

4K60 USB-C to USB-C Extender Kit with USB 3.2, 100W Charging and Touch Return, 40m

One USB-C Cable at the Lectern, One at the Interactive Display: DP Alt Mode Video, USB 3.2 Gen 1 Data and 100W Power Delivery over CAT6a



Extends a laptop's USB-C port to a USB-C interactive display or monitor up to 40m/130ft away - 4K60 video, USB 3.2 data and touch return on one CAT6a cable, with 100W charging at the desk. The EXT-USBC2C4K-40M transmitter accepts a full-featured USB-C input (DisplayPort Alt Mode 1.4a, USB 3.2 Gen 1 data, Power Delivery 3.0) and the receiver delivers a full-featured USB-C output - DP Alt Mode 1.4a video plus USB 3.2 Gen 1 data on the same connector - so a SMART, Promethean, ViewSonic, BenQ, Dell or LG interactive panel plugs in with a single USB-C cable and its touch, camera and hub come back to the presenter's laptop. Three more USB 3.2 downstream ports, de-embedded analog audio and RS-232 pass-through sit at the display end.

Bi-directional 24V PoC powers either end from a single supply, USB 3.2 Gen 1 runs at up to 2.5 Gbps for 4K cameras and touch, and 25 EDID presets plus an ASCII API over the SERVICE port give integrators control of HDCP, EDID and USB port power. Resolutions up to 4096x2160@60, 5120x1440@60 and 5120x2160 (50Hz 4:4:4 / 60Hz 4:2:0) pass over the USB-C link with HDR10+, Dolby Vision and HLG. Requires CAT6a U/FTP 23AWG minimum; 100W laptop charging is available when the transmitter is powered from its own 24V/7.5A supply. For HDMI displays and projectors use EXT-USBCPD4K-40M.

Surge Protection Recommended

— This product contains sensitive electrical components that may be damaged by electrical spikes, surges, electric shock, or lightning strikes. Use of surge protection systems is highly recommended.

TABLE OF CONTENTS

1. Features	2
2. Package Contents	2
3. Specifications	2
4. Panel descriptions	3
Transmitter panel	3
Receiver panel	4
5. Certifications	5
6. Introduction	5
7. Network cable wiring (direct connection)	5
8. API commands	5
Transmitter commands	6
Receiver commands	8
9. Application Example	10
10. Troubleshooting	10
11. Installation FAQ	11
12. Integration FAQ	11

1. Features

- ✓ Extends a full-featured USB-C source (DP Alt Mode 1.4a video, USB 3.2 Gen 1 data, PD 3.0 charging) up to 40m/130ft at 4K and 35m/115ft at 5K over one CAT6a cable
- ✓ Receiver provides a full-featured USB-C output: DP Alt Mode 1.4a video and USB 3.2 Gen 1 data on one connector - interactive displays connect with a single USB-C cable and touch returns to the laptop
- ✓ Up to 4K60 4:4:4 (18Gbps) with HDCP 2.3; also 5120x1440@60 and 5120x2160 (50Hz 4:4:4 / 60Hz 4:2:0)
- ✓ Up to 100W USB-C Power Delivery back to the laptop over the same USB-C cable (transmitter powered from the included 24V/7.5A supply)
- ✓ Three additional USB 3.2 Gen 1 downstream ports at the receiver (2x USB-A, 1x USB-C, 5V/1.5A each) for cameras, speakerphones and storage; up to 2.5 Gbps
- ✓ Bi-directional 24V PoC: power the transmitter or the receiver and the far end needs no supply
- ✓ Analog audio de-embedding (3.5mm, LPCM 2CH) at both ends plus RS-232 pass-through on 3-pin phoenix connectors
- ✓ HDR, HDR10+, Dolby Vision and HLG pass-through; 8/10/12-bit color; RGB and YCbCr 4:4:4 / 4:2:2 / 4:2:0
- ✓ ASCII API over the USB-C SERVICE port (115200 8N1): HDCP mode, 25 EDID presets including two user-defined, USB port power, status and firmware update; metal enclosures, ESD IEC 61000-4-2

