neo:x

BY PULSEEIGHT



USER MANUAL

P8-HDBT3-L-FFMG48-KIT

HDMI HDBT3 HDCP2.3

MADE IN BRITAIN

V1

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INTRODUCTION

The neo:4x is a 4x4 HDMI®/HDBaseT3 video matrix switch for routing multiple 4K UHD sources to multiple locations around a home or commercial space. It supports HDMI® 2.0, HDCP 1.4, 2.2 and 2.3, and 18Gbps bandwidth, so it works with the latest 4K HDR devices as part of a multi-room control system.

The Pulse-Eight neo:4x Video Matrix offers uncompressed switching and transmission of 4K UHD content. It has 4 HDMI® inputs, 4 HDBaseT3 outputs and 4 mirrored HDMI® outputs, one for every zone, plus 4 audio breakout zones for connecting amplifiers or soundbars directly. The neo:4x supports 4K@60Hz 4:4:4 and HDR at up to 60Hz, with both 4K and 1080p extended up to 40 metres (130 feet) over a single Cat6A cable. Automatic EDID management, bi-directional IR and HDMI-CEC control, a web interface and cloud remote monitoring make it a reliable choice for residential and commercial systems.

The Pulse-Eight neo:4x Kit includes 4 neo:Lite3 HDBaseT3 receivers, which are PoH compliant, so no power is needed at the display.

FEATURES

- Ultra HD 4K@60Hz 4:4:4 Video Transmission (up to 600Mhz)
- HDR Support at up to up to 600MHz
- 18Gbps Bandwidth
- HDCP 1.4, 2.2 and 2.3 Support
- 4 x HDMI® Inputs
- 4 x HDBaseT3 Outputs
- 4 x Mirror HDMI® Outputs
- 4 x Audio Breakout Zones
- 4K and 1080p up to 40m over Cat6A
- 4 x neo:Lite3 PoH Receivers Included
- HDMI-CEC Bi-Directional Control
- IR Bi-Directional Control
- Automatic EDID Management
- Cloud Remote Monitoring
- Responsive Web Interface

INSIDE THE BOX (KIT)

- 1 x neo:4x Chassis
- 4 x neo:Lite3 PoH Receivers
- 1 x Rack Mounting Kit
- 1 x External Power Supply (PSU) / 1 x IEC Power Cable
- 1 x Infrared Cable Packr
- 1 x Quick Start Guide

SPECIFICATIONS

Video Resolution	- 3840x2160p @50/60Hz 8bit 4:2:2 - 3840x2160p @24/25/30Hz 8bit 4:4:4 - 3840x2160p @24/25/30Hz 10bit 4:4:4 HDR - All formats 1080p, 1080i, 720p, 576p, 480p @24/25/30/50/60Hz
Video Inputs	4 x HDMI®
Video Outputs	4 x HDBaseT + 4 HDMI® Mirror (4 switchable outputs)
HDMI® Compliance	Up to 2.3
HDCP Compliance	Up to 2.3
Input TMDS Signal	6Gbps per data lane (18Gbps total)
Maxium Bandwidth	18Gbps
HDMI-CEC Control	Full
Extender Technology	HDBaseT 3.0 Class B (PoH compliant)
HDBaseT Connections	4x HDBaseT3 outputs
Transmission Distance	4K up to 1080p up to 40m (130ft)
Chroma Subsampling	YCbCr4:4:4, YCbCr4:2:2, YCbCr4:2:0, RGB
Colorspace	YUV (rec. 601, rec709, rec2020), RGB
Color Depth	Up to 12-bit (8-bit at 4K50/60 4:4:4)
IR Inputs to Room	Yes
IR Outputs to Source	Yes
IR Receiver Port	3.5mm 5V Stereo Jack (Pulse-Eight Type D)
IR Transmitter Port	3.5mm 5V Stereo Jack (Pulse-Eight Type D)
Ethernet Ports	1 x RJ45 (control only)
Available On Internet	Yes, via the Pulse-Eight Remote Monitoring Portal
LED Indicators	Front - 3 LEDs (System Health, Network and Cloud Monitoring) Back - Various (port and signal connectivity status)
Operating Humidity	5% to 90% (non-condensing)
Operating Temperature	0 to +35°C (32 to +95°F)
Storage Temperature	-20°C to 60°C (-4°F to 140°F)
Power Input	DC Input: 48.0V / 2.3A / 110W
Power Supply	Input 100-240V 50/60Hz 1.8A, Output 48V DC 2.5A
Rack Spacing	1U
Certifications	UKCA, CE, FCC, RoHS
ESD Protection	15kV Air, HBM
Included Accessories	Rack Mounting Kit, External PSU, IEC Power Cable, Infrared Cable Pack
Drivers	Control4, Crestron Home, ELAN, RTI, and Savant
Dimensions (W x H x D)	44 x 4.4 x 12 cm
Weight	913g
Box Dimensions (W x H x D)	52.5cm x 13cm x 21cm

SAFETY PRECAUTION

Please read the instructions before attempting to install or operate this equipment.
Please 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, or moisture or install this product near water.
- Never spill liquid of any kind on or into this product.
- Please use the included mounting kit where applicable, avoid blocking any vents on the product and follow best practices in rack design to help avoid overheating.
- Only use the supplied external power supply (PSU) and IEC power cable.
- Never push any objects into this product through any openings or empty slots in the unit 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 the weight of any kind on it.
- 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.
- This product is intended for use in a clean (dust-free) residential environment.

Ventilation
It's important to keep the product well ventilated when installing this Pulse-Eight matrix.

Any electronic equipment will generate heat. A well-ventilated area helps to disperse the heat. If placed in a poorly ventilated area, your equipment may heat up and cause irreparable damage to the circuitries. Allowing systems to run for prolonged periods under high temperatures will break down circuitry and electrical component. It also applies if the device is left in the path of direct sunlight or near any heat source.

Dust tends to accumulate and will disrupt the fan and electronics system. Dust particles contain various compositions like water, oil, and other minerals or chemicals. Having them in your electronic device can sometimes cause a signal error or degradation to the internal chips and circuitries. Because we cannot accurately predict how or when they can affect your device, we highly recommend that you keep Pulse-Eight products not only in a well-ventilated area but also as clean as possible.

In some cases, insects or reptiles can make nests near or inside the electronic casing. Whilst we design our products to maximize the protection of internal electronics, please be aware that insects and reptiles can be drawn to these types of habitats. In the unlikely event, this does happen, this will lead to poor ventilation inside the unit, and it will be unable to disperse heat effectively.

Finally, whenever possible, do not stack audio and video matrices together. Leave enough space in between each unit in order to provide good airflow.

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 **System Health LED** indicates matrix health.
RED - It is powering on or fault found.
GREEN - The system is healthy.

B **Network LED** indicates the matrix network connection.
RED - No network cable is connected.
AMBER (Flashing) - It is discovering the IP address.
AMBER (Solid) - The network has the IP but cannot ping the router.
GREEN (Flashing) - The network cannot reach the internet.
GREEN (Solid) - The network is healthy.

C **Cloud LED:** indicates the matrix connection to the Pulse-Eight Cloud.
RED - It is not connected to the cloud.
GREEN - It is connected to the cloud.

D **Power Connector:**: Connect the supplied external 48V power supply (PSU) here.

E **Ethernet:** Connect to network - Required for connection to Web Interface, Third Party Control, and Cloud Remote Monitoring Portal.

F **IR IN and OUT Ports:** Connect as required.
The IR IN port can be used to accept and distribute IR signals from a controller using a P8-IR-Optocable, as well as distribute IR signals back to the matrix using a compliant Pulse-Eight IR Receiver.

G **HDMI® Inputs:** Connect the appropriate high speed HDMI® cable to each input. These cables should then be connected to the Source device. (Blu-Ray player etc.)

H **Optical audio output:** Optical and Digital Coax options to connect audio-only output devices.

I **Digital Audio out:** Optical and Digital Coax options for Audio Breakouts.

J **HDBaseT3 Outputs:** Connect the appropriate *Category cable to each output. These cables should then be connected to a neo Receiver at each sink device. (TV/Amplifier etc.).
*Category cable: Cat 6A minimum requirement.

K **HDMI® Mirror Outputs:** Connect the appropriate high speed HDMI® cable to each output. These cables should then be directly connected to each Sink device. (TV/Amplifier etc.)

INFRARED BLASTER CABLE PACK

1. **IR Transmitter 3.5mm Stereo Jack** - An IR flasher (emitter) is required when wanting to output (blast) an IR command to an attached device. Please use compliant Pulse-Eight IR emitters (5V) as failure to do so might result in damage to the product.



2. **IR Receiver 3.5mm Stereo Jack** - An IR receiver is required when wanting to accept incoming IR signals - for example, from a remote control - to distribute and control other attached devices remotely. Please use compliant Pulse-Eight IR receivers (5V) as failure to do so might result in damage to the product.



NEO:LITE3 RECEIVER



Ⓐ **HDBaseT3 Input** - Connect the (Cat 6A minimum) to each input of the receiver; these cables should then be connected to one of the HDBaseT outputs on the matrix. When a link is established between the Matrix and the Neo Receiver, the orange LED on the HDBaseT port on the Neo Receiver will illuminate (at this point you can assume that the neo receiver is powered on).

Ⓑ **IR Receiver (RX)** - The IR Receiver port (black) can be used to distribute IR signals back to the matrix when connecting an IR Receiver.

Ⓒ **HDMI® Output** - Connect the appropriate high speed HDMI® cable to this port and connect to the sink device.

Ⓓ **IR Flasher (TX)** - The IR Flasher port (grey) is used to control the connected HDMI® Sink device (TV) using the IR transmitter.

Ⓔ **IR Activity Indicator** - The LED will flash green when an IR signal is being received and red when an IR signal is being transmitted.

the equipment is only suitable for mounting at heights up to 2m

HDBASET CABLING

What Is The Best Type Of Cable To Use?

Pulse-Eight products use the HDBaseT standard, which makes use of standard Category (Cat) cables. The minimum cable used on a neo system is Cat 6A, but it is recommended to use a higher tier cable such as Cat 8 where possible because they have stricter twisted pair and shielding requirements that reduce data loss between data pairs.

Patch cabling is strongly discouraged because it can degrade the signal. Use a long, single high-quality cable for each HDBaseT port whenever possible to allow the system to function at its best.
We do not recommend using pre-made leads unless you are certain of the correct specifications (i.e., solid core 568B); using lower quality cables will result in signal degradation and transmission quality.

Note: Please keep in mind that Copper Clad Aluminum (CCA) cables aren't supported. This will cause a HDBaseT performance issue due to the inherent properties of a CCA.

Shielded Cables

If you prefer shielded FTP cables, please use compatible shielded features such as grounding and termination. A faulty cable can increase interference rather than eliminate it.

Cabling Best Practice

Our recommended and best practice policy is to connect the Pulse-Eight matrix directly to the receiver using a straight cable. This will ensure the best signal quality and the greatest possible distance. On the HDBaseT Alliance website, you can find more information on "**HDBaseT Best Practices.**"
https://installers.hdbaset.org/wp-content/uploads/2014/09/Dos-and-Donts-WP.pdf

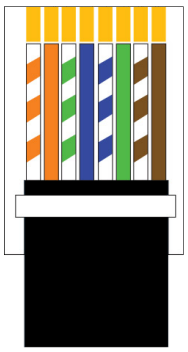
Wall Plates and Patch Panels

If the patch panels are properly terminated, there should be little distance loss. However, the use of wall plates and patch panels has the potential to increase cable resistance and, if not done correctly, could reduce advertised transmission lengths. Brush plates can be used instead of RJ45 wall plates to keep the finish neat.

Connection Termination

For Cat 6A UTP (unshielded) cable, we recommend using full plastic encasements rather than metal ones to avoid any grounding leaks into the Pulse-Eight products. However, when using shielded cables (STP), then please ensure to use metal connectors and that the Cat cable's shield/foil and drain wire are making good contact with the connector's shell.

Terminate the cabling using RJ45 connectors to the 568B wiring standard. (See diagram below).

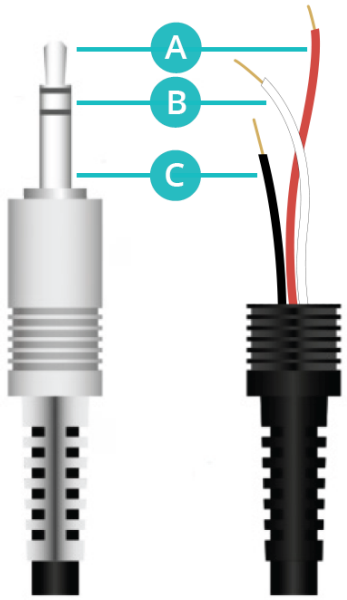


IMPORTANT: Please note that local building regulations may apply to the installation of cabling in properties. It is important to check building regulations to guarantee that you are in accordance with the laws of your territory.

IR PIN ASSIGNMENTS

Pulse-Eight strongly recommends the use of the IR accessories provided. We do not support 3rd party IR component as it could damage the matrix.
The standard range of Pulse-Eight matrices utilise a 3.5mm stereo jack, both for IR flashers and receivers buds.
We strongly recommend purchasing a Pulse-Eight Mono-Stereo Optocable when necessary in your installation.

Note: If you do require rewiring the IR plug to work with a 3rd party device then please note that this will void the warranty on the matrix if there is damage caused.
The Schematic provided below is as a reference only.



A **Tip** - 5V Power (receiver only)
B **Ring** - IR Signal.
C **Sleeve** - Ground

INSTALLATION

Installing In A Rack



1. Attach the rack ears to the front sides of the matrix using the provided screws.
2. connect cabling as described below.

> ⚠ ***WARNING:*** To prevent damage, it is important to ensure adequate ventilation space on the sides of the matrix, especially on the ventilation openings on the side of the product enclosure.

