



USER MANUAL

MODEL:

WP-DEC7
4K AVoIP 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!

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/WP-DEC7 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 **WP-DEC7** 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 is 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/il/quality/environment.

Overview

Congratulations on purchasing your Kramer **WP-DEC7 4K AVoIP Decoder**, an advanced decoder for streaming 4K@60Hz (4:2:0) video signals, RS-232, or CEC signals via Ethernet over copper cable in unicast (one-to-one) or multicast (one-to-many) configurations.

WP-DEC7 decodes encoded video signal and receives RS-232 or CEC signals.

WP-DEC7 provides high-quality, advanced user-friendly operation and flexible control.

Exceptional Quality

- Video Streaming Transmitter/Receiver – Streams up to 4K@60Hz (4:2:0) resolution signals over a 1G network interface.
- HDR Support – HDR10 up to 4K@30Hz 4:2:2 12bits.
- Supports HDCP 2.2.
- Streaming Support – Provides unicast and multicast streaming.
- Analog Audio De-embedding – **WP-DEC7** extracts the HDMI audio signal or LAN streaming audio and outputs it as balanced analog audio.
- Video Wall Support – **WP-DEC7** can create a video wall of up to 16x16 displays.

Advanced and User-friendly Operation

- Convenient and Comprehensive Control – Control the unit using intuitive embedded web pages, Protocol 3000 API commands via Ethernet, or front panel buttons.
- PoE Support – Device power is supplied by a PoE (Power over Ethernet) connection from a PoE switch.
- Control Gateway – Through P3K or special TCP connection, remote users can control/communicate with RS-232, or CEC to the connected devices.
- Separate Service LAN Port – A second LAN port is available for physical separation between AV and command streams to improve security and reliability.

Flexible Connectivity

- Analog/embedded audio outputs.

Typical Applications

WP-DEC7 is ideal for the following typical applications:

- Real-time essential installations such as command and control rooms.
- Large scale AV content sharing installations using existing wires and infrastructure in corporate offices and government applications.
- AV distribution systems with one or more sources and multiple displays in schools, universities, and public venues.

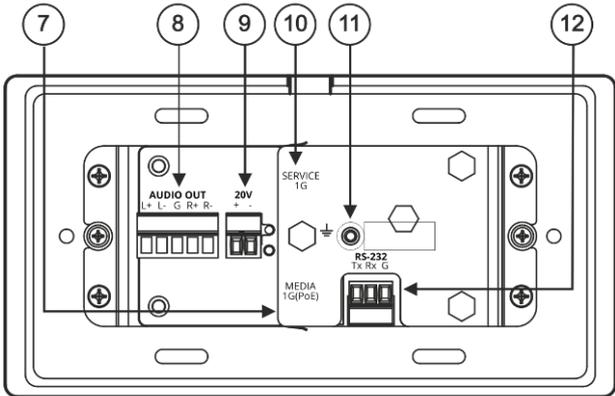
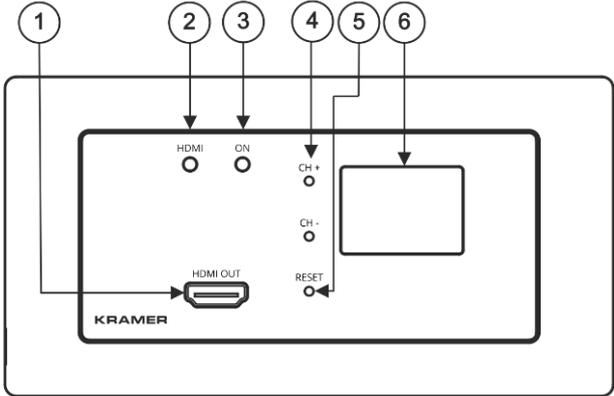
Controlling your WP-DEC7

Control your WP-DEC7 via:

- The Ethernet using built-in user-friendly web pages.
- Protocol commands.

Defining WP-DEC7

EU/UK



US

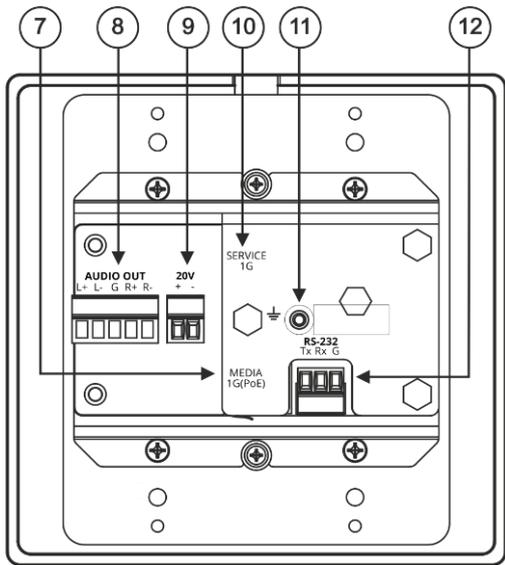
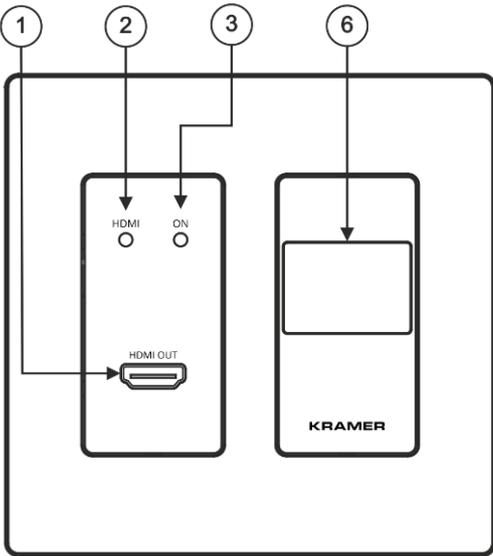


Figure 1: WP-DEC7 4K AVoIP Decoder

#	Feature	Function	
1	HDMI OUT Connector	Connect to an additional WP-DEC7 device to loop the signal, or to connect a local acceptor.	
2	HDMI LED	Lights Green	A link has been established with an encoder which is transmitting A/V signals.
		Flashes Green	A signal is established, and a problem is detected.
3	ON LED	Flashes Red	Default IP address is unavailable, device acquiring fallback address in subnet 192.168.0.0/16. 'ON' LED flashes continuously in slow 0.5/10sec cadence.
		Lights Green	Power is on.
		Flashes Green fast	FW is downloaded in the background.
		Flashes Green very fast (for 60sec)	A device identification command is sent (Flag me).
		Lights Yellow	Device falls back to default IP address (192.168.1.40).

#	Feature	Function
④	CH+ / CH-Recessed Buttons	Press to set the channel ID. The channel ID will show in the LCD display. On the US model access to these buttons requires removal of the frame set.
⑤	RESET Recessed Button	Press and hold for 10 seconds to reset the device to its factory default values. All LEDs flash. On the US model access to this button requires removal of the frame set.
⑥	LCD Display	Displays the channel on which the media is streamed.
⑦	LAN MEDIA 1G(PoE) RJ-45 Port	Unicast: connect for streaming either directly to a decoder or via LAN. Multicast: connect to multiple decoders or connect to one decoder to which multiple decoders are daisy-chained via SERVICE (1G) port. WP-DEC7 is powered by PoE (power over ethernet) delivered through the LAN MEDIA port, unless the optional 20V DC connector is attached.
⑧	AUDIO OUT 5-pin Terminal Block Connector	Connect to a balanced analog stereo audio acceptor.
⑨	20V/1A DC Connector	Connect to the power adapter (optional, purchased separately).
⑩	LAN SERVICE 1G RJ-45 Port	Used optionally for physical separation between AV and command streams to separate LAN for security and reliability purposes.
⑪	Ring Tongue Terminal Grounding Screw	Connect to a grounding wire (optional).
⑫	RS-232 3-pin Terminal Block Connector	Connect to an RS-232 device to use as a Gateway and bi-directional signal extension (even when no AV signal is extended).

Mounting WP-DEC7

This section provides instructions for mounting **WP-DEC7**. 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 **WP-DEC7** before connecting any cables or power.

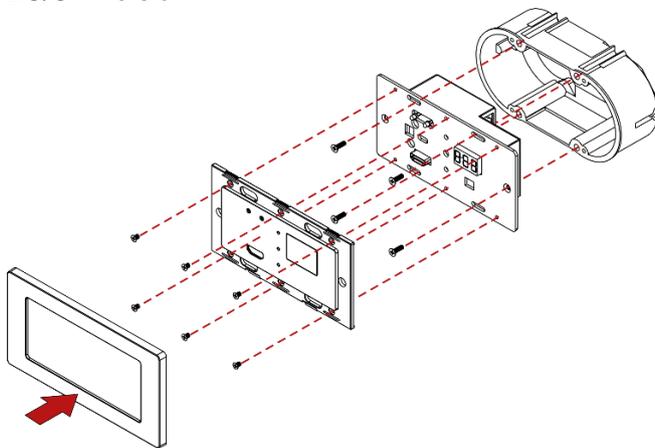


Warning:

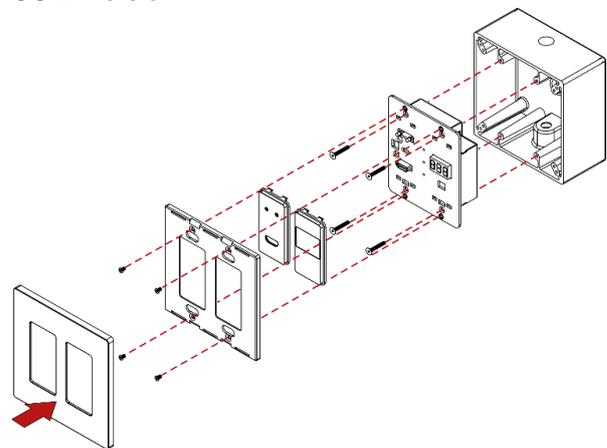
- Ensure that the environment (e.g., maximum ambient temperature & air flow) is compatible for the device.
- Avoid uneven mechanical loading.
- Appropriate consideration of equipment nameplate ratings should be used for avoiding overloading of the circuits.
- Reliable earthing of rack-mounted equipment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

Insert the device into the in-wall box (first connect the RS-232 and LAN/POE RJ-45 Connector cables and/or power) and connect the parts as shown in the illustration:

EU/UK Version



US-D Version



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

We recommend that you use standard 2 gang in-wall junction boxes (or their equivalent):

- **US-D:** 2 gang US electrical junction boxes.
- **EU:** 2 gang in-wall junction box, with a cut-hole diameter of 2x68mm and depth that can fit in both the device and the connected cables (DIN 49073).
- **UK:** 2 gang in-wall junction box (BS 4662), 135x75mm (W, H) and depth that can fit in both the device and the connected cables.
- **EU/UK:** 2 gang on-wall junction box (use the recommended Kramer on-wall box available at www.kramerav.com/product/WP-DEC7).

Connecting WP-DEC7

 By-default, the **WP-DEC7** is powered by PoE (Power over Ethernet). An optional power adapter can be purchased for connecting the product to mains electricity.

Always switch off the power to a device before connecting it to your **WP-DEC7**. After connecting your devices, connect their power and then switch on the power to each device.

In this example, **WP-DEC7** is connected to **KDS-EN7**, but it can be connected to any compatible decoder.

