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CF-HD3100-22KVMC

4K HDMI / USB-C over HDBaseT 3.0 Extender (100m)
with USB / 1G LAN

USER MANUAL

VER 1.1

Thank you for purchasing this product

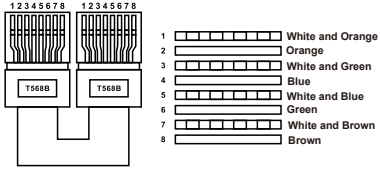
For optimum performance and safety, please read these instructions carefully before connecting, operating or adjusting this product. Please keep this manual for future reference.

Surge protection device recommended

This product contains sensitive electrical components that may be damaged by electrical spikes, surges, electric shock, lighting strikes, etc. Use of surge protection systems is highly recommended in order to protect and extend the life of your equipment.

Caution

The network cable connection method required for this product is direct connection. Please do not cross connect.



Direct Interconnection Method

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1. Introduction

This 4K HDBaseT 3.0 Extender can extend uncompressed HDMI/USB-C signals, bi-directional IR, RS-232, and USB signals up to 328ft/100m via a single CAT6A/7 cable. Video resolution is up to 4K2K@60Hz YUV 4:4:4.
The transmitter features 1x HDMI input, 1x USB-C input (A/V+USB 3.2+1G+ 100W charging), 1x USB 3.2 Host and 3x USB 3.2 Device ports. It can switch between HDBT Standard Mode (as factory default) and HDBT Long Reach Mode. It supports EDID management. The receiver features 1x HDMI output, 4x USB 2.0 Device ports. Both transmitter and receiver support analog audio de-embedding, bi-directional IR, RS-232 and 1G LAN pass-through. This product supports bi-directional 24V PoC function, with PoC switch.
The Extender offers the most convenient solution for video extension via a single CAT cable with long distance capability, and it is a perfect solution for home/commercial applications.

2. Features

- ☆ Compliant with HDCP 2.2 and DisplayPort 1.4a, 18Gbps video bandwidth
- ☆ HDBaseT 3.0 VS3000 chipset based design
- ☆ Support video resolution up to 4K2K@60Hz (YUV 4:4:4), as specified in HDMI 2.0b
- ☆ 4K60/4K30/1080P signal transmission distance up to 328ft/100m via a single CAT6A/7 cable (HDBT Standard Mode)
- ☆ 1080P 8bit signal transmission distance up to 492ft/150m via a single CAT6A/7 cable (HDBT Long Reach Mode)
- ☆ TX features 1x HDMI input, 1x USB-C input, 1x HDMI/HDBT output, 1x USB 3.2 host and 3x USB 3.2 clients
- ☆ RX features 1x HDBT input, 1x HDMI output, 4x USB 2.0 clients
- ☆ USB-C and HDMI signal inputs support auto or manual switching mode
- ☆ Auto switching supports HDMI 5V or signal detect selection
- ☆ TX USB-C host port supports DP-ALT mode for A/V, USB 3.2 data, 1G Ethernet and power charging up to 100 watts
- ☆ TX/RX USB-A client ports VBUS on or off depends on USB host is connected or not
- ☆ HDR, HDR10, HDR10+, Dolby Vision LLM and HLG pass-through
- ☆ 4K to 1080p downscaling features on HDMI output, no frame rate conversion
- ☆ Both TX and RX support analog audio de-embedding
- ☆ RS-232 signal pass-through and API control
- ☆ RS-232/CEC control external device power on/off
- ☆ 1G Ethernet and bi-directional IR signal pass-through
- ☆ Advanced EDID management
- ☆ Support bi-directional 24V PoC, with PoC switch (USB-C charging only from TX power supply)

3. Package Contents

① 1× 4K HDMI/USB-C over HDBaseT 3.0 Extender (Transmitter)
② 1× 4K HDMI/USB-C over HDBaseT 3.0 Extender (Receiver)
③ 2× 3pin-3.5mm Phoenix Connector (male)
④ 2× 5pin-3.5mm Phoenix Connector (male)
⑤ 4× Mounting Ear
⑥ 8× Machine Screw (KM3*6)
⑦ 1× IR Blaster Cable (1.5m)
⑧ 1× IR Receiver Cable (1.5m)
⑨ 1× 24V/7.5A Desktop Power Supply
⑩ 1× User Manual

4. Specifications

Technical	
HDMI Compliance	HDMI 2.0b
HDCP Compliance	HDCP 2.2
DP Compliance	DisplayPort 1.4a
Video Bandwidth	18Gbps
Video Resolution	640x480p60Hz, 800x600p60Hz, 1024x768p60Hz, 1280x1024p 60Hz, 1360x768p60Hz, 1440x900p60Hz, 1440x1050p60Hz, 1600x1200p60Hz, 720x480i59.94Hz(480i59), 720x480p59.94Hz (480p59), 720x576i50Hz(576i50), 720x576p50Hz(576p50), 1280x720p50Hz(720p50), 1280x720p59.94Hz(720p59), 1280x720p60Hz(720p60), 1920x1080i50Hz(1080i50), 1920x1080i59.94Hz(1080i59), 1920x1080i60Hz(1080i60), 1920x1080p23.98Hz(1080p23), 1920x1080p24Hz(1080p24), 1920x1080p25Hz(1080p25), 1920x1080p29.97Hz(1080p29), 1920x1080p30Hz(1080p30), 1920x1080p50Hz(1080p50), 1920x1080p59.94Hz(1080p59), 1920x1080p60Hz(1080p60), 3840x2160p23.98Hz(2160p23), 3840x2160p24Hz(2160p24), 3840x2160p25Hz(2160p25), 3840x2160p29.97Hz(2160p29), 3840x2160p30Hz(2160p30), 3840x2160p50Hz(2160p50), 3840x2160p59.94Hz(2160p59), 3840x2160p60Hz(2160p60), 3840x2160p100Hz(2160p100), 3840x2160p120Hz(2160p120), 4096x2160p23.98Hz, 4096x2160p24Hz, 4096x2160p25Hz, 4096x2160p29.97Hz, 4096x2160p30Hz, 4096x2160p50Hz, 4096x2160p59.94Hz, 4096x2160p60Hz

