ULTRA-4K

Dual 4K UHD, HDMI, and, & USB 2.0 Extender over a single CAT6 to 100m/328ft with 3-port splitter, sender, and Daisy-Chainable receiver

Instructions for Use

Rev. 1.0 — October 16, 2026



IMPORTANT SAFETY INSTRUCTIONS

1. Do not expose this apparatus to rain, moisture, dripping or splashing and that no objects filled with liquids, such as vases, shall be placed on the apparatus.
2. Do not install or place this unit in a bookcase, built-in cabinet or in another confined space. Ensure the unit is well ventilated.
3. To prevent risk of electric shock or fire hazard due to overheating, do not obstruct the unit's ventilation openings with newspapers, tablecloths, curtains, and similar items.
4. Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
5. Do not place sources of naked flames, such as lighted candles, on the unit.
6. Clean this apparatus only with dry cloth.
7. Unplug this apparatus during lightning storms or when unused for long periods of time.
8. Protect the power cord from being walked on or pinched particularly at plugs.
9. Only use attachments / accessories specified by the manufacturer.
10. Refer all servicing to qualified service personnel.

TABLE OF CONTENTS

TABLE OF CONTENTS **3**

INTRODUCTION **4**

Overview 4

Features 5

PACKAGE CONTENTS **6**

ULTRA-4K-S 6

ULTRA-4K-R 6

SETUP **7**

Installation 7

DisplayPort Adapters 7

CONNECTORS & INDICATORS **9**

ULTRA-4K-S (front) 9

ULTRA-4K-S (back) 9

ULTRA-4K-R (front) 10

ULTRA-4K-R (back) 11

TROUBLESHOOTING **12**

SPECIFICATIONS **13**

Sales, Marketing & Customer Support 14

INTRODUCTION

Overview

The ULTRA-4K is comprised of the ULTRA-4K-S Sender and the ULTRA-4K-R Receiver. The system is used to extend USB 2.0 and dual display HDMI video supporting various resolutions including 1080p @ 60 Hz and 4K UHD @ 30 Hz. Dual video and USB can be extended to one or more Receivers up to a distance of 100 m (328 ft.) over a single CAT6 cable.

The Sender features two HDMI inputs and one USB input for connection to a dual-head PC. It provides two local HDMI outputs (corresponding to the two HDMI inputs) and features an internal USB hub with two local USB outputs. Additionally, there are three separate RJ45 output ports to extend video and USB to multiple remote locations.

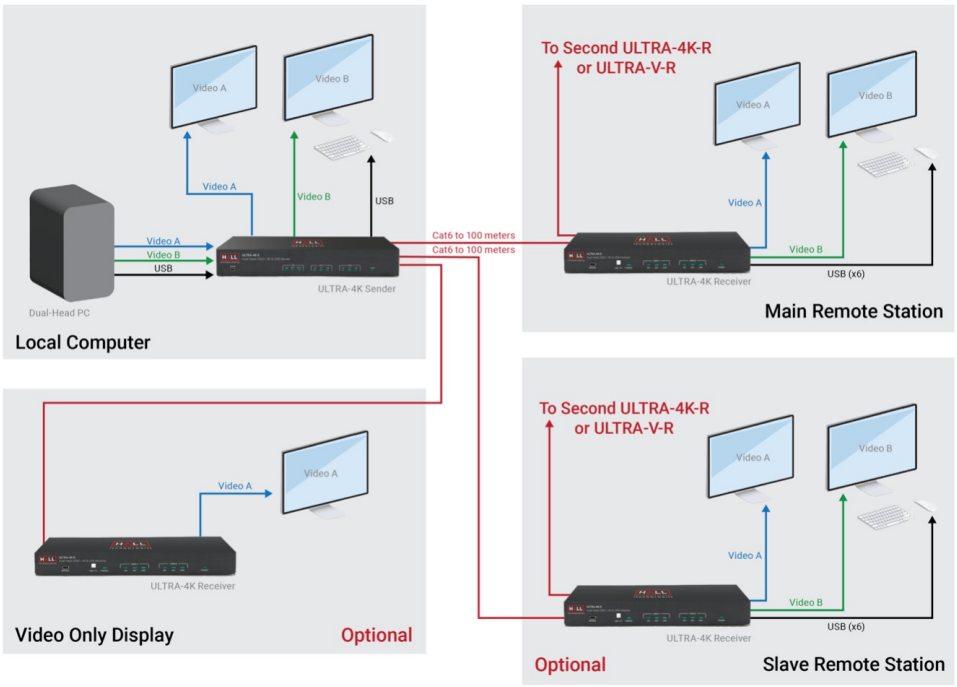
The Receiver provides two HDMI outputs and 6 USB ports. Two of the USB ports are labeled for use with keyboard and mouse; however, they can also be connected to other USB devices such as KVM switches or touchscreen displays if desired.

