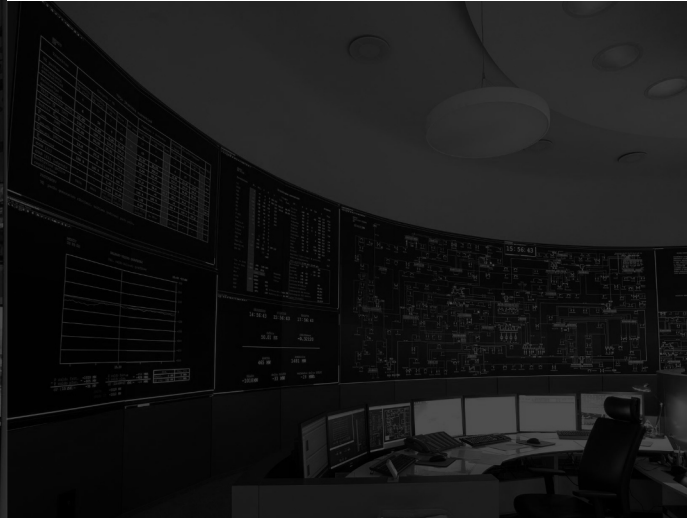


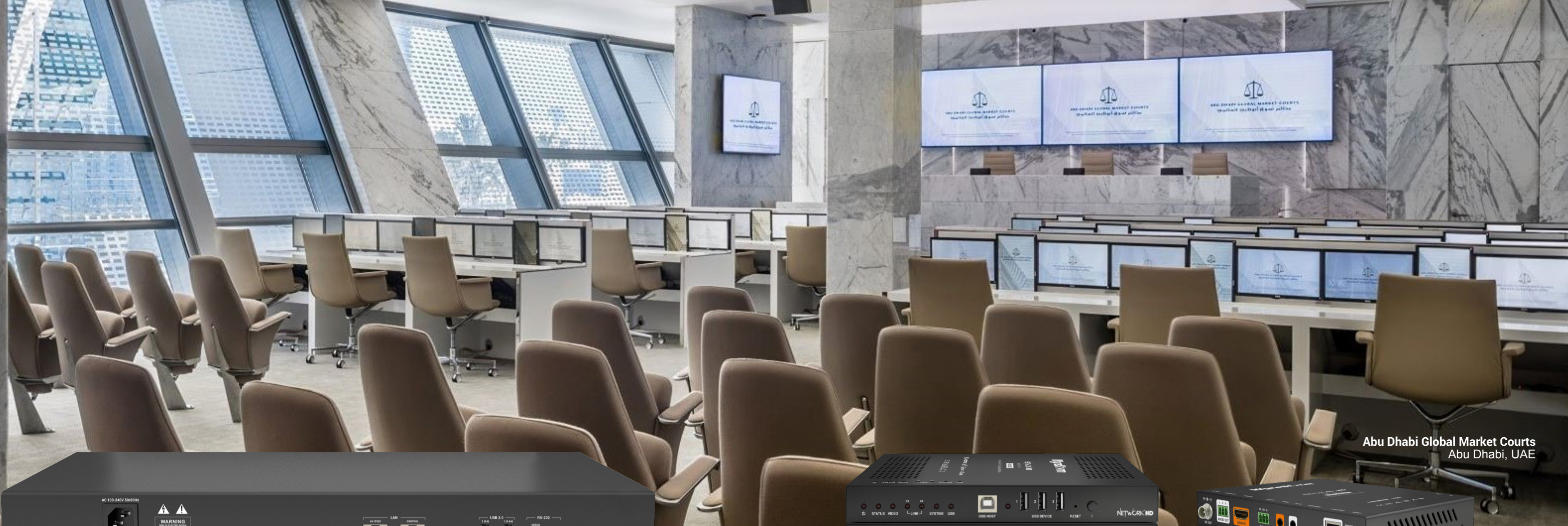


**AV OVER IP
SOLUTIONS
2023**



NETWORKHD





Abu Dhabi Global Market Courts
Abu Dhabi, UAE



THE POWER OF THREE

As there is no one AV over IP technology for all applications, you want to make sure you're using the one best-suited for yours. We've channeled our extensive experience in AV over IP into our unique NetworkHD™ line, comprising of three distinct AV over IP technology platforms. With them all sharing the same installation and configuration experience, each series is designed for integrators to provide solutions perfectly tailored to their application.