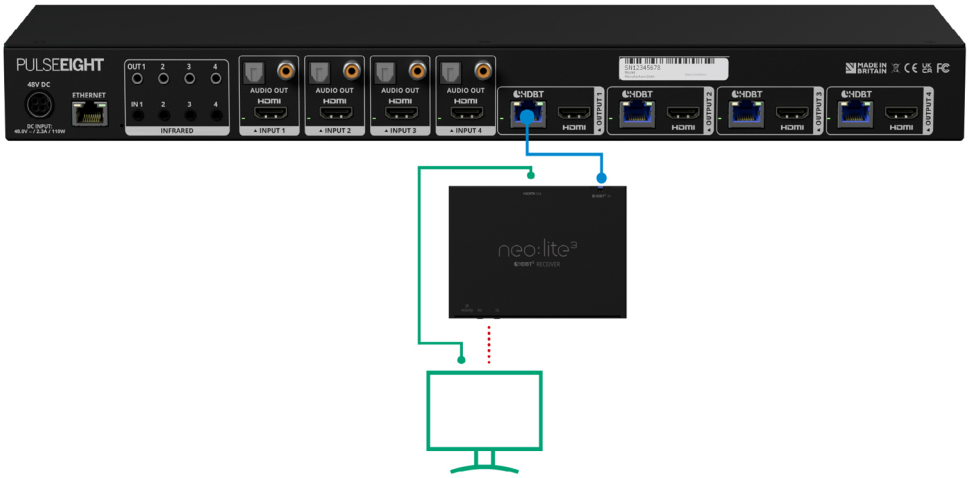
Connecting The Inputs



1. Connect HDMI® cables from your video sources (e.g. Blu-Ray player) to the HDMI® inputs of the matrix.
2. If required, connect the compatible IR Flasher (Emitter/Transmitter) cable to the '**IR Out**' port on the matrix and the IR bud placed over the source device's IR window.

Note: It is recommended, for ease of setup, to connect devices from Input 1 to Input 4 first.

Connecting The HDBaseT Outputs



1. Connect the appropriate category cable (Cat 6A minimum) to each HDBaseT output port
2. Complete the connection by attaching the other end of the Cat cable to a supplied neo Receiver's '**HDBaseT In**' port. The neo Receiver should be situated at the output end (i.e. next to the TV).

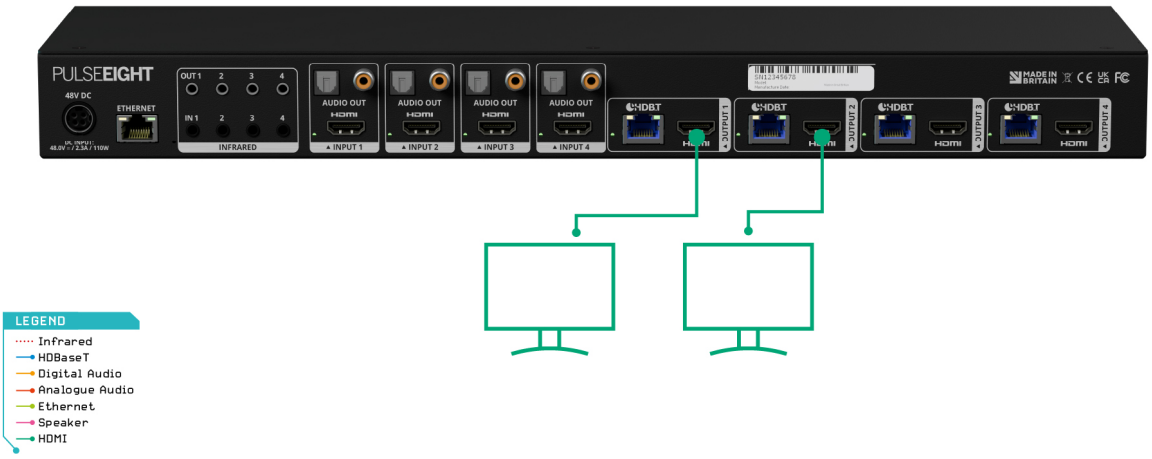
Note: It is recommended, for ease of setup, to connect devices from Output 1 to Output 4 first.

Note: Use only neo:Lite3 Receiver (P8-HDBT3-L-RX)

3. Connect HDMI® Out on the neo Receiver to the sink device (i.e. TV) using a high-speed HDMI® cable.
4. If required, connect the IR Receiver to the neo Receiver's '**INFRARED IN**' port - and place the IR bud on the underside of the sink device (i.e. TV).
5. If required, connect the compatible IR Flasher (Emitter/Transmitter) cable to the '**INFRARED OUT**' port on the neo Receiver with the IR bud placed over the sink device's IR window.

> ⚠ ***WARNING:*** Please make sure to use a compatible 5V IR receiver/transmitter on this product. Please refer to Infrared Blaster Cable Pack section.

Connecting The HDMI® Outputs



For HDMI® Output ports 1, 2, 3 and 4 connect sink devices (e.g. TVs) directly via high speed HDMI® cables.

Note: Can also be used in conjunction with a Pulse-Eight neo HDMI® Extender Set (sold separately) for reaching further distances.

Connecting To The Network



It is necessary to connect a standard Ethernet cable (Category 5e/6/7) from the matrix's '**Ethernet**' port to your router or network switch. Crossover cables are not supported.

Note: A network connection is required for supporting full control/remote monitoring features of the product.

Turning On The Matrix



1. Connect the neo:4x to the provided power supply.
2. Connect the IEC power cable to the external power supply.Then connect to the mains.
3. As it powers ON, the front panel LEDs (System Health, Network and Cloud) will illuminate momentarily before it begins its initialization sequence.

Note: The initialization process takes between 20 seconds and 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 matrix may take longer to initialize. If the System Health, Network and Cloud LEDs flash (orange/green) quickly together then a firmware update is being applied. Please wait and do not disconnect the power until this update has completed.

4. Once initialization has been completed, the System Health, Network and Cloud LEDs should all appear ON (green).
5. Check the LED status on the attached neo Receivers to ensure correct installation and connection. See LED Status in Troubleshooting section.

Note: When a link is established between the Matrix and the Neo Receiver, the orange LED on the HDBaseT port on the Neo Receiver will illuminate (at this point you can assume that the neo receiver is powered on).

IR RECEIVER AND TRANSMITTER PORTS



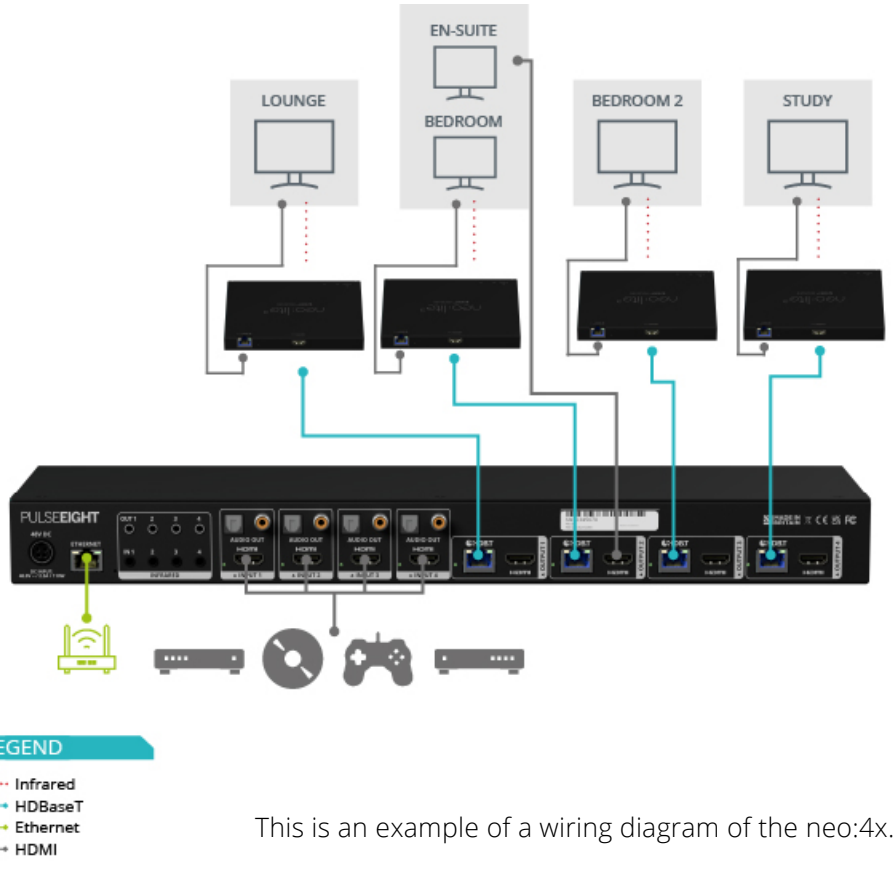
This section is only required when utilizing IR flashers or Receivers in your installation.

1. The IR ports at the '**INFRARED**' box work as follows:
   IN port is a 3.5mm stereo socket that accepts an IR input signal coming into the matrix intended to be sent to another room over the HDBT output below. It extends the IR signal from the matrix to the attached neo Receiver's IR-Flasher port.
   You can connect these ports directly to a 3rd party Control system processor/controller. A P8-IR-Optocable might be required.

2. **OUT** port is a 3.5mm stereo socket output designed to attach an IR Flasher to control the Source (Blu-ray, STB, etc) connected to the HDMI® input below. The original IR signal can come from the following: Any IR signal received by an attached neo Receiver will be routed back to the corresponding '**IR OUT**' port, according to the video routing to that HDBT output – e.g. if the matrix is routing video from HDMI® In #2 on to HDBT out # 4, then any IR signal received by the neo Receiver attached to HDBT port #4 will be routed and blasted out the matrix's IR OUT port #2

Note: If a display is connected locally (i.e. there is no HDBaseT extender set connected to HDMI® output) then this IR INPUT port should generally not be required in an installation.

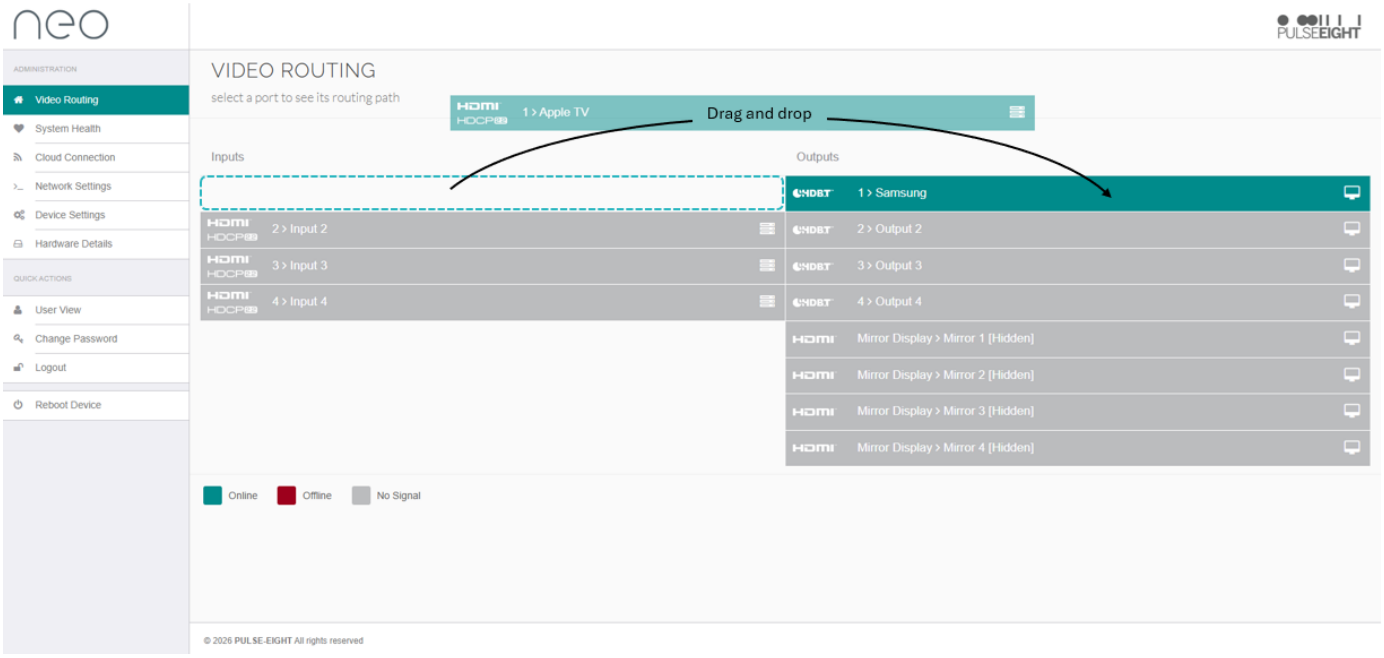
WIRING GUIDELINES



This is an example of a wiring diagram of the neo:4x.

NEO WEB INTERFACE

The front page of the web interface features a user-friendly drag and drop for video routing and display showing all available inputs and outputs. The following steps instruct how to access and customise this for the end-user.

