

## USER MANUAL

### MODEL:

**KDS-EN6 Video Encoder**

**KDS-DEC6 Video Decoder**

**WP-EN6 Video Encoder**

**KDS-EN6 Video Encoder**



**WP-EN6 Video Encoder**



**KDS-DEC6 Video Decoder**



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# Introduction

Welcome to Kramer Electronics! Since 1981, Kramer Electronics has been providing a world of unique, creative, and affordable solutions to the vast range of problems that confront the video, audio, presentation, and broadcasting professional on a daily basis. In recent years, we have redesigned and upgraded most of our line, making the best even better!



Unless specified otherwise **KDS-EN6** refers to both **KDS-EN6** and **WP-EN6** in this document.

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## Getting Started

We recommend that you:

- Unpack the equipment carefully and save the original box and packaging materials for possible future shipment.
- Review the contents of this user manual.



Go to [www.kramerav.com/downloads/KDS-DEC6](http://www.kramerav.com/downloads/KDS-DEC6) to check for up-to-date user manuals, application programs, and to check if firmware upgrades are available (where appropriate).

## Achieving Best Performance

- Use only good quality connection cables (we recommend Kramer high-performance, high-resolution cables) to avoid interference, deterioration in signal quality due to poor matching, and elevated noise levels (often associated with low quality cables).
- Do not secure the cables in tight bundles or roll the slack into tight coils.
- Avoid interference from neighboring electrical appliances that may adversely influence signal quality.
- Position your Kramer **KDS-EN6 / KDS-DEC6 / WP-EN6** away from moisture, excessive sunlight and dust.

## Safety Instructions



### Caution:

- This equipment is to be used only inside a building. It may only be connected to other equipment that is installed inside a building.
- For products with relay terminals and GPIO ports, please refer to the permitted rating for an external connection, located next to the terminal or in the User Manual.
- There are no operator serviceable parts inside the unit.



### Warning:

- Use only the power cord that is supplied with the unit.
- To ensure continuous risk protection, replace fuses only according to the rating specified on the product label which located on the bottom of the unit.

## Recycling Kramer Products

The Waste Electrical and Electronic Equipment (WEEE) Directive 2002/96/EC aims to reduce the amount of WEEE sent for disposal to landfill or incineration by requiring it to be collected and recycled. To comply with the WEEE Directive, Kramer Electronics has made arrangements with the European Advanced Recycling Network (EARN) and will cover any costs of treatment, recycling and recovery of waste Kramer Electronics branded equipment on arrival at the EARN facility. For details of Kramer's recycling arrangements in your particular country go to our recycling pages at [www.kramerav.com/support/recycling/](http://www.kramerav.com/support/recycling/).

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## Overview

Congratulations on purchasing one or more of the of the following Kramer Video Encoders/Decoders:

- **KDS-EN6 Video Encoder**
- **KDS-DEC6 Video Decoder**
- **WP-EN6 Video Encoder**

Kramer **KDS-EN6 / KDS-DEC6 / WP-EN6** Encoder and Decoder units provide AV over IP network and include 4K video, audio, IR, RS-232 and USB over IP with HDCP 2.2.

### **KDS-EN6 / KDS-DEC6 / WP-EN6 features:**

- Video Support – HDMI™ 4K@60Hz (4:2:0), HDMI 4K@30Hz (4:4:4).
- Audio Support – HDMI/line in, 7.1 PCM, Dolby True-HD, and DTS-HD Master audio.
- Virtualization – IR, USB, RS-232 over IP.
- Network – Managed switch, 1G, multicast, jumbo frames, IGMP snooping layer 2.
- Power – PoE or external power supply.
- Control – Kramer Network, Kramer Control, Web UI, API.
- HDCP – 2.2 compliance.
- Flexible video wall setups.
- **KDS-EN6** and **KDS-DEC6** are MegaTOOLS® size, letting you mount two units side-by-side in a 1U rack space with recommended rack adapter (see [www.kramerav.com/product/KDS-DEC6](http://www.kramerav.com/product/KDS-DEC6)).
- **WP-EN6** is a wall plate encoder for a more elegant accessibility.

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## Typical Applications

**KDS-EN6 / KDS-DEC6 / WP-EN6** is ideal for the following typical applications:

- Real-time essential installations such as Command and Control centers and interactive solutions with or without KVM capabilities.
- AV distribution systems with one or more sources and many displays in schools, universities, and public venues.
- Long-distance transmission of signals using existing wires and infrastructure in corporate offices or government applications.

# Defining KDS-EN6



Figure 1: KDS-EN6 Video Encoder Front Panel

#	Feature	Function
1	CH SELECT Buttons	Press the up or down arrow buttons to select the channel ID.
2	CHANNEL Display	Displays the selected channel. If the channel number exceeds 99, the 100 indicator turns on (for example, channel 124 appears as “°24”).
3	STATUS LED	Identifies a device in a system. When sending a P3K FIND-ME command to the system, the LED of the device to be identified flashes for 5 seconds.
4	ON LED	Flashes during power up and lights when on.
5	LINK LED	On when a <b>KDS-EN6</b> to <b>KDS-DEC6</b> link is established and is transmitting A/V signals.

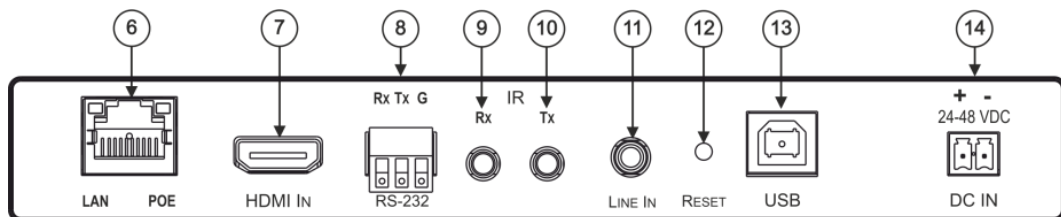


Figure 2: KDS-EN6 Video Encoder Rear Panel

#	Feature	Function
6	LAN/POE RJ-45 Connector	Connect the <b>KDS-EN6</b> to the network using recommended Kramer cables. Note that this port supports power over Ethernet (PoE). LAN LED - Green LED flashes during data transmission. POE LED - Orange LED lights when power is supplied.
7	HDMI IN Connector	Connect an HDMI source.
8	RS-232 (Rx,Tx,Gnd) Terminal Block Connectors	Connect to an RS-232 controller device (to control a device on the decoder side).
9	IR RX on a 3.5mm Mini Jack	Connect to a receiver.
10	IR TX on a 3.5mm Mini Jack	Connect to an emitter.
11	LINE In on a 3.5mm Mini Jack	Connect to an audio source.
12	RESET Button	Press to reset <b>KDS-EN6</b> to its default settings.
13	USB Type B Port	Connect to a USB host, for example, a PC.
14	DC IN 24~48VDC Power Terminal Block Connector	Connect to the Kramer power adapter (DC voltage range should be 24V to 48V), purchased separately (see <a href="http://www.kramerav.com/product/KDS-DEC6">www.kramerav.com/product/KDS-DEC6</a> ).

# Defining KDS-DEC6

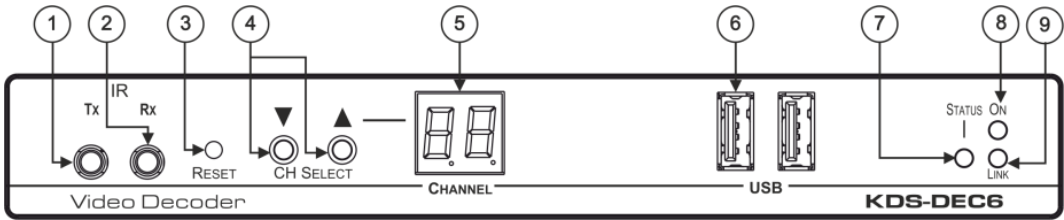


Figure 3: KDS-DEC6 Video Decoder Front Panel

#	Feature	Function
1	IR TX on a 3.5mm Mini Jack	Connect to an emitter.
2	IR RX on a 3.5mm Mini Jack	Connect to a receiver.
3	RESET Button	Press to reset <b>KDS-DEC6</b> to its default settings.
4	CH Select Buttons	Press the arrow buttons up or down to select the channel ID.
5	CHANNEL Display	Displays the selected channel. If the channel number exceeds 99, the 100 indicator turns on (for example, channel 125 appears as “°25”).
6	USB Type A Ports (2)	Connect to a mouse and keyboard.
7	STATUS LED	Identifies a device in a system. When sending a P3K FIND-ME command to the system, the LED of the device to be identified flashes for 5 seconds.
8	ON LED	Flashes during power up and lights when on.
9	LINK LED	On when a <b>KDS-EN6</b> to <b>KDS-DEC6</b> link is established and transmitting A/V signals.

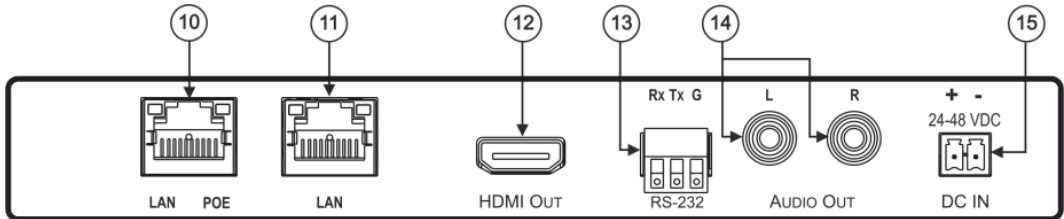


Figure 4: KDS-DEC6 Video Decoder Rear Panel

#	Feature	Function
10	LAN/POE RJ-45 Connector	Connect the <b>KDS-DEC6</b> to the network using the recommended Kramer cable. Note that this port supports power over Ethernet (PoE). LAN LED - Green LED flashes during data transmission. POE LED - Orange LED lights when power is supplied.
11	LAN RJ-45 Connector	Connect the <b>KDS-DEC6</b> to the network or directly to the <b>KDS-EN6 / WP-EN6</b> using the recommended Kramer cable. <b>i</b> Use the LAN port (that is not used for connecting to the network or directly to the encoder) to connect to the next <b>KDS-DEC6</b> device in a daisy chain configuration.
12	HDMI Out Connector	Connect to an HDMI acceptor.
13	RS-232 (Rx,Tx,Gnd) on Terminal Block Connectors	Connect to an RS-232 controlled device.
14	L, R Audio on RCA Connectors	Connect to a powered speaker or an amplifier.
15	DC IN 24~48VDC Power Terminal Block Connector	Connect to the Kramer power adapter (DC voltage range should be 24V to 48V), purchased separately (see <a href="http://www.kramerav.com/product/KDS-DEC6">www.kramerav.com/product/KDS-DEC6</a> ).

# Defining WP-EN6

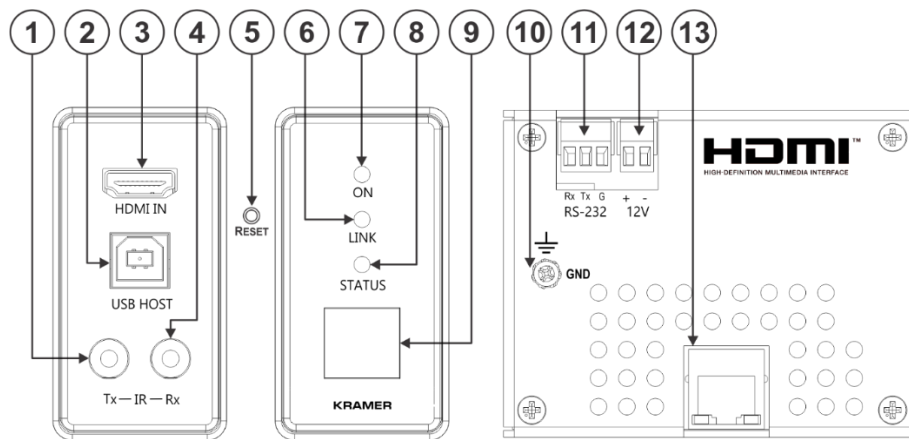


Figure 5: WP-EN6 Video Encoder Wall Plate

#	Feature	Function
1	IR TX on a 3.5mm Mini Jack	Connect to an emitter.
2	USB Type B Port	Connect to a USB host, for example, a PC.
3	HDMI IN Connector	Connect to an HDMI source.
4	IR RX on a 3.5mm Mini Jack	Connect to a receiver.
5	Reset Button (under wall plate)	Press briefly to perform a software reset. Press and hold for 10 seconds to perform a factory reset.
6	LINK LED	On when a <b>WP-EN6</b> to <b>KDS-DEC6</b> link is established and is transmitting A/V signals.
7	ON LED	Flashes during power up and lights when on.
8	STATUS LED	Identifies a device in a system. When sending a P3K FIND-ME command to the system, the LED of the device to be identified flashes for 5 seconds.
9	CHANNEL Display	Displays the selected channel. If the channel number exceeds 99, the 100 indicator turns on (for example, channel 124 appears as "024").
10	Ring Tongue Terminal Grounding Screw	Connect to grounding wire (optional).
11	CONTROL RS-232 3-pin Terminal Block Connector (Tx, Rx and common G)	Connect to a controller to control the device.
12	Power Supply 2-pin Terminal Block Connector	Connect to a power supply (if required). Connect GND to GND, +12V to +12V.
13	LAN/POE RJ-45 Connector	Connect the <b>WP-EN6</b> to the network using recommended Kramer cables. Note that this port supports power over Ethernet (PoE).



