

# 3:1 HDMI/VGA/DP Switching Extender with Scaling Receiver, Relay Triggering and HDCP 2.2

EX-SW-0301-H2



## Quickstart Guide

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



### **!** IMPORTANT! Installation Requirements

This product was released in 2 different versions which contain different chassis designs and feature sets. Refer to [Identifying Product Versions](#) for details.

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-0301-H2 API](#) for advanced configuration not covered in this document.

### In the Box

- 1x EX-SW-0301-H2 Transmitter
- 1x EX-SW-0301-H2 Receiver
- 1x AC 100-240V 50/60Hz to DC 12V Power Adapter
- 5x 3-pin Phoenix Connectors (version 1)
- 3x 3-pin Phoenix Connectors (version 2)
- 2x 4-pin Phoenix Connectors (version 2)
- 4x Mounting Brackets (1set for Transmitter/1set for Receiver)
- 1x Quickstart Guide (This Document)

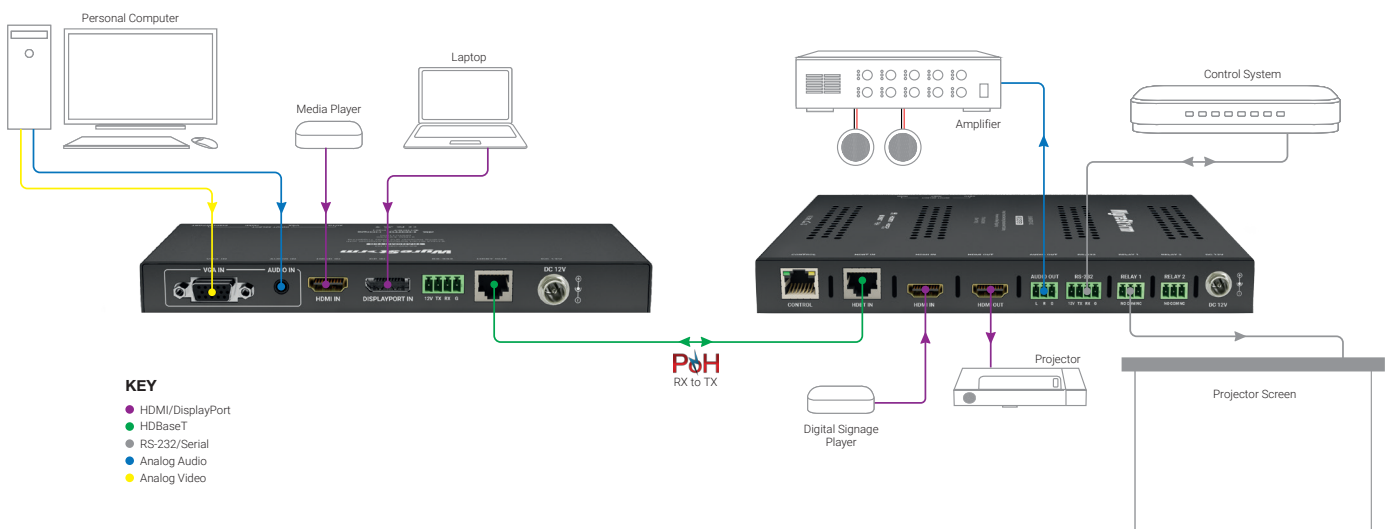
### Identifying Product Versions

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
Web UI for configuration and control	N/A	Added in version 2
RS-232 Port Pinout	3-pin Phoenix	4-pin Phoenix

### Basic Wiring Diagram



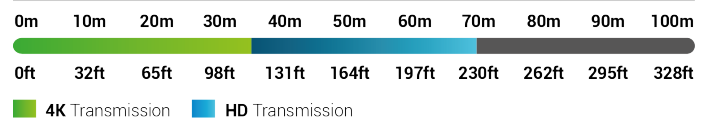
## Wiring and Connections

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 HDMI and DP 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.