2. Package Contents

- ✓ 1× Transmitter (USB-C IN)
- ✓ 1× Receiver (USB-C OUT)
- ✓ 1× 24V/7.5A power adapter
- ✓ 2× 3-pin 3.5mm phoenix connector
- ✓ 4× Mounting ear
- ✓ 8× Machine screw
- ✓ 1× User manual

3. Specifications

TECHNICAL	
USB-C Input (TX)	Full-featured USB-C: DisplayPort Alt Mode 1.4a video, USB 3.2 Gen 1 and USB 2.0 data, USB-C Power Delivery 3.0
USB-C Output (RX)	Full-featured USB-C: DisplayPort Alt Mode 1.4a video and USB 3.2 Gen 1 data on one connector (touch / hub return to the source)
USB Protocol	USB 3.2 Gen 1 and USB 2.0; transfer rate up to 2.5 Gbps (5 Gbps operation not supported)
USB-C Charging	Up to 100W PD to the source (transmitter must be powered from its 24V/7.5A supply)
Video / HDCP	DisplayPort 1.4a Alt Mode; HDCP 2.3 and HDCP 1.x; 18Gbps
Video Resolution	480i to 4096x2160@60; 2560x1080@60, 3440x1440@60, 5120x1440@50/60, 5120x2160@50/60 (5K60 at 4:2:2/4:2:0, 8-bit)
HDR	HDR, HDR10, HDR10+, Dolby Vision, HLG pass-through
Color Depth / Space	8/10/12-bit (8-bit at 5K60 4:2:2); RGB, YCbCr 4:4:4, 4:2:2, 4:2:0
Audio Format	LPCM, Dolby Digital/Plus/EX, Dolby TrueHD, Dolby Atmos, DTS, DTS-EX, DTS-96/24, DTS High Res, DTS-HD Master Audio; analog de-embed LPCM 2CH 32-192kHz
Analog Audio	2.2dBu (1Vrms) max; 20Hz-20kHz +/-0.5dB; dynamic range and S/N >90dB; THD+N <0.006%



continued

Transmission Distance	Up to 40m/130ft at 4K, 35m/115ft at 5K over CAT6a U/FTP 23AWG minimum, direct-wired; USB-C cables 1.5m/4.9ft (USB 3.2 Gen 1 passive) or 2m/6.6ft (USB 2.0 passive)
ESD Protection	IEC 61000-4-2: +/-8kV air-gap, +/-4kV contact
Control	RS-232 pass-through (3-pin phoenix, both ends); ASCII API via USB-C SERVICE port, 115200 baud 8N1; HDCP, 25 EDID presets (2 user-defined), USB port power, status, reboot, reset, firmware update