Color Space	RGB, YCbCr 4:4:4 / 4:2:2, YUV 4:2:0	
Color Depth	8/10/12bit	
HDR	HDR, HDR10, HDR10+, Dolby Vision, HLG	
IR Level	12Vp-p	
Audio Formats	**HDMI/USB-C/HDBT :** LPCM 2/5.1/7.1CH, Dolby Digital/Plus/EX, Dolby True HD, Dolby Atmos, DTS, DTS-EX, DTS-96/24, DTS High Res, DTS-HD Master Audio, DSD **Analog Audio:** LPCM 2CH (sample rate 32~192kHz)	
Audio Parameters	Output Impedance	600 Ohm balanced 300 Ohm unbalanced
	Output Level (Max)	Max 8.2dBu (2Vrms) balanced audio Max 2.2dBu (1Vrms) unbalanced audio
	Frequency Response	20Hz to 20kHz (-/+0.5dB)
	Dynamic Range	> 90dB@0dBu, 1kHzA-weighted
	Audio S/N Ratio	> 90dB@0dBu, 1kHzA-weighted
	Audio THD+N	< 0.01% at +4dBu, 1KHz
	Audio Output Delay	<1ms
USB Support	TX: USB 3.2 Gen 1 5Gbps, compatible with USB 2.0 480Mbps RX: USB 2.0 350Mbps	
USB Host Ports	TX: 1x USB-C 3.2 Gen 1 + 1 USB-B 3.2 Gen 1 RX: None	
USB Device Ports	TX: 1x USB-C 3.2 Gen 1 + 2x USB-A 3.2 Gen 1 RX: 1x USB-C 2.0 + 3x USB-A 2.0	
USB Power Supply	Host ports: TX: 1x USB-C port (100W charging) Device ports: TX: 1x USB-C port (1A) + 2x USB A port (1.5A) RX: 1x USB-C port (1A) + 3x USB A port (1A)	
Transmission Distance	HDMI/USB-C passive cable: 16.4ft/5m USB 3.2 Gen 1 5Gbps passive cable: 5.9ft/1.8m CAT6A/7 cable: 328ft/100m@4K60 (HDBT Standard Mode) CAT6A/7 cable: 492ft/150m@1080P (HDBT Long Reach Mode)	
ESD Protection	IEC 61000-4-2: ±8kV (Air-gap discharge) & ±4kV (Contact discharge)	

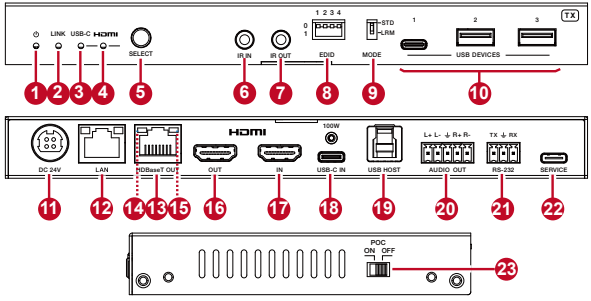
Connection	
Transmitter	Input: 1x HDMI IN [Type A, 19-pin female] 1x USB-C IN [USB Type C, 24-pin female] Output: 1x HDBaseT OUT [RJ45, HDBT output with 24V PoC] 1x HDMI OUT [Type A, 19-pin female] 1x AUDIO OUT [5pin-3.5mm phoenix connector] Control: 1x LAN [RJ45 connector, 1G Ethernet pass-through] 1x RS-232 [3pin-3.5mm phoenix connector] 1x SERVICE [USB-C with USB 2.0 only, 12-pin female] 1x USB HOST [USB Type B, 9-pin female] 1x USB DEVICES [USB 3.2 Type C, 24-pin female] 2x USB DEVICES [USB 3.2 Type A, 9-pin female] 1x IR IN [3.5mm audio jack, 12V level] 1x IR OUT [3.5mm audio jack]
Receiver	Input: 1x HDBaseT IN [RJ45, HDBT input with 24V PoC] Output: 1x HDMI OUT [Type A, 19-pin female] 1x AUDIO OUT [5pin-3.5mm phoenix connector] Control: 1x LAN [RJ45 connector, 1G Ethernet pass-through] 1x RS-232 [3pin-3.5mm phoenix connector] 1x SERVICE [USB-C with USB 2.0 only, 12-pin female] 1x USB DEVICES [USB 2.0 Type C, 12-pin female] 3x USB DEVICES [USB 2.0 Type A, 4-pin female] 1x IR IN [3.5mm audio jack, 12V level] 1x IR OUT [3.5mm audio jack]

