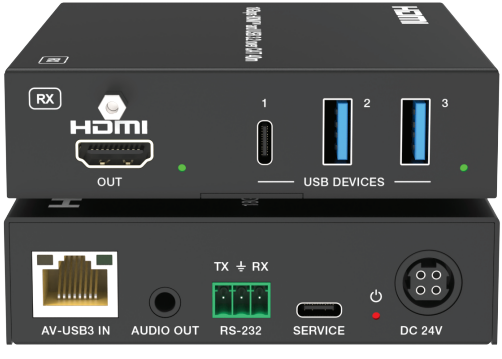
adertech

EXT-U5H-RX

5K60 HDMI™ and USB 3.2 Extender 40m over CAT (Receiver, HDMI OUT)



User manual

VER 1.0

Thank you for purchasing this product

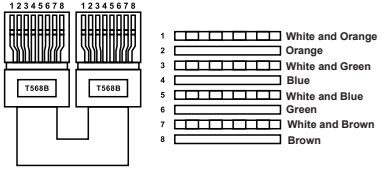
We have done everything possible to ensure that our equipment pleases our consumers. When solving any problems in the operation and connection ADERTECH equipment, it is best to contact authorized companies and specialists who work with our equipment. Our equipment is intended for professional use, so you have professional skills in using such equipment. ADERTECH is a manufacturer of a wide range of multimedia solutions.

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

Table of Contents

1. Introduction..... 1
2. Features..... 1
3. Package Contents..... 1
4. Specifications..... 2
5. Operation Controls and Functions..... 4
6. API Commands..... 5
7. Application Example..... 8

1. Introduction

The extender EXT-U5 series can extend 5K HDMI™ video and USB 3.2 data up to 130ft/40m via a single CAT6a cable. The receiver box (RX) features one HDMI™ output and three USB 3.2 downstream ports. It supports audio de-embedding, RS-232 signal pass-through and bi-directional 24V PoC function. The extender offers the most convenient solution for BYOD extension via a single CAT cable, and it is a perfect solution for commercial A/V applications.

2. Features

- ☆ 5K HDMI™ and USB 3.2 Extender with HDMI™ out
- ☆ Extend 5K@60Hz (4:4:4 8bit) and USB 3.2 Gen 1 signal up to 130ft/40m via a single CAT6a cable
- ☆ HDCP 2.3 compliant, to create a secure connection between the source and display
- ☆ USB 3.2 Gen 1 up to 2.5Gbps
- ☆ Features one HDMI™ output and three USB 3.2 downstream ports
- ☆ Supports audio de-embedding
- ☆ RS-232 pass-through
- ☆ HDR, HDR10+, Dolby Vision LLM and HLG pass-through
- ☆ Bi-directional 24V PoC (power over cable), when TX or RX gets power, the other end does not need an external power supply

3. Package Contents

① 1× 5K60 HDMI™ and USB 3.2 Extender (Receiver)
② 1× 3-pin 3.5mm Phoenix Connector
③ 2× Mounting Ear
④ 4× Machine Screw
⑤ 1× User Manual