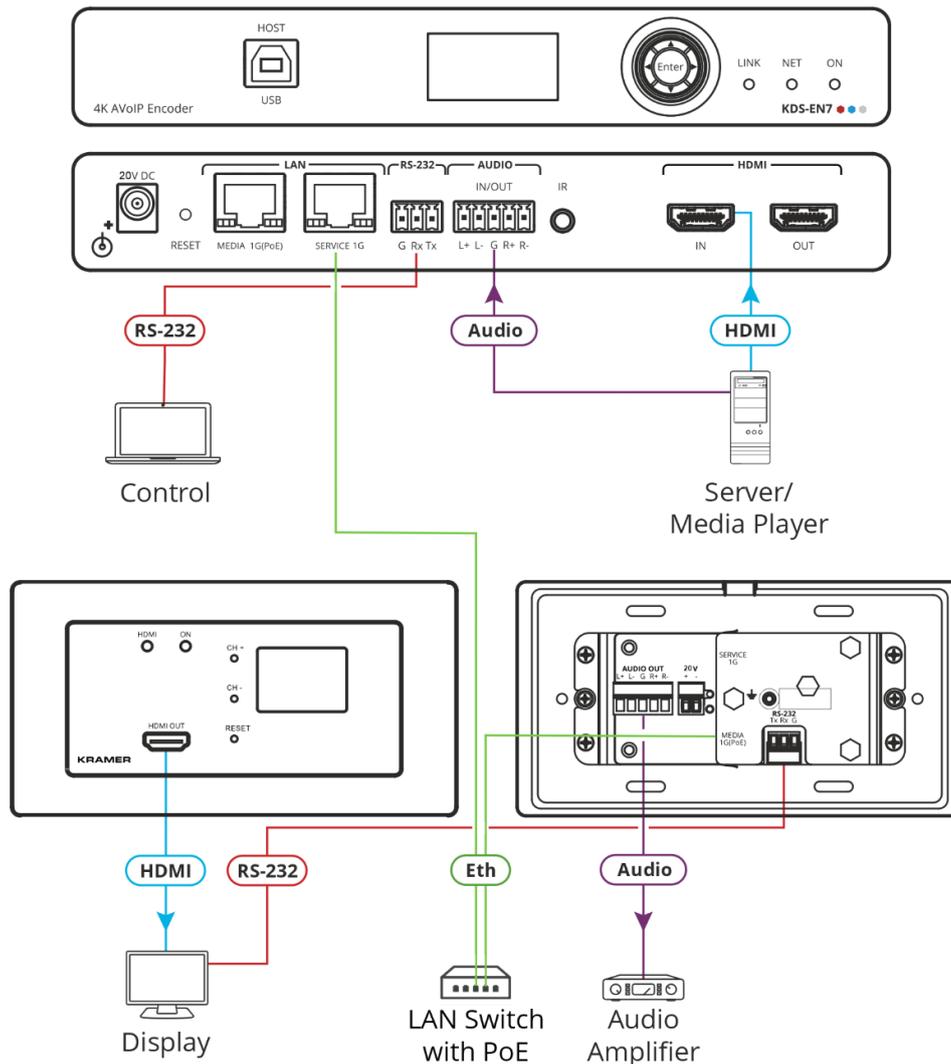


Figure 2: Connecting the WP-DEC7 Decoder to a KDS-EN7 Encoder

To connect WP-DEC7 as illustrated in the example in [Figure 2](#):

1. Connect the LAN MEDIA 1G(PoE) RJ-45 port (7) on the **WP-DEC7** to the LAN MEDIA 1G(PoE) RJ-45 port on the LAN switch.
2. Connect an AV source to the HDMI IN port (for example, a Server or a Media Player) on the encoder. Connect the:
 - Audio port to the AUDIO 5-pin terminal block.
 - HDMI port to the HDMI connector.

3. Connect the HDMI OUT connector (1) on **WP-DEC7** to an HDMI acceptor (for example, a display).
4. Connect RS-232 3-pin terminal block connectors:
 - On the encoder, connect the RS-232 port to a laptop/controller.
 - On the **WP-DEC7**, connect RS-232 (12) to the display.

 RS-232 bidirectional signals can be sent between the display and the laptop connected to the HDMI OUT connector on the **WP-DEC7**.

Connecting the Audio Output

The following are the pinouts for connecting the input/output to a balanced or unbalanced stereo audio acceptor:

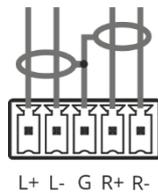


Figure 3: Connecting to a Balanced Stereo Audio Acceptor



Figure 4: Connecting to an Unbalanced Stereo Audio Acceptor

Connecting to WP-DEC7 via RS-232

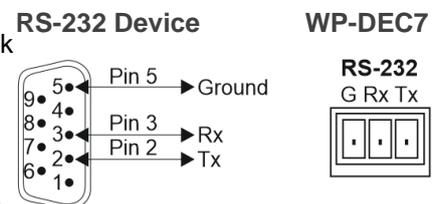
You can connect to **WP-DEC7** via an RS-232 connection (12) using, for example, a PC.

WP-DEC7 features an RS-232 3-pin terminal block connector allowing the RS-232 to control **WP-DEC7**.

Connect the RS-232 terminal block on the rear panel of **WP-DEC7** to a PC/controller, as follows:

From the RS-232 9-pin D-sub serial port, connect:

- Pin 2 to the TX pin on the **WP-DEC7** RS-232 terminal block
- Pin 3 to the RX pin on the **WP-DEC7** RS-232 terminal block
- Pin 5 to the G pin on the **WP-DEC7** RS-232 terminal block



Operating and Controlling WP-DEC7

This section describes the following actions:

- [Configuring the Network Switch](#) on page [9](#).
- [Configuring the WP-DEC7](#) on page [9](#).
- [Operating via Ethernet](#) on page [10](#).
- [Connecting the Ethernet Port Directly to a PC](#) on page [10](#).

Configuring the Network Switch

Before setting the system, make sure that your AV over IP network switch meets the following minimum requirements:

- A PoE (power over ethernet) switch or PoE injector is required to power the **WP-DEC7**. If necessary, an optional 20V DC power supply can be used.
- Jumbo Frames – On. (at least 8000 bytes).
- IGMP Snooping – On.
- IGMP Querier – On.
- IGMP Immediate/Fast Leave – On.



WP-DEC7 supports multicast IGMPv2 version.

- Unregistered Multicast Filtering – On.

Configuring the WP-DEC7

To start operating the **WP-DEC7**:

- Use the recessed CH+/- buttons (12) to match the channel on which the encoded input is streamed. By default, the **WP-DEC7** searches for an encoded stream on channel 1.
- If an encoder source (such as the **Error! No document variable supplied. Error! No document variable supplied.**) is detected, the HDMI LED lights green. If none is detected, it flashes green.
- If an HDMI acceptor is connected, but no encoded stream is detected, a NO SIGNAL screen will be displayed and the bottom right of the screen will show the device's firmware version and local IP.

Use the Web UI to configure **WP-DEC7** (see [Using WP-DEC7 Embedded Web Pages](#) on page [13](#)).

Operating via Ethernet

The **WP-DEC7**'s embedded Web UI provides high-level configuration options. Access to this UI requires an ethernet connection to the **WP-DEC7** and that you identify its IP address.

To identify the device's IP address, use any of the following methods:

- **Connect the WP-DEC7 ethernet port directly to a PC.**

For instructions, see [Connecting the Ethernet Port Directly to a PC](#) on page [10](#).

When connected to a PC, the **WP-DEC7** is given the default static IP address: 192.168.1.40. If this IP address is already in use, the system will provide a random unique IP in the range of 192.168.X.Y

- Connect the Ethernet port of **WP-DEC7** to the Ethernet port on a network hub, switch or router using a straight-through cable with RJ-45 connectors.

Make sure your PC is connected to the same LAN as the **WP-DEC7**.

By default, the **WP-DEC7** is DHCP-enabled. Make sure that there is a DHCP server in the network so the device can obtain a valid IP address.

Identify the device's IP address. This can be achieved by connecting a screen to the **WP-DEC7** HDMI port without providing any encoded input. The screen shows the device's Local IP address at the bottom right.

You can change the Ethernet parameters via the embedded web pages (see [Using WP-DEC7 Embedded Web Pages](#) on page [13](#)).

- Use the Kramer **KDS-7-MNGR** to discover the IP address, see www.kramerav.com/product/KDS-7-MNGR.

Connecting the Ethernet Port Directly to a PC

You can connect the Ethernet port of **WP-DEC7** directly to the Ethernet port on your PC using a crossover cable with RJ-45 connectors.



This type of connection is recommended for identifying **WP-DEC7** with the factory configured default IP address, 192.168.1.40.

To connect the **WP-DEC7** to the Ethernet port, configure your PC as follows:

1. Click **Start > Settings > Network & Internet**.
2. Under **Advanced network settings**, click **Change Adapter Options**.

- Highlight the network adapter you want to use to connect to the device and click **Change settings of this connection**.

The Local Area Connection Properties window for the selected network connection appears as shown in [Figure 5](#).

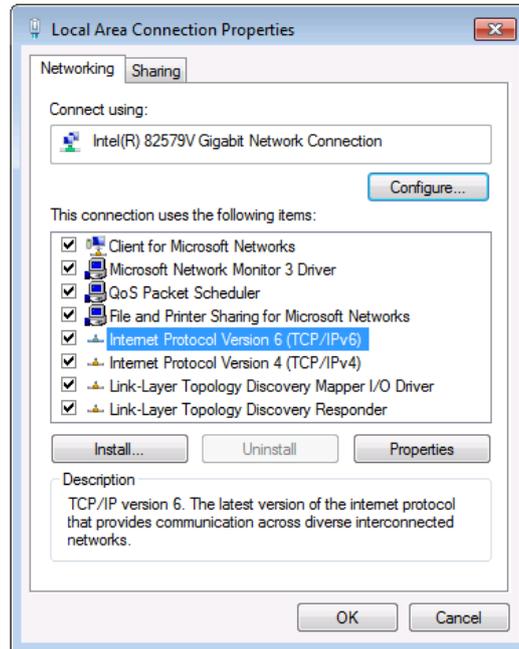


Figure 5: Local Area Connection Properties Window

- Highlight either **Internet Protocol Version 6 (TCP/IPv6)** or **Internet Protocol Version 4 (TCP/IPv4)** depending on the requirements of your IT system.
- Click **Properties**.

The Internet Protocol Properties window relevant to your IT system appears as shown in [Figure 6](#) or [Figure 7](#).

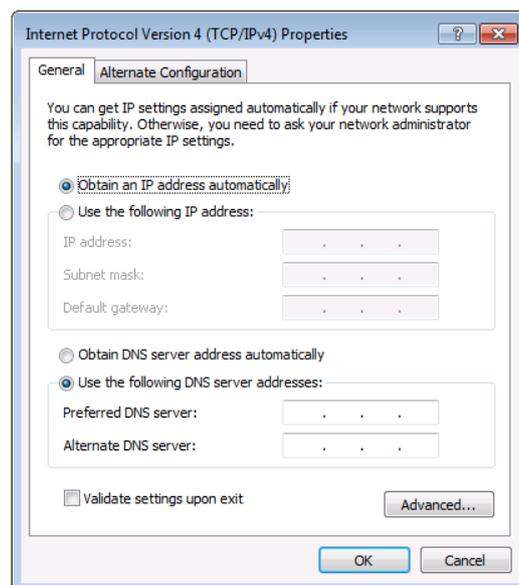


Figure 6: Internet Protocol Version 4 Properties Window

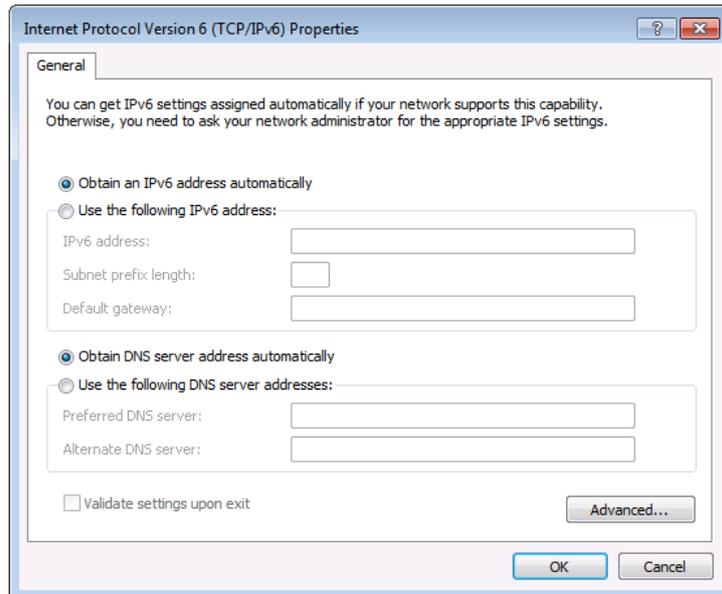


Figure 7: Internet Protocol Version 6 Properties Window

6. Select **Use the following IP Address** for static IP addressing and fill in the details as shown in [Figure 8](#).

For TCP/IPv4 you can use any IP address in the range 192.168.1.1 to 192.168.1.255 (excluding 192.168.1.40) that is provided by your IT department.

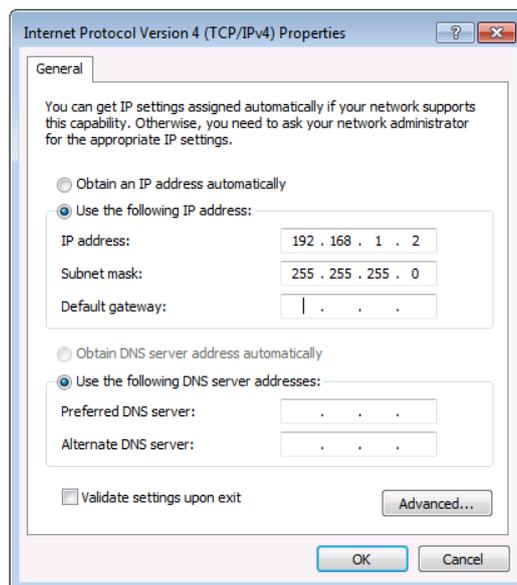


Figure 8: Internet Protocol Properties Window

7. Click **OK**.
8. Click **Close**.
9. Continue with [Using WP-DEC7 Embedded Web Pages](#) on page [13](#).

Using WP-DEC7 Embedded Web Pages

WP-DEC7 can be operated remotely using the embedded Web UI pages. Access the Web UI by typing the WP-DEC7's IP address in a browser and pressing Enter.

