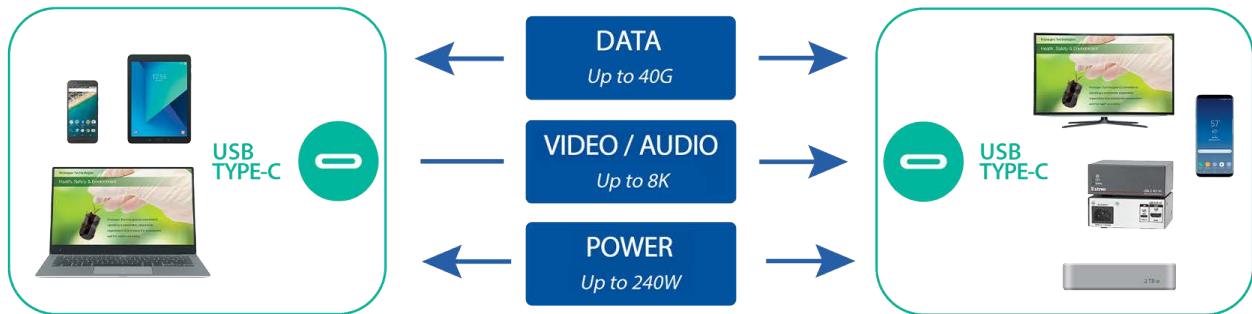
A USB-C connection can support video, audio, data, and power simultaneously, simplifying AV connectivity with minimal cabling.

More information about USB-C connectors and cables is available in the next section.

USB-C for Pro AV

Universal Connection

Initially just an interface for data and peripheral devices, USB technologies have rapidly evolved to support audio, video, data, and fast device charging. The USB-C connector was introduced in 2014 and has become the new standard over the intervening decade. It streamlines AV system connections while providing enhanced speed, functionality, and convenience. USB-C connectors can now be found on many devices, including mobile phones, tablets, monitors, storage drives, and laptops. In some cases, USB-C is the only connection available.



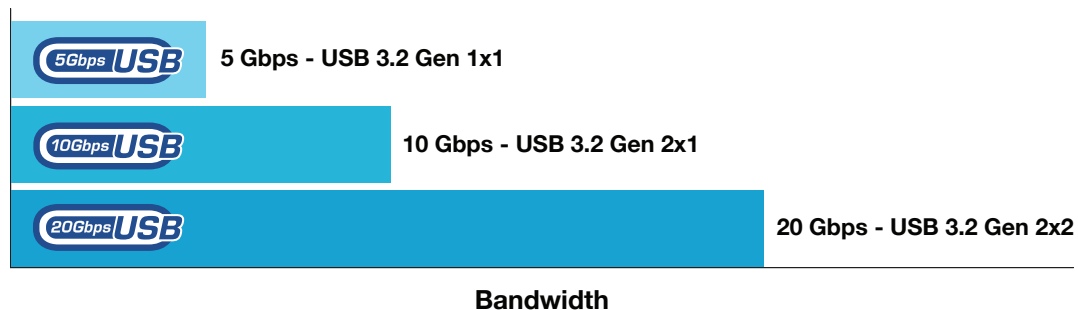
USB-C Connector

The USB-C connector provides significant advantages for professional AV environments. The enhancements include support for alternate data protocols, blazingly fast data transfer rates, and increased power transfer and charging capabilities - all on a single, small connector. These are just some of the features that make USB-C a one-stop shop for AV connectivity.

The USB-C connector was designed to incorporate a small form factor while improving the user experience. In addition to supporting up to 240 watts of power and a connector rated for 10,000 insertions, it offers the convenience of a reversible orientation that enables users to plug their devices in correctly every time.

Bandwidth

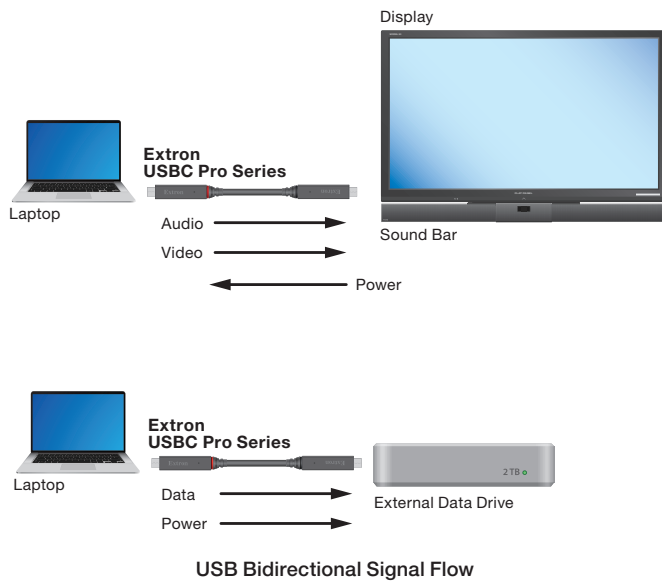
The USB-C connector supports USB 3.x specifications, which provide USB data transfer speeds up to 80 times faster than the USB 2.0 standard of 480 Gbps. The supported data rate can vary by product, offering speeds of 5 Gbps (USB 3.2 Gen 1x1), 10 Gbps (USB 3.2 Gen 2x1), or 20 Gbps (USB 3.2 Gen 2x2), or 40 Gbps and beyond with USB4. The increased bandwidth allows USB to deliver video, audio, and data over a single cable.



USB-C for Pro AV

Power Delivery

USB-C supports USB Power Delivery of up to 240 watts to charge or operate most devices, including tablets, desktops, and workstations. Power can flow in either direction based on the application. For example, a laptop can be powered over a USB-C cable connected to a display, or it can deliver power over a USB-C cable to an external hard drive.



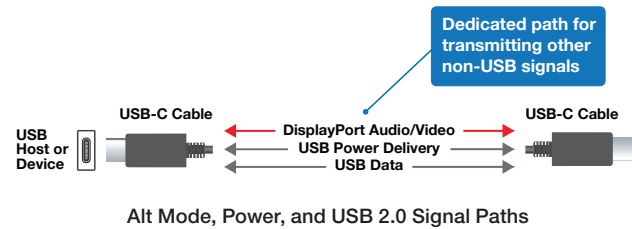
As stated in USB Power Delivery specification version 3.1, USB SPR provides a maximum delivery of 100 watts plus data. This revision added support for 100 - 240 watts with extended power range (EPR). Power can extend beyond 100 watts when using sources, cables, and sinks that adhere to EPR specifications.

USB Power Delivery Evolution			
Specification	Max Current	Max Voltage	Max Power
USB PD 1.0	3 A	5 V	15 W
USB PD 2.0/3.0 (USB-C)	5 A	20 V	100 W
USB PD 3.1 (USB-C)	5 A	48 V	240 W

Previous to this, USB Power Delivery version 1.0 implemented power profiles that allowed a power source to communicate with a device to ensure the proper voltage and current is provided. Version 2.0 incorporated support for the USB-C connector and implemented power rules to ensure that higher voltage, high-power devices can also support devices with lower power requirements.

