









NetworkHD™ Installation Guide

100 | 200 | 400 | 600 Series

Document Revision:	v3.0
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Supported Firmware:	v3.1 or higher

IMPORTANT! Safety Information

Safety Classifications

Note:	Provides special information for installing, configuring, and operating the equipment.
 IMPORTANT!	Provides special information that is critical to installing, configuring, and operating the equipment.
 CAUTION!	Provides special information on avoiding situations that may cause damage to equipment.
 WARNING!	Provides special information on avoiding situations that may cause physical danger to the installer, end user, etc.
 ELECTRIC SHOCK!	The source power poses an electric shock hazard that has the potential to cause serious injury to installers and end users.
 ELECTRICAL DISCONNECT:	The source power outlet and power supply input power sockets should be easily accessible to disconnect power in the event of an electrical hazard or malfunction.
 WEIGHT INJURY!	Installing some of the equipment requires two installers to ensure safe handling during installation. Failure to use two installers may result in injury.

Safety Statements

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

IMPORTANT!

Do Not Hot swap HDMI or LAN connections - Please insert and extract cables carefully with the power SWITCHED OFF. Power is passed along transmissions so connecting and disconnecting cables while powered can result in damage to circuitry or possible injury.

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Overview

The following information outlines the process to configure a NetworkHD system. While the some of the information can be used for design other documents such as the NetworkHD Technical Reference Guide provide more detail on the requirements for NetworkHD.

Before You Begin

Verify that the following items are on hand and that all documentation is reviewed before continuing.

- NetworkHD 100/200/400/600 Series components running the latest version of Firmware.....
- Configured Network Switches, Sources, and Displays.....
- Refer to the [NetworkHD Technical Reference Guide](#) for details on Network guidelines and requirements.
- PC with the WyreStorm Management Suite v3.1 or higher installed
- All required cables and connectors
- Latest Configuration Software, Firmware, and Documentation for NetworkHD.....
- Download from Website or by using this [link](#).

Pre-Configuration Guidelines and Requirements

Before designing, installing, and configuring a NetworkHD system with the content provided in this document, refer to [NetworkHD Technical Reference Guide](#) located on the website. This document contains all the information about network and infrastructure requirements for designing a NetworkHD system.

Technical Reference Guide Important Sections

System Components – Refer to this section for information on the NetworkHD components and how they can be used within a system.

Application Scenarios - Refer to this section for the various application methods that NetworkHD can be used.

System Design Guidelines and Requirements – Refer to this section for guidelines for designing a system and what is required for optimum functionality.

System Infrastructure Guidelines and Requirements – Refer to this section for guidelines and requirements for selecting network switches based on the operation of the system.

Other important information is provided in the [NetworkHD Technical Reference Guide](#). Read through the document in its entirety to be familiar with NetworkHD and how it can be used within applications.

Installation

Mounting Guidelines

NetworkHD components should be installed on a flat, level surface such as a table, cabinet, shelf, or wall. Location should be dry, well ventilated, and out of direct sunlight. Units should never be flat stacked without space between the units for ventilation and the side vent holes should not be obstructed.

Rack Mounting

For AV and IT racks, WyreStorm offers rack mount kits to allow for quick and easy installation that provides a clean properly ventilated installation. All rack mount kits provide a steel housing that can be used in a central and secure location for the components.

NHD-000-RACK is designed for use with 100/200 series encoders

NHD-000-RACK2 is designed for 100/200/400 series encoders

NHD-000-RACK3 is designed for 600 series encoders and decoders

Note: The NHD-200-TX has dipswitches to set the video source format, these switches should be set before mounting the NHD-200-TX. Refer to [NHD-200-TX Dipswitch Settings](#) for details.

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.

IMPORTANT! IR TX/RX Guidelines

Using WyreStorm infrared emitters and receivers is the best way to ensure that most IR coding formats are transmitted and received by the NetworkHD system. Other 3rd party emitters and receivers can be used; however, these devices must operate in the same manner as the WyreStorm devices.

On the 100/200/400 series the IR data modulation (carrier) frequency is passed through NetworkHD from the receiver to the emitter, however on the 600 series the carrier frequency is fixed at 38kHz when used in pass-through mode. When using the API the carrier frequency can be defined for greater compatibility.

Due to differences in IR across 3rd party control systems their IR ports should never be connected directly to a NetworkHD system as an incompatibility may exist. WyreStorm offers a cable that compensates for voltage differences as well adjusts for differences in the pins used within the port. Refer to the [CAB-IR-LINK](#) product page for more information.

LAN Port Wiring

The NetworkHD 600 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

SDVoE Wiring

The NetworkHD 600 Series utilize a 10GbE link connection to a 10GBASE-T Ethernet switch port. Refer to IEEE 802.3an for official guidance on the Ethernet link. Cables must be tested to 500MHz across the entire link. 10GBASE-T uses the IEC 60603-7 8P8C modular connector

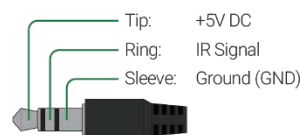
IR TX Port Pinout

Connection for IR TX (transmit) uses a 3.5mm (1/8in) mono plug.



IR RX Port Pinout

Connection for IR RX (receive) uses a 3.5mm (1/8in) stereo jack that outputs +5V DC to power the included IR receiver.



RS-232/Debug Wiring

NetworkHD components use 3, 4, or 5-pin phoenix connectors with no hardware flow control. Most control systems and computers are DTE where pin 2 is RX, this can vary from device to device. Refer to the documentation for the connected device for pin functionality to ensure that the correct connections can be made.

NHD-000-CTL Controller

WyreStorm Connector		3rd Party Device
Pin 1 ST		Reserved
Pin 2 SR		Reserved
Pin 3 G (Ground)	---> To --->	G (Ground)
Pin 4 RX (Receive)	---> To --->	TX (Transmit)
Pin 5 TX (Transmit)	---> To --->	RX (Receive)
Pin 6 +12V		Reserved

NHD 400/600 Series

WyreStorm Connector		3rd Party Device
Pin 1 12V DC Out	---> To --->	Reserved
Pin 2 TX (Transmit)	---> To --->	RX (Receive)
Pin 3 RX (Receive)	---> To --->	TX (Transmit)
Pin 4 G (Ground)	---> To --->	G (Ground)

NHD 100/200 Series

WyreStorm Connector		3rd Party Device
Pin 1 TX (Transmit)	---> To --->	RX (Receive)
Pin 2 RX (Receive)	---> To --->	TX (Transmit)
Pin 3 G (Ground)	---> To --->	G (Ground)

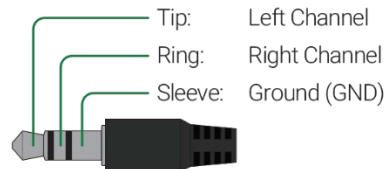
Audio Wiring

Audio connections on NHD components vary from 3.5mm/1/8in TRS Stereo to 3-pin phoenix connectors based on the series and the product. Some products may contain both a 3.5mm TRS and a phoenix connection.

NHD 100/200Series

WyreStorm Connector		3rd Party Device
Pin 1 Left Positive (L+)	---> To --->	Left Positive (L+)
Pin 2 Right Positive (R+)	---> To --->	Right Positive (R+)
Pin 3 Ground (G)	---> To --->	Left Negative (L-) Right Negative (R-)

NHD 200-TX/400/600 Series



NHD-200-TX Dipswitch Settings

While most NHD components are completely configured by the NHD Console software, the NHD-200-TX has dipswitches for type of video format used by the DVI connector. These switches should be configured before mounting the NHD-200-TX.

DVI-D		YPbPr	
HDMI		CVBS	
VGA			

Notes

- The 3.5mm audio input on the NHD-200-TX is only activate in DVI-D or VGA modes.
- An active DVI converter may be necessary if connecting a source, such as PC with a DVI output, to an encoder. If a passive converter/cable is used a color space issue may occur.

System Configuration

The steps listed here should be followed when configuring a NetworkHD system. Aside for the content within this guide there is configuration required for network components that is covered elsewhere. These documents will need to be followed in order to the system operate at its optimum performance level.

Management Suite Configuration Tool

The Management Suite is an All-in-One tool that allows quick and easy access to the most used software applications for WyreStorm products, including NetworkHD. To get started configuring a NetworkHD system perform the following.