The following operating systems and Web browsers are supported:

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



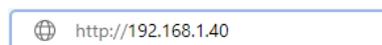
If a web page does not update correctly, clear your Web browser's cache.

Opening the WP-DEC7 Embedded Web Pages

To Browse the WP-DEC7 Web Pages:

1. Open your Internet browser.
2. Type the IP number of the device in the Address bar of your browser. To find out the IP address, see [Operating via Ethernet](#) on page [10](#).

For example, the default IP number:



3. If your device is password-protected, the Login window appears.

Login

Username

Password

Figure 9: Login Window

Enter the Username and Password (admin/admin, by default).

- The WP-DEC7 Main page (AV Routing tab) opens.

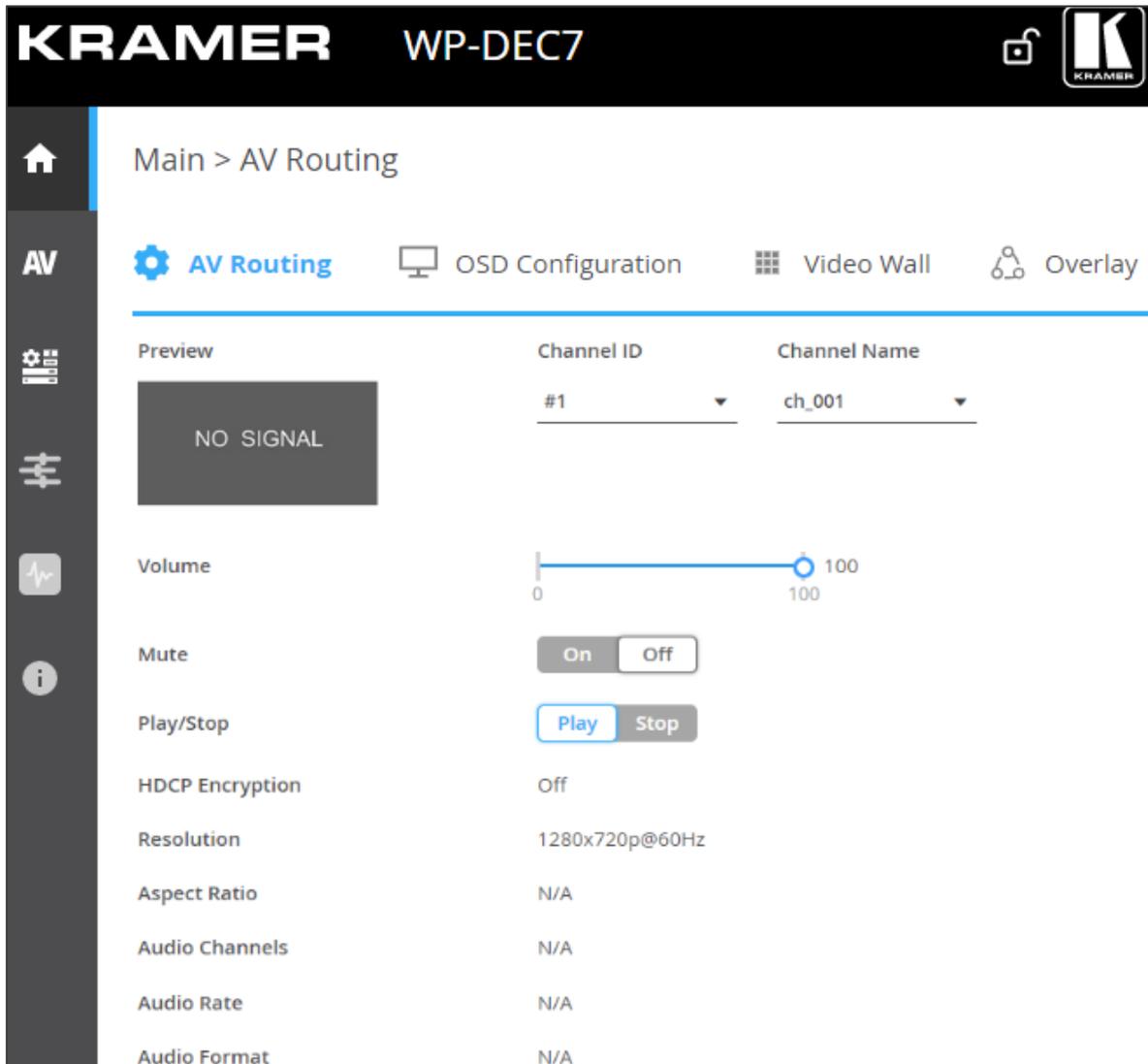


Figure 10: Device Control Page with Navigation List on Left

- Select from the pages on the left side of the screen to access options.

The Web UI has six pages (accessed from the menu on the left side):

 Main page: AV routing.

 AV Settings page.

 **Device Settings** page.

 **Control** page.

 **Diagnostics** page.

 **About** page.

The WP-DEC7 embedded web pages enable performing the following actions:

- [Defining and Viewing AV Routing Parameters](#) on page [15](#).
- [Configuring Device Information](#) on page [17](#).
- [Setting the Video Wall](#) on page [18](#).
- [Configuring the Overlay](#) on page [19](#).
- [Defining Video Settings](#) on page [22](#).
- [Setting General Preferences](#) on page [23](#).
- [Managing Network Settings](#) on page [26](#).
- [Defining an NTP Time and Date Server](#) on page [29](#).
- [Configuring WP-DEC7 for HTTPS and 802.1x](#) on page [30](#).
- [Managing User Access](#) on page [32](#).
- [Defining WP-DEC7 Gateway Settings](#) on page [33](#).
- [Viewing WP-DEC7 Status](#) on page [36](#).
- [Viewing WP-DEC7 Connections Status](#) on page [37](#).
- [Viewing the WP-DEC7 Logs](#) on page [38](#).
- [Viewing the About Page](#) on page [39](#).

Defining and Viewing AV Routing Parameters

To define AV routing settings:

1. In the Navigation pane, Select **Main>AV Routing**. The AV Routing page appears.

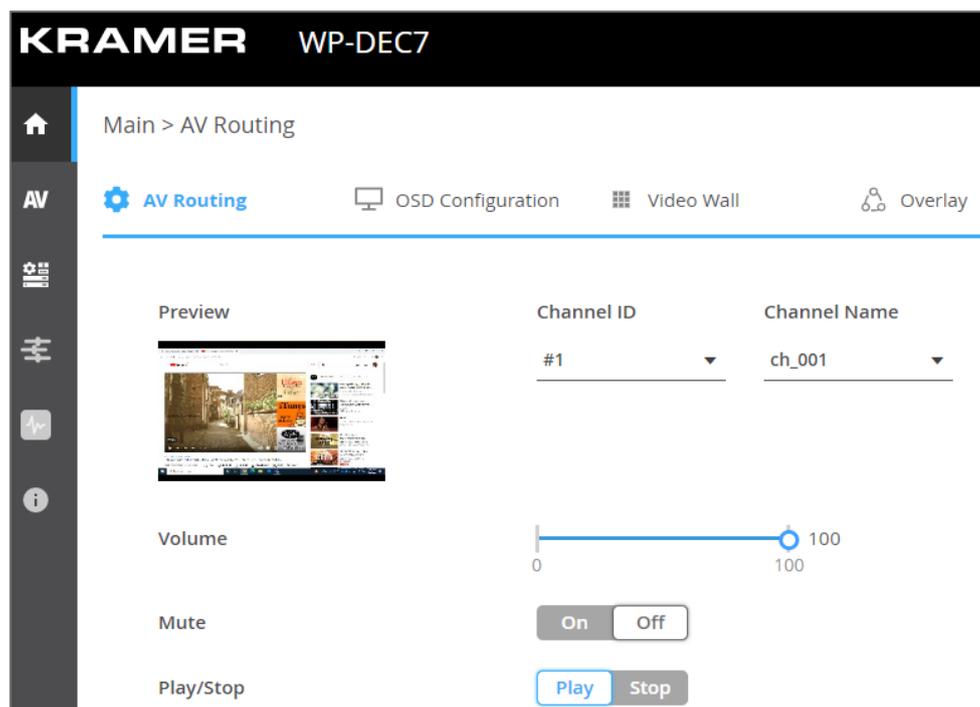


Figure 11: Main page – AV Routing Tab

2. Set the following:

- **Channel ID:** Set Channel ID and click **APPLY**.
Channel ID defines the device input ID (1 to 999). See also [Hiding the Channel Number](#) on page [25](#).
- **Channel Name:** If necessary, enter the Stream Name and click **APPLY**.
Stream name is identical to Host name (see [Setting General Preferences](#) on page [23](#)) can include up to 24 characters; “-“ and “_” are allowed within the name. by default, the name is the model name and MAC address connected by “-“.
- **Volume:** Use the slider to adjust the analog audio output volume (0 to 100%).
Default is 80 (0dB), 100% (12dB) and 0 is mute.
- **Mute:** Mute/unmute all audio outputs (HDMI OUT, AUDIO OUT, and MEDIA ports).
- **Play/Stop:** Start or stop streaming of video, audio, IR, RS-232 and USB signals.

3. View the following streaming parameters:

- HDCP Encryption: On (digital copyright protection is enabled) or Off.
- Resolution: Input video signal resolution.
- Aspect Ratio: Input video signal aspect ratio.
- Audio Channels: The number of audio channels sent in the input signal.
- Audio Rate: Input signal audio sample frequency and bit depth.
- Audio Format: LPCM, Non LPCM (for example, Dolby Digital, Dolby Digital+, and so on), HBR (for example, Dolby TrueHD) or N/A.

HDCP Encryption	Off
Resolution	1280x720p@60Hz
Aspect Ratio	N/A
Audio Channels	N/A
Audio Rate	N/A
Audio Format	N/A

Figure 12: Audio Information – AV Routing Tab

AV routing settings are defined.

Configuring Device Information

Configure the Error! No document variable supplied. OSD settings.

To configure the OSD:

1. In the Navigation pane, Select **Main>AV Routing**. The AV Routing page appears (see Figure 10).
2. Select the OSD Configuration tab.

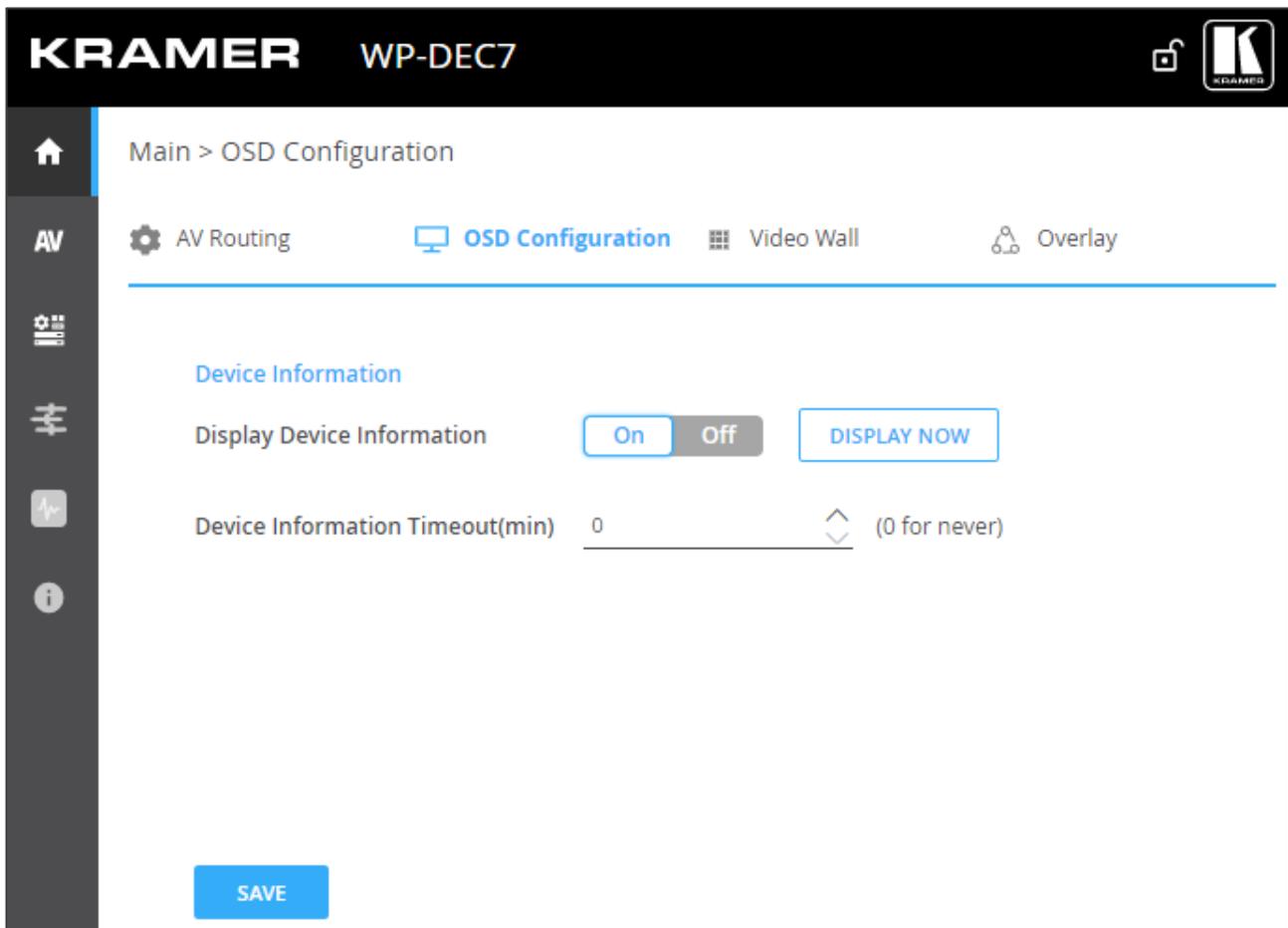


Figure 13: Main Page – OSD Configuration Tab

3. Enable/disable Device information (ON/OFF).
4. Click DISPLAY NOW to display device information.
5. Set the device information timeout.