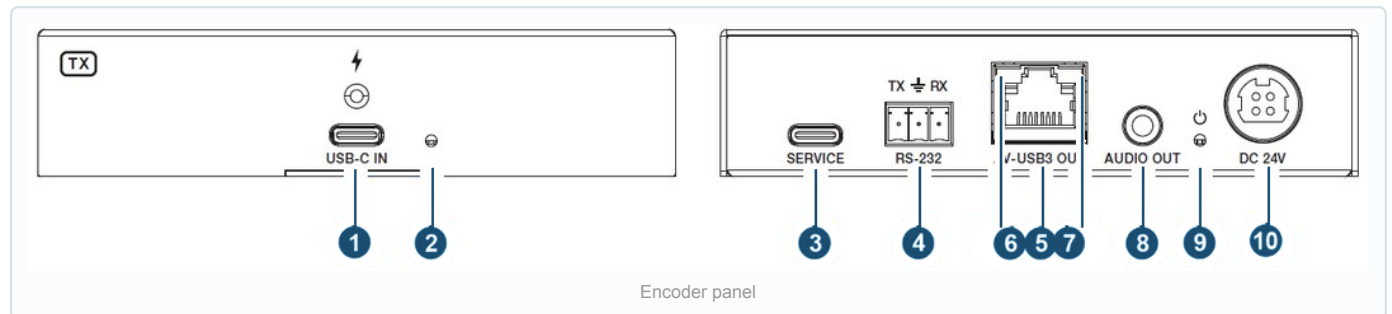
CONNECTIONS

Transmitter	Input: 1x USB-C IN (24-pin female). Output: 1x AUDIO OUT (3.5mm), 1x AV-USB3 OUT (RJ45, 24V PoC). Control: 1x RS-232 (3-pin 3.5mm phoenix), 1x SERVICE (USB-C)
Receiver	Input: 1x AV-USB3 IN (RJ45, 24V PoC). Output: 1x USB-C OUT (DP Alt Mode + USB 3.2 data), 2x USB-A downstream, 1x USB-C downstream (5V/1.5A each), 1x AUDIO OUT (3.5mm). Control: 1x RS-232 (3-pin 3.5mm phoenix), 1x SERVICE (USB-C)

MECHANICAL

Housing / Color	Metal enclosure, black
Dimensions	Transmitter and Receiver each: 4.65" x 4.37" x 1.00" (118 x 111 x 25.5mm)
Weight	Transmitter 0.79 lbs (359g); Receiver 0.80 lbs (365g)
Power Supply	Input AC 100-240V 50/60Hz; output DC 24V/7.5A (included; CE/FCC/UL). Far end powered by PoC
Power Consumption	Transmitter 4.36W max without charging, 106W max with 100W USB-C charging; Receiver 33W max
Operating Temperature	32°F to 104°F (0°C to 40°C); storage -4°F to 140°F (-20°C to 60°C)
Humidity	Operating 20-80% RH; storage 10-90% RH, non-condensing
Certifications	CE, FCC, UL (power supply)

4. Panel descriptions



TRANSMITTER PANEL

No.	Name	Description
1	USB-C IN	Full-featured USB-C port. Connect it to a laptop. It supports DP Alt mode, USB 3.2 Gen 1 data, and PD 100 W charging.
2	USB-C IN LED	Lights red when the USB-C IN port is charging. Lights green when the port is connected to an active source that is not being charged.
3	SERVICE	USB 2.0 port used for firmware upgrade and API control.



continued

No.	Name	Description
4	RS-232	3-pin phoenix connector. Connect it to a computer for RS-232 signal pass-through.
5	AV-USB3 OUT	Connect this to the AV-USB3 IN port on the receiver with a CAT6a cable. It carries the A/V and USB signals and supplies 24V PoC power.
6	LINK LED	On when the transmitter and receiver are connected and linked; off when they are not connected.
7	VIDEO LED	On for video transmission with HDCP encryption; blinking for video transmission without HDCP encryption; off when there is no video signal.
8	AUDIO OUT	Audio de-embedding output. Connect it to an audio device.
9	Power LED	Lights red when the transmitter is powered on.
10	DC 24V	DC 24V/7.5A power input port.

RECEIVER PANEL

No.	Name	Description
1	USB-C OUT	USB-C output port. Connect it to a display device such as a monitor using a USB cable.
2	USB-C OUT LED	Lights green when the USB-C OUT port is connected to a display device.
3	USB DEVICES 1/2	Downstream USB-A ports, output power up to 5V/1.5A. Connect USB devices such as a flash drive or hard disk.
4	USB DEVICES 3	Downstream USB-C port, output power up to 5V/1.5A. Connect a USB device such as a flash drive or hard disk.
5	USB LED	USB signal indicator. On when a USB 3.2 signal is detected; blinking when a USB 2.0 signal is detected; off when there is no USB signal.
6	SERVICE	USB 2.0 port used for firmware upgrade and API control.
7	RS-232	3-pin phoenix connector. Connect it to a control system for RS-232 signal pass-through.
8	AV-USB3 IN	Connect this to the AV-USB3 OUT port on the transmitter with a CAT6a cable. It carries the A/V and USB signals and supplies 24V PoC power.



continued

No.	Name	Description
9	LINK LED	On when the transmitter and receiver are connected and linked; off when they are not connected.
10	VIDEO LED	On for video transmission with HDCP encryption; blinking for video transmission without HDCP encryption; off when there is no video signal.
11	AUDIO OUT	Audio de-embedding output. Connect it to an audio device.
12	Power LED	Lights red when the receiver is powered on.
13	DC 24V	DC 24V/7.5A power input port.

