18Gbps 4K HDR HDBaseT Extender with HDCP 2.2 and 2-way PoH

EX-35-H2

WyreStorm

Quickstart Guide

💡 WyreStorm recommends reading through this document in its entirety to become familiar with the product's features prior to starting the installation process.

4K HDR | **2160p 4:4:4 60** | **HDBT** | **HDMI** | **HDCP 2.2** | **PoH**

⚠ IMPORTANT! Installation Requirements

- This product was released in 2 different versions which contain different chassis designs and feature sets.
- See Identifying Product Versions for details.
- Visit the product page to download the latest firmware, document version, additional documentation, and configuration tools.
- Read through the Wiring and Connections section for important wiring guidelines before creating or choosing premade cables.
- While this product supports CEC, WyreStorm cannot guarantee compatibility with all forms of CEC communication.

In the Box

1x EX-35-H2 Transmitter
1x EX-35-H2 Receiver
1x 18V DC 1A Power Supply (US/UK/EU)
2x 3-pin Screw Down Phoenix Connectors
1x IR Emitter
1x IR Receiver
4x Mounting Brackets (2x for TX | 2x for RX)
1x Quickstart Guide (this document)

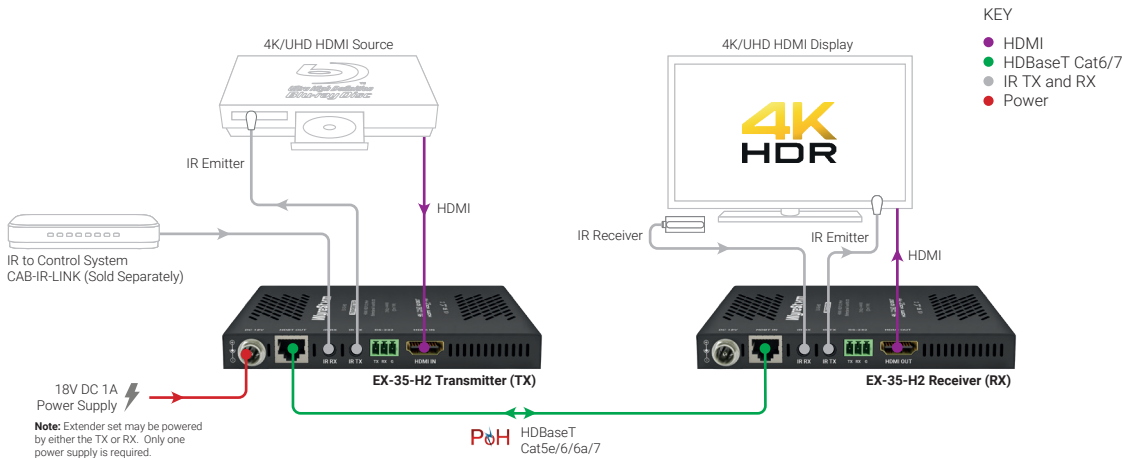### Identifying Product Versions

This product was released in 2 different versions which contain different chassis designs and feature sets. The differences are identified throughout this document in order to make installation and use easier.

Versions can be identified by a v# after the model number on the product chassis model number sticker. Note that version 1 of this product may not contain a v1 after the product while all version 2s will contain a v2 after the model number.
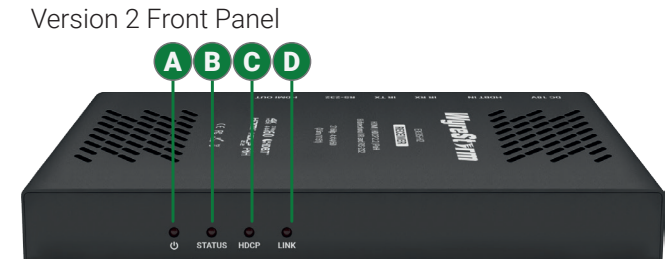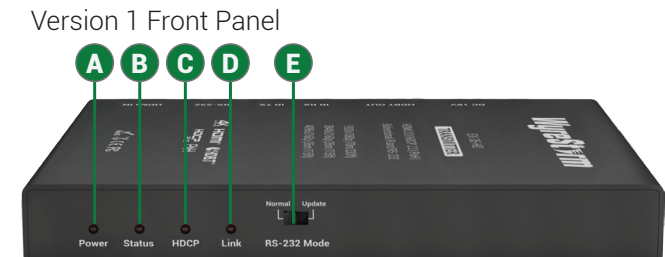
Operational Differences

Feature	Version 1	Version 2
RS-232 Mode Switch	Yes	No – Changes made this switch unnecessary
3840x2160p @60Hz 10bit 4:2:0 HDR 4096x2160p @60Hz 8bit 4:4:4	Not Supported on Category Cable (HDBaseT)	Supported on Category Cable (HDBaseT)

