

**Overview**

The NMX-ENC-N2412A Encoder and NMX-DEC-N2422A Decoder feature keyboard and mouse extension over IP, output scaling, serial, balanced audio, HDMI video connection, Power-over-Ethernet (PoE+), and 1G SFP support for compressed networked AV video. The N2412A Encoder converts video, audio, and control to IP packets for switching and distribution over standard networks. The N2422A Decoder accepts the HD over IP streams and converts them back to synchronized audio and video to allow any video source to any display.

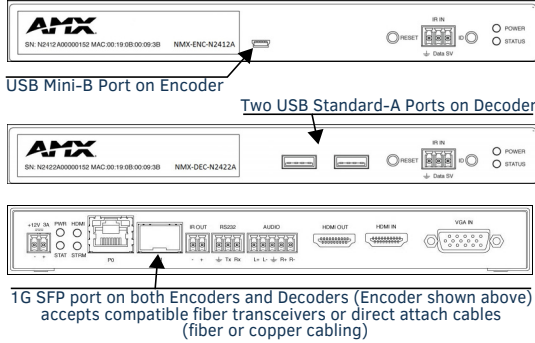


FIG. 1 N24X2 USB AND SFP PORTS

**Basic Installation Guidelines**

Connections	Options
Power:	<p><b>PoE:</b> Connect the unit's <b>P0</b> port to an active, PoE+ enabled network switch.</p> <p><b>External power supply:</b> If not using PoE+ for power, connect a 12V regulated power supply (part number FGN9313) to the unit's two-pin terminal block plug connector labeled <b>+12V 3A</b>.</p>
Network:	<p><b>PoE units:</b> If using PoE+ to power the unit, you should already have a network connection.</p> <p><b>Externally powered units:</b> If not using PoE+, connect the <b>P0</b> port to the network using an Ethernet cable, or connect the <b>P1</b> port to the network with the appropriate cable (fiber transceiver or direct-attach cable is required).</p> <p><b>Daisy-chain configuration:</b> Once network connection is established to one unit, you can daisy chain additional units by connecting Ethernet cables between devices using their <b>P0</b> and/or <b>P1</b> ports. Keep in mind that the number of units supported in this configuration is limited by bandwidth (total aggregate streams must be less than 1 Gb/s).</p> <p><i>NOTE: PoE+ power is only supplied to the unit connected directly to the network. All other units in the daisy-chain must have an external power supply.</i></p>
Video:	<p><b>N2412A Encoders</b></p> <ul style="list-style-type: none"> <li>For video encoding of a <i>digital</i> source, connect the source to the Encoder's <b>HDMI IN</b> port using a video cable with an HDMI connector (or adapter).</li> <li>For video encoding of an <i>analog</i> source, connect the source to the Encoder's <b>VGA IN</b> port using a video cable with a VGA connector (or component adapter).</li> </ul> <p><b>N2422A Decoders</b></p> <ul style="list-style-type: none"> <li>For video decoding, connect a digital display to the Decoder's <b>HDMI OUT</b> port using a video cable with an HDMI connector (or adapter).</li> </ul>
Audio:	<p><b>N2412A Encoders</b></p> <ul style="list-style-type: none"> <li>For audio encoding, connect a line level analog audio source to the <b>Audio</b> input terminal block plug connector, or</li> <li>Use the embedded audio from the video source.</li> </ul> <p><b>N2422A Decoders</b></p> <ul style="list-style-type: none"> <li>For analog audio decoding, connect a line level analog audio device to the <b>Audio</b> output terminal block plug connector, or</li> <li>Send embedded digital audio (embedded in the HDMI connection) to a monitor's speakers.</li> </ul>

Product Specifications	
Models Available:	NMX-ENC-N2412A Encoders NMX-DEC-N2422A Decoders
Power Requirements:	<b>PoE:</b> Can be powered via a PoE+ switch or other equipment with a PoE+ source. Conforms to IEEE 802.3at Class 4 (802.3at Type 2). <b>External power supply:</b> 3.0 Amp @ 12 Volts DC; 100-240 Volts AC power supply; Part number FGN9313 (sold separately).
Dimensions (HWD):	1.05" x 7.888" x 5.5" (2.67cm x 20.04cm x 14cm)
Weight:	1.55 lbs (0.7kg)
Certifications:	FCC, CE, and UL
Environmental:	<b>Temperature:</b> 32° to 104°F (0° to 40°C) <b>Humidity:</b> 10% to 90% RH (non-condensing)
Mounting Options:	Stand alone, surface mount, wall mount, or rack mount.*
<p><i>NOTE: *Mounting wings (part number N9101) required for surface and wall mounting. Rack shelf (part number N9102) or card cage (part number N9206) required for rack mounting. Shelf accommodates two side-by-side N-Series Encoders and Decoders. Card cage accommodates up to six N-Series Encoder and Decoder cards (mix and match any series). Mounting accessories sold separately and are compatible with most N-Series devices.</i></p>	

**Establishing Connection**

N24X2 devices are shipped with **DHCP** as their default IP mode. The IP address is assigned automatically based on the network DHCP server. If no DHCP server is found, the unit will use **Auto IP** mode instead (with a default IP address of 169.254.xxx.xxx).

