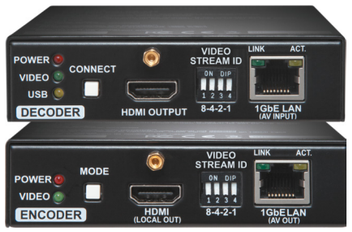
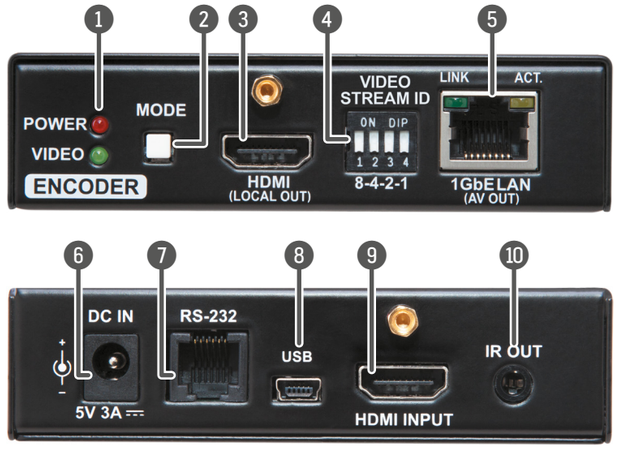
visual engineering
LIGHTWARE



Quick Start Guide

VINX-110-HDMI-DEC
VINX-120-HDMI-ENC

Encoder – Front View and Rear View



1	**Status LEDs**	See the attached list.
2	**Mode Button**	**Short press** (less, than 3 sec): switching between the Video and Graphic modes. **Long press** (more, than 3 sec): reset to factory default settings.
3	**HDMI Output Port**	Forwarding the same Audio / Video content as the AV Output Port.
4	**DIP Switch**	Linking Encoder and Decoder devices (HW setting).
5	**AV Output Port**	RJ45 connector for outgoing A/V signal to the Decoder device(s) or Network switch.
6	**DC 5V Input**	5V DC input for local power supply.
7	**RS-232 Port**	RJ12 connector for transparent serial communication (point-to-point or point-to-multi point).
8	**USB Port**	Mini B-type connector for USB pass-through application.
9	**HDMI Input Port**	Video port for DVI or HDMI signal.
10	**IR Output Port**	IR signal output connector (for 3.5 mm Jack, 3-pole, TRS plug).

Status LEDs

Power LED

- OFF: no power source is connected to the device.
- BLINKING: the device is booting.
- ON: the device is powered.

Video LED

- OFF: the device is not connected to a network.
- BLINKING: the unit is connected to a network but no video streaming is in progress.
- ON: the unit is connected to a network and video streaming is in progress.

Power and Video LEDs

- BLINKING together: there is a Video Stream ID clash in the network.

USB LED

- OFF: there is no USB connection between the Encoder and the Decoder devices.
- ON: there is a USB connection between the Encoder and the Decoder devices.

ℹ USB connection shall be acquired in the Decoder in Multicast mode. In Unicast mode, the USB connection is set up automatically.

Important Safety Instructions

Please read and keep the information in the attached safety instructions supplied with the product before you start using the device.

Introduction

VINX-120-HDMI-ENC and VINX-110-HDMI-DEC encoder/decoder multimedia extenders to extend HDMI video from a local source to a remote sink. The devices can be connected either via a direct CATx cable connection or through a Gigabit Ethernet Switch (L3-switch is necessary) in between. The maximum delivery distance can reach up to 100 m with minimal latency and employ a quality, proprietary wavelet transform based image compression.

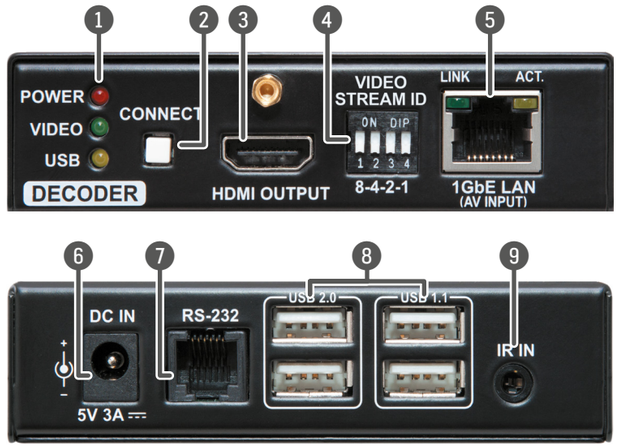
The maximum supported resolution is 3840 x 2160 @ 30Hz with 7.1 audio and scaling is available on the receiver side with optional image cropping. Optionally, bidirectional RS-232 signal transmission, USB Mass storage and Human Interface Device (HID*) signal transmission is also available.

