one IP
BY PULSEEIGHT

USER MANUAL

HDMI® HDCP2.3™

V1.0

MADE IN BRITAIN

CONTENTS

Please note this manual is a setup guide for the physical unit, for a full guide to software, including the web interface please see the Software Guide which can be found at support.pulse-eight.com under the OneIP product page.

INTRODUCTION

OneIP provides an ultra-low latency, multicast AV-over-IP solution capable of distributing UltraHD 4K HDMI® 2.0 video (18Gbps), with support for HDR content, over a 1GbE network.

This product is designed to operate as an encoder, decoder or both simultaneously. Bidirectional functionality allows complete flexibility of hardware placement and simple content management within your network. Plug in anywhere, see it anywhere, manage it centrally.

All of the current OneIP family of products can be powered via PoE+ from the network switch, or by a local DC power supply (available separately).

FEATURES

- Full duplex transceiver enabling Transmit and Receive functions simultaneously
- Supports the HDMI® 2.0 18Gbps specification, up to 4K@60Hz 4:4:4
- Supports 10 and 12-bit HDR sources, including support for Dolby Vision
- Utilises a cost effective 1Gb ethernet managed network
- Visually lossless compression at ultra-low latency
- Supports video scaling (up or down scaling)
- Supports all digital HDMI® audio formats including Dolby TrueHD, Dolby Atmos, DTS-HD Master Audio and DTS:X
- Supports signal routing of bi-directional IR and CEC
- Digital audio breakout of HDMI® output, supporting LPCM, Dolby Digital and DTS
- 1Gb Ethernet passthrough
- PoE+ (power over ethernet) or local DC power supply options
- HDCP 2.3 compliant
- System status and Locator LEDs

INSIDE THE BOX

- 1x OneIP Transceiver
- 1x RS232 Phoenix Connector
- 1x Quick Start Guide

SPECIFICATIONS

Video Inputs	1x HDMI® 2.0
Video Outputs	1x HDMI® 2.0
HDCP Compliance	Up to HDCP 2.3
HDMI Bandwidth	18Gbps
CEC	Yes - Bidirectional
Digital Audio Outputs	1x Optical (TOSLINK)
Audio Support	Passthrough: 2ch PCM up to DTS:X & Dolby Atmos Digital output: 2ch PCM up to Dolby Digital 5.1
Network Ports	2x 1GbE RJ45 connectors (1x PoE+ Capable)
Transmission (Network) Distance	Up to 100m*
Operating Modes	Transmitter (encoder), Receiver (decoder) or Transceiver (encoding and decoding)
End-to-End Latency	1 video frame
Video Distribution Topologies	• Point-to-Point • One-to-Many • Any-to-Any (full-duplex)
Chroma Subsampling	YCbCr4:4:4, YCbCr4:2:2, YCbCr4:2:0, RGB
Colour Space	YUV (rec. 601, rec709, rec2020), RGB
Colour Depth	8-bit, 10-bit, 12-bit per colour
HDR Formats	HDR10, HLG
IR Inputs	1x 3.5mm stereo plug (for IR receiver)
IR Outputs	1x 3.5mm mono plug (for IR flasher)
RS-232 Ports	1x mini-phoenix (3pin)
LED Indicators	Device ID / Network / System
Material	Powder Coated Aluminium
Operating Humidity	5 to 90% RH (no condensation)
Operating Temperature	0 to +35°C (32 to +95°F)
Storage Temperature	-20°C to 60°C (-4°F to 140°F)
Power Input	• PoE+ (via PoE+ Ethernet port) • Power supply 12V 3A (sold separately)
External Power Rating	12V 3.0A 50/60Hz
PoE+ Power Consumption	Max 30W @48VDC - 802.3at
Certifications	UKCA, CE, FCC (SDoC), RoHS
ESD Protection	Human Body Model: 15kV air, 8kV contact
Included Accessories	1x Phoenix Connector
Drivers	Control 4, ELAN, Crestron Home, RTI
Dimensions (W x H x D)	25cm x 15.5cm x 3cm / 9.8 x 6.1 x 1.1 inches
Weight	0.6 kg

* 100m max distance between the switch and OneIP unit when using a single ethernet cable. You can extend over much longer distances with additional network hardware.

SAFETY PRECAUTIONS

Please read the instructions before attempting to install or operate this equipment.