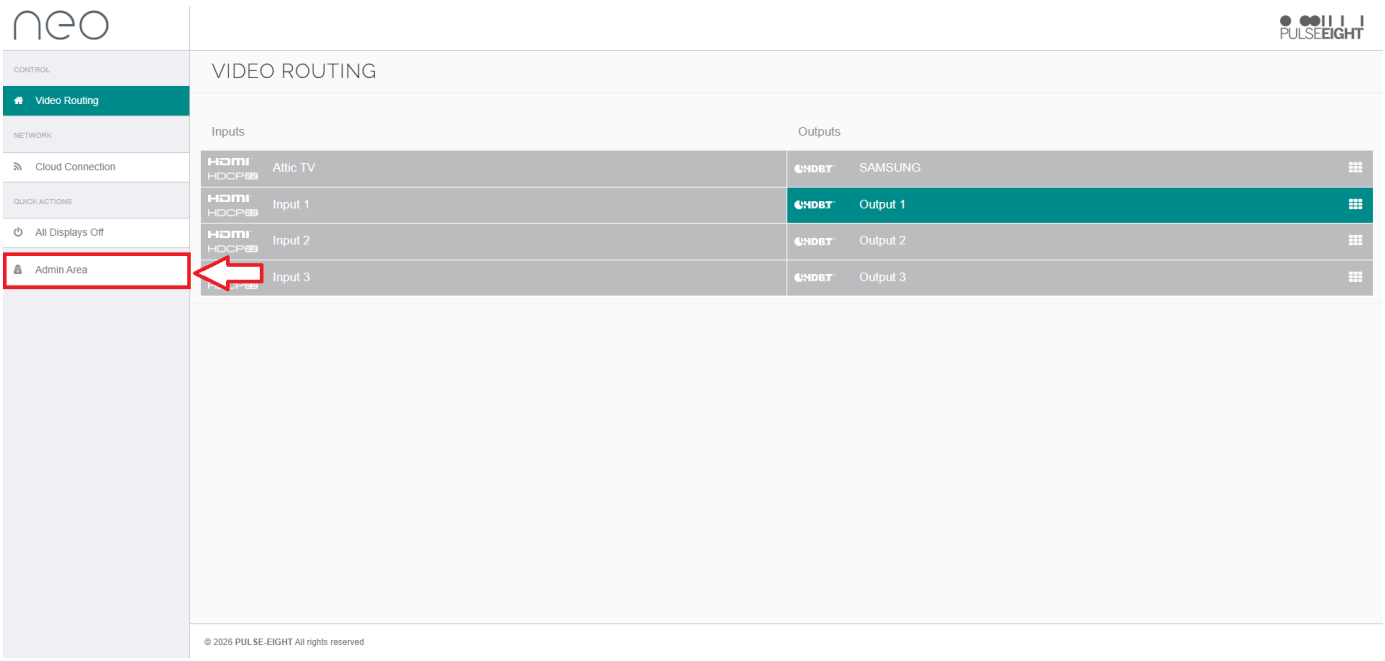


Accessing The Admin Area

When setting up the neo:4x matrix, it is important that the installer can access the admin menu on the Web Interface to configure the matrix according to the installation's requirements.

The Web Interface can be accessed using a computer connected to the same router/network as the matrix and by visiting www.gotomymatrix.com in your web browser. Navigate to the Cloud Connection tab (on the left-hand side) and then click on '**[Admin]'** link at the foot of the page. Insert your password to log in and access all options.

Note: The default password is "**admin**". It is recommended that this is changed to a unique and memorable password once setup has been completed.



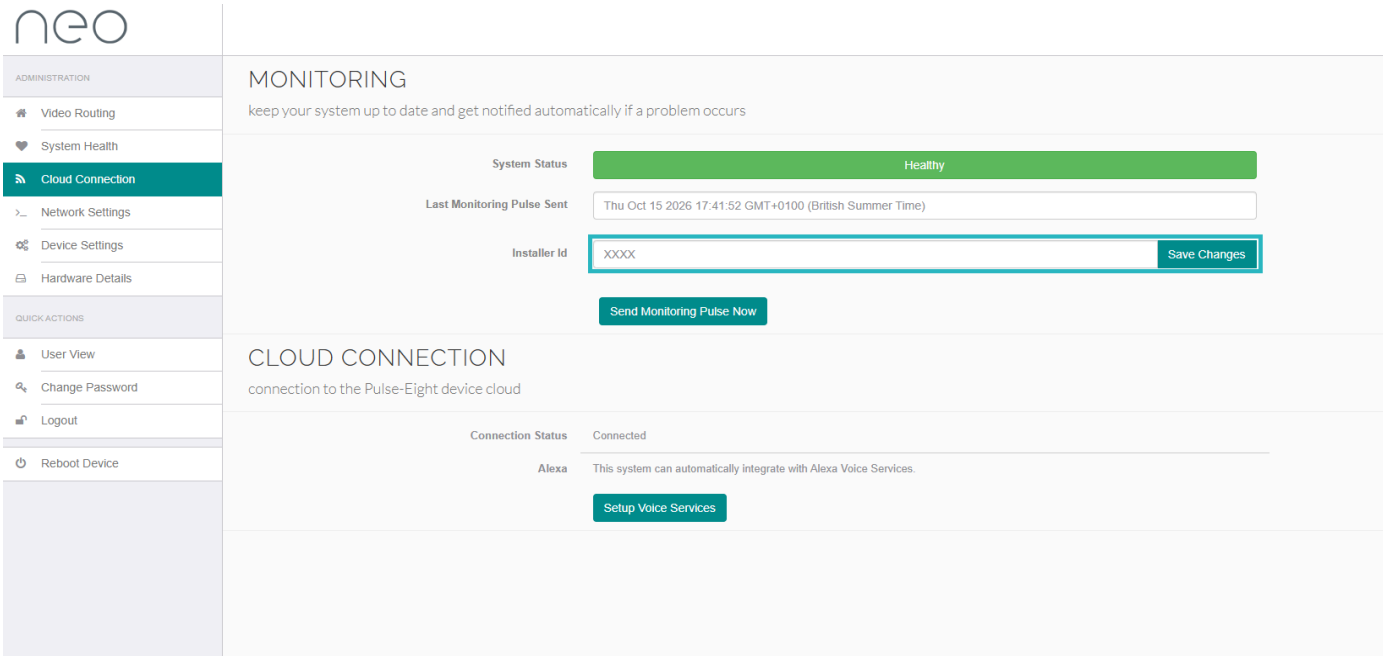
Link The Installer Account

On the Cloud Connection page, insert your Pulse-Eight Installer ID (4-digit) into the box and save changes - this will enable the matrix to be linked to your monitoring account.

Note: If you do not already have an Installer ID then you will need to register for a new account. Please contact your local representative or visit **monitoring.pulse-eight.com/Account/Register.**

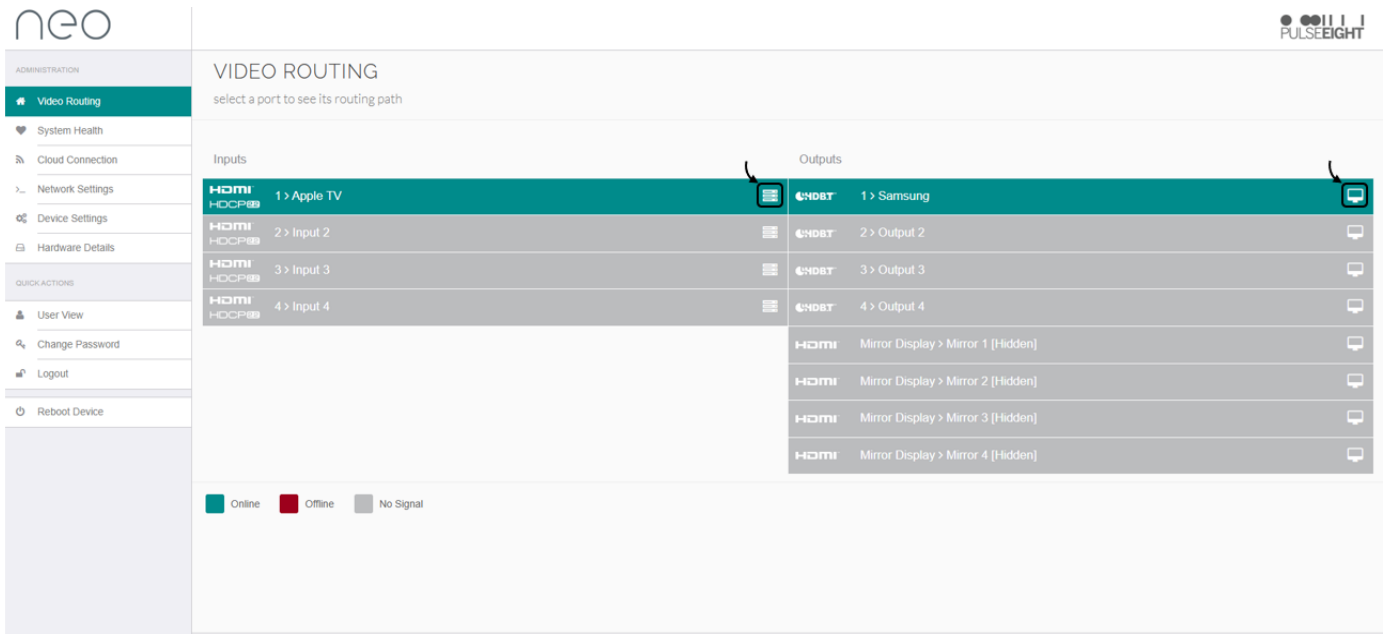
Once you have entered your Installer ID, you will be able to gain access to the Cloud Monitoring Service to monitor all of your Pulse-Eight installations remotely in one place.

For more information, refer to the "**Accessing the Monitoring Portal**" section in this manual.

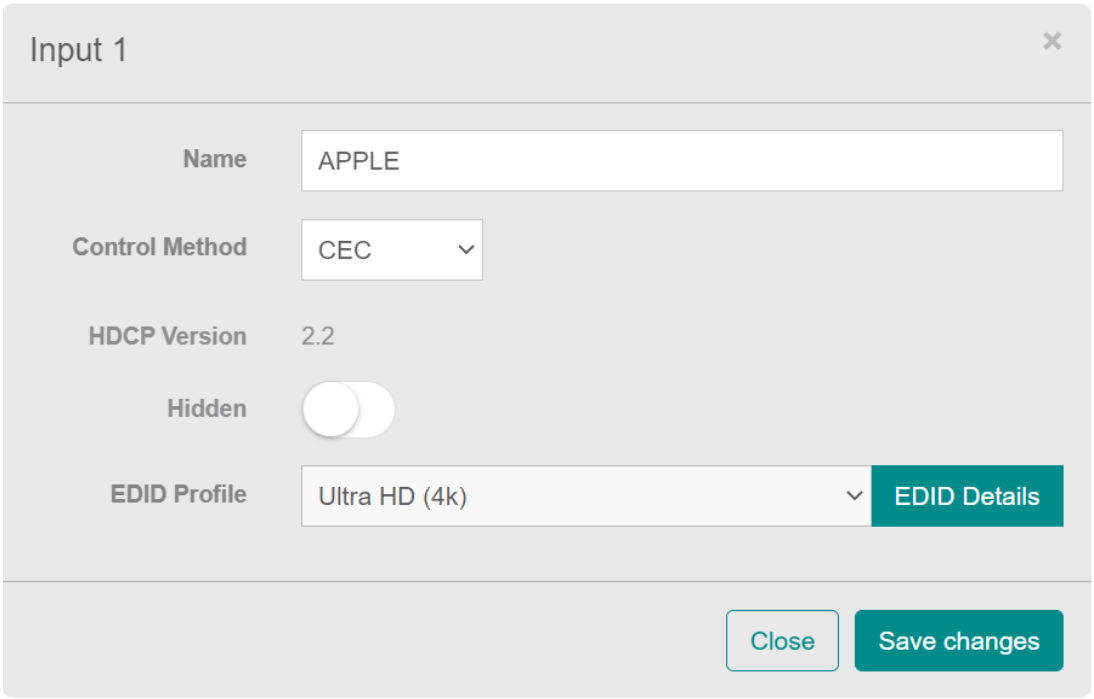


Input and Output Options Setup

To access the Input and Output Setup options, click on the ▤ symbol for changing the selected Input settings and the ▭ symbol for changing the selected output settings.



Input Setup Options



Name: Change the name of the selected input. This name will be displayed on the source list on the display device (TV) menu.

Control Method: Change the control method for the supported Set Top Box. They are:

- CEC (default control)
- Sky UK
- TiVo/Virgin
- Kodi
- Dish
- DirecTV

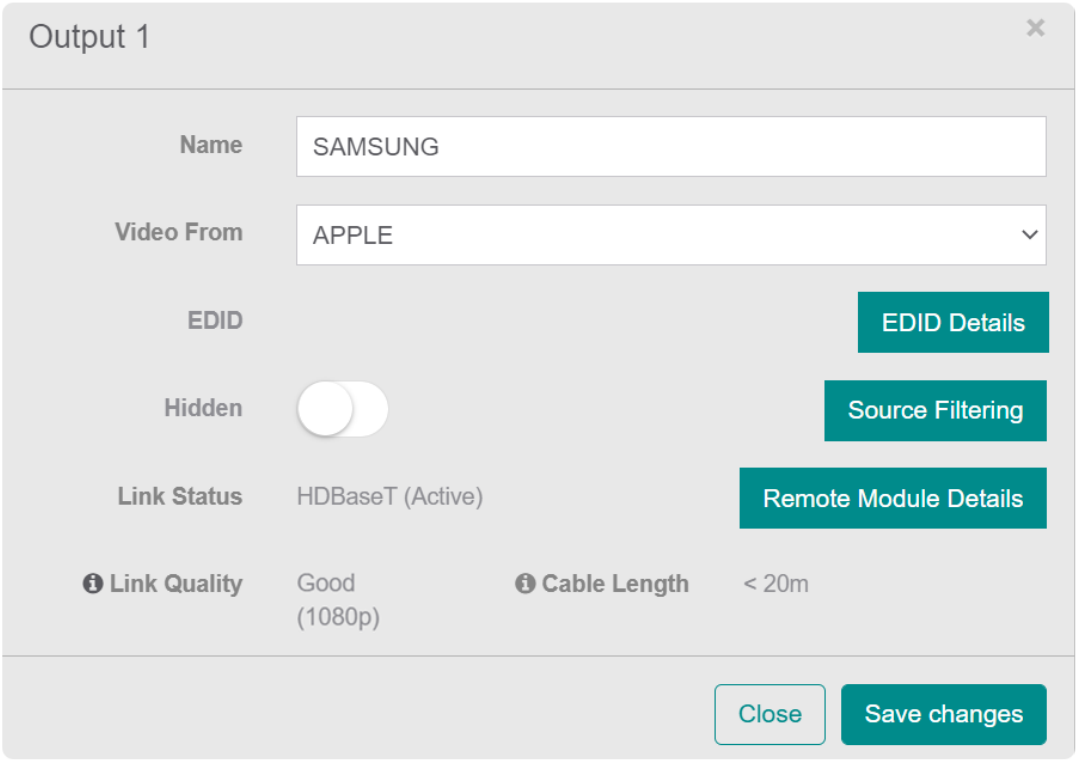
Note: The listed Set Top Boxes (i.e Sky/Virgin/TiVo/Kodi/Dish/DirectTV) can be controlled automatically by the matrix over IP. You will need to enter the IP address of the STB.
The matrix will need to reboot for the changes to take effect and for the control to work.

