



2:1 switcher featuring HDMI and VGA inputs with Power-over-HDBaseT to HDMI and RCA stereo outputs

Part Number SW0201-POH



Wyrestorm HDMI & VGA Switching Solutions

Instruction Manual



Thank you for choosing this Wyrestorm product.
Please read these instructions carefully before installing to avoid complications later.

Contents

- 1 Introduction
- 2 Features
- 3 Safety Precautions
- 4 Packaging Contents
- 5 Connection & Operation
- 6 Specifications
- 7 Panel Descriptions
- 8 Typical Application
- 9 EDID Management
- 10 RJ45 Termination
- 11 Troubleshooting
- 12 FAQ's
- 13 Maintenance
- 14 Product Service
- 15 Mail In Service
- 16 Warranty
- 17 Warranty Limits and Exclusions
- 18 Notes

1. Introduction

The Wyrestorm SW0201-POH is a two-input HDMI and VGA switcher comprising of a transmitter and receiver that converts either input to an HDBaseT™ output to enable the transmission of VGA or HDMI sources over distances up to 100m/328ft using a single Cat5e/6 cable for lossless 1080p HD video and HD Audio distribution.

Featuring powerful HDBaseT technology for stable and reliable transmissions that safeguard against electromagnetic interference, the SW0201-POH also features Power-over-HDBaseT – the latest evolution of power-over-Ethernet – to enable display receiver operation without the need for mains power for even greater convenience and flexibility. Additionally, the SW0201-POH can be cascaded up to 7 times for larger distributions with each unit independently powered as a PoH receiver and as a pass-through to power the next receiver in the cable run.

VGA and HDMI inputs are automatically selected and switched when the unit detects a signal, with a smart detection feature prioritizing VGA over HDMI if two devices are transmitting at the same time.

The SW0201-POH also includes Mini USB for firmware updates and RCA stereo outputs for connection to third party amplification and speakers in display zones

Both SW0201-POH Transmitters/Receivers include auto equalization and amplification to ensure successful signal distribution over long cable distances including PoH without any loss in transmission quality

The SW0201-POH offers an excellent solution to any commercial or residential environment where switching between VGA with audio and HDMI over distance is required, with the added benefit of stereo breakout for increased audio options and robust HDBaseT transmission technology negating the need for mains power at display points.

For further information on this product and other Wyrestorm ranges, visit our website or download our latest product guide. www.wyrestorm.com

2:1 switcher featuring HDMI and VGA inputs with Power-over-HDBaseT to HDMI and RCA stereo outputs

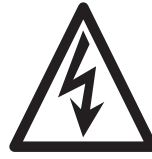
Part Number SW-0201-POH

2. Features

- 2:1 switching between VGA and HDMI inputs to HDMI output
- Robust HDBaseT technology for reliable distribution of lossless 1080p HD video and audio
- Transmission distance up to 100m/328ft
- PoH capabilities – power to display receiver supplied by transmitter over Cat5e/6 cable. No mains power required at display zones
- Automatic input detection (VGA preferred)
- HDMI V1.3 compliant
- Full 3D support - frame packing/sequential (Bu-Ray) and interlaced stereoscopic (satellite/cable broadcasts)
- Converts DVI, R/L audio or SPDIF digital audio into complete HDMI
- Mini USB for firmware updates
- HDCP compliant
- Compact size for convenient and unobtrusive installation

Note: Wyrestorm reserves the right to make changes in the hardware, packaging and any accompanying documentation without prior written notice.