Keep the following in mind as you unpack and install this equipment:

- Always follow basic safety precautions to reduce the risk of fire, electrical shock, and injury.
- To prevent fire or shock hazards, do not expose the unit to rain, moisture or install this product near water.
- To protect the unit from overheating do not block any vents or openings in the unit housing that provides ventilation.
- Allow sufficient space for air to circulate around the unit.
- Use a compatible PoE+ source or the OneIP power supply (available separately). If you require additional power supplies, please contact your Pulse-Eight representative.
- Never push any objects into this product through any openings or empty slots as you may damage parts inside and/or cause an electrical shock.
- Do not allow anything to rest on the power cabling and avoid putting weight of any kind on it.
- Never spill liquid of any kind on or into this product.
- This product is intended for use in a clean (dust-free) residential environment.

Ventilation

It's important to keep the product well ventilated. Any electronic equipment will generate heat. A well-ventilated area helps to disperse heat. If placed in a poorly ventilated area, this product may heat up and cause irreparable damage.

Allowing this device to run for prolonged periods under high temperatures may break down circuitry and electrical components. This risk also applies if the device is exposed to direct sunlight or placed near heat sources.

Over time, dust buildup can interfere with the functioning of the fan and electronics within this device. Dust particles contain various substances such as water, oil, minerals, and chemicals, which may lead to signal errors or degradation in internal chips and circuitry. Given the unpredictable nature of these effects, it is strongly advised to maintain Pulse-Eight products in a well-ventilated environment and ensure they remain as clean as possible.

In vary rare occassions, insects or reptiles may establish nests in close proximity to or within the electronic casing. Although our products are engineered to provide optimal protection for internal electronics, it's important to note that these creatures are naturally attracted to such environments. In the unlikely event of such an occurrence, it can result in inadequate ventilation within the unit, impairing its ability to effectively dissipate heat.

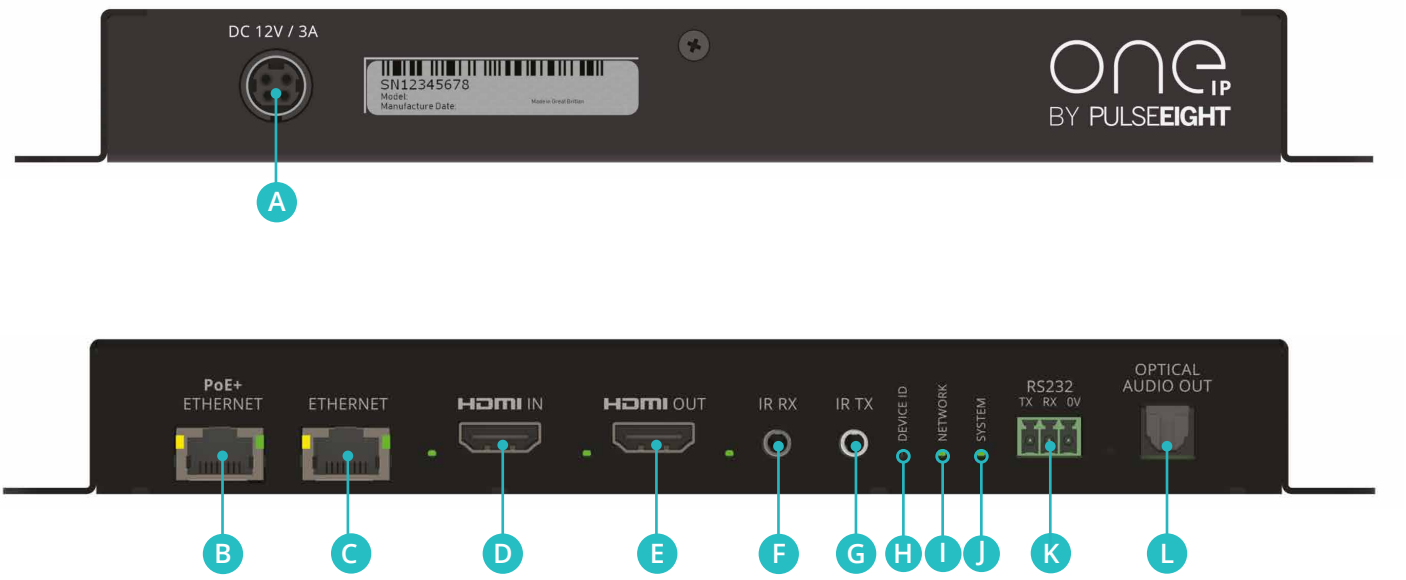
Please avoid stacking OneIP devices together. Ensure there's ample space between each unit to allow for proper airflow. OneIP single and multiple racking systems are available separately.

FCC Warning

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

PANEL DESCRIPTIONS



A **Power Connector:** The 4 pin DIN power supply connector is only to be used with the recommended 12V 3A DC power supply (sold separately). An external power supply is only required when PoE+ power is not being used or is unavailable.

