



KRAMER ELECTRONICS LTD.

USER MANUAL

MODELS:

KDS-EN3

HD Video Encoder/Streamer

KDS-DEC3

HD Video Decoder

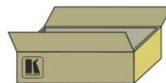


KDS-EN3, KDS-DEC3 Quick Start Guide

This guide helps you install and use your product for the first time. For more detailed information, go to <http://bit.ly/k-prod-downloads> to download the latest manual or scan the QR code on the left.

Step 1: Check what's in the box

- ✓ **KDS-EN3, KDS-DEC3**
- ✓ HD Video Encoder/Decoder
- ✓ 2 Power adapters (5V DC)
- ✓ 8 Rubber feet
- ✓ 1 Quick Start sheet



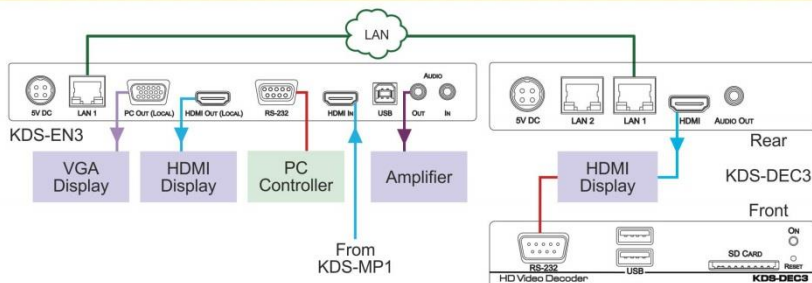
Save the original box and packaging materials in case you need to return your products for service.

Step 2: Install the KDS-EN3, KDS-DEC3

Attach the rubber feet and place on a table.

Step 3: Connect the AV inputs and outputs

Always switch off the power on each device before connecting it to your **KDS-EN3, KDS-DEC3**.



Always use Kramer high-performance cables for connecting AV equipment to the **KDS-EN3, KDS-DEC3**.

Step 4: Connect the devices to the IP network

Ensure that DHCP (Dynamic Host Configuration Protocol) is available for automatic assignment of IP addresses.

Step 5: Connect the power

Connect the 5V DC power adapters to the **KDS-EN3, KDS-DEC3** and plug the adapters into the mains electricity.



Step 6: Install the KDS-EN3 Manager software

Configure and control the system using the Kramer KDS-EN3 Manager software.

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1 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 video, audio, presentation, and broadcasting professionals on a daily basis. In recent years, we have redesigned and upgraded most of our line, making the best even better!

Our 1,000-plus different models now appear in 14 groups that are clearly defined by function: GROUP 1: Distribution Amplifiers; GROUP 2: Switchers and Routers; GROUP 3: Control Systems; GROUP 4: Format/Standards Converters; GROUP 5: Range Extenders and Repeaters; GROUP 6: Specialty AV Products; GROUP 7: Scan Converters and Scalers; GROUP 8: Cables and Connectors; GROUP 9: Room Connectivity; GROUP 10: Accessories and Rack Adapters; GROUP 11: Sierra Video Products; GROUP 12: Digital Signage; GROUP 13: Audio; and GROUP 14: Collaboration.

Congratulations on purchasing your Kramer **KDS-EN3**, **KDS-DEC3** *HD Video Encoder/Decoder*, which is ideal for the following typical applications:

- 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, government applications
- Advanced applications where functions such as recording, archiving, scaling and more are required

2 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 http://www.kramerelectronics.com/support/product_downloads.asp to check for up-to-date user manuals, application programs, and to check if firmware upgrades are available (where appropriate).

2.1 Achieving the Best Performance

To achieve the 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-EN3**, **KDS-DEC3** away from moisture, excessive sunlight and dust



This equipment is to be used only inside a building. It may only be connected to other equipment that is installed inside a building.

2.2 Safety Instructions



Caution: There are no operator serviceable parts inside the unit

Warning: Use only the Kramer Electronics input power wall adapter that is provided with the unit

Warning: Disconnect the power and unplug the unit from the wall before installing

2.3 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 <http://www.kramerelectronics.com/support/recycling/>.