3. Safety Precautions



WARNING

To reduce the risk of fire, electric shock or product damage:

1. Do not expose this apparatus to rain, moisture, sprays, drips or splashes and ensure that no objects containing liquids are placed on the apparatus, including cups, glasses and vases.
2. Do not place this unit in a confined space such as enclosed shelving, cabinets or bookshelves. Ensure the unit is adequately ventilated.
3. To prevent the risk of electric shock or fire hazard due to overheating, do not cover the unit or obstruct ventilation openings with material, newspaper, cardboard or anything that may restrict airflow into the unit.
4. Do not install near external heat sources such as radiators, heat registers, boilers or any device that produces heat such as amplifiers or computers and do not place near sources of naked flame.
5. Unplug apparatus from power supply during lightening storms or when unused for long periods of time.
6. Protect the power cable from being walked on, pinched or restricted in any way, especially at plug connections.
7. Only use attachments/accessories specified by the manufacturer.
8. Units contain non-servicable parts - Refer all servicing to qualified service personnel.

4. Package Contents

- 1 x Main unit: SW0201-POH Transmitter
- 1 x Main unit: SW0201-POH Receiver
- 1 x 19vDC power supply
- Printed instruction manual (digital copy available at www.wyrestorm.com)
- USB Flash drive

5. Connection & Operation

1 Connect HDMI or VGA input sources (such as Blu-Ray, DVD, HDD, Satellite/cable, computer, CCTV, media server etc. etc.) to the SW0201-POH Transmitter.

Note: Take care when connecting cables and do not force insertion if resistance is felt.

2 Attach a good quality and well-terminated Cat5e/6/7 cable from the UTP OUT port of the Transmitter to the UTP IN port of the SW0201-POH Receiver.

Note: Although fully operable with Cat5e cable, we recommend Cat6 as the preferred category cable for the added bandwidth capacity.

Attention The transmission distance of the SW0201-POH is 100m/328ft under perfect transmission conditions. Please be aware that transmission can be adversely effected by kinks, strains or bends in the cable, the use of patch panels or wall outlets or electrical or environmental interference. Steps should be taken to minimize these factors (or remove completely) during installation for best results.

3 Connect an HDMI sink device (such as: LED/LCD TV or digital projector) to the HDMI OUT port of the SW0201-POH Receiver using a good quality HDMI cable, ensuring firm connection in both ports.

4 Connect the 19v DC power supply provided to the SW0201-POH Transmitter and power on the unit, ensuring Power status LED is lit to indicate the unit is powered.

5 Power on the HDMI or VGA Input source to be used. Check the STATUS LED on the Transmitter to confirm a signal is being received by the unit.

Note: If both inputs are powered and sending a signal, VGA will be preferred.

6 If using the SW0201-POH as an extender set, the SW0201-POH Receiver draws power directly from the Transmitter HDBaseT so no mains power is required at the display zone.

Note: The SW0201-POH Receiver also includes a 19v DC power input for optional use or when using the unit as a standalone display receiver.

7 Power on the HDMI display device.

8 Operation: the SW0201-POH features input auto-detection, with VGA taking priority when both HDMI and VGA sources are connected. To select the HDMI input, simply power on the HDMI input device and power off the VGA device.

Attention Insert/Extract cables gently.