* HID: USB mouse, keyboard, presenter, etc.

Compatible Devices

The signal transmission works only between these Encoder and Decoder devices, other Lightware devices cannot be connected to the 1GbE LAN (AV input/output) ports.

Decoder – Front View and Rear View



1	**Status LEDs**	See the attached list.
2	**Connect Button**	**Short press** (less, than 3 sec): acquire USB connection (only in Multicast mode). **Long press** (more, than 3 sec): reset to factory default settings.
3	**HDMI Output Port**	HDMI output to a sink device.
4	**DIP Switch**	Linking Encoder and Decoder devices (HW setting).
5	**AV Input Port**	RJ45 connector for incoming A/V signal from the Encoder device or Network switch.
6	**DC 5V Input**	5V DC input for local power supply.
7	**RS-232 Port**	RJ12 connector for transparent serial communication (point-to-point or point-to-multi point).
8	**USB Ports**	USB 1.1 and 2.0 compatible A-type ports for transmitting USB HID devices in Unicast mode.
9	**IR Input Port**	IR signal input connector (for 3.5 mm Jack, 3-pole, TRS plug).

Mounting Options

To mount the device Lightware supplies optional accessories for different usage:

- VESA100 Mounting adapter for extenders
- Under-desk mounting kit
- Under-desk double mounting kit
- 1U high rack shelf

To order mounting accessory kits please contact sales@lightware.com.

Mounting by Using the VESA100 Mounting adapter for extenders

VINX Device (bottom view) | VESA100 Mounting adapter | HDTV (rear view)

Two mounting holes can be found at the bottom of the extender at each side, the VESA-compatible accessory plate can fixed as indicated. The other two holes of the plate can be fixed to a VESA-compatible device (e.g. rear panel of an HDTV).

Box Contents

[1] Supplied with the Decoder
[2] Supplied with the Encoder
[3] Optional accessory

Connecting Steps (Multicast Mode)

Arrange the Encoder and the desired Decoder devices.

⚠ First of all, please set the parameters of the L3 Switch to meet with the requirements. Please turn the paper to see the list in the 'Preparing the Network' section.

CATx	Connect CATx cables between the Extender devices and the L3 Switch.
HDMI	Connect an HDMI source device (e.g. a Computer) to the HDMI input port of the Encoder. Optionally connect a Local Display to the Output port of the Encoder. Connect HDMI sink devices to the HDMI output port of the Decoder devices.
RS-232	Optionally for RS-232 serial transmission: connect the desired devices (e.g. a Touch Control, Relay Box) to the RS-232 ports by the supplied serial cables.
USB	Optionally for USB extension: connect USB devices to the USB ports of the Decoders. Connect the desired host device (e.g. Computer) to the Encoder via the USB mini-B type port. Please pay attention to the indicated port types (USB 1.1 and USB 2.0 support).
Power	Connect the power cord of the supplied adaptor to the DC input first, then to the AC power socket.
CATx	Connect a computer to the L3 Switch to arrange the necessary settings easily.

Further Steps

- Pair the devices by the DIP switch or via the built-in website (see the **Software Control** section) and define the Video Wall.
- Select the desired Decoder for USB transmission (see the **Device Concept** section).

Further Information

The document is valid with the following firmware version: 1.1.0
The User's manual of this appliance is available on www.lightware.com.
See the Downloads section on the website of the product.

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Device Concept

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

Signal	Unicast mode	Multicast mode
Video	E → D	E → D, D, D
USB	E ↔ D	E ⇢ D, D, D
RS-232	E ↔ D	E ↔ D, D, D
IR	E ← D	E ← D, D, D

E Encoder D Decoder

The USB, Serial, and IR data transmission is working independently from the video signal presence.