Alternate Mode and Lane Usage

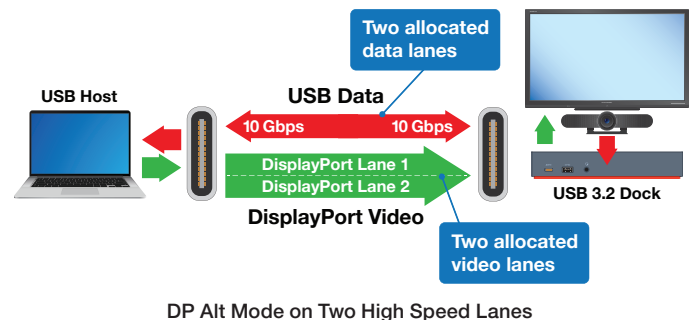
USB-C supports Alternate Mode, which allows for transmission of alternate data protocols such as DisplayPort, MHL, VirtualLink, and Thunderbolt 3.



The four high-speed lanes available with USB-C can be used partially or fully for Alternate Mode data. For example, two lanes can be used for DisplayPort data while the remaining two lanes are available for USB 3.x data. Alternatively, if higher video bandwidth is required, all four lanes can be used for DisplayPort data, with dedicated USB 2.0 lines used for data transfer. This flexibility to carry non-USB data greatly expands the capabilities of the USB-C cable, reduces cable clutter, and simplifies system connectivity.

Two-Lane DisplayPort Video and Audio Signals

DisplayPort Transmission Mode	Data Per Lane	Total Data	Max. Video Resolution
HBR (DP 1.1)	2.7 Gps	5.4 GBps	1080p/60
HBR2 (DP 1.2)	5.4 Gbps	10.8 GBps	4K/30
HBR3 (DP 1.3/1.4)	8.1 Gbps	16.2 GBps	4K/30



Four-Lane DisplayPort Video and Audio Signals

DisplayPort Transmission Mode	Data Per Lane	Total Data	Max. Video Resolution
HBR (DP 1.1)	2.7 Gps	10.8 GBps	4K/30
HBR2 (DP 1.2)	5.4 Gbps	21.6 GBps	4K/60
HBR3 (DP 1.3/1.4)	8.1 Gbps	32.4 GBps	8K/30

Beyond USB 3

USB4

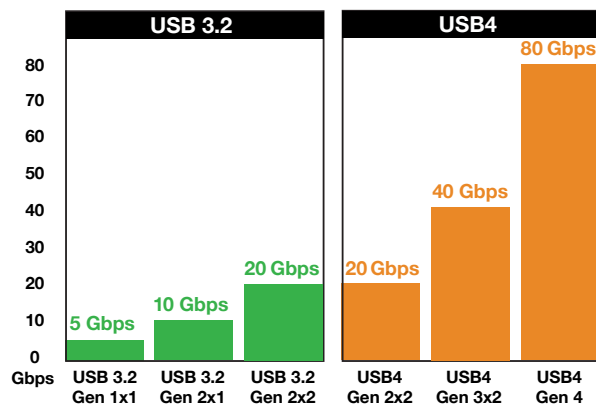
The USB4 specification, introduced in 2019, builds upon previous USB 2.0 and USB 3.2 specifications. It provides increased data throughput and incorporates a new data transfer protocol similar to Thunderbolt. It is compatible with USB 2.0 and USB 3.2, as well as Thunderbolt 3.

USB-C Connection

The USB-C connector has proven to be a reliable, compact delivery method for high-speed data and power delivery to support ever larger devices. It serves as the sole connection type for USB4 hosts, peripherals, and hubs.

Bandwidth

The current USB4 specification defines multiple operational modes, as does the USB 3.2 specification. These definitions include data transfer rates of 20 Gbps (USB4 Gen 2x2), 40 Gbps (USB4 Gen 3x2), and 80 Gbps (USB4 Gen 4).



USB 3.2 vs. USB4 Data Rate Comparison

USB4 is based on the Thunderbolt 3 protocol specification, with data transfer operating in a similar manner. With USB4, USB, DisplayPort, and PCIe protocols are multiplexed together across the four lanes, creating a single high-speed pipeline. Being compatible with USB 3.2, USB4 also supports video and data transmission on dedicated lanes for hosts and peripherals that support USB 3 but not USB4.

As mentioned previously, USB4 is compatible with Thunderbolt 3. It is important to note that Thunderbolt 3 support is optional for USB4 hosts and peripherals, so support varies from device to device. However, Thunderbolt 3 support is a required feature for USB4 hubs.

Power Delivery

USB4 uses the USB 3.1 Power Delivery specification, providing a maximum of 240 watts for powering and charging devices. The table below provides a breakdown of the latest USB Power Delivery 3.1 specification based on a power source's maximum output.

USB Power Delivery 3.1		
Max Current	Supported Voltage	Max Power
3A	5V	15W
3A	5V, 9V	27W
3A	5V, 9V, 15V	45W
5A	5V, 9V, 15V, 20V	100W
5A	28V, 36V, 48V	240W

Video Performance

Like USB 3, USB4 supports DisplayPort Alt Mode. This means DisplayPort data can be sent either with lane-dedicated DisplayPort Alt Mode or via USB4 tunneling. USB4 can deliver DisplayPort 2.1 content at 20 Gbps per lane for a maximum total video bandwidth of 80 Gbps, enabling video resolutions up to 8K at 60 Hz with HDR10 color depth.

Extron Technology Logos

Power, Data, and Video

With the wide variety of power delivery modes, data transfer speeds, and video throughput capabilities that USB 3.x offers, it can be confusing to know exactly what a product supports. Extron has simplified the product selection experience by creating USB technology logos that appear on the majority of our website's USB product pages. These are explained below.

Power Delivery Logos

Version 3.1 of the USB Power Delivery specification defines capabilities up to 240 watts. It facilitates powering and fast charging of Apple® and Android™ devices, such as tablets and smartphones, as well as external storage and laptop computers. The technology provides tested and verified higher performance device charging, an improvement on traditional device-charging options. The maximum available power depends on product design and USB-C cable selection. Extron USB power logos make it easy to optimize power delivery through an entire system.



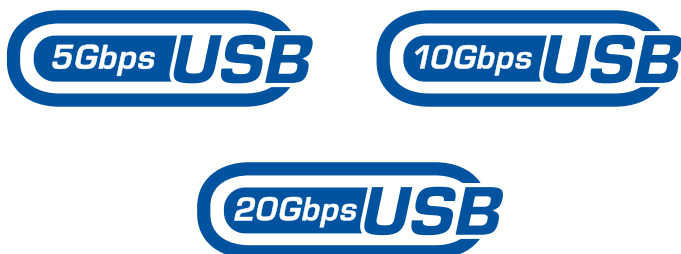
DP Alt Mode Logos

The distribution of DisplayPort audio and video via USB's Alt-mode feature has greatly simplified video distribution. It enables support of video resolutions up to 8K on a compact USB-C connection. Based on cable design and source/sink capabilities, the bandwidth allocated to video and audio delivery varies among products. Extron DP Alt Mode logos assist with product selection.



Data Transfer Logos

USB data transfer rates can vary by product, offering rates of USB 5 Gbps, USB 10 Gbps, or USB 20 Gbps for USB 3, and USB 40 Gbps with USB4. The data transfer logos make it easy to know which data transfer speeds are supported by a given Extron product. This is especially helpful when selecting cables for your system.



Thunderbolt

What is Thunderbolt?

Thunderbolt™ is a hardware interface that delivers peripheral component interconnect express (PCIe) data, DisplayPort video and audio, and DC power. These connections can be found on devices such as external drives, displays, and I/O hubs. Thunderbolt ports and cables are identified with the Thunderbolt logo. Thunderbolt 3 is backwards-compatible with USB 3.x, which allows interoperability with USB 3 devices.



