The VINX AP-series devices are compatible with the VINX-120-HDMI-ENC and VINX-110AP-HDMI-DEC (basic VINX devices). Please note that certain features are not available when mixing VINX-AP and basic VINX devices. 

Compatible Devices

- HDMI, VGA
- Powering modes: adapter, PoE
- Network interface: RJ45, SFP
- Analog audio (de)embedding
- Dante® or AES67 audio de-embedding
- USB Connect Button
- USB Ports
- Front and rear View of VINX-110AP-HDMI-DEC
- Rear View of VINX-120AP-HDMI-ENC
- Front View of VINX-120AP-HDMI-ENC and VINX-120AP-HDMI-ENC-DNT
- VGA input port
- HDMI output port
- Microphone input port
- Dante® audio output port (Encoder)
- USB connection is established automatically.

Status LEDs

- **POWER**: on: The device is powered. off: No power source is connected to the device.
- **VIDEO**: on: The unit is connected to a network and video streaming is in progress. off: The device is not connected to a network.
- **POWER and VIDEO LEDs together**: blinking: There is a Video Stream ID clash in the network.

Further Information

- The document is valid with the following package version: 2.0.0
- The User’s manual of this appliance is available on www.lightware.com.
- See the Downloads section on the dedicated product page.

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Doc. ver.: 1.5

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Connecting an HDMI source device (e.g., a laptop) to the HDMI input port of the Encoder can be routed back to the Audio output of the Encoder.

Step 1 - Make the VNX and the control devices meet

The following cases may occur in case of a factory default device:

a. There is a DHCP server in the network: the VNX device got an IP address from the DHCP server. Make sure the control PC is connected to the same network.

b. There is no DHCP server in the network: the VNX device generates an IP address in the 169.254.x.x range (AutoIP). Set the IP address of the control PC to match with this range (with subnet mask 255.255.0.0).

Step 2 - Establish the connection

Connect to the VNX in any of the following ways:

a. Connecting via the Lightware Device Controller Software:
   Download the software from www.lightware.com, install and launch it. The Device Discovery screen will appear and list all the available devices.

b. Connecting via the Built-in Web Page:
   If you do not have the chance to install a software or you would access the built-in web page from a mobile device, type the IP address of the desired device into the address line of the browser.

How to Connect to a VNX Device to Control?

When the VNX device and a control device (PC, laptop, mobile device) are connected to the same network, the VNX can be configured via a web browser (Google Chrome and Mozilla Firefox are recommended), or by running Lightware Device Controller (LDC).

Typical Application (Multicast Mode)

The following are defined to avoid Video Stream ID conflicts:

- The following help to have a successful install: check the settings listed below.

**Arranging the Extenders to Groups**

Encoder and Decoder devices must be assigned to each other in order to transfer the desired video and control signals – in any of the following ways:

1. HW switch: set the DIP switch at the front panel to set the Video Stream ID: set the DIP switch states to the same value on the desired devices. If you set a DIP switch on a device, the other devices can be configured via the web page. Please note that the value of DIP switch assigned Video Stream ID can range from 1 to 15 inclusive.

2. SW setting: set the Video Stream ID via the built-in web page:
   Connect to the device as described in the Software Control section. The Video Stream ID shall be between 1 and 256 inclusive. In this case make sure that the DIP switches of the affected devices are set to ‘000’.

**Video Stream ID Rules**

The following rules are defined to avoid Video Stream ID conflicts:

- When the DIP switch is not in ‘000’ position, the SW setting will be valid.
- When the DIP switch is set back to ‘000’, the SW setting will inherit the ID (the previous DIP switch value).
- SW setting and HW setting can be combined within the group, but in this case, the DIP switch value will determine the common Video Stream ID. 
- The DIP switch state can be ignored by an LWC command, see the User’s Manual.

Preparing the Network – The Requirements of the Switch

The recommended type of network device: 1Gbps network with Layer 2 or 3 switch. Gigabit Ethernet. In TCPP/IP terminology, Layer 2 is the data link layer that is responsible for splitting the information coming from higher layers in the TCP/IP stack into Ethernet frames. An Ethernet frame contains labeling information with source and destination physical addresses (called source and destination MAC address). These physical addresses uniquely identify the source and destination physical devices (e.g. a VNX encoder and a VNX decoder). Ethernet frames provide error resilience by incorporating a redundancy check field, through which transmission errors can easily be detected. The device that only uses the physical address information found in the Ethernet frame to route the packet to one of its input ports or to more of it outputs in an unmanaged switch.