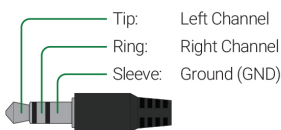
Cat6 Cable Performance Guide



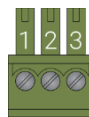
## Audio Connections

### Audio In (TX)

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



### 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-0301-H2 uses a 3-pin (v1) or 4-pin (v2) 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 functionality to ensure that the correct connections can be made.

### PC Connection

Connection to a PC 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.

### Relay Wiring

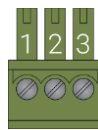
The relays on this extender can be used to be trigger devices such as projector screens that are Normally Open (NO) or Normally Closed (NC).

## Troubleshooting

### No or Poor Quality Picture (snow or noisy image)

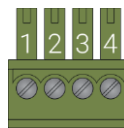
- Verify that power is being supplied to the transmitter and receiving device.
- Verify that the HDBaseT cable is properly terminated following EIA568B standard.
- Verify that the output resolution of the source and display is supported by this extender.
- Configure EDID Settings to a lower resolution.
- If transmitting 3D or 4K, verify that the HDMI cables used are 3D or 4K rated.
- Verify that all source and HDBaseT connections are not loose and are functioning properly.

### Version 1 (3-pin)

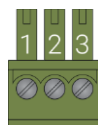


WyreStorm Connector		3rd Party Device
Pin 1	TX (Transmit)	---> To ---> RX (Receive)
Pin 2	RX (Receive)	---> To ---> TX (Transmit)
Pin 3	G (Ground)	---> To ---> G (Ground)

### Version 2 (4-pin)



WyreStorm Connector		3rd Party Device
Pin 1	12V DC Out	Reserved
Pin 2	TX (Transmit)	RX (Receive)
Pin 3	RX (Receive)	TX (Transmit)
Pin 4	G (Ground)	G (Ground)



WyreStorm Connector		3rd Party Device
Pin 1	NO (Normally Open)	NO (Normally Open)
Pin 2	Common (Ground)	Common (Ground)
Pin 3	NC (Normally Closed)	NC (Normally Closed)

### No or Intermittent 3rd party Device Control

- Verify that the RS-232/Ethernet cables are properly terminated following the [Wiring and Connections](#) section.

### Relays Not Functioning

- Verify polarity of the relay connections.

### Troubleshooting Tips

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

## Setup and Configuration

The EX-SW-0301-H2 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-0301-H2 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 an Output Resolution to be used by the RX. See [Configuring RX Output Resolution](#)
3. 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.

Version 2 or higher of the EX-SW-0301-H2 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

<b>Baud rate:</b>	115200
<b>Data Bits:</b>	8bits
<b>Parity:</b>	None
<b>Stop Bits:</b>	1bit
<b>Flow Control:</b>	None
<b>Default IP Address</b>	192.168.11.43
<b>Default IP Port</b>	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 RX Output Resolution

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

<b>Set Output Resolution</b>	Resolution = 0~8
SET RES all [Resolution] rx<CR><LF>	0 Auto Scaler (Default)
Example: SET RES all Fix:1920x1200@60 rx<CR><LF>	1 1024x768@60Hz
Response: RES SET all Fix:1920x1200@60 rx<CR><LF>	2 1280x720@60Hz
<b>Query Output Resolution</b>	3 1280x800@60Hz
GET RES_OUT all rx<CR><LF>	4 1280x1024@60Hz
Example: GET RES_OUT all rx<CR><LF>	5 1920x1080@60Hz
Response: RES GET all Fix:1920x1200@60 rx<CR><LF>	6 1920x1200@60Hz
	7 3840x2160@30Hz
	8 3840x2160@60Hz 4:4:4