Basic Wiring Diagram

KEY
- ● HDMI
- ● HDBaseT Cat6/7
- ● IR TX and RX
- ● Power

4K/UHD HDMI Source
4K/UHD HDMI Display
IR Emitter
IR to Control System CAB-IR-LINK (Sold Separately)
HDMI
IR Receiver
IR Emitter
HDMI
EX-35-H2 Transmitter (TX)
EX-35-H2 Receiver (RX)
18V DC 1A Power Supply
Note: Extender set may be powered by either the TX or RX. Only one power supply is required.
PoH HDBaseT Cat5e/6/6a/7

Front Panel (TX/RX)

Version 1 Front Panel

Version 2 Front Panel

Rear Panel (TX/RX)

Version 1 Rear Panel

Version 2 Rear Panel

A	**Power LED**	**Solid:** The receiver is powered On **Off:** The receiver is powered Off
B	**Status LED**	**Flashing:** The receiver is operating normally. **Off:** The receiver is Not operating normally.
C	**HDCP LED**	**Solid:** HDCP content is present. **Flashing:** HDCP content is not present. **Off:** No signal.
D	**LINK LED**	**Solid:** Link to receiver has been established. **Flashing:** Link to receiver has not been established.
E	**RS-232 Mode** Version 1 Only	Switches the mode for the RS-232 port. **Normal:** RS-232 HDBaseT pass-through. **Update:** RS-232 firmware update.

A	**Power In**	5.5mm Screw Down Barrel Jack Connect to the included 18V DC 1A power supply. to the transmitter. A power supply is not required on the receiver as it will be powered using PoH. See Power Supply Wiring for important information.
B	**HDBT In** **HDBT Out**	8-pin RJ-45 female Connect the transmitters **HDBT Out** to receivers **HDBT In.**
C	**IR TX** **IR RX**	**IR TX** - 3.5mm (1/8in) Mono Jack: Connect to the supplied IR emitter to control a local device from the remote display location via HDBaseT. **IR RX** - 3.5mm (1/8in) Stereo Jack: Connect to the supplied IR receiver to send IR to the remote display location via HDBaseT. See IR TX/RX Guidelines for more information.
D	**RS-232**	1x RS-232: 3-pin Phoenix
E	**HDMI In** **HDMI Out**	19-pin type A HDMI female Supports HDMI and DVI/D with adapter

Wiring and Connections

WyreStorm recommends that all wiring for the installation is run and terminated prior to making connections to the switcher. Read through this section in it's entirety before running or terminating the wires to ensure proper operation and to avoid damaging equipment.

⚠ **IMPORTANT! Wiring Guidelines**

- The use of patch panels, wall plates, cable extenders, kinks in cables, and electrical or environmental interference will have an adverse effect on signal transmission which may limit performance. Steps should be taken to minimize or remove these factors completely during installation for best results.
- WyreStorm recommends using pre-terminated HDMI cables due to the complexity of these connector types. Using pre-terminated cables will ensure that these connections are accurate and will not interfere with the performance of the product.

Cat6 Cable Performance Guide

0m	10m	20m	30m	40m	50m	60m	70m	80m	90m	100m
0ft	32ft	65ft	98ft	131ft	164ft	197ft	230ft	262ft	295ft	328ft

■ **4K** Transmission   ■ **HD** Transmission

RS-232 Wiring

The EX-35-H2 uses a 3-pin RS-232 with no hardware flow control. Most control systems and computers are DTE where pin 2 is RX, this can vary from device to device. Refer to the documentation for the connected device for pin functionally to ensure that the correct connections can be made.

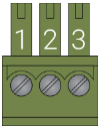| WyreStorm Connector			3rd Party Device
Pin 1	TX (Transmit)	---> To --->	RX (Receive)
Pin 2	RX (Receive)	---> To --->	TX (Transmit)
Pin 3	G (Ground)	---> To --->	G (Ground)

IR TX/RX Guidelines

- Using WyreStorm infrared emitters and receivers is the best way to ensure that most IR coding formats are transmitted and received by the NetworkHD system. Other 3rd party emitters and receivers can be used; however, these devices must operate in the same manner as the WyreStorm devices.
- Due to differences in IR across 3rd party control systems their IR ports should never be connected directly to a NetworkHD system as an incompatibility may exist. WyreStorm offers a cable that compensates for voltage differences as well adjusts for differences in the pins used within the port. Refer to the CAB-IR-LINK product page for more information.

IR TX Port Pinout

Connection for IR TX (transmit) uses a 3.5mm (1/8in) mono plug.
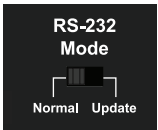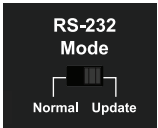
Tip: Anode
Sleeve: Cathode (IR Signal)

IR RX Port Pinout

Connection for IR RX (receive) uses a 3.5mm (1/8in) stereo jack that outputs +5V DC to power the included IR receiver.