B **PoE+ Ethernet Port:** Connect to the 1GbE network being used for the OneIP product using an Ethernet cable (Cat5e or better).

C **Ethernet Port:** Connect to a separate local Ethernet device for network connection sharing.

D **HDMI® In Port:** Connect your source device (such as Blu-Ray player, STB, etc) to this port via an appropriate high speed HDMI cable.

E **HDMI® Out Port:** Connect your sink device (such as a display or projector) to this port via an appropriate high speed HDMI cable.

F **The IR RX Port (Black):** To receive signals from a remote control and relay these signals to the source device from another connected OneIP device or the local unit depending on the active routing configuration.

G **The IR TX Port (Grey):** To control the connected HDMI Source device (STB, Blu-Ray, etc) using a compliant Pulse-Eight IR Emitter. These ports can also be connected directly to a suitable control system for other use cases. In these scenarios, use a suitable IR coupling cable.

H **Device ID LED:** This LED can be used to help identify OneIP devices by pressing the 'Locate Device' button within the web interface.

I **Network LED:** Indicates the status of the OneIP device network connection.

J **System LED:** Indicates the status of the OneIP device system health.

K **RS232 Phoenix Port:** For transmitting RS232 commands.

L **Optical Audio Out Port:** Digital Optical (S/PDIF TOSLINK) audio output that matches the audio from the HDMI Output Port.

CABLING

Ethernet Cable

The Ethernet ports on the Pulse-Eight OneIP product are designed to use standard Category (Cat) cables. The minimum cable used on a OneIP system is Cat5e, but it is recommended to use a higher tier cable such as Cat6 or Cat6A where possible because they have stricter twisted pair and shielding requirements that can reduce data loss. We do not recommend the use of CCA (copper clad aluminium) as this is known to cause PoE+ issues due to higher DC resistance.

Recommended T568B wiring pattern

IMPORTANT: Please note that local building regulations may apply to the installation of cabling in properties. It is important to check building regulations to guarantee that you are in accordance with the laws of your territory.

HDMI® Cables

The HDMI® ports on the Pulse-Eight OneIP product are designed to use high-speed HDMI 2.0 cables.

Not every HDMI cable in the market is built the same. Cables can easily suffer from bent pins, poor soldering that failing under stress, substandard intra-pair twist ratios as well as other manufacturing issues. It is important to use high-speed HDMI 2.0 cables from reputable suppliers and to verify before any installation that each individual cable can support the full 18Gbps bandwidth reliably.

NETWORK SWITCH REQUIREMENT

Pulse-Eight's OneIP is able to efficiently distribute bi-directional video and audio (full-duplex) over a Layer 2 managed network.

OneIP is compatible with a wide range of Gigabit Ethernet switches, supporting IGMP snooping and individual-port multicast settings.

Note: Pulse-Eight has provided a OneIP Network Configuration Setup Guide and a list of switches tested and approved for use with OneIP. This can be found at support.pulse-eight.com under the OneIP product page. Please note our support team can only advise on approved switches.

Please select an Ethernet switch supporting PoE+ when it is not possible to use a local power supply on all of the OneIP units.

INSTALLATION

Pulse-Eight OneIP units can be installed anywhere within a property, such as in a centralised rack, behind a TV or in a remote room.

For units that need to be installed in an AV rack please follow step 1.
For units that will be installed behind a TV, loose or in a remote zone, please follow step 2.

Installing In A Rack

1. We recommend the use of the OneIP rack mount kit (sold separately) when installing multiple devices into a centralised location. Please follow the instructions provided with the rack mount kit for successful installation and continue to step 4.

Installing OneIP Unit In A Remote Zone

2. OneIP devices can be mounted on the wall or placed flat on a shelf. OneIP devices have built-in wings for easy wall mounting.
3. It is important never to block or limit the air flow to both the fan vent on top of the unit or the vents on the sides of the unit. Doing so may cause overheating and potential failure.

Connecting PoE+ Ethernet Ports

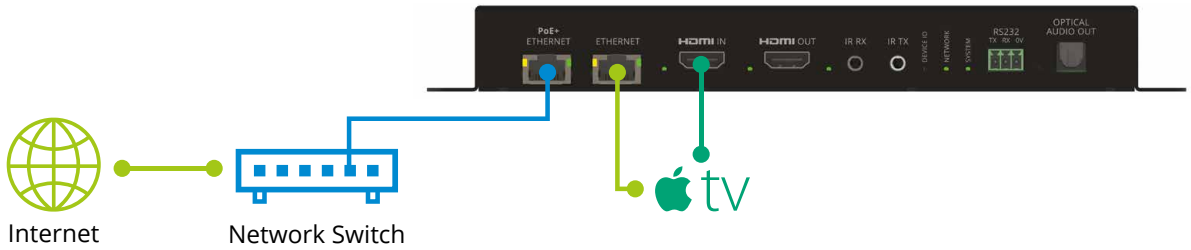
4. Connect the Ethernet cable (Cat5e or better) to the PoE+ Ethernet port.
5. Complete the connection by connecting the other end of the Ethernet cable to one of the ports of the Ethernet switch.

