


**NetworkHD™ 100 Series AV over IP
H.264 Quad Encoder
NHD-140-TX**

 WyreStorm recommends reading through this document in its entirety to become familiar with the product's features prior to starting the installation process.

NETWORKHD HDMI HDCP

 **IMPORTANT! Installation Requirements**

- Visit the NetworkHD product pages download section at wyrestorm.com to check for the latest firmware, document versions, and WyreStorm Management Suite configuration tools.
- Install the latest firmware onto all encoders and decoders using the Maintenance Tool found in the Management Suite and via the NHD-000-CTL web interface. Full firmware update instructions are included with the firmware download.
- NetworkHD requires a Layer 2+ or Layer 3 managed switch network with support for Multicast & IGMP snooping enabled.
- WyreStorm highly recommends using network switches listed in the [NetworkHD Switch Recommendation Guide](#). These switches have been verified by WyreStorm to meet the requirements of a NetworkHD system.
- Configure all network switches to the exact specification of the guides at wyrestorm.com prior to connecting any NetworkHD devices.
- NetworkHD uses stateless address autoconfiguration (auto-IP) to assign link-local IP addresses in the range of 169.254.x.x to encoders and decoders out of the box. Your PC must be set to an address in this range in order to discover the encoders, decoders and NHD-000-CTL.
- WyreStorm recommends the use of the NHD-140-RACK-1U or NHD-000-RACK4 for installations containing multiple NetworkHD devices. Use of this product provides an enclosure to mount and secure all NetworkHD devices in a standard 19-inch rack frame (EIA-310).

In the Box

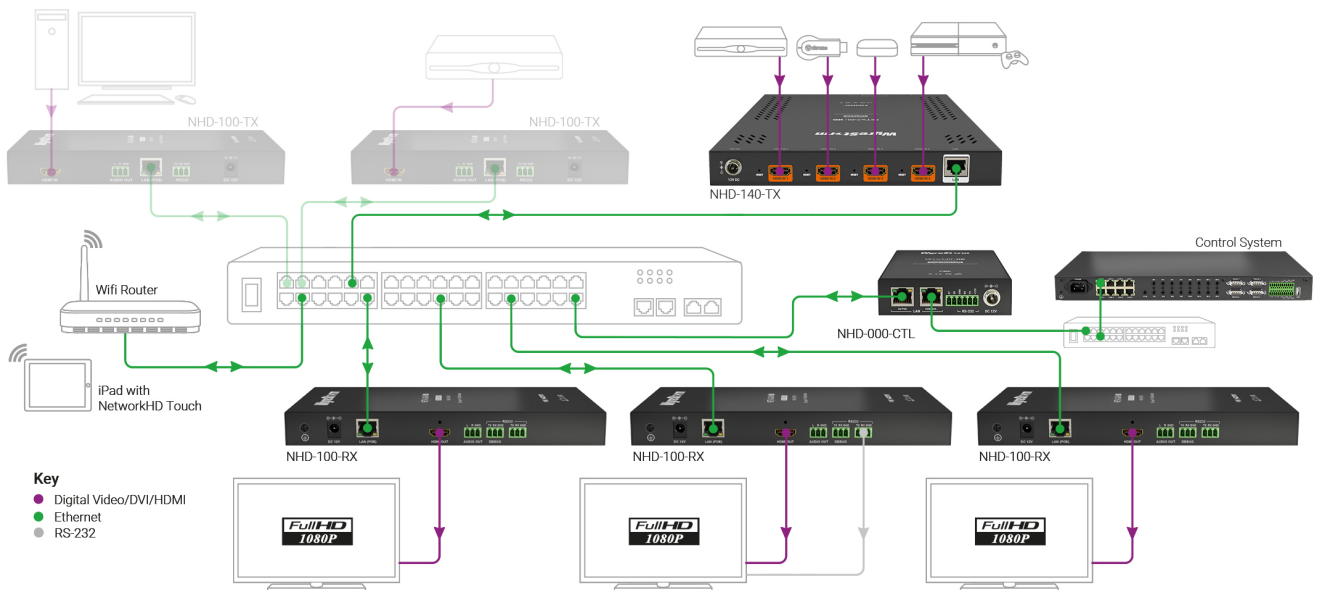
- 1x NHD-140-TX Encoder
- 1x 12V DC Power Supply (US | UK | EU)
- 2x Rack Mounting Brackets
- 2x Wall Mounting Brackets
- 1x Quick Start Guide (This Document)

Additional Information

More information and required software can be found within the Download section of the product page on wyrestorm.com.