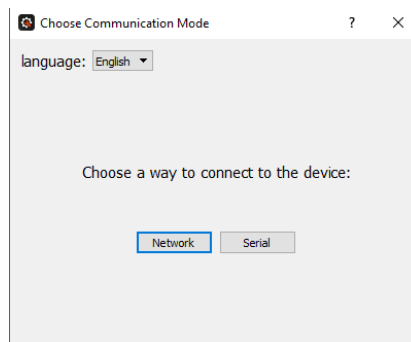
1. Download the [Management Suite](#) from a NetworkHD product download tab located on [wyrestorm.com](#)
2. Install the Management Suite by extracting the contents of the zip file to your computer.
3. Run the WyreStormManagementSuiteSetup.exe and complete the installation.
4. Launch the WyreStorm Management Suite application.



NetworkHD Maintenance Tool

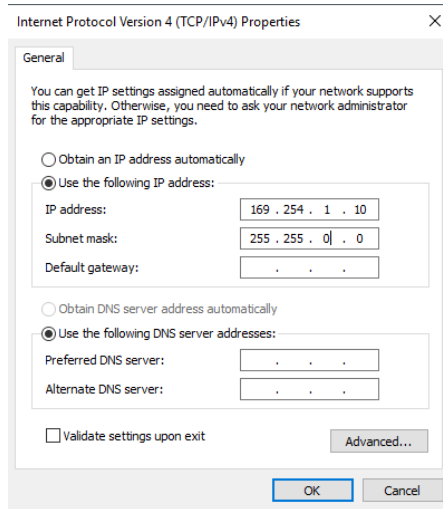
The NetworkHD Maintenance Tool is used to view detailed information for encoders and decoders. It is also used to update firmware on encoders and decoders. To use the Maintenance Tool, perform the following.

1. Open the WyreStorm Management Suite.
2. From the Management Suite Menu select the Maintenance Tool.
3. When prompted, select Network and the connection method.



Firmware updates for NetworkHD can always be found at [WyreStorm.com](#) in the Downloads tab of any NetworkHD product. Once any applicable firmware updates have been downloaded perform the following.

4. Extract the contents of the **NHD000Series_UpdateX.zip** file to a location on your computer. You will need to change the IP address of your computer to match the same subnet as the NetworkHD Encoders and Decoders, which by default is 169.254.x.x. Use a subnet mask of 255.255.0.0.



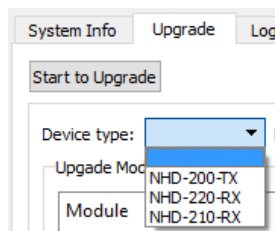
5. Return to the Maintenance Tool and press the Search button to find available NetworkHD components.

Alias	HostName	IP Address	Version	VISelect	VITiming
Warehouse	NHD-210-RX-70B3D5D59600	192.168.1.17	v2.11.3		
VW-TR	NHD-210-RX-E4CE020004C1	192.168.1.12	v2.11.3		
VW-TL	NHD-210-RX-E4CE0210002C	192.168.1.16	v2.11.3		
VW-BR	NHD-210-RX-E4CE02000479	192.168.1.14	v2.11.3		
VW-BL	NHD-210-RX-E4CE0200046B	192.168.1.15	v2.11.3		
VideoRoom	NHD-100-RX-E4CE02000199	192.168.1.28	v2.11.3		
SetTopBox	NHD-200-TX-E4CE0200083D	192.168.1.20	v2.11.3	hdmi1	720P_60
ScreenLink	NHD-200-TX-70B3D5D5A5C3	192.168.1.23	v2.11.3	hdmi3	none
Roku	NHD-200-TX-E4CE020008AF	192.168.1.19	v2.11.3	hdmi1	720P_60
NHD-SW-0501-...	NHD-SW-0501-70B3D5D5A...	192.168.1.27	v3.0.2	hdmi1	none
Kitchen	NHD-210-RX-E4CE021000DE	192.168.1.11	v2.11.3		
KathTV	NHD-210-RX-E4CE021000CF	192.168.1.10	v2.11.3		
Conference	NHD-210-RX-E4CE02000476	192.168.1.13	v2.11.3		
Bluray	NHD-200-TX-70B3D5D5A5E7	192.168.1.22	v2.11.3	hdmi1	1080P_60

Note: If no devices are discovered follow these steps:

- Ensure the Maintenance Tool is allowed through Windows Firewall.
- Ensure the PC's IP address is in the same range as NetworkHD components.
- Ensure the Layer 2 network switch is a supported model and fully configured.

6. Reboot your PC.
7. Press the dropdown menu next to Device Type and choose the encoder or encoder model you wish to update first.



Note: Devices of the same model can be upgraded simultaneously. For example, if you have 20, NHD-200-TXs, all 20 can be upgraded at the same time.

8. In the Upgrade Module section select the Open button next to **IP_MAIN**.
9. Select the appropriate .bin firmware file for the device(s) being upgraded.

Module	File
IP_FPGA	Open...
IP_MCU	Open...
IP_MAIN	Open...
UpgradeAgent	Open...

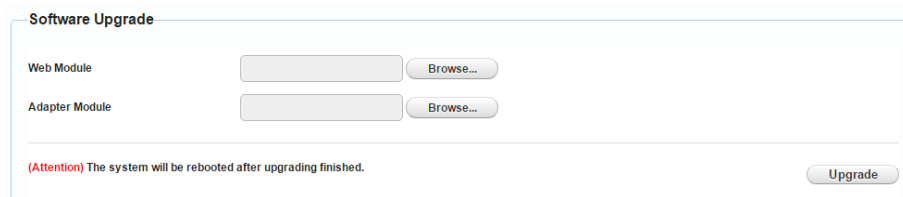
Note: Be vigilant in choosing the correct .bin file for the currently selected device type. Installing the wrong firmware file for a NetworkHD component could break the product.

10. Ensure the Auto Reboot After Upgraded check box is selected.
11. Press the Start to Upgrade button.

The progress of the upgrade can be seen as it is performed. Repeat this process for any other devices.

To update the firmware on the NHD-000-CTL perform the steps below.

12. Open a web browser and log into the WebUI of the CTL. The default IP addresses are 192.168.11.243 (Control Port) or 169.254.1.1 (AV Port). The default username and password are both admin.
13. Select the Controller Settings Tab and scroll down to reach the Software Upgrade section.
14. Click browse next to both the Web and Adaptor modules and select the appropriate .bin file for each.
15. Click the Upgrade button.



The screenshot shows a web interface titled "Software Upgrade". It contains two rows of input fields and buttons. The first row is labeled "Web Module" and the second row is labeled "Adapter Module". Each row has a text input field followed by a "Browse..." button. Below these fields, there is a red warning message: "(Attention) The system will be rebooted after upgrading finished." At the bottom right of the form, there is an "Upgrade" button.

The CTL will now perform the upgrade. This process will take 3-4 minutes to complete. A pop-up message will appear at the top right of the web browser indicating completion.

Note: DO NOT refresh the web browser during the process.

For quicker reference to the Maintenance Tool or the firmware update process refer to the [NetworkHD 100 & 200 Series Firmware Update Application Note](#) available for download at [WyreStorm.com](#).

NetworkHD 000 Console Software

The NetworkHD Console Software is the center for configuring encoders and decoders. It allows for the creating of video walls and groups, along with a number of further options to setup a NetworkHD system. To begin using the Console software perform the following.

IMPORTANT! Requirements Before Proceeding

The following firmware and software is required when using the NHD-600 and/or running CTL firmware v1.17/v8.2.3(8.2.6) or higher.