GEETA KIRPALANI

"They've been doing IP-based solutions longer than anyone else, and they were very helpful and supportive"

"Using the NetworkHD solution gave us the flexibility we needed. The solid performance made it an easy selection"

OPUS|2

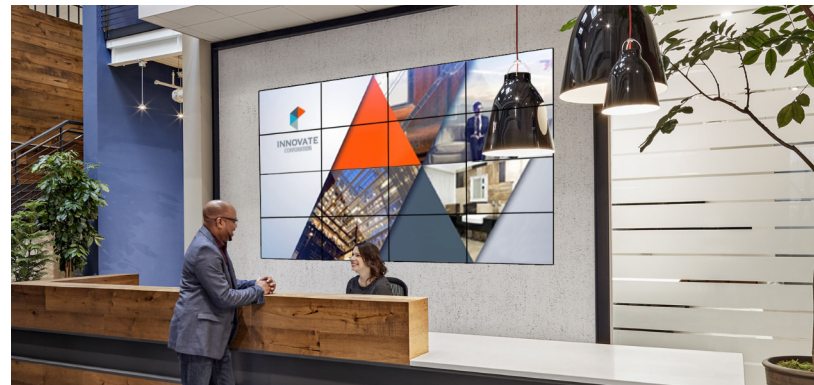
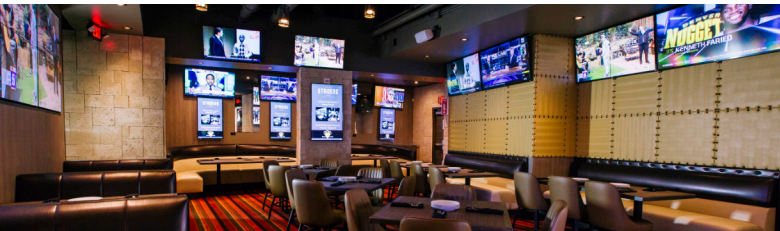
RICHARD PAGE

WHAT IS AV OVER IP?

AV over IP (AVoIP) is a method of distributing audio, video, control signals and more over standard IP Networks utilizing a variety of compression technologies to encode and decode transmissions between source and display depending on network demands and desired image quality.

AVoIP was initially used in a variety of ProAV applications due to its low bandwidth characteristics, compatibility with existing network infrastructures and cost efficient scalability for large footprint arrays.

However, AVoIP technology has evolved to include low and zero latency transmissions, seamless switching and lossless video quality supporting 4K UHD, high frame rates, 4:4:4 and HDR to become an increasingly viable alternative to conventional AV transmission over distance technologies for both residential and commercial applications.



ADVANTAGES OF USING AN AV OVER IP SOLUTION



An AV solution for the IT professionals



Perfect for decentralized system designs



Cost scales in-line to Inputs/Outputs



Utilizes tried and tested industry network standards to distribute content cost efficiently and reliably over IP Networks with PoE support



Dynamic AV routing without the need for additional distribution amplifiers or multiple transmitters at a back-end patch panel



True convergence of AVoIP and other IT services reduces hardware and installation costs when compared to non-IP AV



Connect a display device to any room Network port and the video will automatically be routed to it



Ideal for projects 16x16 and over, AVoIP is capable of the largest AV distribution spanning multiple floors or buildings



Far greater flexibility than fixed port matrix solutions for large-scale installations perfectly tailored to applications



Overcome distance limitations by utilizing optical fiber network links



AV distribution is now as flexible as your network

WHAT IS THE RIGHT SOLUTION FOR YOUR INSTALL?

2160p
4:4:4 **60**

2160 4:4:4

Using powerful technology standards, full 18Gb/s HDMI content, including HDR10, Dolby Vision and HLG



Ultra-Low Latency

With latency of just a single frame of video or better, these products are perfect for interactive and live applications.



Multiview

Show multiple source video windows on a single display, perfect for image grids or Picture-in-Picture applications.