- Management Suite v1.4 or Higher
- NetworkHD Switch Recommendations
- NetworkHD Switch Mapping Worksheet
- NetworkHD Switch Configuration Guides
- NetworkHD Touch Installation Guide
- NetworkHD Touch User Guide
- Drivers for Popular Control Systems

Basic Wiring Diagram



Wiring and Connections

WyreStorm recommends that all wiring for the installation is run and terminated prior to making connections to the switcher. Read through this section in its entirety before running or terminating the wires to ensure proper operation and to avoid damaging equipment.

IMPORTANT! Wiring Guidelines

- The use of patch panels, wall plates, cable extenders, kinks in cables, and electrical or environmental interference will have an adverse effect on signal transmission which may limit performance. Steps should be taken to minimize or remove these factors completely during installation for best results.
- WyreStorm recommends using pre-terminated HDMI and DP cables due to the complexity of these connector types. Using pre-terminated cables will ensure that these connections are accurate and will not interfere with the performance of the product.

LAN Port Wiring

The NetworkHD 100 Series LAN port is a 1GbE link for connection to a 1000BASE-T Ethernet device port. Refer to IEEE 802.3ab for official guidance on the Ethernet link. Cables must be tested to 100MHz across the entire link. 1000BASE-T uses the IEC 60603-7 8P8C modular connector.


Setup and Configuration

IMPORTANT! Installation Guidelines

- Do not connect the power supply until all NetworkHD devices are connected to the network switch.
- NetworkHD 100 Series uses stateless address autoconfiguration (auto-IP) to assign link-local IP addresses in the range of 169.254.x.x to encoders and decoders out of the box. Your PC must be set to an address in this range in order to discover the encoders, decoders and NHD-000-CTL.
- In order to configure the NetworkHD encoders and decoders, the AV port on the NHD-000-CTL MUST be connected to the same LAN/VLAN and Subnet as the NHD encoders and decoders.
- In order for the devices in the system to be controlled via a 3rd party controller on a different VLAN, the CONTROL port MUST be connected to the same LAN/VLAN and Subnet as the control system.
- The NHD-000-CTL's two Ethernet ports are designed to be used in different Networks or VLANs. When using a single Network or VLAN for example when using NetworkHD Touch – do not connect both ports – only use the AV port of the CTL.

Installation and Connections

1. Install NHD devices to allow airflow through the product - WyreStorm recommend using the NHD-000-RACK4 or NHD-140-RACK-1U. The install location should be dry, well ventilated and guaranteed to maintain the mandatory operating temperature range of the product.
2. Connect sources to the NetworkHD encoders using a HDMI cable from a quality brand such as [WyreStorm Express](#) ensuring a firm port connection.
3. Connect the HDMI display to the NetworkHD decoders using a HDMI cable from a quality brand such as [WyreStorm Express](#) ensuring a firm port connection.
4. Connect NetworkHD encoders, decoders, and CTL to the network switch using well terminated and tested category cable, whilst ensuring compliance with IEEE 802.3ab (for CTL, encoder, and decoder 1GbE ports).

 Download the **NetworkHD Switch Mapping Worksheet** from any NetworkHD product page to keep track of Mac addresses, device and alias names for later reference. This will aid the setup process in NetworkHD Console and help with any reconfiguration or troubleshooting

NetworkHD Console Configuration

In addition to the steps below more information on configuration can be found in the [NetworkHD Installation Guide](#).

1. Connect a computer running Windows™ to the same LAN/VLAN as the NetworkHD components and ensure its IP is within the same subnet as the NetworkHD default 169.254.x.x IP addresses. The NHD-000-CTL AV port is set to a static address of 169.254.1.1 by default – do not choose this address for your PC.
2. Power **On** the NHD devices by connecting the included power supplies to the **Power Input**.
3. Open the WyreStorm Management Suite (Available from the [WyreStorm](#) website) and launch the **NetworkHD Console** software and press **Search**.

Note: If a no devices are discovered, verify that encoders/decoders, CTL and PC are within the same subnet scope and within the same range of the CTLs AV Port and disable or create an exception for the **NetworkHD Console** in the **Windows Firewall**.

