4+2 Input HDBaseT Switching Extender with USB2.0 & Relay Triggering

EX-SW-0401-H2-PRO

WyreStorm®

Quickstart Guide

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

4K UHD · **HDBT** · **HDMI** · **HDCP 2.2**

⚠️ **IMPORTANT! Installation Requirements**

- 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.
- Visit the product page to download the latest firmware, document version, additional documentation, and configuration tools.

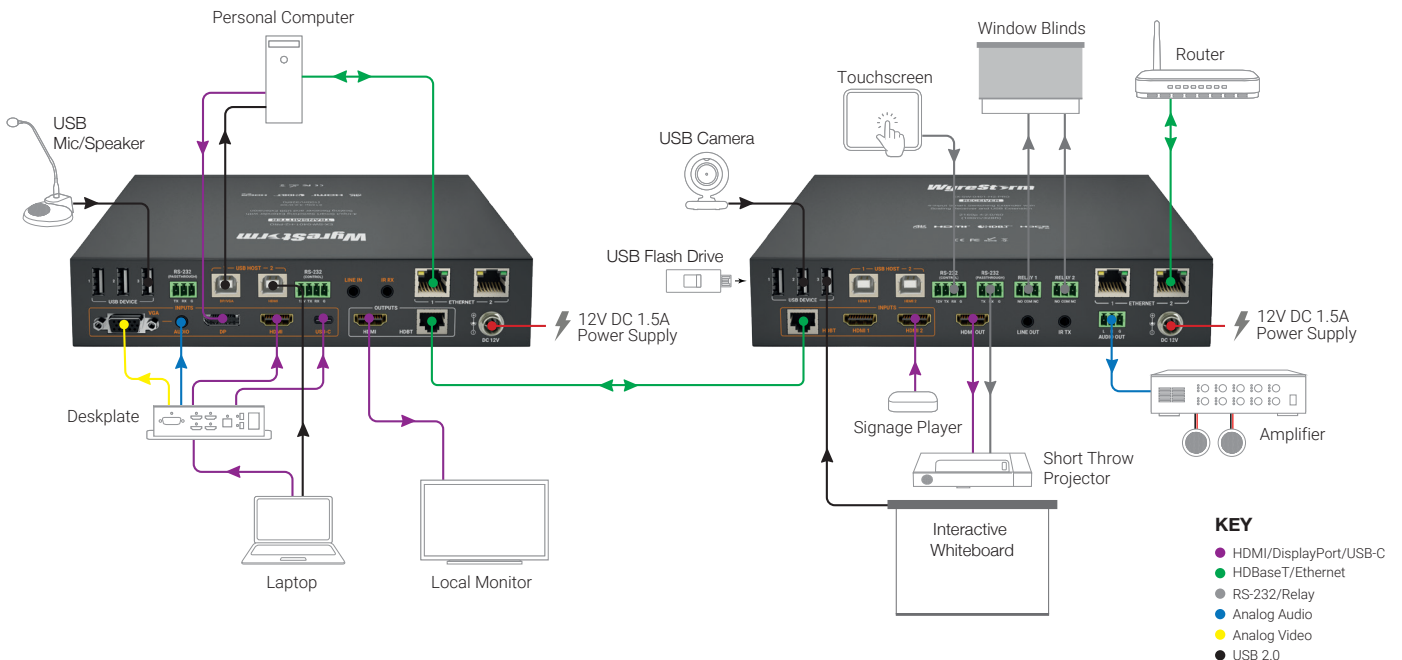**Information and Parts Required for Installation**

This extender requires connection via RS-232 or Ethernet in order to configure functions such as EDID. Ensure that the following items are on hand before proceeding with the installation.

- PC or Mac
- Telnet and Terminal software such as PuTTY
- USB COM Port Adapter (Not Included)
- WyreStorm Part: CAB-USB-3PIN
- Network router and/or switch if using IP telnet for configuration.
- Latest version of the EX-SW-0401-H2-PRO API for advanced configuration not covered in this document.

In the Box

1x EX-SW-0401-H2-PRO Transmitter
1x EX-SW-0401-H2-PRO Receiver
2x 12V DC Power Supply (US/UK/EU)
1x IR Transmitter
1x IR Receiver
4x Mounting Brackets (2x for TX | 2x for RX)
5x 3-pin Screw Down Phoenix Connector
2x 4-pin Screw Down Phoenix Connector
1x Quickstart Guide (This Document)

Basic Wiring Diagram

KEY
- ● HDMI/DisplayPort/USB-C
- ● HDBaseT/Ethernet
- ● RS-232/Relay
- ● Analog Audio
- ● Analog Video
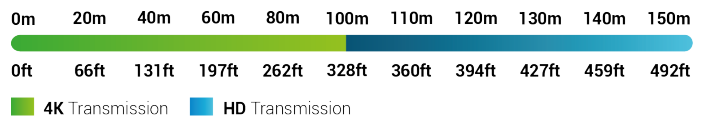- ● USB 2.0

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 its entirety before running or terminating any wires to ensure proper operation and to avoid damaging the 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 VGA, HDMI, DP and USB 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.

