5Gbps Dual-Host USB-C Extender over CAT6a (100m/328ft) with Dual 4K HDMI Out

TX/RX Kit with 100W USB-C PD Charging, Balanced/Unbalanced Audio Output, RS-232 & FSYNC GPIO



Extend two USB-C host laptops to a remote location up to 100 meters away — with dual 4K displays, USB peripherals, analog audio, and control — over a single CAT6a cable. The KanexPro EXT-USBCPD2X4K-100M is a 5Gbps USB 3.2 Gen 1 extender kit that carries USB, two HDMI displays, analog audio and control to the far end. Two selectable USB-C host ports on the transmitter support auto/manual switching for seamless presenter handoff, while USB-C PD charging up to 100W powers laptops directly from the TX.

At the receiver, dual HDMI 2.0b outputs deliver mirrored or extended displays at up to 4K@60Hz. Balanced and unbalanced analog audio is de-embedded via a 5-pin phoenix connector for integration with existing speaker systems. Three downstream USB device ports on each unit support webcams, PTZ cameras, keyboards, mice, and touch panels. RS-232 pass-through enables third-party control system integration, while FSYNC GPIO provides industrial camera synchronization. Bi-directional 24V PoC allows flexible power deployment at either end of the cable run.

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. Introduction 3
5. Panel descriptions 4
Transmitter (TX): front and rear 4
Receiver (RX): front and rear 5
6. Default Settings & API Communication 6
Status output (get status) 6
RS-232 / API communication 7
7. API Commands 7
RS-232 pin assignment 8
Audio output pin assignment 8
8. Troubleshooting 8
9. Connection Diagram 9
10. Troubleshooting 9
11. Installation FAQ 10
12. Integration FAQ 10

1. Features

- ✓ Extends USB 3.2 signals at 5Gbps up to 100m/328ft over a single CAT6a cable via HDBaseT
- ✓ Dual USB-C host inputs on TX with auto/manual switching — supports two-laptop redundancy or presenter handoff
- ✓ USB-C PD charging up to 100W (1×100W or 2×50W) — powers laptops directly from the transmitter
- ✓ Dual HDMI 2.0b outputs on RX at up to 4K@60Hz — mirror or extend displays (Synaptics DisplayLink driver required)
- ✓ Balanced and unbalanced analog audio de-embedding on RX (LPCM 2CH, 32–192kHz) via 5-pin phoenix connector
- ✓ Three downstream USB device ports on each unit (1× USB-C + 2× USB-A) for webcams, PTZ cameras, keyboards, and touch panels
- ✓ RS-232 pass-through on both TX and RX for third-party control system integration
- ✓ FSYNC GPIO pass-through for industrial camera synchronization (default level range 0–5V)
- ✓ Bi-directional 24V PoC — power either TX or RX, the other unit is powered over the CAT6a link

2. Package Contents

- ✓ 1× USB 3.2 Extender (TX)
- ✓ 1× USB 3.2 Extender (RX)
- ✓ 1× 24V/7.5A Locking Power Supply
- ✓ 2× 4pin-3.5mm Phoenix Connector
- ✓ 1× 5pin-3.5mm Phoenix Connector
- ✓ 4× Mounting Ears
- ✓ 8× Machine Screws (KM3*4)

3. Specifications

TECHNICAL	
USB Protocol	USB 3.2 Gen 1
Transmission Rate	Up to 5Gbps
HDMI Compliance	HDMI 2.0b
HDMI Video Bandwidth	18Gbps
HDMI Video Resolution	Up to 4K@60Hz
Color Depth	8/10/12-bit
Color Space	RGB, YCbCr 4:4:4 / 4:2:2 / 4:2:0
Audio Format	HDMI: Up to LPCM 2.0/5.1CH • Analog De-embedding: LPCM 2CH (32–192kHz)
Transmission Distance	100m/328ft via CAT6a (F/FTP) • 1.5m via USB • 3m via HDMI
ESD Protection	IEC 61000-4-2: ±8kV (air-gap) & ±4kV (contact)
CONNECTIONS — TRANSMITTER	
Input	2× USB-C HOST [24-pin female]
Output	2× USB-A DEVICE [9-pin female] • 1× USB-C DEVICE [24-pin female]
Link	1× HDBT-USB3 [RJ45, 24V PoC]
Control	RS-232 + FSYNC on one 4-pin 3.5mm phoenix block (TX, ground, RX, IO) • 1× SERVICE [USB-C]
CONNECTIONS — RECEIVER	
Input	1× HDBT-USB3 [RJ45, 24V PoC]