Before using your N24X2 unit, it must be configured using the free N-Able device management software. However, you will not be able to configure units until they are in the same subnet as the host computer. The sample steps below show how the required changes (to the host computer's IP settings) are made in a Windows environment.

**Steps for IP address configuration (for Windows 8):**

- From the **Control Panel > Network and Internet** dialog box, select **Network and Sharing Center**.
- Select **Change adapter settings**.
- Select the wired interface connected to your AV network.
- Click the **Properties** button.
- Scroll down in the list to the **Internet Protocol Version 4 (TCP/IPv4)** option. Highlight it and click the **Properties** button.
- Enable the **Use the following IP address** option, and enter the static IP address *provided to you by your network administrator*.

*NOTE: If the computer does not need Internet access, you can simply enter a unique 169.254.xxx.xxx IP address with a 255.255.0.0 Subnet mask. Please contact your network administrator if you are unsure of how to configure the existing interface. If the computer has a statically-assigned IP address, click on the Advanced button. Then click Add to enter a unique 169.254.xxx.xxx address with a subnet of 255.255.0.0.*

**Steps for auto discovering devices on the network:**

- Use the host computer to download and install the latest version of N-Able: PC version - <http://www.amx.com/products/N-ABLE-PC.asp> Mac version - <http://www.amx.com/products/N-ABLE-MAC.asp>
- Attach your N24X2 unit(s) to the layer-3 network switch.
- Disable the wireless adapter on your computer (it must be hard-wired to the switch).
- Connect the host computer to the layer-3 network switch.
- Open the N-Able application.

If all devices do not appear automatically, click the **Auto Discover** button on the **Unit Management** tab. This issues a broadcast command that will discover all units even if they are not in the same IP subnet.

**Logging in Using N-Able Software**

Once the host IP address is configured properly, you can view all discovered units using the N-Able software. Access the N24X2 units from the following tabs:

- Unit Management** tab - **N2400 Encoder/Decoder** is listed in the **Type** field.
- Video Matrix** tab - N24X2 units are found on the **N2400** sub-tab of this screen.

Double-click the unit's name (in one of the lists mentioned above) to view its control page. If prompted, enter **admin** and **password** for the default username and password. Once logged in, you can change the username and password (using the options on the unit's **Settings** page).

*NOTE: If you would like for N-Able to support auto-login to your units, make sure N-Able's Device Auto-login settings match the unit's username and password (by selecting N-Able > Settings from the N-Able tool bar).*

*NOTE: N24X2 units force HTTPS connections, so your web browser may give you a security warning. N-Able on Windows will ask you to download OpenSSL for Windows to connect HTTPS.*

## Basic KVM Setup

The N2412A Encoders and N2422A Decoders are KVM-capable. By default, USB connections are enabled and configured to follow video switching. Follow these steps for basic KVM setup. To learn about some of the more advanced KVM capabilities, see the section *Advanced KVM Setup (with added security features)*.

1. On the N2412A Encoder, connect the USB Mini-B port (designated by a laptop icon) to the computer to be controlled.
2. Connect the computer's video output to the Encoder's **HDMI IN** port.
3. On the N2422A Decoder, connect the **HDMI OUT** to the display.
4. Connect a USB keyboard and mouse to the Decoder's USB Standard-A ports (they can be plugged into either port).

*NOTE: For wireless devices, simply plug the wireless signal receivers into these ports. For keyboard and mouse combos (with a single connection) use the keyboard port.*

5. Using N-Able, click the **Unit Management** tab.
6. Click the **Auto Discover** button to discover your new devices (if you have not already done so).
7. Once discovery is complete (and you see the new units listed in N-Able), click the **Video Matrix** tab.
8. On the matrix, click the common cell for the desired Encoder/Decoder streaming combination. See the screen shot below for an example.
9. Click the **Take** button to make the change to your matrix. The radio button turns green to indicate the connection was successful.

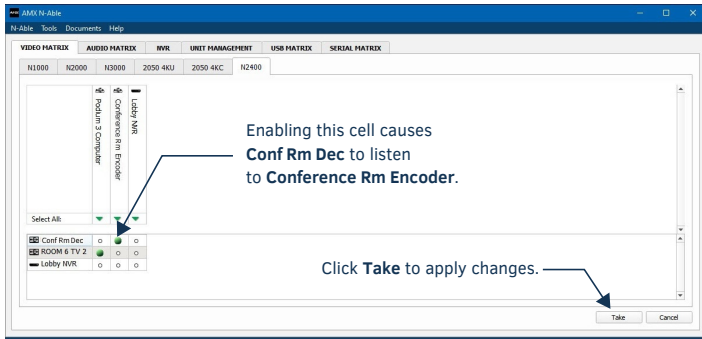


FIG. 2 CREATING STREAMING COMBINATIONS

### Video/USB Switching Options

**USB Follows Video:** By default, units can be switched using N-Able without modifying the configuration. When you switch video streams (using the matrix as shown above) the USB functionality will follow the video.