Mechanical	
Housing	Metal Enclosure
Color	Black
Dimensions	Transmitter/Receiver: 208mm [W] x 122mm [D] x 22mm [H]
Weight	Transmitter: 687g, Receiver: 636g
Power Supply	Input: AC 100 - 240V 50/60Hz Output: DC 24V/7.5A (US/EU standard, CE/FCC/UL certified)
Power Consumption (Max)	173W (Power supply from TX, 100W USB-C charging, PoC to RX) 73W (Power supply from TX or RX, without USB-C charging)
Operating Temperature	32°F ~ 104°F / 0°C ~ 40°C
Storage Temperature	-4°F ~ 140°F / -20°C ~ 60°C
Operating Humidity	20% ~ 80% (relative humidity, no condensation)
Storage Humidity	10% ~ 90% (relative humidity, no condensation)

Recommended HDMI Cable Length			
Video Resolution	**4K60**	**4K24**	**1080P60**
HDMI IN / OUT	16.4ft/5m	33ft/10m	49ft/15m
The use of “Premium High Speed HDMI” cable is highly recommended.			

5. Operation Controls and Functions

5.1 Transmitter Panel



No.	Name	Function Description
1	Power LED	Red LED indicates that the transmitter is powered on.
2	LINK LED (Green)	▪ Light on: Transmitter and receiver are in good connection status. ▪ Light flashing: Transmitter and receiver are in poor connection status. ▪ Light off: Transmitter and receiver are not connected.
3	USB-C LED (Green)	When the USB-C IN port is selected as the video signal input channel, the USB-C LED will be on.
4	HDMI LED (Green)	When the HDMI IN port is selected as the video signal input channel, the HDMI LED will be on.
5	SELECT button	Press this button to switch HDMI/USB-C signal input.
6	IR IN	IR signal input port, connected to IR Receiver cable.
7	IR OUT	IR signal output port, connected to IR Blaster cable.
8	EDID DIP switch	Used for EDID setting. The EDID setting list is shown as follow. Note: Only when the EDID DIP switch is set to 1111, the EDID settings through API commands are valid.
9	MODE switch	Used to switch HDBT mode. **Switch to "STD":** The HDBT Standard Mode (as factory default) is enabled, it can extend 4K60/4K30/1080P signal between the transmitter and the receiver up to 100m via a single CAT6A/7 cable. **Switch to "LRM":** The HDBT Long Reach Mode is enabled, it can extend 1080P 8bit signal between the transmitter and the receiver up to 150m via a single CAT6A/7 cable.

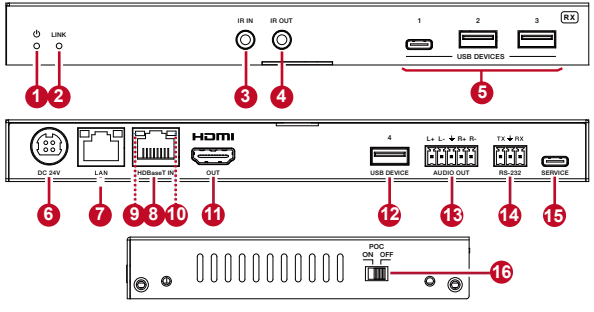
No.	Name	Function Description
10	USB Device ports	Three USB 3.2 device ports (two USB-A ports and one USB-C port) connected to mouse, keyboard, USB Flash Drive or other USB devices.
11	DC 24V	DC 24V/7.5A power supply input port. *Note that the extender supports PoC function, it means that either transmitter or receiver is powered on by 24V/7.5A power adapter, the other one doesn't need power supply.*
12	LAN	1G Ethernet pass-through port. When it switches to 1000Mbps Ethernet, the yellow indicator flashes; When it switches to 100Mbps Ethernet, the green indicator flashes.
13	HDBaseT OUT	HDBaseT output port, connected to the HDBaseT IN port of receiver with a CAT6A/7 cable. It is used for HDMI, network and USB signals pass-through.
14	Data Signal Indicator (Yellow)	▪ Light on: There is video signal transmission with HDCP encryption. ▪ Light flashing: There is video signal transmission without HDCP encryption. ▪ Light off: There is no video signal transmission.
15	Link Signal Indicator (Green)	▪ Light on: Transmitter and receiver are in good connection status. ▪ Light flashing: Transmitter and receiver are in poor connection status. ▪ Light off: Transmitter and receiver are not connected.
16	HDMI OUT	HDMI signal loop output port, connected to HDMI display device.
17	HDMI IN	HDMI signal input port, connected to HDMI source device.
18	USB-C IN	USB Type C port with following four functions: (1) USB-C video signal input port, connected to source device. (2) USB-C host port. When the USB-C port is selected as the video signal input channel, the USB-C port can be used as the USB 3.2 Gen 1 signal transmission port simultaneously. (3) USB-C charging port. Only when TX is connected to the 24V/7.5A power supply, the USB-C port can provides 100W charging power for external USB-C devices. When TX is not connected to the power supply and RX is connected to the power supply, the USB-C port can not provide charging function. (4) 1G Ethernet access port.
19	USB HOST	USB 3.2 Gen 1 host port, connected to PC.
20	AUDIO OUT	Analog audio output port, supporting balanced audio output (with a maximum support of 2Vrms) and unbalanced audio output (with a maximum support of 1Vrms). Balanced connection method: L+, L -, GND, R+, R - Unbalanced connection method: L+, GND, R+

No.	Name	Function Description
21	RS-232	RS-232 serial port, used for RS-232 signal pass-through and API commands control.
22	SERVICE	USB 2.0 Type C port, used for firmware upgrade and API commands control.
23	POC switch	24V PoC on/off switch. ON: PoC is enabled (as factory default). OFF: PoC is disabled (need local DC/24V power supply).