continued

Output	2× USB-A DEVICE • 1× USB-C DEVICE • 2× HDMI OUT [Type A] • 1× AUDIO OUT [5pin phoenix]
Control	RS-232 + FSYNC on one 4-pin 3.5mm phoenix block (TX, ground, RX, IO) • 1× SERVICE [USB-C]
MECHANICAL	
Housing	Metal Enclosure, Black
Dimensions	TX: 180 × 95 × 23mm • RX: 180 × 95 × 23mm
Weight	TX: 482g • RX: 486g
Power Supply	AC 100–240V 50/60Hz → DC 24V/7.5A (TX input 24V/7.5A; RX input 24V/3.75A)
Power Consumption	TX: 120W max (incl. PD 100W) • RX: 19.44W max
Operating Temp	32–113°F / 0–45°C
Storage Temp	−40–140°F / −40–60°C
Operating Humidity	20–80% RH (non-condensing)
Storage Humidity	10–90% RH (non-condensing)

4. Introduction

The EXT-USBCPD2X4K-100M extends USB 3.2 signals at 5Gbps up to 328ft (100m) over a single CAT6a cable. The transmitter (TX) has two selectable USB-C host ports with automatic or manual switching, and can charge connected laptops at up to 100W over USB-C Power Delivery (PD). The receiver (RX) has:

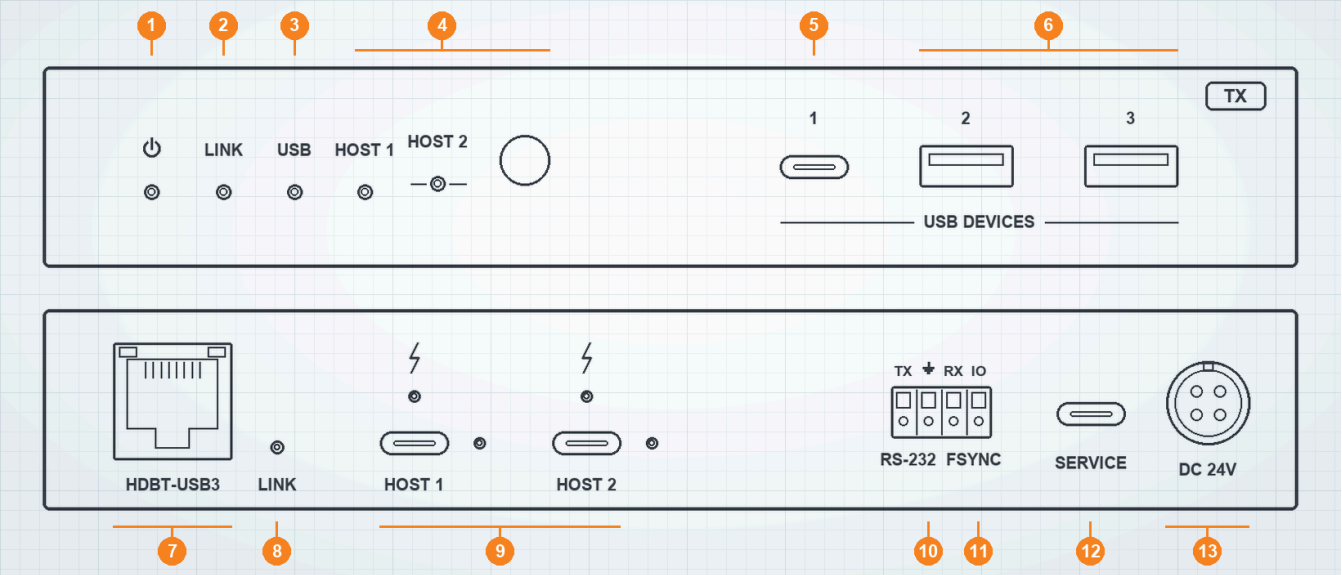
- two HDMI outputs at up to 4K@60Hz
- balanced or unbalanced analog audio de-embedding
- downstream USB device ports for webcams, PTZ cameras, keyboards and touch panels