For connection of other USB devices such as printers or scanners, four additional general-purpose USB 2.0 ports are available. For security purposes, USB memory devices are not supported by default. If you want to enable USB memory support, please contact Hall Research.

In a setup with one sender going to only one Receiver, the USB ports automatically pair with the Sender. However, when there are more than one ULTRA-4K Receiver connected to the same sender, only one Receiver can be paired at a given time. Pairing is accomplished using a push button on the front panel of the Receiver. A corresponding LED next to the button indicates USB pairing status with the Sender.

Each Receiver features an RJ45 “LINK OUT” port that can be daisy-chained to down-stream Receivers. All signals are re-buffered, so the LINK OUT port can drive cables to 100 meters long.

It is important to note that the RJ45 output ports (on the Sender or the Receiver), can also be connected to ULTRA-V Receivers. ULTRA-V Receivers provide only one video output and no USB. The ULTRA-V Receivers show Video A by default; however, they can be configured to display Video B if desired. Please refer to the ULTRA-V User’s Manual for further details.



Typical Connection Diagram

Features

- Supports high resolution HDMI video including FHD. (1920x1080), WQHD (2560x1440), and 4K UHD (3840x2160)
- Two video streams and one USB port extended over a single CAT6 cable up to 100 m/328ft.
- Full plug-and-play support with USB keyboard, mouse, and connected peripherals.
- Computer OS independent – No driver or software required.
- Local HDMI and USB output on the Sender
- Three Sender extension outputs and one Receiver daisy-chain output to distribute video to multiple locations.
- No video calibration required, no video quality reduction due to cable length or resolution.
- Locking power supply connector to prevent inadvertent disconnection.
- Sender includes mounting ears for standard 19” rack; Receiver includes mounting brackets for surface mounting.

PACKAGE CONTENTS

ULTRA-4K-S

- 1x ULTRA-4K-S
- 2x Rack mount ears and screws
- 1x power supply (Hall P/N 511-IEC5V4AP5L, MFG P/N 3A-186DB05)
- 1x user manual card

ULTRA-4K-R

- 1x ULTRA-4K-R
- 2x Surface-mount brackets
- 1x power supply (Hall P/N 511-IEC5V4AP5L, MFG P/N 3A-186DB05)
- 1x user manual card

SETUP

Installation

- Connect the PC HDMI outputs to the ULTRA-4K-S ports marked “HDMI A IN” and “HDMI B IN” using quality HDMI cables.
- Connect the PC USB to the ULTRA-4K-S port marked “USB IN” using a USB cable.
- Optionally, connect HDMI displays to HDMI A/B OUT ports, and USB peripherals to the USB LOCAL ports.
- Using a CAT6 cable, connect the ULTRA-4K-S “link out” port to the ULTRA-4K-R “link in” port.
- Connect remote HDMI displays to the ULTRA-4K-R HDMI A and HDMI B output ports.
- Connect keyboard, mouse, KVM Switch, or touchscreens to the ULTRA-4K-R ports marked as KBRD/MOUSE
- Optionally, connect other USB devices to any of the USB 2.0 ports.
- Optionally, connect external speakers to “audio out” to use audio from “HDMI A” or “AUDIO INPUT” of ULTRA-4K-R.

DisplayPort Adapters

While HDMI is the most widely adopted video standard, there are a number of computer and display manufacturers that rely on DisplayPort for higher resolutions such as 2560 or 4K. Hall Research offers 4K compatible adapters to convert between these two video standards.

> **NOTE:** These adapters are unidirectional. For example, the DisplayPort to HDMI adapter cannot convert a HDMI signal to DisplayPort.

To connect to a source (PC) with DisplayPort output, use GC-DP-HD.



Model GC-DP-HD: DisplayPort source to HDMI output

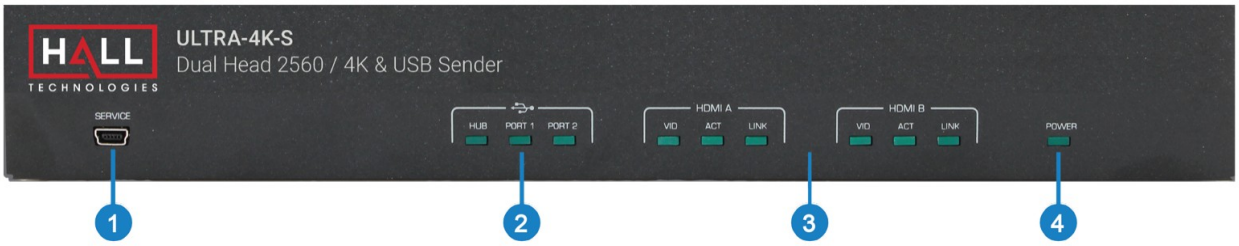
Virtually all monitor and TV’s have HDMI (or DVI) inputs. But if your display only has a display port input, the following adapter converts HDMI to DP.