4K HDR

4K HDR
Compatible with full 4K 60Hz video standards such as HDR and DV



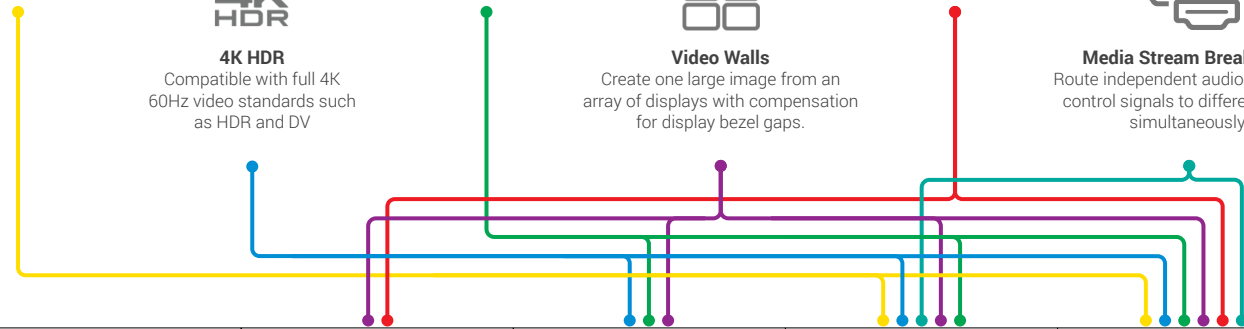
Video Walls

Create one large image from an array of displays with compensation for display bezel gaps.



Media Stream Breakaway

Route independent audio, video and control signals to different places simultaneously.



	100/200 Series	400 Series	500 Series	600 Series
Max. Resolution	1920x1200 (1080p)	4K UHD	4K UHD/DCI	4K UHD/DCI
Compression Codec	H.264/H.265	JPEG 2000	JPEG 2000	SDVOE
Max. 4K Timing	✗	60fps 4:2:0	60fps 4:4:4	60fps 4:4:4
Dolby Vision/HDR	✗	HDR 30Hz	DV 60Hz	DV 60Hz
Multichannel Audio	✗	✓	✓	✓
Min. Latency	250ms (High Quality Mode) 80ms (Low Latency Mode)	16ms @ 1080p	16ms @ 4K 60	Zero Latency (GenLock)
PoE	✓	✓	✓	✓
Video Wall	✓	✓	✓	✓
Mosaic Video Walls	✗	✓	✓	✗
Bezel Gap Correction	✓	✓	✓	✓
Image Rotation	✓	✓	✓	✗
Bandwidth Control	✓	✓	✓	✗
CEC	✓	✓	✓	✓
USB	✗	✓	✓	✓
Fast Switching	✓	✗	✓	✓
Max. Video Wall Size	16x16	16x16	16x16	8x8
Multiview	With NHD-250-RX	✗	✗	✓
Network Type	1Gb Multicast	1Gb Multicast	1Gb Multicast	10Gb Multicast
Peak Bandwidth	30 Mb/s per TX	850 Mb/s per TX	850 Mb/s per TX	9Gb/s per TX
Fiber	✗	✗	✓	✓
Dante/AES67	✗	✓	✗	✓
Warranty (years)	5	5	5	5
Drivers	Crestron™, AMX™, RTI™, Control4™	Crestron™, AMX™, RTI™, Control4™	Crestron™, AMX™, RTI™, Control4™	Crestron™, AMX™, RTI™, Control4™

NETWORKHD™ 600 Series (SDVoE)

Lossless 4K/60 4:4:4 and HDR over 10GbE using SDVoE technology

The NetworkHD™ 600 Series offers the ultimate AV over IP platform for when only the absolute best image quality will do. Supporting highly scalable, secure and fully lossless high bandwidth video content alongside multi-channel audio and a variety of connectivity and control options. The 10GbE system is easily managed in a flexible, unified software environment for the ultimate AV over IP experience for commercial and high-end residential applications.