Hidden: Turn on to hide the selected input from the end user's web interface.

EDID Profile: Drop down menu to select an alternative EDID profile for the selected Input. See the EDID Management section of this manual for more information.

EDID Details: This will bring up a page detailing the current EDID information for the selected Input.

Output Setup Options



Name: Change the name of the selected output.

Video From: A dropdown list displaying the current source of the output and allowing you to change the routing for this output.

Mirror: Select an output from the list for the video to mirror another display (selected output).

EDID Details: This will bring up a page detailing the EDID information of the HDMI® Sink (display) connected to that output.

Hidden: The toggle switch can be turned on to hide the selected output from the end user's web interface.

Source Filtering: Toggle switches to select which inputs can be routed to the selected output display.

Link Status: Indicates if the HDBT link is active.

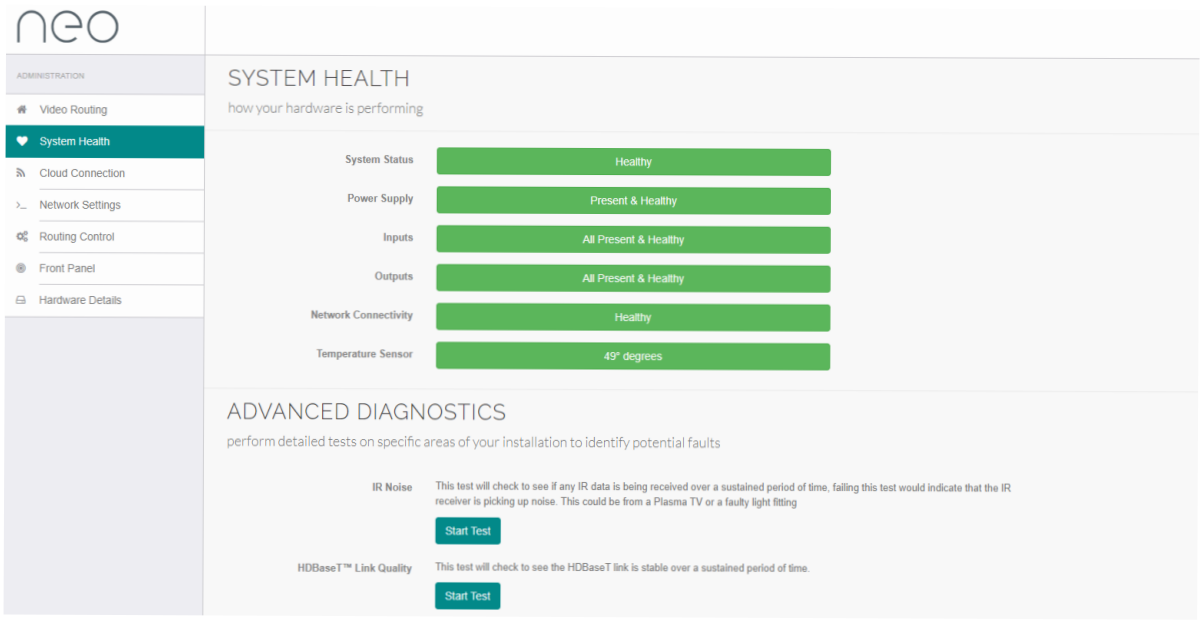
Remote Module Details: This will display a popup providing details on the attached neo Receiver.

Link Quality: Indicated the quality of the link. Click the icon to view Link Quality Test Tool.

Cable Length: Indicates the approximate length of the Cat cable inserted into the output. This is an estimate based on the cable's performance and may not be accurate.

Note: Ensure that after any changes you click the '**Save Changes**' button.

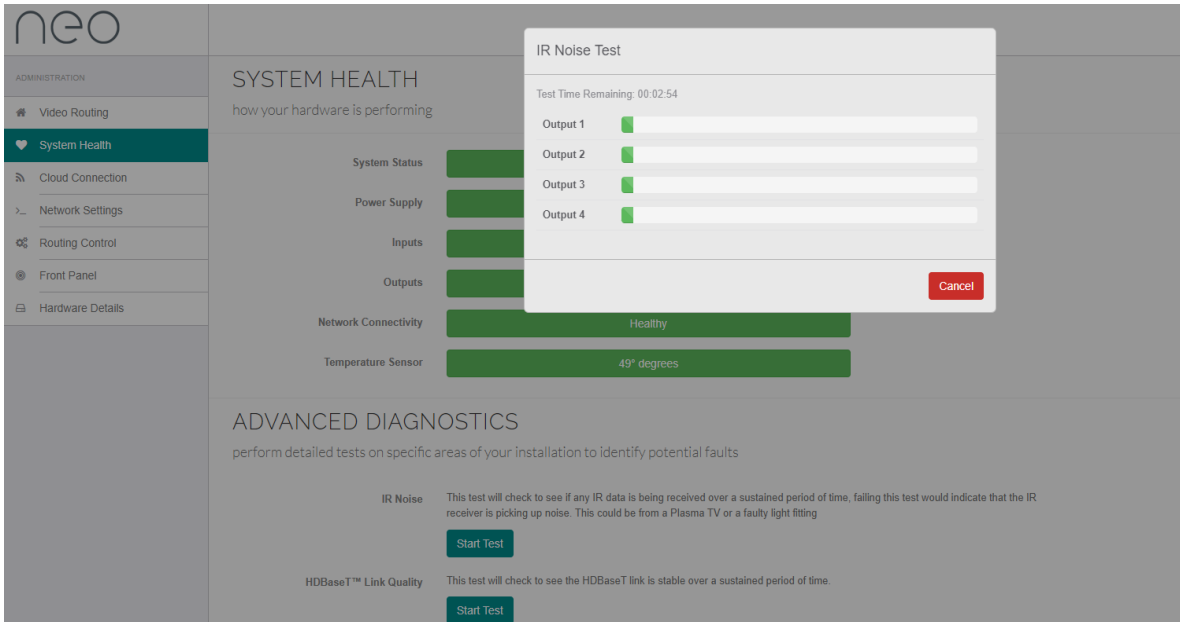
System Health



Under the System Health tab, information about the hardware's performance is displayed. The colour-coded (**Green = Good, Orange = Warning, Red = Issue**) boxes will indicate if it is performing correctly along with the reading of the internal temperature sensor that will indicate if the system is overheating.

Under the **System Health tab**, you will also find Advanced Diagnostics that will perform detailed tests on specific areas of your installation to identify potential faults.

IR Noise Test



The **IR Noise Test** will check to see if any unwanted IR noise is being received over a sustained period of time for each port. Failing this test would indicate that the IR receiver on its video output zone (neo receiver) is picking up noise in its environment.

Example of failure message: The IR receiver connected to this port is occasionally picking up stray IR messages, this may occasionally interrupt IR communication to the connected source device and/or control system. If you repeat this test and it remains in this state, we recommend relocating the IR receiver.

HDBaseT Link Quality Test



The HDBaseT Link Quality Test will check the HDBaseT link is stable over a sustained period of time. There are two drop down menus, the first is the output you are testing, the second is the type of test you are doing.

The **Mean Square Error** test is the ratio (in dB) of the signal power in relation to the originally transmitted signal vs the received and it is an analog measurement. This reading is directly affected by kinks, termination & other cable issues. Each Channel has a colour that represents the same colour in the twisted pair in the Cat cable. All four of these Channels should each be below the -15dB line. Otherwise, the cable quality will be marked as "**Poor**". Also, all four of these Channels should be within 3dB's of each other, for example, -21dB. -20dB. -21dB & -19dB. Otherwise, the cable quality will be marked as "**Poor**".

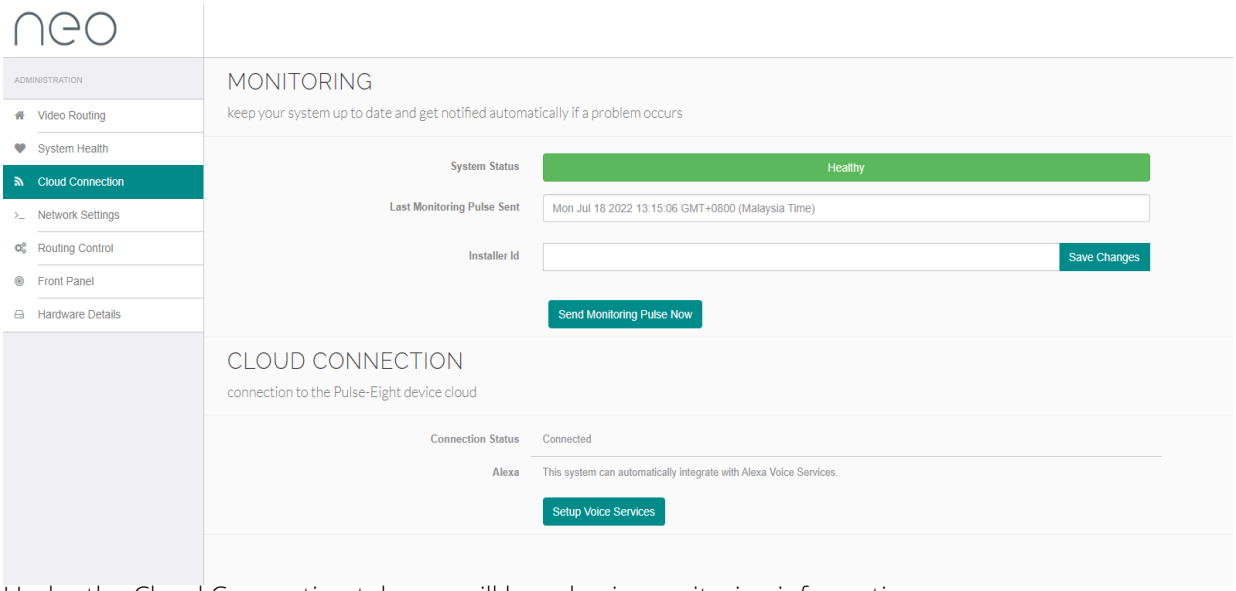
Note: If any of the above criteria is broken at any time but it then recovers to normal, this can still indicate an issue in the cabling so the matrix will remember this information and will continue to mark the cable as "**Poor**". This can explain if your cables look to meet the MSE test criteria but are still marked as "**Poor**" then it is likely to be caused by a momentary "**bad spike**" (reading below MSE criteria) happening in the past.

The **Channel Errors** test is a measurement of the number of digital errors on the channel, such as packet loss and bit errors. Each Channel has a colour that represents the same colour as the twisted pair in the Cat cable. All four of these Channels should be below the 40-line. Otherwise, the cable quality will be marked as "**Poor**". Also, all four of these Channels should be within 3 of each other, for example, 35. 36. 35. 34. Otherwise, the cable quality will be marked as "**Poor**".

Note: If any of the above criteria is broken at any time for any of the channels but it then recovers to normal, this can still indicate an issue in the cabling so the matrix will remember this information and will continue to mark the cable as "**Poor**". This can explain if your cables look to meet the Channel Error test criteria but are still marked as "**Poor**" then it is likely to be caused by a momentary "**bad reading**" (below Channel Error criteria) happening in the past.

It is also possible to check the link quality remotely by logging into your installer account at **monitoring.pulse-eight.com**

Cloud Connection



Under the Cloud Connection tab, you will have basic monitoring information:

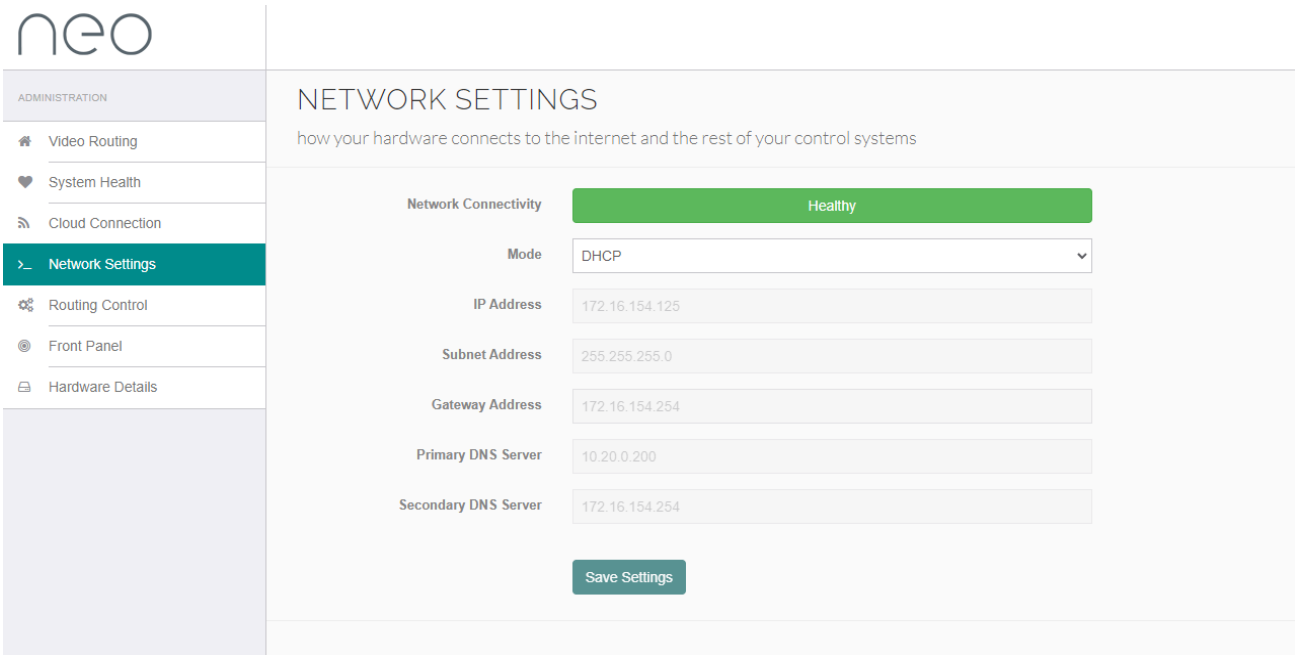
System Status: This colour-coded status (**Green = Good, Orange = Warning, Red = Issue**) will notify you if the system is healthy or if there is an issue.