USB-C Connector

While older versions of Thunderbolt used a mini DisplayPort connector, Thunderbolt 3 and 4 are supersets of USB 3 which incorporate the USB-C port. Thunderbolt 3 and 4 cables can work as USB-C cables because they use the same connector and compatible wiring. Although the ports and interfaces look the same, there are notable differences. Though Thunderbolt 3 and 4 are USB-C Alt Modes, Thunderbolt host ports, peripherals, and cables typically offer a superset of features. These features can include additional bandwidth and backwards compatibility with host and peripheral ports. Hosts, devices, and cables that are certified as supporting Thunderbolt are marked with the Thunderbolt symbol to differentiate them from their USB counterparts.



Thunderbolt USB-C Connector

Data Transfer Rates

Thunderbolt 3 and 4 implement USB-C Alt Mode to transfer up to 40 Gbps of full-duplex data. The original Thunderbolt 3 specification provided support for DisplayPort 1.2, although a later update extended that to DisplayPort 1.4. Currently, Thunderbolt 3 and 4 combine the PCIe data together with DisplayPort video data, which is sent to a docking device or display. Here, the DisplayPort video is separated from the PCIe data. Then, the data is converted to standard USB and made available through USB ports added to the PCIe Expansion Bus.

The host ports can configure themselves to directly supply USB data and DisplayPort Alt Mode video to USB 3.x devices. This enables compatibility with peripherals that do not support Thunderbolt 3 or 4. Total data rate will be limited to the USB 3.2 rate of USB 20 Gbps.

Power Delivery

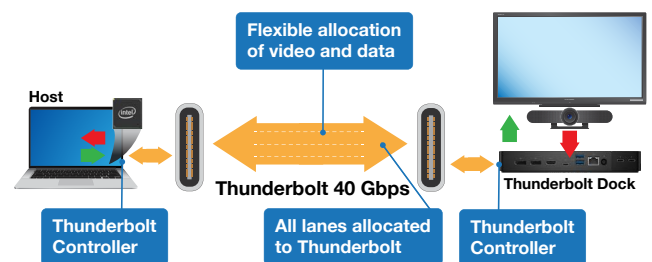
Thunderbolt 3 and 4 support the USB-PD specification, supplying up to 100 watts of power for operation and/or charging of either the host or sink device. A Thunderbolt 3 and 4 host can deliver 15 watts of power to a downstream peripheral. Power delivery up to 130 watts is possible among specific Thunderbolt 3 and 4 devices.

Lane Usage

USB 3.x specifies four lanes of high-speed data on the USB-C connector that can be used for DisplayPort Alt Mode video and USB data. The table below shows how the lanes can be allocated between data and video. The high-speed lanes are allocated in pairs.

USB 3.x Lane Allocation	
High-Speed Lanes Used for Video	Available High-speed Lanes for Data
0	4
2	2
4	0

A Thunderbolt controller takes the video and data and then multiplexes them dynamically across the four lanes. The dock or peripheral demultiplexes the content back to discrete video and data. No one lane is allocated purely to video or data, so video can take a much greater proportion of the available bandwidth. Combined with the 40 Gbps of bandwidth, it can drive more than a single display at 4K60 while still having sufficient data bandwidth available for other functions.



Thunderbolt 3/4 Lane Allocation

Design Considerations

Integrating USB with AV

When incorporating USB devices into your AV systems, there are a few things to bear in mind. While the efficiency of delivering video, audio, data, and power on a single USB-C port can streamline cabling, there are limits to how many devices can be in the USB signal path and how far USB data can travel before additional equipment is required. Cable compatibility is another factor.

Hubs

The topology of a USB system design is limited by the number of “hops” from device to device. USB bus topology consists of seven “tiers”, each starting with a USB hub. The first of the seven tiers is the host device and its root hub. The last tier is the final peripheral in the chain. That leaves a maximum of five additional hubs in your signal chain.

A product’s specification should clearly state its hub count, which helps with hub “budget” calculations. Keep in mind that a hub may consist of a device other than a traditional USB hub that splits one USB connection into multiple ports. A hub circuit can be included in an active USB cable to act as a repeater, enabling cable lengths beyond that of a passive cable. A USB extender, explained below, is another example.

Extenders

There are limits to how far a USB 3 signal can be sent over traditional cabling. Copper USB-C cables are generally six feet in length or less. For longer distances, active cables are typically required. Even with active cables, there are still limitations and inconveniences that can make extending USB signals a challenge.

USB extenders allow USB data to be sent point-to-point over twisted pair cabling, or over category or optical cabling via networks for even greater reach.

Extenders require that at least one or two hubs be used within the transmitter for emulation and “keep alive” functions. Receivers with multiple USB ports also contain a hub. Each of these hubs counts toward the five cascading hub limit.

Switchers

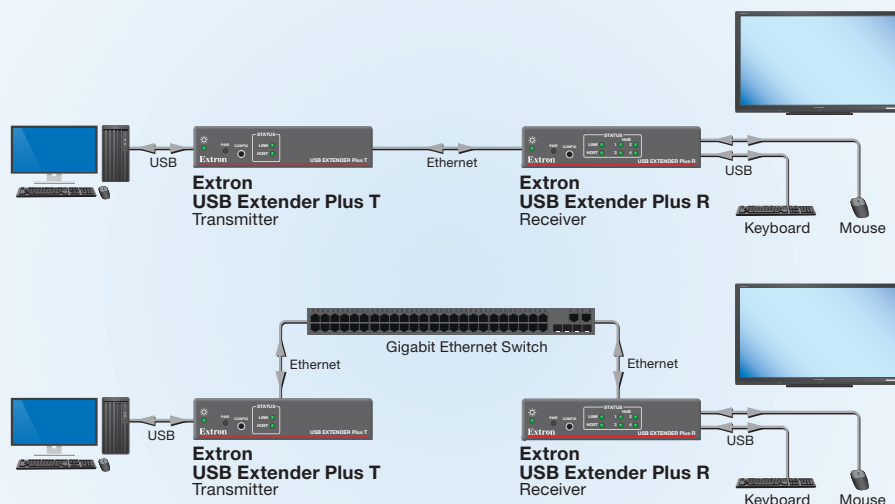
Sometimes, host controllers need to switch between USB buses. Keyboard/video/mouse (KVM) switches accommodate this requirement for low-speed keyboard and mouse devices. However, USB switchers can also be used to switch between higher speed devices. Many USB switchers include emulation functions on each of the USB ports to mimic a host for the peripheral. This is true even when no host is connected. After the initial connection between the switcher and peripheral, enumeration and USB driver loading are unnecessary. This capability also reduces the total switching time

Lane Usage

Understanding a device’s high-speed lane usage is crucial to ensure compatibility with the selected cable. For example, if a device is configured to transmit video using all four high-speed USB lanes, it must be used with a cable that can utilize all four high-speed lanes for video. USB active optical cables have set lane configurations that typically cannot be altered; selecting the proper configuration is critical. Lane management is explained in detail in the previous section entitled “Alternate Mode and Lane Usage”.

Lane usage on some USB 3.x devices can be altered, making the cable’s lane allocation a non-issue. Some cables can dynamically manage lane allocation to accommodate the lane architecture of the connected host as needed. An understanding of how a system’s devices and cables manage lane allocation can alleviate frustration during integration.