Note: Please make sure that the Ethernet switch is configured as per our setup guides before making this connection.

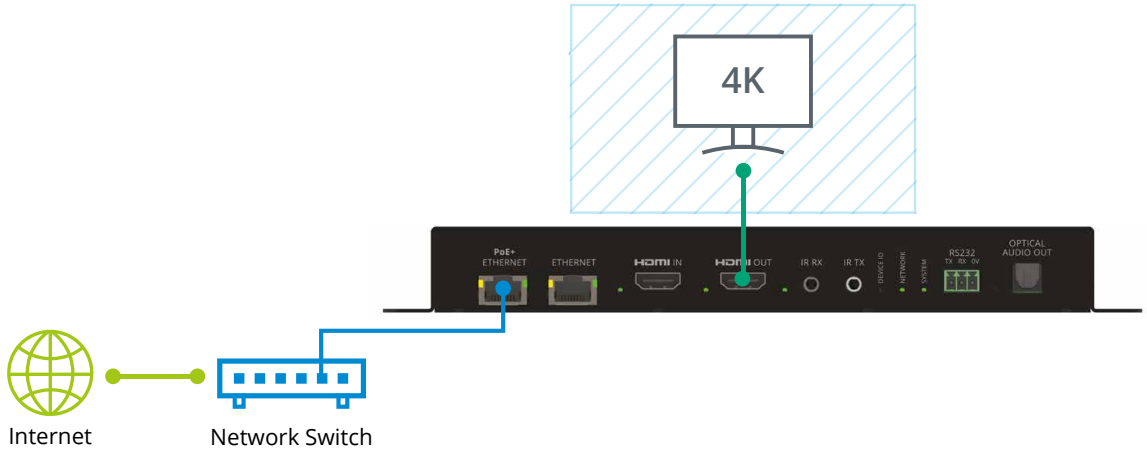
Connecting the HDMI Input and Output

This device can work as a Transmitter (encoder), Receiver (decoder), or Transceiver (simultaneous encoder and decoder).

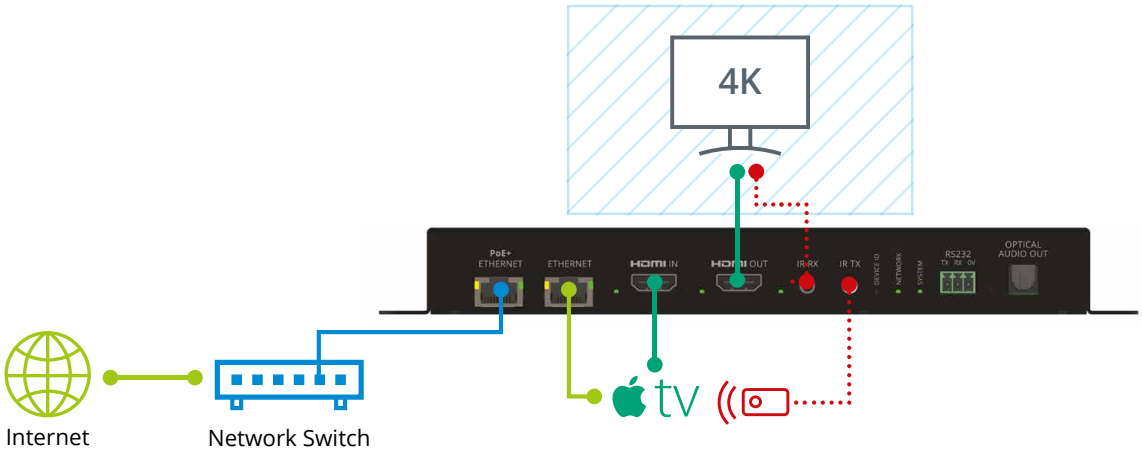
6. Acting as a Transmitter, you will need to connect an HDMI source to this device. Connect an HDMI cable from your video source (e.g. Blu-Ray player) to the HDMI input of this device.



7. Acting as a Receiver, you will need to connect an HDMI sink to this device. Connect an HDMI cable from the HDMI output port of the OneIP to your sink device (e.g. TV).