- This product contains a USB-C connection that can be used as an audio/video input. When using this connection verify that the USB-C cable used supports audio/video functionality as not all USB-C cables support this requirement.
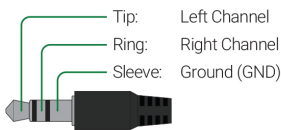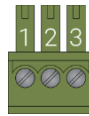
Cat6 Cable Performance Guide

0m	20m	40m	60m	80m	100m	110m	120m	130m	140m	150m
0ft	66ft	131ft	197ft	262ft	328ft	360ft	394ft	427ft	459ft	492ft

🟩 **4K** Transmission   🟦 **HD** Transmission

Audio Connections

Audio In (TX)

The audio connections use a 3.5mm (1/8in) TRS Stereo Jack.

Tip: Left Channel
Ring: Right Channel
Sleeve: Ground (GND)

Audio Out (TX/RX)

WyreStorm Connector			3rd Party Device
Pin 1	L (Left Signal)	---> To --->	Left Signal (L+)
Pin 2	R (Right Signal)	---> To --->	Right Signal (R+)
Pin 3	GND (Ground)	---> To --->	Left Ground (L-) Right Ground (R-)

Communication Connections

RS-232 Wiring

The EX-SW-0401-H2-PRO 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.

PC Connection

Connection to a PC uses the RS-232 Control connection and requires the use of a USB to 3-pin Port Adapter cable (CAB-USB-3PIN) in order for a port to be provided on the PC. Note that this adaptor can be used on both v1 and v2 versions.

RS-232 Passthrough
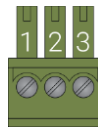
WyreStorm Connector			3rd Party Device
Pin 1	TX (Transmit)	---> To --->	RX (Receive)
Pin 2	RX (Receive)	---> To --->	TX (Transmit)
Pin 3	G (Ground)	---> To --->	G (Ground)

RS-232 Control
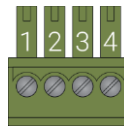
WyreStorm Connector			3rd Party Device
Pin 1	12V DC Out	---> To --->	Reserved
Pin 2	TX (Transmit)	---> To --->	RX (Receive)
Pin 3	RX (Receive)	---> To --->	TX (Transmit)
Pin 4	G (Ground)	---> To --->	G (Ground)

Relay Wiring

The relays on this extender can be used to be trigger devices such as projector screens that are Normally Open (NO) or Normally Closed (NC).
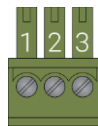
WyreStorm Connector			3rd Party Device
Pin 1	NO (Normally Open)	---> To --->	NO (Normally Open)
Pin 2	Common (Ground)	---> To --->	Common (Ground)
Pin 3	NC (Normally Closed)	---> To --->	NC (Normally Closed)

Troubleshooting

No or Poor Quality Picture (snow or noisy image)

- Verify that power is being supplied to the transmitter and receiving device.
- 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, RS-232, and Ethernet cables are properly terminated following the Wiring and Connections section.

Relays Not Functioning

- Verify polarity of the relay connections.

💡 **Troubleshotting Tips**

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

Setup and Configuration

The EX-SW-0401-H2-PRO is configured using RS-232 and/or Telnet commands for IP address, Output Resolution, and EDID. Follow these steps to properly configure the extender based on the system requirement.

Note: The steps and information provided in this QSG are for basic operation of the extender out of the box. Refer to the EX-SW-0401-H2-PRO API for full configuration settings.

1. Assign a Static IP Address to ensure proper communication on an IP Network. See Configuring a Static IP Address
2. Set EDIDs to be used at each input of the device. See Configuring Input EDIDs

Communication Settings

The commands listed below can be sent by connecting to either the TX or RX for RS-232 and the RX only for Ethernet. Each device must be connected together via HDBaseT in to order to send a command from one device to the other. The only exception is Configuring a Static IP Address which requires connection to the RX.

The EX-SW-0401-H2-PRO contains a web UI that can be accessed by connecting to a network and entering the IP address. We recommend that the IP address is changed from default before accessing the web UI for the first time.

RS-232 and IP Settings

Baud rate:	115200
Data Bits:	8bits
Parity:	None
Stop Bits:	1bit
Flow Control:	None
Default IP Address	192.168.11.43
Default IP Port	23

Configuring a Static IP Address

By default, the switcher is set to a static IP of 192.168.11.043. We recommend changing this as it shared with other WyreStorm products and may cause improper communication if left unchanged. Connect to the RX via RS-232 and send the following command to set the IP address.