Last Monitoring Pulse Sent: This will indicate the date and time when the matrix last '**phoned home**'.

Installer ID: Enter your Pulse-Eight Installer ID to link to the Pulse-Eight Monitoring Portal.

Connection Status: This will detail if the matrix is connected to the Pulse-Eight Monitoring Portal.

Network Settings



Under the Network Settings tab you will find details about the system's connection to the internet and the rest of your control systems:

Network Connectivity: This colour-coded status(**Green = Good, Orange = Warning, Red = Issue**) will notify you if the system is connected to a network or if there is an issue.

Mode: Dropdown menu to either set a static IP or DHCP.

IMPORTANT: Ensure that after making any changes to network settings, that you click Save Settings button.

ACCESSING THE MATRIX WITHOUT AN INTERNET CONNECTION

While the neo video matrix works best with an active internet connection it is possible to still configure and operate the system without one. However, to configure the system from its defaults a local network connection is required. Normal operation of the CEC and IR control systems does not require any network connection, but IP-based API control or Web-based control does require a persistent network connection.

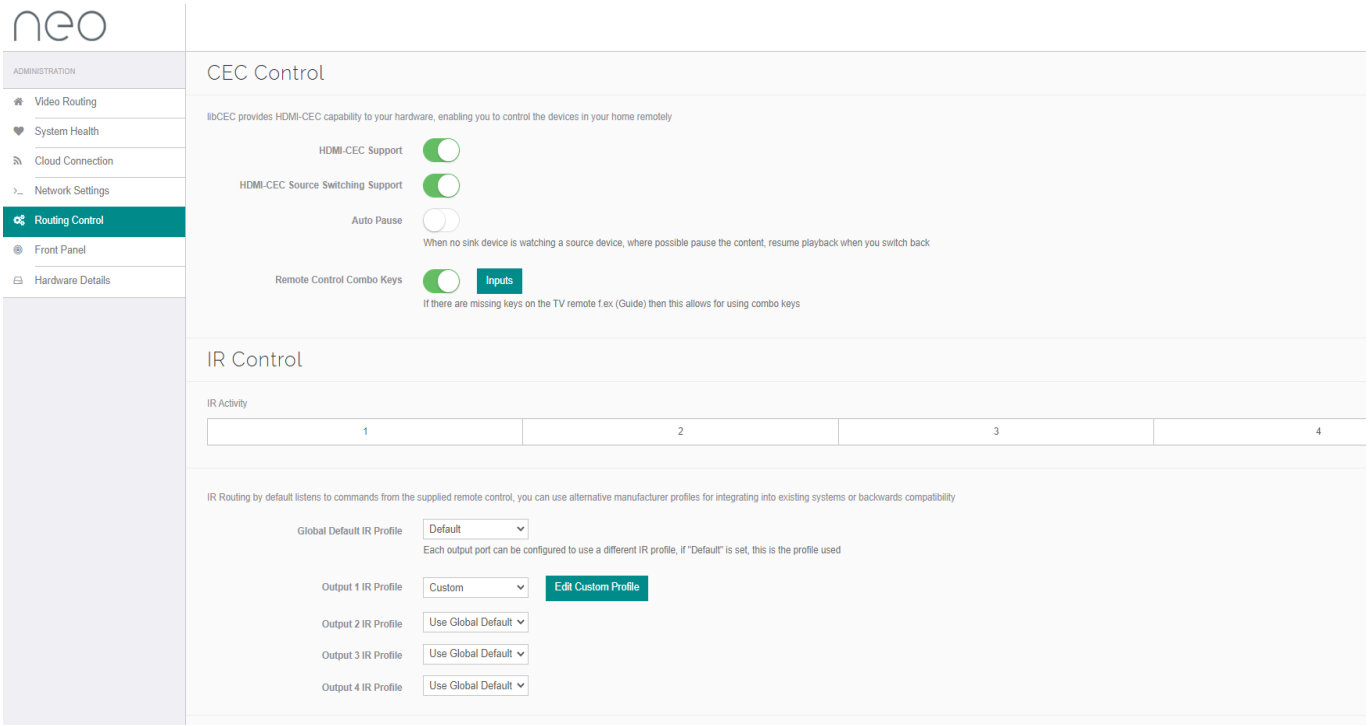
Discovery Tool

You can download a discovery tool from your monitoring portal at http://monitoring.pulse-eight.com/ this program will run on Windows 7 or newer only. When run it will scan your network and detect the IP address of your matrix. If you have multiple neo devices on the same network, the discovery tool will only display the last found. If you do have more than one system, it is advised that you disconnect other systems first.

The discovery tool will display the IP address of the matrix, you can then access the matrix by typing that IP address into your web browser's address bar.

Note: It is recommended in this mode that you configure the networking to use a static IP address, this allows you to bookmark the page easily and return to the web interface easily without needing to run the discovery tool again.

Routing Control Tab



Under the **Routing Control tab**, you will find settings for CEC control and IR Control Section:

CEC Control: Built-in HDMI-CEC lets the Neo:4x control connected TVs and sources without a third-party control system, using the TV's own remote. Remote Control Combo Keys can stand in for buttons missing from a TV remote, such as Guide.

HDMI-CEC Support: Toggle switch to turn CEC control on or off, according to your requirements. By having CEC turned on, you will have the ability to control your connected devices (with CEC) without the need for a third-party Control system. The matrix can work independently. If no CEC features are used in the installation, then we recommend turning this off.

HDMI CEC Source Switching Support: This allows you to turn off/on the CEC source switching feature while keeping all other CEC features working, assuming that HDMI-CEC Support is still enabled.

Auto Pause: This feature utilises CEC and allows the matrix to automatically pause content from a Source (e.g. movie) when turning the TV off and then continue playing when routing the connected Source to another room. When the feature is not used, it is recommended to turn it off.

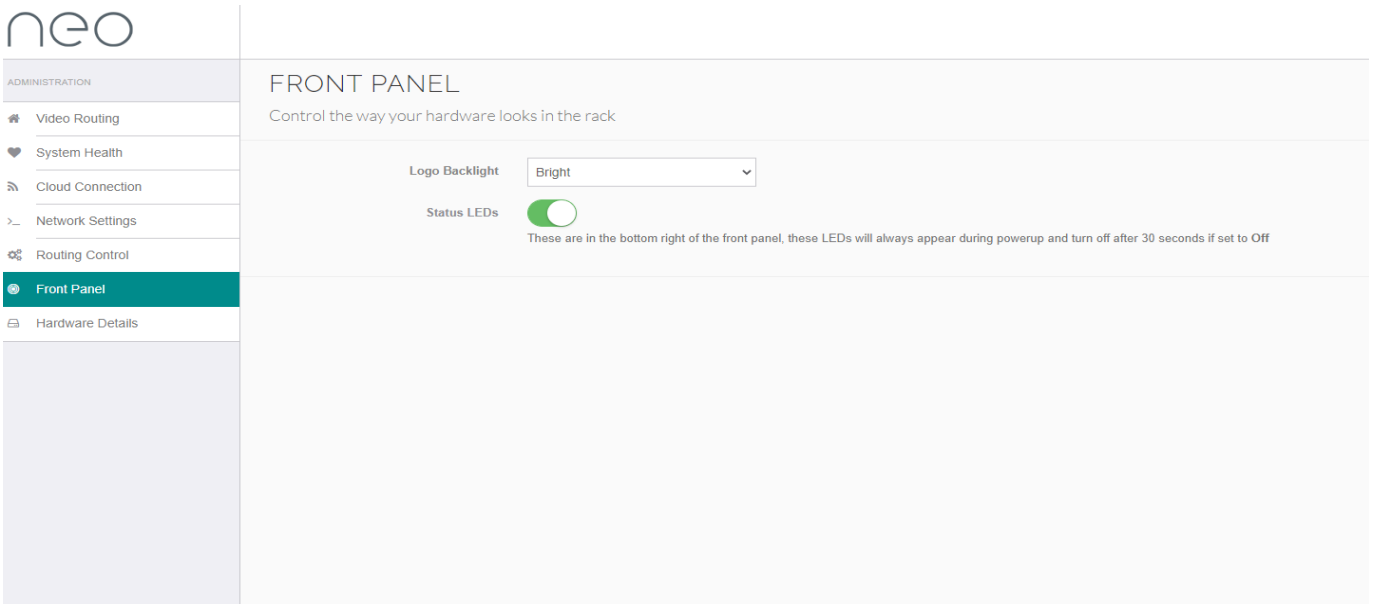
Remote Control Combo Keys: Toggle switch to turn on this function. If there are missing/broken keys on the TV's remote – e.g. the Guide button - then enabling this function allows you to use a combination of keys on the remote instead to achieve the missing function.

IR Control: Bi-directional IR lets you control sources from any room with their own remotes. Each output can use its own IR profile, including third-party profiles such as Bang & Olufsen, and a live IR activity view makes setup and troubleshooting quick."

IR Activity: A useful test for IR activity. The panel lists each IR activity box which will illuminate whenever an IR signal is received over the video output ports (HDBaseT or HDMI®).

IR Control Settings: By default, IR Routing passes commands from each source's own remote control to the attached sources (no remote in the kit)(e.g. play, pause, etc). However, you can also use alternative manufacturer profiles (e.g. Bang & Olufsen) for easily integrating into existing systems and backward compatibility.
Each output port can be configured to use a different IR profile, if "**Default**" is set, this is the profile used.

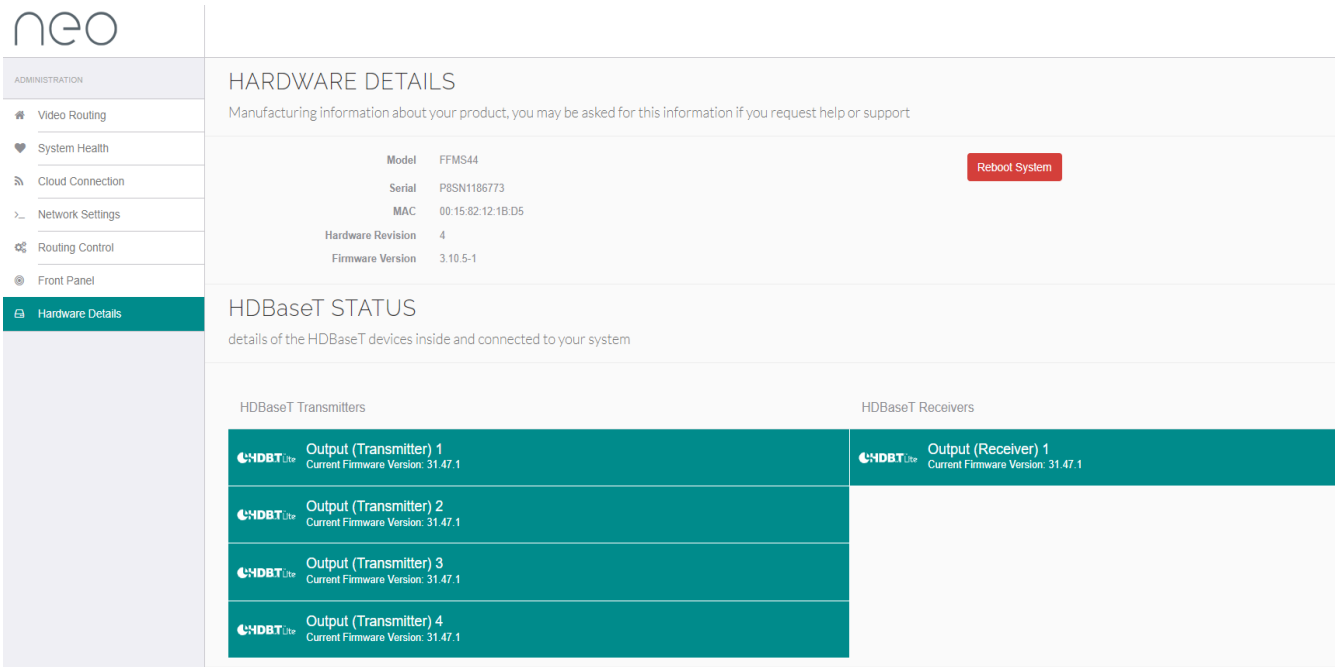
Front Panel Settings



Under the Front Panel tab, you will find options for the front panel of the matrix for turning off the status LEDs.

Note: The status LEDs are in the bottom right of the front panel, these LEDs will always appear during powerup and turn off after 30 seconds if set to Off.

Hardware Details

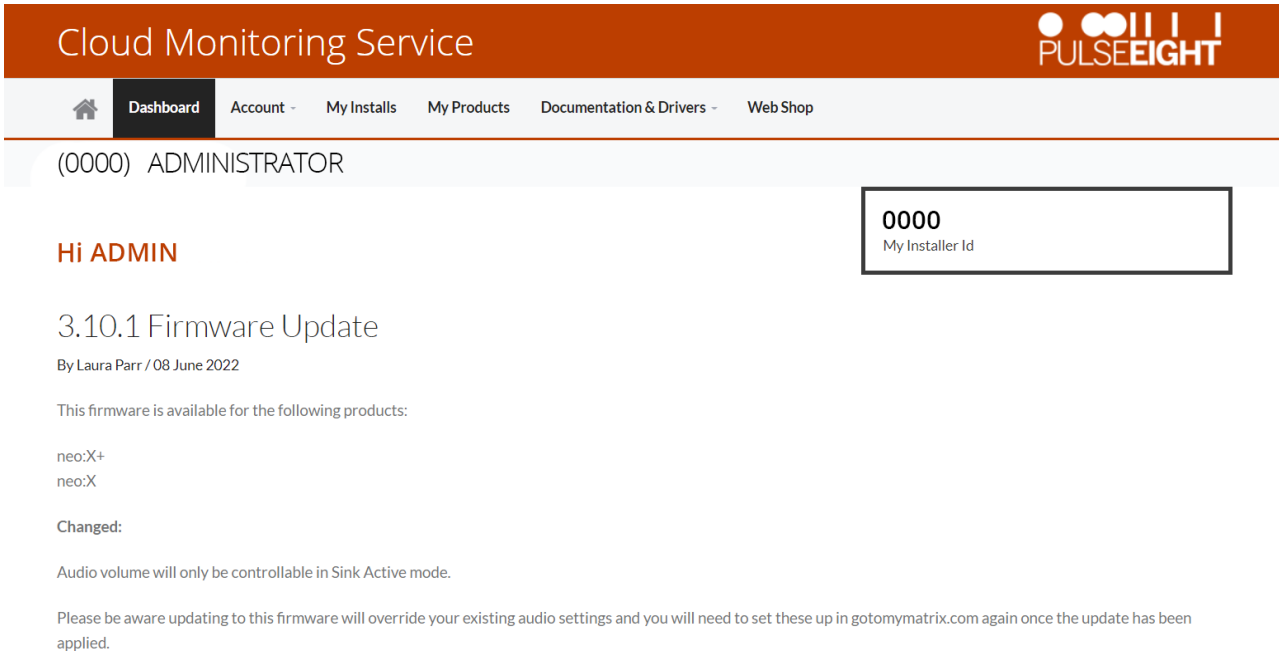


Under the Hardware Details tab, you will find manufacturing information about your product such as model, serial number, MAC, hardware revision, and current firmware version installed. You may be asked for this information if you request support.
It also details the firmware versions for the HDBaseT components (transmitters and connected receivers) in your installation.