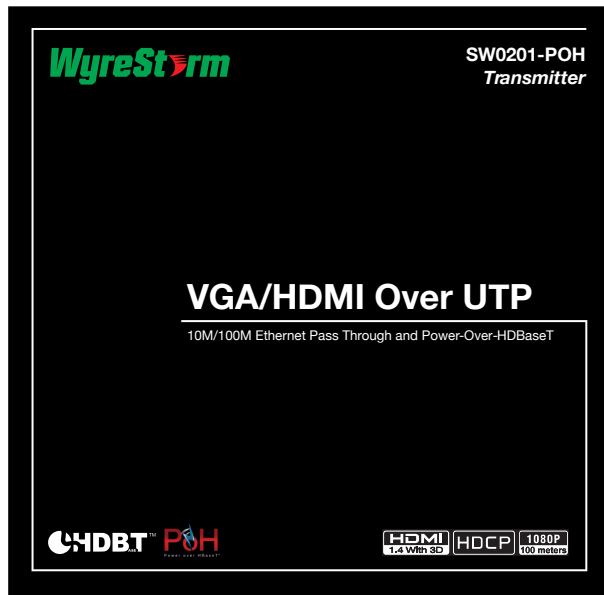
6. Specifications

Operating temperature range	-5 to +35°C (-41 to +95°F)
Operating humidity range	5 to 90% RH (no condensation)
Signalling rates	2.25 Gbits x 3
Input Video Signal	0.5-1.0 volts p-p
Input DDC Signal	5 volts p-p (TTL)
Video(HDMI) format supported	DTV/HDTV: 1080p/1080i/720p/576p 480p/576i/480i
VGA format supported	640x480/800x600/1204x768/1280x1024 1600x1200/1920x1200
Output Video	HDMI 1.3
Output Audio	PCM 2.0
Maximum transmission distance	100m / 328ft
Power Consumption	15 Watts (Max.)
Dimensions (WxDxH)	117mm/4.06" x 107/4.2" x 24mm/0.94"
Mass (Main unit)	0.3kg/0.66lb

Note: Specifications are subject to change without notice. Mass and dimensions are approximate.

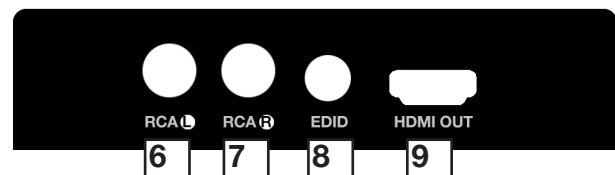
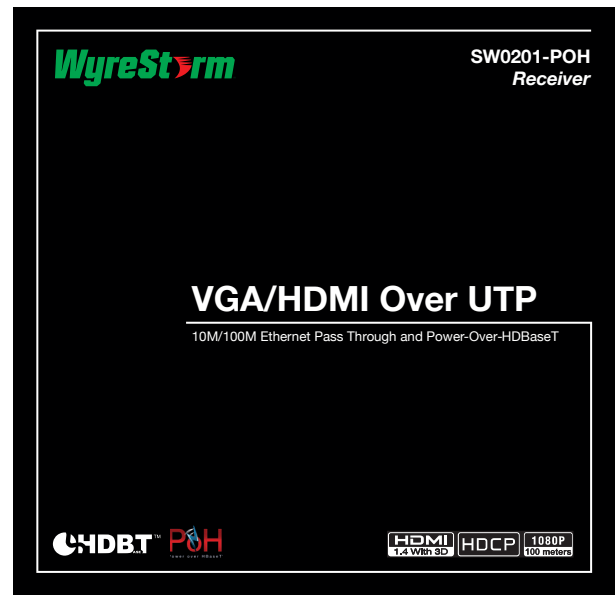
7. Panel Descriptions

SW0201-POH Transmitter



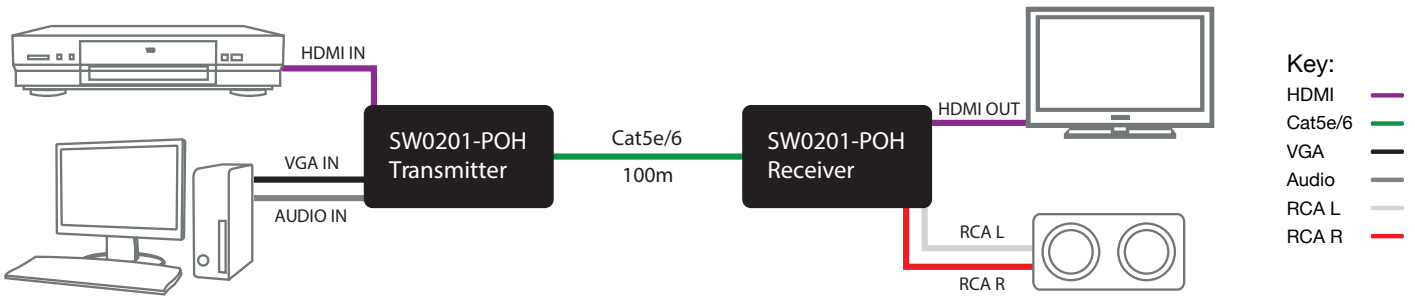
- 1** VGA Input
- 2** HDMI Input
- 3** Audio Input (for use with VGA source)
- 4** USB for firmware update
- 5** LED signal status
- 6** HDBaseT Cat5e/6 Output
- 7** Power input
- 8** LED power status