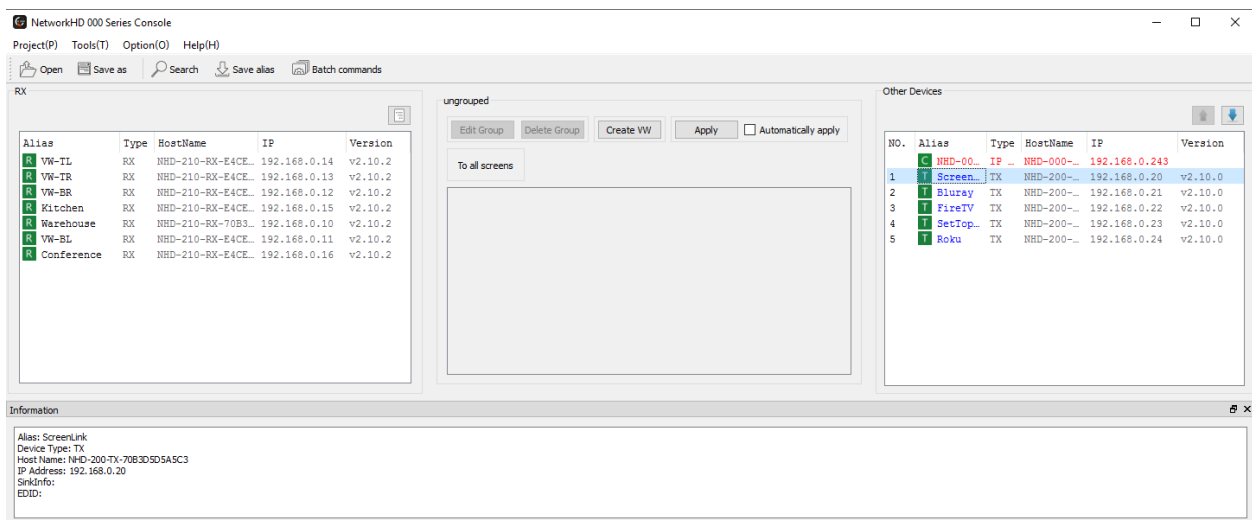
NHD-000-CTL firmware v1.17/v8.2.3(8.2.6) or higher	Required to configure and operate the NHD-600.
NHD console v8.3.1 or higher Contained in Management v1.3 or higher.	Required for CTL firmware v1.17/v8.2.3(8.2.6) or higher

To successfully search and find available NetworkHD components, the PC's LAN adapter must be set into the same IP range as encoders and decoders. By default, this range is 169.254.x.x with a subnet mask of 255.255.0.0.

For example, a static IP address of 169.254.1.10 could be set.

Note: It is important to configure a static IP address to a PC prior to opening the Console Software.

1. Select the NetworkHD 000 Series Console from the Management Suite Menu
2. Select Create a New project file.
3. Press the Search button and the Console will find and populate a list of all available devices. Decoders appear at the left of the Console and encoders, along with the NHD-000-CTL, appear at the right.



Note: If no devices are discovered follow these steps:

- Ensure all NetworkHD Components are running the latest available firmware from the products downloads section at wyrestorm.com
 - Ensure the Software is allowed through the Windows firewall by checking you firewall settings and allowed applications
 - Ensure that your PC's IP address is in the same range as the NetworkHD components
4. Reboot your PC

Configuring IP Addresses

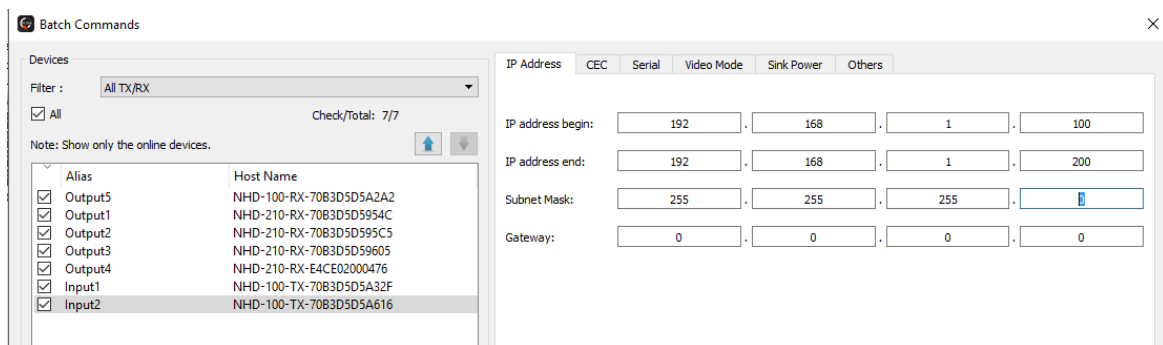
In most NetworkHD installations it is not necessary to adjust encoders and decoder from their AutoIP settings, however, if configuring a system to use NetworkHD Touch or if the networking environment requires such perform the steps below.

Encoder and decoder IP address can be changed individually by right clicking the device and choosing **General Settings**. In larger systems you can change the IP addresses of multiple devices in one action using Batch Commands.

Batch IP Address Editing

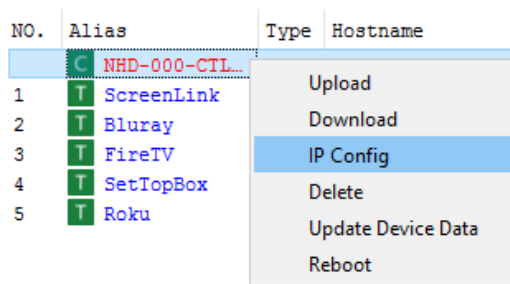
1. Press the Batch commands button and select the IP address tab.
2. Filter to a specific device type using the Filter dropdown menu
3. In the left pane select the All checkbox.
4. Enter the required starting IP address of the encoders and decoders in the Starting IP address field and the highest IP address in the Finishing IP address field.
5. Ensure the Device Restart box is checked and then click Apply.

Note: You will need to change the IP address of your PC in order for the Console to rediscover the devices on the network after changing the devices addresses. Online devices have green icons.

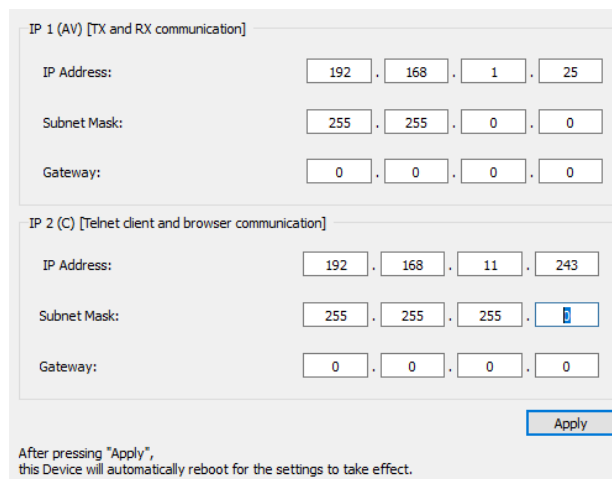


To change the NHD-000-CTL's IP addresses perform the following.

1. Right click the CTL in the **Other Devices** section and choose **IP Config**.



2. Enter in the IP information for the AV and Control Ports and click Apply when done. The CTL will then reboot, please be patient as the process will take approximately 2 minutes to complete. A solid blue status light on the CTL indicates it is fully booted and operational. Note that both ports cannot be on the same subnet and must be on independent subnets. If there is only one subnet, then only one port connection is needed.



Creating Aliases

Aliases can be set to encoders and decoders. If using a third-party control system driver from WyreStorm alias names should start with "INX" or "OUTX" where X is a number 1 or higher. The alias names can also include a " - " followed by display or source information. For example, a complete alias could look like **IN1-AppleTV** or **OUT1-ConferenceTV**.

To adjust device aliases, perform the following.

1. Right click a decoder or encoder and select General Settings
2. Enter in the desired alias
3. Click Apply for the alias to take effect.

Alias	Type	Hostname	IP	Version
VW-TL	RX	NHD-210-RX-E4CE...	192.1...	v2.11.3
VW-			4CE...	192.1...
Kat			4CE...	192.1...
Kit			4CE...	192.1...
VW-			4CE...	192.1...
Vi			4CE...	192.1...
Wa			0B3...	192.1...
VW-			4CE...	192.1...
Co			4CE...	192.1...