USB Extension



System Designs

USB System Design

The following system designs highlight applications where USB signal management is an integral part of the user experience. From USB extension in an esports center to rooms with Zoom and Microsoft Teams videoconferencing, to an enhanced UC space, these examples show how Extron technology integrates seamlessly with USB PCs, displays, cameras, soundbars, and other peripherals.



Esports Center
Pg. 10



Zoom Conference Room
Pg. 12



Teams Meeting Room
Pg. 14



Enhanced UC Space
Pg. 16

Esports Center with USB Extension



Requirements

In this Esports facility, coaches need to be able to monitor players throughout the entire room. The USB camera and microphone pair at each player station needs to be available at two coaching stations to enable monitoring and two-way communication. During competitions, the camera and audio feeds must be sent to a streaming workstation for distribution to remote viewers. These capabilities require a simple USB extension system that can send AV signals at least 150' to the farthest player stations.

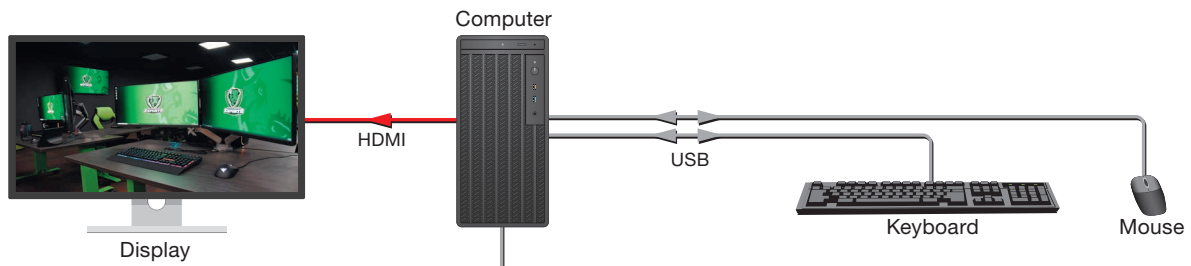
Extron Equipment List

SW4 USB Pro	Four Input USB 10G Switcher
UCS FTR 900 Kit	USB 5 Gbps Extender Kit
2LC OM4 MM P/50	LC to LC Laser-Optimized Multimode Fiber Optic Cable - Plenum 50 m (164')

Capabilities

- Seamless switching of source video on the coaching stations
- Instantaneous USB switching using peripheral emulation
- USB device support for data rates up to USB 5 Gbps
- USB extension to coaching stations at distances up to 50 m (164')
- USB-C connections supported at each coaching station

Viewing Stations

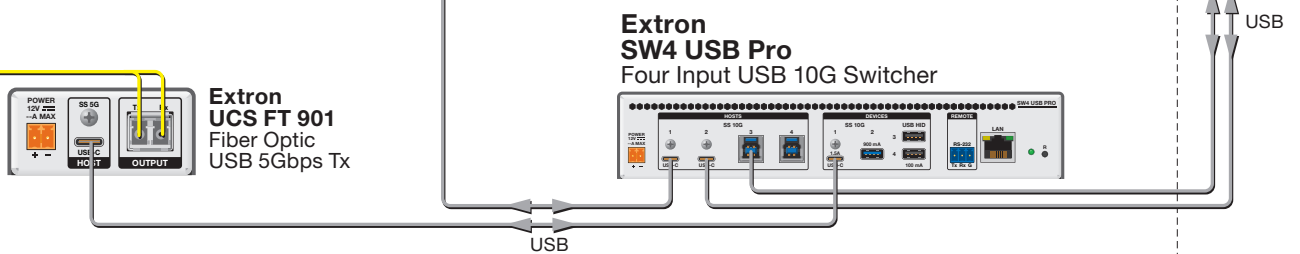


Instructor 1

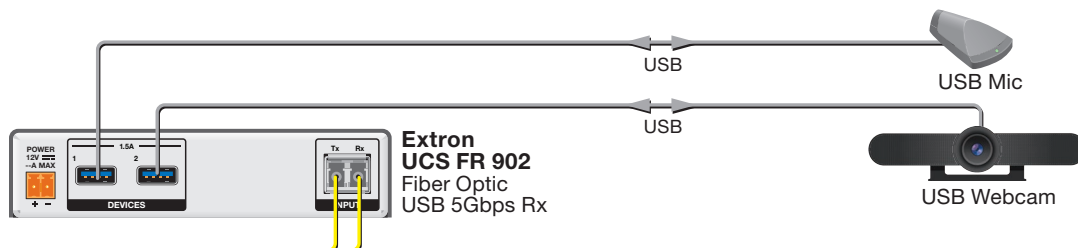
Instructor 2

Streaming Feed

Equipment Rack



Player Stations



Single-Input BYOM Zoom Conference Room



Requirements

A presenter needs to run a UC (Unified Communications) meeting from this room. A Zoom meeting can be run from the videobar using the Zoom Room's touchpanel to set up and control the system during the meeting. The camera, microphone, and speakers are housed within the videobar. To share content to everyone in the Zoom meeting and power the laptop, a USB-C connection should be available from an architectural enclosure mounted in the table.

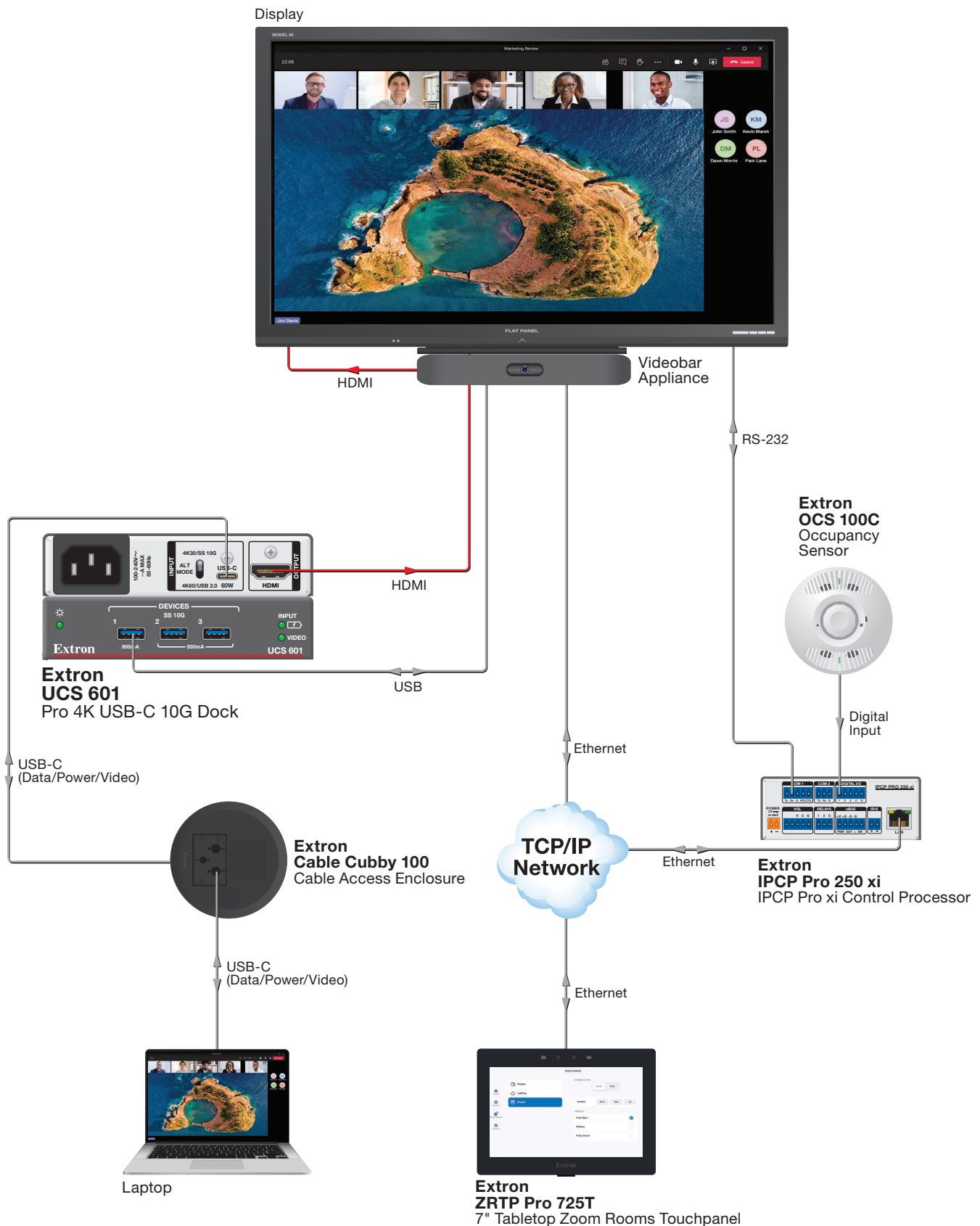
The presenter also needs to be able to run a UC meeting from their laptop and use the USB camera, microphone, and speakers in the videobar. UC meeting operation must be easy and intuitive, preferably using a touchpanel. The touchpanel must provide controls to select BYOM (Bring Your Own Meeting) Mode so the laptop can run the UC meeting instead of running the meeting from the computing device built into the videobar. The room should also have a system-connected occupancy sensor that automatically powers off the display and other equipment once the meeting is over and everyone has left the room.