SW0201-POH Receiver

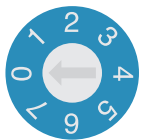


- 1** Mini USB for firmware update
- 2** LED signal status
- 3** HDBaseT Cat5e/6 input
- 4** Power input (optional)
- 5** LED power status
- 6** RCA L: left audio Channel
- 7** RCA R: right audio Channel
- 8** EDID DIP Switch (see EDID section)
- 9** HDMI Output

8. Typical Application



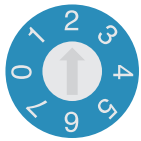
9. EDID Management



EDID Copy
(Analog Audio Output Enabled)



EDID Copy
(Analog Audio Output Disabled)



EDID set to PCM2.0
3D compatible



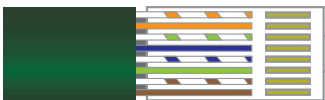
EDID set to PCM2.0
3D incompatible

Settings 4-7 are Reserved for future uses

10. RJ45 Termination

Cat5e Wiring Guide

The quality of termination for every RJ45 is essential. Poor terminations leads to intermittent performance and longer install times



Cat5e Cable Performance Guide

5m	10m	15m	20m	25m	30m	35m	40m	45m	50m	60m	70m	80m	90m	100m
HDBaseT HDMI & VGA Switcher														
SW0201-POH														
16ft	33ft	49ft	65ft	82ft	98ft	115ft	131ft	148ft	164ft	197ft	230ft	262ft	295ft	328ft
1080p				1080i										

11. Troubleshooting

Generally, the majority of HD distribution installation issues are either caused by minor connection errors, communication problems between devices, or when the transmission of high signal bandwidth is attempted using insufficient cable. Should you encounter any technical difficulties when installing and configuring the matrix, we are confident solutions can be found by working through the following troubleshooting checklist before seeking alternative technical support.

No Picture or poor quality picture

1) Power – are your HDBaseT transmitter or display receiver baluns powered both ends? Transmitters and receivers should have their own power source i.e. the 5v power adaptors included with your baluns.

Are all sources definitely powered and firmly connected?

2) If possible, always use test equipment prior to installation and to troubleshoot any problems.



Test Monitor

Part Number TTMONITOR



Signal Generator

Part Number TTSIGNAL

3) Distance – Is your cable too long for the signal to be transmitted effectively? HDBaseT allows transmission of 1080p up to 100m (328ft) so make sure your cable

distance matches your requirements and is well within the maximum transmission distance of the signal.

Note: If you are approaching the limits of the transmission capabilities, you will need to use an additional Wyrestorm Extender set for the signal to transmit effectively.

4) Cable joins? Joins in your cable run can impact on signal strength, resulting in reduced transmission that may manifest itself in poor picture quality or a complete lack of picture

5) Signal Reduction – Are you using stranded patch leads as interconnects between patch panels or wall outlets? Such use reduces signal strength – we recommend solid core straight through connections to be used wherever possible.

6) Resolution – If you reduce the resolution of the source, do you get a picture? If so, this suggests a discrepancy between source and display resolution or a bandwidth capacity issue with your cable. Check that your inputs and outputs share the same resolution and that the signal is being successfully transmitted along your cable run.

7) Correct connection – It may seem obvious but double check all UTP, HDMI, power and IR cables are connected to the correct ports.

Note: Even a fraction off can be the difference between a perfect picture and a blank screen. Double check all connections are firmly made in the correct ports.

9) Cable wired to 568B standard? Is your cable wired and terminated correctly and are those terminations connected to the correct ports?

10) Electrical interference – HDBaseT is less susceptible to interference compared to regular transmissions but the location of cables and devices should be considered - could any form of interference be generated? If so, attempt to remove the source of electrical interference or move the cable run to decrease the effects of the interference.