A managed switch, on the other hand, can handle the traffic and forward input packets to output packets by utilizing information from higher layers. This gives the managed switch more flexibility and also allows for more sophisticated functions like multicast forwarding. Since even a simple VNX network, where one VNX encoder supplies more VNX decoders, relies on multICASTing, a multicast capable switch (i.e. a managed one) is a must. The managed switch shall offer the following capabilities:

- GMPv2
- GMP snooping, GMP fast leave, GMP querier
- Multicast filtering
- Jumbo frames

For more information about the requirements and technologies, please see the Application Note on our website.

Device Concept

The following signals are transmitted between the Encoder and the Decoder devices:

<table>
<thead>
<tr>
<th>Signal</th>
<th>Unicast mode</th>
<th>Multicast mode</th>
</tr>
</thead>
<tbody>
<tr>
<td>Video</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Analog audio</td>
<td></td>
<td></td>
</tr>
<tr>
<td>USB</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RS-232</td>
<td></td>
<td></td>
</tr>
<tr>
<td>IR</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* The indicated return audio is available only if the Analog audio input is selected in the Encoder to transmit towards the Decoder. Thus, the analog audio signal (MIC IN) connected to the Decoder can be routed back to the Analog audio output of the Encoder.

** In this case, the analog audio signal can be selected in the Encoder to be embedded in the video stream in the Decoder.

The USB and IR data transmission works independently of the video stream presence.

Video Transmission Quality

When the network bandwidth is not enough to transmit the video signal, the following modes are available in the Encoder:

- Movie mode: Lower image quality (i Less bandwidth): The image quality is adjusted to the available bandwidth. If the bandwidth is decreased, the image quality will be lower, but the video streaming will be continuous.
- Graphics mode: Best image quality (i High bandwidth): The image quality is kept at a high level. If the bandwidth is decreased, the image quality does not change, but frame dropping may appear.

The setting takes effect when the available bandwidth is less than required.

Factory Default Settings

IP address: Dynamic (AutoIP with DHCP fallback)

RS-232 port setting:

- RS-232 port setting:
  1. USB 1.1
  2. USB 2.0
  3. IR IN

Connecting method: Multicast mode

Selected video input (VNX-1.25AP-HDMI-ENC): Auto

Selected audio input: Auto select analog

Decoded stream ID (with DIP switch): 1

Emulated EDID (VGA input): F80 (Universal Analog EDID)**

User EDID memory: Empty (default)

Output video mode (Encoder): Auto mode

Output video signal (Encoder): Auto detect from EDID, no rotation

Define video walls: Empty (default)

Universal HDMI EDID: allows many common resolutions. The preferred timing for F47 is 1920x1080p60 with 2ch LPCM audio support

** Universal analog EDID: allows many common resolutions. The preferred timing for F80 is 1920x1080p60 Hz.

Installation Checkpoints

The following help to have a successful install: check the settings listed below.

Network and Switch-related Settings

- Check the settings as described in the Preparing the Network section.

Connecting the Devices

- Use CAT7 SFP ANG23 cables: the maximum allowed cable length is 100m.
- Supply the devices by adapters or by PoE; the feature is enabled on the RAJPs by default.

Powering Options

- Power on the devices as the final step of the cabling:
  1. Power on the L3 switch first. Wait a few minutes for the device to be ready.
  2. Power on the VNX devices.

Port Settings

- Check if the desired input port is selected to transmit.
- Make sure that each Encoder has a unique video stream ID. Set the same ID in the desired Decoders and Encoder.
- Pair the devices via the built-in website or by LDC and define the Video Wall.
- Select the desired Decoder for USB transmission (see the Device Concept section).

EDID

Universal EDID is emulated on the input ports that supports many common resolutions. If necessary, emulate a specific resolution by selecting a factory pre-programmed EDID.