Model GC-DP-HD: DisplayPort source to HDMI output

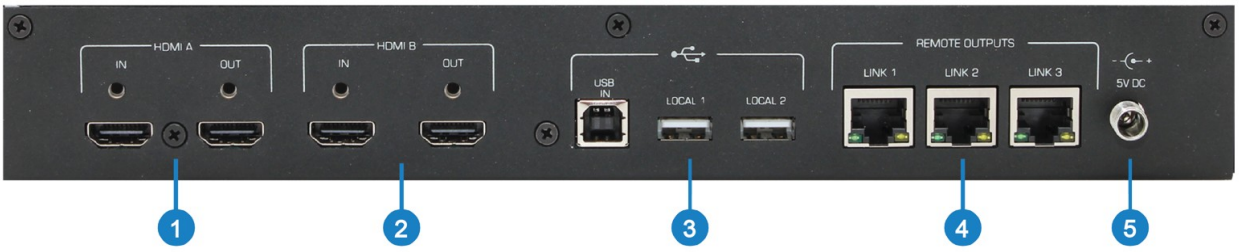
CONNECTORS & INDICATORS

ULTRA-4K-S (front)



No.	Name	Description
1	SERVICE	• USB-Mini connection, used for upgrading firmware or configuring parameters such as EDID via free PC GUI.
2	USB HUB	• LEDs show presence of USB input and local devices. The Hub LED indicates that the hub is active (note that PC/Host has the ability to put the hub in “selective suspend” mode in which case the Hub LED will turn off. Hosts usually do this if no downstream devices are connected to the hub. The Port 1 and 2 LEDs correspond to the two USB (type A) ports available on the rear panel. They should be on if there is a USB device connected to them.
3	VID/LINK	• Status indicators of HDMI A/B - VID: This LED is lit when HDMI video input is present. - ACT: This LED blinks when HDMI extender core processor is active (normal)
4	POWER	• Power LED lights when power is supplied.

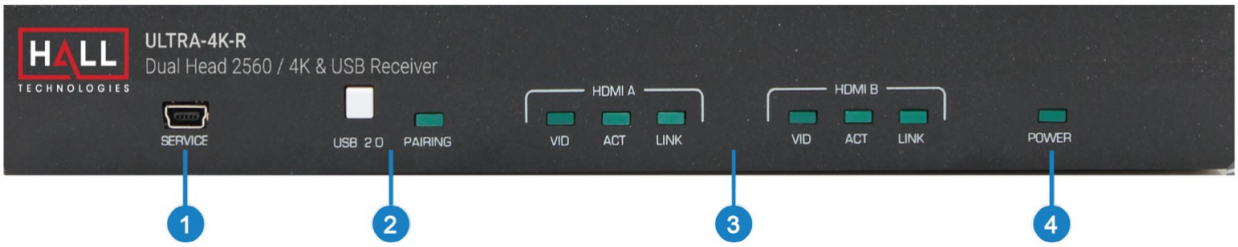
ULTRA-4K-S (back)



No.	Name	Description
1	HDMI A IN/OUT	HDMI A input port and local output. HDMI A IN is extended to ULTRA-4K-R HDMI A OUTPUT.
2	HDMI B IN/OUT	HDMI B input port and local output. HDMI B IN is extended to ULTRA-4K-R HDMI B OUTPUT.

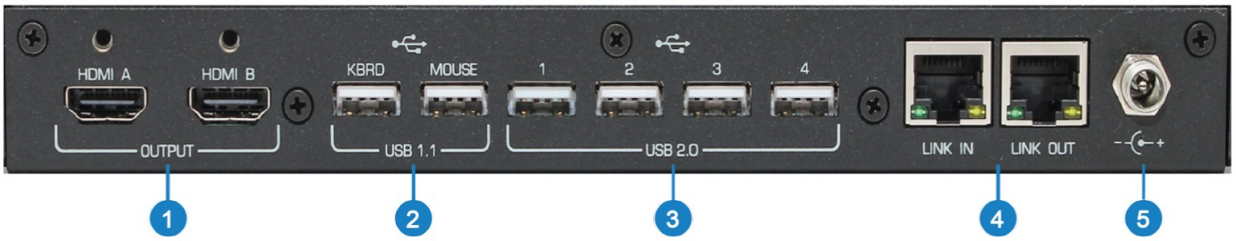
No.	Name	Description
3	USB IN/LOCAL1/LOCAL2	USB input port, and local outputs. USB IN is extended to ULTRA-4K-R USB 1.1/USB 2.0 ports.
4	REMOTE OUTPUTS/LINK 1/LINK2/LINK3	Three separate outputs for connection to remote ULTRA-4K-R receivers. Use CAT6 cable to extend up to 100 m/328 ft. - GREEN LED on left side of ports indicates an active link to ULTRA-4K-R or ULTRA-V-R.
5	5V DC	Power input. Connect supplied 5V DC locking power supply to power sender.