Bi-directional 24V Power over Cable (PoC) lets you power the system from either end. RS-232 pass-through and FSYNC GPIO pass-through let third-party control systems work with the extender and keep industrial cameras in sync.

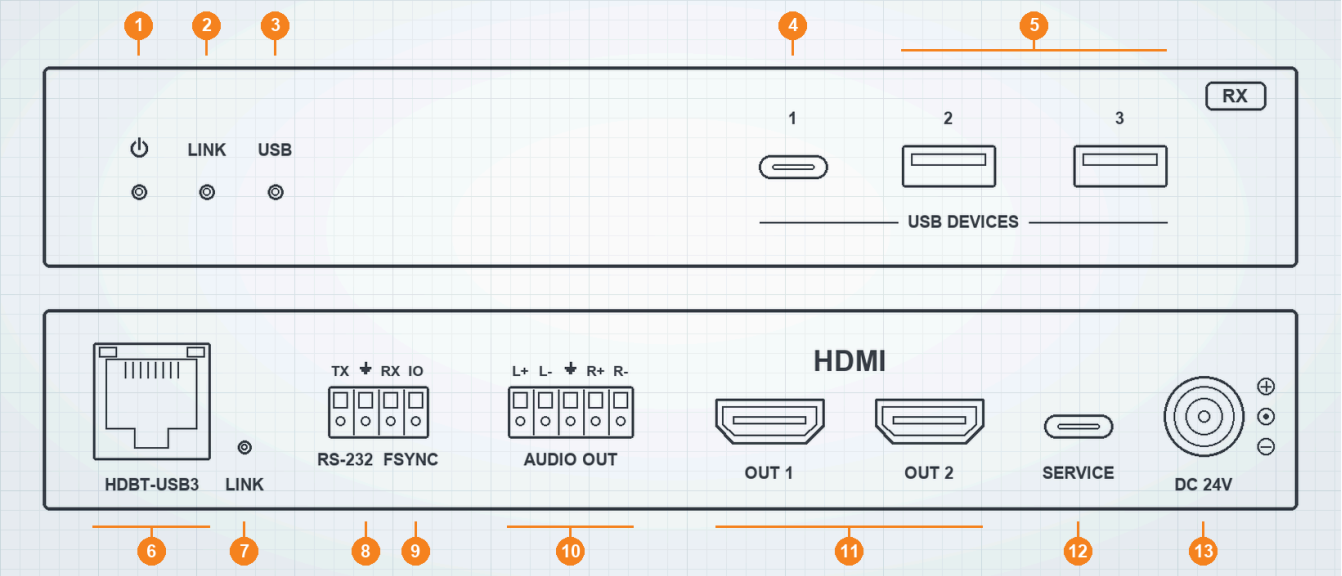
Surge protection recommended. This product contains sensitive electrical components that electrical spikes, surges, electric shock or lightning strikes can damage. A surge protection system is strongly recommended.

Caution: use a straight-through cable. Wire the network cable T568B to T568B at both ends. Do not use a crossover cable.