# Initial Setup

The **KDS-EN6 / KDS-DEC6 / WP-EN6** can be powered either via PoE (using the RJ-45 LAN/POE port) if available or via a 24-48V DC power adapter.



If 24-48V DC power is connected, PoE is disabled automatically.

- Initial setup using device buttons can be performed on **KDS-EN6** and **KDS-DEC6** devices only.
- Initial setup using Embedded Web Pages can be performed on all devices (see [Using Embedded Web Pages](#) on page [23](#)).

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## Configuring Network Switch

To configure your network switch:

The following are recommended settings for managing the network switch to be used in your **KDS-EN6 / KDS-DEC6 / WP-EN6** installation.

1. Assign the switch to an IP address.
2. Set your switch to the following:
  - Jumbo Frames – On.
  - IGMP Snooping – On.
  - IGMP Querier – On.
  - IGMP Immediate/Fast Leave – Off.

## Initial Setup Using Device Buttons

The device default IP address is written on the bottom of the device.



To avoid conflicts with multiple devices and allow web page control for each device, it is important to change each device's IP address

### Setting KDS-EN6 / KDS-DEC6 IP Address

**To set the KDS-EN6 / KDS-DEC6 IP address:**

1. Connect the **KDS-EN6 / KDS-DEC6** LAN/POE RJ-45 port to your network (if your network does not support PoE, connect a 24-48V DC power adapter).

The ON LED lights green and the LINK LED flashes (indicating that no streaming activity is detected).

2. Press and hold ▼ for 3 seconds.
3. Press ▲ or ▼ to select DH (DHCP) or SC (static) IP address setup.



When setting to DHCP we recommend that you contact your IT administrator for setting the system IP addresses.

- If you selected DHCP on a **KDS-DEC6** device, press and hold ▲ or ▼ for 3 seconds to save your selection.

The channel display flashes "--" 3 times and the device reboots.

- If you selected DHCP on a **KDS-EN6** device, the channel display flashes "ID" 3 times.
- If you selected Static for either device, press and hold ▲ or ▼ for 3 seconds to save your selection.

The channel display flashes "IP" 3 times and the device reboots.

4. Press ▲ or ▼ to set the IP address.



You can only define the last three digits of the IP address when setting the IP address via the channel buttons. To change the entire IP address, go to [Setting IP Address](#) on page [24](#).

5. Press and hold ▲ and ▼ for 3 seconds to save your selection.



The **KDS-EN6** channel number can be set immediately after the IP address is set.

## Setting Channel Number



If the channel number exceeds 99, the indicator on the display lights.

### To set the channel number for the KDS-DEC6:

- Press the ▲ or ▼ buttons at any time.

### To set the channel number for the KDS-EN6:

1. Press and hold ▼ for 3 seconds.
2. Press ▲ or ▼ to select DH (DHCP).
3. Press and hold ▲ or ▼ for 3 seconds to save your selection.
4. Wait until the channel display flashes “ID” 3 times.
5. Press ▲ or ▼ to select the channel number.
6. Press and hold ▲ and ▼ for 3 seconds to save your selection.

The channel display flashes “--” 3 times and the device reboots.

## Viewing the IP Address and Channel Number

You can view the current IP address and channel number any time.

### To view the IP address and channel number:

1. Press and hold ▲ for 3 seconds.
2. The channel display shows “IP” for 3 seconds followed by the IP address for 3 seconds followed by the channel number.

# Mounting KDS-EN6 / KDS-DEC6

This section provides instructions for mounting **KDS-EN6 / KDS-DEC6**. Before installing, verify that the environment is within the recommended range:



- Operation temperature – 0° to 40°C (32 to 104°F).
- Storage temperature – -40° to +70°C (-40 to +158°F).
- Humidity – 10% to 90%, RHL non-condensing.



**Caution:**

- Mount **KDS-EN6/KDS-DEC6** before connecting any cables or power.



**Warning:**

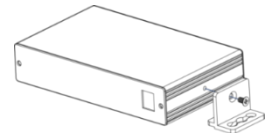
- Ensure that the environment (e.g., maximum ambient temperature & air flow) is compatible for the device.
- Avoid uneven mechanical loading.
- Appropriate consideration of equipment nameplate ratings should be used for avoiding overloading of the circuits.
- Reliable earthing of rack-mounted equipment should be maintained.
- Maximum mounting height for the device is 2 meters.

**Mount KDS-EN6/KDS-DEC6 in a rack:**

- Use the recommended rack adapter (see [www.kramerav.com/product/KDS-DEC6](http://www.kramerav.com/product/KDS-DEC6)).

**Mount KDS-EN6/KDS-DEC6 on a surface using one of the following methods:**

- Attach the rubber feet and place the unit on a flat surface.
- Fasten a bracket (included) on each side of the unit and attach it to a flat surface. For more information go to [www.kramerav.com/downloads/KDS-DEC6](http://www.kramerav.com/downloads/KDS-DEC6).



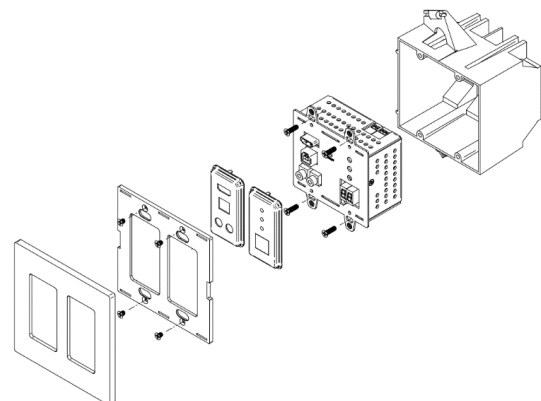
## Installing WP-EN6

Insert the device into the in-wall box (note that first you need to connect the LAN/POE RJ-45 Connector cable and/or power) and connect the parts as shown in the illustration.

- DECORA® design frames are included in US-D models.

DECORA® is a registered trademark of Leviton Manufacturing Co., Inc.

We recommend that you use a US-D 2 gang US electrical junction box (or their equivalent).



# Connecting KDS-EN6 / KDS-DEC6



Always switch off the power to each device before connecting it to your **KDS-DEC6**. After connecting your **KDS-DEC6**, connect its power and then switch on the power to each device.



When connecting **KDS-EN6** to **KDS-DEC6** via the Ethernet, use a 1 Giga LAN switch and make sure that jumbo frame (over 8k) and IGMP snooping are enabled.

The BC-UNIKAT cable length connecting **KDS-EN6** to **KDS-DEC6** to the network should not exceed 330 feet (100m).

The **KDS-EN6** operates with a default EDID. If you need to copy the EDID from the acceptor, do so via the Web pages.

Following the initial setup (see [Initial Setup](#) on page [7](#)), you can configure the **KDS-EN6** and **KDS-DEC6** devices in any of the following ways:

- **Unicast setup:** single encoder-decoder unicast connection, see [KDS-EN6 / KDS-DEC6 / WP-EN6 Unicast Installation](#) on page [12](#).
- **Multicast configuration setup:** a multicast setup can include any of the following configurations:
  - One encoder to many decoders, see [One-to-Many Configuration](#) on page [14](#).
  - Many encoders to many decoders (matrix switcher configuration), see [Matrix Configuration](#) on page [16](#).
  - Video wall configuration, see [Video Wall Setup](#) on page [17](#).
- **KVM (Keyboard, Video, Mouse) setup:** many encoders to a single decoder see [KVM Setup](#) on page [20](#).

## KDS-EN6 / KDS-DEC6 / WP-EN6 Unicast Installation

You can use one **KDS-EN6** device and one **KDS-DEC6** device to configure an encoder and decoder system (see [Figure 6](#)).

The encoder and decoder devices can be connected directly or via LAN.

- i** Always switch off the power to each device before connecting it to your **KDS-DEC6/KDS-EN6**. After connecting your **KDS-DEC6/KDS-EN6**, connect its power and then switch on the power to each device.

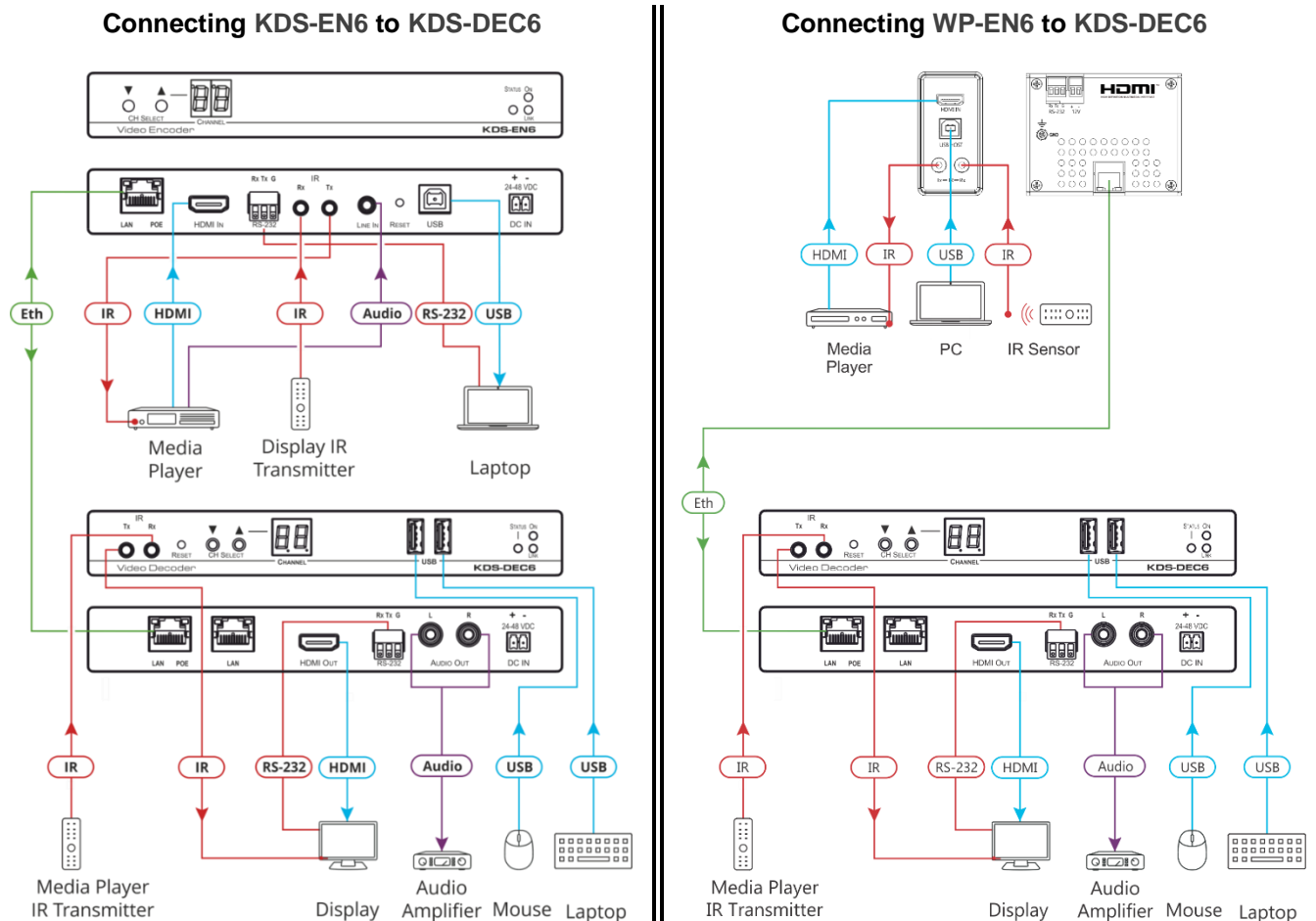


Figure 6: Connecting an Encoder and Decoder System

- i** When connecting the encoder-decoder system over the network, connect the LAN-PoE RJ-45 port on the **KDS-EN6** to the Ethernet and on the other side connect the Ethernet to the LAN-PoE/Lan RJ-45 port on the **KDS-DEC6**.

**To connect the encoder and decoder system as shown in the example in [Figure 6](#):**

1. On the **KDS-EN6**, connect an HDMI source (for example, a media player) to the HDMI IN connector.
2. On the **KDS-DEC6**, connect the HDMI OUT connector to an HDMI acceptor (for example, a display).