3 Overview

Kramer DigiTOOL® **KDS-EN3** Encoder and **KDS-DEC3** Decoder units work in conjunction to provide unicast (one-to-one) or multicast (one-to-many) streaming over an IP network. Using Kramer **KDS-EN3 Manager** software, you can manage your entire **KDS-EN3** network from a single system.

More specifically the units feature:

- MPEG-4 AVC support using H.264 and AAC codecs
- Downscale streams locally before distribution over the network to lower bandwidth consumption
- Scaling and cropping features that enable flexible display of source content on the decoder output
- Open encoding to enable software decoding through VLC® player software
- Standard 10/100/1000Mb Ethernet network operation
- A decoder-integrated network switch that allows for **KDS-DEC3** daisy chaining and network extension
- Kramer **KDS-EN3 Manager** software that allows for multiple instances and remote management of the **KDS-EN3** network
- HDMI®/DVI video support
- HDMI or analog audio support
- Unicast and multicast streaming support through RTSP (Real Time Streaming Protocol)
- Manual and scheduled recording to network storage option on encoders
- Fail safe video playback or image display when a decoder loses its connection to an encoder
- **KDS-EN3 Manager** auto-detection and discovery of **KDS-EN3/KDS-DEC3** units on a subnet (DHCP server required)
- RS-232 virtualization from encoder to decoder

3.1 Defining the KDS-EN3

Figure 1 defines the **KDS-EN3**.

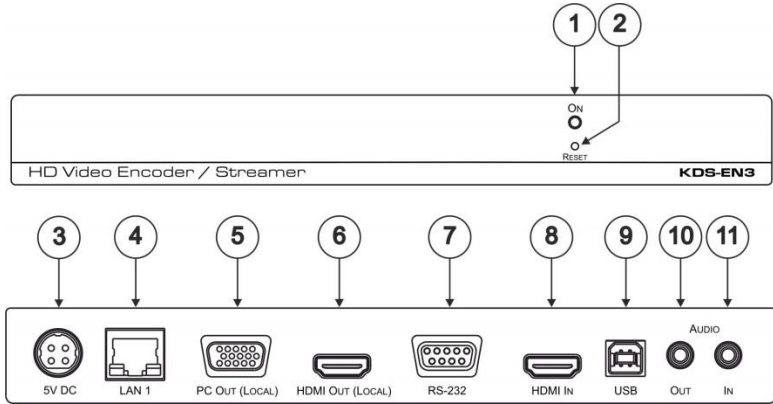


Figure 1: KDS-EN3 HD Video Encoder/Streamer

#	Feature	Function
1	<i>ON LED</i>	Lights when power is connected to the unit
2	<i>RESET</i> Button	Press and hold for less than 2 secs to reboot the unit and keep all current settings Press and hold for more than 5 secs to reboot the unit and restore all factory settings
3	<i>5V DC</i> Connector	Connects to the 5V DC power supply
4	<i>LAN 1</i> RJ-45 Connector	Connects to a network
5	<i>PC OUT (LOCAL)</i> 15-pin HD Connector	Connects to an analog display
6	<i>HDMI OUT (LOCAL)</i> Connector	Connects to a digital monitor
7	<i>RS-232</i> 9-pin D-sub Connector	Connects to control an RS-232 device. A standard (non-null modem) cable is required
8	<i>HDMI IN</i> Connector	Connects to an HDMI source
9	<i>USB - B</i> Connector	Not currently supported
10	<i>AUDIO OUT</i> 3.5mm Mini Jack Connector	Connects to an unbalanced stereo audio acceptor
11	<i>AUDIO IN</i> 3.5mm Mini Jack Connector	Connects to an unbalanced stereo audio source

3.2 Defining the KDS-DEC3

Figure 2 defines the **KDS-EN3**.