Note: In the HDBT Long Reach Mode, due to bandwidth limitations, USB cannot transmit USB 2.0 devices, but only can transmit USB HID devices (such as mice and keyboards). When using the USB pass-through function, the serial baud rate may also be limited.

* EDID Setting List:
[DIP]=0000: EDID Auto (default
[DIP]=0001: HDMI 1080p@60Hz, Audio 2CH PCM
[DIP]=0010: HDMI 4K@30Hz 4:4:4, 8-bit, Audio 2CH PCM
[DIP]=0011: HDMI 4K@60Hz 4:4:4, 8-bit, Audio 2CH PCM
[DIP]=0100: HDMI 1080p@60Hz, Audio 5.1CH DTS/DOLBY
[DIP]=0101: HDMI 1080p@60Hz, Audio 7.1CH DTS/DOLBY/HD
[DIP]=0110: HDMI 4K@60Hz 4:4:4, 8-bit, Audio 5.1CH DTS/DOLBY
[DIP]=0111: HDMI 4K@60Hz 4:4:4, 8-bit, Audio 7.1CH DTS/DOLBY/HD
[DIP]=1000: HDMI 1920x1200@60Hz, Audio 2CH PCM
[DIP]=1001: DVI 1920x1080@60Hz, Audio None
[DIP]=1010: DVI 1920x1200@60Hz, Audio None
[DIP]=1011: EDID pass-through (Copy from TX HDMI OUT
[DIP]=1100: EDID pass-through (Copy from RX HDMI OUT
[DIP]=1101: User Defined 1
[DIP]=1110: User Defined 2
[DIP]=1111: Software EDIDs

5.2 Receiver Panel

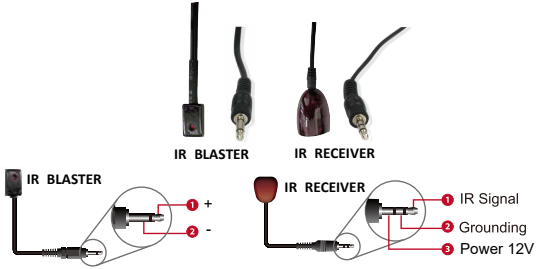


No.	Name	Function Description
1	Power LED	Red LED indicates that the receiver is powered on.
2	LINK LED (Green)	▪ Light on: Transmitter and receiver are in good connection status. ▪ Light flashing: Transmitter and receiver are in poor connection status. ▪ Light off: Transmitter and receiver are not connected.
3	IR IN	IR signal input port, connected to IR Receiver cable.
4	IR OUT	IR signal output port, connected to IR Blaster cable.
5	USB Device ports	Three USB 2.0 device ports (two USB-A ports and one USB-C port) connected to mouse, keyboard, USB Flash Drive or other USB devices.
6	DC 24V	DC 24V/7.5A power supply input port. *Note that the extender supports PoC function, it means that either transmitter or receiver is powered on by 24V/7.5A power adapter, the other one doesn't need power supply.*
7	LAN	1G Ethernet pass-through port. When it switches to 1000Mbps Ethernet, the yellow indicator flashes; When it switches to 100Mbps Ethernet, the green indicator flashes.
8	HDBaseT IN	HDBaseT input port, connected to the HDBaseT OUT port of transmitter with a CAT6A/7 cable. It is used for HDMI, network and USB signals pass-through.
9	Data Signal Indicator (Yellow)	▪ Light on: There is video signal transmission with HDCP encryption. ▪ Light flashing: There is video signal transmission without HDCP encryption. ▪ Light off: There is no video signal transmission.
10	Link Signal Indicator (Green)	▪ Light on: Transmitter and receiver are in good connection status. ▪ Light flashing: Transmitter and receiver are in poor connection status. ▪ Light off: Transmitter and receiver are not connected.
11	HDMI OUT	HDMI signal output port, connected to HDMI display device, such as TV or monitor.
12	USB DEVICE	USB 2.0 device port, connected to mouse, keyboard, USB Flash Drive or other USB device.
13	AUDIO OUT	Analog audio output port, supporting balanced audio output (with a maximum support of 2Vrms) and unbalanced audio output (with a maximum support of 1Vrms). Balanced connection method: L+, L -, GND, R+, R - Unbalanced connection method: L+, GND, R+

No.	Name	Function Description
14	RS-232	RS-232 serial port, used for RS-232 signal pass-through and API commands control.
15	SERVICE	USB 2.0 Type C port, used for firmware upgrade and API commands control.
16	POC switch	24V PoC on/off switch. ON: PoC is enabled (as factory default). OFF: PoC is disabled (need local DC/24V power supply).

6. IR Pin Definition

IR Receiver and Blaster pin's definition as below:



Note: When the angle between the IR receiver and the remote control is ± 45 °, the transmission distance is 0-5 meters; when the angle between the IR receiver and the remote control is ± 90 °, the transmission distance is 0-8 meters.