3. Connect the LAN RJ-45 connector on the **KDS-DEC6** directly to the LAN RJ-45 connector on the **KDS-EN6** using an Ethernet cable (or via LAN).
4. If you are not powering the device via PoE, connect the **KDS-DEC6** and the **KDS-EN6** to the 24-48V DC power adapter and connect the adapter to the mains electricity (not shown in [Figure 6](#)).
5. If required, connect a PC and/or controller to the RS-232 terminal block connector on the **KDS-EN6**.
6. If required, connect the USB ports:
  - On the **KDS-EN6** connect a PC to the USB type B port.
  - On the **KDS-DEC6** connect a mouse and a keyboard to the two USB type A ports.
7. If required, connect an unbalanced stereo audio source to the **KDS-EN6** (for example, the media player's audio signal) and an unbalanced stereo audio acceptor (for example, speakers) to the **KDS-DEC6**.



You do not have to use all the possible control options.

8. If required, control the media player connected to **KDS-EN6** from the decoder side via IR:
  - On the **KDS-DEC6**, connect a Kramer External IR Sensor cable to the IR Rx 3.5mm mini jack.
  - On the **KDS-EN6**, connect a Kramer IR Emitter cable to the IR Tx 3.5mm mini jack and attach the emitter to the IR receiver on the media player.

The media player's remote control sends a command while pointed at the External IR Sensor. The IR signal passes through the ETH cable and the IR Emitter to the media player. The media player responds to the command.

9. If required, control the display connected to **KDS-DEC6** from the encoder side via IR:
  - On the **KDS-EN6**, connect a Kramer External IR Sensor cable to the IR Rx 3.5mm mini jack.
  - On the **KDS-DEC6**, connect a Kramer IR Emitter cable to the IR Tx 3.5mm mini jack and attach the emitter to the IR receiver on the display.

The display remote control sends a command while pointed at the External IR Sensor. The IR signal passes through the ETH cable and the IR Emitter to the display. The display responds to the command.



IR signals can be passed only between linked devices.

10. If required, control the display connected to **KDS-EN6** from the decoder side via RS-232:
  - Connect an RS-232 cable from the laptop to the RS-232 terminal block connector on the **KDS-DEC6**.
  - On the **KDS-EN6**, connect the RS-232 terminal block connector to the RS-232 port on the display.

RS-232 bidirectional signals can be sent between the display and the laptop connected to the **KDS-EN6**.

## One-to-Many Configuration

You can set one encoder to several decoders in one of the following ways:

- **One-to-many via LAN switcher:** one encoder is connected to the input of a LAN switch and its outputs are connected to the decoders, see [One-to-Many via LAN Switcher](#) on page [14](#).
- **One-to-many via daisy chain:** one encoder is connected to a decoder and all the other decoders are daisy chained to the first decoder, see [One to Many via Daisy Chain](#) on page [15](#).

### One-to-Many via LAN Switcher

In this configuration, the source video is streamed via the LAN switch and appears on all the displays.

The one-to-many configuration consists of one encoder that connects to a LAN switch and several decoders that connect to the LAN switch output. A display is connected to the output of each decoder.

#### Configure the devices:

- Verify that the **KDS-EN6** and **KDS-DEC6** devices each are set with a unique IP address (see [Initial Setup](#) on page [7](#)).
- Set all the devices to the same channel number.

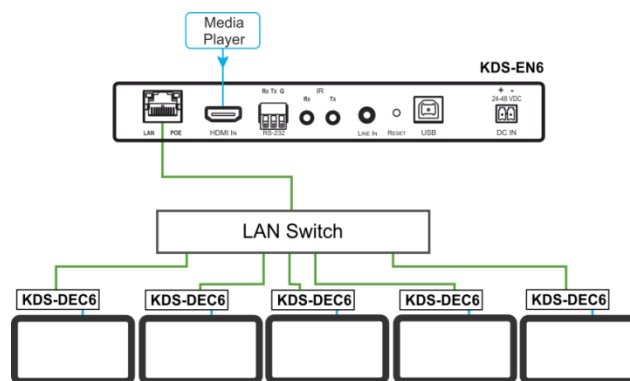


Figure 7: Connecting a One-to-Many System



# One to Many via Daisy Chain

In this configuration, the source video is streamed via the encoder to the first decoder and the next decoders are daisy-chained to the first decoder via the second LAN port. A display is connected to the output of each decoder.

### Configure the devices:

- Verify that the **KDS-EN6** and **KDS-DEC6** devices each are set with a unique IP address (see [Initial Setup](#) on page 7).
- Set all the devices to the same channel number.

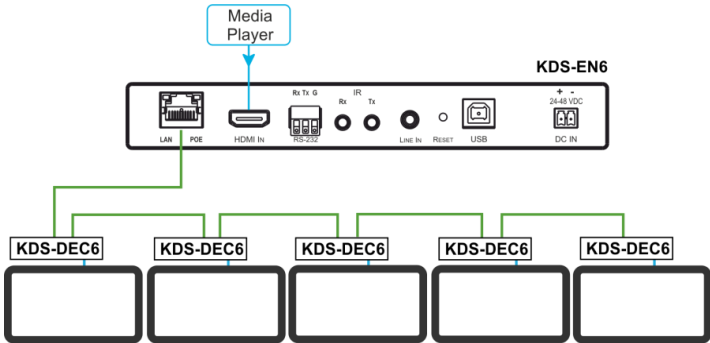


Figure 8: Connecting a Daisy-Chain System

## Matrix Configuration

In this configuration, several source videos are streamed via the LAN switch and are routed to the linked decoders.

The many-to-many configuration consists of several encoders that connect to a LAN switch together with several decoders. A display is connected to the output of each decoder.

### Configure the Devices:

- Verify that the **KDS-EN6** and **KDS-DEC6** devices each are set with a unique IP address (see [Initial Setup](#) on page 7).
- Set each encoder to a unique channel number and change the decoder channel numbers according to the desired link to an encoder.

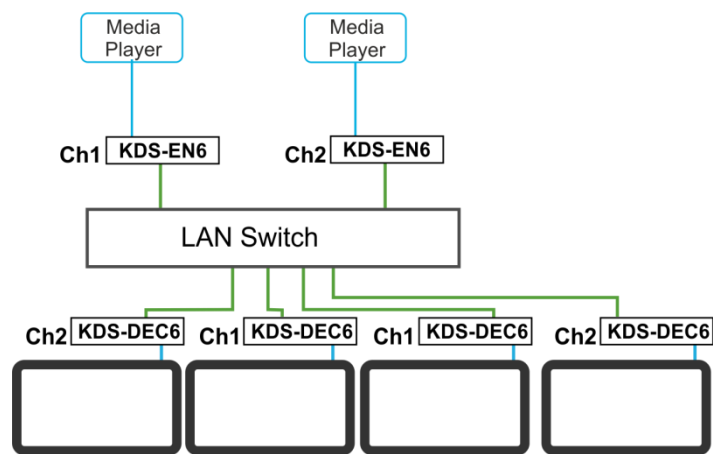


Figure 9: Connecting the KDS-EN6, KDS-DEC6 Video Encoder/Decoder

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## Video Wall Setup

In the video wall setup, one encoder transmits a signal to a series of decoders creating a video wall configuration.

The video wall configuration consists of an encoder that connects to a LAN switch input and a series of decoders (connected to the LAN switch output) that together make up the video wall. Each screen on the video wall is connected to the HDMI output of one decoder.

The **KDS-EN6** and **KDS-DEC6** units are each defined by their location in the video wall layout. Each **KDS-EN6** is assigned a row number and defined by row number and position in the row. The position definition is unique and is usually defined once during the basic setup.

The PC controller can be connected via LAN to control the encoders and decoders that make up the video wall.

Video wall setup includes three basic steps:

- Mounting the video wall
- Setting up the devices
- Configuring the video wall

## Mounting the Video Wall

Before mounting the video wall, verify that each device (encoder and decoders) has a unique IP address (see [Setting IP Address](#) on page 24).



Always switch off the power to each of the peripheral devices before connecting it to your **KDS-DEC6 / KDS-EN6**. After connecting your **KDS-DEC6 / KDS-EN6**, connect its power and then switch on the power to each device.

### To configure a video wall (for example, a 3x3 video wall):

1. Connect an HDMI source (for example, a media player) to the **KDS-EN6** HDMI IN connector.
2. Connect the **KDS-EN6** LAN/PoE RJ-45 port to the RJ-45 connector on a LAN switch.
3. Connect the RJ-45 ports on the LAN switch to nine **KDS-DEC6** units.
4. Connect the HDMI OUT connector on each **KDS-DEC6** device to a display (9 displays altogether).
5. Position the displays in a 3x3 video wall setup.
6. Check that all the system components are connected correctly.
7. Power the system.

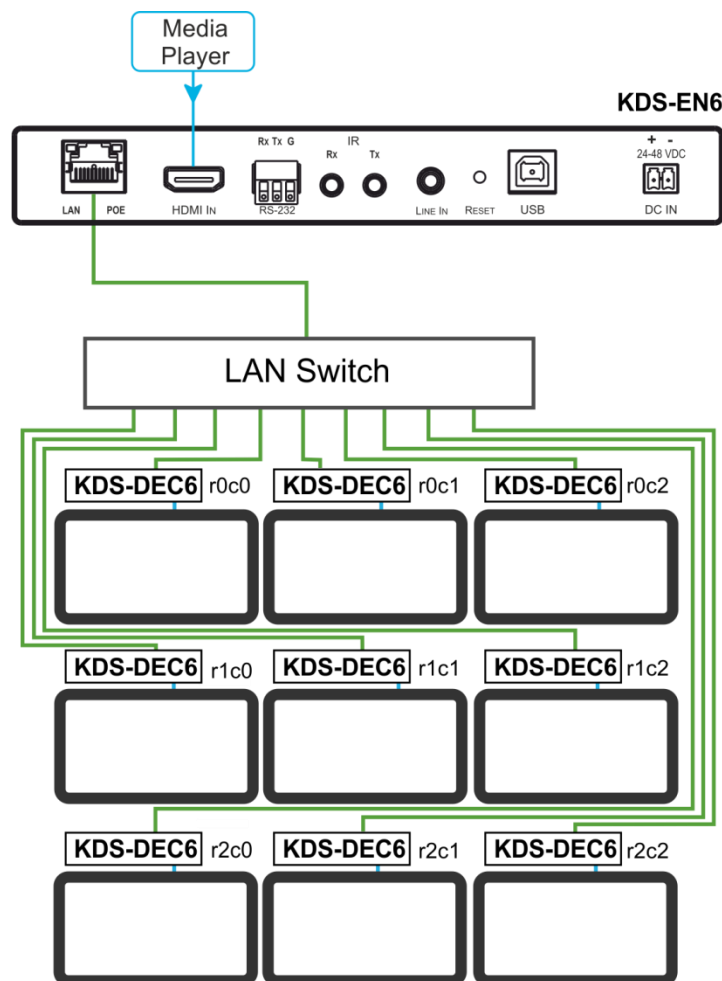


Figure 10: Video Wall Setup

## Setting Up the Devices

To configure the video wall devices:

1. Open your Internet browser.
2. Type the actual IP address of the device in the address bar of your browser. For example:



3. In the Functions tab, check Enable Video Wall (see [Video over IP Behavior](#) on page 36).
4. In the Network tab, set the Casting Mode to Multicast (see [Casting Mode](#) on page 35).
5. Select the Video Wall tab.
6. In Basic Setup, set the Bezel and Gap Compensation (see [Setting the Bezel and Gap Compensation](#) on page 32).
7. Set the Wall Size and Position Layout.
8. Open the Apply To drop down box. Select the Client device to which you want to assign the position.



You do not have to open a new web page per device.

9. Repeat this procedure for all the video wall decoders in the video wall.

## KVM Setup

In this configuration, on the decoder side, a keyboard and a mouse are connected to the USB ports and a display is connected to the HDMI output. On the encoder side, each encoder is connected to a PC via the USB and HDMI ports.

### Configure the Devices:

- Verify that the **KDS-EN6** and **KDS-DEC6** devices each are set with a unique IP address (see [Initial Setup](#) on page 7).
- Set each encoder to a unique channel number and change the decoder channel numbers according to the desired link to an encoder.