Note: The design and features of the Web Interface are ever-evolving and may be subject to changes at any time without warning.

MONITORING PORTAL

Accessing The Monitoring Portal

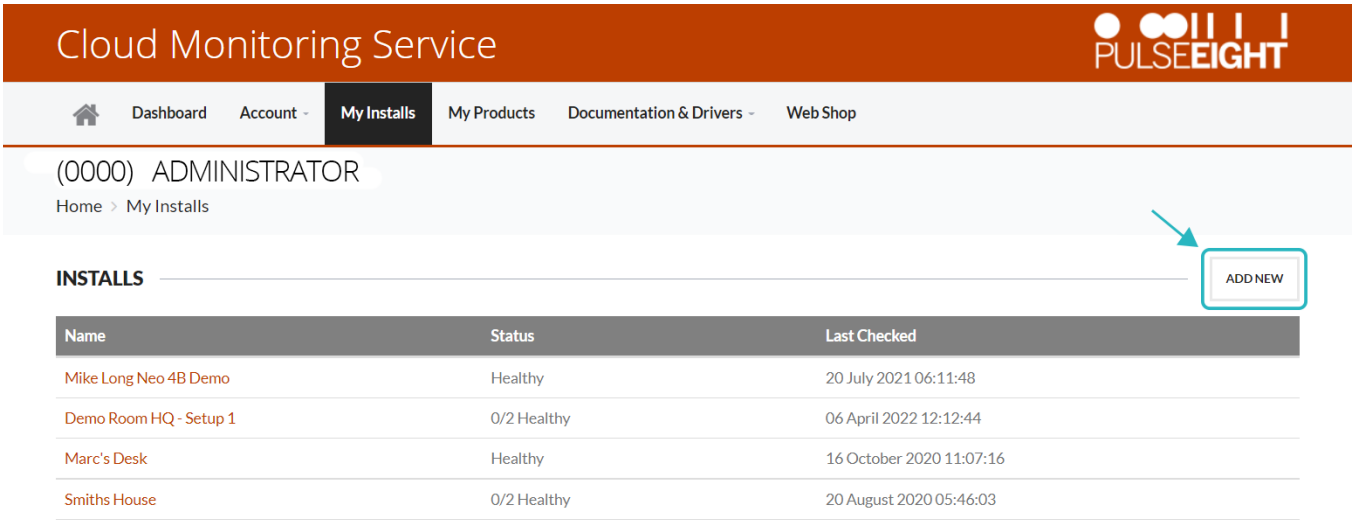


To access the monitoring portal please visit monitoring.pulse-eight.com, click '**Login**' in the top left corner, and sign in with your registered details.
Once logged in, the dashboard will display your details including your Installer ID.

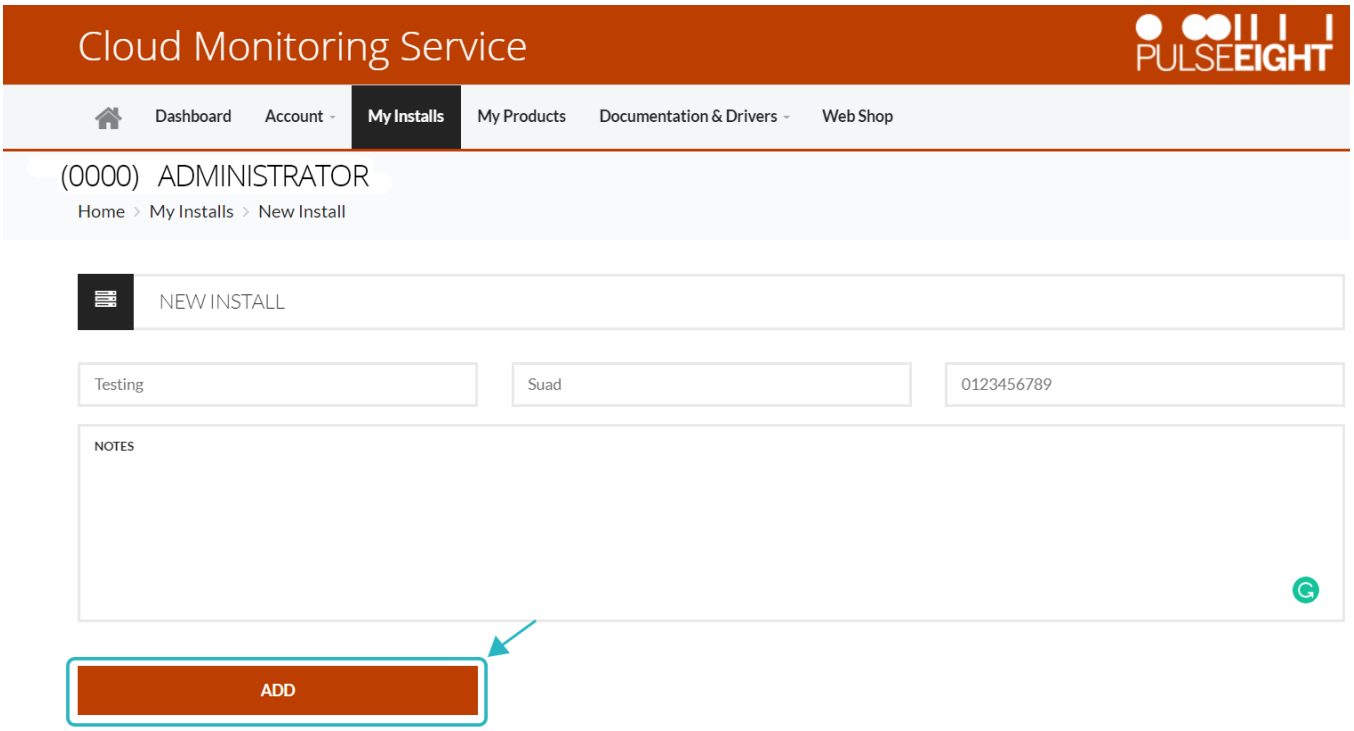
Note: If you do not already have an Installer ID then you will need to register for a new account. Please contact your local representative or visit **monitoring.pulse-eight.com/Account/Register.**

My Installs

Under the My Installs tab you can add projects and assign your installed systems in order to easily access and monitor certain installations.
To create an install, click the '**Add New**' button and insert the details on the following screen.



Once created, you will then be able to assign systems to the install by clicking the '**Add' button in the 'Products**' section. This will then bring up a page with a dropdown menu to select a system.



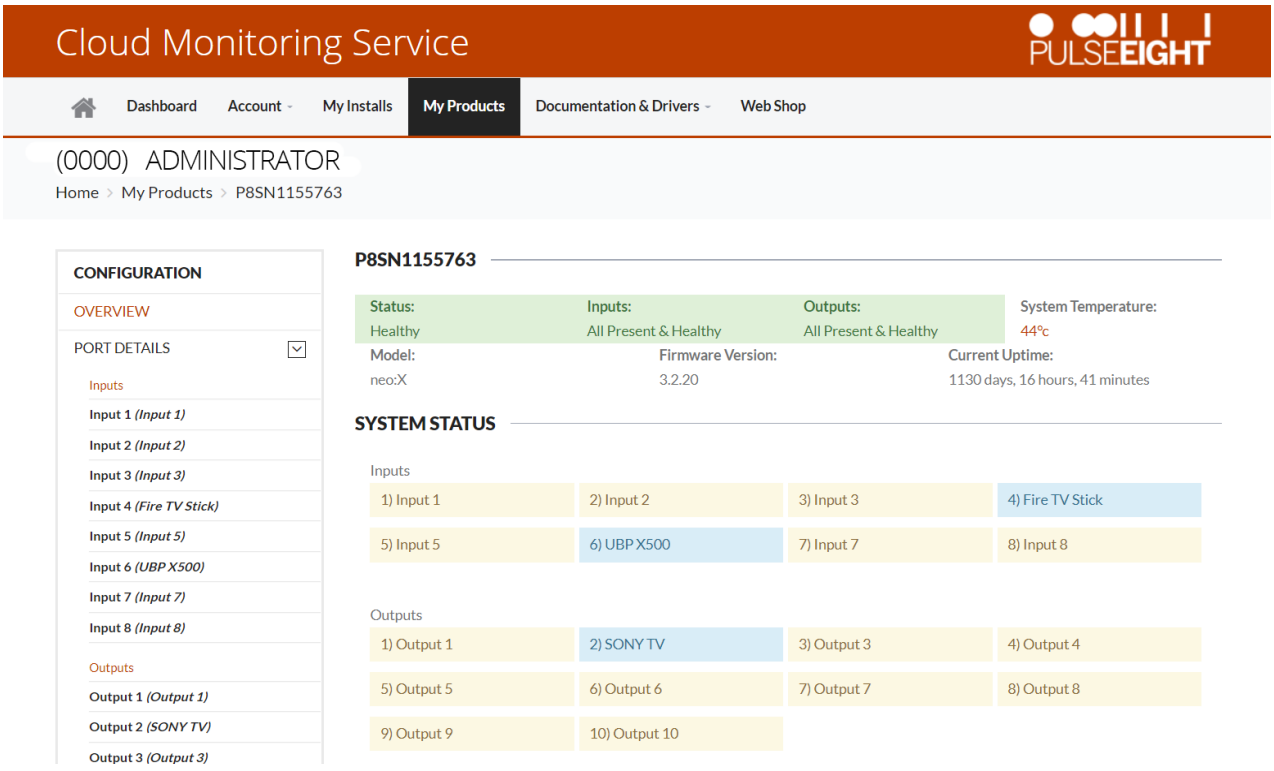
My Products

Under the My Products tab, all your assigned Pulse-Eight systems will be listed.

Note: If the system you are looking for is not listed, please make sure you have added your Installer ID into the web interface of the system.

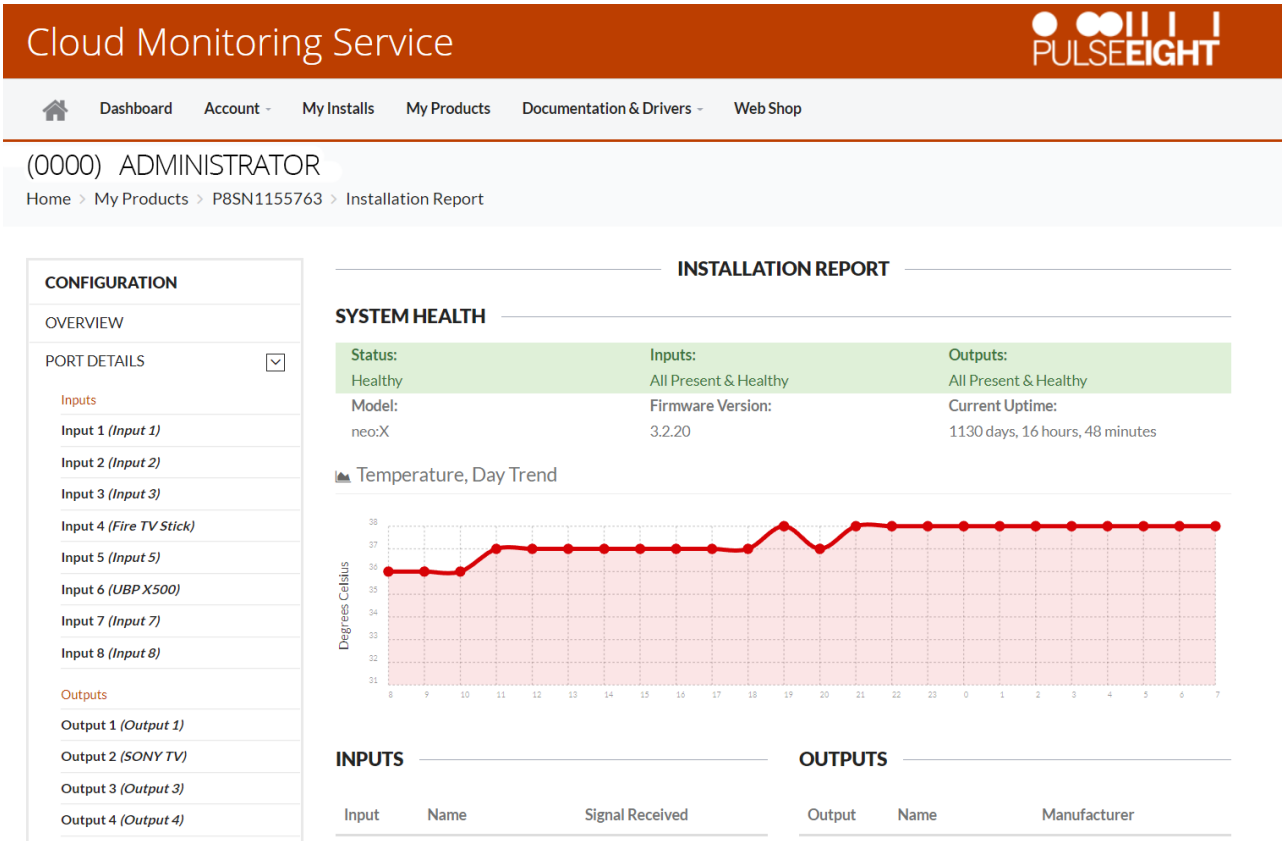
When you click on a system, an overview page will appear with details of the unit such as:

- Serial Number
- Model Number
- Status
- System Temperature
- Firmware Version
- Current Uptime
- System Status - Inputs
- System Status - Outputs
- External Network Details
- Local Network Configuration
- System Commands
- Reboot Function



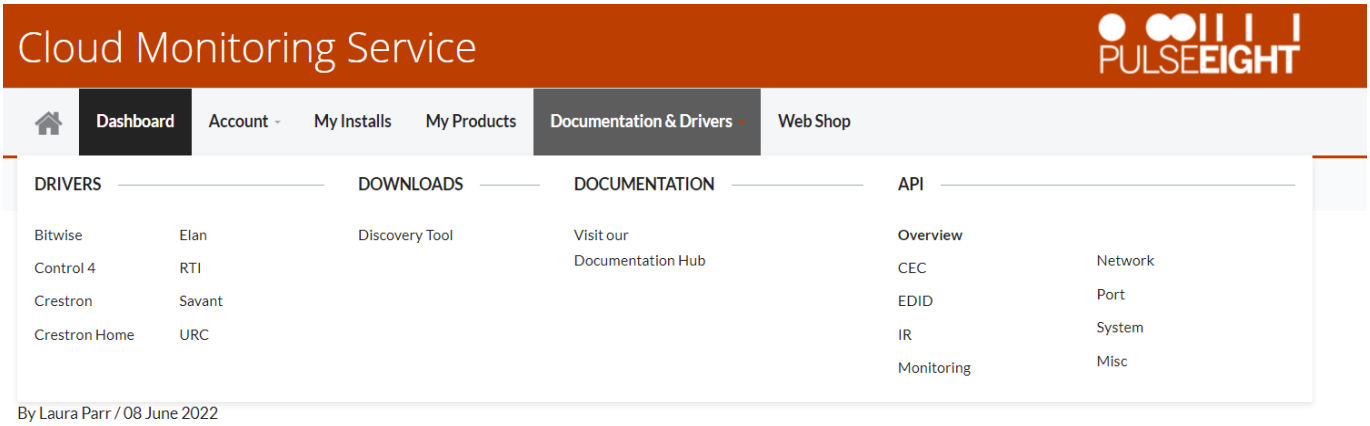
On the left hand side, a navigation bar features more options:

- Port Details allows you to individually monitor all inputs and outputs.
- Health displays information about the system's health plus a visual history of the system's temperature over the previous month.
- Updates display the current software version and detail any updates available for the system. There is also a toggle switch to turn on 'Hotfix Updates' whereby updates are delivered automatically to the system.
- Installation Report displays all crucial information about the installation on one page. We recommend you print this page once the installation is complete to ensure the installation is correct.



Documentation & Drivers

Under the Documentation and Drivers tab you will find links to the latest third party control drivers, manuals and troubleshooting guides alongside API information.



By Laura Parr / 08 June 2022

This firmware is available for the following products:

neo:X+
neo:X

Changed:

Audio volume will only be controllable in Sink Active mode.

Please be aware updating to this firmware will override your existing audio settings and you will need to set these up in gotomymatrix.com again once the update has been applied.

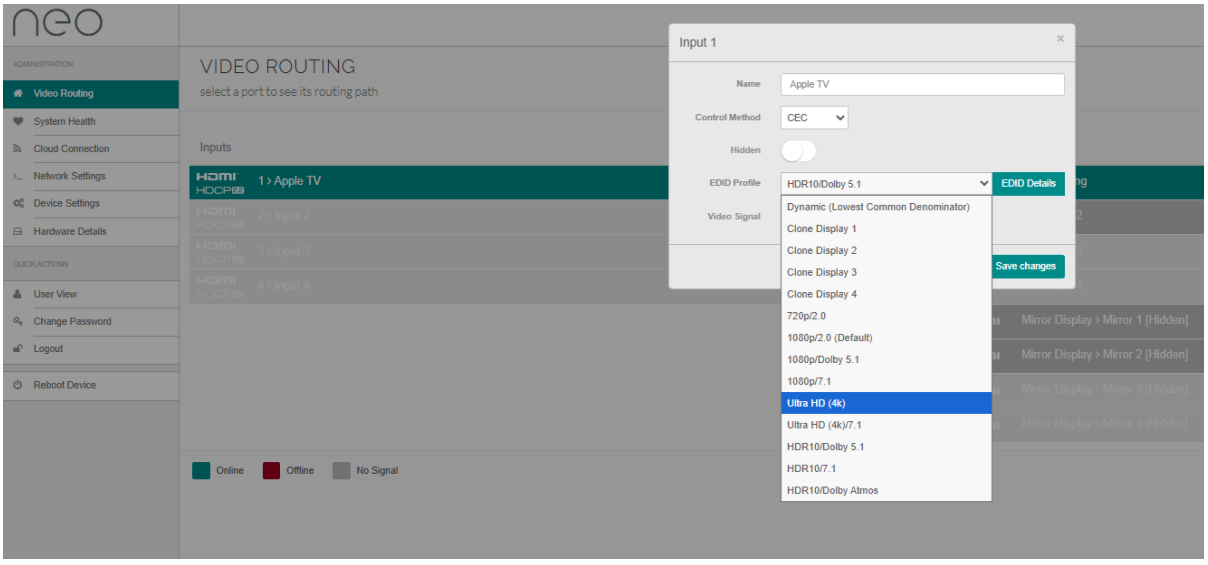
EDID MANAGEMENT

For your home entertainment to work with each other, Extended Display Identification Data or EDID is required by the source (e.g. media box, game console, etc) to identify what is the capability of the output screen. You may need to perform an "**EDID handshake**" when changing EDID profiles for it to work properly.

The neo video matrix contains EDID presets to ease the setup configuration - please refer to the "Video Routing (Admin)" tab in the neo Web Interface section of this manual.

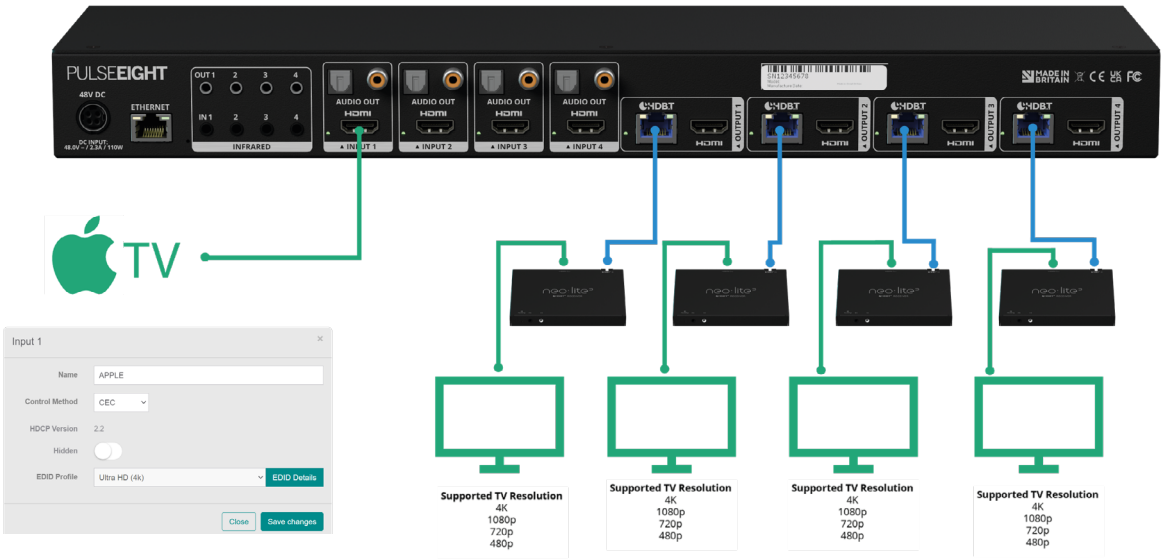
Types of EDID Profile available:

- Dynamic (Lowest Common Denominator): It will set the EDID to only support the resolutions supported by all the displays connected to the outputs.
- Clone Display: Clone Display: It copies the same EDID as the Sink (TV or AVR) attached to the selected output. This setting is recommended when connecting an AVR to the output as it ensures the AVR's audio capabilities are reflected on the input EDID.
- HDR/UltraHD(4K)/1080p/720p: It sets the EDID to support 4K HDR/ 4K/ 1080p/720p as the maximum resolution supported, as well as some audio support.

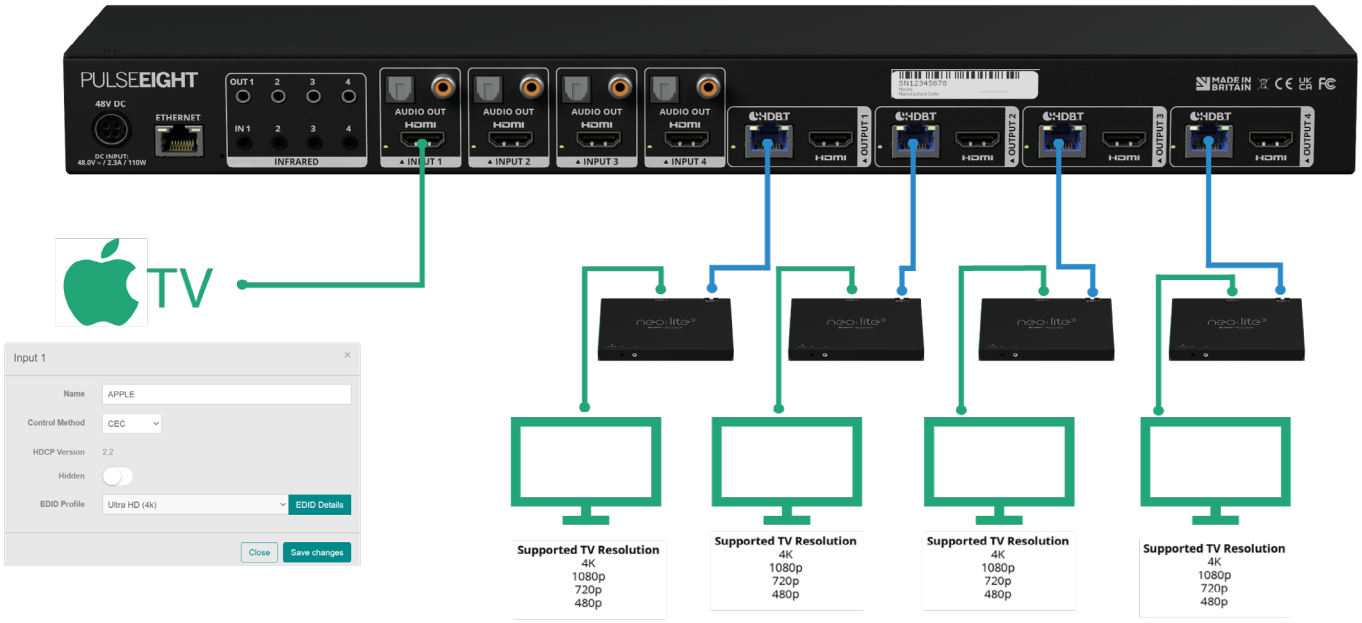


The matrix does not support individual video downscaling. If there is a mixture of displays with different resolution capabilities, then it is important to select the correct EDID profile and/or use an external downscaler.

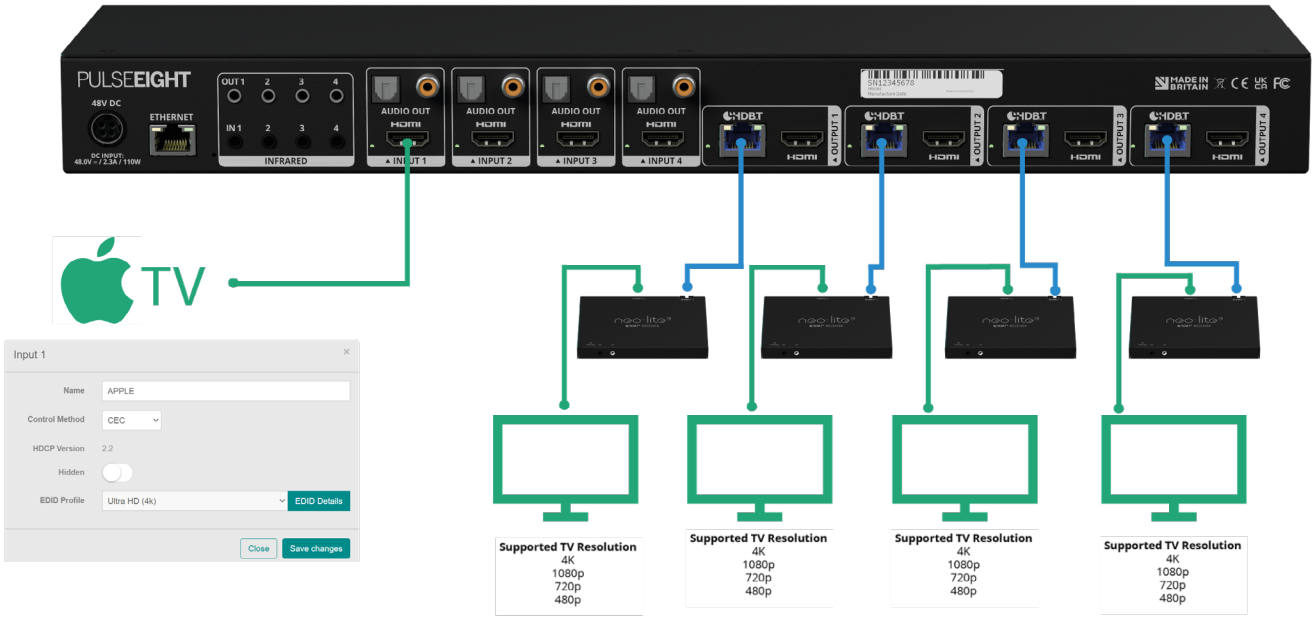
In this scenario, if Dynamic setting is selected, then the HDMI® Input 1 will limit the resolution of the source to a maximum of 1080p. This means all displays will receive a 1080p video signal.