If video is lost, and the sleep image is displayed, Device Information appears, and at this state cannot be turned off.

Device information is displayed.

Setting the Video Wall

Configure the Error! No document variable supplied. video wall.

To configure the Error! No document variable supplied. video wall:

1. In the Navigation pane, Select **Main>AV Routing**. The AV Routing page appears (Figure 10).
2. Select the Video Wall tab.

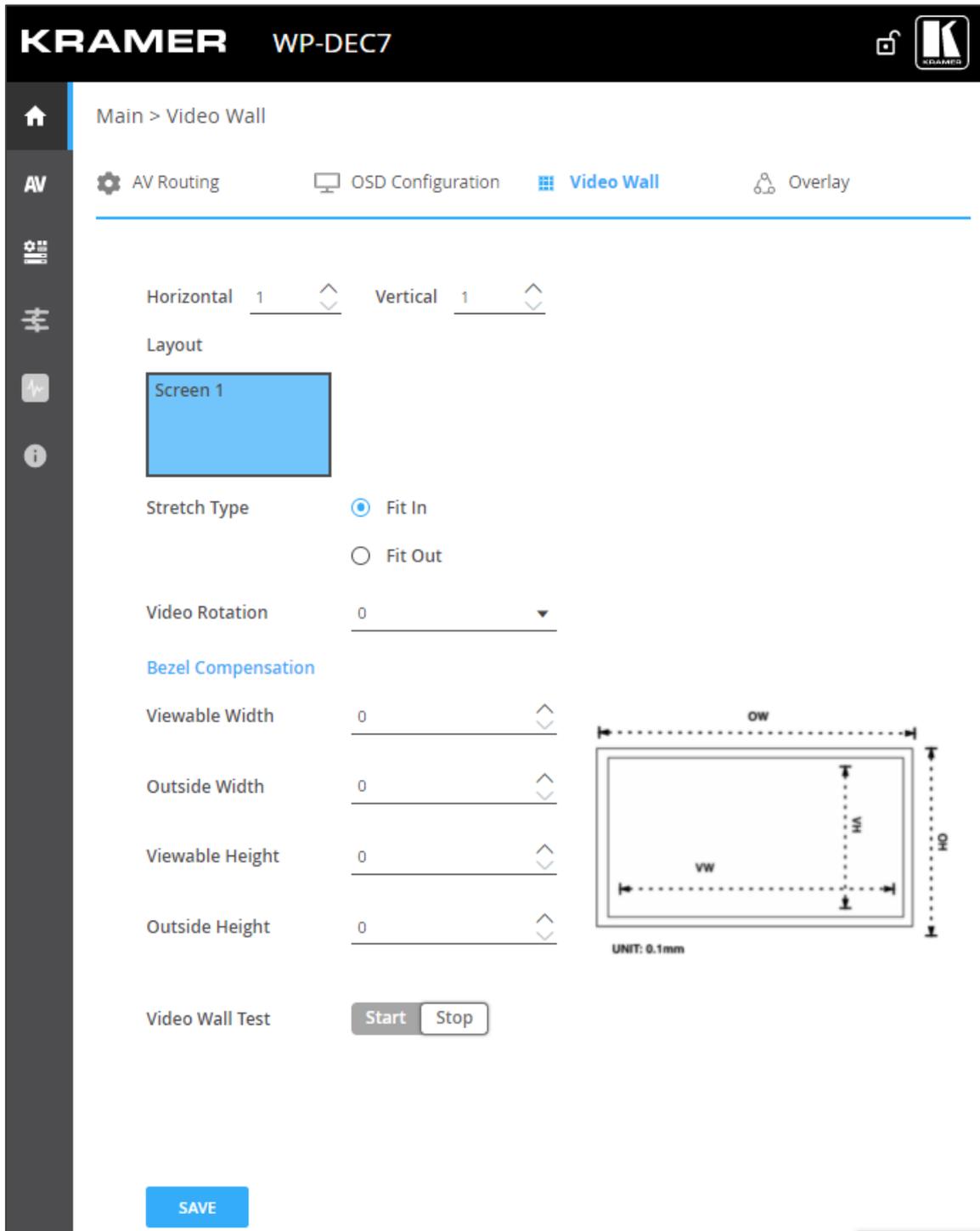


Figure 14: Main Page – Video Wall Tab

- Set the video wall horizontal and vertical size (up to 16x16). For example, select a 2x3 video wall and view the layout.

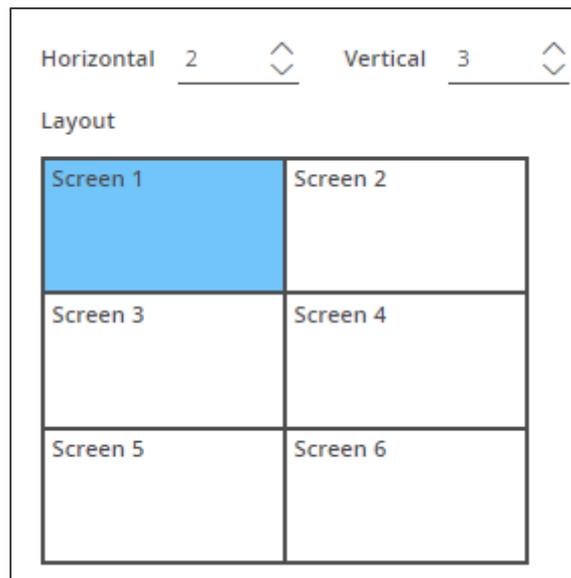


Figure 15: 2x3 Video Wall Configuration

- Define the Image stretch type over the video wall. Check:
 - Fit In**, to stretch the video to fit the screen.
 - Fit Out**, to maintain the source video aspect ratio and fill the video to the screen. Note that part of the video may be cut out.
- If required, rotate the video image by 90, 180 or 270 degrees (default is 0).
- Set Bezel Compensation.
- Click **Start** to test video wall, then click **Stop**.
- Click **SAVE**.

Video wall is configured.

Configuring the Overlay

Use the Overlay tab to perform the following actions:

- [Configuring the Image Overlay](#) on page [20](#).
- [Configuring the Text Overlay](#) on page [21](#).

Configuring the Image Overlay

To configure the image overlay:

1. In the Navigation pane, Select **Main>AV Routing**. The AV Routing page appears (see [Figure 10](#)).
2. Select the Overlay tab.

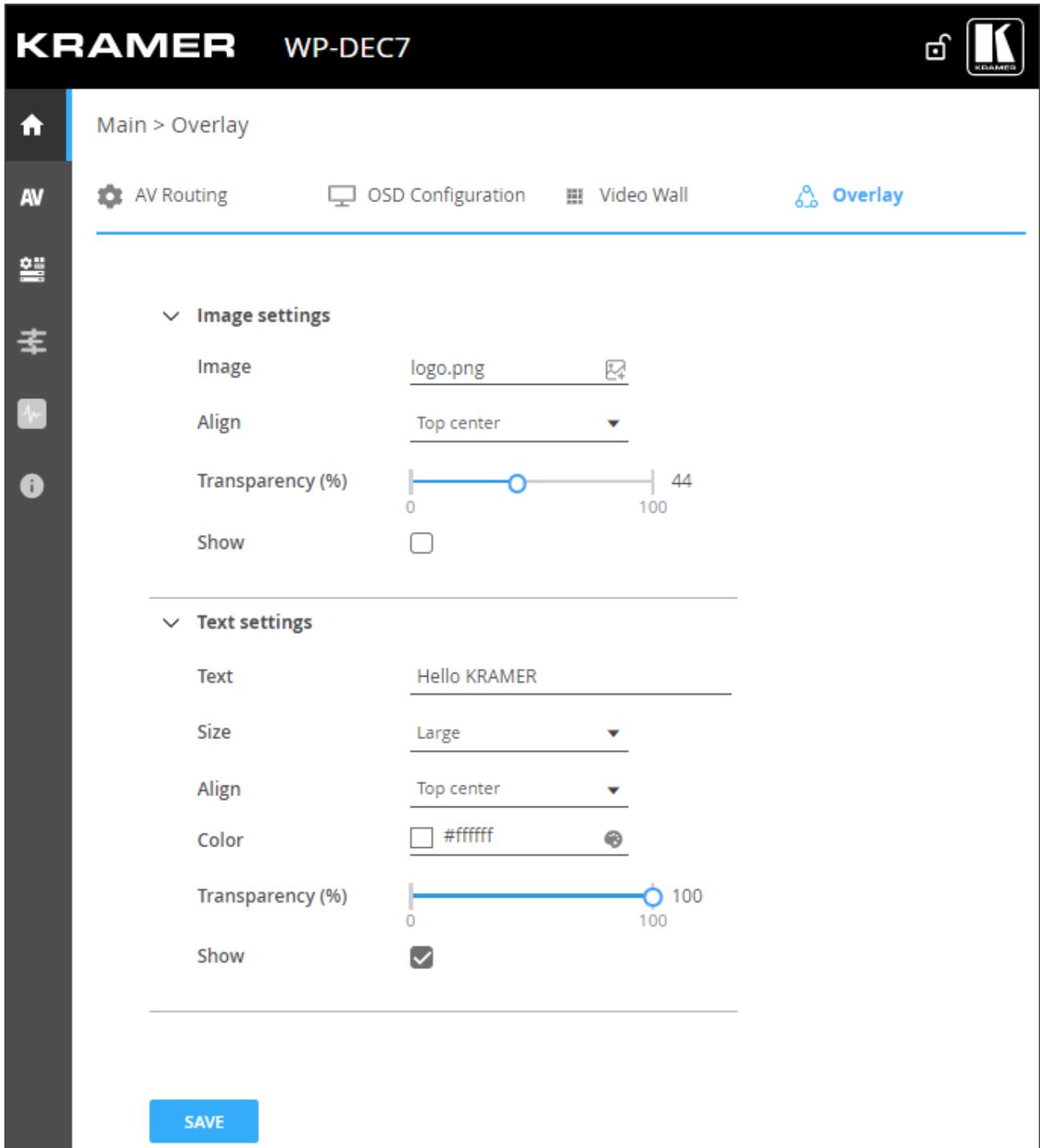


Figure 16: Main – Overlay Tab

3. Click image icon to upload an image.



The image format must be PNG, the resolution up to 640x360, and file size up to 256KB.

4. Set the image location from the drop-down box (default is Top center).
5. Use the slider to define the image transparency from 0 to 100% (invisible).
6. Check **Show** to display the image.
7. Click **SAVE**.

Image overlay is configured.

Configuring the Text Overlay

To configure the image overlay:

1. In the Navigation pane, Select **Main>AV Routing**. The AV Routing page appears (see [Figure 10](#)).
2. Select the Overlay tab (see [Figure 16](#)).

The screenshot shows a configuration panel for text overlay. It includes the following elements:

- Text settings** (expanded header)
- Text**: Hello KRAMER
- Size**: Small
- Align**: Top center
- Color**: #ffffff
- Transparency (%)**: A slider ranging from 0 to 100, with a blue circle indicating the current value.
- Show**: A checked checkbox.
- SAVE**: A blue button at the bottom left.

Figure 17: Main Page – Text Overlay Tab

3. Enter the overlay text.
4. Set the text size.
5. Set the text location from the drop-down box (default is Top center).
6. Set the text color.
7. Use the slider to define the text transparency from 0 to 100% (invisible).
8. Check **Show** to display the text.
9. Click **SAVE**.

Text overlay is configured.

Defining Video Settings

Define WP-DEC7 video settings.