NetworkHD™ 4K60 10GbE SDVoE AV over IP Encoder and Decoder with Dante Audio

NHD-610-TX | NHD-610-RX

- Full HDMI 2.0 encoding/decoding up to 4K60 4:4:4 with Dolby Vision/HDR compatibility
- USB 2.0 connectivity for extension of USB peripheral devices
- Dante/AES67 audio output on NHD-610-TX encoder
- NHD-610-RX decoder capable of video wall and multiview processing
- Secure communications using AES, SSH and TLS protocols



NetworkHD™ 600 Series 4K60 4:4:4 10Gb SDVoE Fiber Transceiver

NHD-600-TRXF

- Operates as a transceiver that can encode and decode simultaneously
- Fiber transport supporting up to 300m distance using OM3 multimode
- Full HDMI 2.0 encoding/decoding up to 4K60 4:4:4 with Dolby Vision/HDR compatibility
- Native video wall and multiview processing
- Secure communications using AES, SSH and TLS protocols



2160p
4:4:4 **60**

NetworkHD™ 600 Series 4K60 4:4:4 10GbE SDVoE Transceiver

NHD-600-TRX

- Operates as a transceiver that can encode and decode simultaneously
- Full HDMI 2.0 encoding/decoding up to 4K60 4:4:4 with Dolby Vision/HDR compatibility
- USB HID connectivity for extension of USB peripheral devices.
- Zero latency A/V transmissions using SDVoE technology
- Native video wall and multiview processing
- Secure communications using AES, SSH and TLS protocols



NETWORKHD™ 500 Series (4K60 HDR)

4K/60 4:4:4 and HDR over 1GbE or Fiber using JPEG 2000 technology

The NetworkHD 500s series offers a full HDMI 2.0 AV over IP solution. The 500 series is capable of encoding up to 4K60 4:4:4 8bit and support for high framerate Dolby Vision, HDR10 and HLG content. Advanced processing features include video walls with bezel correction, incredibly fast matrix switching, and ultra-low latency distribution. The 500 series also include support for ARC for residential applications along with high-speed USB routing for commercial installs. The best part is that all of this is achieved over a 1GbE network.



NetworkHD™ 4K60 4:4:4 JPEG 2000 AV over IP Encoder and Decoder

NHD-500-TX | NHD-500-RX

- Full HDMI 2.0 encoding/decoding up to 4K60 4:4:4 with Dolby Vision/HDR compatibility
- Flexible output supports either Ethernet or Fiber connections (300m w/ OM3 fiber)
- USB connectivity for extension and routing of USB peripheral devices
- ARC (Audio Return Channel) capable for distributing audio from smart TVs
- NHD-500-RX decoder capable of 16x16 video wall processing, including mosaic
- Secure communications using AES, SSH and TLS protocols



NetworkHD™ 500 Series Lite 4K60 4:4:4 AV over IP Encoder and Decoder

NHD-500-E-TX | NHD-500-E-RX

- Supports encoding and decoding of full HDMI 2.0 content up to 4K60 4:4:4 8bit
- Compatible with Dolby Vision, HDR10 & HLG content up to 60Hz
- Essential connectivity for streamlined audio and video distribution
- Video wall processing up to a 16x16 with bezel adjustments
- Balanced audio de-embed for connecting external audio systems



NetworkHD™ 500 Series 4K60 4:4:4 JPEG2000 In-Wall Encoder

NHD-500-IW-TX

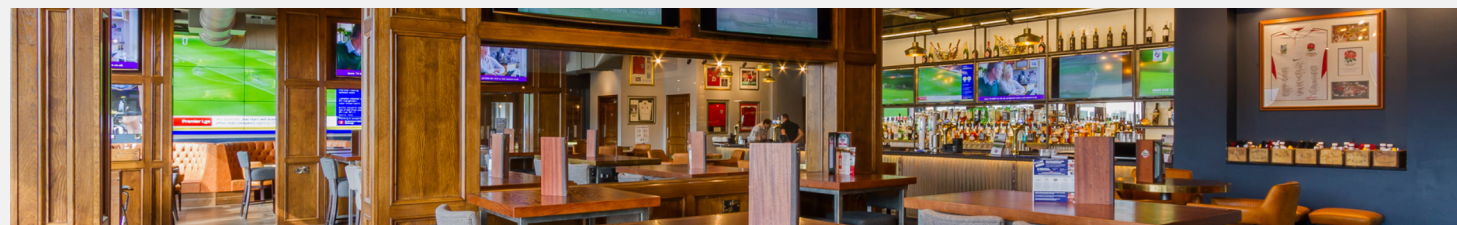
- Supports encoding full 4K60 4:4:4 8bit or RGB content
- 2-Gang US style in-wall form factor
- HDMI and USB-C Switchable inputs
- USB extension and routing for peripheral USB devices
- Dedicated stereo input for connecting external audio devices