Creating Groups

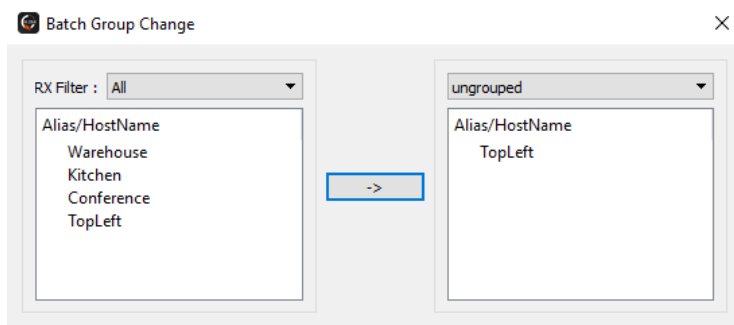
Decoders can be organized in groups. These groups represent rooms, areas or video walls in the building. Each group can have any number of decoders as members. For example, for a sports bar you can create a group for the Bar, Dining and Waiting areas and another for the main video wall. These groups only appear on the main screen of NetworkHD Touch and can have custom icons (these are configured in the app).

By default, all devices are added to the Ungrouped Group

1. Create a group by pressing All Groups in the RX area and then press Create Group button in the central area. In the pop up, enter a name and press OK.

2. Add decoders to the group by right clicking them, select Change Group and then select the desired group.

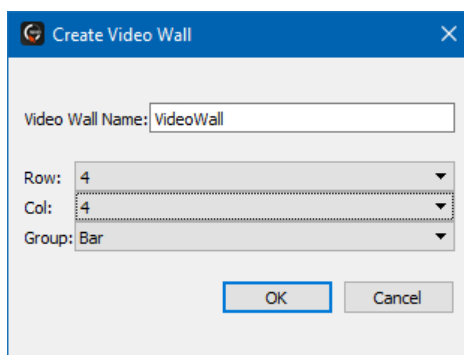
Bulk decoder group assignments can be accomplished by selecting the Batch Group Change option.



Creating Video Walls

Video walls are only possible with NetworkHD 210 decoders or 400 series. Up to a 16x16 video wall can be created and the video wall must be a member of a group.

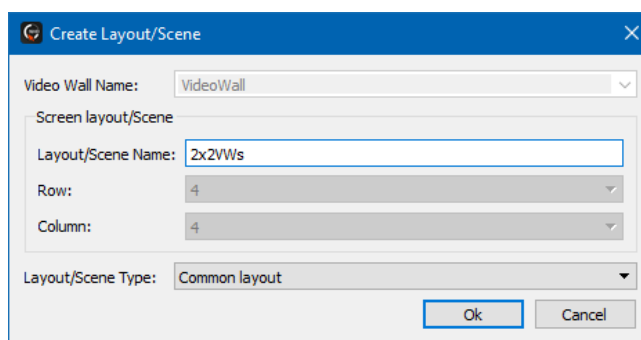
1. If not done already, create a group.
2. Select a group and then press the Create VW button.
3. Give the video wall a name and choose its size.



Each video wall can have multiple scenes. Scenes dictate the configuration for a video wall – for example a 4x4 video wall could contain a scene in which all 16 displays combine into a single image, while another scene consists of four 2x2 video walls. The possibilities are endless and the user can switch between these scenes at the touch of a button.

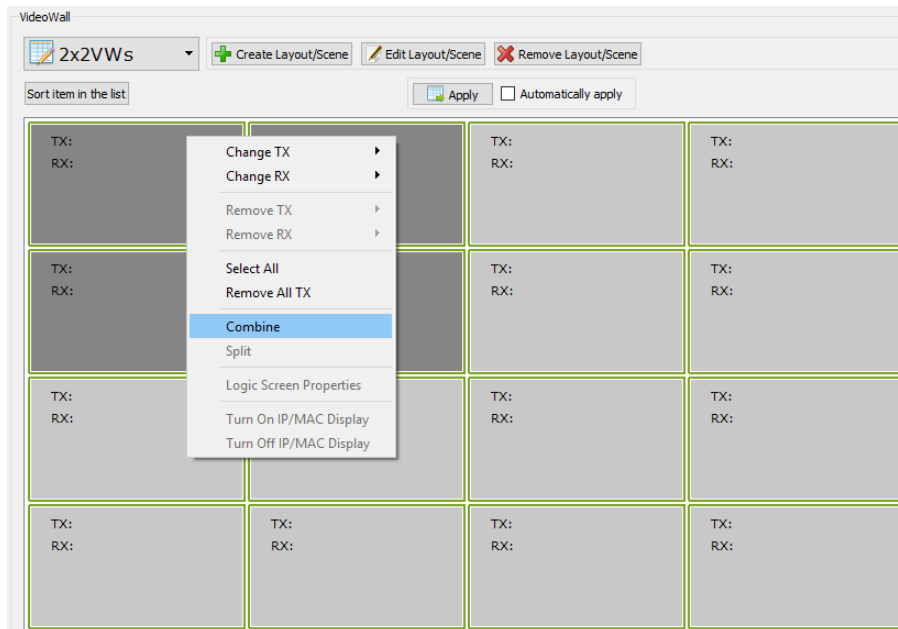
4. To create a scene within the video wall, press the Create Scene/Layout button and name it.

Note: Scene names must be alphanumeric and cannot include spaces or special characters (!@£\$%^*~\<+\" etc.)

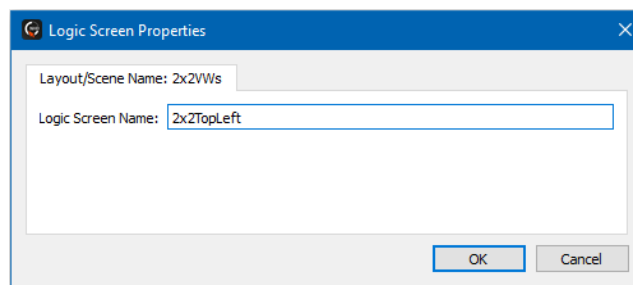


5. Once a Scene has been created screens can be combined to create the video wall. For example, to create a 2x2 image in a video wall hold the PC's CTRL button and select 4 displays.
6. Right click one of the selected displays and choose the option to **Combine**.

Note: Video walls must be a complete shape – ie. 2x1 or 2x2, 3x3 etc – They cannot be L or T shaped etc. It is recommended that walls have the same number of columns as rows so that video stretching does not occur.

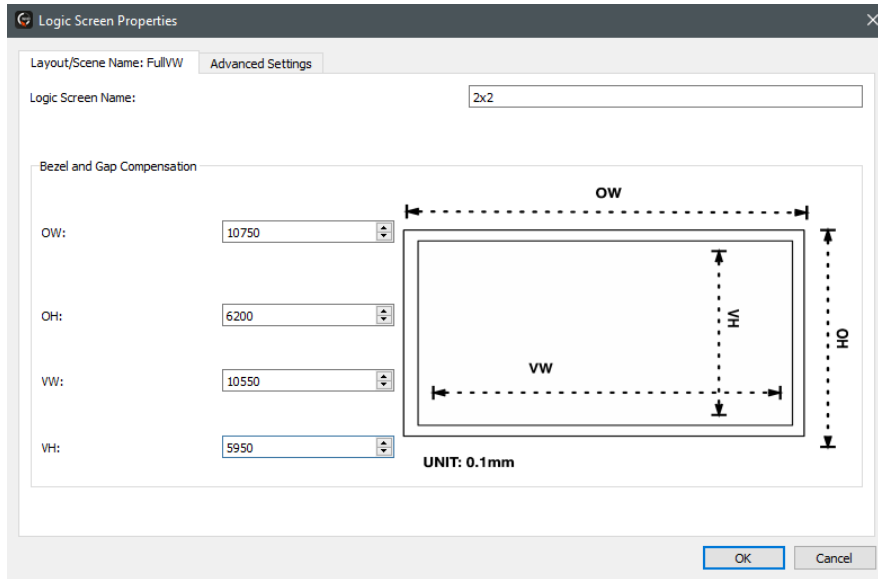


7. If using NetworkHD 200 series, the following prompt will appear asking for a Layout name. In this example, the 2x2 image could be called 2x2TopLeft.
8. Enter in a name and click the Ok button. When finished continue to step 11