5. Certifications

The manual states the following in the Power Supply specification line: **CE, FCC, UL** (power supply is built to US/EU standards and is CE/FCC/UL certified). The unit is also ESD-tested to **IEC 61000-4-2** (±8 kV air-gap, ±4 kV contact). No RoHS mark appears in the manual.

6. Introduction

This is an extender kit that carries a full USB-C signal — video plus USB 3.2 data — up to 40 m/130 ft over a single CAT6a cable. The **transmitter (TX)** has one full USB-C input supporting DisplayPort Alt mode (v1.4a) A/V, USB 3.2 Gen 1 data, and PD 100 W charging to a laptop. It supports audio de-embedding, RS-232 signal pass-through, and the bi-directional 24V PoC function. The **receiver (RX)** has one full USB-C output with DisplayPort Alt mode (v1.4a) A/V and USB 3.2 Gen 1 data, plus three USB 3.2 downstream ports. It also supports audio de-embedding, RS-232 pass-through, and bi-directional 24V PoC. The kit is intended as a convenient single-cable solution for full USB-C extension in commercial A/V applications.

7. Network cable wiring (direct connection)

Caution — the CAT cable between the transmitter and receiver must be a direct (straight-through) connection. Do not cross-connect the two ends. Terminate both ends to the same pin/color order:

PAIR COLOR
White and Orange
Orange
White and Green
Blue
White and Blue
Green
White and Brown
Brown

A surge protection device is recommended: the unit contains sensitive electronics that electrical spikes, surges, shock or lightning can damage, and surge protection helps protect and extend the equipment's life.

8. API commands

The product accepts API command control. Connect the **SERVICE** port on the unit to a PC and open a serial-command tool to send commands.

Communication protocol — SERVICE (USB-C port presenting as a virtual RS-232 port, connect to a laptop): baud rate 115200 (fixed), data bit 8, stop bit 1, parity none.

TRANSMITTER COMMANDS

COMMAND	FUNCTION	EXAMPLE	FEEDBACK	DEFAULT
?	Get the list of all commands	?		
help	Get the list of all commands	help		
get version	Get all firmware versions	get version	TX BOOT: V1.01.01 / TX FW: V1.00.01 /RX FW: V1.00.01 /SUB MCU1: V1.00.00.01 / SUB MCU2: V1.00.17	
reboot	Reboot the device	reboot	Reboot... System Initializing... Initialization Finished! TX FW v1.0.0 RX FW v1.0.0	
reset	Reset to factory defaults	reset	Sure to RESET to default settings? Type "Yes" after next prompt to confirm...	
status	Get system status	status	See the status block below	
set tx input x hdcp y	Set TX input x (x=0–1) HDCP to y (y=0–2). x=0 all inputs, x=1 input 1; y=0 HDCP off, y=1 HDCP 1.4, y=2 HDCP 2.3	set tx input 0 hdcp 2 / set tx input 1 hdcp 0	TX all input HDCP 2.3 / TX input 1 HDCP off	HDCP 2.3
get tx input x hdcp	Get TX input x (x=0–1) HDCP status	get tx input 1 hdcp	TX input 1 HDCP 2.3	
get tx input x connected	Get TX input x (x=0–1) cable connected status. x=0 all inputs, x=1 input 1	get tx input 1 connected	TX input 1 connected / TX input 1 disconnected	
get tx input x signal	Get TX input x (x=0–1) signal status	get tx input 1 signal	TX input 1 3840x2160p 60Hz YUV 4:4:4 8bit / TX input 1 no signal	
set tx input x edid y	Set TX input (x=0–1) EDID to y (01–23). x=0 all inputs, x=1 input 1. See EDID table below	set tx input 1 edid 1	TX input 1 EDID 01:auto EDID (default)	1
get tx input x edid	Get TX input x (x=0–1) EDID	get tx input 1 edid	TX input 1 EDID 01: Auto EDID (default)	