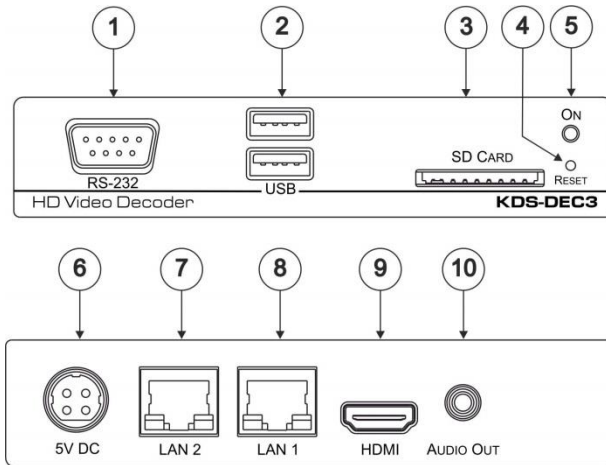


Figure 2: KDS-DEC3 HD Video Decoder

#	Feature	Function
1	RS-232 9-pin D-sub Connector	Connects to control an RS-232 device. A null-modem cable (where transmit and receive lines are cross linked) is required
2	USB Connectors (2)	Not currently supported
3	SD Card Slot	Not currently supported
4	RESET Button	Press and hold for less than 2 secs to reboot the unit and keep all current settings Press and hold for more than 5 secs to reboot the unit and restore all factory settings
5	ON LED	Lights when power is connected to the unit
6	5V DC Connector	Connects to the 5V DC power supply
7	LAN 2 RJ-45 Connector	Connects to daisy-chain additional decoders
8	LAN 1 RJ-45 Connector	Connects to a network
9	HDMI Connector	Connects to a digital display
10	AUDIO OUT 3.5mm Mini Jack Connector	Connects to an unbalanced stereo audio acceptor

4 How It Works

Kramer **KDS-EN3** Encoder and **KDS-DEC3** Decoder units work in conjunction to provide unicast (one-to-one) or multicast (one-to-many) streaming over an IP network. Using Kramer **KDS-EN3 Manager** software, you can manage your entire **KDS-EN3** network from a single system. A Kramer **KDS-EN3** environment is made up of four elements connected to a network:



- **Source** – A video source connected to an encoder, for example, a media player, computer system, or camera
- **KDS-EN3 Encoder** – An encoder is needed for each source in your **KDS-EN3** environment. An encoder can transmit to a single decoder or to multiple decoders
- **KDS-DEC3 Decoder** – A decoder is needed for each output in your environment. A computer system using VideoLAN® VLC media player as a video player can also be used to decode the signal from an encoder
- **Controller system** – A system connected to the network and running Kramer **KDS-EN3 Manager**. A controller system can also be a source

4.1 Setting Up Your KDS-EN3 Environment

Before connecting your units, we recommend you prepare:

- A DHCP (Dynamic Host Configuration Protocol) server
- A DNS (Domain Name System) server
- A controller system
- At least one output device (monitor or HDTV) to preview your video sources
- All devices (**KDS-EN3** units and controller system) on the same subnet
- At least one video source

Adding an encoder or a decoder unit to your environment

To avoid potential problems, before you add a decoder or an encoder unit to your **KDS-EN3** environment, perform a factory reset of your unit to reset the IP address, and any other settings that may prevent you from using the unit in your environment. For more information on resetting your unit, see [Section 5.4](#).

4.2 Managing Your Passwords

Your **KDS-EN3 Manager** software, **KDS-EN3** Encoder unit, and **KDS-DEC3** Decoder units use passwords for secure communication. **KDS-EN3 Manager** uses two types of passwords: the environment password and the unit password.

4.2.1 Environment Password

When you start **KDS-EN3 Manager** for the first time, you need to provide your environment password.

A **KDS-EN3** environment has a single password that allows **KDS-EN3 Manager** to access the units in that environment. An environment password is *case sensitive*. It can be between 6 and 8 alphanumeric characters long.

- In a new environment, you can provide any environment password. Any detected unit with no password will have its password updated to use the new environment password

- In an established environment, use the password already entered for that environment

4.2.2 Unit Password

Each unit has a password. To access a unit, the unit password must match the environment password. When a new unit is added to the environment, it has no password. You need to manually update that unit password.

If a unit has no password, or if a unit password doesn't match the environment password, the unit is listed as **Access denied**. You can see the properties of a unit listed as **Access denied**, but you cannot change them.