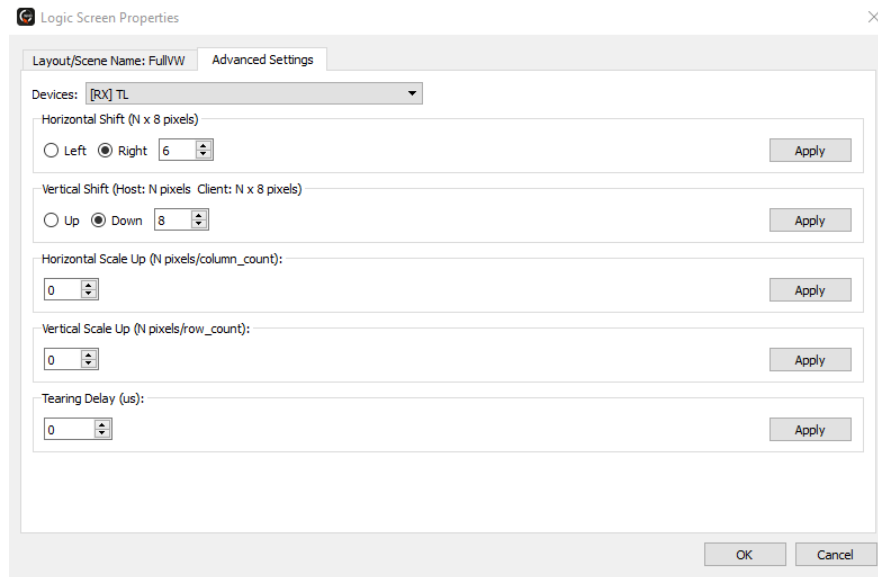
If using NetworkHD 400 series a different window will appear asking to adjust for display bezel and gaps. It is not always necessary to adjust for bezel and gaps. However, if parts of the video image are being cut off, display measurements should be made to compensate appropriately

9. Start by giving the Layout a name.
10. Measure the OW (outer width), OH (outer height), VW (viewable width) and VH (viewable height) of a single screen which is part of the video wall. Measurements should be recorded in centimeters and then multiplied by 100. For example, if the OW (outer width) of a display is 90cm, $90 \times 100 = 9000$. Once calculated, 9000 would be entered into the OW field. Repeat this process for all dimensions.

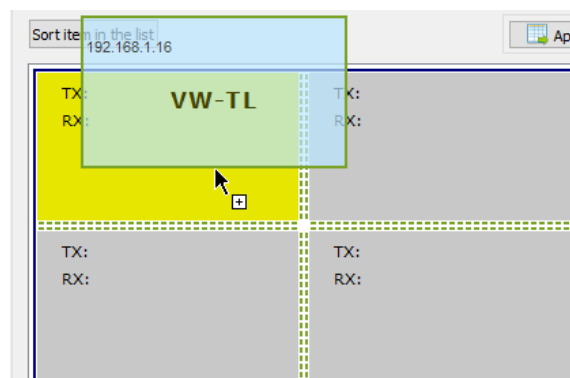


Each section of a video wall allows for the video image to be independently adjusted. To do this select the Advanced Settings tab.

11. Select a decoder and enter a value in the appropriate field. All values entered will be multiplied by 8



12. To populate the displays, drag and drop decoders and an encoder to the layout to build the video wall.



Configuring the NHD-600TX/RX Video/Audio Switching

The NHD-600 has features not available on the other series that can be configured within the NHD Console.

Note that the NHD-600 has specific firmware and software requirements. Refer to [IMPORTANT! Requirements Before Proceeding](#) in the [NetworkHD 000 Console Software](#) section before proceeding.

From the Batch Commands Video Tab, the following configurations can be made:

Transmitters:

- Set input between HDMI, Display Port or Automatic
- Enable or Disable HDCP 1.4 or 2.2

Receivers:

- Set video mode between Genlock or Fast Switch
- Force video output scaling. (Can only be used with Fast Switch video mode).
- Adjust HDMI audio output between a transmitter's HDMI source, transmitter analog audio source or down mix transmitter HDMI audio. (Down mixing can only be used in Fast Switch mode).

After making any changes in the Video Tab a transmitter or receiver reboot is required.

The screenshot shows the 'Video' tab in the NHD Console. On the left, a 'Devices' panel is filtered to 'NHD-600-RX' and shows four checked devices. The main configuration area has tabs for IP, Video, Image, Audio, Serial, Power, EDID, IR, and Others. Under the 'Video' tab, there are three radio buttons: 'For JPEG 2000', 'For H.264', and 'For SDVoE' (selected). Below are several configuration sections, each with an 'Apply' button: 'Input' (set to HDMI), 'HDCP Support' (set to Enable, with 'Disable HDCP 2.2 Support' unchecked), 'Video Mode' (set to Genlock), 'HDMI Timing Hybrid' (set to 720P@50, with a note 'Video Scaling is not available when using Genlock mode'), 'HDMI Audio' (set to TX HDMI Audio, with a note 'Downmix is not available when using Genlock mode'), and 'Stretch Type' (set to None).

From the Batch Commands Audio Tab, the following configurations can be made:

Transmitters:

- Set the analog audio connector to an input to be transmitted to a receiver or an output which de-embeds audio from the locally connected HDMI or Display Port source.

Receivers:

- Play audio from a transmitter's analog audio connector or to down mix from a transmitter's HDMI source.

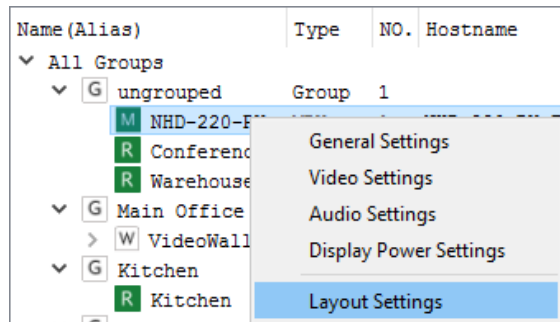
After making any changes in the Audio Tab a transmitter or receiver reboot is required.

The screenshot shows the 'Audio' tab in the NHD Console. On the left, the 'Devices' panel is the same as in the previous screenshot. The main configuration area has tabs for IP, Video, Image, Audio, Serial, Power, EDID, IR, and Others. Under the 'Audio' tab, there are three configuration sections, each with an 'Apply' button: 'Audio delay' (a text input field with '(0-500ms)' next to it), 'Analog Direction' (set to Input), and 'Analog Audio Source' (set to Analog Audio).

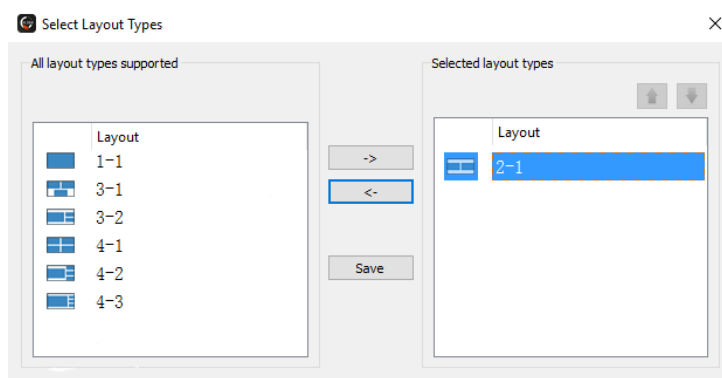
Configuring the NHD-220-RX Multiview

The NHD-220-RX is a multi-view decoder allowing up to 8 streams to be shown on a single display simultaneously in a number of different layouts. To adjust which layouts are accessible in the NetworkHD Touch app or to create default source assignments perform the following.

1. Right click a NHD-220-RX and choose Layout Settings



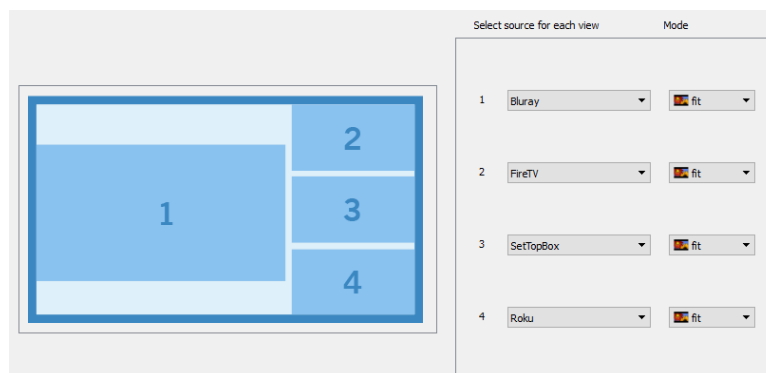
2. Click the drop down menu and choose Edit
3. Select the desired layouts to be accessible from the Touch app



4. Click the Save button

To assign default encoders to multi-view layouts perform the following.