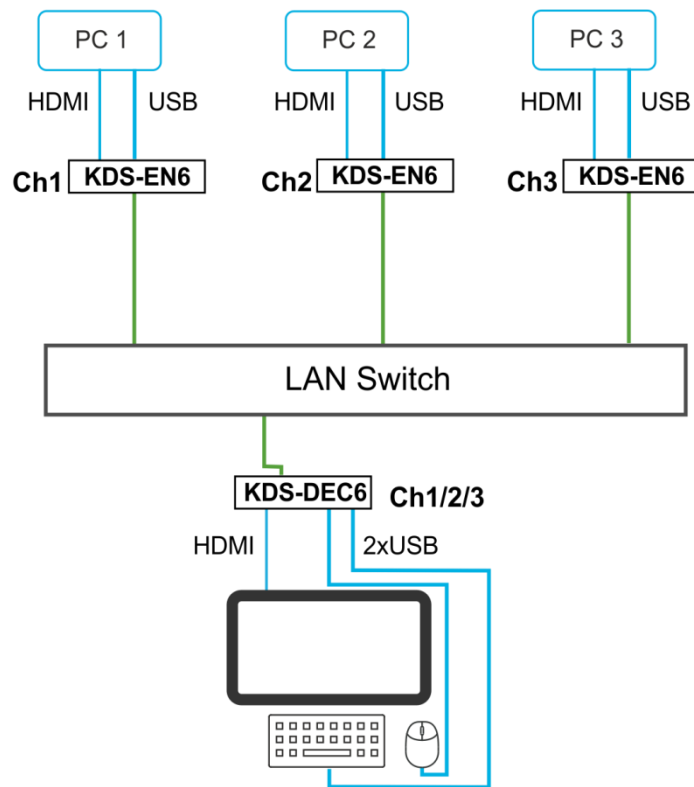


Figure 11: KVM Setup

# KVM Roaming Setup

KVM Roaming enables interacting with multiple hosts via USB from one master KDS-DEC6 decoder connected to a keyboard and mouse.

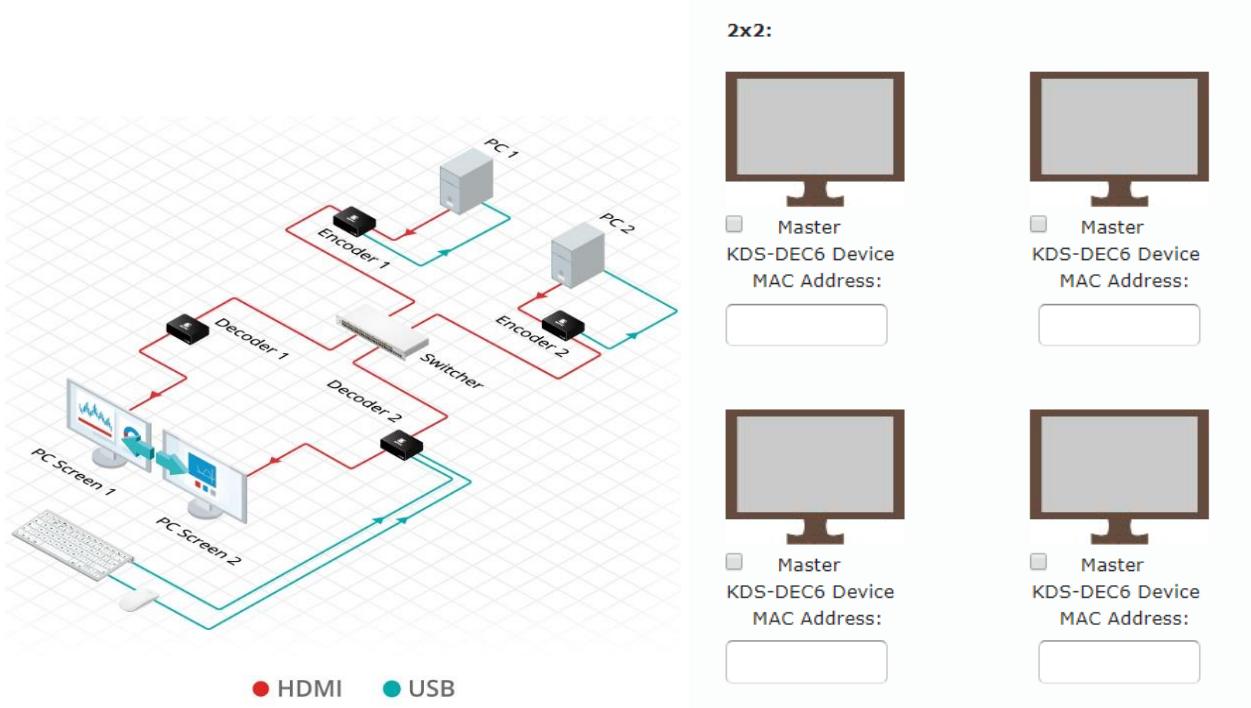


Figure 12: KVM Roaming Setup

### To configure KVM roaming setup:

1. On the webpage of each encoder and decoder configure the USB over IP section according to the figure below:

The screenshot shows the "USB over IP" configuration page. It includes the following sections:

- Enable USB over IP:** A checkbox that is currently unchecked.
- Operation Mode:** Three radio button options: "Auto select mode (Recommended, choose per network casting mode)", "Active on link (Unicast network's default mode)", and "Active per request (Multicast network's default mode)".
- Compatibility Mode:** Two checkboxes: "Mouse not responding well (Check when USB mouse responding is slow and queer)" and "KVM over IP (Uncheck when mouse/keyboard/touch panel not working as expected)". The "KVM over IP" checkbox is checked.
- Apply:** A blue button at the bottom right.

Figure 13: KVM Roaming Configuration

2. On the master decoder webpage, check both 1x4 and 2x2 setups.



Figure 14: Master Decoder web page - 1x4 and 2x2 setups



# Using Embedded Web Pages

The web pages enable you to control **KDS-EN6 / KDS-DEC6 / WP-EN6** via the Ethernet. The web pages include all the OSD items and are accessed using a Web browser and an Ethernet connection.

## Browsing Web Pages

The following operating systems and Web browsers are supported:

Operating Systems	Browser
Windows 7	Firefox
	Chrome
	Safari
Windows 10	Edge
	Firefox
	Chrome
Mac	Safari
iOS	Safari
Android	N/A

To browse the **KDS-EN6 / KDS-DEC6 / WP-EN6** web pages:

1. Open your Internet browser.
2. Type the IP address of the device in the address bar of your browser.



The device default IP address is written on the bottom of the device.

By default, **KDS-EN6** IP address is 192.168.1.40 and **KDS-DEC6** IP address is 192.168.1.39.

The Authentication window appears (if set, security is enabled):

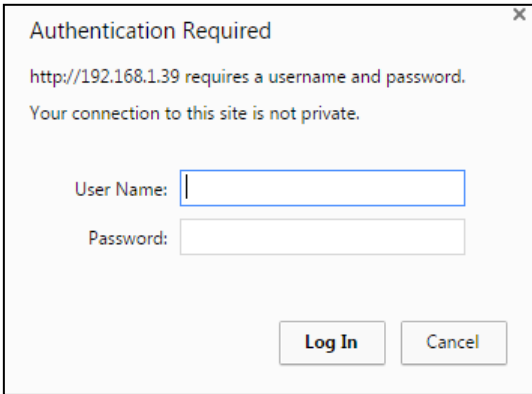


Figure 15: Using the Embedded Web pages – Authentication

3. Enter the **User Name** and **Password** (Admin, empty string, by-default) and click **OK**. The System page appears:

---

## Modifying and Viewing the System

The KDS-EN6 / KDS-DEC6 web pages enable performing the following:

- [Setting IP Address](#) on page [24](#).
- [Setting Channel Number](#) on page [25](#).
- [Viewing System Version Information](#) on page [25](#).
- [Updating Firmware](#) on page [26](#).
- [Setting System Utilities](#) on page [27](#).
- [Viewing System Statistics](#) on page [29](#).



Note that the computer IP address should be set to same domain name as HD over IP, such as 169.254.1.11, and that subnet mask set to 255.255.0.0.

### Setting IP Address

Using the embedded web pages, you can change the entire IP address.

#### To set the IP address:

1. Connect the **KDS-EN6 / KDS-DEC6** Ethernet port to the Network and power the device (either by using the power adapter or via PoE).
2. Access the embedded web pages (see [Using Embedded Web Pages](#) on page [23](#)).
3. In the Network tab (see [Setting Up the Network](#) on page [35](#)) select the IP mode.
4. If you selected Static, type in the IP address.



When setting to DHCP we recommend that you contact your IT administrator for setting the system IP addresses.

5. Click **Apply** and reboot the device.

## Setting Channel Number

Use API commands to set channel numbers.



A **KDS-EN6** channel number usually remains constant during normal operation. However, a **KDS-DEC6** channel number must be modified according to the channel number of the currently linked encoder (for example, in a matrix configuration). This enables linking to different encoders in the network

### To set the channel number:

1. Connect the **KDS-EN6** / **KDS-DEC6** Ethernet port to the Network and power the device (either using the power adapter or via PoE).
2. Access the embedded web pages (see [Using Embedded Web Pages](#) on page 23).
3. In the System tab select Utilities (see [Setting System Utilities](#) on page 27).
4. In the Console API Command text box enter the following command:

For the **KDS-EN6**:

- a. "astparam s multicast\_ip 225.0.100.X; astparam s hostname\_id 000X; astparam s reset\_ch\_on\_boot n; astparam save;"

where X=Channel number, for example:

for multicast\_ip: 225.0.100.8 or 225.0.100.10

for hostname\_id: 0008 or 0010

- b. Click **Apply**.
- c. Power cycle the device.

For the **KDS-DEC6**:

- a. "Switchto X"  
where X=Channel number.

- b. Click **Apply**.



API commands can also be entered directly via Telnet. The default is Telnet port 24. Use "root" to log in. No password is required.

## Viewing System Version Information

Click the Version Information line to view the version detail information:

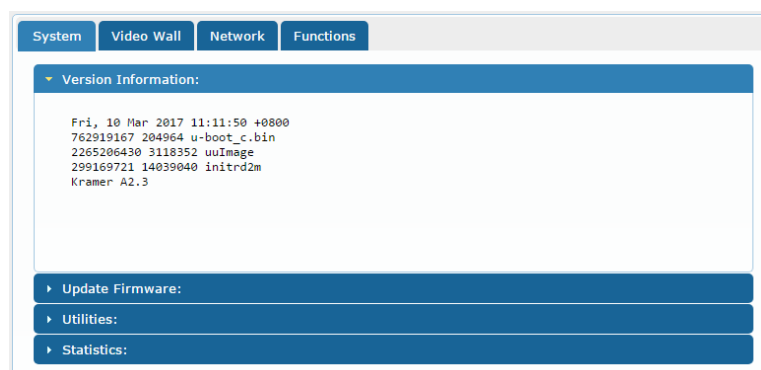


Figure 16: The System Tab – Version Information

## Updating Firmware

To update the firmware:

1. In the System tab, select **Update Firmware**.

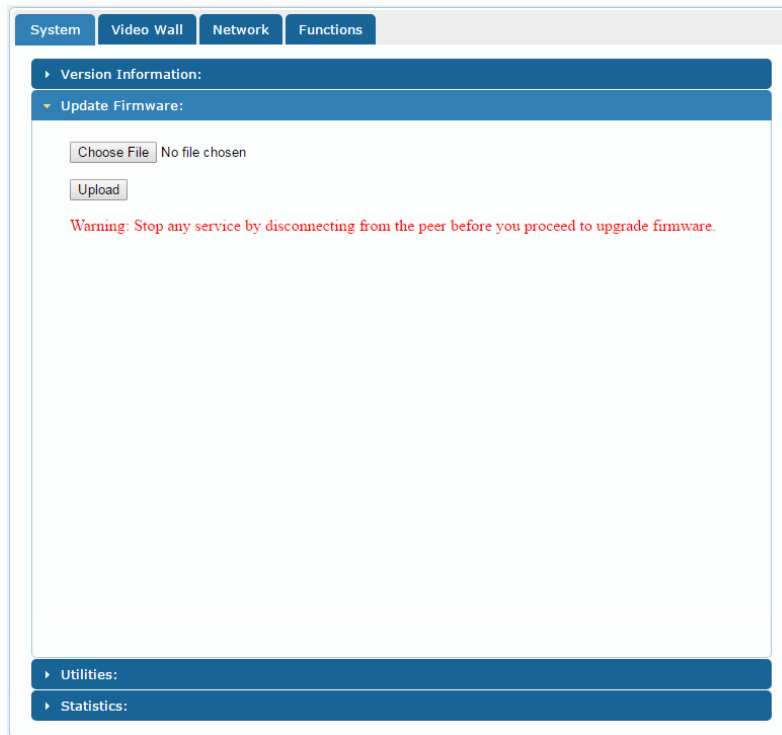


Figure 17: The System Tab – Firmware upgrade

2. Click **Choose File**, select firmware file version from the list and click **OK**.

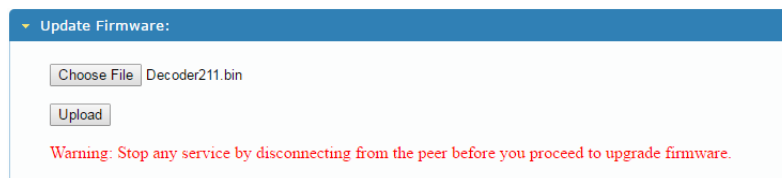


Figure 18: The System Tab – selecting the Firmware File



To cancel this operation click **Choose File** again to open the file window and click **Cancel**.