Preparing the Network – The Requirements of the Switch

The recommended type of network device: 1GbE network with Layer 3 switch, Gigabit Ethernet. In TCP/IP terminology Layer 2 is the data link layer that is responsible for splitting up 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 VINX encoder and a VINX decoder). Ethernet frames provide error resilience by incorporating a redundancy check field through which transmission errors can easily be detected. The device that does uses only the physical address information found in the Ethernet frame to root the packet from one of its input ports to one or more of it output ports is 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 VINX network where one VINX encoder supplies more VINX decoders relies on multicasting, a multicast capable switch (i.e. a managed one) is a must. The managed switch shall offer the following capabilities:

- IGMPv2
- IGMP snooping, IGMP fast leave, IGMP querier
- Multicast filtering
- Jumbo frames

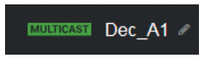
For more information about the requirements and technologies please see the Application Note at the website of the product.

Arranging the Extenders to Groups

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

1. **HW setting**: use the **DIP switch** at the front panel to set the Video stream ID: set the DIP switch states to the same value at the desired devices. If you set a DIP switch at 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 65535 inclusive. In this case make sure that the DIP switches of the affected devices are set to '0000'.



Video Stream ID Rules

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

- When the DIP switch is in **'0000'** position the **SW setting** will be valid.
- When the DIP switch is **not in '0000'** position the **HW setting** will be valid.
- When the DIP switch is set **back to '0000'** 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 LW3 command, see the User's Manual.

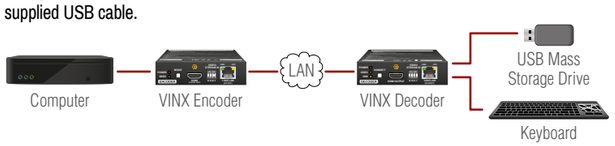
Factory Default Settings

IP address	Dynamic (DHCP is enabled)
RS-232 port setting	115200 BAUD, 8, N, 1
DIP Switch state	0000
Video stream ID	1
Connecting method	Multicast mode
Emulated EDID	F47 (Universal HDMI EDID) *
User EDID memory	Empty (cleared)
Output video mode (Encoder)	Video mode
Output scaling (Decoder)	Pass-through, no rotation
Defined video walls	Empty (cleared)

* Most of the factory preset EDIDs include only one resolution. This is to force the connected source to give a signal with the needed resolution. The Universal EDID allows many common resolutions; the preferred timing is 1920x1080p60 with 2ch LPCM audio support.

USB Transmission

The USB data transmission works as shown in the figure below. The USB devices are connected to the Decoder, the host device (computer) is connected to the Encoder by the supplied USB cable.



Supported Devices

USB HID devices (keyboard, mouse, presenter, etc.) and mass storage devices (flash drive, external hard drive).

Establishing the Connection

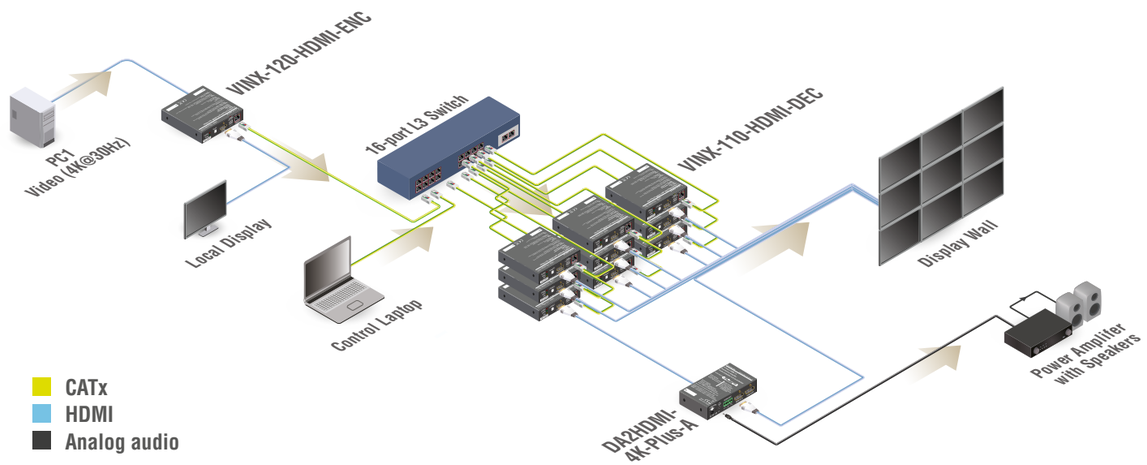
The data transmission is working always between an Encoder and a Decoder. In Unicast mode (one Encoder and one Decoder) the transmission is enabled automatically. When the extenders are in Multicast mode the desired Decoder can be selected by:

- Pressing the **Connect** button at the front panel of the Decoder, or
- Pressing the **Acquire USB connection** button via the built-in website of the Decoder (Advanced Settings).

Thus, the USB ports of the active Decoder are working as the ports of an extended USB hub.

The data communication of the USB devices connected to the other Decoders is suspended, however, they are still powered over USB.

Typical Application



Supported Resolutions

Resolution	Refresh Rate (Hz)	Resolution	Refresh Rate (Hz)
640 x 480	50/59/60/72/75	1440 x 900	59/60/75
720 x 480 (480P)	50/59/60/75	1600 x 900	59/60
720 x 576 (576P)	50	1600 x 1024	59/60
800 x 600	50/59/60/72/75	1600 x 1200	50/59/60
1024 x 768	50/60/75	1680 x 1050	50/59/60
1152 x 864	60	1920 x 1080i	25
1280 x 720 (720p)	50/59/60/75	1920 x 1080 (1080P)	50/59/60
1280 x 768	50/59/60/75	1920 x 1200	50/60
1280 x 800	59/60/75	2560 x 1080	24/25/30/60
1280 x 960	50/59/60	2560 x 1200	30/60
1280 x 1024	50/59/60/75	2560 x 1600	60
1360 x 768	50/59/60/75	3840 x 2160	24/25/30
1366 x 768	59/60	4096 x 2160	24/25/30

RS-232 Transmission

The RS-232 serial data transmission is fully transparent between the Encoder and the connected Decoder devices. All data received at the serial port of the Decoders is transmitted to the serial port of the Encoder and vice versa: the data received at the serial port of the Encoder is transmitted to the serial port of all connected Decoders.

The data transmission works only if the serial port parameters set to the same values in all the devices: serial data sender/receiver and the VINX Encoder and Decoder devices.

Video Transmission Quality

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

- **Video mode** (Lower image quality @ 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 is continuous.
- **Graphics mode** (Best image quality @ High bandwidth): The image quality is kept at a high level. If the bandwidth is decreased the image quality does not change, but frame drop may appear.

The setting has an affect when the available bandwidth is less than required.

Software Control – by Using the Built-in Webpage

When the device and a computer are connected to the same network, the VINX can be configured via a web browser (Google Chrome and Mozilla Firefox are recommended):

1. Arrange the desired extenders with source/sink devices.
2. Connect the extenders to the network switch and power them on.
3. Connect a suitable control device (e.g. computer, mobile device) to the same network.
4. Open the web browser and type the IP address of the desired device in the address line. If the address is not known try any of the followings:
   a. The factory default IP address is Dynamic (DHCP). Check the list of the connected devices (DHCP client list) on the DHCP server and note the IP address.
   b. In the case of a **Decoder**, type the following in the address line: http://LWR-clientAABBCCDDEEFF.local
   c. In the case of an **Encoder**, Type the following in the address line: http://LWR-gatewayAABBCCDDEEFF.local
   AABBCCDDEEFF is the MAC address of the device (without hyphens) – which can be seen on the housing of the extender.

Video Wall Layout Examples

The following examples show how the VINX devices can be arranged to video wall applications. See more details in the User's Manual available at www.lightware.com.

Multicast Mode with Video Wall

Features of the system:

- Displaying one of the two video signals on the video wall and on a sink.
- Displaying the other video signal on a sink.
- The other video signal can be displayed on the video wall by using software tools (built-in web or LW3 protocol commands).

Two Video Walls and Local Monitors with One Encoder

Features of the system:

- One Encoder is enough to supply the Decoders.
- Displaying one video signal on two different video walls (e.g. in different rooms).
- Displaying the video signal on 1-1 single sinks.