## 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.

<b>Set Input EDID</b>	Input=in1 (VGA)   in2 (HDMI)   in3 (DP)	
SET EDID [Input] [Resolution] [Device]<CR><LF>	Device=tx   rx   all	
Example: SET EDID in1 1 tx<CR><LF>	Resolution=1~8	
Response: EDID SET in1 1 tx<CR><LF>		
<b>Query Input EDID</b>		
GET EDID [Input] [Device]<CR><LF>		
Example: GET EDID in1 tx<CR><LF>		
Response: EDID GET in1 1 tx<CR><LF>		
	<b>VGA EDID</b>	<b>HDMI EDIDs</b>
	1 1920x1200@60Hz 2CH	1 3840x2160@30Hz 2CH
	2 1920x1080@60Hz 2CH (Default)	2 1920x1080@60Hz 2CH (Default)
	3 1680x1050@60Hz 2CH	3 1680x1050@60Hz 2CH
	4 1600x900@60Hz 2CH	4 1600x900@60Hz 2CH
	5 1440x900@60Hz 2CH	5 1440x900@60Hz 2CH
	6 1360x768@60Hz 2CH	6 1360x768@60Hz 2CH
	7 1280x768@60Hz 2CH	7 1280x720@60Hz 2CH
	8 1024x768@60Hz 2CH	8 1024x768@60Hz 2CH

## Specifications

Audio and Video				
	Transmitter		Receiver	
<b>Inputs</b>	1x VGA In: 15-pin VGA 1x Display Port In: DisplayPort 1.3 1x HDMI In: 19-pin type A		1x HDMI In: 19-pin type A 1x HDBT In: 8-pin RJ-45 Female	
<b>Outputs</b>	1x HDBT Out (Class A): 8-pin RJ-45 Female		1x HDMI Out: 19-pin type A 1x Audio Out: 3-pin Phoenix	
<b>Output Video Encoding</b>	HDBaseT Class B			
<b>Encoding Data Rate</b>	9.2Gbps			
<b>End to End Latency</b>	10µs (micro seconds)			
<b>Audio Formats</b>	2ch Analog/PCM   Multichannel: LPCM			
<b>Video Resolutions (Max)</b>	<b>Video Resolution</b>	<b>HDMI</b>	<b>Cat6</b>	<b>Cat6a/7</b>
	1920x1200p @60Hz 12bit	15m/49ft	60m/197ft	70m/230ft
	1920x1080p @60Hz 12bit	15m/49ft	60m/197ft	70m/230ft
	3840x2160p @30Hz 8bit 4:4:4	7m/23ft	35m/115ft	40m/131ft
	4096x2160p @60Hz 8bit 4:2:0	7m/23ft	35m/115ft	40m/131ft
<b>Supported Standards</b>	DCI   RGB			
<b>Maximum Pixel Clock</b>	HDMI: 600mHz   HDBaseT: 297MHz			
Communication and Control				
<b>HDMI</b>	HDMI   HDCP 2.2   EDID   DVI/D supported with adapter (not included)			
<b>HDBaseT</b>	HDMI   HDCP 2.2   EDID   1-way PoH Receiver to Transmitter			
<b>Ethernet</b>	1x 8-pin RJ-45 female   IP Control (TELNET)   Web UI (v2 only)			
<b>RS-232</b>	1x RS-232: v1 Chassis: 3-pin Phoenix   v2 Chassis: 4-pin Phoenix (Transmitter and Receiver)			
<b>Relays</b>	2x Relay: 3-pin Phoenix (Receiver Only)			
Power				
<b>Power Supply</b>	12V DC 3A			
<b>PoH</b>	IEEE 802.3af 15.4W Max   Receiver to transmitter			
<b>Max Power Consumption</b>	Transmitter: 7W   Receiver: 17W			
Environmental				
<b>Operating Temperature</b>	0 to + 45°C (32 to + 113 °F), 10% to 90%, non-condensing			
<b>Storage Temperature</b>	-20 to +70°C (-4 to + 158 °F), 10% to 90%, non-condensing			
<b>Maximum BTU</b>	Transmitter: 24 BTU/hr   Receiver: 58 BTU/hr			
Dimensions and Weight				
	Transmitter		Receiver	
<b>Rack Units/Wall Box</b>	<1U		<1U	
<b>Height With   Without Feet</b>	20mm/0.79in		25mm/0.99in	
<b>Width With   Without Brackets</b>	194mm/7.64in		223mm/8.78in	
<b>Depth With   Without Handles</b>	94mm/3.71in		154mm/6.07in	
<b>Weight</b>	0.5kg/1.1lbs		0.94kg/2.07lbs	
Regulatory				
<b>Safety and Emission</b>	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](http://wyrestorm.com) for more details on our limited product warranty.