4.2.3 Updating Your Unit Password

If a unit is listed as Access denied, you must update its password to match the environment password.

To update a unit password,

1. Select the unit tile and click the Change password icon of the tile.
2. If a unit does not have a password (for example, new units or units reset to factory default), you must enable **Update units that have no password**.
3. If a unit has a password, you need to enable **Update units that have an existing password** and provide the current unit password for the update to take effect.
4. After the unit password is updated, the unit is no longer listed as Access denied.

5 Connecting the Product



Always switch off the power to each device before connecting it to your **KDS-EN3**, **KDS-DEC3**. After connecting your **KDS-EN3**, **KDS-DEC3**, connect its power and then switch on the power to each device.

5.1 Connecting the KDS-EN3

To connect the **KDS-EN3** as illustrated in the example in [Figure 3](#) you must:

1. Connect the LAN 1 RJ-45 connector to a network cable.
2. Connect an HDMI source (for example, a KDS-MP1) to the HDMI IN connector.

The following connections are optional:

3. Connect the PC (Out Local) 15-pin HD connector to a VGA acceptor (for example, a display).
4. Connect the HDMI (Out Local) connector to an HDMI acceptor (for example, a display).
5. Connect the RS-232 9-pin D-sub connector to a computer serial controller (for example, a PC) using a standard straight-through cable.
6. Connect an audio acceptor (for example, an amplifier) to the AUDIO OUT 3.5mm mini jack connector.
7. Connect an unbalanced stereo audio source (for example, a DVD) to the AUDIO IN 3.5mm mini jack connector.

5.2 Connecting the KDS-DEC3

To connect the **KDS-DEC3** as illustrated in the example in [Figure 3](#):

1. Connect a network cable to the LAN 1 RJ-45 connector.
2. Connect the HDMI connector to an HDMI acceptor (for example, a display).
3. Optionally, connect the RS-232 9-pin D-sub connector to a controlled RS-232 device (for example, a display) using a null-modem, cross-linked cable.

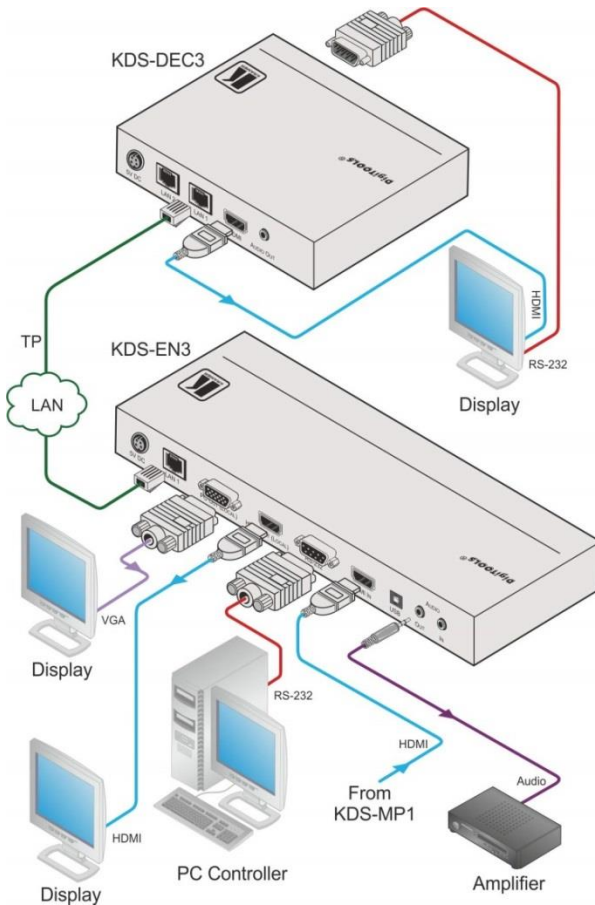


Figure 3: Connecting the KDS-EN3, KDS-DEC3 HD Video Encoder/Decoder

5.3 Daisy Chaining Your Decoder Units

You can daisy chain the network connections for your decoder units by connecting one decoder to another.