4. Configure the system as per the instructions in the [NetworkHD Installation Guide](#). Right Click on the NHD-140-TX to see its available options, including setting the device's IP address and setting an Alias name. You will also find other configuration options under the **Batch Settings** window.

Note: If a 3rd Party control system with a WyreStorm driver for NetworkHD is going to be used, the encoders must use the Alias prefix IN1, IN2, etc. This also applies to decoders, OUT1, OUT2, etc. For example, **IN1-Satellite Receiver 1**

5. Upload to the configuration to the NHD-000-CTL by right clicking the CTL in the **Other Devices** section and selecting Upload.
6. Configure the scaling and HDCP values of each decoder based on the requirements of the content and display using the settings found in the **Video** tab in the **Batch Settings** screen.

Troubleshooting



Verify that all NHD devices contain the latest version of firmware. This will ensure that all devices are up to date and working at their highest performance level.

NetworkHD Software fails to locate TX/RX/CTL Devices

- Verify that all NHD and Network devices are powered On.
- Adjust Windows Firewall Settings – Create an exception for NetworkHD Console.
- Verify that the PC, CTL AV Port, and NHD encoders and decoders are on the same LAN/VLAN/Subnet.
- Verify that all network switches share the same VLAN configuration.
- Reboot all system components including the NHD-000-CTL and the PC.
- Ensure that only one CTL port is connected per LAN/VLAN. If only one LAN/VLAN exists only use the AV port.
- Ensure the network switch is fully configured per the appropriate switch configuration guide.

Failure to Connect to CTL Controller

- Follow the previous steps for failing to connect to devices. If these are unsuccessful, press and Hold the reset button on the front of the CTL for 5 seconds.
- After a reboot the CTL will be returned to the default IP address of 192.168.11.243 for the control port and 169.254.1.1 for the AV port.

No Image Appearing on Displays

- Verify that all NHD, Network, Source, and Display devices are powered On.
- Verify that the configuration in NetworkHD Console is correct based on system layout and components used.
- Test sources and displays by connecting them directly together.
- Swap out the HDMI cable.

Specifications

Audio and Video	
Inputs	4x HDMI In: 19-pin HDMI Type A
Outputs	1x LAN: 8-pin RJ-45 (AV Transmission to RX)
Output Video Encoding	H.264
Encoding Data Rate	Max: 30Mb/s – per stream (120 Mb/s total)
End to End Latency (Max)	~79ms (low latency mode) ~250ms (high quality mode)
Audio Formats	2ch LPCM 48KHz
Video Resolutions (Max)	All resolutions listed are 8bit RGB. 1920x1080p @24/25/30/50/60Hz 1920x1080i @25/30Hz 1280x720p @50/60Hz 720x576p @50Hz 720x576i @25Hz 720x480p @60Hz 720x480i @30Hz 1680x1050 1400x1050 1280x1024 1440x900 1280x800 1366x768 1360x768 1024x768 800x600 640x480 @ 60Hz:
Maximum Pixel Clock	165MHz
Communication and Control	
HDMI	HDCP 1.4
Ethernet	1x LAN: 8-pin RJ-45 ANSI/TIA-568 8P8C, 1000Base-T
Power	
Power Supply	12V DC
Max Power Consumption	19.44W
Environmental	
Operating Temperature	0 to + 45°C (32 to + 113 °F), 10% to 90%, non-condensing
Storage Temperature	-20 to +70°C (-4 to + 158 °F), 10% to 90%, non-condensing
Maximum BTU	68 BTU/hr
Dimensions and Weight	
Rack Units/Wall Box	<1U flat on shelf 6U in NHD-000-RACK4 1U in NHD-140-RACK-1U
Height	25mm/1in
Width	215mm/8.46in
Depth	260.2mm/10.24in
Weight	1.46kg/3.21lbs
Regulatory	
Safety and Emission	CE FCC RCM RoHS

Note: WyreStorm reserves the right to change product specification, appearance or dimensions of this product at any time without prior notice.

Warranty Information

WyreStorm Technologies LLC warrants that its products to be free from defects in material and workmanship under normal use for a period of five (5) years from the date of purchase. Refer to the [Product Warranty](#) page on [wyrestorm.com](#) for more details on our limited product warranty.