To define Video settings:

1. In the Navigation pane, Select **AV**. The Video page appears.

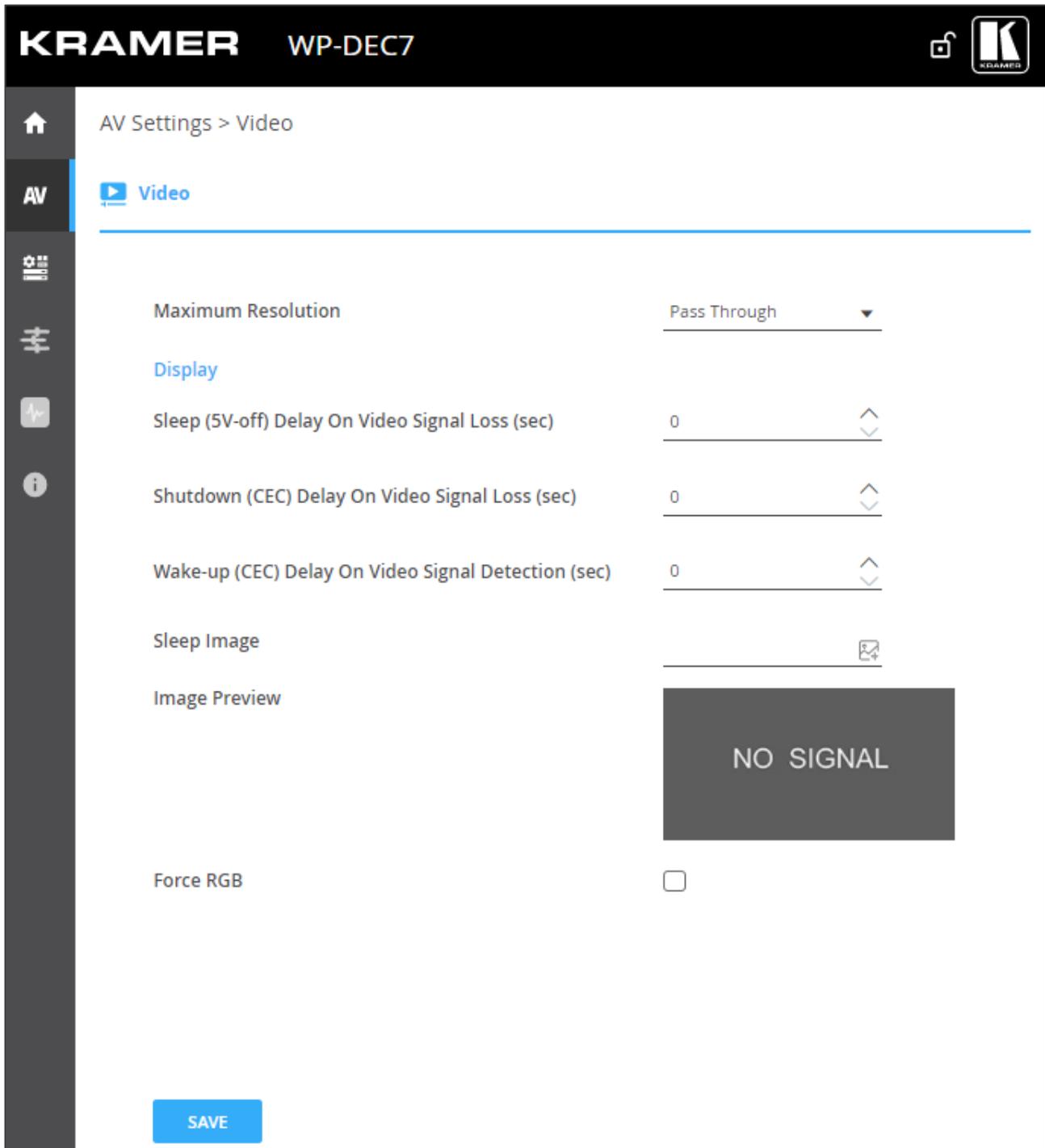


Figure 18: Video Settings

2. From the drop-down list, set the maximum output resolution: Pass Through (default, the output video resolution follows the input stream resolution), Full HD (720p60), Full HD (1080p60), Full HD (1080p50), Ultra HD 2160p25 or Ultra HD (2160p30).



You cannot upscale a source with horizontal pixels > 1920.
For example, 2048x1080, 3840x2160 are not supported.

The output resolution can be downscaled by downscaling the horizontal + vertical resolutions by half.

For example: 4096x2160 can be downscaled to 1920x1080.

Meaning 128 horizontal pixels are missing ($4096/2 - 1920 = 128$).

For example, 3840x2160 can be downscaled to 1280x720.

Meaning 640 horizontal pixels are missing ($3840/2 - 1280 = 640$) 360 vertical pixels will be missing ($2160/2 - 720 = 360$).

3. Define display behavior:

- **Sleep (5V-off) Delay On Video Signal Loss (sec):** when video signal is lost, define the delay time before setting 5V power off.
- **Shutdown (CEC) Delay On Video Signal Loss (sec):** when video signal is lost, define the delay time before a CEC shutdown command is sent to the unit.
- **Wake-up (CEC) Delay on Video Signal Detection (sec):** when the device detects a video signal, define the delay time before a CEC wake up command is sent to the unit.

4. Click next to Sleep Image to upload the image to be displayed when there is no signal on the input.

5. View live stream preview.

6. Set Force RGB mode:

- Check (default) to force RGB as the output video format.
- Uncheck.

7. Click **SAVE**.

HDMI input settings are defined.

Setting General Preferences

The  **Device Settings** page, **General** tab (default) provides the following options:

- [Changing Device Host Name](#) on page [24](#).
- [Hiding the Channel Number](#) on page [25](#).
- [Importing or Exporting Device Settings](#) on page [25](#).
- [Locating the Device \(making the LEDs flash\)](#) on page [25](#).
- [Managing the Firmware](#) on page [26](#).
- [Restarting or Resetting the Device](#) on page [26](#).

Changing Device Host Name

To change the device's network ID (also known as the host name):

1. Open the **General** tab of the  **Device Setting** page. The General tab appears.

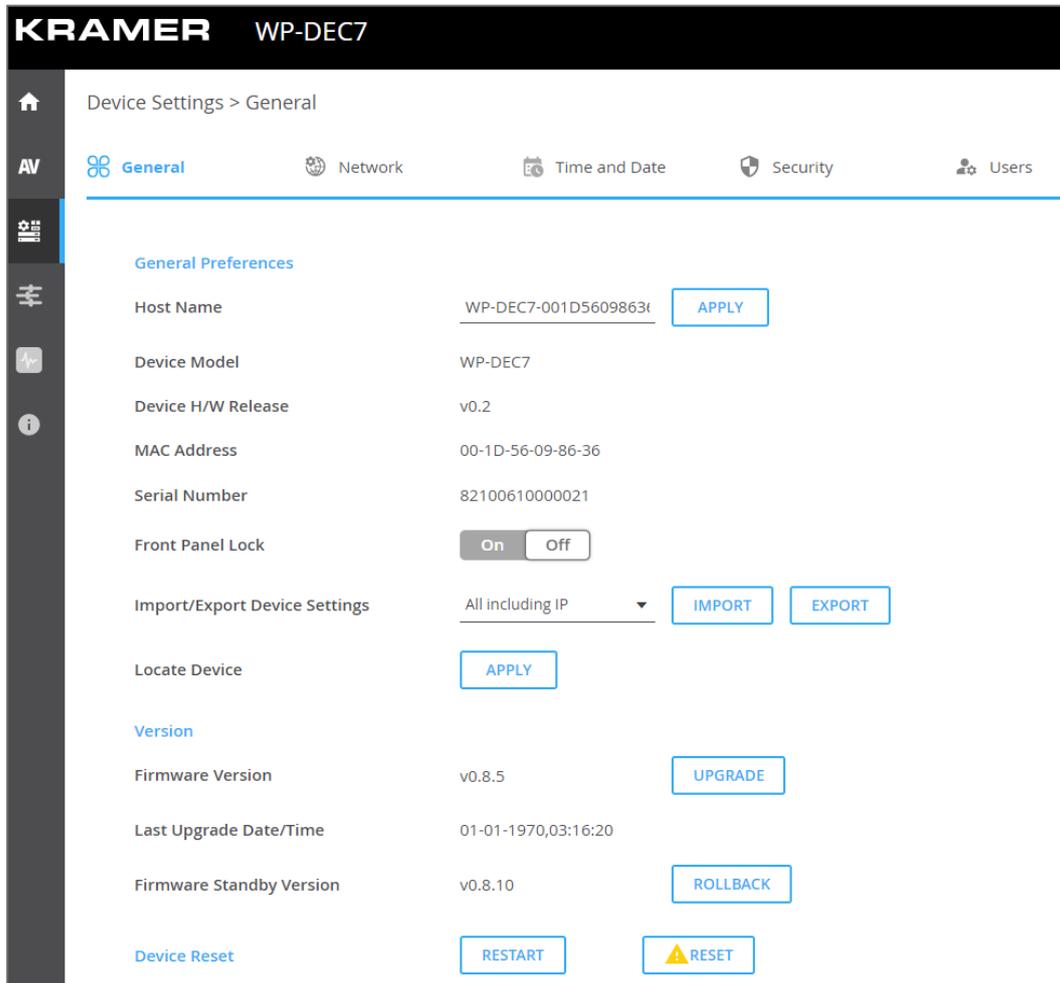


Figure 19: Device Settings Page – General Tab

2. Enter a new Host Name and click **Apply**.
The Host Name has a maximum 24 characters and can include the special characters hyphen “-” and underscore “_”, but not at the start or end of the name.
The default host name is WP-DEC7-xxxxxxxxxxxx (“xxxxxxxxxxxx” = MAC address).
3. View the following identification fields:
 - **Device Model:** Displays the device model number.
 - **Device H/W Release:** Displays device hardware version.
 - **MAC Address:** Displays the device MAC address.
Note: Users can configure a second ethernet port using a separate IP for commands sent to the device. To define a second IP address, see the [Managing Network Settings](#) on page 26. Both IP addresses use the same MAC number.
 - **Serial Number:** Displays device serial number.

Hiding the Channel Number

The channel number displayed by the LCD on the front panel can be switched off.

To hide the channel number:

1. Go to the  **Device Setting** page's **General** tab.
2. Set the **Front Panel Lock** to On.



Figure 20: Device Settings Page – Front Panel Lock

Importing or Exporting Device Settings

Device settings can be exported to a backup file and uploaded to the device. Settings are imported/exported in a series of JSON files zipped into a single file. Use the **Export** button to output examples.

To export the device settings:

1. Open the  **Device Setting** page's (default) **General** tab.
2. Select the type of information you want to export or import:
 - **All without IP** - All settings excluding IP addresses.
 - **Streams** - Channel ID information for video, audio, CEC and RS232 streams, and the channel map.
 - **AV Settings only** - Video and audio settings.
 - **All including IP** - All settings including the IP addresses (default).



Figure 21: Device Settings Page – Import/Export Device Settings

3. Click the **Export** button to output a list of JSON files compressed into a single tar.gz file.

Device Settings file is exported.

Locating the Device (making the LEDs flash)

To flash the LEDs on the WP-DEC7 front panel for 60 seconds, so that you can identify the device:

1. Open the  **Device Setting** page's default **General** tab.
2. Click **Apply** on the **Locate Device** field.



Figure 22: Device Settings Page – Locating the Device

Device is located.

Managing the Firmware

To view or upgrade the firmware version:

1. Open the  **Device Setting** page's default **General** tab.
2. Click **Upgrade** to run a firmware upgrade. For a detailed procedure, see [Upgrading Firmware](#) on page 41.
3. The system saves the Last Upgrade Date/Time and previous firmware version (the Standby Version) in memory:
 - Click **Rollback** to roll back the firmware to the last loaded version. For example, if the current firmware version is v0.5.5, and the last is v0.5.4; After “Rollback”, the device will update firmware to the v0.5.4 version.



Figure 23: Device Settings Page – Firmware Upgrade

Restarting or Resetting the Device

To restart or reset the device:

1. Open the  **Device Setting** page's default **General** tab.
2. Next to Device Reset:
 - Click **RESTART** to reboot the device.
 - Click **RESET** to restore the device to its factory defaults settings.

Device is reset.

Managing Network Settings

The **Network Settings** tab in the  **Device Settings** page controls the Ethernet port and IP settings of the WP-DEC7.

Perform the following actions:

- [Using the Service Port for P3K & Gateway Transmissions](#) on page 27.
- [Defining IP Casting Mode Setting and TTL](#) on page 28.
- [Managing TCP/UDP Ports](#) on page 28.

Using the Service Port for P3K & Gateway Transmissions

WP-DEC7 has two Ethernet ports (SERVICE 1G and MEDIA 1G). By default, all network connections are handled by MEDIA with DHCP enabled and 802.1Q disabled.