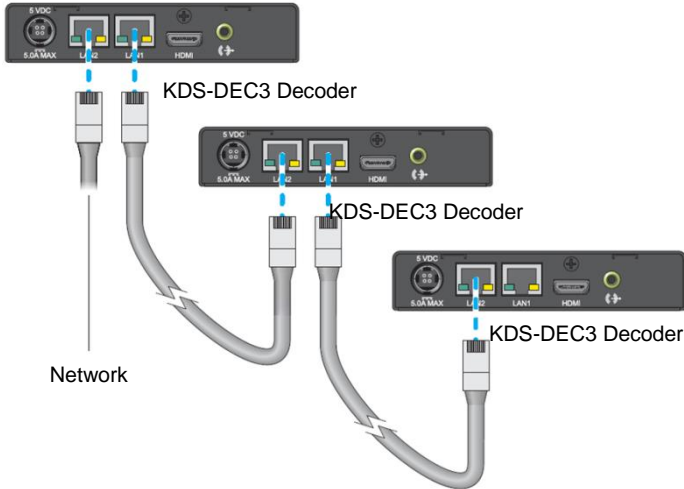


Figure 4: Daisy-Chaining KDS-DEC3 Decoders

When daisy chaining decoders, consider the following:

- Some DHCP servers may encounter problems when assigning an IP address to a new decoder daisy chained to an existing decoder in your **KDS-EN3** environment. To avoid potential problems, we recommend you first connect a new decoder directly to the network. You can daisy chain the new decoder to a decoder in your **KDS-EN3** environment *after* the decoder is assigned an IP address through DHCP.
- When daisy chaining network connections, the maximum number of **KDS-DEC3** decoders connected together is ten (10). Depending on your hardware and network settings, the number of decoders you can daisy chain on the same network jack may be lower.

5.4 Resetting Your Unit

To reset a decoder or encoder unit, press and hold the **Reset** button on your unit with the tip of a paper clip:

- **Reboot** – Holding for *less than 2 seconds* reboots your unit and keeps your settings. This *keeps all* your unit settings, including the IP address and password.
- **Factory reset** – Holding for *more than 5 seconds* (until the LED turns amber) reboots your unit and restores the factory settings. This *resets all* unit settings, including the IP address and password.

6 Validating Your KDS-EN3 Setup

After connecting your **KDS-EN3/KDS-DEC3** units, we recommend you validate your connection setup, network discovery, and the quality of your audio and video sources before you continue.

6.1 Description of LEDs

The network connector LEDs and power LED on your **KDS-EN3** units provide information that can help you troubleshoot your Kramer product.

Network Connector

The network connectors on your Kramer Encoder and Decoder unit use indicator lights (LEDs) to provide information on the network activity and presence. The following describes the different network connector LEDs.

LED color	Network activity	Network presence
No LED (black)	No data transfer in progress or no network detected	No communication established
Green (flashing)	Data transfer in progress	—
Orange	—	Network communication established

Encoder/Decoder

The power LED (ON) on your Kramer Encoder or Decoder unit provides information on the status of your unit. The following describes the power LED on your **KDS-EN3/KDS-DEC3** unit.

LED color	Encoder	Decoder
No LED (black)	Unit isn't powered	Unit isn't powered
Green/Red (flashing)	Unit is initializing	Unit is initializing
Green	Unit is ready	Unit is ready
Green (flashing)	Encoding and streaming	Decoding network stream
Red (flashing)	No valid audio/video input signal detected	Unit isn't in use
Red	Fatal error detected	Fatal error detected
Amber	Unit reset to factory default. Unit requires maintenance	Unit reset to factory default. Unit requires maintenance
Amber (flashing)	Configuring or updating firmware	Configuring or updating firmware

6.2 Validating Network Discovery

KDS-EN3 units are initially assigned their IP addresses through DHCP (Dynamic Host Control Protocol). After connecting your devices, we recommend verifying that all your devices are discovered by the network.

Windows 8/7 – To make sure all your units are discovered by the network:

- Windows 8 – From the Start screen, go to *All Apps > Windows System > File Explorer > Network*. Under *Other Devices*, make sure all the connected units are listed
- Windows 7 – Click *Start > Accessories > Windows Explorer > Network*. Under *Other Devices*, make sure all the **KDS-EN3** units connected are listed

If prompted to enable network discovery and file sharing on your network when validating network discovery, enable these two features by clicking on the prompt at the top of your Windows Explorer window. These two features must be enabled for **KDS-EN3 Manager** to detect **KDS-EN3/KDS-DEC3** units on your subnet.