1. Select a layout from the drop down menu.
2. Select a source for each location in the multi-view layout.
3. Click the Save button.

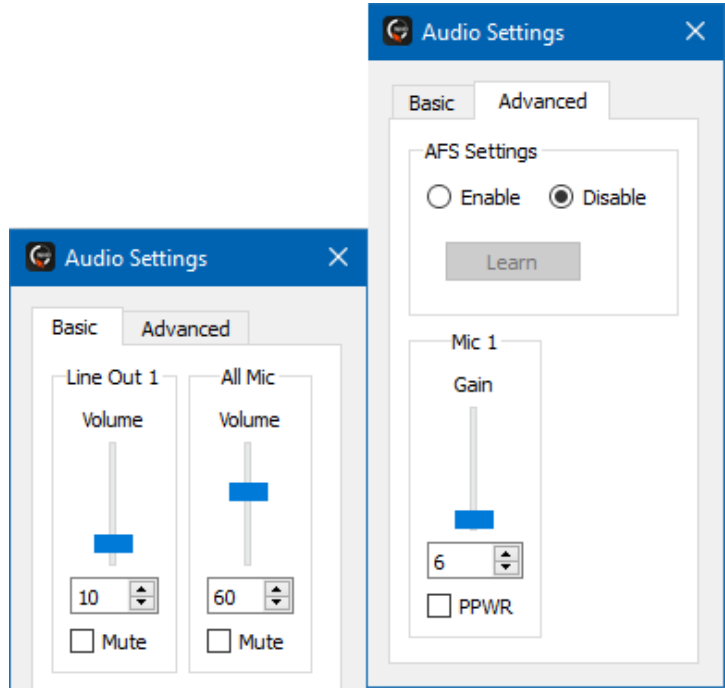


Configuring the NHD-SW-0501 Switching Functions

The NHD-SW-0501 is a five-input switcher which functions as a NetworkHD encoder. The NHD-SW-0501 has many added capabilities over a traditional encoder which includes four HDMI inputs, one VGA input, microphone overlay, local HDMI loop out and ScreenLink. The Console software includes features specific settings for the NHD-SW-0501. To adjust these settings, perform the following.

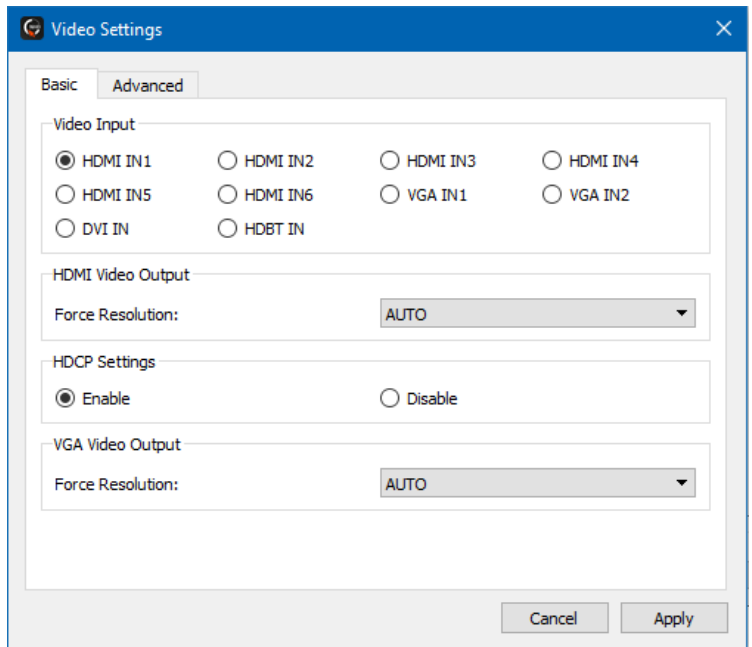
1. Right click a NHD-SW-0501 from the Other Devices section and choose **Audio Settings**. The following adjustments can be made.
 - Line Out Volume
 - All Mic Volume
 - Mute for Line Level or Mic Volume

- Mic Input Gain
- Phantom Power On/Off
- Auto Switching Enable/Disable



2. Right Click the NHD-SW-0501 again to adjust **Video Settings**. The following adjustments can be made:

- Video Input Selection
- Local HDMI Output Resolution
- HDCP Enable/Disable
- VGA Output Resolution

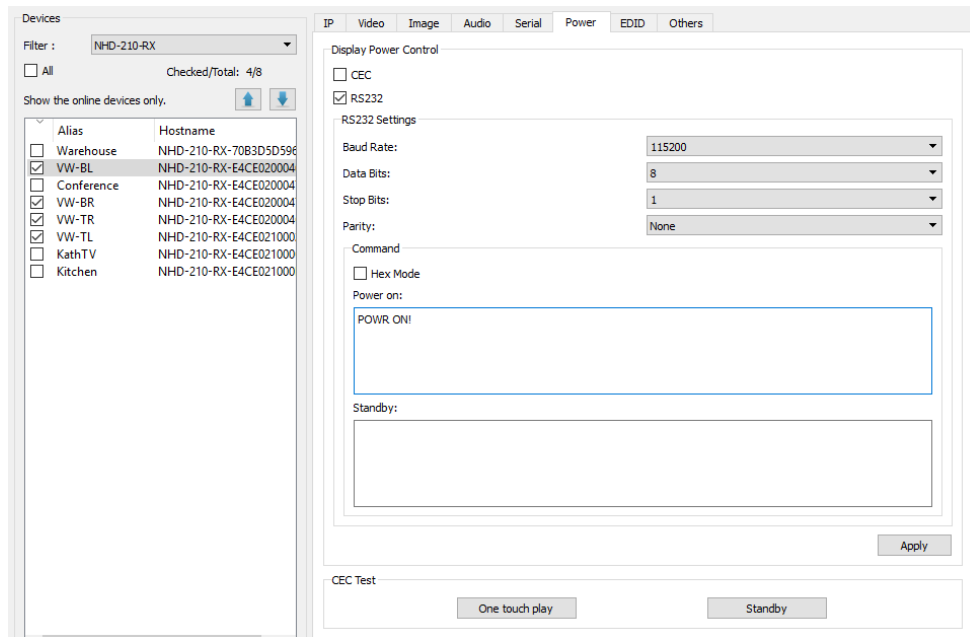


Configuring CEC & RS-232 Control

The Batch Commands window can be used to configure decoders to send CEC or RS-232 commands to the attached displays. These commands can be triggered from the NetworkHD Touch app when the power on or off buttons are pressed. It is also a useful tool for verifying and testing CEC or RS-232 commands to connected displays.

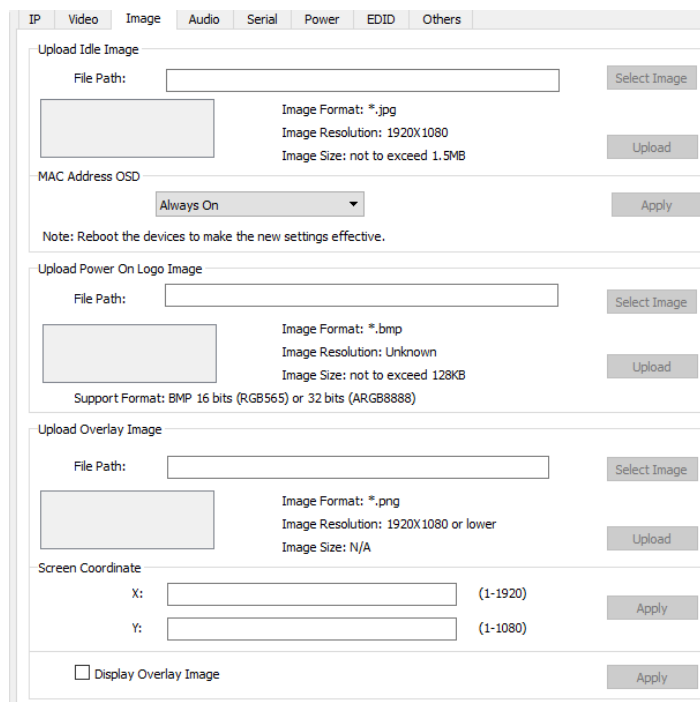
CEC control can be found on most modern displays. If the display being controlled doesn't have CEC capability, then RS-232 can be used as an alternative.