SET IPADDR STATIC ip4addr [IP Address] netmask [Netmask]<CR><LF>
Example: SET IPADDR STATIC ip4addr 192.168.11.243 netmask 255.255.255.0 <CR><LF>
Response: IPADDR STATIC ip4addr 192.168.11.243 netmask 255.255.255.0 <CR><LF>

Note: This command can only be sent to the receivers (RX) RS-232 port.

Configuring Input EDIDs

By default, all inputs are set to an EDID or 1920x1080@60Hz 2CH. However, this can be configured to suit the installation.

Set Input EDID	Input= VGA | DP | TXHDMI | USBC | RXHDMI1 | RXHDMI2
SET EDID [Input] [Resolution] [Device]<CR><LF>	Resolution={Below tables based on connection}
Example: SET EDID in1 1 tx<CR><LF>	
Response: EDID SET in1 1 tx<CR><LF>	

VGA EDID	HDMI/USB-C EDIDs
1024x768@60Hz 2CH	1024x768@60Hz 2CH
1280x768@60Hz	1280x720@60Hz
1360x768@60Hz	1360x768@60Hz
1440x900@60Hz	1440x900@60Hz
1600x900@60Hz	1600x900@60Hz
1680x1050@60Hz	1680x1050@60Hz
1920x1080@60Hz	1920x1080@60Hz
1920x1200@60Hz	3840x2160@30Hz

Query Input EDID
GET EDID [Input] [Device]<CR><LF>
Example: GET EDID in1 tx<CR><LF>
Response: EDID GET in1 1 tx<CR><LF>

Specifications

Audio and Video				
	Transmitter		**Receiver**	
Inputs	1x VGA In: 15-pin VGA 1x Display Port In: DisplayPort 1.3 1x HDMI In: 19-pin type A 1x Audio In: 3.5mm (1/8in) TRS Stereo 1x Line In: 3.5mm (1/8in) TRS Stereo		2x HDMI: 19-pin type A 1x HDBT In: 8-pin RJ-45 Female	
Outputs	1x HDMI Out: 19-pin type A 1x HDBT Out: 8-pin RJ-45 Female		1x HDMI Out: 19-pin type A 1x Audio Out: 3-pin Phoenix 1x Line Out: 3.5mm (1/8in) TRS Stereo	
Video Encoding	HDBaseT Class C			
Encoding Data Rate	9.2Gbps			
End to End Latency	10μs (micro seconds)			
Audio Formats	2ch Analog/PCM	Multichannel: LPCM			

	Video Resolution	**HDMI**	**Cat6**	**Cat6a/7**
Video Resolutions (Max)	1920x1200p @60Hz 8bit	15m/49ft	150m/492ft	150m/492ft
	1920x1080p @60Hz 8bit	15m/49ft	150m/492ft	150m/492ft
	3840x2160p @30Hz 8bit 4:4:4	7m/23ft	100m/328ft	100m/328ft
	4096x2160p @60Hz 8bit 4:2:0	7m/23ft	100m/328ft	100m/328ft

Supported Standards	DCI	RGB
Maximum Pixel Clock	297MHz

Communication and Control	
HDMI	HDMI	HDCP 2.2	EDID	DVI/D supported with adapter (not included)
HDBaseT	HDMI	HDCP 2.2	EDID	CEC	2ch audio	USB
Ethernet	2x 8-pin RJ-45 female	Web UI	IP Control	Bidirectional over HDBaseT
RS-232	1x RS-232 (Control): 3-pin Phoenix	1x RS-232 (Passthrough): 3-pin Phoenix
IR	1x IR TX: 3.5mm (1/8in) TS Mono
Relays	1x Screen UP: 3-pin Phoenix	1x Screen DWN: 3-pin Phoenix
USB	1x USB-C: USB 3.1 Audio/Video (Transmitter Only)	2x USB Host: USB-B	3x USB Device: USB-A (Transmitter and Receiver)

Power	
Power Supply	12V DC 2A
Max Power Consumption	Transmitter: 14.02W	Receiver: 16.25W

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	Transmitter: 56.3BTU/hr	Receiver: 55BTU/hr

Dimensions and Weight		
	Transmitter	**Receiver**
Rack Units/Wall Box	<1U	<1U
**Height With	Without Feet**	44.5mm/1.76in	42mm/1.66in	44.5mm/1.76in	42mm/1.66in
**Width With	Without Brackets**	263mm/10.36in	220mm/8.67in	263mm/10.36in	220mm/8.67in
**Depth With	Without Handles**	148.7mm/5.86in	148.7mm/5.86in	148.7mm/5.86in	148.7mm/5.86in
Weight	0.97kg/2.13lbs	0.95kg/2.09lbs

Regulatory	
Safety and Emission	CE	FCC	RoHS

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

Warranty Information

WyreStorm Technologies LLC warrants that its products to be free from defects in material and workmanship under normal use for a period of five (5) years from the date of purchase. Refer to the Product Warranty page on wyrestorm.com for more details on our limited product warranty.