



UHBX-R-WP

**HDBaseT Wall Plate Receiver with IR
and RS232 Control**

Extends uncompressed HDMI to 150m

UMA1245 Rev 1

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FCC RADIO FREQUENCY INTERFERENCE STATEMENT

This device complies with part 15 Class A of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation. Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.



1.0 Introduction

The UHBX-R-WP is a compact HDBaseT receiver in a wall plate. Perfectly suited for installations with shallow space between the wall and display, the receiver extends HDMI, IR and RS232 to 150m (500ft). The Receiver is powered via HDBaseT from the sender and no additional power supply is needed. RS232 and bi-directional IR ports are perfect for control. The unit is compatible with any compliant HDBaseT Transmitter (sender) with PoH sourcing function such as Hall Research UHBX-S-PSE (see [section 3.1](#) for a list of compatible senders).

The UHBX-R-WP has a Mini-USB port (located inside enclosure) which is used to access the device's advanced settings or update its firmware using Windows® GUI software (available on the product's webpage).

The UHBX-R-WP graphical user interface (GUI) is a Windows® software used to view the HDBaseT® input status, to configure advanced settings such as power management, or to update firmware version of the device. Use of the software requires USB connection the device and a Windows® PC. For convenience, a USB cable is provided with the receiver.

1.1 Block Diagram

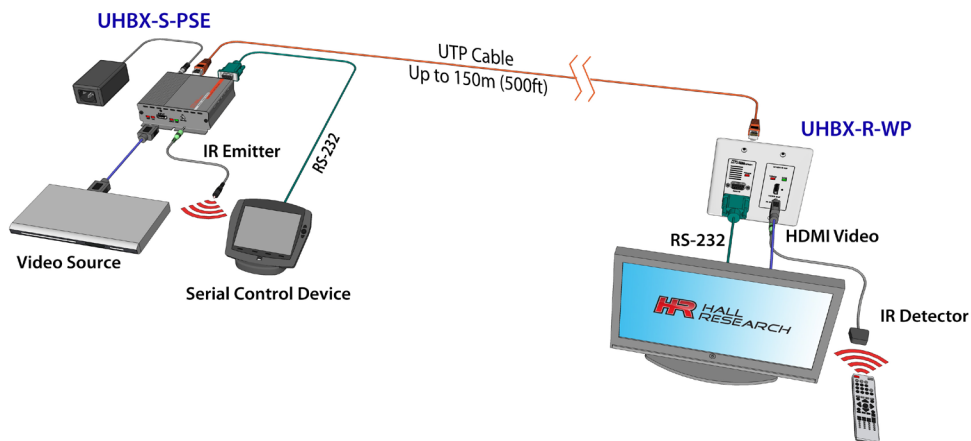


Figure 1 – Block Diagram

The maximum distance between the sender and receiver in Long Reach mode is 150 meters (500 ft). Long Reach mode does not support 4K video or higher than 8 bit color depth. In Standard mode, it is 100 meters (330 ft) for 1080p video or 70 meters (230 ft) for 4K video.

The Distance Mode Switch is located on the circuit board and accessible by removing the wall-plate cover (see [section 4.1](#))

2.0 Features

- Extends uncompressed HDMI video, RS232, and IR, up to 500 feet on a single CAT6 cable
- Supports HDCP, 3D, Deep color, and 4K (UHD) video
- Supports bidirectional RS232 and IR extension
- Supports virtually all HDMI and DVI PC and HDTV resolutions
- PoH powered from the sender, no additional power supply needed
- Meets IEEE 802.3af standard for Power-over-HDBaseT (PoH)
- Complies fully with HDBaseT standard
- IR extension supports 30 KHz to 60 KHz modulation to provide compatibility across all IR standards
- Fully isolates ground between TX and RX sides
- Compact, Rugged, Reliable, and Economical
- Made in the USA

2.1 Package Contents

Qty (1) UHBX-R-WP

Qty (1) 1m/3ft Type A USB to Mini-USB Cable

Qty (1) Mud Ring for drywall installation

Qty (1) User's Manual



Figure 2 – Mud-ring for drywall installation included in the package

3.0 Setup

3.1 Installation

- The UHBX-R-WP is an HDBaseT™ receiver, meaning that a compatible transmitter (sender) must already exist in the system. Hall Research provides various compatible transmitters, from economical video only, to video, plus RS232 for control, and IR extension. The Table below lists recommended senders and their characteristics.

Sender P/N	Description	Video	RS232	IR	PoH
UH-1BT-S 	HDBaseT Sender Requires 511-POH-17W PoH injector	✓			
UH-1BTX-S 	HDBaseT Sender Requires 511-POH-17W PoH injector	✓			
UHBX-S 	HDBaseT Sender with Bidirectional IR, and RS232 Requires 511-POH-17W PoH injector	✓	✓	✓	
UHBX-S-PSE 	HDBaseT Sender with Bidirectional IR, and RS232	✓	✓	✓	✓
UHBX-3S 	HDMI on HDBaseT™ 1x3 Splitter (3 HDBaseT outputs, and one HDMI local output) (Requires 511-PS4812 Power Supply)	✓	✓		✓
UHBX-8X 	8 channel HDMI to HDBaseT™ converter (with 8 HDMI inputs and 8 HDBaseT outputs) (Requires 511-PS4812 Power Supply)	✓	✓	✓	✓

Connect a good quality HDMI cable to the HDMI output of the unit to a display device. The HDMI output connector on the box has a locking nut above it. Hall Research offers compatible locking HDMI cables.