7. API Commands

The product also supports API commands control. Connect the RS-232 port of the product to a PC or control system with a 3-pin phoenix connector cable, or connect the SERVICE port of the product to a PC with a USB-C cable. Then, open a serial command tool on PC to send ASCII commands to control the product. The ASCII commands list about the product is shown as below.

ASCII Commands

1. Service port (USB-C virtual RS-232) communication protocol (Internal debug supports command line operations)
   Baud rate: 115200 (Fixed) Data bit: 8 Stop bit: 1 Parity bit: none
2. Phoenix RS-232 port communication protocol (Connect to control system)
   Baud rate: 2400~115200 (Configurable) Data bit: 8 Stop bit: 1 Parity bit: none

Command Code	Function Description	Example	Feedback	Default
?	Get the list of all commands	?	List all commands	
help	Get the list of all commands	help	List all commands	
get fw version	Get the firmware version	get fw version	TX FW v1.00.00 RX FW v1.00.00	
set reboot	Reboot the device	set reboot	Reboot… System Initializing... Initialization Finished! TX FW v1.00.00 RX FW v1.00.00	
set reset	Reset to factory defaults	set reset	Sure to RESET to default settings? Type "Yes" after next prompt to confirm…	
get status	Get system status	get status	Please refer to the note at the end of the list.	
set tx key on/off	Set TX front panel key on/off	set tx key on set tx key off	Set TX key on Set TX key off	On
get tx key	Get TX front panel key on/off status	get tx key	On	
set tx Usbc AccessNetwork	Set TX USB-C input port access network on/off	set tx Usbc AccessNetw	Set TX USB-C access network on Set TX USB-C access network off	On
get tx Usbc AccessNetwork	Get TX USB-C input port access network on/off status	get tx Usbc AccessNetwork	On	
set tx source x	Set TX input source (x=0~4) x=0: OFF x=1: USB-C input x=2: HDMI input x=3: AVMUTE x=4: Internal pattern	set tx source 1 set tx source 0	Set TX source to USB-C Set TX source to off	1
get tx source	Get TX input source	get tx source	USB-C	

Command Code	Function Description	Example	Feedback	Default
set tx pattern x y	Set TX internal signal generator resolution (x=1~6) pattern (y=1~12) x=01: 4K60Hz x=02: 4K50Hz x=03: 4K25Hz x=04: 4K24Hz x=05: 1080P60Hz x=06: 480P60Hz y=01: Black y=02: Checkboard y=03: Strip y=04: Red y=05: Green y=06: Blue y=07: White y=08: Ramp y=09: Red ramp y=10: Green ramp y=11: Blue ramp y=12: PRBS	set tx pattern 1 2	Set TX pattern 4K60Hz checkboard	
get tx pattern	Get TX internal pattern generator output resolution and pattern	get tx pattern	TX pattern 4K60Hz checkboard	
set tx input x hdcp y	Set TX input (x=0~2) HDCP to (y=0~2) x=0: All inputs x=1: USB-C input x=2: HDMI input y=0: HDCP OFF y=1: HDCP 1.4 y=2: HDCP 2.2	set tx input 0 hdcp 2 set tx input 2 hdcp 0	Set TX all inputs HDCP 2.2 Set TX HDMI input HDCP off	HDCP 2.2
get tx input x hdcp	Get TX input (x=0~2) HDCP status x=0: All inputs x=1: USB-C input x=2: HDMI input	get tx input 0 hdcp	TX USB-C input HDCP 2.2 TX HDMI input HDCP 2.2	
set tx output x hdcp y	Set TX output (x=0~2) HDCP mode to (y=0~3) x=0: All outputs x=1: HDBT output x=2: HDMI output y=0: Signal management y=1: Auto (default, Follow sink) y=2: Force HDCP 1.4 y=3: Force HDCP 2.2	set tx output 2 hdcp 1	Set TX HDMI output HDCP to auto	1

Command Code	Function Description	Example	Feedback	Default
get tx output x hdcp	Get TX output (x=0~2) HDCP mode x=0: All outputs x=1: HDBT output x=2: HDMI output	get tx output 0 hdcp	HDBT output HDCP auto HDMI output HDCP auto	
set tx usb x	Set TX USB source (x=0~2) x=0: Follow video x=1: USB-C host x=2: USB-B host	set tx usb 0 set tx usb 2	Set TX USB source follow video Set TX USB source USB-B host	0
get tx usb	Get TX USB source	get tx usb	Follow video	
get tx usbh5v x	Get TX USB host (x=0~2) input 5V status x=0: All USB host inputs x=1: USB-C input x=2: USB-B input	get tx usbh5v 0	TX USB-C host 5V on TX USB-B host 5V off	
set tx usbd5v x to y	Set TX USB device output (x=0~3) 5V to (y=0~2) x=0: All USB device ports x=1: USB device 1 x=2: USB device 2 x=3: USB device 3 y=0: Disable 5V output y=1: Follow host y=2: Force 5V always output	set tx usbd5v 0 to 1	Set TX all USB device output 5V follow host	1
get tx usbd5v x	Get TX USB device output (x=0~3) 5V status x=0: All USB device ports x=1: USB device 1 x=2: USB device 2 x=3: USB device 3	get tx usbd5v 0	TX USB device 1 output 5V follow host TX USB device 2 output 5V follow host TX USB device 3 output 5V follow host	
set tx autoswitch on/off	Set TX auto-switching on/off	set tx autoswitch on set tx autoswitch off	Set TX autoswitch on Set TX autoswitch off	on
get tx autoswitch	Get TX auto-switching status	get tx autoswitch	On	
set tx autoswitch mode x	Set TX auto-switching mode x=0: 5V detection x=1: signal detection	set tx autoswitch mode 1	Set TX autoswitch mode to signal detection	signal detection
get tx autoswitch mode	Get TX auto-switching mode	get tx autoswitch mode	Signal detection	