continued

COMMAND	FUNCTION	EXAMPLE	FEEDBACK	DEFAULT
<code>get tx input x edid data</code>	Get TX input x (x=0–1) EDID data	<code>get tx input 1 edid data</code>	TX input 1 EDID <00 FF FF FF...>	
<code>set user edid x <y></code>	Set user-defined EDID x (x=0–2) to y. x=0 both User Defined 1 & 2, x=1 User Defined 1, x=2 User Defined 2. y = 256 bytes of EDID data	<code>set user edid 1 <00 FF FF FF...></code>	User Defined 1 EDID is loaded	
<code>get user edid x</code>	Get user-defined EDID x (x=0–2) data. x=0 both, x=1 User Defined 1, x=2 User Defined 2	<code>get user edid 1</code>	<00 FF FF FF...>	
<code>get tx usb connected</code>	Get TX USB cable connected status	<code>get tx usb connected</code>	TX USB connected / TX USB disconnected	1
<code>set hdbt update</code>	Set the SERVICE port to HDBT UART for firmware update	<code>set hdbt update</code>	HDBT update...	

EDID options for `set tx input x edid y`:

Y	EDID
01	Copy EDID from RX output (default)
02	1080p60, 2CH PCM
03	1080p60, 5.1CH DTS/DOLBY
04	1080p60, 7.1CH DTS/DOLBY/HD
05	4K60, 2CH PCM
06	4K60, 5.1CH DTS/DOLBY
07	4K60, 7.1CH DTS/DOLBY/HD
08	5K60, 2CH PCM
09	5K60, 5.1CH DTS/DOLBY
10	5K60, 7.1CH DTS/DOLBY/HD
11	4K30, 2CH PCM
12	4K30, 5.1CH DTS/DOLBY
13	4K30, 7.1CH DTS/DOLBY/HD
14	720p60, 2CH PCM
15	1920×1200p60, 2CH PCM
16	1680×1050p60, 2CH PCM
17	1600×1200p60, 2CH PCM
18	1440×900p60, 2CH PCM
19	1360×768p60, 2CH PCM
20	1280×1024p60, 2CH PCM



continued

Y	EDID
21	1024×768p60, 2CH PCM
22	User Defined 1
23	User Defined 2

Transmitter status feedback:

```

`` ===== Status Info 5K USB-C
and USB 3.2 Extender over CAT TX FW v1.0.0 TX Cable Signal HDCP EDID Input Connected 3840x2160p60Hz
YUV 4:4:4 8bit HDCP 2.3 01_Auto EDID (default) TX_USB Cable TX_01 Connected
===== ``

```

RECEIVER COMMANDS

COMMAND	FUNCTION	EXAMPLE	FEEDBACK	DEFAULT
?	Get the list of all commands	?		
help	Get the list of all commands	help		
get version	Get all firmware versions	get version	RX BOOT: V1.01.01 / RX FW: V1.00.01 / TX FW:V1.00.01 / SUB1 MCU: V1.00.00.01 / SUB2 MCU: V1.00.01	
reboot	Reboot the device	reboot	Reboot... System Initializing... Initialization Finished! TX FW v1.0.0 RX FW v1.0.0	
reset	Reset to factory defaults	reset	Sure to RESET to default settings? Type "Yes" after next prompt to confirm...	
status	Get system status	status	See the status block below	
set rx output x source y	Set RX output x (0–1) source to y (0–2). x=0 all outputs, x=1 output 1; y=0 off, y=1 TX input, y=2 AVMUTE	set rx output 1 source 1 / set rx output 1 source 0	RX output 1 source 1 from tx input 1 / RX output 1 source off	
get rx output x source	Get RX output x (x=0–1) source	get rx output 1 source	RX output 1 source from tx input 1	