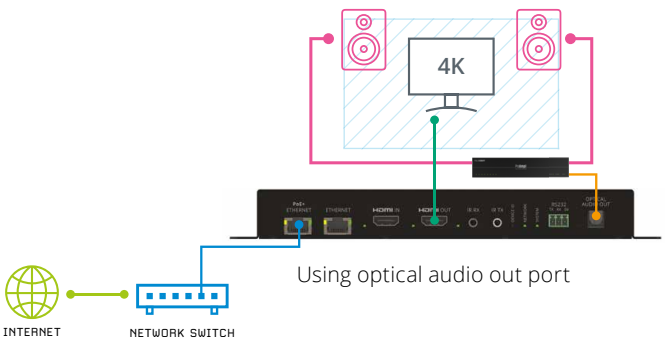
8. If required, connect a compatible IR flasher (emitter) to the 'IR TX' port (grey) on the OneIP device and place the IR bud over the IR window of the source device (i.e. Blu-Ray player).
9. If required, connect a compatible IR receiver to the 'IR RX' port (black) on the OneIP device and place the IR bud in line of sight of any remote controls to be used.



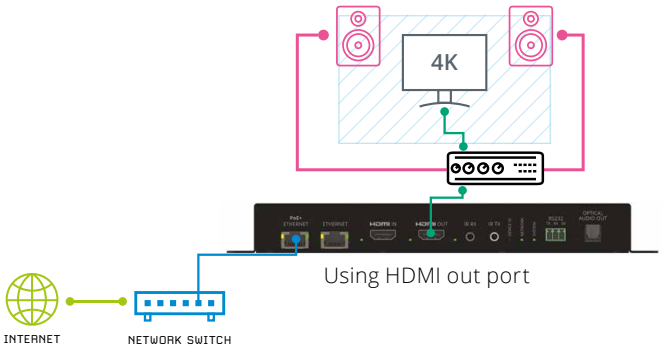
⚠ **WARNING**: Please only use a compatible 5V IR receiver/transmitter on this unit (sold separately)

Connecting to an Audio Processor

10. If you wish to use the digital audio output from the unit, connect an optical cable to the optical audio output port or connect an HDMI cable to the HDMI out port on the OneIP unit.
11. Complete the connection by attaching the other end of the cable to your amplifier/AVR.



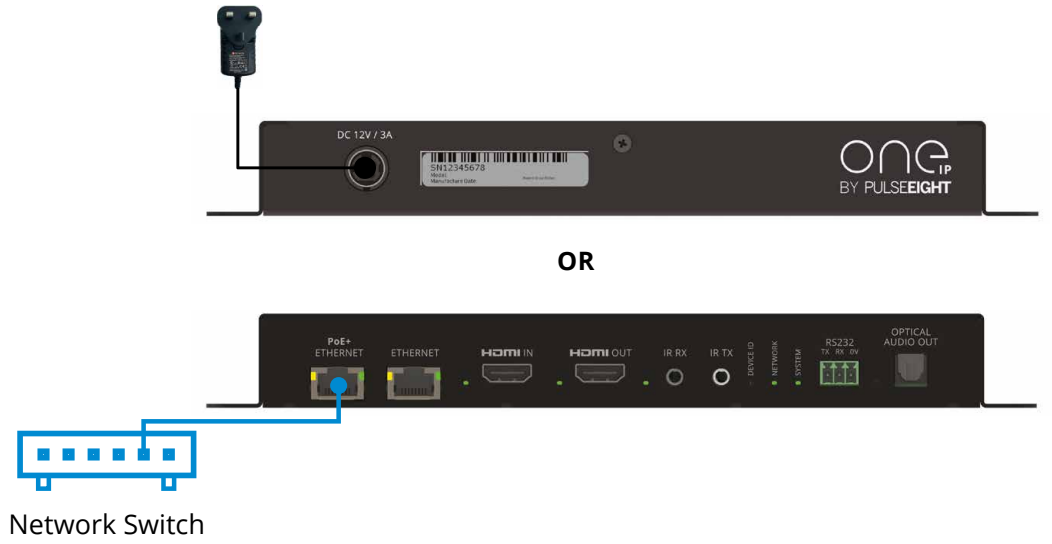
Using optical audio out port



Using HDMI out port

Powering Up

12. If your Ethernet switch supports PoE+, then this device will power on automatically. If your Ethernet switch does not support PoE+, you will need to use a local OneIP power supply (sold seperately).



13. As the device powers on, the front panel LEDs (Device ID, Network, System) will illuminate momentarily before it begins its initialization sequence. The fan will run at full speed until the unit has initialised. This is normal behavior.