**Independent USB Switching:** Use N-Able's **USB Matrix** tab to switch USB control (without affecting video).

**Independent Video Switching:** To switch video streams *without* affecting USB control, first select **N-Able > Settings** from N-Able's main menu. When the **N-Able Settings** dialog box is displayed, disable the **USB follows Video switching for KVM units**. Now you can use the **Video Matrix** to switch video streams only.

**Advanced KVM Functionality:** To have the ability to use KVM hotkeys for switching, **KVM Advanced Settings** must be enabled on the individual unit (select **KVM** from the top of the unit's web interface). The next section discusses these settings in more detail.

### Advanced KVM Setup (with added security features)

You can configure devices for more advanced KVM operation on the Encoder and Decoder **KVM** pages. To access these pages, double-click the unit's name in the matrix and click **KVM** at the top of the unit's configuration page (see below).

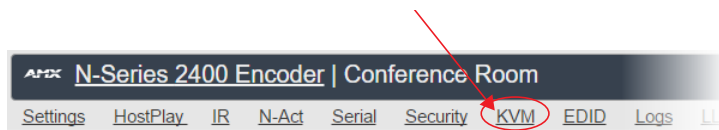


FIG. 3 SELECTING THE KVM PAGE

*NOTE: Many of these options are easier to manage in N-Able's KVM Wizard (especially in large configurations). Select **Tools > KVM Wizard** from the N-Able main menu to access the wizard.*

The following table describes some of the more advanced functionality. It is important to note that many of these options only appear on the **KVM** page when **USB** is enabled as well as **KVM Advanced Settings**.

Options	Descriptions
Permission Levels	Determines which Decoders can communicate with which Encoders. A Decoder must have a permission level that is <i>equal to or greater than</i> the Encoder in order for communication to be successful.
KVM Encoders table	Use the <b>KVM Encoders</b> table (on the Decoder's <b>KVM</b> page) to: <ul style="list-style-type: none"> <li>• Let the Decoder know the Encoder passwords it needs to establish communication.</li> <li>• Assign Encoder hotkeys.</li> <li>• Add/remove Encoders from the Decoder's list.</li> </ul>
Passwords	By default, KVM streams are encrypted with a common password. You can change the password on the <b>Settings</b> page of the Encoder. If you change Encoder passwords, you will need to supply the new information to the Decoders to allow communication to continue. A Decoder only receives password information for the Encoders on the network that have been associated with that Decoder as mentioned previously.
Hotkeys	To use hotkeys for easy switching, enable <b>KVM Directory Screen Enable</b> on the Decoder's <b>KVM</b> page. You can now access the KVM Directory Screen at any time by pressing the <b>&lt;Scr Lk&gt;</b> button twice on the keyboard connected to the Decoder. This screen displays all Encoders associated with that Decoder (and their corresponding hotkey).
Import and export KVM CSV files	Multiple Encoders and Decoders can be configured from a single CSV file (which is generated using the <b>KVM Wizard</b> in N-Able). Once all changes are made, upload the file to each unit using its <b>KVM</b> page. Click the <b>Choose File</b> button, browse to the CSV file you exported from the wizard, and click the <b>Upload</b> button.

*Warning! You must assign KVM passwords to your Encoders and Decoders (as well as change the default login password from admin/password) in order for your system to be secure.*

## Troubleshooting Guidelines

Problem	Possible Solution
Video is not transmitting.	<ul style="list-style-type: none"> <li>• Verify that the Encoder <b>TX Enable</b> setting is turned on. (Encoders ship from the factory with their video output turned off by default.)</li> </ul>
Local Play graphic is displayed.	<ul style="list-style-type: none"> <li>• Verify Decoder is assigned to view a valid stream in the N-Able matrix.</li> <li>• Verify Decoder is currently in live play mode (black text on matrix view).</li> <li>• Verify network is properly configured and set up. If needed, connect Encoder directly to Decoder to verify network issues.</li> </ul>
Host Play graphic is displayed.	<ul style="list-style-type: none"> <li>• Verify Encoder is in live play mode (black text in matrix).</li> <li>• Verify source is attached and is outputting a valid signal (<b>HDMI LED</b> on Encoder is on).</li> </ul>
Unsupported Resolution graphic is displayed.	<ul style="list-style-type: none"> <li>• Change source resolution to a valid resolution (try 720p60).</li> <li>• Verify cabling is correct.</li> </ul>
Copy Protected Content screen is displayed.	<ul style="list-style-type: none"> <li>• Contact technical support.</li> </ul>
Black screen/no graphic is displayed.	<ul style="list-style-type: none"> <li>• Set Decoder to local play. If the local play graphic does not appear, check the display input settings and cabling.</li> <li>• If local play appears, set Decoder to live play and verify network is configured properly.</li> </ul>
No audio is detected.	<ul style="list-style-type: none"> <li>• If there is no audio on <b>all</b> Decoders, verify audio settings are correct on Encoder.</li> <li>• If there is no audio on a <b>single</b> Decoder, verify audio settings are correct on Decoder.</li> </ul>

Please contact technical support at [svsupport@harman.com](mailto:svsupport@harman.com) or 256.461.7143 (x9900) for assistance with any installation issues.



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