After validating your connection setup, install Kramer **KDS-EN3** Manager software (see [Section 8](#)).

6.3 Multiple Subnet Support

Controller systems and computers can detect **KDS-EN3/KDS-DEC3** units in the same subnet through the UPnP (Universal Plug and Play) protocol. If you have units in different subnets of your network, you need to validate network discovery in each subnet separately. For more information on using **KDS-EN3** units in different subnets in the same **KDS-EN3** environment, see “Using multiple subnets” in Kramer **KDS-EN3 Manager** help.

6.4 Validating Video and Audio Quality

Your decoder unit can only output video and audio as good as the quality received by your encoder.

To validate the video and audio quality of your source and content:

- Connect the source directly to the monitor and audio output device that is used by your decoder
- Use a different source to preview your content
- Use **KDS-EN3 Manager** to change the local output method on your encoder to **Use pass through**

To validate the source capture by your encoder and your local output settings:

- Use **KDS-EN3 Manager** to change the local output method on your encoder to **Use confidence preview**

6.5 Using Pass Through or Confidence Preview

For your encoder, **KDS-EN3 Manager** has two local output options:

- Pass through – When using pass through, your encoder outputs the video and audio signals of your source directly to your monitor and audio output device. While this is enabled, the local output settings of your encoder are disabled.

Because the signal is direct from the source to the output devices:

- There is no video output on the VGA connector (analog video output connector) since there is no corresponding analog input on the encoder
 - If the HDMI output device connected to your encoder does not support audio output, your HDMI source may disable its audio output. Since no audio is received at input, there is no audio for the encoder and all decoders connected to this encoder
- Confidence preview – When using confidence preview, your encoder uses the **KDS-EN3 Manager** video and audio local output and capture settings for your encoder to output to your video and audio output devices. The local output settings let you:

- Scale the video output to fit the resolution of your video output device
- Correct image appearance
- Adjust audio levels

The local output of an encoder is not the result of decoding its own encoded video and audio stream.

7 Installing Kramer KDS-EN3 Manager

This section describes how to install Kramer **KDS-EN3 Manager** software for Windows® 8, Windows® Server® 2012, Windows® 7, and Windows® Server® 2008 R2.

Before you begin:

- You may need administrator rights to install or uninstall certain software. For more information, see Windows documentation or contact your system administrator
- Windows Server 2012 and Server 2008 R2 – Make sure the SSPD Discovery service, network discovery, and file sharing options are enabled

Obtaining Kramer **KDS-EN3 Manager**:

KDS-EN3 Manager software is available on the Kramer Technical Support Web site (<http://www.kramerelectronics.com>). Kramer makes available a unified version of the software (32- and 64-bit). The proper version installs depending on your operating system.

Installing your software:

- To install the software for your product, run the installation program for your software package. Follow the on-screen instructions.

8 Kramer KDS-EN3 Manager Software

Kramer **KDS-EN3 Manager** software allows you to remotely control, manage, and update your **KDS-EN3/KDS-DEC3** units from a controller system in your **KDS-EN3** environment.

Accessing Kramer KDS-EN3 Manager

Windows 8/7 – To access the main interface of **KDS-EN3 Manager**:

- Windows 8 – From the Start screen, click Kramer **KDS-EN3 Manager**
- Windows 7 – Click *Start > All Programs (or Programs) > Kramer KDS-EN3 Manager > Kramer KDS-EN3 Manager*. (Depending on your version and configuration of Windows, this part of the step may not be necessary)

Accessing Kramer KDS-EN3 Manager Help

For information on Kramer **KDS-EN3 Manager** features and options, see the help files included with your **KDS-EN3 Manager** software.