Note: The initialization process takes up to 2 minutes. However, it is possible that a firmware update may be available the first time the unit is powered ON - in this instance the device may take longer to initialize. Please wait and do not disconnect the power until this update has completed.

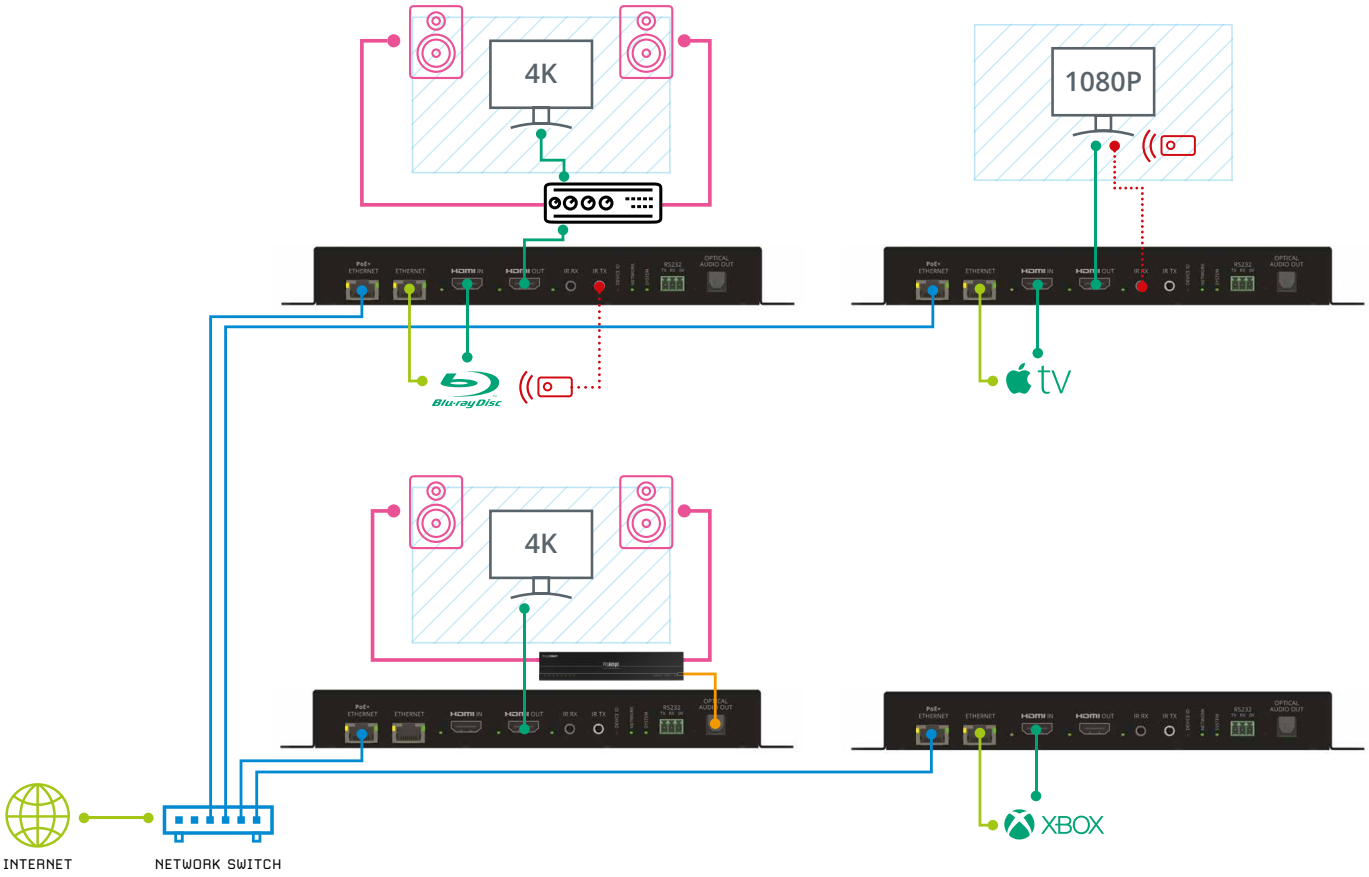
14. Once initialization has been completed, the System LED will turn on (green) and Network LED will also turn on when a network connection has been established.

15. Check the LEDs on the OneIP units. Be aware that other units may have taken a longer time to initialize. If System and Network LEDs are not solid green, please refer to the full user manual for details.

Detecting OneIP Units on the Network

16. Once all the OneIP units are connected and have powered on, you can access the system Web Interface.
17. The OneIP system can be found using a computer connected to the same router/network by visiting www.gotomymatrix.com in a web browser. Please refer to the OneIP software manual.