3. Click **Upload** and wait for the completion of the update process to finish.

## Setting System Utilities

To update the firmware:

1. In the System tab, select **Utilities**.

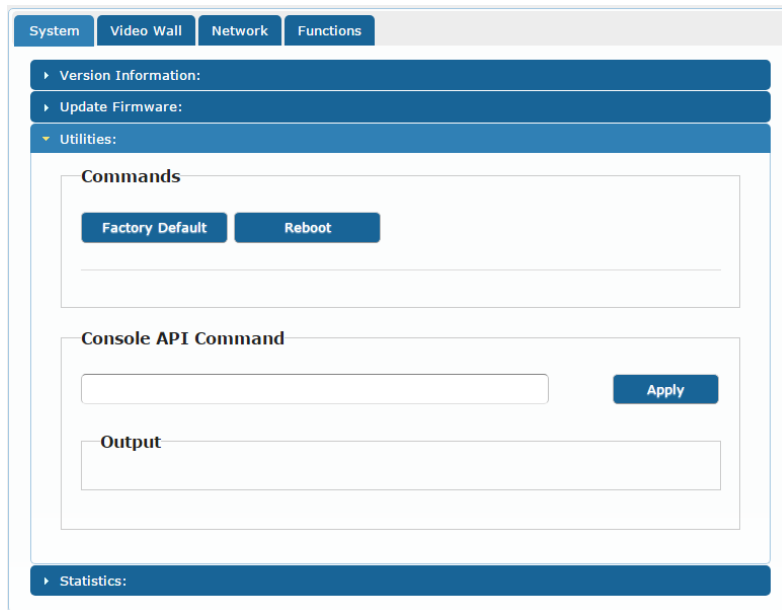


Figure 19: The System Tab – Utilities for KDS-DEC6

2. Perform the following actions:
  - a. Click **Factory Default** to reset to factory default values (see [Resetting to Factory Default](#) on page 28).
  - b. Click **Reboot** to reboot the system.
  - c. Type an API command via **Console API Commands** text box and click **Apply** to send the command to a peripheral device, and see the reply in the **Output** box.

For the **KDS-EN6** you can also reset the EDID to a selected default value and then click **Apply**.

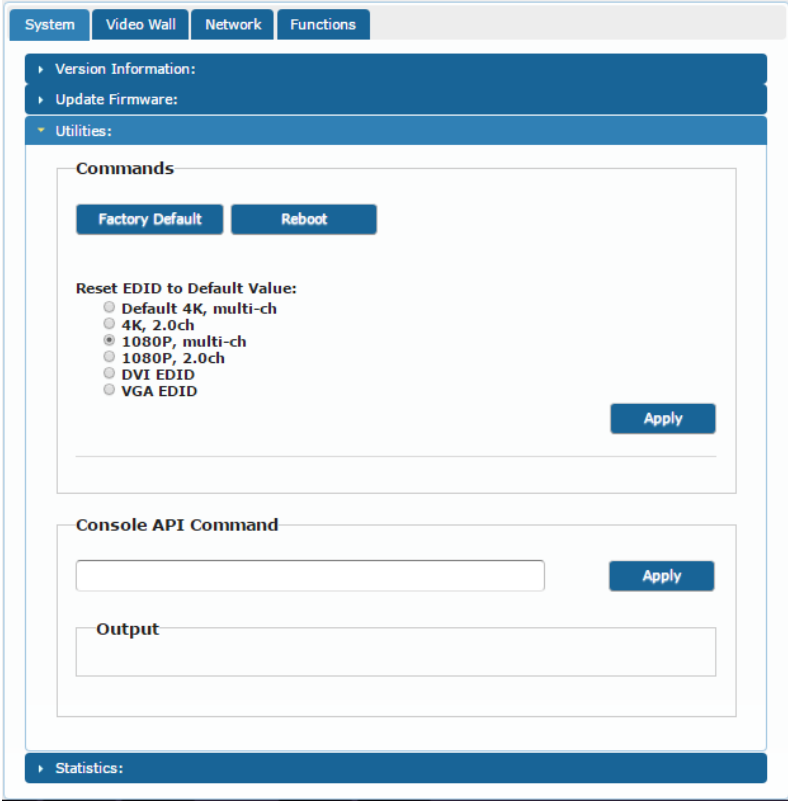



Figure 20: The System Tab – Utilities Window for **KDS-EN6**

### Resetting to Factory Default

Click **Factory Default** to reset the device to its default values (see [Figure 20](#)).

Following a factory reset, the current IP address returns to its default value. You cannot access the Web pages using the last known IP address. The default IP address can be found on the connected display or by using IP address detection software, such as Kramer K-Upload.

-  Following a factory reset, set the casting mode to multicast if changed.  
Factory reset does not reset the EDID.

# Viewing System Statistics

System statistics include the **KDS-EN6 / KDS-DEC6** machine status, network, video information including EDID information (only for the encoder) and display information.

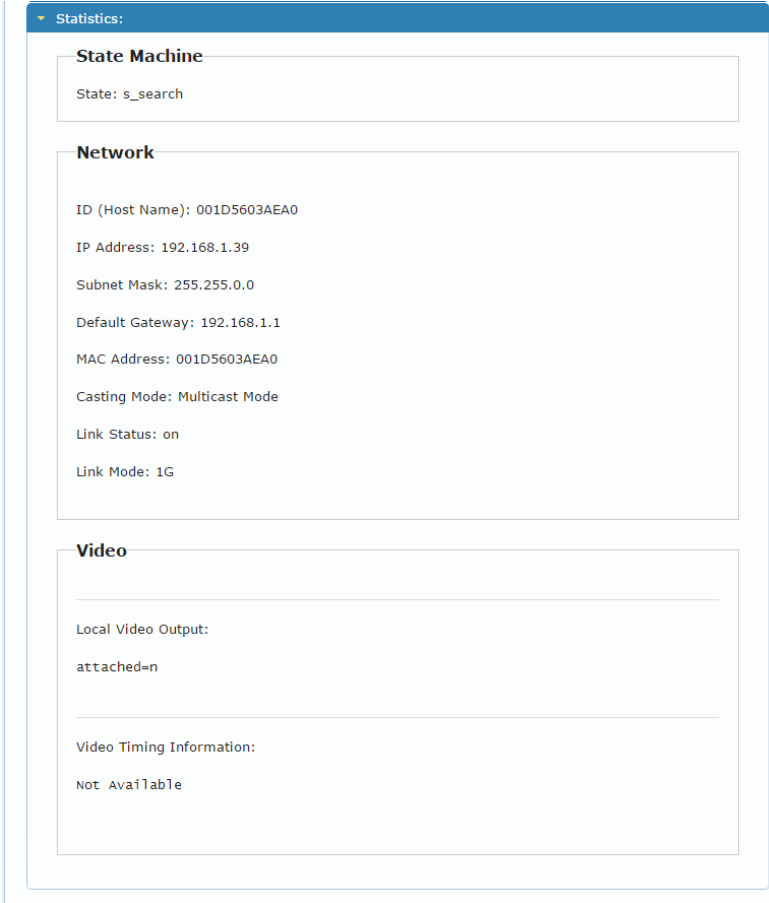


Figure 21: The System Tab – Utilities, Machine State and Network Information

For KDS-EN6, the EDID information also appears:

**Video**

EDID Used:

```
00 ff ff ff | ff ff ff 00 | 59 24 03 00 | 01 00 00 00 |
05 19 01 03 | 80 3d 23 78 | 2a 5f b1 a2 | 57 4f a2 28 |
0f 50 54 bf | ef 80 71 40 | 81 00 81 c0 | 81 80 95 00 |
a9 c0 b3 00 | d1 00 04 74 | 00 30 f2 70 | 5a 80 b0 58 |
8a 00 60 59 | 21 00 00 1e | 00 00 00 fd | 00 18 4b 1e |
5a 1e 00 0a | 20 20 20 20 | 20 20 00 00 | 00 fc 00 47 |
65 6e 65 72 | 69 63 5f 34 | 4b 0a 20 20 | 00 00 00 ff |
00 30 0a 20 | 20 20 20 20 | 20 20 20 20 | 20 20 01 3f |
02 03 39 c3 | 4b 90 04 1f | 13 03 12 20 | 0f 1e 24 26 |
35 09 7f 04 | 0f 7f 04 15 | 07 50 3d 1f | c0 5f 54 01 |
57 06 00 67 | 54 00 83 5f | 00 00 6e 03 | 0c 00 10 00 |
80 3c 20 10 | 80 01 02 03 | 04 02 3a 80 | d0 72 38 2d |
40 10 2c 45 | 80 60 59 21 | 00 00 1e 01 | 1d 00 72 51 |
d0 1e 20 6e | 28 55 00 60 | 59 21 00 00 | 1e 02 3a 80 |
18 71 38 2d | 40 58 2c 45 | 00 60 59 21 | 00 00 1e 00 |
00 00 00 00 | 00 00 00 00 | 00 00 00 00 | 00 00 00 9d |
```

---

Local Video Output:  
attached=n

Video Timing Information:

Timing Table: Serial Number[0x0000] [1920]X[1080] [60]Hz  
Pixel Rate: 148500KHz, Htotal: 2200, Vtotal: 1125  
Hbp: 148, Vbp: 36, Hsw: 44, Vsw: 5  
Progressive, HPos, VPos

Color Depth: [0]  
HDCP: [OFF]  
HDCP Convert: Disable  
Capture Windows: [1920]X[1080] [60]Hz  
Compress Windows: [1920]X[1080] [60]Hz  
Active Windows: [1920]X[1080] [60]Hz  
CRT Windows: [1920]X[1080]  
Scan Mode: Progressive  
Signal Type: HDMI 16:9

Figure 22: The System Tab – Utilities, Video Information



# Setting the Video Wall

A video wall consists of several screens that are tiled together to form a single large display. Each display in the video wall is connected to a **KDS-DEC6** device and needs to be configured according to its specific location on the video wall. The position definition is unique and is usually defined once during the basic setup.

You can setup the **KDS-EN6 / KDS-DEC6** video wall, via the Video Wall tab, for each device (encoder or decoder) from the Web page of any one of the video wall encoder/decoder devices.

## Basic Setup

Use the basic setup to configure the video wall.

### To configure the video wall:

1. In the Video Wall tab, select **Basic Setup**.

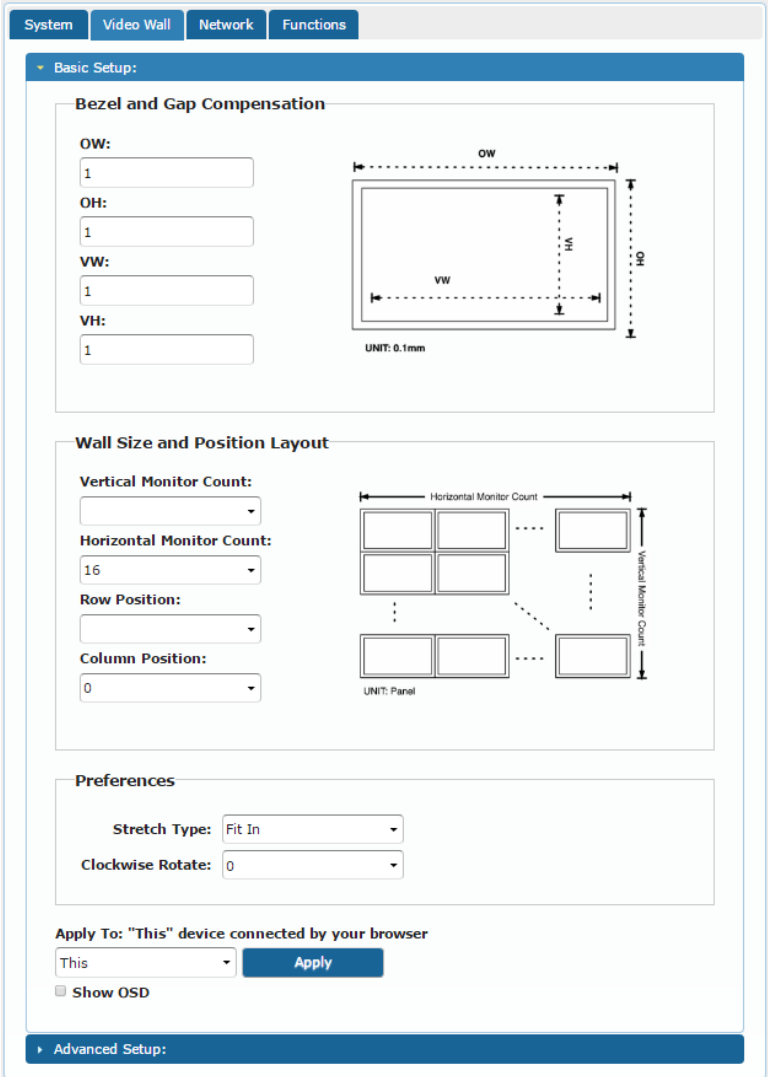


Figure 23: The System Tab – Video Wall, Basic Setup

2. Set the following:
  - Set the bezel and gap compensation in 0.1mm units (this is usually the same for all the video wall displays), see [Setting the Bezel and Gap Compensation](#) on page 32.
  - Set the Vertical Monitor Count (the number of rows) and the Horizontal Monitor Count (the number of columns) to define the size of the video wall, see [Wall Size and Position Layout](#) on page 33.
  - Set the row position and column position of a specific decoder in the video wall layout, see [Wall Size and Position Layout](#) on page 33.
  - If required, set the stretch type (Fit In or Stretch Out), see [Preferences](#) on page 33.
  - If required, rotate the image, see [Preferences](#) on page 33
  - Enable OSD for the selected device, see [Preferences](#) on page 33.
3. When the basic setup is complete, select the device to which the setup applies (this, any other device or all the devices) and click **Apply**.