NetworkHD™ 500 Series 4K60 4:4:4 JPEG 2000 Encoder with Dante/AES67 Audio

NHD-500-DNT-TX

- Supports encoding full HDMI 2.0 content up to 4K60 4:4:4 8bit
- Compatible with Dolby Vision, HDR10 & HLG up to 60Hz
- Integrated Dante/AES67 2CH audio output
- Dedicated Dante LAN port for easy connection to separate Dante network
- USB extension and routing for connecting peripherals USB components



NETWORKHD™ 400 Series (4K HDR)

Low latency 4K HDR over 1GbE with image scaling, multichannel audio and video wall processing using JPEG 2000 technology

The NetworkHD™ 400 Series offers stunning 4K HDR video, multi-channel audio support and 4K/2K auto-scaling to seamlessly handle distribution of mixed resolution sources, content and display devices over a 1GbE network. Featuring incredibly low latency matrix switching and video wall capabilities, the 400 Series is the ideal AV over IP solution for systems where high quality and low latency are key requirements; making it perfect for both residential and commercial applications.



NetworkHD™ 400 Series 4K AV over IP JPEG 2000 Encoder and Decoder

NHD-400-TX | NHD-400-RX

- 4K encoding up to 4K60 4:2:0 with HDR10/HLG compatibility
- USB connectivity for extension and routing of USB peripheral devices
- Ultra-low, single frame latency
- NHD-400-RX decoder capable of 16x16 video wall processing, including mosaic
- Secure communications using AES, SSH and TLS protocols



NetworkHD™ 400 Series 4K AV over IP JPEG 2000 Encoder and Decoder

NHD-400-E-TX | NHD-400-E-RX

- 'Lite' versions of the NHD-400-TX/RX with only essential I/O
- 4K encoding up to 4K60 4:2:0 with HDR10/HLG compatibility
- Ultra-low, single frame latency
- NHD-400-E-RX decoder capable of 16x16 video wall processing, including mosaic
- Secure communications using AES, SSH and TLS protocols



NetworkHD™ 400 Series In-Wall 4K AV over IP JPEG 2000 Encoder

NHD-400-TX-IW

- 2-Gang US style wall plate
- 4K encoding up to 4K60 4:2:0 with HDR10/HLG compatibility
- USB connectivity for extension and routing of USB peripheral devices
- Ultra-low, single frame latency
- Secure communications using AES, SSH and TLS protocols



NetworkHD™ 400 Series 4K AV over IP JPEG 2000 Encoder with Dante

NHD-400-DNT-TX

- NHD-400-TX with added Dante/AES67 network output
- Includes additional stereo audio input
- 4K encoding up to 4K60 4:2:0 with HDR10/HLG compatibility
- Ultra-low, single frame latency
- Secure communications using AES, SSH and TLS protocols



NETWORKHD™ 100/200 Series (1080p)

Low bandwidth HD over 1GbE with video-wall and multiview processing using H.264/H.265 technology

The NetworkHD™ 100/200 Series utilizes low bandwidth, infinitely scalable H.264/H.265 technology with the addition of powerful video wall support up to 16x16 for the best all-round solution for commercial AV installations. A 100 Series encoder can either be paired with a 100 Series decoder for matrix switching to individual screens or for video wall decoding, with both decoders including HDMI and analog audio breakout outputs, or an NHD-250-RX decoder for multiview monitoring.