11) Do you get a picture if you connect the source directly to the display? If not then the problem could lie with the input or output device rather than the means of distribution i.e. the cable or matrix itself.

12) HDMI lead condition and quality – HDMI cables and connectors are delicate and can be damaged much easier than component or coax cable. Furthermore, lead quality varies dramatically, particularly in lower price

brackets. Swap your HDMI or VGA leads and check operation – damage to or quality of your leads could be the problem. If in doubt, swap them over. Always take care inserting and extracting your cables from ports so as not to damage the connectors or ports.

13) Picture snow/HD ‘noise’ – represents a poorly established signal that may be caused by poor quality terminations or excessive cable lengths. Try swapping the display adaptors from a location you know is functioning properly or swapping the outputs of the matrix switch used.

If the problem remains on the same screen this may be caused by a connection problem between matrix and display – turn off all equipment and swap the signal carrying cables at both ends to ascertain if the cable or termination is at fault.

14) Blu-ray: Deep Colour – make sure Deep Colour is turned on in your Blu-ray settings and displays.

15) Blu-ray: Resolution – if a reduction of resolution to 720/1080i produces an image, cable issues such as interference, patch panels, wall outlets, stranded cable use or excessive cable length are likely restricting transmission of a full 1080p signal.

16) Blu-ray: 3D – is the equipment used 3D enabled/compatible? Is a 3D disc being played in a 3D enabled Blu-ray player or through a compatible amplifier?

17) Colour distortion – a pink or green screen indicates an incompatibility between colour spacing formats – the commonly used RGB or YUV used by older displays. Some sources allow switching between RGB and YUV which may solve any colour problems. If not, try changing the HDMI cable between the source and the matrix to rule out defective cabling.

Audio is transmitted within the video signal – there is no separate audio track – so generally a problem with sound will be accompanied by a problem with picture. However, if technical issues with audio are experienced, the cause is typically communication between sources, displays and/or AV receiver settings.

No sound or poor quality audio

1) If using an AV receiver, check your source input assignment – do you have specific speaker sets or zones enabled? Some AV receivers allow individual speaker

selections assigned to specific zones in the set up so check the speakers used are fully connected to the amplifier and correctly assigned within the system set up.

Note: If you experience problems when an AV receiver is used, the cause is usually the settings of the AVR itself. Refer to the AVR manufacturer’s guidelines on the correct settings to use for your requirements.

2) Consistency of audio output between devices – Is there any discrepancy between the audio output of the source, the audio or zonal settings of the AV receiver and the speaker configuration used needed for successful audio replication? If you are outputting 5.1, make sure all devices connected are also outputting 5.1

Note: Occasionally with some sources, the device settings allow the specification of audio output through a TV or an HDMI port. If using an AV receiver, check the HDMI output option is selected.

3) Do all the local sources work through the AV receiver?

Check the operation of each source individually.

Bandwidth

1) If using a graphics-based source (such as a PC/Mac/media server), make sure the source resolution is set to a maximum of 1080p, 50Hz. Higher resolutions available for graphics-based systems require higher bandwidth that may affect transmission of signals as well as incompatibility with devices.

IR (available on selected devices)

1) Check you are using emitters at the IR TX transmitter end and receivers at the IR RX receiver end – are they connected to the correct ports on the matrix and display receiver.

2) Is the emitter correctly positioned on the source?

Fix the emitter directly over the infrared sensor of the source and attach using the adhesive backing.

Note: Locate the infrared source sensor by using a flashlight to find a small sensor within the fascia of the source display. If necessary, secure the emitter over the sensor with a small amount of contact adhesive.

3) Is your remote powered and sending a signal?

Note: IR is invisible to the naked eye, so use a digital camera/ phone camera to check the remote signal – point the camera at the remote control when pressing a button.

You should see the remote transmitter flashing to indicate a signal being sent. Replace batteries if flashing is not seen on the digital camera screen.