5. Panel descriptions



Transmitter (TX)



Receiver (RX)

TRANSMITTER (TX): FRONT AND REAR

No.	Name	Description
1	**Power LED**	Lights red when the transmitter is powered on.
2	**LINK LED**	Shows the connection status. It is on when the TX and RX are linked and off when they are not connected.
3	**USB LED**	Steady on means a USB 3.0 signal is detected. Blinking means a USB 2.0 signal. Off means no USB signal.

continued

No.	Name	Description
4	**HOST Switch & LEDs**	Press the button to switch between HOST 1 and HOST 2. The LED for the selected host lights.
5	**USB-C DEVICE**	Downstream USB-C port (5V/1A). Connect USB devices such as flash drives or hard disks.
6	**USB-A DEVICE (×2)**	Downstream USB-A ports (5V/1.5A each) for USB devices.
7	**HDBT-USB3**	RJ45 port. Connect it to the RX with a CAT6a cable. This port also carries 24V PoC.
8	**LINK LED (rear)**	Shows the connection status, the same as the front LINK LED.
9	**USB-C HOST 1/2**	Upstream USB-C ports. Connect these to your computers. They provide PD charging up to 100W, or 50W each when both ports are charging. The LED for the selected host lights.
10	**RS-232**	RS-232 pins (TX, ground, RX) of the 4-pin phoenix block for RS-232 pass-through and API control.
11	**FSYNC**	IO pin of the 4-pin phoenix block. Passes a level signal from the TX to the RX (0–5V by default).
12	**SERVICE**	USB 2.0 port for firmware upgrades.
13	**DC 24V**	DC 24V/7.5A power input.

USB-C charging note. USB-C charging works only when the TX is powered from the external power supply. If the TX is powered over PoC from the RX, it cannot charge. To charge laptops, connect the power supply to the transmitter.

RECEIVER (RX): FRONT AND REAR

No.	Name	Description
1	**Power LED**	Lights red when the receiver is powered on.
2	**LINK LED**	On when the TX and RX are linked, off when they are not connected.
3	**USB LED**	Steady on means USB 3.0. Blinking means USB 2.0. Off means no USB signal.
4	**USB-C DEVICE**	Downstream USB-C port (5V/1A).
5	**USB-A DEVICE (×2)**	Downstream USB-A ports (5V/1.5A each).
6	**HDBT-USB3**	RJ45 port. Connect it to the TX with a CAT6a cable. This port also carries 24V PoC.
7	**LINK LED (rear)**	Shows the connection status, the same as the front LINK LED.
8	**RS-232**	RS-232 pins (TX, ground, RX) of the 4-pin phoenix block for RS-232 pass-through and API control.

continued

No.	Name	Description
9	FSYNC	IO pin of the 4-pin phoenix block. Outputs the level signal passed through from the TX.
10	AUDIO OUT	5-pin phoenix connector. Balanced output (max 2Vrms) or unbalanced output (max 1Vrms), LPCM 2CH, 32–192kHz.
11	HDMI OUT (1/2)	HDMI outputs (4K@60Hz). These outputs need the Synaptics DisplayLink driver installed on the host computer.
12	SERVICE	USB 2.0 port for firmware upgrades.
13	DC 24V	DC 24V/3.75A power input.

6. Default Settings & API Communication

The table below shows the factory defaults. You can change them with API commands sent through the SERVICE port or the RS-232 port.

PARAMETER	DEFAULT VALUE
Source	01 (USB Host 1)
Front panel key	On
RS-232 baud rate	115200
Auto-switching (USB 5V)	On
TX USB device power	Follows USB host power
RX USB device power	Follows host (ports 1–2); Force On (port 3)
USB host input port	USB Host 1 (USB-C)

STATUS OUTPUT (GET STATUS)

The `get status` command returns:

- the TX and RX firmware versions
- the active source
- the front-panel key lock state
- the baud rate
- the auto-switch status
- the power state of every USB device port

FIELD	EXAMPLE	DESCRIPTION
Firmware	TX_FW 1.0.0 RX_FW 1.0.0	TX and RX firmware versions
Source	01	Active USB host (01 = Host 1)
Key	On	Front panel key status
Baud	115200	RS-232 baud rate
Autoswitch	On	USB 5V auto-switching
Input 01/02	5V / None	Host voltage detected
TX_01–03	Follow_Input	TX USB device port power mode
RX_01–02	Follow_Input	RX ports 1–2 power mode
RX_03	Force_On	RX port 3 always powered

RS-232 / API COMMUNICATION

You can send API commands through either of two ports:

- **SERVICE port.** It appears to your computer as a virtual RS-232 port. It runs at a fixed 115200 baud, 8N1.
- **Phoenix RS-232 port.** Its baud rate can be set from 4800 to 115200 and it uses 8N1. The default is 115200.