1. From the Batch Commands window select the Display Power tab.



2. Select decoders from the list at the left. You can then choose to program these decoders to send CEC or RS-232 by select checking the CEC or RS232 boxes respectively.
3. For RS-232 control adjust the RS-232 Settings for the displays and enter in the serial commands in the Power on and Standby boxes respectively. It is important to note the format of the display's serial command
4. Click Apply for the settings to take effect.

The Batch Commands window offers additional capabilities such as custom Idle and Overlay images. Custom images can be uploaded to NetworkHD devices by simply selecting the Image tab.



Bulk encoder and decoder video and latency settings can be adjusted by selecting the Video tab. Ensure the proper device format is selected prior to adjusting settings. NHD-IP products use the JPEG 2000 options and the NHD-100 or 200 series products use H.264.

IP Video Image Audio Serial Power EDID Others

For JPEG 2000 For H.264

Modify Advanced Parameters

Rate Control: vbr

Max Bitrate(kbps): 20000 (64~40960)

FPS: 60 (1~60)

Transport Type: raw [Apply]

Video Mode: high quality video [Apply]

HDCP Settings: Enable Disable [Apply]

Configuring NHD-600 IR

From the Batch Commands IR Tab, IR commands data can be entered and sent to a NHD-600-TX or RX IR TX port for testing. IR command data must be entered in pronto hex format.

Devices

Filter: NHD-600-RX

All Checked/Total: 4/4

Show the online devices only. [Up] [Down]

Alias	Host
<input checked="" type="checkbox"/> NHD-600-RX-D88039E540EF	NH
<input checked="" type="checkbox"/> NHD-600-RX-D88039E58A95	NH
<input checked="" type="checkbox"/> NHD-600-RX-D88039E5CE2A	NH
<input checked="" type="checkbox"/> NHD-600-RX-D88039E5D3C9	NH

IP Video Image Audio Serial Power EDID IR Others

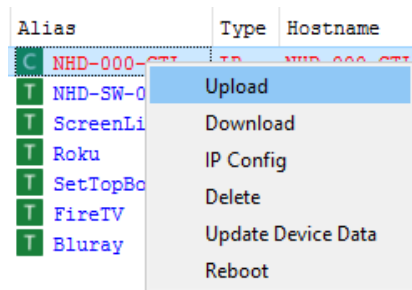
IR Test

```
0000 0067 0000 0015 0060 0018 0018 0018 0030 0018 0030 0018 0030 0018 0018 0018 0018 0018 0018 0018
0030 0018 0018 0018 0030 0018 0030 0018 0030 0018 0030 0018 0030 0018 0030 0018 0018 0030 0018 0018
0018 01d9]
```

[Send]

Uploading Configurations to the NHD-000-CTL

When you have completed creating all required groups, video walls and layouts you can upload the configuration to the CTL directly from the Console software. Simply right click the CTL in the **Other Devices section** and press **Upload**. This will upload the configurations you have created in the Console Software to the configuration file of the CTL.



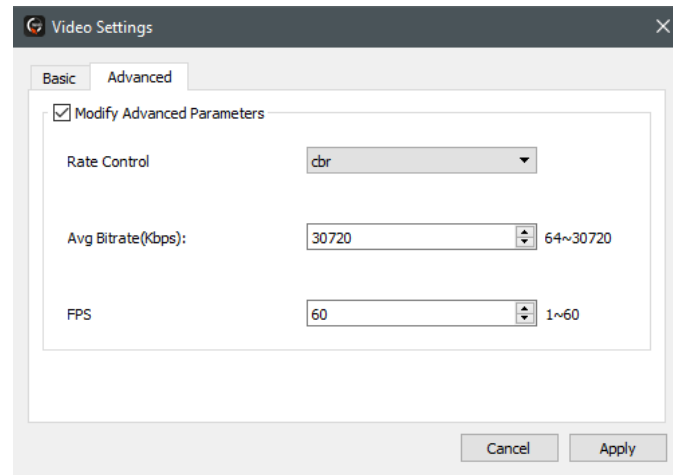
Once the configuration file has been uploaded to the CTL you can then open the NetworkHD Touch application or begin to configure a third-party control system.

Video Adjustments

NetworkHD 100, 200 & 400 components offer various video quality adjustments. These adjustments can be configured per encoder and decoder or in bulk using Batch Commands. To perform video adjustments per encoder, perform the following.

Note that the NHD-600 has separate video adjustments. Refer to [Configuring the NHD-600TX/RX Video/Audio Switching](#) for details.

1. Right click an encoder in the Other devices section and choose **Video Settings**.
2. Select the Advanced tab and then tick **Modify Advanced Parameters**. Adjust settings respectively.

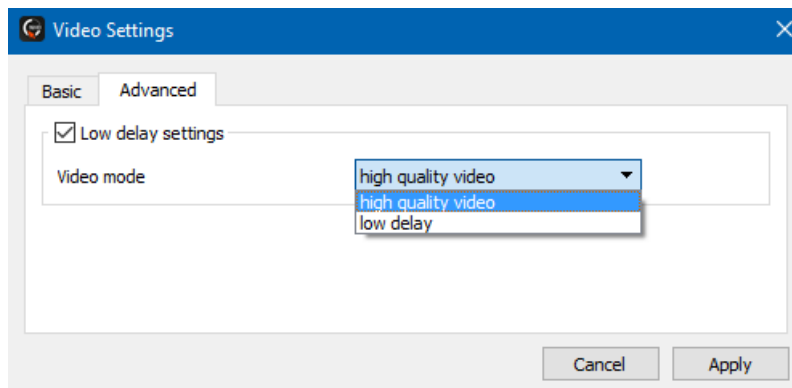


100 & 200 series decoders offer both High Quality and Low Delay video modes. Each mode has its appropriate use. High Quality mode is the default setting and is typically used where video quality is a priority. High Quality mode ensures that you are achieving the best possible image on a display but will increase source to display latency to 250ms-300ms.

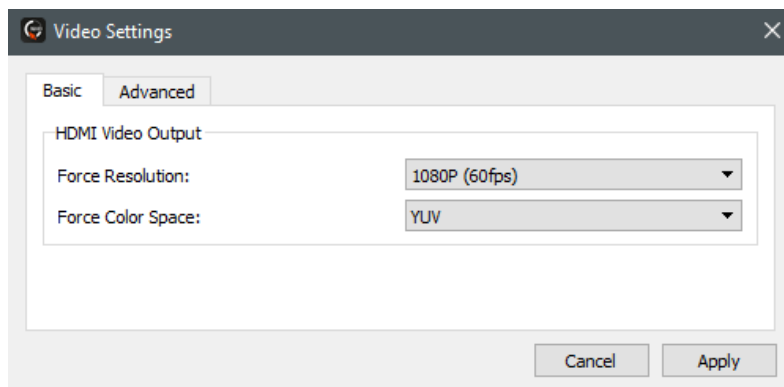
Low Delay mode will decrease the source to display latency to 60ms-90ms. This mode is typically configured in a presentation scenario where a computer mouse is being used. Image quality will be decreased in order to achieve a lower latency.

To configure the Video Mode for a decoder

1. Right click a decoder in the RX section of the Console and choose **Video Settings**.
2. Click the Advanced Tab
3. Check the Low delay settings box
4. Select the drop down menu next to Video mode and select High Quality video or Low Delay.
5. Click Apply.



Decoder output resolutions and color spacing can be adjusted by selecting the Basic tab in Video Settings.



Video settings for a large number of encoders and decoders can be adjusted using Batch Commands.

1. Select Batch Commands from the main menu.
2. Click the Video tab and select H.264 for 100 & 200 series or JPEG 2000 for 400 series.
3. From the device list check any appropriate devices.
4. Adjust any suitable settings and click Apply.