Figure 3 – C-HDMI-L locking HDMI cable

If IR Extension is required, connect compatible I.R. Emitter and detector cables to the respective 3.5 mm connectors. Recommended IR emitter: p/n [CIR-EMT](#) and IR detector cable: p/n [CIR-DET-P2](#).

4.0 Configuration

As shipped, no user configuration is needed for extending HDMI video. By default the length of CAT6 cable plugged to the input can be as long as 150 meters (500 ft).

To achieve 150m, the receiver has to be in "Long Reach" distance mode setting. If the HDBaseT "Source Device" connected to the input of the receiver also supports "Long Reach" operation, 1080p video (with 8-bit color) can be extended to 150m (500 ft).

If RS232 control output is going to be used (for example to control on/off function of compatible TV or projector connected to the HDMI output, please refer to [section 4.3](#) below.

4.1 Distance Mode Switch

This switch affects the operation at the HDBaseT input. It is recommended to leave it in Auto (standard) position. In LR mode, UTP cable lengths of up to 150 m can be accommodated but deep color and 4K video are not supported.

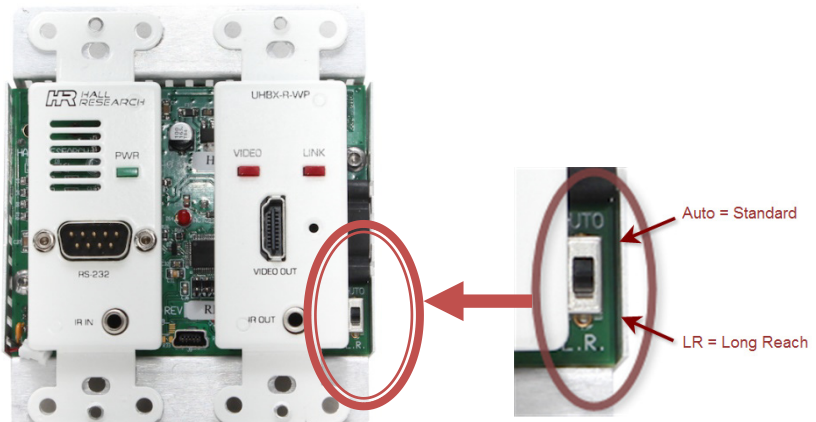


Figure 4 – Location of Distance Mode Switch on the Circuit board

The slide switch is located on the right side of the IR OUTPUT connector on the PC board. To change the setting, open the metal plate and slide the switch to desired position using the tip of a pencil or a small screw driver.

Mode	UTP Length	Notes
Auto	0 to 100 m (330ft)	Default setting (supports deep color & 4K)
L.R.	0 to 150 m (500ft)	Long Reach setting (supports up to 1080p)

4.2 LED Indicators

The front panel of the wall plate contains LEDs that show the state of operation.



Figure 5 – LED Indicators

POWER	Used as power indicator. Comes on after the wall plate successfully negotiates PoH and gets power from the PSE sender (or power inserter). If it is lit dimly (or blinking) , it means that PoH function is working but there is some sort of other malfunction on the board such as over temperature (it will go to low power mode and automatically recover when temperature is back to acceptable range), or HDBaseT logic circuit is experiencing problems.
VIDEO	Displays Video Status. Off = No Video being received, Blinking = Video without HDCP is being received, Solid ON = Video with HDCP is received
LINK	Solid on means the HDBaseT input is connected to and communicating with the up-stream sender. Blinking means Link has been established but the unit is in low power mode. Off means the HDBaseT link to the sender is not working (check cable length, cable quality, connection integrity).

4.3 More on RS-232 Serial Connection and Operation

If required, plug DB9 null modem RS232 cable from the Receiver to the device being controlled (such as a projector or switcher). Pin out of the Male RS232 connector on the sender is shown below

DB9-M Pin	Term	Direction
2	RX	Input
3	TX	Output
5	GND	

The UHBX-R-WP supports bidirectional RS232 and communicates with a host through its HDBaseT input at a baud rate ranging from 110 thru 115200.

4.3.1 Power Management and RS-232 Operation

By default “Power Management” is turned on. This means that if there is no video being extended, after some time, the system will place it’s HDBaseT link in low power mode (and consume only about 10% of normal power). The system will wait for HDMI source signal to become active (and for HPD from connected TV to be asserted) and will wake up on its own.

A characteristic of HDBaseT chipset is that in low power mode it only supports RS-232 up to 9600 baud. So if power mgmt is active (default) and

you want to send RS-232 commands having higher baud-rate than 9600, the data may not go through when there is no video being extended.