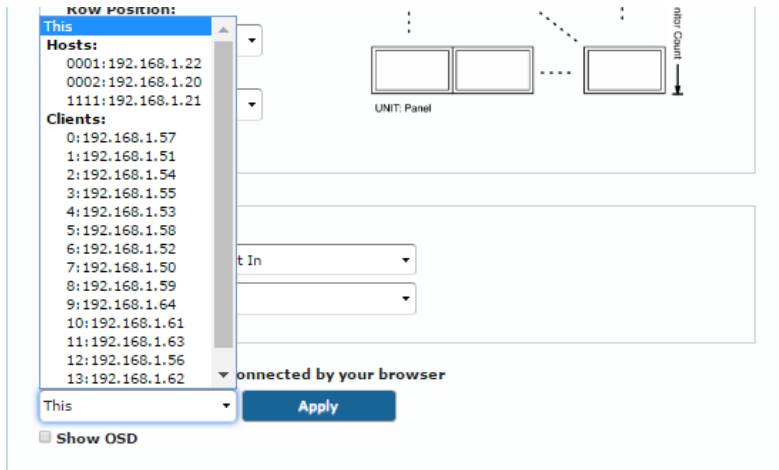


Figure 24: The System Tab – Video Wall, Applying the Basic Setup to a Device

4. Repeat the basic setup for each device in the video wall.

### Setting the Bezel and Gap Compensation

Set the display and screen sizes (width and height) for bezel and gap compensation. If you do not need this calculated, set all values to 0.



When setting bezel and gap compensation, a value of 1 equals 0.1mm. You can only enter whole numbers.

#	Function
OW	Set the display outside width.
OH	Set the display outside height.
VW	Set the screen viewable width.
VH	Set the screen viewable height.

### Wall Size and Position Layout

Define the wall size and layout:

#	Function
Vertical Monitor Count	Set the number of vertical displays in the video wall.
Horizontal Monitor Count	Set the number of horizontal displays in video wall.
Row Position	Set the row in which the specific display is positioned.
Column Position	Set the column in which the specific display is positioned.



Each specific display is defined by the IP address of the **KDS-DEC6** device to which it is connected.

### Preferences

Set the video wall preferences:

#	Function
Stretch type	Select Stretch Out to keep the aspect ratio of the original video source. Select Fit In to auto adjust aspect ratio to fit the screen.
Clockwise Rotate	Rotate the video to 0, 180 or 270 degrees.
Show OSD	Check to show the position number of the display on screen. The position number can help you to identify the screen position in the video wall.

### Advanced Setup

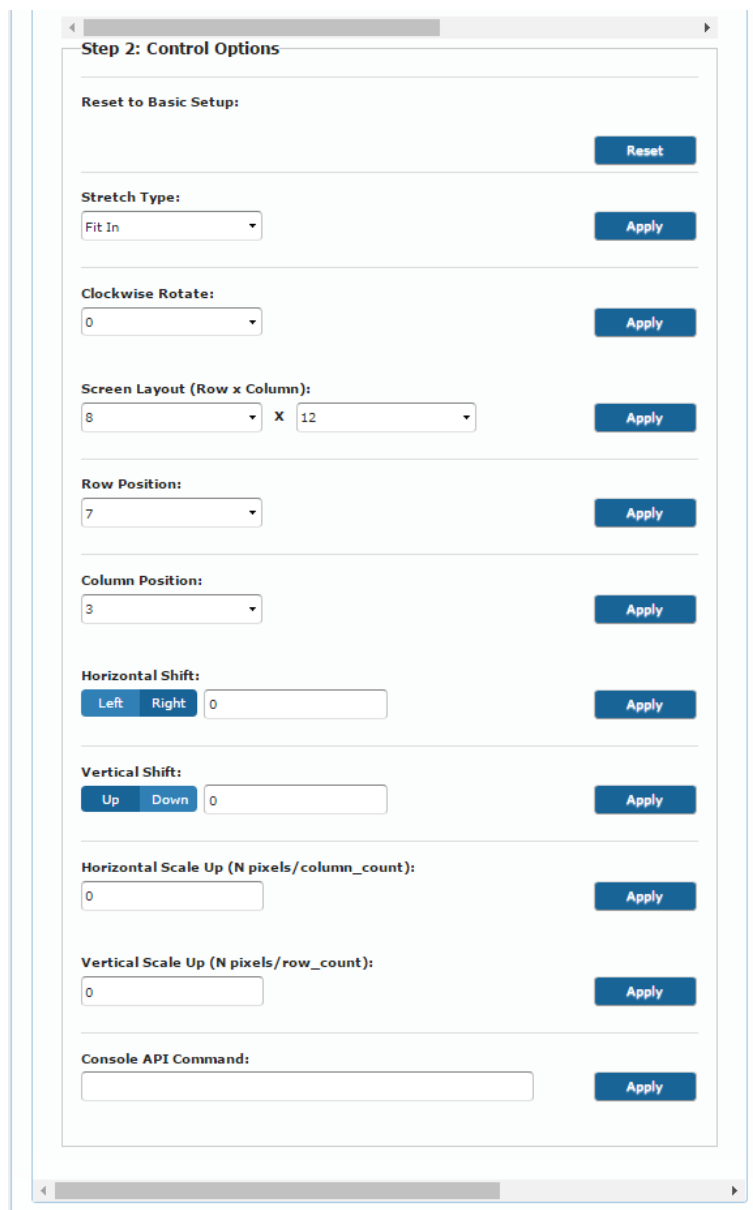
The basic setup is usually sufficient for setting the video wall layout. However, you can choose a specific device/column/row in the video wall layout.



Figure 25: Video Wall Tab – Advanced Setup, Selecting a specific Device, Column or Row

To set a Specific device, column or row:

1. In the Video Wall tab, select **Advanced Setup**.
2. Perform the following changes:
  - a. Reset it to the basic setup (as defined in [Basic Setup](#) on page 31).
  - b. Set the stretch type and rotation.
  - c. Change the screen layout (the number of columns and rows).
  - d. Change the position of the device/column/row.
  - e. Shift the image vertically or horizontally.
  - f. Scale the image up horizontally and vertically.
  - g. Send an API command.



**Step 2: Control Options**

Reset to Basic Setup:

Stretch Type:

Clockwise Rotate:

Screen Layout (Row x Column):  X

Row Position:

Column Position:

Horizontal Shift:

Vertical Shift:

Horizontal Scale Up (N pixels/column\_count):

Vertical Scale Up (N pixels/row\_count):

Console API Command:

Figure 26: Video Wall Tab – Advanced Setup Configuration

3. Click **Apply** to any change you make.

# Setting Up the Network

The Network tab enables you to set the IP mode and address and set the casting mode.

## IP Setup

The network parameters (IP address, subnet mask and default gateway can be set via one of the three different IP modes:

- **Auto IP:** the IP address is assigned randomly
- **DHCP:** the DHCP server assigns the IP address
- **Static:** type the IP Address manually

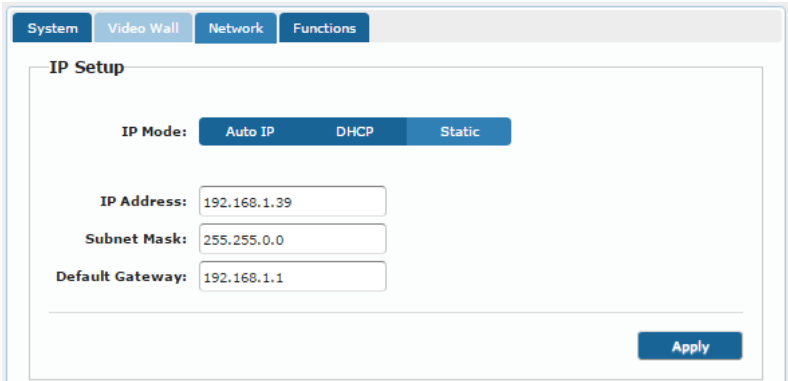


Figure 27: Network Tab – IP Setup

## Casting Mode

Set the Casting mode to **Multicast** or **Unicast**. A **Multicast** transmission sends IP packets to a group of hosts on a network. A **Unicast** stream transmits IP packets to a single destination IP address.



**KDS-EN6** and **KDS-DEC6** should be set to the same Casting Mode.

We recommend that you set the system to multicast mode for it is applicable to both one-to-multi or multi-to-multi applications.

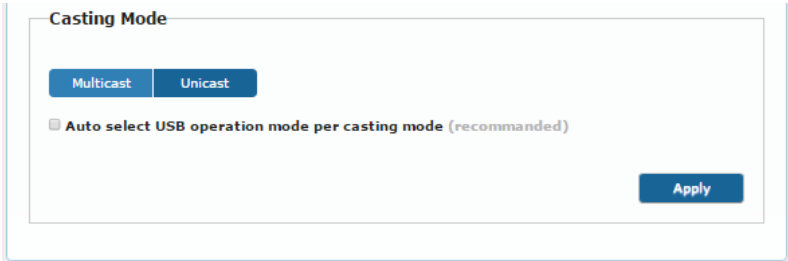


Figure 28: The Network Tab – Casting Mode

Check **Auto select USB operation mode per casting mode** for USB operation to follow the casting mode.

---

## Setting Operation Functions

Use the function tabs to set the encoder/decoder system functionality before activation.

Set the functionality of:

- Video signal over IP, see [Video over IP Behavior](#) on page [36](#).
- USB over IP, see [USB over IP](#) on page [38](#).
- Serial signal over IP, see [Serial over IP](#) on page [39](#).

### Video over IP Behavior

Set the video behavior over IP.



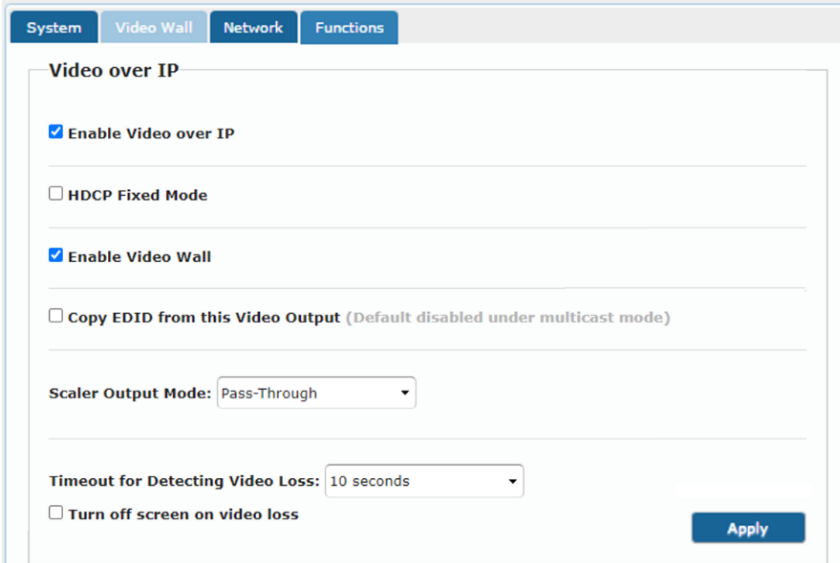
Setup is slightly different for the encoder and decoder.

For both encoder/decoder check **Enable Video over IP** and/or **Enable Video Wall**, if required.