WIRING CONCEPT



LEGEND

- Infrared
- PoE+ Ethernet
- Digital Audio
- Ethernet
- Speaker
- HDMI

TROUBLESHOOTING

Should you encounter installation difficulties or issues with device communication, the following checklist of common issues and causes should help resolve your issues. If you still continue to experience issues, please contact your local representative for further assistance.

No or Poor Picture Quality

- Connected and powered? Double check that all HDMI, Ethernet and power cables are firmly connected to the correct ports and all devices are correctly powered.
- Cable length? Are you approaching the maximum distance of the Cat cable (e.g. 100m). Cables bundled together may cause cross-talk and further degrade signal quality.
- Signal strength? The use of cable joins, stranded patch panels, wall outlets and stranded patch leads as interconnects between them can significantly reduce signal strength. Use solid core straight through connections wherever possible.
- If you reduce the resolution of the source (e.g. from 4K to 1080p), do you get a picture? If so, this suggests a conflicting resolution between source and display or a bandwidth capacity issue with your cable. Check all inputs and outputs share the same resolution capabilities.
- Pink or off-colour picture? This could be caused by an invalid EDID or the source device failing to read the EDID from the unit. Try re-booting the unit and all source devices to force the re-reading of the EDID.
- Cable quality and condition - HDMI cable/connectors can easily be damaged and the quality of material can vary. Always use good quality leads and cables and try swapping cables that are known to be working into the solution to see if this improves your image.

EDID Handshake

There may be times you will need to perform an EDID Handshake on your unit. This is often after a new piece of equipment has been introduced to your setup or any changes have occurred.

To do an EDID Handshake:

1. Turn off the unit and all sources
2. Turn on all TVs, and make sure these are not set to standby
3. Wait 45 seconds
4. Power on units and wait for 2 Green Lights on the front panel
5. Wait a further 2 minutes
6. Turn on all sources

IR Not Functioning

1. Make sure to only use the compatible OneIP IR emitter/receivers.
2. Check and see if the LED beside the IR port is lighting up. It signifies whether the IR connection is working.
3. If the IR bud is not receiving or transmitting, test it out with a different port or swap with another IR bud to deduce the problem

Note: Do not mix and match IR buds or use from other brands as they could cause irreparable damage.

IR Control

- Are the IR emitters and receivers correctly positioned to allow infrared signals to be transmitted and received? Emitters should be fixed firmly over infrared sensors of sources. Receivers should be attached or next to displays ensuring a clear line of sight to the remote control used to operate. Each IR port has an LED, when correctly installed the LED will flash when IR is transmitting or receiving.
- Is your remote control powered and sending a signal? As IR is invisible to the naked eye, a good trick to check whether your remote is transmitting a signal is by viewing the remote handset sensor through a digital camera/ camera phone. The sensor should flash when a button on the handset is held down, this is not supported by all phone cameras.
- IR signal dropout can be experienced due to exterior emissions of infrared radiation. Ensure emitters and receivers are away from direct sunlight. Halogen lighting and plasma screens may also interfere with IR signals.

WARRANTY TERMS & CONDITIONS

IMPORTANT INFORMATION ABOUT YOUR RIGHTS AND OBLIGATIONS, AS WELL AS LIMITATIONS AND EXCLUSIONS THAT MAY APPLY TO YOU. YOUR RIGHTS AND THIS LIMITED WARRANTY

This Limited Warranty gives you specific legal rights. You may also have other legal rights that vary by country, state, province, or jurisdiction. The disclaimers, exclusions, and limitations of liability under this Limited Warranty will not apply to the extent prohibited by applicable law. For a full description of your legal rights, you should refer to the laws applicable in your jurisdiction and you may wish to contact a relevant consumer advisory service.

1. WHAT THIS LIMITED WARRANTY COVERS; PERIOD OF COVERAGE

Pulse-Eight Limited ("Pulse-Eight"), 8-12 Alder Hills, Poole, BH12 4AL, UK, warrants to the owner of the enclosed product that the product contained in this box ("Product") will be free from defects in materials and workmanship for a period of three years from the date of delivery following the original purchase (the "Warranty Period"), or if this product has been professionally installed, the warranty start date is from the date your installer purchased the item, not your system commissioning date. Please check with your installer for their purchase date. If the Product fails to conform to this Limited Warranty during the Warranty Period, Pulse-Eight will, at its sole discretion, either (a) repair or replace any defective Product or component; or (b) accept the return of the Product and refund within 45 days of return the money actually paid by the original purchaser for the Product. Repair or replacement may be made with a new or refurbished product or components, at Pulse-Eight's sole discretion.