Command Code	Function Description	Example	Feedback	Default
set tx edid x to y	Set TX input ports (x=0~2) EDID to (y=1~19) x=0: All inputs x=1: USB-C input x=2: HDMI input y=01: HDMI 1080p@60Hz, Audio 2CH PCM y=02: HDMI 1080p@60Hz, Audio 5.1CH DTS/DOLBY y=03: HDMI 1080p@60Hz, Audio 7.1CH DTS/DOLBY/HD y=04: HDMI 4K@30Hz 4:4:4, 8-bit, Audio 2CH PCM y=05: HDMI 4K@30Hz 4:4:4, 8-bit, Audio 5.1CH DTS/DOLBY y=06: HDMI 4K@30Hz 4:4:4, 8-bit, Audio 7.1CH DTS/ DOLBY/HD y=07: HDMI 4K@60Hz 4:4:4, 8-bit, Audio 2CH PCM y=08: HDMI 4K@60Hz 4:4:4, 8-bit, Audio 5.1CH DTS/DOLBY y=09: HDMI 4K@60Hz 4:4:4, 8-bit, Audio 7.1CH DTS/ DOLBY/HD y=10: HDMI 4K@60Hz 4:2:0, 8-bit, Audio 2CH PCM y=11: HDMI 4K@60Hz 4:2:0, 8-bit, Audio 5.1CH DTS/DOLBY y=12: HDMI 4K@60Hz 4:2:0, 8-bit, Audio 7.1CH DTS/ DOLBY/HD y=13: HDMI 1920x1200@60Hz, Audio 2CH PCM y=14: DVI 1920x1080@60Hz, Audio None y=15: DVI 1920x1200@60Hz, Audio None y=16: EDID pass-through (Copy from TX HDMI OUT) y=17: EDID pass-through (Copy from RX HDMI OUT) y=18: User Defined 1 y=19: User Defined 2	set tx edid 0 to 1	Set TX all EDID to 01: HDMI 1080p@60Hz, Audio 2CH PCM	1

Command Code	Function Description	Example	Feedback	Default
get tx edid x	Get TX input ports (x=0~2) EDID x=0: All inputs x=1: USB-C input x=2: HDMI input	get tx edid 0	TX USB-C EDID 01: HDMI 1080p@60Hz, Audio 2CH PCM TX HDMI EDID 01: HDMI 1080p@60Hz, Audio 2CH PCM	
get tx edid data x	Get TX input ports (x=0~2) EDID data x=0: All inputs x=1: USB-C input x=2: HDMI input	get tx edid data 0	TX USB-C EDID <00 FF FF FF….> TX HDMI EDID <00 FF FF FF….>	
set user edid x <y>	Set user defined EDID (x=0~2) to y x=0: User Defined 1 and User Defined 2 x=1: User Defined 1 x=2: User Defined 2 y=00 FF FF FF ….. (y is 256 bytes EDID data)	set user edid 1 <00 FF FF FF….>	User Defined 1 EDID is loaded	
get user edid x	Get user defined EDID (x=0~2) data x=0: User Defined 1 and User Defined 2 x=1: User Defined 1 x=2: User Defined 2	get user edid 1	<00 FF FF FF….>	
set tx downscale auto/on/off	Set TX HDMI output downscale mode auto: Automatically according to display's capability on: Force 1080p off: Bypass	set tx downscale auto	Set TX downscale mode to auto	auto
get tx downscale	Get RX downscale mode	get tx downscale	Auto	
set tx audio mute on/off	Set TX de-embedding audio mute on/off	set tx audio mute on set tx audio mute off	Set TX de-embedding audio mute on Set TX de-embedding audio mute off	off
get tx audio mute	Get TX de-embedding audio mute on/off status	get tx audio mute	Mute on	
set rx output display y	Set RX output display mode (y=0~3) y=0: Off (disable TMDS output) y=1: Input video y=2: AVMUTE y=3: Internal pattern	set rx output display 1	Set RX output display input video	

Command Code	Function Description	Example	Feedback	Default
get rx output display	Get RX output display mode	get rx output display	Input video	
set rx output hdcp y	Set RX output HDCP mode to (y=0~3) y=0: Signal management y=1: Auto (default, Follow sink) y=2: Force HDCP 1.4 y=3: Force HDCP 2.2	set rx output hdcp 1	Set RX output HDCP to auto	1
get rx output hdcp	Get RX output HDCP mode	get rx output hdcp	Auto	
set rx pattern x y	Set RX internal signal generator resolution (x=1~6) pattern (y=1~13) x=01: 4K60Hz x=02: 4K50Hz x=03: 4K25Hz x=04: 4K24Hz x=05: 1080P60Hz x=06: 480P60Hz y=01: Black y=02: Checkboard y=03: Strip y=04: Red y=05: Green y=06: Blue y=07: White y=08: Ramp y=09: Red ramp y=10: Green ramp y=11: Blue ramp y=12: PRBS	set rx pattern 1 2	Set RX pattern 4K60Hz checkboard	
get rx pattern	Get RX internal pattern generator output resolution and pattern	get rx pattern	RX pattern 4K60Hz checkboard	
set rx downscale auto/on/off	Set RX downscale mode auto: Automatically according to display's capability on: Force 1080p off: Bypass	set rx downscale auto	Set RX downscale mode to auto	auto
get rx downscale	Get RX downscale mode	get rx downscale	Auto	