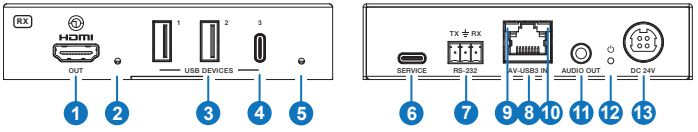
4. Specifications

Technical	
USB Protocol	USB 3.2 Gen 1
Transmission Rate	Up to 2.5Gbps
HDCP Compliance	HDCP 2.3 and HDCP 1.x
HDMI™ Compliance	HDMI™ 2.0b
HDMI™ Video Bandwidth	18Gbps
HDMI™ Video Resolution (Input & Output)	640x480p60Hz, 800x600p60Hz, 1024x768p60Hz, 1280x1024p60Hz, 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), 2560x1080p60Hz, 3440x1440p60Hz, 3840x2160p23.98Hz(2160p23), 3840x2160p24Hz(2160p24), 3840x2160p25Hz(2160p25), 3840x2160p29.97Hz(2160p29), 3840x2160p30Hz(2160p30), 3840x2160p50Hz(2160p50), 3840x2160p59.94Hz(2160p59), 3840x2160p60Hz(2160p60), 4096x2160p23.98Hz, 4096x2160p24Hz, 4096x2160p25Hz, 4096x2160p29.97Hz, 4096x2160p30Hz, 4096x2160p50Hz, 4096x2160p59.94Hz, 4096x2160p60Hz, 5120x1440p50Hz, 5120x1440p60Hz, 5120x2160p50Hz, 5120x2160p60Hz
HDR	HDR, HDR10, HDR10+, Dolby Vision, HLG
Color Depth	8/10/12-bit
Color Space	RGB, YCbCr_4:4:4, YCbCr_4:2:2, YCbCr_4:2:0
Audio Format	**HDMI™ OUT:** LPCM, 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 De-embedding:** LPCM 2CH (sample rate 32~192kHz)
Transmission Distance	40m/130ft via CAT6a (F/FTP) cable 1.5m/4.9ft via USB 3.2 Gen 1 5Gbps passive cable 3m/9.8ft via HDMI™ passive cable
ESD Protection	IEC 61000-4-2: ±8kV (Air-gap discharge), ±4kV (Contact discharge)

Audio Parameters	Output Level (Max)	2.2dBu(1Vrms) @balanced audio
	Frequency Response	20Hz to 20kHz (-/+0.5dB)
	Dynamic Range	>103dB@0dBu, 1kHzA-weighted
	Audio S/N Ratio	>103dB@0dBu, 1kHzA-weighted
	Audio THD+N	< 0.006%@+4dBu, 1KHz
	Audio Output Delay	<2ms
Connections		
Receiver	Input: 1× AV-USB3 IN [RJ45 connector, 24V PoC] Output: 2× USB-A [Downstream, 9-pin female] 1× USB-C [Downstream, 24-pin female] 1× OUT [HDMI™ Type A, 19-pin female] 1× AUDIO OUT [3.5mm audio jack] Control: 1× RS-232 [3pin-3.5mm phoenix connector] 1× SERVICE [USB-C, firmware update port]	
Mechanical		
Housing	Metal Enclosure	
Color	Black	
Dimensions	Receiver: 118mm [W] × 111mm [D] × 25.5mm [H]	
Weight	Receiver: 383g	
Power Supply	Input: AC 100~240V 50/60Hz; Output: DC 24V/2A (US/EU standards, CE/FCC/UL certified)	
Power Consumption	Receiver: 25.4W (Max)	
Operating Temperature	0°C ~ 40°C / 32°F ~ 104°F	
Storage Temperature	-20°C ~ 60°C / -4°F ~ 140°F	
Operating Humidity	20%~80% relative humidity, non-condensing	
Storage Humidity	10%~90% relative humidity, non-condensing	

5. Operation Controls and Functions

Receiver Panel



No.	Name	Function Description
1	HDMI OUT	HDMI signal output port, connected to a display device such as a monitor with HDMI cable.
2	HDMI OUT LED	The green LED will light up, when the HDMI OUT port is connected to a display device.
3	USB DEVICES 1/2	Downstream USB-A ports, with output power up to 5V/1.5A. Connect to USB devices such as U disk or hard disk.
4	USB DEVICES 3	Downstream USB-C port, with output power up to 5V/1.5A. Connects to USB device such as U disk or hard disk.
5	USB LED	USB signal indicator. ▪ **Light On:** USB 3.2 signal is detected. ▪ **Light Blinking:** USB 2.0 signal is detected. ▪ **Light Off:** 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, connected to a control system for RS-232 signal pass-through.
8	AV-USB3 IN	Connects to the AV-USB3 IN port on RX with CAT6a cable, used for AV and USB signal transmission and 24V PoC power supply.
9	LINK LED	Connection signal indicator. ▪ **Light On:** TX and RX are connected and linked. ▪ **Light Blinking:** TX and RX link is off due to low power mode. ▪ **Light Off:** TX and RX are not connected.

No.	Name	Function Description
10	VIDEO LED	▪ **Light On:** There is video signal transmission with HDCP encryption. ▪ **Light Blinking:** There is video signal transmission without HDCP encryption. ▪ **Light Off:** There is no video signal transmission.
11	AUDIO OUT	HDMI de-embedded audio output port, connected to an audio device.
12	Power LED	The red LED will light up, when the receiver is powered on.
13	DC 24V	DC 24V/2A power input port.