continued

COMMAND	FUNCTION	EXAMPLE	FEEDBACK	DEFAULT
<code>set rx output x hdcp y</code>	Set RX output x (0–1) HDCP mode (y=0–4). x=0 all outputs, x=1 output 1; y=0 signal management, y=1 follow sink (default), y=2 follow source, y=3 force HDCP 1.4, y=4 force HDCP 2.3	set rx output 1 hdcp 1	RX output 1 HDCP follow sink	1
<code>get rx output x hdcp</code>	Get RX output x (x=0–1) HDCP mode. x=0 all outputs, x=1 output 1	get rx output 1 hdcp	RX output 1 HDCP follow sink (default)	
<code>get rx output x connected</code>	Get RX output x (x=0–1) cable connected status. x=0 all outputs, x=1 output 1	get rx output 1 connected	RX output 1 connected / RX output 1 disconnected	
<code>get rx output x signal</code>	Get RX output x (x=0–1) signal status. x=0 all outputs, x=1 output 1	get rx output 1 signal	RX output 3840x2160p60Hz YUV 4:4:4 8bit / RX output no signal	
<code>set rx usbd x power y</code>	Set RX USB device ports (x=0–3) power (y=0–2). x=0 all USB device ports, x=1–3 USB device 1–3; y=0 follow USB host power, y=1 force power on, y=2 force power off	set rx usbd 0 power 1	RX all USB device ports power follow USB host power	0
<code>get rx usbd x power</code>	Get RX USB device ports x (x=0–3) power status. x=0 all, x=1–3 device 1–3	get rx usbd 0 power	RX all USB device ports power follow USB host power	
<code>set hdbt update</code>	Set the SERVICE port to HDBT UART for firmware update	set hdbt update	HDBT update...	

Receiver status feedback:

```

`` ===== Status Info 5K USB-C
and USB 3.2 Extender over CAT RX FW v1.0.0 RX Cable Signal HDCP Source Output Connected
3840x2160p60Hz YUV 4:4:4 8bit Follow sink (default) TX_Input RX_USB USB_Power RX_01 Follow_host
RX_02 Follow_host RX_03 Follow_host
===== ``

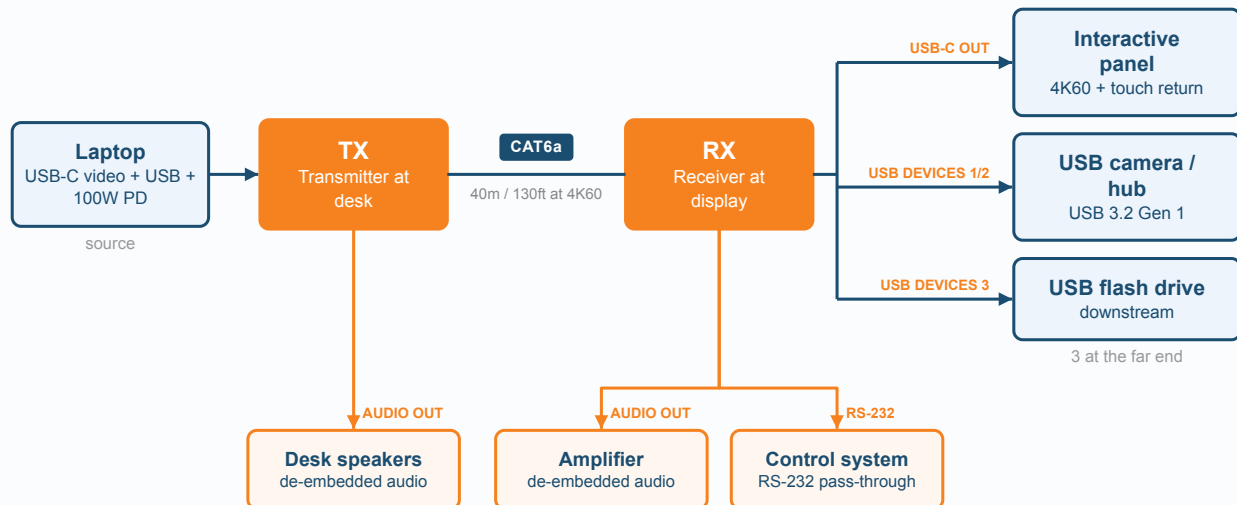
```



9. Application Example

TYPICAL SETUP

4K60 USB-C to USB-C Extender Kit with USB 3.2, 100W Charging and Touch Return, 40m



How it works: Bi-directional 24V PoC powers either end from a single supply, USB 3.2 Gen 1 runs at up to 2.5 Gbps for 4K cameras and touch, and 25 EDID presets plus an ASCII API over the SERVICE port give integrators control of HDCP, EDID and USB port power. Resolutions up to 4096x2160@60, 5120x1440@60 and 5120x2160 (50Hz 4:4:4 / 60Hz 4:2:0) pass over the USB-C link with HDR10+, Dolby Vision and HLG. Requires CAT6a U/FTP 23AWG minimum; 100W laptop charging is available when the transmitter is powered from its own 24V/7.5A supply. For HDMI displays and projectors use EXT-USBCPD4K-40M.