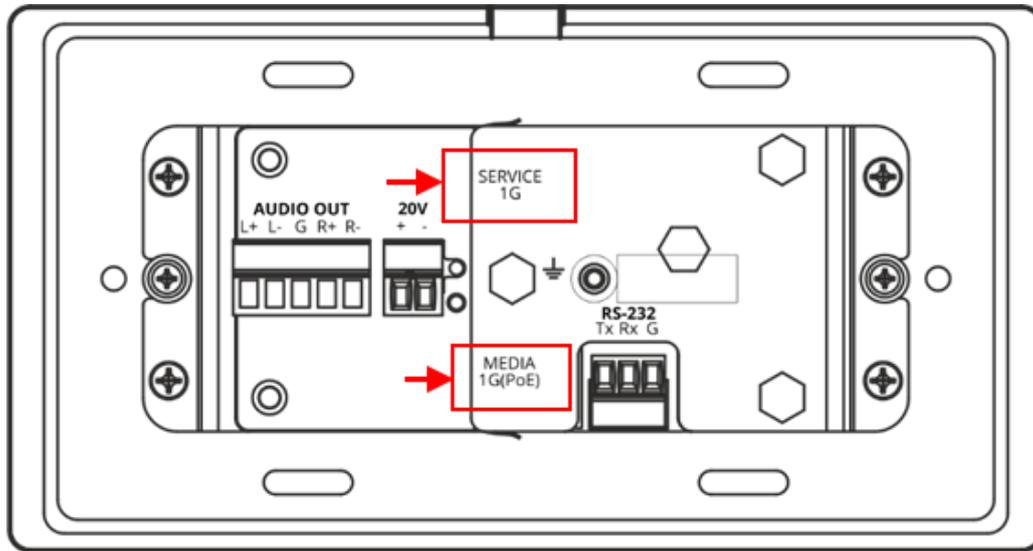
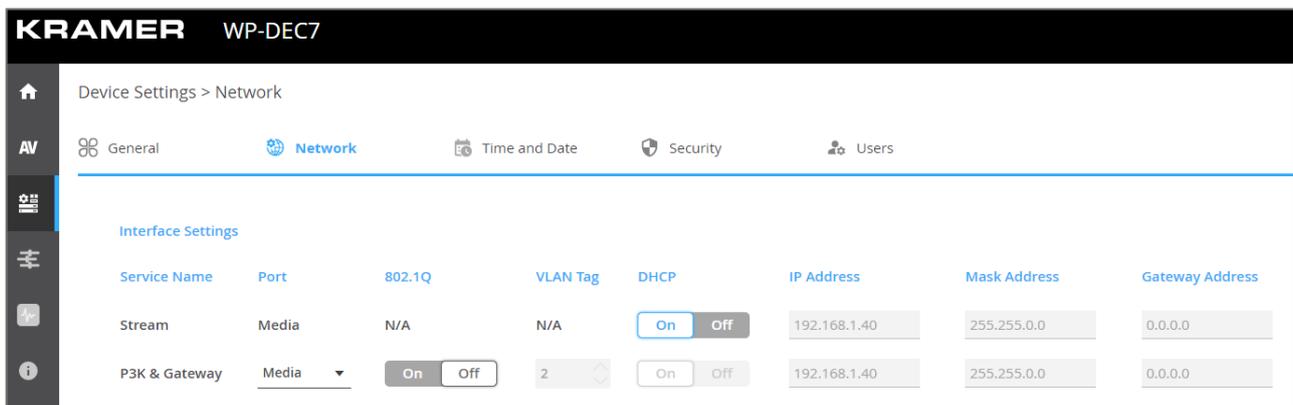


Figure 24: Ethernet ports on the Rear of the WP-DEC7

WP-DEC7 can maintain a separate IP address for P3K & Gateway traffic and receive that traffic on the Service ethernet port. Video and other types of streaming always use the MEDIA ethernet port.

To separate P3K & Gateway from the AV streams:

1. Open the  **Device Setting** page's default **General** tab.
2. Select the Network tab.



Service Name	Port	802.1Q	VLAN Tag	DHCP	IP Address	Mask Address	Gateway Address
Stream	Media	N/A	N/A	<input checked="" type="checkbox"/> On <input type="checkbox"/> Off	192.168.1.40	255.255.0.0	0.0.0.0
P3K & Gateway	Media	<input checked="" type="checkbox"/> On <input type="checkbox"/> Off	2	<input checked="" type="checkbox"/> On <input type="checkbox"/> Off	192.168.1.40	255.255.0.0	0.0.0.0

Figure 25: Device Settings Page – Network Tab

3. Change the following settings in the Interface Settings section:
 - In the Port column select **Service** and set 802.1Q to **On**.
 - In the VLAN ID column, enter an integer number (2 - 4093) for P3K & Gateway services. This separates the P3K & Gateway packets.



802.1Q and VLAN are not required for the Media port.

- If you want the P3K & Gateway port to have a static IP set DHCP to **Off** and enter a subnet mask and gateway address. If there is no valid DHCP server in the system, it will look for the random unique IP in the range of 169.254.X.Y. The allocated IP address can be seen by attaching an HDMI screen (with no streamed input).

P3K and Gateway are separated for streams.

Defining IP Casting Mode Setting and TTL

The **IP Casting Mode** is set by the Encoder. The setting on this field needs to be the same as that on the encoder:

- **Unicast** – The encoded stream is intended for this decoder alone.
- **Multicast** (default) – Any decoder can access the encoded stream.

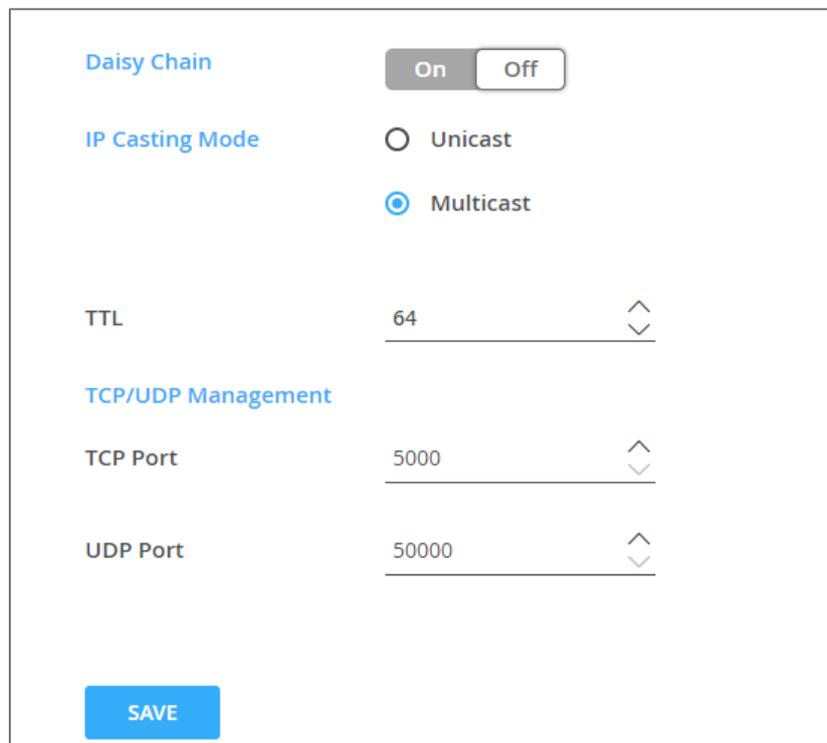
TTL (time to live) limits the lifetime of the streamed data in the computer network. It prevents the IP packet from propagating endlessly through the network. The default value is 64, which means that after 64 hops the data packet is dropped.

Managing TCP/UDP Ports

TCP and UDP are protocols that define how data is streamed. The port on which the data is received must be defined in the system.

To manage TCP/UDP ports:

- Open the  **Device Setting** page's default **Network** tab.
- Set the **TCP Port** (default value 5000) and **UDP Port** (default value 50000).



The screenshot shows the 'Port Management' section of the device settings. It includes the following controls:

- Daisy Chain:** A toggle switch currently set to 'On'.
- IP Casting Mode:** Radio buttons for 'Unicast' and 'Multicast', with 'Multicast' selected.
- TTL:** A numeric input field set to '64' with up and down arrow icons.
- TCP/UDP Management:** A section header for the port settings.
- TCP Port:** A numeric input field set to '5000' with up and down arrow icons.
- UDP Port:** A numeric input field set to '50000' with up and down arrow icons.
- SAVE:** A blue button at the bottom left of the settings area.

Figure 26: Device Settings – Port Management

The TCP and UDP ports are set.

Defining an NTP Time and Date Server

You can sync the device time and date to any server around the world.

To sync device time and date to a server:

1. In the  **Device Settings** page open the **Time and Date** tab:

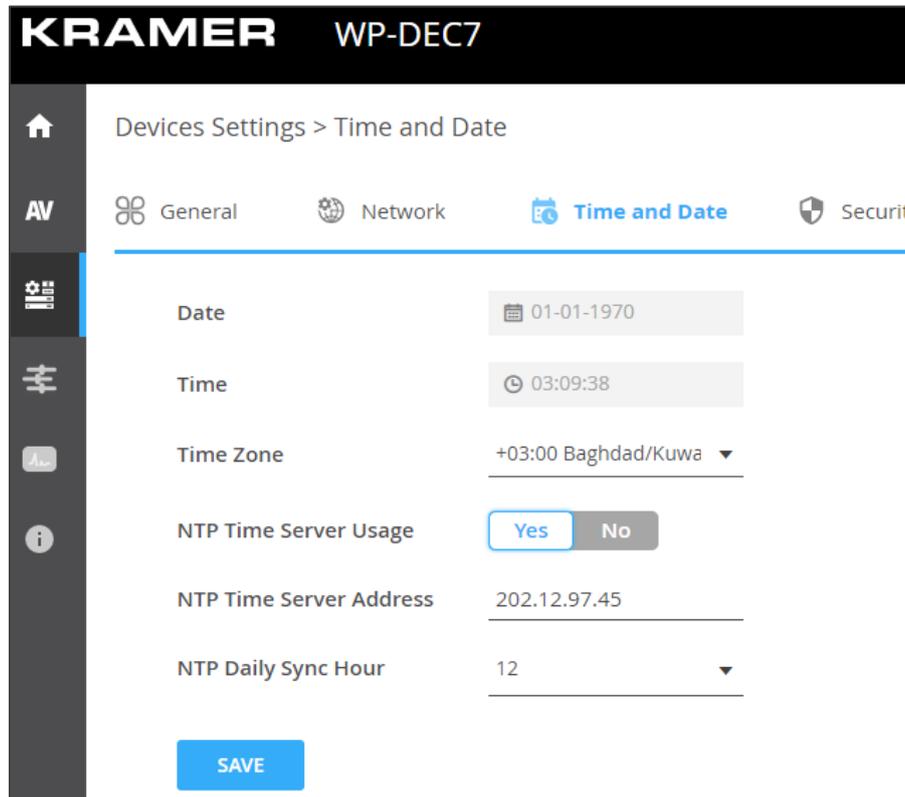


Figure 27: Device Settings – Time and Date Tab2. Set the following:

- Set **NTP Time Server Usage** to **Yes**. This enables the Time Server fields.
- Enter the **NTP Time Server Address** and the **NTP Daily Sync Hour**.

3. Click **SAVE**.

The device's date and time is synchronized to the time server.

Configuring WP-DEC7 for HTTPS and 802.1x

The  **Device Settings** page, **Security** tab configures device 802.1x authentication access to the network, and HTTPS/TLS when an encrypted connection is used on the network.

This section describes the following actions:

- [Configuring HTTPS](#) on page [30](#).
- [Defining 802.1x Authentication](#) on page [31](#).



Contact your IT administrator for the network access authentication.