Command Code	Function Description	Example	Feedback	Default
set rx audio mute on/off	Set RX de-embedding audio mute on/off	set rx audio mute on set rx audio mute off	Set RX de-embedding audio mute on Set RX de-embedding audio mute off	off
get rx audio mute	Get RX de-embedding audio mute on/off status	get rx audio mute	Mute on	
set rx usbd5v x to y	Set RX USB device output (x=0~4) 5V to (y=0~2) x=0: All USB device ports x=1: USB device 1 x=2: USB device 2 x=3: USB device 3 x=4: USB device 4 y=0: Disable 5V output y=1: Follow host y=2: Force 5V always output	set rx usbd5v 0 to 1	Set RX all USB device output 5V follow host	1
get rx usbd5v x	Get RX USB device output (x=0~4) 5V status x=0: All USB device ports x=1: USB device 1 x=2: USB device 2 x=3: USB device 3 x=4: USB device 4	get rx usbd5v 0	RX USB device 1 output 5V follow host RX USB device 2 output 5V follow host RX USB device 3 output 5V follow host RX USB device 4 output 5V follow host	
set display x auto power function on/off	Set display (x=0~2) auto power function on/off when input signal is on/off x=0: All outputs x=1: TX HDMI output x=2: RX HDMI output	set display 0 auto power function on	Set all outputs auto power function on	off
get display x auto power function	Get display (x=0~2) auto power function on/off status x=0: All outputs x=1: TX HDMI output x=2: RX HDMI output	get display 0 auto power function	All outputs auto power function on	
set display x auto power on/off time y	Set display (x=0~2) auto power on/off after period time y when input signal is on/off x=0: All outputs x=1: TX HDMI output x=2: RX HDMI output y= 0~1200sec	set display 0 auto power on time 5 set display 0 auto power off time 50	Set all outputs auto power on after 5sec when input signal is on Set all outputs auto power off after 50sec when input signal is off	5

Command Code	Function Description	Example	Feedback	Default
get display x auto power on/ off time	Get display (x=0~2) auto power on/off after period time y when input signal is on/off x=0: All outputs x=1: TX HDMI output x=2: RX HDMI output	get display 0 auto power on time	All outputs auto power on time 5sec	
set display x power on/off	Set display (x=0~2) power on/off x=0: All outputs x=1: TX HDMI output x=2: RX HDMI output output	set display 0 power on set display 0 power off	Set all outputs power on Set all outputs power off	off
set display x control type y	Set display (x=0~2) power on/off control type (y=1~3) x=0: All outputs x=1: TX HDMI output x=2: RX HDMI output y=1: CEC y=2: RS-232 y=3: CEC and RS-232	set display 0 control type 1	Set all outputs control type CEC	CEC
get display x control type	Get display (x=0~2) power on/off control type x=0: All outputs x=1: TX HDMI output x=2: RX HDMI output	get display 0 control type	All outputs control type CEC	
set display x cec y	Set display (x=0~2) CEC command (y=1~5) x=0: All outputs x=1: TX HDMI output x=2: RX HDMI output y=1: Power on y=2: Power off y=3: Volume up y=4: Volume down y=5: Mute	set display 0 cec 1 set display 0 cec 2	Set all outputs CEC power on Set all outputs CEC power off	
set serial x setting y	Set serial port (x=0~2) setting to y x=0: TX/RX RS-232 x=1: TX RS-232 x=2: RX RS-232 y= 115200-8n1 Baud rate: 115200/57600/ 56000/38400/19200/9600/ 4800/2400 Data bits: 9/8 Parity: n(None)/ o(Odd) / e(Even) Stop bits: 1/2	set serial 2 setting 115200-8n1	Set RX RS-232 115200-8n1	115200-8n1