## KDS-DEC6 Setup

Perform the following and then click **Apply**:

- Select this specific device from which the encoder copies the EDID. When checked, **KDS-DEC6** sends the display EDID to **KDS-EN6**. The new EDID is saved to **KDS-EN6** and remains even if **KDS-DEC6** is disabled.
- Select HDCP Fixed Mode to allow an HDCP 2.2 source connected to the encoder to play on an HDCP 1.4 TV/display connected to this decoder.
- Set the scaler output mode: Pass-Through, Auto Detect, Full HD 1080p60, Full HD 1080p50, Ultra HD 2160p30 or Ultra HD 2160p25.
- Set the time out for video loss and define screen behavior after video signal loss: Set the time for the system to keep the latest video image after video loss detection. When enabled, **KDS-DEC6** turns off the display following video signal loss.



The screenshot displays the 'Functions' tab in the configuration interface, specifically the 'Video over IP' section. The settings are as follows:

- Enable Video over IP:**
- HDCP Fixed Mode:**
- Enable Video Wall:**
- Copy EDID from this Video Output (Default disabled under multicast mode):**
- Scaler Output Mode:** Pass-Through (selected in a dropdown menu)
- Timeout for Detecting Video Loss:** 10 seconds (selected in a dropdown menu)
- Turn off screen on video loss:**

An 'Apply' button is located at the bottom right of the configuration area.

Figure 29: Functions Tab – Video over IP for KDS-DEC6s

## KDS-EN6 Setup

Perform the following and then click **Apply**:

- Set HDCP to ON for the device to follow HDCP Input settings. Set HDCP to OFF so that the device identifies itself as a device that does not support HDCP.
- Select the maximum bit rate if there is a total throughput limit on the network. Note that limiting the maximum bit rate may affect video quality.
- Set the maximum frame rate. If the frame rate is too low the video will not appear continuous.

The screenshot shows the 'Functions' tab in a web interface. Under the 'Video over IP' section, there are several settings:
 

- Enable Video over IP
- HDCP ON/OFF: ON (dropdown menu)
- Enable Video Wall
- Maximum Bit Rate: Best Effort (dropdown menu)
- Maximum Frame Rate: Capture up to 100% of frames (slider control)

 An 'Apply' button is located at the bottom right of the configuration area.

Figure 30: The Functions Tab – Video over IP for KDS-EN6

## USB over IP

Set the USB over IP behavior of the encoders/decoders before activating the system.

The screenshot shows the 'Functions' tab in a web interface. Under the 'USB over IP' section, there are several settings:
 

- Enable USB over IP
- Operation Mode:
  - Auto select mode (Recommended, choose per network casting mode)
  - Active on link (Unicast network's default mode)
  - Active per request (Multicast network's default mode)
- Compatibility Mode:
  - K/M over IP (Uncheck when mouse/keyboard/touch panel not working as expected)

 An 'Apply' button is located at the bottom right of the configuration area.

Figure 31: The Functions Tab – USB over IP for KDS-DEC6

Check **Enable USB over IP** to enable USB transmission over the Ethernet cable and then Set the following:

- Operation Mode, select one of the following operation modes:
  - **Auto select** – the operation mode is automatically selected according to the network casting mode selection (see [Casting Mode](#) on page 35).
  - **Active on Link** – (unicast network default) in the unicast mode, once a connection



(link) is established, USB connectivity is enabled.

- **Active per request** – (multicast network default) in the multicast mode, whoever moves the mouse gets the token. When not active, another USB device can take the token and become active.
- Compatibility Mode, check the following:
  - K/M over IP – uncheck if mouse, keyboard or touch panel are not working as expected.



In order to manually enable/disable keyboard or mouse devices connected to the USB ports, the following commands can be used after unchecking this option and restarting the device:

```
ast_send_event -1 e_start_usb
ast_send_event -1 e_stop_usb
```

For more information refer to the *KDS-EN6, KDS-DEC6 API Guide* available at [www.kramerav.com/downloads/KDS-DEC6](http://www.kramerav.com/downloads/KDS-DEC6).

- Mouse not responding well – (**KDS-EN6** only) check if the cursor moves slowly or unexpectedly.

Figure 32: The Functions Tab – USB over IP for KDS-EN6

## Serial over IP

Set the serial over IP behavior:

Figure 33: The Functions Tab – RS-232 over IP

Set the following:

- **Enable Serial over IP:** check to enable serial transmission over the Ethernet cable.

When unchecked, serial transmission via network is disabled.



Setting this function differently for devices in the system may affect the video quality.

- Operation Mode, select an operation mode: Type 1, Type 2 or type 2 guest mode:
  - Type 1 – (dynamic baud rate) **KDS-DEC6** RS-232 baud rate is configurable via special RS-232 commands. Redirection is controlled by the PC RS-232 connected to the **KDS-EN6**. Use a fixed baud rate (115200,8,none,1) The connection can be dynamically changed.  
**Applies to:** HDMI Multicast TV Broadcast system that requires display control.
  - Type 2 – (static baud rate) RS-232 redirection is automatically established between encoders and decoders. There is no need to explicitly issue commands for establishing redirection.  
The FW code automatically links the host and clients all together using a preconfigured baud rate setting (default is 115200,8,n,1). Normally, this static baud rate setting is preconfigured on manufacturing. The baud rate setting can be changed by "Console API".  
**Applies to:** a multicast system with touch panels on the client sides that need communication with the PC on the host side.
  - Type 2 Guest mode: designed for controlling UART port 1 through a controller (for example, PC) that is connected to the network. Both Type1 and Type2 are supported.
- Baud Rate Setting: set RS-232 format in this area. **KDS-EN6** and **KDS-DEC6** should have the same baud rate format.

Go to [Setting Up RS-232 over IP](#) on page 43 for detailed instructions on how to setup serial communication over IP.

# Enabling Channel OSD

On the KDS-DEC6 web page:

- 1. Select the Function Tab.
- 2. Check the **KCM over IP** in the USB over IP section.
- 3. Click Apply.
- 4. Reboot KDS-DEC6.

On the KDS-EN6/WP-EN6 web page:

- 1. Select the Function Tab.
- 2. Check the **KCM over IP** in the USB over IP section.
- 3. Click Apply.
- 4. Assign meaningful channel names in the KCM OSD Setting section.



Maximum OSD Channel name is 8 characters.

**KVM OSD Setting**

**KVM OSD Setting**

Menu Timeout (Sec) 180

Channel Page 2

**Current Channel:** Channel 3 (menachem3)

**Channel 6**  
CH6

**Channel 7**  
CH7

**Channel 8**  
CH8

**Channel 9**  
CH9

**Channel 10**  
CH10

Apply

Figure 34: KDS-EN6/WP-EN6 KCM OSD Setting

- 5. Reboot KDS-EN6/WP-EN6.

# Using the KDS-DEC6 Channel OSD

1. Enable the Channel OSD using the **KDS-EN6** and **KDS-DEC6** web pages (see [Enabling Channel OSD](#) on page 41).
2. Attach a USB keyboard into the **KDS-DEC6** USB port for OSD navigation control.

## To Display OSD

- Double-click **Caps Lock** on the Keyboard to display Channel OSD.

The Channel OSD appears ([Figure 35](#)).



Figure 35: Channel OSD

## To Navigate OSD:

- Press **Page Up** or **Page Down** on the keyboard to display previous or next page of channels.
- Press hold ▲ (up key) or ▼ (down key) on the keyboard to move up or down channels.
- Press **ENTER** on the keyboard to choose selected channel.
- Press any letter on the keyboard to filter the list to only display channels beginning with that letter.
- Double Click on **ESC** key to exit OSD Menu.

# Operating KDS-EN6 and KDS-DEC6

After connecting your **KDS-EN6/ KDS-DEC6** units, we recommend that you validate your connection setup, network discovery, and the quality of your audio and video sources before you continue.

## Setting Up RS-232 over IP

RS-232 signals pass via the system to and/or from the peripheral devices that are connected to the decoders via a controller that is connected on the encoder side.

Select the connection type according to your requirements (see [Serial over IP](#) on page 39).

### Type 1 Setup

In the Type 1 setup, RS-232 redirection is set and controlled by an RS-232 command.

In the following example, a system of two encoders and two decoders is connected via a LAN switch. A laptop is connected to **KDS-EN6** 1 and a display is connected to each of the two **KDS-DEC6** devices. The baud rate of the displays is different to that of **KDS-EN6** 1.

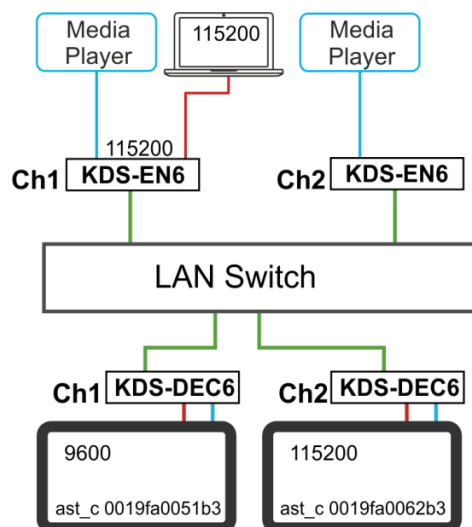


Figure 36: Serial over IP – RS-232 over IP

Note that:

- The RS-232 settings of the encoders should always be 115200-8n1.
- The RS-232 setting of the RS-232 controller (the laptop) should always be 115200-8n1.

## To send an RS-232 command from the PC to the display on KDS-DEC6 1:

1. Verify that both encoders and decoders enable serial over IP and are set to Type 1 operation mode.

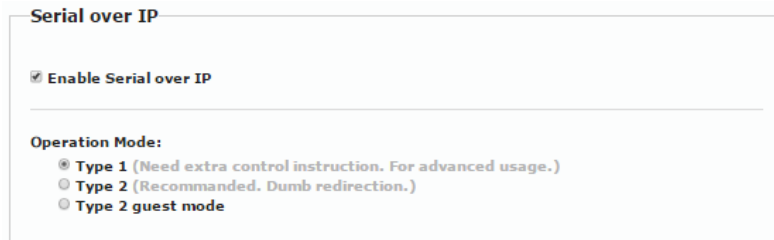


Figure 37: Serial over IP – Type 1 Operation Mode

2. On your PC, open HyperTerminal and press **Ctrl+N**.
3. Type the **KDS-DEC6 1** open command:  
"ast\_c 0019fa0051b3 9600-8n1" (the MAC address of the device and the RS-232 settings of the display).
4. Press **Enter**.  
**KDS-EN6 1** RS-232 signal is redirected to **KDS-DEC6 1** and you can control the display on **KDS-DEC6 1** via your PC.

```
>ast_c 0019fa0051b3 115200-8n1
Finding client (ast3-client0019fa0051b3.local)...Connecting...
====<Start of ast3-client0019fa0051b3.local>====
-
```

5. To stop redirection, press **Ctrl+N**.

## Type 2 Setup

In the Type 2 setup, RS-232 redirection is performed automatically you just need to verify the following:

- The encoders and decoders in the system are all linked.
- RS-232 can be passed over IP.

In the following example, a system of two encoder and two decoders is connected via a LAN switch. A laptop is connected to **KDS-EN6** and a touch panel is connected to each of the two **KDS-DEC6** devices. The baud rates of the touch panels are set to the same common lowest value for each device on the system.

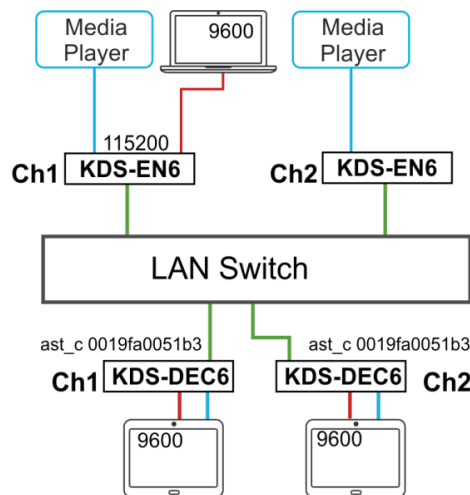


Figure 38: Serial over IP – Type 2 connection

### To detect an RS-232 signal sent from a touch panel to the PC:

1. Verify that both encoders and decoders enable serial over IP and are set to Type 2 operation mode.
2. Set all encoders and decoders to the common lowest baud rate value.  
For example, if the encoder is set to 115200 but the touch panels' baud rates are 9600, set the baud rate to 9600 for all the devices in the system that requires RS-232 communication.

Figure 39: Serial over IP – Type 2 Operation Mode

3. On your PC, open HyperTerminal and set the PC baud rate to 9600.

# Guest Type 2 Mode Setup

Use guest type 2 for RS-232 communication with the peripheral devices on the encoders-decoders system via a controller that is connected to the network.

In this example, two encoders and two decoders are connected to a LAN switch and a laptop is connected to the network.