Configuring HTTPS

To enable HTTPS:

1. In the  **Device Settings** page, select the **Security** tab.

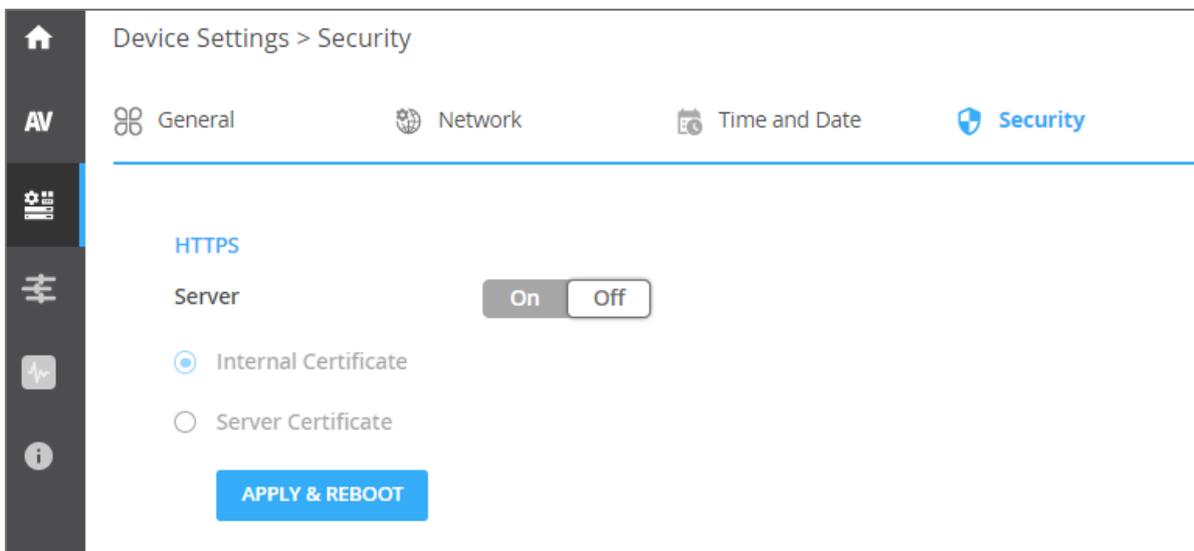


Figure 28: Device Settings – Security Tab

2. In the HTTPS area, set Server to **On** (default) to enable HTTPS authentication.

3. Select one of the following:
 - **Internal Certificate** – Uses the factory default certificate for authentication.
 - **Server Certificate** – Submits a public certificate for authentication, click  to upload the certificate and enter the private key password (usually assigned by the IT administrator).

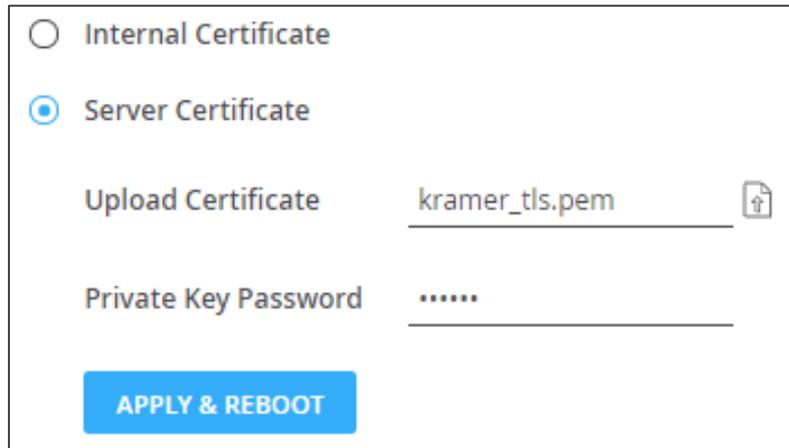


Figure 29: Security Tab – Server Certificate

4. Click **APPLY & REBOOT**.

HTTPS is enabled.

Defining 802.1x Authentication

To configure security for the device:

1. In the  **Device Settings** page, select the Security tab:
2. In the 802.1x area, click **ON** to enable 802.1x authentication service. 802.1x supports authentication based on port and MAC address.
3. Select one of the following:
 - **PEAP-MSCHAP V2** – Enter a Username (up to 24 alphanumeric characters, including “_” and “-”) and Password (up to 24 ASCII characters):

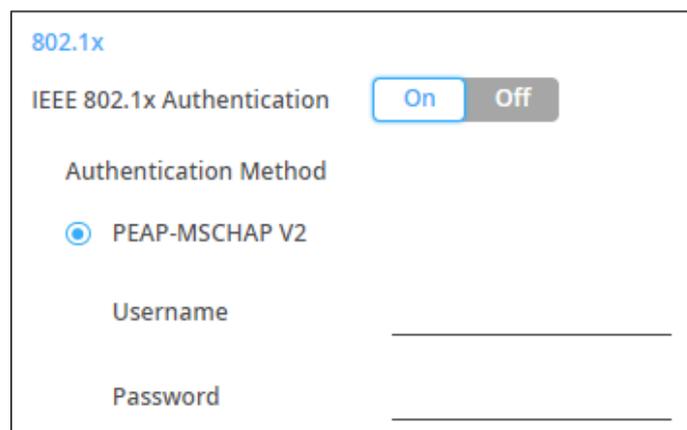


Figure 30: Security Tab – EAP-MSCHAP V2 Authentication

- **EAP-TLS** – To submit a server certificate for authentication, enter the Username and click  to upload the certificates and keys, then enter the private key password (assigned by IT administrator). Set Server Certificate **On**.

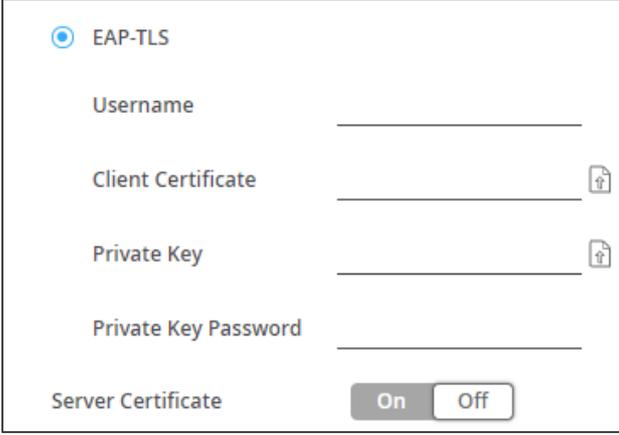


Figure 31: EAP-TLS – Certificates and Password

2. Click **APPLY**.

Security is configured.

Managing User Access

To activate logon authentication and restrict access to the Web UI, go to the **Users** tab of the  **Device Settings** menu.

The default password is **admin**; By default, security is disabled.

Enabling Password Protection

To restrict device configuration to authorized users:

1. In the  **Device Settings** page, select the **Users** tab.

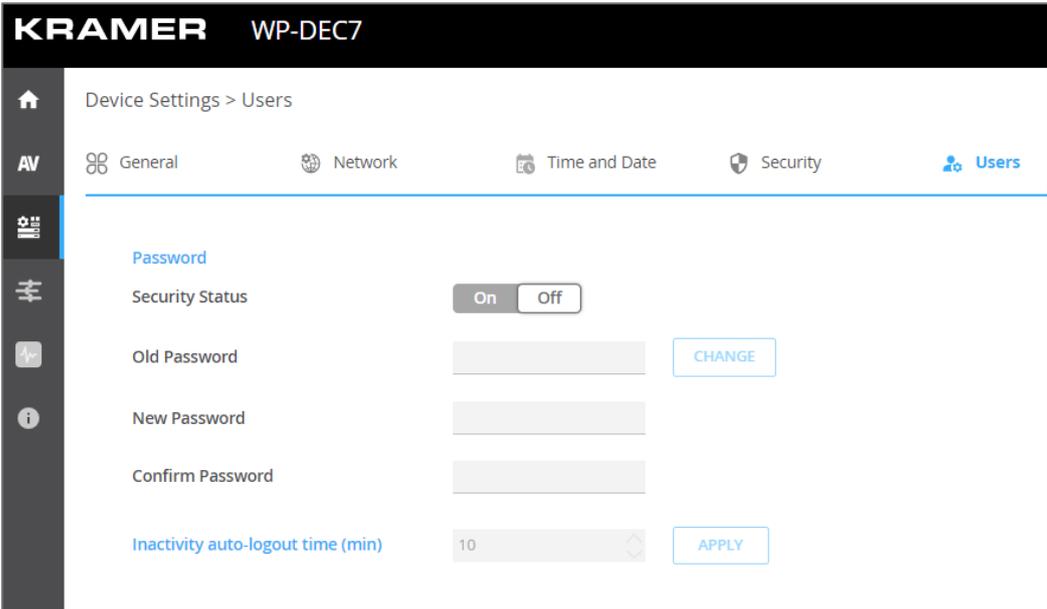


Figure 32: Device Settings – Users Tab

2. Set Security Status to **On** (Off by default). The following message appears:

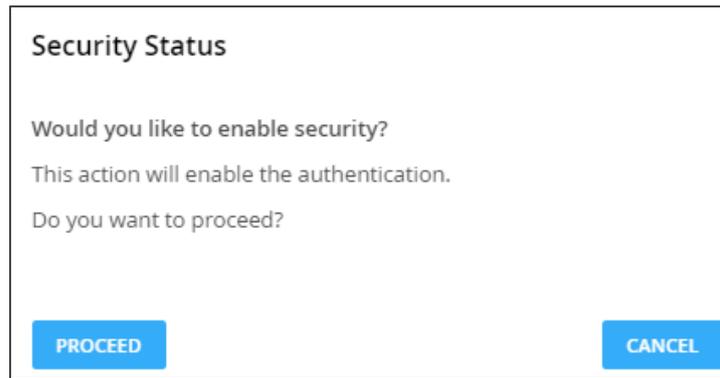


Figure 33: Security Tab – Security Status

3. Click **PROCEED** and enter a password (the default password is "admin"). Security is enabled and access requires authentication.

Password protection is active.

Setting Auto-Logout time

Set the Inactivity auto-logout time (in minutes), to cause the page to log out automatically. This option requires password-controlled access to the embedded web pages (Security Status set to On). The default password is **admin** (the user is always "admin").

To set inactivity locking:

1. Open the  **Device Settings** page, **Users** tab.
2. Set **Security Status** to On (this activates password use).
3. In the **Inactivity auto-logout time** field, enter the number of minutes to wait before activating device locking (10 minutes by default).

The device locks automatically after the set period of inactivity.

Defining WP-DEC7 Gateway Settings

The  **Control** page is used to configure CEC and/or RS-232. Remote devices connected to an encoder can use CEC or RS-232 to control or enter data to the HDMI device connected to WP-DEC7. You can perform the following actions:

- [Configuring CEC Settings](#) on page [34](#).
- [Configuring RS-232 Settings](#) on page [35](#).

Configuring CEC Settings

The WP-DEC7 can transmit CEC commands from the HDMI output device back to the CEC enabled devices connected to the encoder.

To enable CEC control commands:

1. Open the  **Control** page.

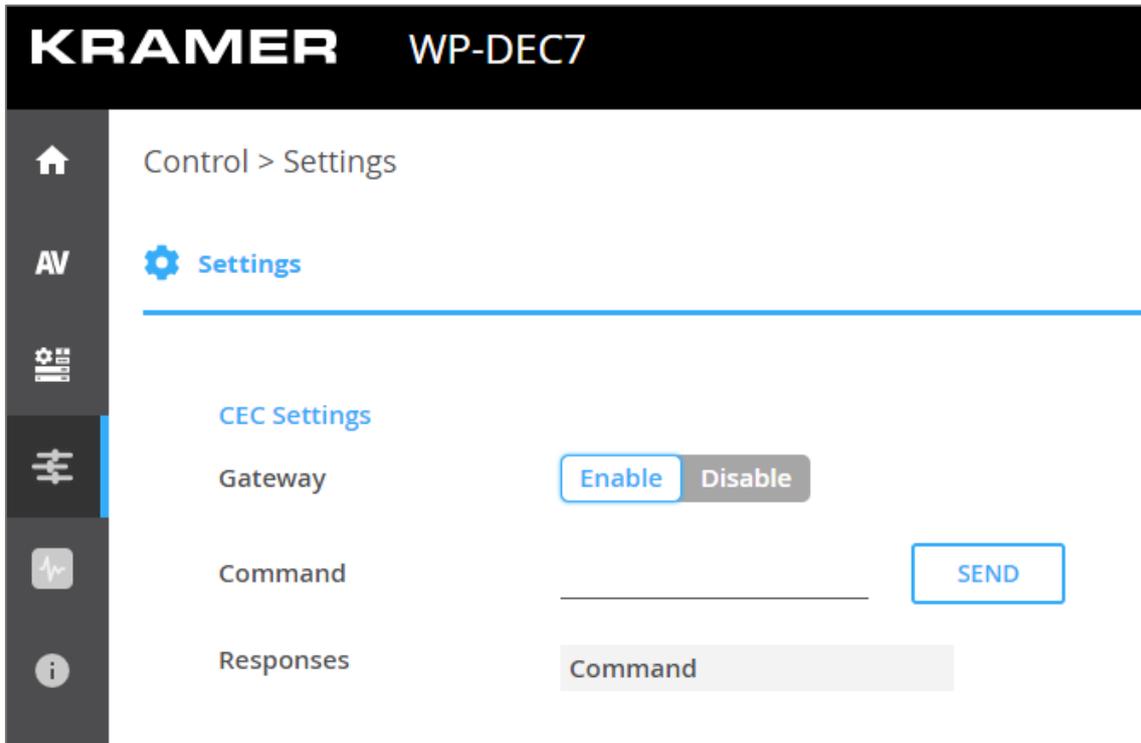


Figure 34: Control > Settings Page – CEC Settings

2. Under CEC Settings, set Gateway to **Enable**.
3. Enter the CEC command, in hex format, 32 hex digits.
4. Click **SEND**.
5. View the CEC-enabled device response.