7. API Commands

COMMAND	FUNCTION	EXAMPLE	DEFAULT
`?`	List all commands	`?`	—
`help`	List all commands	`help`	—
`get fw version`	Get firmware version	`get fw version`	—
`set reboot`	Reboot device	`set reboot`	—
`set reset`	Factory reset	`set reset`	—
`get status`	Get system status	`get status`	—
`set key on/off`	Enable or disable the front panel key	`set key on`	on
`get key`	Get key status	`get key`	—
`set baud x`	Set RS-232 baud rate (x = 1: 4800, 2: 9600, 3: 19200, 4: 38400, 5: 57600, 6: 115200)	`set baud 6`	115200
`get baud`	Get baud rate	`get baud`	—
`get usb5v x`	Get host 5V status (x = 0: all, 1: Host 1, 2: Host 2)	`get usb5v 0`	—
`set autoswitch x`	Turn auto-switching on USB 5V on or off	`set autoswitch on`	on
`get autoswitch`	Get auto-switch status	`get autoswitch`	—
`set input x`	Set host input (x = 1: Host 1, 2: Host 2)	`set input 1`	1
`get input`	Get host input	`get input`	—
`set tx usbd x power y`	Set TX USB device port power (x = 0: all, 1: USB-C, 2: USB-A-2, 3: USB-A-3; y = 0: Off, 1: Follow, 2: On)	`set tx usbd 0 power 1`	1
`get tx usbd x power`	Get TX USB device port power (x = 0: all, 1–3)	`get tx usbd 0 power`	—
`set rx usbd x power y`	Set RX USB device port power (same values as TX)	`set rx usbd 0 power 1`	1
`get rx usbd x power`	Get RX USB device port power	`get rx usbd 0 power`	—
`set hdbt update`	Set the SERVICE port to HDBT UART for a firmware update	`set hdbt update`	—

RS-232 PIN ASSIGNMENT

PIN	SIGNAL
1	TX
2	RX
3	GND

AUDIO OUTPUT PIN ASSIGNMENT

PIN	SIGNAL	CONNECTION
1 (L+)	Left positive	Balanced: L+, L−. Unbalanced: L+, GND
2 (L−)	Left negative	
3 (GND)	Ground	Common ground
4 (R+)	Right positive	Balanced: R+, R−. Unbalanced: R+, GND
5 (R−)	Right negative	

The balanced output is limited to 2Vrms and the unbalanced output to 1Vrms.