ULTRA-4K-R (front)



No.	Name	Description
1	SERVICE	• USB-Mini connection, used for upgrading firmware or configuring parameters such as USB Mass Storage Class device filtering via free PC GUI.
2	USB 2.0 PAIRING	• When only one receiver is connected to a sender, the receiver will automatically pair by default and then the PAIRING LED will be on. If multiple receivers are connected, the user needs to decide which receivers USB ports is to be paired with the sender. To change pairing to a different receiver, press the button and the PAIRING LED will light. If the pairing LED is solidly lit, the receiver has successfully paired with the sender, but if it is blinking, the pairing was unsuccessful, and you should press the pairing button again until the LED is solidly lit.
3	HDMI A/B VID/LINK	• Status indicators of HDMI A/B - VID: This LED is lit when HDMI video is being output. - ACT: This LED blinks when HDMI processor is active (normal) - LINK: This LED indicates the system is actively receiving video and data. Blinks if system is not receiving video.
4	POWER	• Power LED lights when power is supplied.

ULTRA-4K-R (back)



No.	Name	Description
1	HDMI A/HDMI B OUTPUT	Outputs HDMI from ULTRA-4K-S HDMI A/HDMI B Input ports respectively.
2	USB 1.1/KBRD/MOUSE	Connect keyboard/mouse/KVM switchers or other HID input devices including touchscreens to K/M ports.
3	USB 2.0	These are general purpose ports for other USB devices such as printers or scanners. By default, USB memory devices are not allowed, and these USB ports do not support USB webcams.
4	LINK IN/LINK OUT	LINK IN receives video/USB from ULTRA-4K-S; LINK OUT is used to daisy-chain to another ULTRA-4K-R or ULTRA-V-R.
5	5V DC	Power input. Connect supplied 5V DC locking power supply to power receiver.

TROUBLESHOOTING

If you are experiencing problems getting the ULTRA-4K to work properly, please use the following troubleshooting suggestions.

- Ensure that all connections are secure. Check all status LEDs to ensure proper operation.
- Try resetting the system by unplugging the power supply, waiting 5 seconds, and plugging it back.
- Try restoring factory defaults using the PC GUI.

SPECIFICATIONS

Specification	ULTRA-4K
Video	
Standards	DVI (single link)
Connectors	**ULTRA-4K-S** 2x HDMI inputs, 2x HDMI outputs 1x USB-B host port, 2x USB-A device ports 3x RJ45 Link outputs 1x 2.1 mm locking DC power input **ULTRA-4K-R** 2x HDMI outputs 2x USB-A 1.1 device ports 4x USB-A 2.0 device ports 1x RJ45 link input, 1x RJ45 link output 1x 2.0mm locking DC power input
Resolutions	**PC** VGA to WQXGA (2560x1600) **HDTV** 480p to 4K UHD including QHD (2560x1440)
Refresh Rates	60 Hz for resolutions up to and including HD (1920x1080) and WUXGA (1920x1200) 30 Hz for resolutions above and including QHD (2560x1440)
Other Signals	
USB	ULTRA-4K-S: USB 2.0 (2) from built-in hub ULTRA-4K-R: USB 1.0 (2) and USB 2.0 (4)
General	
Power Supply	100 VAC to 240 VAC, 47-63 Hz, External; 5 VDC
Temp/humidity	Storage: -40 to +158 degrees F (-40 to +70 degrees C)/ 10% to 90%, non-condensing Operating: +32 to +122 degrees F (0 to +50 degrees C) / 10% to 90%, non-condensing
Typical DC	5 VDC, 4.0 A power supply
Current Draw	ULTRA-4K-S: 2.5 A DC depending on # and type of connected USB devices. ULTRA-4K-R: 1.5 A DC depending on # and type of connected USB devices.
Cooling	Convection
Enclosure Type	Metal (Steel)

Specification	ULTRA-4K
Dimensions	ULTRA-4K-S: 6.09” L x 11.23” W x 1.66” H ULTRA-4K-R: 5.04” L x 9.00” W x 1.12” H
Product Weight	Model only ULTRA-4K-S: 2.8 lbs (1.3 Kg) ULTRA-4K-R: 1.3 lbs (0.6 Kg) Shipping ULTRA-4K-S: 4.4 lbs (2.0 Kg) ULTRA-4K-R: 3.1 lbs (1.4 Kg)
MTBF	90,000 hours (estimate)
Warranty	3 years parts and labor
Certifications	
Safety	CE
EMI/EMC	CE, FCC, Class A
Certifications	CE, FCC, RoHS

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Sales, Marketing & Customer Support

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