Windows 8/7 – To access the Kramer **KDS-EN3 Manager** help:

- Windows 8 – From the Start screen, click Kramer **KDS-EN3 Manager** Help file.
- Windows 7 – Click *Start > All Programs (or Programs) > Kramer KDS-EN3 Manager > Kramer KDS-EN3 Manager help file*. (Depending on your version and configuration of Windows, this part of the step may not be necessary)
- It is also possible to access the Kramer **KDS-EN3 Manager** help file from the main application screen, by clicking on the question mark (?) icon.

9 Technical Specifications

	KDS-EN3	KDS-DEC3
INPUTS:	1 HDMI, 1 unbalanced stereo audio on a 3.5mm mini jack (line in)	–
OUTPUTS:	1 HDMI, 1 VGA on a 15-pin HD connector, 1 unbalanced stereo audio on a 3.5mm mini jack	1 HDMI, 1 unbalanced stereo audio on a 3.5mm mini jack
PORTS:	1 Ethernet on an RJ-45 connector, 1 RS-232 on a 9-pin D-sub connector	2 Ethernet on RJ-45 connectors (fully switched), 1 RS-232 on a 9-pin D-sub connector
VIDEO ENCODING/DECODING:		
SINGLE CHANNEL HD:	Up to 1920x1080p60 and 1920x1200(60Hz)	
COMPRESSION STANDARD:	H.264/Mpeg4 Part 10 (AVC)	
PROFILES:	Baseline, Main, High	
LEVELS:	Up to 4.2	
BIT RATES:	100Kbps to 25Mbps	
RATE CONTROL:	CBR, VBR, adjustable GOP (Group Of Pictures) size	
AUDIO ENCODING/DECODING:		
COMPRESSION STANDARD:	MPEG4 AAC-LC	
CHANNELS:	2 channel (stereo), HDMI with digital L-PCM audio	
ANALOG SAMPLE FREQUENCY:	32, 44.1, and 48kHz	
BIT RATES:	96, 128, 192, and 256Kbps	
INPUT RESOLUTIONS:	1920 × 1200, 1920 × 1080, 1680 × 1050, 1600 × 1200, 1600 × 900, 1440 × 900, 1400 × 1050, 1360 × 768, 1280 × 1024, 1280 × 960, 1280 × 720, 1024 × 768, 800 × 600, 720 × 576, 720 × 480, and 640 × 480	–
OUTPUT RESOLUTIONS:	1600 × 900, 1440 × 900, 1400 × 1050, 1366 × 768, 1360 × 768, 1280 × 1024, 1280 × 960, 1280 × 768, 1280 × 720, 1024 × 768, 852 × 480, 848 × 480, 800 × 600, 720 × 576, 720 × 480, 640 × 480	1600 × 900, 1440 × 900, 1400 × 1050, 1366 × 768, 1360 × 768, 1280 × 1024, 1280 × 960, 1280 × 768, 1280 × 720, 1024 × 768, 852 × 480, 848 × 480, 800 × 600, 720 × 576, 720 × 480, 640 × 480
MAXIMUM UNICAST CONNECTIONS:	8	–

	KDS-EN3	KDS-DEC3
POWER CONSUMPTION:	5V DC, 3A 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:	21.6cm × 2.6cm × 10.7cm (8.5" × 1.0" × 4.0")	12.8cm × 2.6cm × 10.9cm (5.05" × 1.02" × 4.29")
WEIGHT:	0.36kg	0.26kg
INCLUDED ACCESSORIES:	Power supply, power cord, plastic bracket set	
Specifications are subject to change without notice at http://www.kramerelectronics.com		

LIMITED WARRANTY

The warranty obligations of 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.

How Long Does this Coverage Last

Three years as of this printing; please check our Web site for the most current and accurate warranty information.

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.
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.

How to Obtain a Remedy under this Limited Warranty

To obtain a remedy under this limited warranty, you must contact either the authorized Kramer Electronics reseller from whom you purchased this product or the Kramer Electronics office nearest you. For a list of authorized Kramer Electronics resellers and/or Kramer Electronics authorized service providers, please visit our web site at www.kramerelectronics.com or contact the Kramer Electronics office nearest you.

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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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SAFETY WARNING

Disconnect the unit from the power supply before opening and servicing



P/N: 2900-300375



Rev: 2