4) IR dropout issues can be due to exterior influences emitting infrared radiation that can interrupt IR signals. Ensure emitters and receivers are away from the following causes of IR interference.

- **Direct sunlight**
- **Halogen lighting**
- **Plasma screens**

5) UTP Termination Issues - swap cables over at both transmitter and receiver ends to see if control is established. If so, a possible re-termination of the cable could remedy the problem.

6) Are you using Wyrestorm emitters and receivers? The use of third party products/magic eyes may not be compatible. Always use Wyrestorm components included with your purchase or check compatibility of third party control systems with your Wyrestorm dealer.

7) If problems persist, swap out the IR emitters and receivers to rule out faults with the units themselves. Use emitters you know are fully operational to test working condition.

8) Reactivate the IR callback function on your matrix and swap IR ports on the matrix to rule out a fault with the device connection ports.

9) Should IR remain unresponsive, turn off and disconnect all cables and reconnect zones one at a time to assess if one location in particular is the problem. If so, run new cables directly to the display – if this fixes the problem, it is likely that electromagnetic interference /damage to the cable somewhere along the run is causing the IR signal to drop out. Investigate and remove EM interference from the run or replace damaged UTP cable.

12. FAQ's

5e or 6?

While our equipment is tested and graded to Cat 5e cable standard; tests have shown that better results are achieved when using Cat6 cable. The lower gauge, thicker copper cores ensure better signal transfer. Newly installed cabling should always conform to Part P Regulation and BS 7671 (17th Edition), and should be terminated to 568B standard

Can I use a single Cat 5e cable?

Although conventional transmission is considered to be two Cat 5e cables, it is possible to send the signal down a single cable if necessary. All of our pro-matrix switches and UTP splitters support single UTP mode, however in this mode IR control of sources and matrix switching is not possible. However using HDBaseT transmission; all of the twin cable features are supported with the added benefit of Ethernet and RS232 control.

How far can the signal travel?

Under perfect transmission conditions our HD receivers will operate at 30, 50 or 100m (@1080p) depending on the model used. Perfect conditions mean no electrical interference, straight cable runs with no bends or kinks and no patch panels or wall outlets. If some of the above are factors in your installation then signal strength and bandwidth can be compromised. If a cable run is reaching the upper limit of the receivers' capabilities, then the signal can be boosted by way of an extender set (Rx TX) or by simply using an in-line repeater. Our transmission signals can be repeated up to 5 times (250m) using a conventional TMDS signal or 7 times (700m) using HDBaseT technology.

What about 3D?

All of our matrix switches and most of our extender products will pass-through a 3D Blu-ray signal. The 30m and Coax extender sets do not support frame sequential 3D (Blu-ray), but will still pass-through interlaced stereoscopic 3D (Satellite etc.)

How do I control the sources?

Most of our HDMI distribution products support some kind of IR pass-through from point-to-point extender sets to pro and HDBaseT matrices. Most of the range now supports wideband IR meaning it is compatible with any IR device available on the market. Our Pro and HDBaseT matrix range (Cat 5e) has IR pass-through from each of the outputs and has discrete IR outputs at the switch end, meaning you can have multiple identical sources yet the IR would be routed only to the applicable source.

Do I need power at the TV end?

Yes. Our HD display adaptors require a 5v power supply at the TV end to operate. It's important that these are powered locally and do not receive remote power from the rack as there can be issues resulting from voltage drop along the length of cable. Our new USB power cables overcome the problem of having a second mains outlet behind the TV. These useful leads draw the 5v from the USB socket on the TV to power the receiver, this also

means that the receiver is only powered when the TV is on making the system more environmentally friendly.

Do I need to use 1 or 2 cables?

Using our conventional pro (TMDS) transmission method the Video & Audio is sent along cable #2, IR and HDCP data is sent along cable #1. Using our HDBaseT technology it's possible to send Audio (up to DTS Master), Video (up to 4k), Ethernet (10/100), and control (RS232 & 2-way IR) down a single Cat 5e cable.