Extron Equipment List

UCS 601	Pro 4K USB-C 10G Dock
ZRTP Pro 725T	7" Tabletop Zoom Rooms Touchpanel
IPCP Pro 250 xi	Control Processor
OCS 100 C	Ceiling Mount Occupancy Sensor
Cable Cubby 100	Cable Access Enclosure for AV Connectivity

Capabilities

- BYOM mode supports multiple UC services using a videobar camera and microphone
- Easy BYOM and HDMI input selection from touchpanel
- USB device support for data rates up to USB 10 Gbps
- Up to 60 watts of power to the USB-C laptop connection
- Automatic system shutdown using room occupancy sensor



Dual-Input BYOM Teams Meeting Room



Requirements

A presenter needs to run a UC meeting from this room. A Microsoft Teams® meeting can be run from the compute module using the videobar camera, microphone, and speakers. The MTR Touchscreen Console controls must facilitate meeting set up and operation. The camera, microphone, and speakers are housed within the videobar. To share content within the Teams meeting, a USB-C and a USB-A plus HDMI connection should be available from an architectural enclosure mounted in the table. The USB-C connection must also provide power to the laptop through a single connection.

The presenter also needs to be able to run a UC meeting from their laptop and use the USB camera, microphone, and speakers in the videobar. UC meeting operation from the MTR touchpanel must be easy and intuitive. The touchpanel must also provide controls to select BYOM mode, enabling the UC meeting to be run from the laptop rather than the compute module.

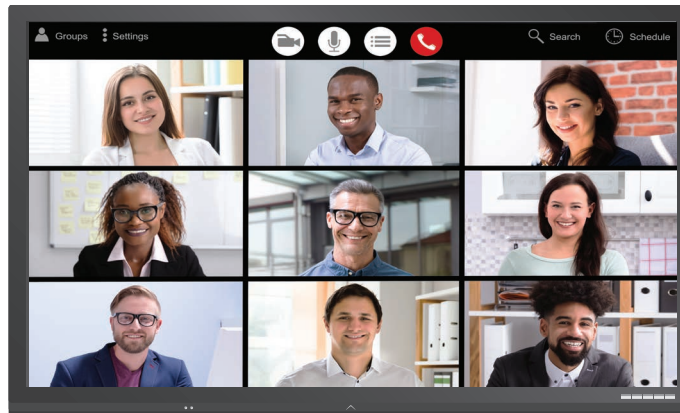
Extron Equipment List

UCS 303	3x1 4K/60 Collaboration and Presentation Switcher
IPCP Pro S1 xi	Control Processor
Cable Cubby 100	Cable Access Enclosure for AV Connectivity

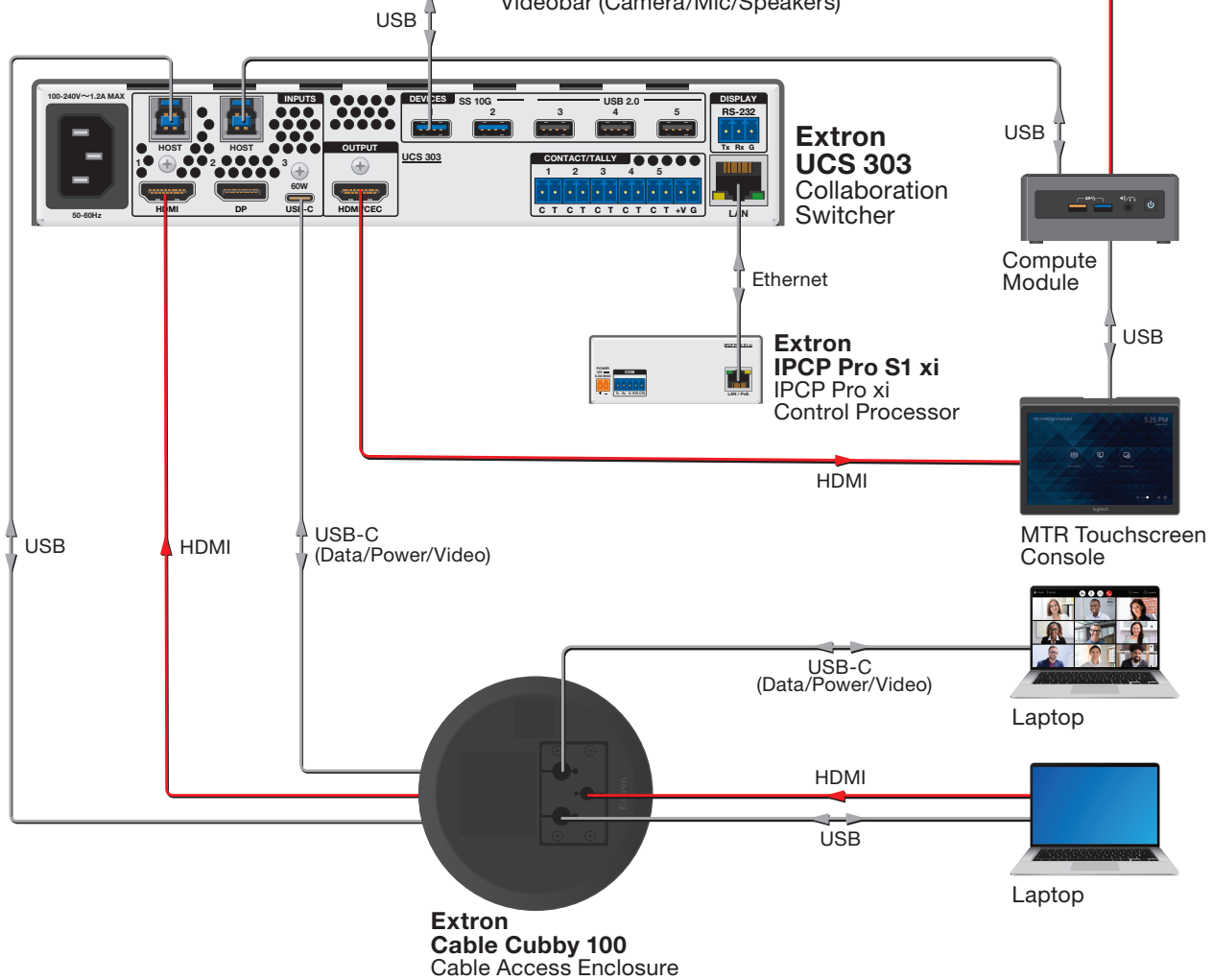
Capabilities

- BYOM mode supports many UC services using videobar camera and microphone
- Up to 60W of power to the USB-C laptop connection
- Quick switching of source video inputs to the Teams Room System
- Instant USB switching using peripheral emulation
- USB device support for rates up to USB 10Gbps
- Simple BYOM and HDMI Input selection from MTR Touchscreen Console