Tip: +5V DC
Ring: IR Signal
Sleeve: Ground (GND)

RS-232 Mode Settings

The RS-232 connector is used to transmit RS-232 over HDBaseT to the remote location and for firmware updates. Ensure that the RS-232 Mode switch in the proper position for the operation being performed. This connection is only available on version 1 of this product.
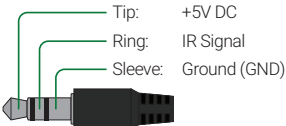
Set the mode switch to Normal to transmit RS-232 signals from the TX to the RX for controlling devices in the remote location.

RS-232 Mode
Normal Update

Set the mode switch to the Update position to install a firmware update in either the TX or RX.

RS-232 Mode
Normal Update

Power Supply Wiring

The EX-35-H2 can supply power from the transmitter to the receiver using PoH on the same category cable that transmits audio and video. The included power must be connected to the transmitter in order to power the receiver. Should distance of the category cable or other factors prevent PoH from being used, connect an 18V DC 1A power supply to both devices. Additional power supplies may be purchased from WyreStorm.

Specifications

Audio and Video		
	Transmitter	**Receiver**
Inputs	1x HDMI In: 19-pin type A	1x HDBT In: 8-pin RJ-45 Female
Outputs	1x HDBT Out: 8-pin RJ-45 Female	1x HDMI Out: 19-pin type A
Output Video Encoding	HDBaseT Class B	
Encoding Data Rate	9.2Gbps	
End to End Latency (Max)	10µs (micro seconds)	
Audio Formats	2ch Analog/PCM | Multichannel: LPCM	

	Video Resolution	HDMI	Cat6		Cat6a/7	
		v1/2	v1	v2	v1	v2
Video Resolutions (Max)	1920x1080p @60Hz 12bit	15m/49ft	70m/230ft	70m/230ft	70m/230ft	70m/230ft
	1920x1080p @60Hz 16bit	7m/23ft	70m/230ft	70m/230ft	70m/230ft	70m/230ft
	3840x2160p @24Hz 10bit 4:2:0 HDR	3m/10ft	35m/115ft	35m/115ft	35m/115ft	35m/115ft
	3840x2160p @30Hz 8bit 4:4:4	7m/23ft	35m/115ft	35m/115ft	35m/115ft	35m/115ft
	3840x2160p @60Hz 10bit 4:2:0 HDR	3m/10ft	NA	35m/115ft	NA	35m/115ft
	4096x2160p @60Hz 8bit 4:2:0	7m/23ft	35m/115ft	35m/115ft	35m/115ft	35m/115ft
	4096x2160p @60Hz 8bit 4:4:4	7m/23ft	NA	35m/115ft	NA	35m/115ft

Supported Standards	DCI | RGB | HDR | HDR10 | Dolby Vision up to 30Hz | HLG | BT.2020 | BT.2100
Maximum Pixel Clock	HDMI: 600MHz | HDBaseT: 297MHz

Communication and Control	
HDMI	HDMI 2.0 | HDCP 2.2 | EDID | CEC Pass-through | DVI/D supported with adapter (not included)
HDBaseT	HDMI 2.0 | HDCP 2.2 | EDID | 2-way PoH | Bidirectional IR and RS-232
CEC	CEC Pass-through – Requires CEC compatibility between source and display
IR	1x IR TX 3.5mm (1/8in) Mono | Bidirectional over HDBaseT | 1x IR RX 3.5mm (1/8in) Stereo | Bidirectional over HDBaseT
RS-232	1x 3-pin Screw Down Phoenix Connector | Bidirectional over HDBaseT

Power	
Power Supply	18V DC 1A
PoH	48V 15.4W
Max Power Consumption	8.88W

Environmental	
Operating Temperature	0 to + 45°C (32 to + 113 °F), 10% to 90%, non-condensing
Storage Temperature	-20 to +70°C (-4 to + 158 °F), 10% to 90%, non-condensing
Maximum BTU	30.30 BTU/hr

Dimensions and Weight		
	Version 1	**Version 2**
Rack Units/Wall Box	<1U	<1U
Height	17mm/0.67in	15.2mm/0.6in
Width	140mm/5.52in	136.4mm/5.38in
Depth	90.2mm/3.563in	74.2mm/2.93in
Weight	0.36kg/0.79lbs	0.22kg/0.48lbs

Regulatory	
Safety and Emission	CE | FCC | RoHS | RCM

Troubleshooting

No or Poor Quality Picture (snow or noisy image)
- Verify that all HDMI and HDBaseT connections are not loose and are functioning properly
- Verify that the HDBaseT cable is properly terminated following EIA568B standard
- Verify that the output resolution of the source and display is supported by this extender
- Configure EDID Settings to a lower resolution.
- If transmitting 3D or 4K, verify that the HDMI cables used are 3D or 4K rated.

No or Intermittent 3rd party Device Control
- Verify that the IR and RS-232 cables are properly terminated following the Wiring and Connections section.

 Troubleshooting Tips:
- WyreStorm recommends using a cable tester or connecting the cable to other devices to verify functionality.

Note: WyreStorm reserves the right to change product specification, appearance or dimensions of this product at any time without prior notice.