If the Product or a component incorporated within it is no longer available, Pulse-Eight may replace the Product with a similar product of similar function, at Pulse-Eight's sole discretion. This is your sole and exclusive remedy for breach of this Limited Warranty. Any Product that has either been repaired or replaced under this Limited Warranty will be covered by the terms of this Limited Warranty for the longer of ninety (90) days from the date of delivery or the remaining Warranty Period. This Limited Warranty is transferable from the original purchaser to subsequent owners, but the Warranty Period will not be extended in duration or expanded in coverage for any such transfer.

2. TOTAL SATISFACTION RETURN POLICY

If you are the original purchaser of the Product and you are not satisfied with this product for any reason, you may return it in its original condition within thirty (30) days of the original purchase and receive a full refund. If this is a professionally installed product, you must check with your installer regarding their own returns policy.

3. WARRANTY CONDITIONS; HOW TO GET SERVICE IF YOU WANT TO CLAIM UNDER THIS LIMITED WARRANTY

Before being able to claim under this Limited Warranty, the owner of the Product must (a) notify Pulse-Eight of the intention to claim by emailing support@pulse-eight.com during the Warranty Period and providing a description of the alleged failure, and (b) comply with Pulse-Eight's return shipping instructions, and (c) ship the Product at owner's cost (except where prohibited by applicable law) to Pulse-Eight for repair or replacement. Pulse-Eight will have no warranty obligations with respect to a returned Product if it determines, in its reasonable discretion after examination of the returned Product that the Product is an Ineligible Product (defined below). Pulse-Eight will bear all costs of return shipping to the owner, except with respect to any Ineligible Product, for which the owner will bear all shipping costs.

4. WHAT THIS LIMITED WARRANTY DOES NOT COVER

This warranty does not cover the following (collectively "Ineligible Products"): Products marked as "sample" or sold "AS IS"; or Products that have been subject to: (a) modifications, alterations, tampering, or improper maintenance or repairs; (b) handling, storage, installation, testing, or use not in accordance with the Installation Guide or other instructions provided by Pulse-Eight; (c) abuse or misuse of the Product; (d) breakdowns, fluctuations, or interruptions in electric power or the telecommunications network; or (e) Acts of God, including lightning, fire, flood, tornado, earthquake, or hurricane. This warranty does not cover consumable parts, including batteries unless damage is due to defects in materials or workmanship of the Product, or software (even if packaged or sold with the product). Pulse-Eight recommends that you use only authorized service providers for maintenance or repair. Unauthorized use of the Product or software can impair the Product's performance and may invalidate this Limited Warranty. Pulse-Eight does not warrant that operation of the Product will be error-free or uninterrupted or that the Product will in every case process all data correctly.

5. DISCLAIMER OF WARRANTIES

Except as stated previously in this limited warranty, and to the maximum extent permitted by applicable law, Pulse-Eight disclaims all express, implied, and statutory warranties and conditions with respect to the product, including the implied warranties of merchantability, fitness for a particular purpose. To the maximum extent permitted by applicable law, also limits the duration of any implied warranties or conditions to the duration of this limited warranty.

6. LIMITATION OF DAMAGES

In addition to the above warranty disclaimers, in no event will Pulse-Eight be liable for any consequential, incidental, exemplary, or special damages, including any damages for lost data or lost profits, arising from or relating to this limited warranty or the product, and Pulse-Eight's total cumulative liability arising from or related to this limited warranty or the product will not exceed the amount actually paid for the product by the original purchaser.

7. LIMITATION OF LIABILITY

Pulse-Eight disclaims all liability of any kind of Pulse-Eight's suppliers. The Pulse-Eight online services ("services") may provide you with information ("product information") regarding your product's performance and/or peripherals connected to your product ("product peripherals"). The type of product peripherals that may be connected to your product may change from time to time. Without limiting the generality of the disclaimers above, all product information is provided for your convenience, "as is", and "as available". Pulse-Eight does not represent, warrant, or guarantee that product information will be available, accurate, or reliable. You use all product information, the services, and the product at your own discretion and at risk. You will be solely responsible for (and Pulse-Eight disclaims) any and all loss, liability, or damages, including to your HVAC system, plumbing, home, product, product peripherals, computer, mobile device, and all other items and pets in your home, resulting from your use of the product information, services, or product. The product information provided by the services is not intended as a substitute for direct means of obtaining the information.

8. VARIATIONS THAT MIGHT APPLY TO THIS LIMITED WARRANTY

Some jurisdictions do not allow limitations on how long an implied warranty lasts or exclusions/limitations on incidental or consequential damages, so some of the limitations set out above may not apply to you.

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