H.264 Settings

IP Video Image Audio Serial Power EDID Others

For JPEG 2000 For H.264

Modify Advanced Parameters

Rate Control

Avg Bitrate(Kbps): 64~30720

FPS 1~60

Apply

Video Mode

Apply

HDCP Settings

Enable Disable

Apply

JPEG 2000 Settings

IP Video Image Audio Serial Power EDID Others

For JPEG 2000 For H.264

HDCP Hybrid

Apply

HDMI Timing Hybrid

Apply

Screen Settings

Detecting video lost

Timeout for detecting video lost: seconds

Turn off screen when video lost

Apply

Stretch Type

Apply

Display Rotation

Apply

Note: Reboot the devices configured for the new settings to take effect.

Audio Adjustments

Audio delay for NHD-100/200 series encoders and decoders can be adjusted using Batch Commands. Audio delay adjustments are typically used when incorporating a third-party audio distribution system. Adjusting delay will ensure audio and video stay in sync. Delay can be adjusted by the millisecond with a value between 0-500.

Note that the NHD-600 has separate audio adjustments. Refer to [Configuring the NHD-600TX/RX Video/Audio Switching](#) for details.

IP Video Image Audio Serial Power EDID Others

Audio delay (0-500ms)

Preview Streams

NetworkHD encoders generate a unicast MPEG preview stream. This stream can be accessed by control systems to provide live video feedback of connected sources.

Note that the NHD-600 does not support preview streams.

In order for any device to access an encoder's preview stream it must exist in the same IP address range as the encoder. In most NetworkHD installations, encoders and decoders exist in a separate IP range as the control/Wi-Fi network. It may be necessary to change the configuration of the network so that the encoders, decoders, CTL and any network routers or access points are part of the same IP address range as the device accessing the preview stream.

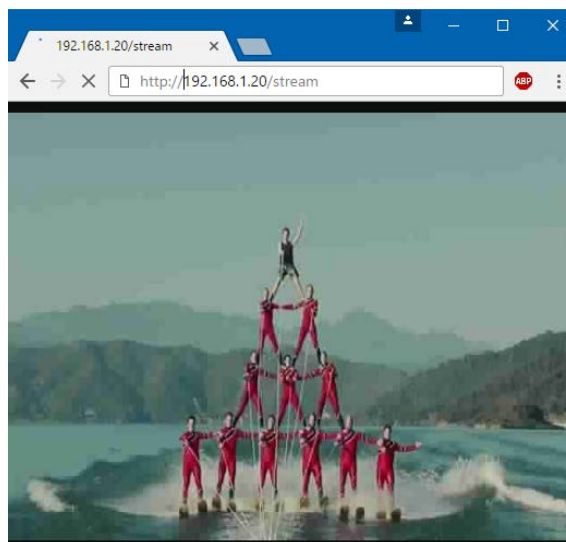
The following steps show how to access and configure an encoder's preview stream using the latest version of Google Chrome running on a Windows PC.

1. Connect a PC to the same network switch as the NetworkHD encoders by using a category cable.
2. Assign the PC's IP address into the same range as the encoder(s). By default, this will be in the **169.254.x.x** range with a subnet mask of **255.255.0.0**.
3. Run the WyreStorm Management Suite and start the NetworkHD Console software.
4. Hit the search button located at the top left of the Console. All available NetworkHD components along with their IP addresses will populate. NetworkHD encoders appear at the right of the Console in the Other Devices section.

NO.	Alias	Type	Hostname	IP	Version
	C NHD-000-CTL...	IP ...	NHD-000-CTL-E4C...	192.168.1.25	v1.13/v7
1	T ScreenLink	TX	NHD-200-TX-70B3...	192.168.1.23	v2.11.3
2	T Roku	TX	NHD-200-TX-E4CE...	192.168.1.19	v2.11.3
3	T SetTopBox	TX	NHD-200-TX-E4CE...	192.168.1.20	v2.11.3
4	T FireTV	TX	NHD-200-TX-E4CE...	192.168.1.21	v2.11.3
5	T Bluray	TX	NHD-200-TX-70B3...	192.168.1.22	v2.11.3

Note: The WyreStorm Management Suite is only available on Windows OS. If using a Mac computer, network scanning software can be used to find encoders and their IP addresses. The NetworkHD Console is required if adjusting IP addresses.

5. Choose an encoder from the list and note its IP address.
6. Open Google Chrome and type the following address into the URL: **http://<Encoder_IP_Address>/stream**



Note: Google Chrome is not required to access the preview stream. Most modern web browsers support the codec to access the preview stream. VLC Media Player can also be used, from the **Media Menu** select **Open Network Stream**. The preview stream's quality can be adjusted on the 100 & 200 series by appending the URL as follows. Accepted values for RESOLUTION, FPS & BITRATE are listed in the table.

Note: Adjustments to preview stream quality are only available on the 100 & 200 series TX and cannot be adjusted on the NHD-400-TX.

- <http://192.168.1.55/stream?resolution=RESOLUTION&fps=FPS&bitrate=BITRATE>

RESOLUTION	CIF 480P 720x480 1280x720
FPS	1 - 30
BITRATE	128 – 2000 (kbps)

Example URL: <http://192.168.1.55/stream?resolution=CIF&fps=10&bitrate=256>

Encoders also generate a still jpg or bmp source preview image which can be used by control systems that support consistent refresh, such as WyreStorm's Enado. The URLs to access this stream are listed below.

NHD-100 & 200 Encoders: TXIPADDR/capture.jpg

NHD-400 Encoder: TXIPADDR/capture.jpg OR TXIPADDR/capture.bmp

Example URL: 192.168.1.242/capture.jpg

Note: WyreStorm cannot guarantee all control systems support the decoding of NetworkHD MPEG preview stream. Contact the control system's manufacturer for detailed information.

Setting an encoder's preview stream to its maximum values will overload the processor. This will cause severe video performance issues. Always test settings in a real-world environment.

The preview stream is a unicast signal. This means every device that accesses the stream will add to the encoder's processor load. Stress testing should be performed to ensure the main H.264 stream is not adversely affected. WyreStorm recommends no more than 5 receivers/preview panels per encoder stream.

The quality query string is optional and does not need to be sent to access the preview stream. Once set, the quality query does not need to be resent.

Troubleshooting

No Audio or Video

- Verify the network switch has been configured 100% per appropriate guide.
- Verify TX and RX units show online, either in the NHD-000-CTL Web UI or Console software.
- Ensure TX to RX assignments have been made.
- Check that the display is powered on and the correct input is selected
- Check that the source device is powered on and is sending an A/V signal

Sluggish or Unresponsive System

- Commonly caused by an improperly configured network switch. A broadcast loop could be occurring or multicast traffic is being directed incorrectly.

If no devices are discovered when a search is performed follow these steps:

- Ensure all NetworkHD Components are running the latest available firmware from the products downloads section at wyrestorm.com
- Ensure the Software is allowed through the Windows firewall by checking the firewall settings and allowed applications
- Ensure that your PCs IP address is in the same range as NetworkHD components
- Reboot your PC

NetworkHD Touch or a 3rd party control system is not properly controlling the system:

- Ensure the Console configurations have been uploaded into the NHD-000-CTL
- The NHD-000-CTL is in the same IP range as the control system.
- If IP addresses have been adjusted ensure all devices have been configured properly

Cannot Connect to the NHD-000-CTL

- Ensure both the Power and Status LEDs are solid.
- Perform a factory reset by holding the reset button for 5 seconds.

Note: Resetting the CTL will cause it to lose all TX and RX alias information.

Alias Cannot Be Set

- If a device Alias cannot be set, another device may have been previously connected with the same Alias - ensure that the old device is offline and use the X in the CTL matrix to remove its record from the CTL.

Contacting Technical Support

Should further clarification of the content of this manual or assistance on troubleshooting be required, please contact WyreStorm technical support.

Phone: UK: +44 (0) 1793 230 343 | ROW: 844.280.WYRE (9973)

Contact Request: <http://wyrestorm.com/contact-tech-support>

Revision History

v1.1 – April 2018	
Various	Added content to support the NHD-600 as noted throughout document.
Multiview Modes	Added note regarding this feature not being available on v1 of NHD-600.
Video Wall Features	Added note regarding this feature not being available on v1 of NHD-600.
v1.0 – March 2018	
All Sections	Initial Release

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