NetworkHD™ 1080p HD Low Bandwidth H.264/H.265 AV over IP Encoder and Decoder

NHD-110-TX | NHD-110-RX

- Low bandwidth 1080p60 encoding
- Dual encoding options allow either H.264 or HEVC H.265
- Instant matrix switching with no freeze frames
- NHD-110-RX supports video wall processing up to 16x16
- Secure communications using AES, SSH and TLS protocols



NetworkHD™ 1080p HD Low Bandwidth H.264/H.265 AV over IP Encoder and Decoder

NHD-110-RX-S

- Treated with Sealoc's proprietary protection where the sensitive electronics are shielded from weather, adverse elements, and corrosive environments
- Powerful video wall processing supporting standard video wall configurations
- Image scaling ensures compatibility with mixed resolution displays
- Analog audio de-embed for easy connection to external audio DSP or amplifier



NETWORKHD™ Series Controllers

The NHD-000-CTL and NHD-CTL-PRO are innovative control interfaces that make the powerful NetworkHD system the most simple and quickest-to-configure AV over IP system available. Designed to be used with all NetworkHD systems to bridge the various encoders and decoders to a single, API-based connection point for use by a control processor or the NetworkHD Touch™ App. Additionally, they provide monitoring and remote access for Integrators via their on-board Web UI.

NHD-CTL-PRO

- Auto discovery of all NetworkHD endpoints
- Powerful web-based UI for intuitive control & management
- Isolated AV and control LAN ports for seamless integration into any network
- LED screen for access to system info
- 7 steps wizard for easy configuration
- Compact chassis for installation into NHD-000-RACK4

NHD-000-CTL

- Provides automatic discovery of NetworkHD encoders and decoders
- Simple browser management of encoders and decoders
- Integrates with major control systems, including the NetworkHD Touch™
- Dual Ethernet ports for complete isolation of control and AV network traffic
- PoE or DC power options

2160p
4:4:4
60



4-Input 4K60 Multiview Processor for NetworkHD

NHD-0401-MV

- 4-Inputs supporting 4K60 source content
- Multiview processing up to 4 inputs simultaneously
- Works seamlessly with NetworkHD 400 & 500 series
- Can be used as a standalone multiview processor
- Compatible with NetworkHD Touch



NetworkHD™ 100 Series AV over IP H.264 Quad Encoder

NHD-140-TX

- Quad encoder helps reduce amount of separate components
- Combines all four inputs into a single ethernet output
- Low bandwidth H.264 1080p60 encoding
- Interoperable with NHD-110-TX/RX
- Secure communications using AES, SSH and TLS protocols



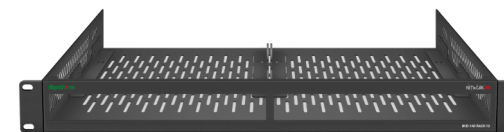
NetworkHD™ 200 Series AV over IP H.264 Multiview Processor

NHD-250-RX

- Multiview processor supports up to 9 unique windows
- Fully customizable multiview layouts
- 4K output scaling
- Interoperable with NHD-110-TX and NHD-140-TX
- Secure communications using AES, SSH and TLS protocols



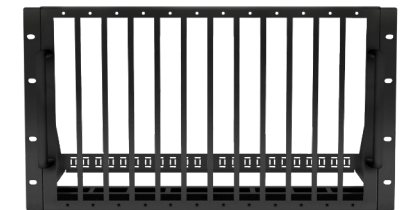
RACK MOUNTING SOLUTIONS: 2 OPTIONS FOR MOUNTING NETWORKHD AND PRO AV DEVICES



1U/2 Slot Rack Mount for NetworkHD™ NHD-140-TX

NHD-140-RACK-1U

- Designed to support two NHD-140-TX quad encoders while also compatible with the NHD-300-TX and EXP-CON-H2-DD
- 1U height and shallow depth for small footprint installation
- NHD-140-TX encoders can be mounting front or rear facing to suit cable management designs
- Ensures proper thermal dissipation of NetworkHD components



6U/12 Slot Rack Mount for all NetworkHD Encoders

NHD-000-RACK4

- Supports all NetworkHD series encoders
- Ensures proper thermal dissipation of NetworkHD components
- All-steel design offers solid, secure, and professional installation
- Removable rear facing bar provide easy cable management
- Detachable front-facing handles improves rack maneuverability



NETWORKHD TOUCH

FREE, POWERFUL AND SIMPLE CONTROL SOLUTIONS FOR NETWORKHD AV OVER IP

A revolution in touchscreen control, the award-winning free NetworkHD Touch App for iPad puts entire NetworkHD™ 100, 200, 400, and 500 Series AV over IP systems at your fingertips for single screen, video wall and MultiView applications.