In the same scenario, selecting 4K as the EDID profile will set the resolution to a maximum of 4K that is then distributed to all connected displays. Any legacy display (supporting up to 1080p only), will likely display an error or no picture.

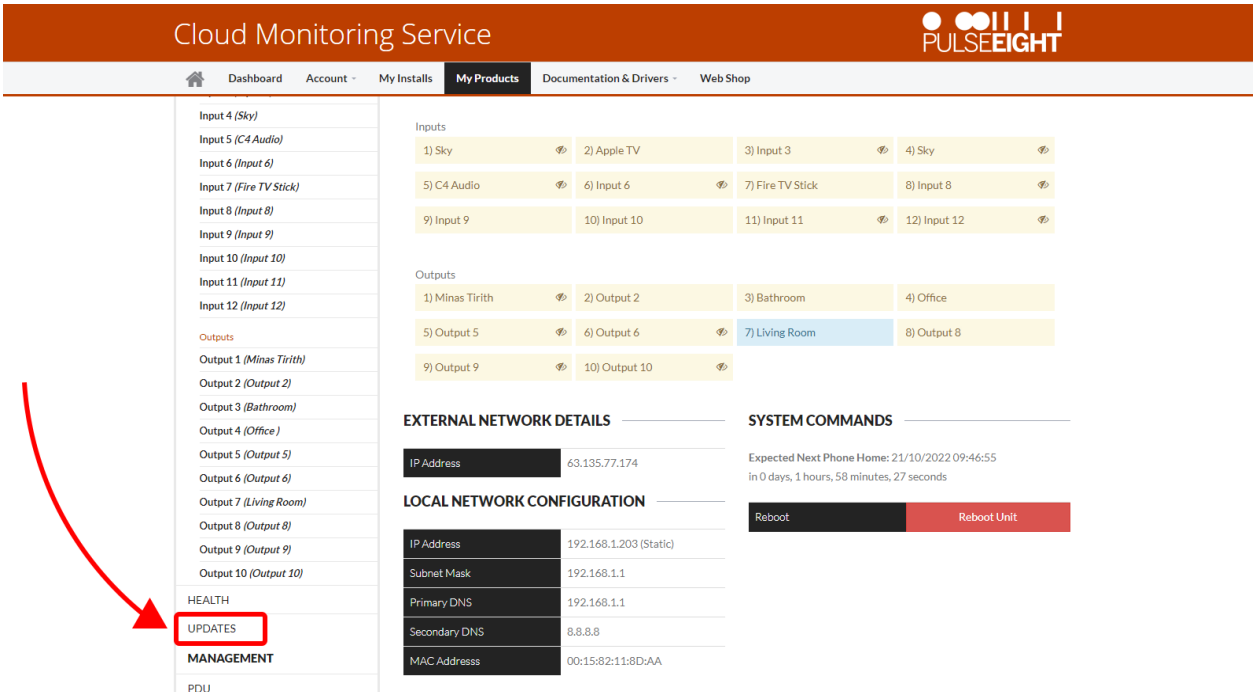


When this occurs, it is possible to use a separate 4K Downscaler which ensures that all displays receive the maximum resolution possible.

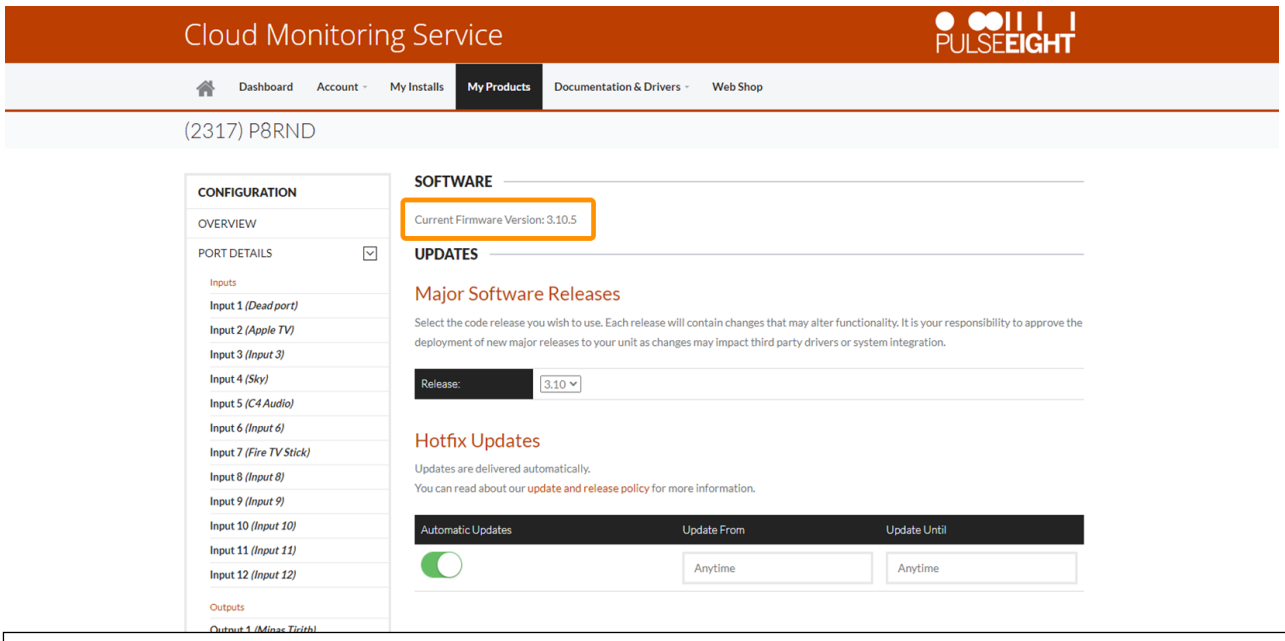


UPDATING MATRIX FIRMWARE

You can update the firmware on your Neo Matrix by logging into Cloud Monitoring.
To update your product, go to '**My Products**' and find the Video Matrix you want to change.
'**Updates**' can be found on the bottom left side.

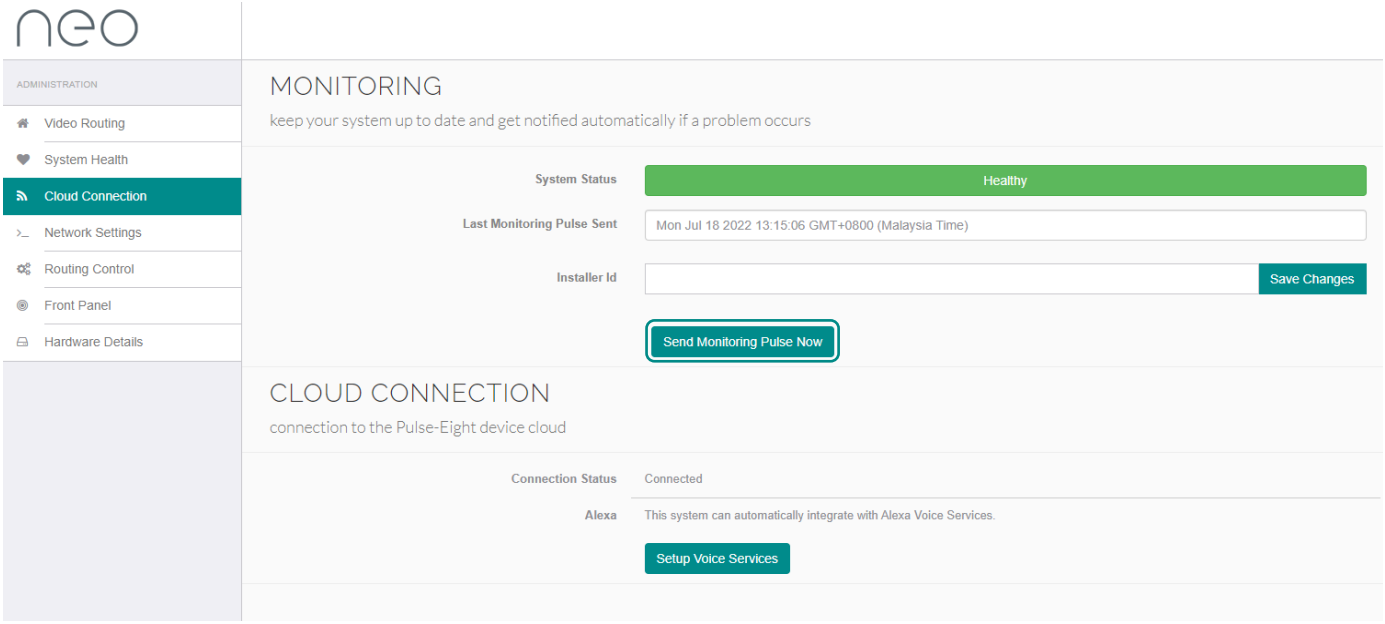


Click here to see what firmware the unit is currently running (circled in orange), as well as a drop down menu with a list of available firmware for this model. To change the firmware, simply select the firmware you want the matrix to use from the dropdown menu. When the unit calls home again (every hour), it will download and install the firmware. Please keep in mind that the unit will reboot during the updating process.



IMPORTANT: If your unit is on an older firmware and you are trying to update it we would advise not to jump to the newest update if your current firmware is more than two versions old. Please do not update more than two available versions in one go. Once the newer firmware has been applied you can then progress to the next one.
For example: If your firmware is on 3.1, we would advise updating to 3.3, then 3.5 rather than going straight from 3.1 to 3.5
To clarify this is no more than 2 available versions. For example it is safe to update from 3.5 to 3.9 as 3.6-3.8 was not officially released and therefore will not cause any issues to your update.

If you want the update to apply to the unit sooner rather than waiting for the unit to next phone home, you can '**send a monitoring pulse**' by logging into www.gotomymatrix.com and sending the Pulse from the Cloud Connection menu on the left once you have logged into admin section. If you have not previously accessed this area, the default password is: admin (all lowercase).
By pressing the '**send monitoring pulse now**' button, the unit will immediately phone home and the update will be applied.



Alternatively you can contact Pulse-Eight support and they can apply the firmware update for you.

⚠ ***WARNING:*** While the update is being applied, please DO NOT turn off or reboot your unit or network connection. As part of the process, the unit will reboot itself. If the unit loses power or a network connection during the update, the update may fail or the unit's existing firmware may be lost.

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.

Infrared Not Functioning

1. Make sure to use the compatible IR flasher/receiver for this video matrix.
2. Check and see if the IR Activity LED beside the IR port on the HDBaseT receiver 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 12V or 5V to different video matrixes 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 red/green 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 and 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.

No Sound on Speaker

Make sure that you are wiring the matrix to the amplifier correctly.
If connecting to a stereo amplifier, please ensure that you are using a suitable HDMI® (digital) to analog converter with downmix.

EDID Handshake

There may be times you will need to perform an EDID Handshake on your Matrix. 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 Matrix and all Sources
2. Turn on all TVs, and make sure these are not set to standby
3. Wait 45 seconds
4. Power on Matrix and wait for x3 Green Lights on the front panel
5. Wait a further 45 seconds
6. Turn on all sources

Back Panel LED Values

There are several debug LEDs next to the input and output ports that can help with any further troubleshooting.



A ETH RJ45 Left:
OFF - No activity.
AMBER (Blinking) - Activity on Network.

ETH RJ45 Right:
OFF - No Ethernet.
GREEN - Connected to Network.

B HDMI® Input:
OFF - No Signal.
GREEN - HDMI® +5V and Signal.

C HDBT Output:
OFF - No HDBT RX connected.
GREEN - HDBT RX connected / PoH enabled.

D HDBT RJ45 Left:
OFF - No HDBT Link.
AMBER - HDBT Link established.

HDBT RJ45 Right:
OFF - No Video
GREEN (Blink) - Video Present (No HDCP).
GREEN (Solid) - Video Present (HDCP).

WARRANTY PROCEDURE

The following policies cover all Pulse-Eight products.

Unless otherwise instructed, please do not open any of our products. Doing so will invalidate your warranty. As part of the troubleshooting procedure, you may be instructed to open the device, but you can only proceed with this once consent has been given.

To open a support ticket, please visit: **www.pulse-eight.com/support.**

Please Note: Warranty cover for ALL products starts from date of receipt of goods NOT date of installation. Should we find that your product does need replacing, we will send your replacement directly to the distributor you purchased from, if not purchased directly from Pulse-Eight.

From 1st April 2022, any products purchased will have new warranty lengths. The length of warranty is determined by the type of product purchased. Our cover can be broken down into 3 categories:

Gold, Silver, and Bronze.

GOLD: Pulse-Eight Audio and Video Matrices

- 5-year warranty as standard
  - 3-year advanced replacements
  - 2-year return to base for repair

SILVER: Pulse-Eight Amps, Extender Sets, and Accessories

- 3-year warranty as standard
  - 1-year advanced replacements
  - 2-year return to base for repair

BRONZE: IR, Cables, Brackets, and our Tech Tools

- 1-year advanced replacements

Pulse-Eight Current Product—Within the advanced replacement warranty year(s)

1. Contact support via phone or a support ticket. Pulse-Eight will try to help troubleshoot and resolve the issue remotely.
2. If unable to resolve the fault remotely and the unit needs replacing an advanced replacement will be raised with the installer who purchased it. If you purchased from a distributor you will need to return to your distributor and they will contact Pulse-Eight to get the RMA raised. All distributor advanced replacements will be sent to the distributor and cannot be sent directly to their installer.

Pulse-Eight Current Product—Within return to base warranty

1. Contact support via phone or a support ticket. Pulse-Eight will try to help troubleshoot and resolve the issue remotely.
2. If unable to resolve the fault remotely and the unit needs to be repaired, an RMA will be raised with the installer if purchased direct from Pulse-Eight. Or if purchased from a distributor, the installer will be directed back to their distributor who will raise an RMA.

Pulse-Eight Products Purchased Before 1st April, 2022.

Please visit: Warranty Page. Or Contact support via phone, opening a support ticket or emailing **support@pulse-eight.com.**

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 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 above 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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