The UHBX-R-WP does have a wakeup on RS-232 function so even if it is in low power mode, it will wake up and go into full power mode if it detects RS-232 data coming through. Therefore users may have to send the command twice if there is no video. The first command wakes up the system and after a short delay, the repeated command will go through error free.

If you are using RS-232 communication when there is no video and do not want to send commands twice as described above, then you can turn the power management feature **off**. This is done by connecting the mini-USB port on the wall-plate (under the front cover) to a Windows® PC and using GUI disable the Power Management feature. When power mgmt is off, the HDBaseT link will stay fully awake even if there is no video. This will increase power consumption.

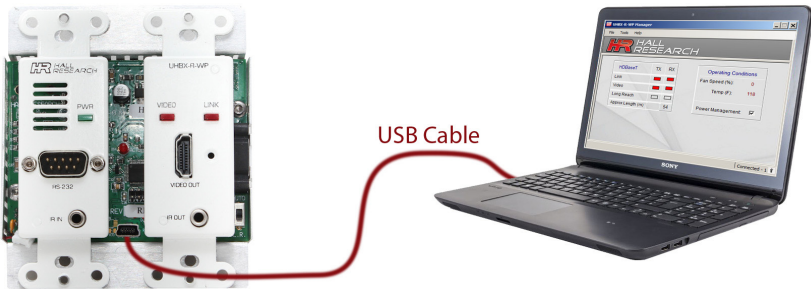


Figure 6 – Connection to a Windows® PC for using the GUI

5.0 Troubleshooting

If you are experiencing problems getting the extender to work properly, please use the following troubleshooting suggestions.

- Make sure that all of the connections on both the sender and the receiver are solid. Loose connections are the number one cause of issues.
- Try resetting the system by unplugging the power supply connected to the sender side, waiting 5 seconds and plugging it back.
- Check the state of the LED's on the front of both the sender and the receiver. Refer to the table in section [4.2](#) to interpret the status being indicated. Alternatively, hookup the USB port to a PC and run the Windows® GUI and check the status indicators in the GUI.
- If the cable length is longer than 100 meters (330 ft) set the Mode on the sender to L.R. (Long Reach) position (see section [4.1](#)). Note that in L.R. mode the unit does not support deep-color video.

- Make sure the display is compatible with the video source by connecting them directly.
- Make sure that the UTP or STP cable meets the requirements. Never use low-skew cable for digital video extension. We recommend using CAT6 or CAT6a. In noisy environments use Shielded Cat6 (23 gauge).
- The extender requires that the source DDC signals of its HDMI output operate at 100 KHz or less and support clock-stretching. The vast majority of sources meet these requirements. But if you determine that a particular source does not (by substituting a video pattern generator, or a different source), an HDMI transceiver may be needed. Hall Research offers the model HD-AUD that has a compatible output, can handle virtually any HDMI input, and can resolve source incompatibility issues.

If you still are not able to get the system working properly, contact Hall Research support (preferably via email or the form on support page of www.hallresearch.com) with a detailed description of the issue and the troubleshooting steps you have taken.

Do not open or try to repair the unit yourself as this will void your warranty. To return the extender for repair, you must contact HR Support at 714-641-6607 or via email or web. To ship the unit back for repair, make sure to obtain a Return Material Authorization (RMA) number.

6.0 Specifications

Video

Standards	DVI (single link) and HDMI (compliant with HDMI 1.4 and 2.0 video specifications including 12 bit color depth, 3D video and 4K/30 or 4K/60 4:2:0)	
Signal type	TMDS	
Connectors	Locking HDMI	
Resolutions	DVI signal	VGA (640x480) thru WUXGA (1920x1200)
	HDTV signal	480i through 4K/30 (or 4K/60 4:2:0)

Audio

Formats	All HDMI Embedded Audio including: LPCM 7.1CH, Dolby TrueHD and DTS-HD Master Audio (32-192kHz sample rate)
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Other Signals

DDC	Pass-Thru DDC for reading EDID directly from remotely connected TV/Display and HDCP handshake
CEC	Pass-Thru
RS232	Pass thru baud rate, 110 – 115200 bps
IR	Bi-directional IR. Carrier modulation range from 30 KHz to 60 KHz

General

Power Consumption	Rated Class-2, 6 W	
Temp/humidity	Storage: -40 to +158 °F (-40 to +70 °C) / 10% to 90%, non-condensing Operating: +32 to +122 °F (0 to +50 °C) / 10% to 90%, non-condensing	
Cooling	Convection plus temperature controlled variable speed forced air (Fan)	
Enclosure type	Metal (includes metal 2-gang Decora® faceplate and plastic mud ring)	
Dimensions	5.00" H x 4.72" W x 1.18" D (127mm H x 120mm W x 30mm D)	
Product weight	Receiver	8 oz (0.5 lb or 230 g)
	Kit (shipping)	16 oz (1 lb or 460 g) includes: receiver, USB cable, manual, and packaging
Vibration	ISTA 1A in carton (International Safe Transit Association)	
Safety	CE	
EMI/EMC	CE, FCC Class A	
MTBF	90,000 hours (Calculated Estimate)	
Warranty	3 years parts and labor	

Specifications are subject to change without notice



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