An app like no other, NetworkHD Touch is made for iPad with no training required and zero learning curve for users to negotiate. The result is an unrivaled user experience and effortless AV control using a device and gestures users already know, making it ideal for applications as varied as hospitality, retail, exhibition, residential and more.

MATRIX SWITCHING, VIDEO WALLS & MULTIVIEW
BEST AV CONTROL SOLUTION... PERIOD
MULTI-ZONE DEMONSTRATION MODE
3RD-PARTY CONTROL INTEGRATION



COMPANION

SIMPLE CONTROL APPLICATION FOR CONNECTED SOURCES

Companion Control provides additional capability to a NetworkHD system by working seamlessly with NetworkHD hardware and the NetworkHD Touch app. Companion adds the ability to control source devices by leveraging already existing hardware and the NetworkHD API.

The app offers an incredibly quick and intuitive experience driven by a wizard-guided setup. Preloaded control commands for the industry's most common source devices such as DirecTV, SKY, Apple TV, Roku and more are available with a modern user interface that is built automatically.



OUR COMMITMENT TO SECURITY

In today's world, the majority of Pro AV devices exist on a network. While it may be easy to connect a device via an ethernet cable to a switch or router, it's critical to understand how that device is capable of being secure. At WyreStorm, we recognize the need to be secure and take it seriously. We want you and your customers to feel confident that when a WyreStorm product exists on a network it will not fall susceptible to malicious activity. Below are protocols that we have implemented on a number of our solutions and how they keep WyreStorm devices secure.

Transport Layer Security (TLS)

Protects and secures API access to devices. A widely adopted security method intended to facilitate private communication between devices on a network.

SSH (Secure Shell)

Another method to protect and secure API access. Can also be used for secure data transfer over a network such as firmware updates.

AES Encryption

Is used to encrypt audio and video streams. AES is implemented in hardware & software solutions around the world to protect sensitive data, including the U.S. Government.

HTTPS

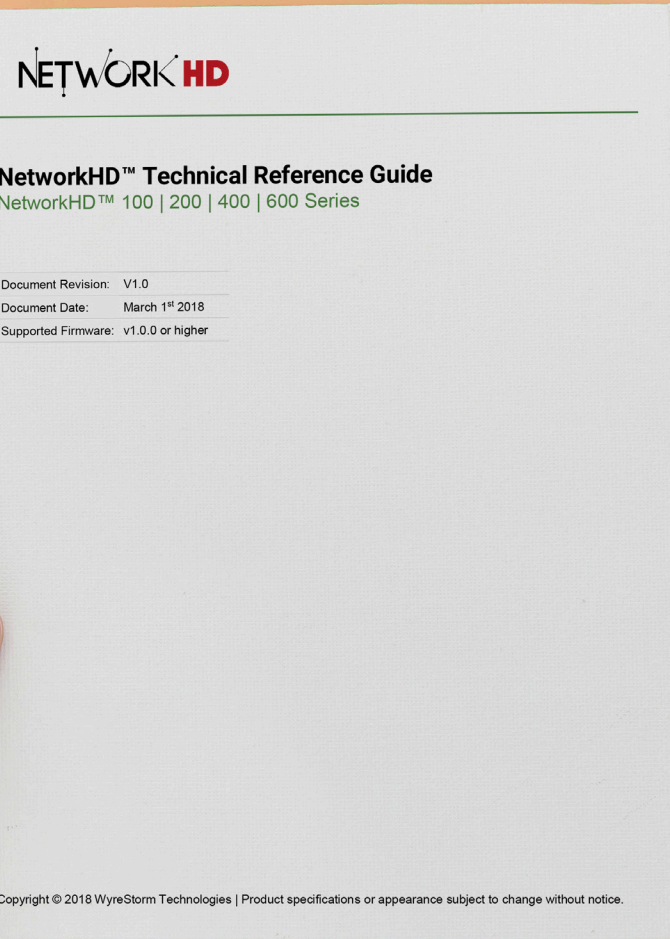
HTTPS uses Transport Layer Security (TLS) to encrypt the data that is shared between a web server and a client device, such as a computer.