8. Troubleshooting

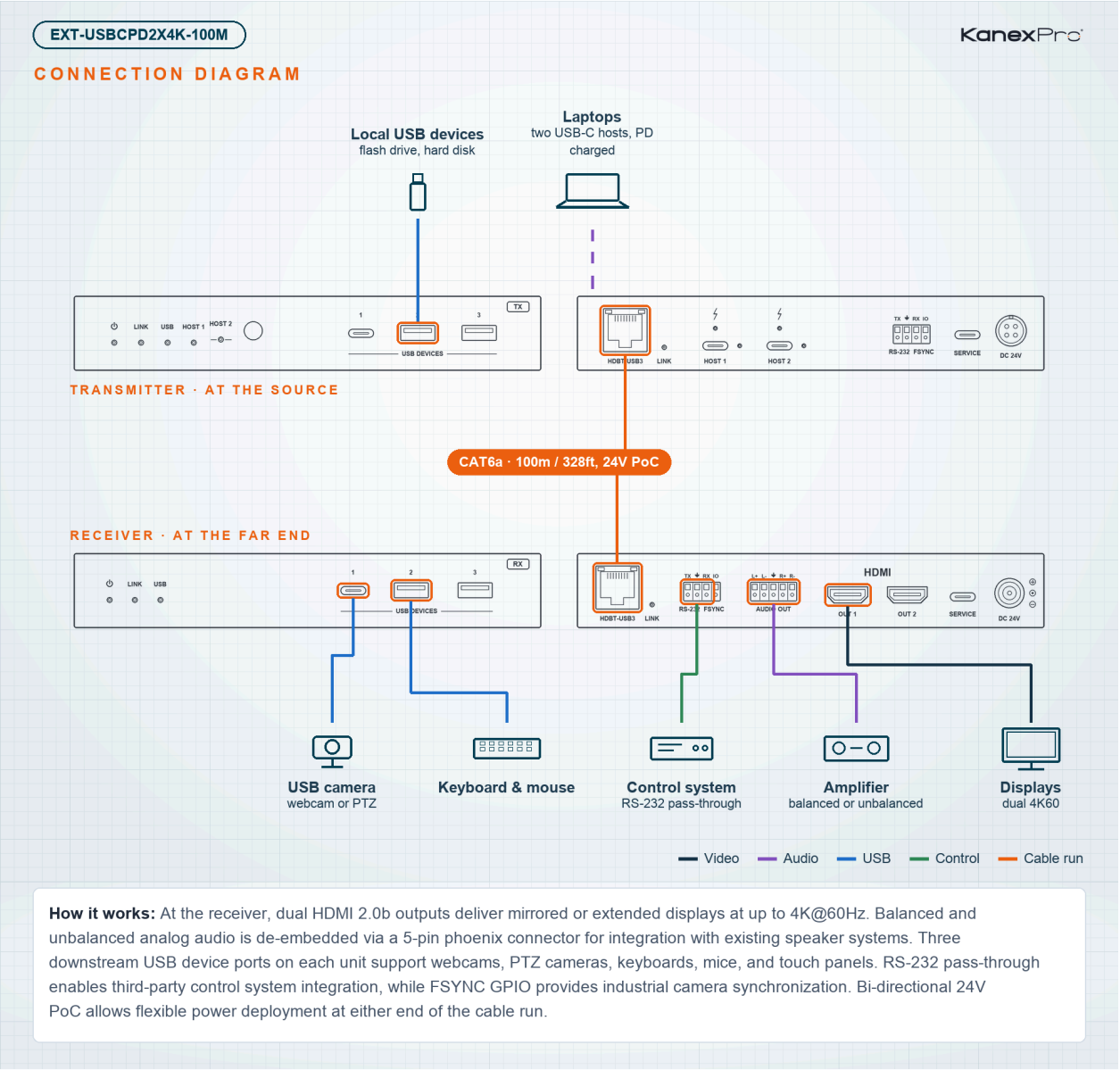
There is no video on the connected displays. Make sure the latest Synaptics DisplayLink driver is installed on the host computer. Use HDMI cables no longer than 9.8ft (3m). Check that the LINK LED is lit on both units.

USB devices are not detected at the RX. Check that the USB LED is on or blinking. Use a straight-through CAT6a cable (T568B to T568B), and make sure the cable run is no longer than 328ft (100m).

USB-C PD charging is not working. PD charging needs the TX to be powered from the external power supply, not over PoC. When two hosts charge at the same time, each is limited to 50W.

How do I send API commands? Connect the SERVICE port (USB-C) or the RS-232 phoenix port to a PC. Open a serial terminal at 115200 baud, 8N1, and type `help` to list all commands.

9. Connection Diagram



How it works: At the receiver, dual HDMI 2.0b outputs deliver mirrored or extended displays at up to 4K@60Hz. Balanced and unbalanced analog audio is de-embedded via a 5-pin phoenix connector for integration with existing speaker systems. Three downstream USB device ports on each unit support webcams, PTZ cameras, keyboards, mice, and touch panels. RS-232 pass-through enables third-party control system integration, while FSYNC GPIO provides industrial camera synchronization. Bi-directional 24V PoC allows flexible power deployment at either end of the cable run.