Display



Videobar (Camera/Mic/Speakers)



Enhanced UC Space



Requirements

A presenter needs to send content wirelessly and run a UC meeting. Connections to a wireless presentation system must allow users to share content without a traditional wired AV connection. A Microsoft Teams meeting can be run from the compute module using the PTZ camera, with audio pickup from a ceiling-mounted microphone and program audio through the speakers by the display. To share content within the Teams meeting, a USB-C connection for a laptop should be available from an architectural enclosure mounted at the table.

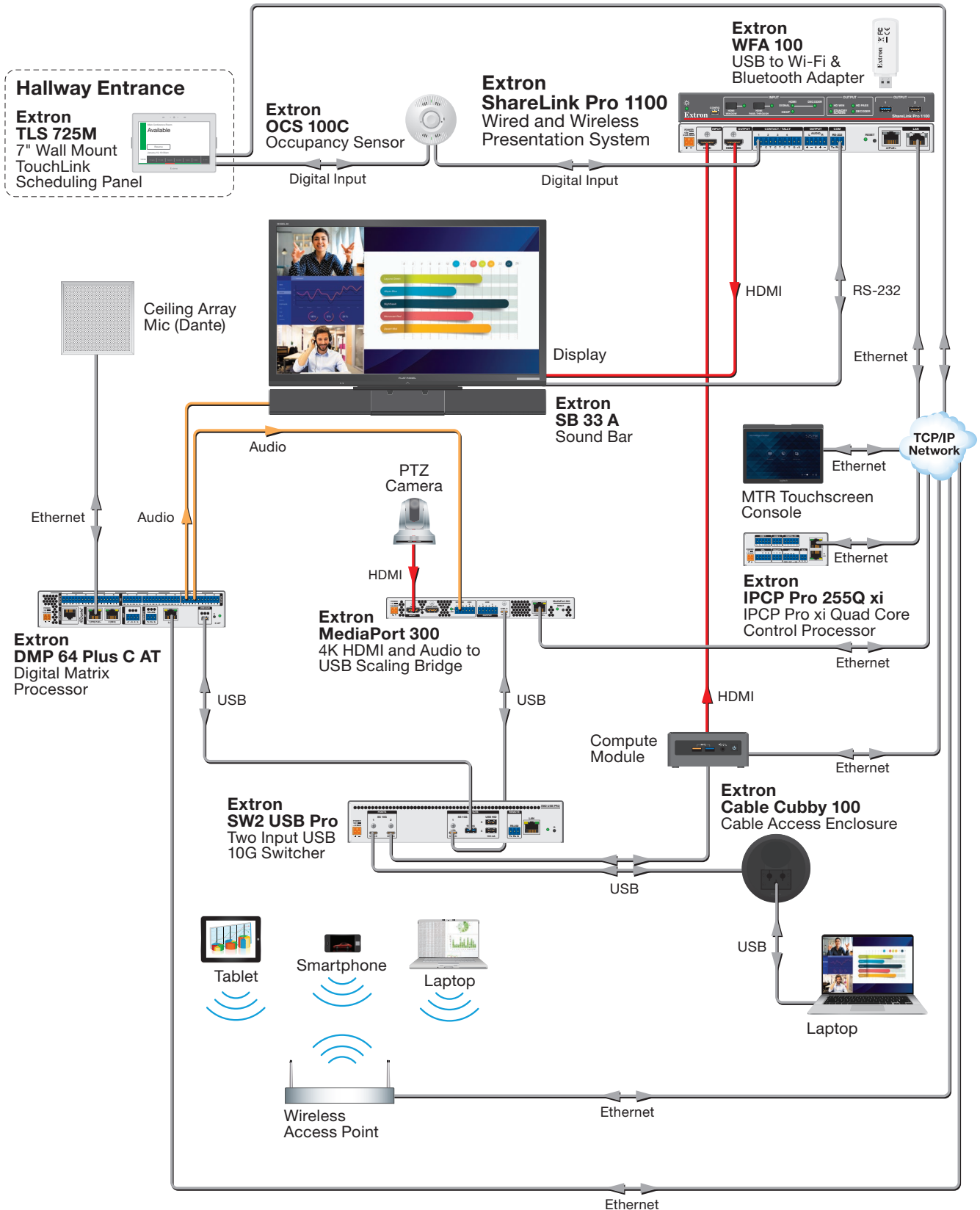
The presenter also needs to be able to run a UC meeting from the laptop and use the room's PTZ camera, ceiling microphone, and speakers. UC meeting operation using the MTR touchpanel must be easy and intuitive. The touchpanel must provide controls to select BYOM mode to allow the laptop to run the UC meeting instead of running the meeting from the compute module. A scheduling panel should be located outside of the room entrance. Also, an occupancy sensor connected to the system should automatically power off the display and other equipment once the meeting is over and everyone has left the room.

Extron Equipment List

SW2 USB Pro	Two Input USB 10G Switcher
MediaPort 300	4K HDMI and Audio to USB Scaling Bridge
DMP 64 Plus C AT	6x4 Digital Matrix Processor w/ AEC and Dante
SB 33A	Wired and Wireless Presentation System
ShareLink Pro 1100	Cable Access Enclosure for AV Connectivity
WFA 100	USB to Wi-Fi & Bluetooth Adapter
IPCP Pro 250 xi	Control Processor
TLS 725M	7" Wall Mount TouchLink Scheduling Panel
Cable Cubby 100	Cable Access Enclosure for AV Connectivity

Capabilities

- Wireless presentation allows users to share content without a wired AV connection
- BYOM mode supports many UC services using a room camera and microphone
- 4K HDMI Video to USB Scaling for high quality room video images available to remote users
- Audio DSP and microphone array for superior audio to remote users
- Easy BYOM and HDMI input selection from MTR Touchscreen Console
- Automatic system shut down using room occupancy sensor
- Scheduling panel located at room entrance to display room availability status



Notes

Extron USB Solutions

USB Integration

USB signal management has become one more element to account for when designing a system. You may need to extend USB signals between a host and peripheral, switch multiple peripherals to a single host, or integrate a USB-C laptop with USB peripherals and a display. Extron has an ever-growing selection of products to simplify the process of integrating USB video, audio, data, and charging into an AV system, which are presented on the following pages.