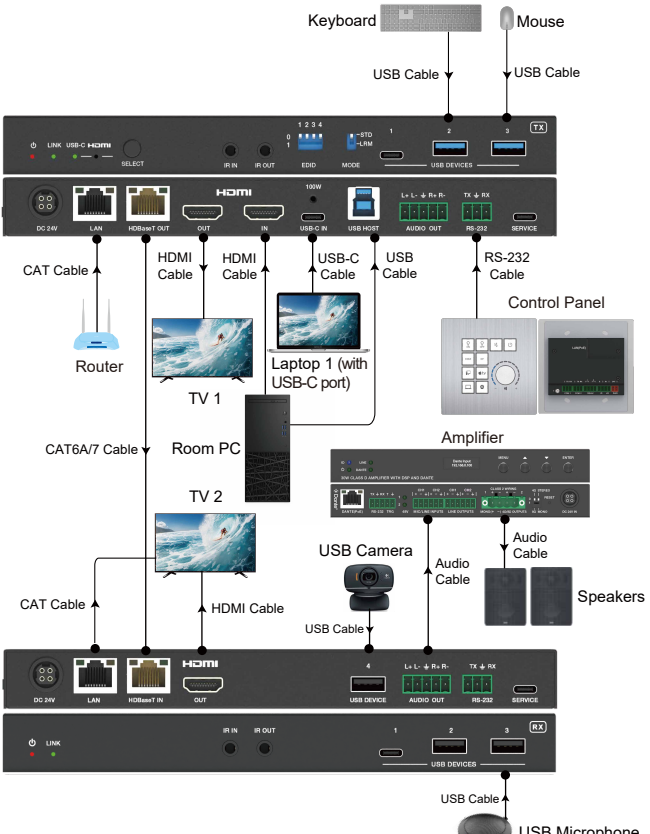
Command Code	Function Description	Example	Feedback	Default
get serial x setting	Get serial port (x=0~2) setting x=0: TX/RX RS-232 x=1: TX RS-232 x=2: RX RS-232	get serial 0 setting	TX RS-232 115200-8n1 RX RS-232 115200-8n1	
set serial x HEX/ ASCII power on <y1> delay <y2> input <y3> delay <y4>	Set serial port (x=0~2) HEX/ASCII power on <y1> delay <y2> input <y3> x=0: TX/RX RS-232 x=1: TX RS-232 x=2: RX RS-232 Command format is HEX or ASCII y1= RS-232 power on command, support multiple commands using comma separated(,) y2= 0~1200sec y3= RS-232 input port selection, support multiple commands using comma separated(,) y4= 0~1200sec NOTE: delay <y2> input <y3> delay <y4> can be NULL	set serial 1 ASCII power on <PWR ON1> delay <10> input <INPUT2> delay<1> set serial 2 ASCII power on <PWR ON> set serial 2 hex power on <50 4f 57 45 52,4f 4e,36 36 36> delay <1> input <49 4e 50 55 54 31,49 4e 50 55 54 32> delay <4>	Set TX RS232 ASCII power on <PWRON1> delay <10> input <INPUT2> delay <1> Set RX RS-232 ASCII power on <PWRON> Set RX RS232 HEX power on <50 4f 57 45 52,4f 4e,36 36 36> delay <1> input <49 4e 50 55 54 31,49 4e 50 55 54 32> delay <4>	
get serial x power on command	Get serial port (x=0~2) power on command x=0: TX/RX RS-232 x=1: TX RS-232 x=2: RX RS-232	get serial 0 power on command	TX RS-232 ASCII power on <PWRON> delay <10> input <INPUT1> RX RS-232 ASCII power on <PWRON>	
set serial x HEX/ ASCII power off <y1> delay <y2>	Set serial port (x=0~2) HEX/ASCII power off <y1> delay <y2> x=0: TX/RX RS-232 x=1: TX RS-232 x=2: RX RS-232 Command format is HEX or ASCII y1= RS-232 power off command, support multiple commands using comma separated(,) y2= 0~1200sec NOTE: delay <y2> can be NULL	set serial 1 ASCII power off <PWROFF> set serial 2 HEX power off <66 77, 88 99>	Set TX RS-232 ASCII power off <PWROFF> Set RX RS-232 HEX power off <66 77, 88 99>	

Command Code	Function Description	Example	Feedback	Default
get serial x power off command	Get serial port (x=0~2) power off command x=0: TX/RX RS-232 x=1: TX RS-232 x=2: RX RS-232	get serial 0 power off command	TX RS-232 ASCII power off <PWROFF> delay <1> RX RS-232 HEX power off <66 77, 88 99>	
set hdbt update	Set SERVICE to HDBT UART for FW update	set hdbt update	HDBT update…	

Notes:
(1) The API command “set hdbt update” is for internal use only.
(2) The feedback of the command of “get status” is as following.

```
==========================================================================================
Status Info 4K HDMI/USB-C Extender
TX FW V1.00.01  RX FW V1.00.01

TX_Key   USB-C_5V   USB-B_5V   TX_Baud    RX_Baud    AutoSwitch    AutoSwitch_Mode
On       On         On         115200     115200     On            Signal_detection
USB-C_AccessNetwork
On

TxOutputFrom     RxOutputFrom     USB_Source
USB-C            Input video      Follow video

Input        Cable        Resolution       ColorSpace  ColorDepth  HDCP  EDID
01_USB_C     Connected    3840x2160p60     RGB         8bit        2.2   DIP_0000: EDID Auto
02_HDMI      Connected    3840x2160p60     RGB         8bit        Off   DIP_0000: EDID Auto

Output          Cable          Resolution       ColorSpace  ColorDepth  Downscale  HDCP
TX_HDMI_Out     Connected      3840x2160p60     RGB         8bit        Auto       Off
RX_HDMI_Out     Connected      3840x2160p60     RGB         8bit        Auto       Off

Display_AutoPower   On/Off   Time(s)   Control_Mode
TX_HDMI_Out         On       1         RS232
RX_HDMI_Out         On       1         RS232

USB_Device    USB_5V
TX_Device_1   Follow_host
TX_Device_2   Follow_host
TX_Device_3   Follow_host
RX_Device_1   Follow_host
RX_Device_2   Follow_host
RX_Device_3   Follow_host
RX_Device_4   Follow_host
==========================================================================================
```

8. Application Example



HIGH-DEFINITION MULTIMEDIA INTERFACE

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