10. Troubleshooting

Q: The LINK LED is off on one or both units. What should I check?
A: First, check that the Power LED is red on both units. If it is not, make sure the supply is plugged into one unit and the CAT6a cable is seated in the HDBT-USB3 port at both ends. Then confirm the cable is wired straight through (T568B to T568B, not crossover) and the run is no longer than 100m (328ft).

Q: Pressing the HOST button does not switch between laptops. What should I check?
A: The front-panel key may be disabled. Send get key, and if it reports off, send set key on. You can also switch hosts directly with set input 1 or set input 2.

Q: The extender switches to a different laptop on its own. Why?
A: With auto-switching on (the default), the extender selects a host when it detects USB 5V on it. To keep a fixed host, send set autoswitch off, then select the host you want with set input 1 or set input 2.

Q: A control system gets no response over the RS-232 phoenix port. What should I check?
A: Check the wiring: TX, ground and RX must cross over correctly to the controller. Then connect a PC to the SERVICE port, which is fixed at 115200 8N1, and send get baud to read the phoenix port's rate. Set the controller to match it at 8N1, or change the rate with set baud.

Q: A USB device plugged into the TX or RX gets no power. What should I check?
A: By default, most device ports power on only when a powered host is connected. Check get usb5v 0 to see which hosts supply 5V, and get tx usbd 0 power or get rx usbd 0 power to read each port's mode. Send set rx usbd x power 2 (or the TX equivalent) to force that port on.

Need help? — For additional support, visit kanexpro.com/support, or scan the QR code below for the product page.

11. Installation FAQ

Q: Which unit should the power supply be plugged into?
A: Plug the 24V/7.5A supply into the DC 24V input on the transmitter. The receiver then gets 24V over the CAT6a link. If you power only the RX, the system still runs over PoC, but the TX cannot charge the laptops.

Q: What do I connect to each end of the system?
A: At the TX, connect one or two laptops to USB-C HOST 1 and HOST 2, then run CAT6a from the HDBT-USB3 port to the RX. At the RX, connect the two HDMI outputs to displays, the 5-pin AUDIO OUT to speakers or an amplifier, and webcams, PTZ cameras, keyboards or touch panels to the USB device ports.

Q: How is the 4-pin control block wired?
A: Each unit has one 4-pin 3.5mm phoenix block with the pins TX, ground, RX and IO. TX, ground and RX carry RS-232. The IO pin carries FSYNC, which passes a level signal (0-5V by default) from the TX to the RX for camera synchronization.

Q: How is firmware updated on the extender?
A: Each unit has a SERVICE port (USB-C, USB 2.0) for firmware upgrades. The command set hdbt update switches the SERVICE port to HDBT UART for the update.

12. Integration FAQ

Q: What RS-232 settings does a control system need to use?
A: The phoenix RS-232 port runs at 8N1 and its baud rate can be set from 4800 to 115200 (default 115200) with set baud 1-6. The SERVICE port appears to the PC as a virtual serial port at a fixed 115200 baud, 8N1.

Q: Can a control system select the active laptop instead of the front-panel button?
A: Yes. Send set input 1 or set input 2 to select a host, and get input to read the current one. Use set autoswitch on or off to choose whether the extender picks the host automatically when it detects USB 5V.

Q: Can I lock the front panel so users cannot switch hosts?
A: Yes. Send set key off to disable the front-panel key and set key on to enable it again. Use get key to check its state.

Q: Can a control system turn power on or off at individual USB device ports?
A: Yes. Use set tx usbd x power y or set rx usbd x power y, where x is 0 for all ports or 1-3 for a single port, and y is 0 for Off, 1 to follow the host, or 2 for On. By default, RX port 3 is always powered and the other ports follow the host.

Q: What does a control system get back when it polls the extender's status?
A: The get status command returns the TX and RX firmware versions, the active source, the front-panel key state, the baud rate, the auto-switch state, the 5V detected on each host input and the power mode of every USB device port.