10. Troubleshooting

Q: There is no image on the display connected to the EXT-USBC2C4K-40M. What should I check?

A: Check the transmitter VIDEO LED: solid means video with HDCP, blinking means video without HDCP, off means no signal. Then confirm the LINK LED is on at both ends, the USB-C IN LED is green for an active source, and the receiver's USB-C OUT LED is green for a connected display.

Q: The LINK LED on the EXT-USBC2C4K-40M is off. What does that indicate?

A: The transmitter and receiver are not linked. Confirm a single CAT6a cable (U/FTP 23AWG minimum) runs from the transmitter AV-USB3 OUT to the receiver AV-USB3 IN, that it is straight-through and not cross-connected, and that the run is within 40m for 4K or 35m for 5K.

Q: USB devices on the EXT-USBC2C4K-40M receiver are not detected. What should I check?

A: Check the receiver USB LED: on for a USB 3.2 signal, blinking for USB 2.0, off for no USB signal. Confirm the downstream port power state with get rx usbd 0 power, and verify the USB-C source is connected at the transmitter.

Q: The laptop is not charging through the EXT-USBC2C4K-40M. What should I confirm?

A: The USB-C IN LED lights red when the port is charging; if it is not, confirm the transmitter is powered from its own 24V/7.5A supply, since USB-C charging is supported only when the transmitter has its own power supply.



Need help? — For additional support, contact KanexPro technical support at support@kanexpro.com or 888.975.1368, or scan the QR code below for the product page.

11. Installation FAQ

Q: Does each end of the EXT-USBC2C4K-40M need its own power supply?

A: No. The kit ships with one 24V/7.5A adapter; plug it into either the transmitter or receiver and bi-directional 24V PoC powers the far end over the same CAT6a cable. USB-C charging to the laptop, however, works only when the transmitter has its own supply.

Q: How must the CAT cable between the two boxes on the EXT-USBC2C4K-40M be wired?

A: It must be a direct, straight-through run, terminated to the same pin and color order at both ends; do not cross-connect the two ends. A surge protection device is recommended to protect the electronics from spikes and surges.

Q: What plugs into the receiver of the EXT-USBC2C4K-40M?

A: The USB-C OUT connects to a display or monitor, and the receiver adds two downstream USB-A ports and one downstream USB-C port (5V/1.5A each) for devices such as flash drives or hard disks, plus a 3.5mm AUDIO OUT for de-embedded audio.

Q: How long can the USB-C cables at each end of the EXT-USBC2C4K-40M be?

A: Use a passive USB-C cable up to 1.5m/4.9ft for USB 3.2 Gen 1, or up to 2m/6.6ft for USB 2.0.

12. Integration FAQ

Q: How do you control the EXT-USBC2C4K-40M from an AV system?

A: It offers RS-232 pass-through on a 3-pin phoenix connector at both ends, plus an ASCII API over the SERVICE USB-C port at 115200 baud, 8N1.

Q: Can HDCP mode be set by command on the EXT-USBC2C4K-40M?

A: Yes. At the transmitter, for example, send set tx input 0 hdcp 2 for HDCP 2.3, and at the receiver set rx output 1 hdcp selects follow sink, follow source, or force HDCP 1.4/2.3.

Q: Can EDID be managed remotely on the EXT-USBC2C4K-40M?

A: Yes. It carries 25 EDID presets, two of them user-defined, selectable with a command such as set tx input 1 edid 5 for a 4K60 2CH PCM profile.

Q: Can the downstream USB port power on the EXT-USBC2C4K-40M be controlled?

A: Yes. Send set rx usbd x power y to set the receiver's USB device ports to follow USB host power, force power on, or force power off.