PKI Authentication

Ensures access to a device only from the intended user using digital signatures and certificates for authentication.

Want to Learn More?

To read the Commitment to Security Technical Brief and to learn which WyreStorm products use these security protocols, visit wyrestorm.com/support/technical-briefs



SYSTEM BUILD CHECK LIST

Decoder	Encoder	Platform	Function	Controller	Rack Kit	Control
NHD-110-RX	NHD-110-TX NHD-140-TX	H.264/H.265	Matrix with Fast Switch	NHD-000-CTL	NHD-000-RACK4 (NHD-140-RACK-1U)	NetworkHD Touch NetworkHD Device Drivers NetworkHD API
NHD-250-RX	NHD-110-TX NHD-140-TX	H.264	Multiview	NHD-000-CTL	NHD-000-RACK4 (NHD-140-RACK-1U)	NetworkHD Touch NetworkHD Device Drivers NetworkHD API
NHD-400-RX	NHD-400-TX NHD-400-TX-IW	JPEG2000	4K HDR Matrix with low-latency Video wall	NHD-000-CTL	NHD-000-RACK4	NetworkHD Touch NetworkHD Device Drivers NetworkHD API
NHD-500-RX	NHD-500-TX	JPEG2000	4K60 4:4:4 Matrix with low-latency Video wall	NHD-CTL-PRO	NHD-000-RACK4	NetworkHD Touch NetworkHD Device Drivers NetworkHD API
NHD-610-RX	NHD-610-TX NHD-600-TRX NHD-600-TRXF	SDVoE	4K60 4:4:4 Matrix with zero-latency Video wall Multiview	NHD-000-CTL	NHD-000-RACK4	NetworkHD Touch NetworkHD Device Drivers NetworkHD API
NHD-600-TRX	NHD-610-TX NHD-600-TRX NHD-600-TRXF	SDVoE	4K60 4:4:4 Matrix with zero-latency Video wall Multiview	NHD-000-CTL	NHD-000-RACK4	NetworkHD Touch NetworkHD Device Drivers NetworkHD API
NHD-600-TRXF	NHD-610-TX NHD-600-TRX NHD-600-TRXF	SDVoE	4K60 4:4:4 Matrix with zero-latency Video wall Multiview	NHD-000-CTL	NHD-000-RACK4	NetworkHD Touch NetworkHD Device Drivers NetworkHD API

SYSTEM DESIGN ASSISTANCE

Need help planning a project? Our system design team can work with you to produce a focused system schematic, outlining connections and equipment topology required to realize project aims, while utilizing an optimized and budget-aware approach.

Whether you're a designer, specifier, integrator or project manager, working with a WyreStorm system design specialist will help focus your project and ensure the right technology is being used for the application. You'll benefit from functional and easy to follow system diagrams to use in project tenders and proposals that will add value to any opportunity, as well as separating you from the competition.

Get in contact with us at systemdesigns@wyrestorm.com and let us help you get your project started!

REFERENCE YOUR INSTALLATIONS

Whether you're new to AV over IP, thinking of specifying your first WyreStorm NetworkHD™ system, or installing a new NetworkHD™ Series solution, you'll no doubt have some questions. Luckily, our new enhanced NetworkHD™ Technical Reference Guide has all the answers.

SUBJECTS INCLUDE

- Main advantages of using AVoIP
- What AVoIP technologies WyreStorm offers and the differences between them
- The different components that make up a NetworkHD™ system
- How and when these components should be used
- Which NetworkHD™ AVoIP technology is best for your application?
- Application scenarios
- System design guidelines and requirements
- System infrastructure and requirements
- Relevant PoE standards used within a system
- How multicast is managed
- Ethernet connectivity types required
- Guidance on network switch requirements and what type of switch you should buy
- Installation guidance and checklist



Powerful. Reliable. Simple

WyreStorm Technologies

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