Are Wyrestorm products compatible with HDMI 1.4?

HDMI 1.4 refers to a list of 'features' that a device is capable of supporting, including Ethernet channel, return audio channel, 3D etc. Due to the continuously evolving nature of the technology, HDMI Licensing LLC have now decided to simplify terminology by testing and referring to cable in terms of STANDARD or HIGH-SPEED rather than in generations 1.3, 1.4 etc.

- STANDARD (or "category 1") HDMI cables perform at speeds of 75Mhz or up to 6.75Gbps, which is the equivalent to a 720p/1080i signal.
- All Wyrestorm equipment support HIGH-SPEED (or "category 2") HDMI cables that have been tested to perform at speeds of 340Mhz or up to 10.2Gbps, which is the highest bandwidth currently utilised over an HDMI cable and can successfully handle 1080p signals including those at increased color depths and/or increased refresh rates from the Source. High-Speed cables are also able to accommodate higher resolution displays, such as WQXGA cinema monitors (resolution of 2560 x 1600).

What about screens with different resolution capabilities?

When sending a signal point to point a TV will communicate it's capabilities to the source, then the source will output a suitable signal that compatible (i.e. 1080p Stereo audio). If you were to use a matrix switch with three 1080p screens and one 1080i screen, the resultant image would be 1080i across all screens. The matrix switches do not scale per output but instead negotiate with the source a signal that all screens are capable of supporting.

How do Wyrestorm devices handle HDCP?

HDCP (High Definition Copyright Protection) is a feature built in to HDMI devices to prevent theft of or illegal distribution of HD content. Unlike competing products, Wyrestorm devices are legal and comply with HDCP regulations. They do this by assigning a "key" to every display connected to the switch. HDCP "keys" are

assigned to a display when connected to a HDMI device normally. This doesn't change when connected to a switch; it just assigns more of them.

I can get 1080i but not 1080p at a TV location

Firstly ensure that both the source is outputting 1080p and that the TV is Full HD 1080p screen. If this is the case then the receiver may need setting up for long cable mode using the DIP switches. This useful feature uses an alternative Equalisation method to re-sync the signal over longer distances. (feature available on selected models)

I cannot get a signal out from my A/V receiver along a Cat 5e extender set

Check to ensure that the A/V Receiver isn't adding CEC (HDMI Control Protocol) to the outgoing signal, this can sometimes have an effect on the HDMI signal.

13. Maintenance

Clean this unit with a soft, dry cloth only. Never use alcohol, paint thinner or other harsh chemicals.

14. Product Services

Provided Service:

- 1. Damage requiring service:** This unit should be serviced by a qualified service personnel if:
 - The DC power supply or AC adaptor has been damaged.
 - Objects or liquid have gotten into the unit.
 - The unit has been exposed to rain.
 - The unit does not operate normally or exhibits a marked change in performance.
 - The unit has been dropped or the cabinet damaged.
- 2. Servicing Personnel:** Do not attempt to service the unit beyond that described in these operating instructions. Refer all other servicing to authorised servicing personnel.
- 3. Replacement Parts:** When parts need replacing, ensure parts approved by the manufacturer are used – either those specified by the manufacturer or parts possessing the same characteristics as the original parts. Be aware – unauthorised substitutes may result in fire, electric shock, or other hazards and will invalidate your warranty.
- 4. Safety Check:** After repairs or service, ask the service



www.wyrestorm.com

■ WyreStorm Offices

US Office: 6991 Appling Farms Parkway, Suite 104, Memphis, TN 38133

Tel: + 901 384 3575 Fax: + 901 384 3574

Unit 22, Ergo Business Park, Swindon, Wiltshire, SN3 3JW UK

Tel: +44 (0) 1793 230 343 Fax: +44 (0) 1793 230 583

■ WyreStorm Technical Support

US: +86 6677 0053

UK:- +44 (0) 1793 238 338

Email: support@wyrestorm.com

We reserve the right to change specification or product dimensions at any time.