AV to USB Bridges



Pg. 20

USB Collaboration Switchers



Pg. 21

USB Interfaces



Pg. 22

USB Extenders



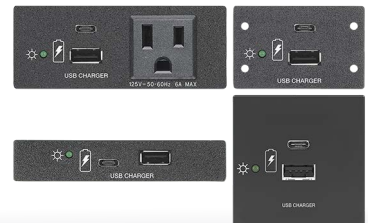
Pg. 23

USB Switchers



Pg. 24

Architectural Products



Pg. 25

USB-C Cables



Pg. 26

AV to USB Bridges



Bring Professional Quality AV to Remote Users

The Extron MediaPort 300 and MediaPort 200 make it easy to bring conferencing computers into pro AV system designs. The MediaPort 300 supports 4K resolutions, while the MediaPort 200 supports 1080p. These HDMI to USB bridges integrate software codec conferencing applications, supporting popular software communications platforms such as Microsoft Teams and Zoom. They bridge the gap between simple webcam-to-computer solutions and professional AV conferencing systems.

Features

- Seamlessly integrates pro AV systems and sources into software codec applications
- Integrated audio mixing, level, and mute control
- MediaPort 300 enhanced capabilities:
 - USB-C computer connection utilizes generic USB drivers for universal compatibility
 - Vector 4K video scaling provides USB output up to 4K/30 to match common software codec requirements
 - PoE+ delivers power and communications over a single Ethernet cable

Supported UC Platforms

The MediaPort 300 and MediaPort 200 can be used with popular software and cloud-based communications platforms including:



MediaPort 300

4K HDMI and Audio to USB Scaling Bridge 60-1873-01

MediaPort 200

HDMI and Audio to USB Scaling Bridge 60-1488-01

USB Collaboration Switchers



The Ultimate USB Switcher for Collaboration

The UCS 303 is a powerful collaboration and presentation switcher designed to meet the unique needs of unified communications meeting spaces. Three inputs support connection of USB-C, HDMI, and DisplayPort sources, while five USB device ports connect to peripherals such as USB cameras and microphones at data rates up to USB 10 Gbps. The USB-C input supports AV signals, USB data, and also provides 60 watts of power to charge a user's laptop computer. With the UCS 303, your meeting space can integrate your room's USB cameras and microphones with users' portable laptops into Teams®, Zoom™, or other UC meetings.

Features

- Switches up to three AV sources to a display and up to five USB devices between the AV sources
- Supports computer and video resolutions up to 4K/60 @ 4:4:4
- Provides USB device connections up to USB 10 Gbps
- Provides up to 60 watts of power to a USB-C source
- Auto-input switching
- Display control options including RS-232 and CEC over HDMI

Supported UC Platforms

The UCS 303 can be used with these popular software and cloud-based communications platforms and more.



UCS 303

3x1 4K/60 Collaboration and Presentation Switcher 60-1797-01



Video and Power USB-C HD 101

Video, Data, and Power UCS 601

Pro USB-C Video, Data, and Power Capabilities

Extron USB Interfaces are ideal in collaboration spaces wherever a full-featured Pro AV docking solution is needed.

The **UCS 601** is a powerful, Pro 4K USB-C dock designed to meet the unique needs of unified communications meeting spaces. It supports connection of a USB-C laptop, and the three USB device ports connect to peripherals such as USB cameras and microphones at data rates up to USB 10 Gbps. The USB-C input supports video/audio and USB data. The interface also provides 60 watts of power to charge a laptop. The **USB-C HD 101** is a 4K USB-C to HDMI interface that enables connection of a USB-C laptop, without the USB data capabilities of the UCS 601. The USB-C input supports AV signals and provides 60 watts of power to charge a user's laptop computer.

Features

- Connects USB-C sources that support DisplayPort Alt Mode to AV systems with HDMI inputs
- Single USB-C connection for video, audio, USB data (UCS 601), and power
- Provides USB device connections up to USB 10 Gbps (UCS 601)
- Provides up to 60 watts of power to the USB-C host
- Supports computer and video resolutions up to 4K/60
- HDCP 2.3 compliant
- Internal Extron Everlast® power supply
- Patented ZipClip 200 mounting kit included
- Rack-mountable, half rack width metal enclosure

UCS 601
Pro 4K USB-C 10G Dock 60-2042-01

USB-C HD 101
USB-C to HDMI interface 60-1883-01



Extend USB Peripherals over Network or CATx

Extron USB extenders are ideal in AV spaces whenever you need to extend USB beyond what USB cables can deliver. The transmitter and receiver connect peripherals like USB cameras, conference systems, mass storage devices, keyboards, and mice to a computer, laptop, or USB host.

The **UCS 900 Series** are fiber optic extenders that send USB signals over multimode fiber optic cable. They support data rates up to USB 5 Gbps. To streamline integration, the transmitter can be powered by the host device and the receiver features a two-port USB hub for connecting remote peripherals. The **USB Extender Plus Series** extends and switches USB 2 signals from peripheral devices to a host computer through an Ethernet network or point-to-point over one CATx cable. It supports USB data rates up to High Speed. For networked applications, the controller provides easy set up and control for creating a distributed USB matrix switching system.

Features

UCS 900 Series (USB 3)

- Extends USB peripherals up to 490 feet (150 meters)
- Supports USB data rates up to USB 5 Gbps
- All-in-one kit includes extender, 10-meter (32.8-foot) plenum-rated fiber optic cable, power supplies, & mounting bracket

USB Extender Plus Series (USB 2)

- Extends USB peripherals up to 1,980 feet (600 meters) over Ethernet and 330 feet (100 meters) over one CATx cable

- Supports devices with data rates up to High Speed (USB 2)
- Choice of rack-mountable and architectural form factors

UCS FTR 900 Kit (USB 3)

USB 5 Gbps Extender Kit 42-298-01

USB Extender Plus Series (USB 2)

USB Extender Plus Transmitter	60-1471-12
USB Extender Plus Receiver	60-1471-13
USB Extender Plus Decorator Transmitter	60-1473-13
USB Extender Plus Decorator Receiver	60-1473-23
USB Extender Plus AAP Receiver	60-1472-22
USB Plus Matrix Controller	42-267-01



Switch USB 10 Gbps Devices with Ease

The Extron SW USB Pro Series are two- and four-input USB switchers that facilitate USB 3 compatible switching between multiple host devices and multiple USB peripherals. They provide integrator-friendly solutions for USB-C and Thunderbolt hosts and peripherals with data rates up to USB 10 Gbps. HID peripheral ports support hotkey input switching via a connected keyboard. SW USB Pro switchers also support auto and manual host and peripheral switching and control via RS-232 or Ethernet. To provide "keep alive" functionality, they feature Host and Peripheral Emulation Modes that continuously mimic host and keyboard/mouse communications within the switcher. This emulation eliminates the need for enumeration and reduces the chance of failed device communications throughout the switching process.

Features

- Supports data rates up to USB 10 Gbps
- Four-port output hub provides USB-C and USB Type-A connections
- Offers Hot Key, Auto, and manual switching capability
- Supports selectable Host and Peripheral emulation
- Provides front-panel selection buttons and status indicators
- Enables Ethernet and RS-232 control
- Includes front-panel security lockout
- Rack-mountable, 1U half rack width metal enclosure

SW2 USB Pro

Two input USB 10G Switcher

60-1833-01

SW4 USB Pro

Four input USB 10G Switcher

60-1834-01



USB-C Architectural Solutions Make Power and Data Connectivity Easy and Accessible

Need to integrate USB-C connectivity and power into your meeting or collaboration space? Extron offers cable access enclosures with power, charging, and connectivity options that solve any USB-C design challenge. Cable Cubby Series enclosures accommodate a variety of USB power and charging requirements, and AAP and MAAP USB connectivity modules handle the rest. The Cable Cubby F55 Series provides USB power and charging, and Flex55 modules offer flexible connectivity. Both enclosure lines support our exclusive Retractor Series of retractable USB-C cable modules. Our online Cable Cubby Builder and AV Connectivity Module Selector tools make designing the perfect system a snap.