6. API Commands

The product supports API commands control. Connect the SERVICE port on the product to a PC, then open a Serial Command tool on PC to send API commands to control the product. The API commands list is shown below.

ASCII Commands				
SERVICE (USB-C port with virtual RS-232) communication protocol (Connect to laptop) Baud rate: 115200 (fixed), Data bit: 8, Stop bit: 1, Parity bit: none				
Commands	**Function**	**Example**	**Feedback**	**Default**
?	Get the list of all commands	?		
help	Get the list of all commands	help		
get version	Get all firmware version	get version	RX BOOT: V1.1.1 RX FW: V1.00.01 TX FW: V1.00.01 SUB MCU: V1.0.1	
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…	

Commands	Function	Example	Feedback	Default
status	Get system status	status	Please refer to the note at the end of the list.	
set rx output x source y	Set RX output x(0~4) video source from (y=0~3) 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 from tx input 1 RX output 1 source off	1
get rx output x source	Get RX output (x=0~4) video source	get rx output 1 source	RX output 1 source from tx input 1	
set rx output x hdcp y	Set RX output x(0~4) HDCP mode to (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
get rx output x hdcp	Get RX output (x=0~4) hdcp mode x=0:All Outputs x=1:Output 1	get rx output 1 hdcp	RX output HDCP follow sink	
get rx output x connected	Get RX output (x=0~4) cable connected status x=0:All Outputs x=1:Output 1	get rx output 1 connected	RX output 1 connected RX output 1disconnected	
get rx output x signal	Get RX output (x=0~4) 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	
set rx hdmi out x power x	Set RX HDMI output(x=0~4) 5V power to (y=0~2) x=0:All Outputs x=1:HDMI Output 1 y=0:Follow input y=1:Force HDMI out 5V power on y=2:Force HDMI out 5V power off	set rx hdmi out 1 power 1	HDMI out power force 5v always output	

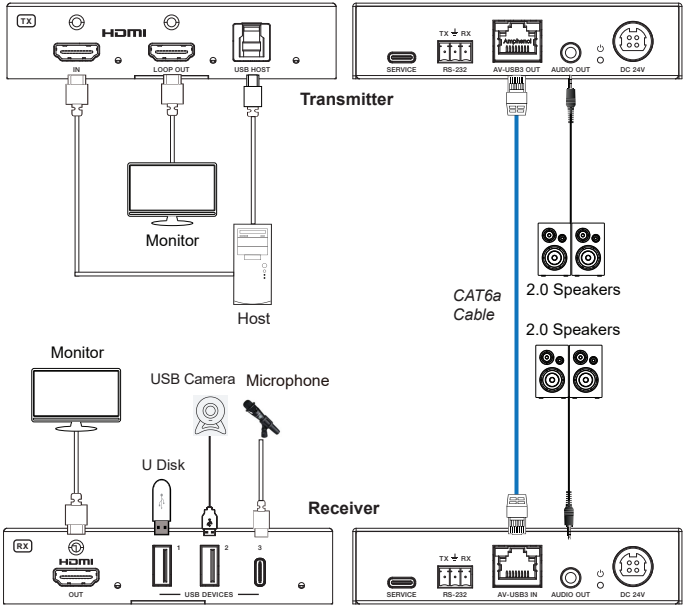
Commands	Function	Example	Feedback	Default
get rx hdmi out x power	Get HDMI output(x=0~n) 5V status	get rx hdmi out 1 power	HDMI out 1 power force 5v always on	
set rx usbd x power y	Set RX USB device ports (x=0~4) power to (y=0~2) x=0:RX all USB device ports x=1:RX USB device 1 x=2:RX USB device 2 x=3:RX USB device 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
get rx usbd x power	Get RX USB device ports (x=0~4) power status x=0:RX all USB device ports x=1:RX USB device 1 x=2:RX USB device 2 x=3:RX USB device 3	get rx usbd 0 power	RX all USB device ports power follow USB host power	
set hdbt update	Set SERVICE port to HDBT UART for FW update	set hdbt update	HDBT update…	

Note: The feedback of the command of “status” is as follow.

```
================================================================================
Status Info 5K HDMI 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   HDCP 2.3   TX_Input

RX_USB  USB_Power
RX_01   Follow_host
RX_02   Follow_host
RX_03   Follow_host
================================================================================
```

7. Application Example



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