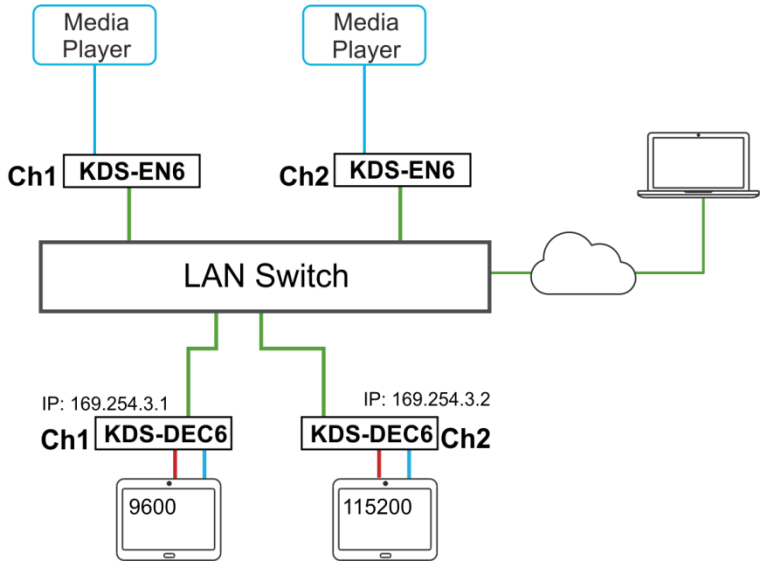


Figure 40: Serial over IP – Type 2 Guest connection

### To send an RS-232 command from the PC to the display on KDS-DEC6 2:

1. Verify that both encoders and decoders enable serial over IP and are set to Type 2 Guest operation mode.

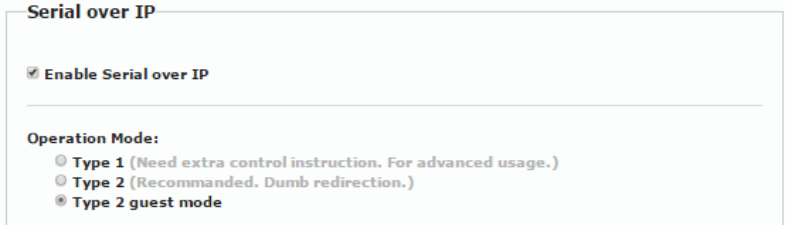


Figure 41: Serial over IP – Type 2 Guest Operation Mode

2. On your PC open the HyperTerminal and then press **Ctrl+N**.
3. Set the baud rate to 115200-8n1.
4. Use the Telnet utility to connect to the box’s port 6752 (169.254.3.2.6752).

The laptop can pass RS-232 data to **KDS-DEC6 2**.



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## Setting Up USB over IP

For detailed instructions, see [USB over IP](#) on page 38 and [KVM Setup](#) on page 20.

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## Setting Up IR over IP

You can control the peripheral devices remotely using IR over IP. For example you can control the media player from the display side by pointing the media player IR remote controller toward the IR receiver connected on the **KDS-DEC6** side, see [Figure 6](#).



The IR signal can only be extended between linked units.

---

## Fast Video Switching

To optimize switching time, verify that:

- All the encoders and decoders in the system have the same firmware version.
  - The current video streaming source and the new video streaming source have:
    - The same resolution, refresh rate, and scanning mode (interlace/progressive mode).
    - Switching from HDMI to HDMI or HDMI to DVI.
    - The same HDCP mode.
    - The same HDMI info frame and “Video quality table”.
- 

## Resetting the KDS-EN6/ KDS-DEC6 to Factory Default Values

You can reset the devices to their factory default values via the embedded Web pages (see [Resetting to Factory Default](#) on page 28) or by using the channel buttons on the device:

1. Power down the device.
2. Press and hold the down button for 10 seconds while powering the device.
3. The device powers up and after 5 to 8 seconds resets back to factory default values.

# Technical Specifications

	KDS-EN6	WP-EN6	KDS-DEC6
Inputs:	1 HDMI connector, 1 unbalanced stereo audio on a 3.5mm mini jack (line in) 1 RS-232 on terminal block connectors 1 USB (type B) port 1 IR on 3.5mm mini jacks (Rx)	1 HDMI connector, 1 RS-232 on terminal block connectors 1 USB (type B) port 1 IR on 3.5mm mini jacks (Rx)	1 Ethernet (LAN / PoE) on an RJ-45 connector 1 IR on 3.5mm mini jacks Rx
Outputs:	1 Ethernet (LAN / PoE) on an RJ-45 connector 1 IR on 3.5mm mini jacks (Tx)	1 Ethernet (LAN / PoE) on an RJ-45 connector 1 IR on 3.5mm mini jacks (Tx)	1 HDMI connector 2 left and right unbalanced stereo audio on RCA connectors 1 RS-232 on terminal block connectors 2 USB (type A) ports 1 IR on 3.5mm mini jacks (Tx) 1 Ethernet on an RJ-45 connector (daisy-chain LAN)
Network:	10M/100M/1000M		
Network Switch:	1G Multicast, IGMP Snooping Non-blocking, Layer 2		
Streaming:	Unicast and multicast through RTSP (Real Time Streaming Protocol)		
Controls:	Reset button, up and down channel buttons, channel 7-segment display, STATUS, LINK and ON LEDs		
IR:	Wide-band 20kHz~60kHz bidirectional IR transmission		
Management:	API, Kramer Control, Kramer AV services (Powered by Kramer Network)		
Video Encoding/Decoding:			
Compression Standard:	MJPEG		
HDCP	HDCP 2.2		
Scaling and Cropping:	Built in scaling and cropping for flexible display of source content on the decoder output		
Bit Rates:	4K Peak: 850Mbps; 4K Average: 350Mbps; 1080p Average: 250Mbps		
Resolution:	4096x2160@60Hz, 3840x2160@60Hz, 1920x1200@60Hz, 1920x1080@60Hz, 1864x1050@60Hz, 1856x1392@60Hz, 1792x1344@60Hz, 1728x1080@60Hz, 1704x960@60Hz, 1680x1050@60Hz, 1600x1200@60Hz, 1600x1050@60Hz, 1600x900@60Hz, 1536x960@60Hz, 1440x900@60Hz, 1440x576@60Hz, 1440x480@60Hz, 1400x1050@60Hz, 1366x768@60Hz, 1360x768@60Hz, 1280x1024@60Hz, 1280x960@60Hz, 1280x800@60Hz, 1280x768@60Hz, 1280x720@60Hz, 1224x768@60Hz, 1152x864@60Hz, 1152x720@60Hz, 1152x720@60Hz, 1024x768@60Hz, 1064x600@60Hz, 1024x384@60Hz, 960x600@60Hz, 848x480@60Hz, 800x600@60Hz, 768x480@60Hz, 720x576@60Hz, 720x480@60Hz, and 640x480@60Hz, 640x400@60Hz, 640x350@60Hz		
Audio Encoding/Decoding:			
Compression Standard (Analog In/Out):	AAC-LC		
Channels (HDMI embedded Audio):	PCM 2, 5.1, 7.1 Channel, Dolby Digital 5.1 Channel, Dolby Digital Plus, Dolby Digital True-HD, DTS 5.1 Channel, DTS-ES, DTS-HD High Resolution, DTS-HD Master Audio		
Video Latency:	30–60ms		
Power Options:	PoE, External power supply		
Power Consumption:	48V DC, 140mA max.	48V DC, 140mA max.	48V DC, 185mA max.
Operating Temperature:	0° to +40°C (32° to 104°F)		
Storage Temperature:	-40° to +70°C (-40° to 158°F)		
Humidity:	10% to 90%, RHL non-condensing		
Dimensions:	19cm x 10.3cm x 2.3cm (7.48" x 4.06" x 0.91") W, D, H		
Shipping Dimensions:	34.5cm x 16.5cm x 5.2cm (13.58" x 6.5" x 2.05") W, D, H		
Weight:	0.55kg (1.2lbs) approx.		
Shipping Weight:	0.782kg (1.7lbs) approx.		
Options:	IR Cable (PN: 3500-900617)		
Specifications are subject to change without notice at <a href="http://www.kramerav.com">www.kramerav.com</a>			

For optimum range and performance use the recommended Kramer cables available at [www.kramerav.com/product/KDS-DEC6](http://www.kramerav.com/product/KDS-DEC6). Using third-party cables may cause damage!

The warranty obligations of Kramer Electronics Inc. ("Kramer Electronics") for this product are limited to the terms set forth below:

#### **What is Covered**

This limited warranty covers defects in materials and workmanship in this product.

#### **What is Not Covered**

This limited warranty does not cover any damage, deterioration or malfunction resulting from any alteration, modification, improper or unreasonable use or maintenance, misuse, abuse, accident, neglect, exposure to excess moisture, fire, improper packing and shipping (such claims must be presented to the carrier), lightning, power surges, or other acts of nature. This limited warranty does not cover any damage, deterioration or malfunction resulting from the installation or removal of this product from any installation, any unauthorized tampering with this product, any repairs attempted by anyone unauthorized by Kramer Electronics to make such repairs, or any other cause which does not relate directly to a defect in materials and/or workmanship of this product. This limited warranty does not cover cartons, equipment enclosures, cables or accessories used in conjunction with this product. Without limiting any other exclusion herein, Kramer Electronics does not warrant that the product covered hereby, including, without limitation, the technology and/or integrated circuit(s) included in the product, will not become obsolete or that such items are or will remain compatible with any other product or technology with which the product may be used.

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The standard limited warranty for Kramer products is seven (7) years from the date of original purchase, with the following exceptions:

1. All Kramer VIA hardware products are covered by a standard three (3) year warranty for the VIA hardware and a standard three (3) year warranty for firmware and software updates; all Kramer VIA accessories, adapters, tags, and dongles are covered by a standard one (1) year warranty.
2. Kramer fiber optic cables, adapter-size fiber optic extenders, pluggable optical modules, active cables, cable retractors, ring mounted adapters, portable power chargers, Kramer speakers, and Kramer touch panels are all covered by a standard one (1) year warranty.
3. All Kramer Cobra products, all Kramer Calibre products, all Kramer Minicom digital signage products, all HighSecLabs products, all streaming, and all wireless products are covered by a standard three (3) year warranty.
4. All Sierra Video MultiViewers are covered by a standard five (5) year warranty.
5. Sierra switchers & control panels are covered by a standard seven (7) year warranty (excluding power supplies and fans that are covered for three (3) years).
6. K-Touch software is covered by a standard one (1) year warranty for software updates.
7. All Kramer passive cables are covered by a ten (10) year warranty.

#### **Who is Covered**

Only the original purchaser of this product is covered under this limited warranty. This limited warranty is not transferable to subsequent purchasers or owners of this product.

#### **What Kramer Electronics Will Do**

Kramer Electronics will, at its sole option, provide one of the following three remedies to whatever extent it shall deem necessary to satisfy a proper claim under this limited warranty:

1. Elect to repair or facilitate the repair of any defective parts within a reasonable period of time, free of any charge for the necessary parts and labor to complete the repair and restore this product to its proper operating condition. Kramer Electronics will also pay the shipping costs necessary to return this product once the repair is complete.
2. Replace this product with a direct replacement or with a similar product deemed by Kramer Electronics to perform substantially the same function as the original product. If a direct or similar replacement product is supplied, the original product's end warranty date remains unchanged and is transferred to the replacement product.
3. Issue a refund of the original purchase price less depreciation to be determined based on the age of the product at the time remedy is sought under this limited warranty.

#### **What Kramer Electronics Will Not Do Under This Limited Warranty**

If this product is returned to Kramer Electronics or the authorized dealer from which it was purchased or any other party authorized to repair Kramer Electronics products, this product must be insured during shipment, with the insurance and shipping charges prepaid by you. If this product is returned uninsured, you assume all risks of loss or damage during shipment. Kramer Electronics will not be responsible for any costs related to the removal or re-installation of this product from or into any installation. Kramer Electronics will not be responsible for any costs related to any setting up this product, any adjustment of user controls or any programming required for a specific installation of this product.

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In order to pursue any remedy under this limited warranty, you must possess an original, dated receipt as proof of purchase from an authorized Kramer Electronics reseller. If this product is returned under this limited warranty, a return authorization number, obtained from Kramer Electronics, will be required (RMA number). You may also be directed to an authorized reseller or a person authorized by Kramer Electronics to repair the product.

If it is decided that this product should be returned directly to Kramer Electronics, this product should be properly packed, preferably in the original carton, for shipping. Cartons not bearing a return authorization number will be refused.

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Your rights under this limited warranty are not diminished if you do not complete and return the product registration form or complete and submit the online product registration form. Kramer Electronics thanks you for purchasing a Kramer Electronics product. We hope it will give you years of satisfaction.



P/N: 2900-300655



Rev: 8



## SAFETY WARNING

Disconnect the unit from the power supply before opening and servicing

For the latest information on our products and a list of Kramer distributors, visit our website where updates to this user manual may be found.

We welcome your questions, comments, and feedback.

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