Features

- The Cable Cubby series of cable access enclosures accommodate AV connectivity and power modules that include the USB-C 100 Series, AAP SuperPlate Series, USB+AC 300 Series, USB PowerPlate 300 Series, and Retractor and Retractor XL Series cable retraction modules
- The Cable Cubby F55 Series of cable access enclosures accommodate connectivity and power modules that include the Flex55 SuperPlate Series, USB-C 100 Series, and USB PowerPlate 300 Series
- AC+USB 300 Series Power Modules for Cable Cubby enclosures provide access to AC, USB-C, and USB-A power and charging, with standard regional AC outlets

USB-C Connectivity and Power Solutions

USB-C 100 Series

USB-C AVPD 101 AAP (Black)	70-1241-02
USB-C AVPD 101 MAAP (Black/White)	70-1242-02/-03
USB-C AVPD 101 Flex55 (Black/White)	70-1243-02/-03

AAP SuperPlate Series

HDMI, USB 2 Type, A, USB-C, Network (Black)	70-1076-72
HDMI, USB 3 Type, A, USB-C, Network (Black)	70-1238-72

Flex55 SuperPlate Series

HDMI, USB 2, and USB-C (Black/White)	70-1143-72/-73
HDMI, USB 3, and USB-C (Black/White)	70-1239-72/-73

USB PowerPlate 300 Series

USB PowerPlate 311 AAP (Black)	60-1783-02
USB PowerPlate 311 AC AAP (Black)	60-1938-02
USB PowerPlate 311 MAAP (Black)	60-1785-02
Flex55 USB 311 PowerPlate (Black/White)	60-1786-02/-03



USBC 6' (1.8 m)

USBC Pro Series

Extron USB-C Cabling - The Essential Link Between Your USB Devices

Extron USB-C to USB-C cables provide reliable delivery of USB video, audio, data, and power - making them the essential link between USB hosts and peripherals in your system. They are available in copper or hybrid optical-copper variants in lengths from 6' to 30' (3.6 m to 9.1 m). Supporting features such as data rates up to USB 5 Gbps, 4K and 8K video, embedded audio signals, and power delivery up to 60 watts, you get the same high-performance and dependability that you have come to trust from all Extron products.

Features

- Supports data rates up to USB 5 Gbps
- USB power delivery up to 60 watts
- Enables up to 4K video and embedded audio signal transmission – USB/6 and USB Pro Series
- Facilitates up to 8K video and embedded audio signal transmission – USB Pro 8K Series
- No external power is needed
- Available in lengths up to 30' (9.1 m)

USB-C Cable Solutions

USBC	
USBC/6 USBC, 6' (1.8 m)	26-715-06
USBC Pro Series	
USBC Pro/12 12' (3.6 m)	26-741-12
USBC Pro/15 15' (4.5 m)	26-741-15
USBC Pro/25 25' (7.6m)	26-741-25
USBC Pro/30 30' (9.1 m)	26-741-30
USBC Pro 8K Series	
USBC Pro 8K/12 12' (3.6 m)	26-748-12
USBC Pro 8K/15 15' (4.5 m)	26-748-15
USBC Pro 8K/25 25' (7.6m)	26-748-25
USBC Pro 8K/30 30' (9.1 m)	26-748-30

Additional Resources

Design Guides

Extron Design and Product Guides are useful, in-depth technical and practical resources for system designers and integrators working with key AV technologies. These resources cover USB and AV integration in enterprise and collaborative spaces, esports facilities, and more.

Enterprise Technologies Guide:

<https://www.extron.com/enterprisetechologies>

Esports Systems Design Guide:

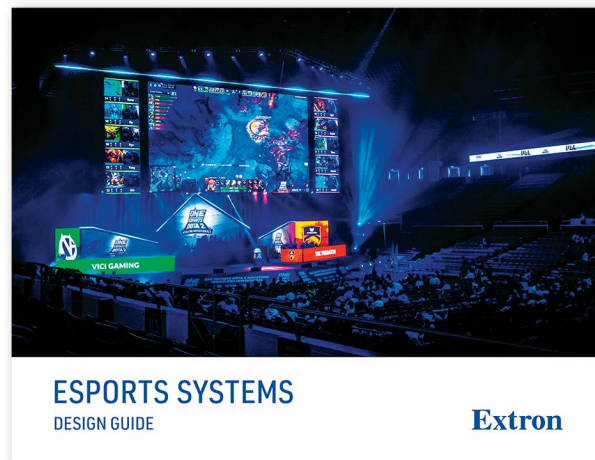
<https://www.extron.com/esports>

Learning Environments Guide:

www.extron.com/learningenvironments

More...

www.extron.com/designguides

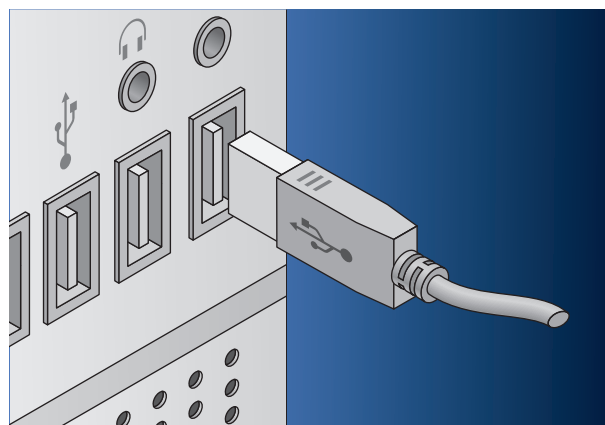


Extron White Papers

USB is increasingly being used in AV systems for much more than basic keyboard and mouse connections. It is used for connecting storage devices, extending and distributing audio and video signals, and even for transmitting power. The **Understanding USB in Professional AV Environments** white paper is an in-depth tool for AV professionals, explaining how USB works, including its advantages and limitations, in order to optimize its use in a Pro AV environment.

Extron White Paper:

www.extron.com/whitepapers



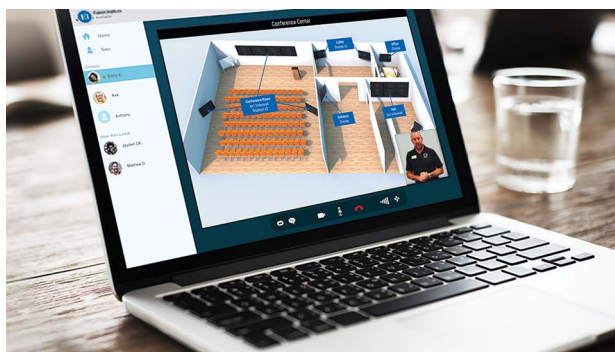
Online Training

Understand the legacy and the future of USB-C:

- Gain a firm knowledge of USB operation, standards, and principles
- Learn unique USB design considerations: distribution, extension, etc.
- Identify how Extron USB offerings integrate within Pro AV systems

Extron Technology Workshops:

www.extron.com/workshops



Notes

Extron

www.extron.com | Follow us on:  