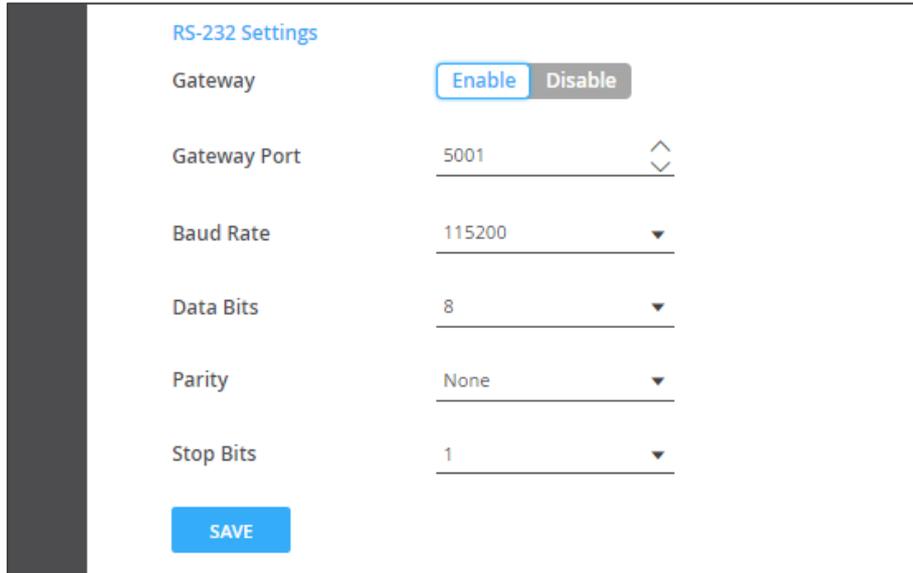
CEC Gateway is configured.

Configuring RS-232 Settings

RS-232 commands can be transmitted from remote devices, through the **WP-DEC7** to devices that are connected to the **WP-DEC7** RS-232 port.

To enable RS-232 commands:

1. Open the  **Control** page.



RS-232 Settings	
Gateway	<input checked="" type="checkbox"/> Enable <input type="checkbox"/> Disable
Gateway Port	5001 <input type="text"/>
Baud Rate	115200 <input type="text"/>
Data Bits	8 <input type="text"/>
Parity	None <input type="text"/>
Stop Bits	1 <input type="text"/>
<input type="button" value="SAVE"/>	

Figure 35: Control > Settings Page – RS-232 Settings

2. Under **RS232 Settings**, set **Gateway** to Enable.
3. Set the Gateway Port (5001, by default).
4. Enter the Baud Rate: 9600, 19200, 38400, 57600 or 115200 (default).
5. Enter the Data Bits: 5, 6, 7 or 8 (default).
6. Enter Parity: None (default), Odd or Even.
7. Enter Stop Bits: 1 (default) or 2.
8. Click **SAVE**.

RS-232 Gateway is configured.

Viewing WP-DEC7 Status

The  **Diagnostics** page, **Status** tab displays general status information for the device.

To view general status information:

1. Open the Status tab in the  **Device Setting** page.

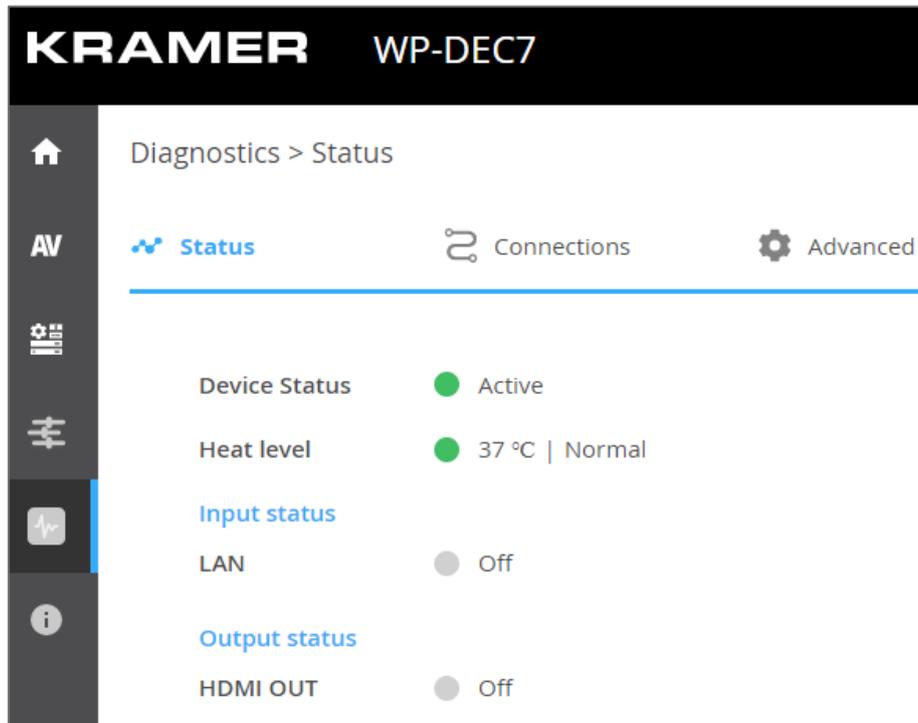


Figure 36: Diagnostics – Status Tab

2. View the Device Status:
 - Active – (green indicator) normal operation.
 - Standby – device is powered Off, booting or in standby mode (yellow indication).
3. View the Heat level:
 - Normal – (green indicator), temperature under 45°C.
 - High – (orange indicator), temperature between 45°C and 60°C.
 - Overheat – (red indicator), temperature higher than 60°C.
4. View the LAN input status:
 - On – (green indicator) input is transmitting a valid signal.
 - Off – (gray indicator) no input or no valid signal.
5. View the HDMI OUT status:
 - On – (green indicator) output is transmitting a signal.
 - Off – (gray indicator) no output.

General status information is viewed.

Viewing WP-DEC7 Connections Status

The Connections tab in the  **Diagnostics** page shows the device connections status.

To view the connections status:

1. Open the Connections tab in the  **Diagnostics** page.

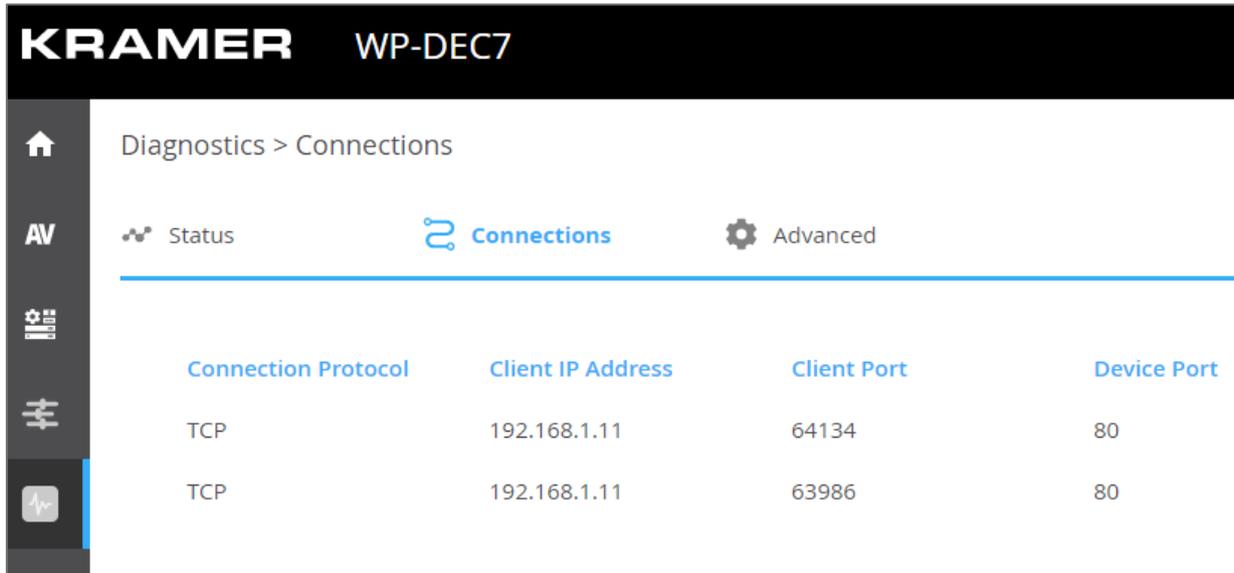


Figure 37: Diagnostics – Connections Tab

2. View the Connections protocol type, client IP address, client port, and the device (**WP-DEC7**) port.

Connections status is viewed.

Viewing the WP-DEC7 Logs

View the system log and gateway messages counter.

To view the log and a count of RS-232 and CEC messages:

1. Open the  **Diagnostics page**, Advanced tab.

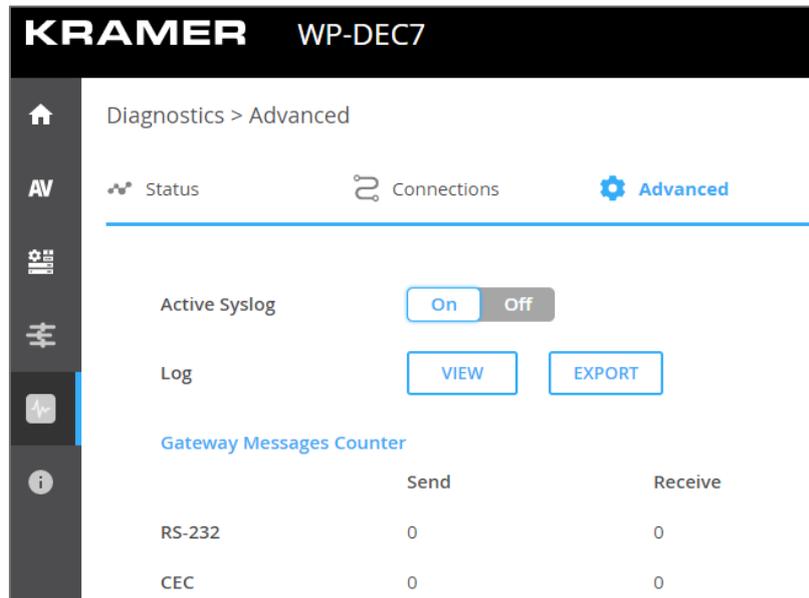


Figure 38: Diagnostics – Advanced Tab

2. To activate the log:
 - **On**, enables the WP-DEC7 system log.
 - **Off** (default), disables the system log.
3. Click **VIEW** to view the system log on the screen.
4. Click **EXPORT** to copy the system log to a (.txt) file.
5. To view a count of the RS-232 or CEC messages, see the **Gateway Messages Counter**: This shows the number of sent and received RS-232 and CEC messages.

You have viewed the log and gateway message counter.

Viewing the About Page

The  **About** page shows the model number, hardware release, firmware version and Kramer Electronics Ltd details.

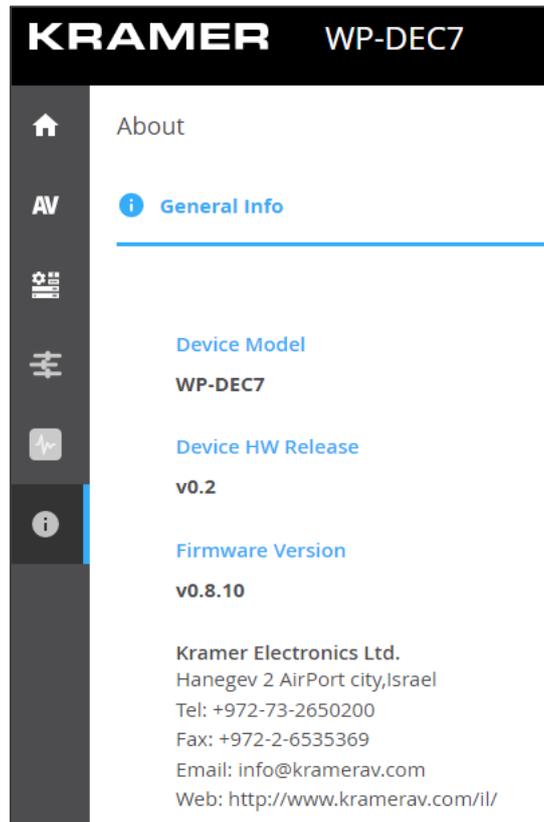


Figure 39: About Page

Fast Switching

Fast switching makes it simple to switch between different encoders and decoders. Before setting devices to fast switching, make sure the network components are correctly configured.

To set the devices properly:

1. Ensure the system devices (**WP-DEC7** and encoder) and PC are all connected to the same Network.
2. Power all the devices in the system.
3. Configure the Network switch as follows:
 - Jumbo Frames – On. (at least 8000 bytes).
 - IGMP Snooping – On.
 - IGMP Querier – On.
 - IGMP Immediate/Fast Leave – On.
 - Unregistered Multicast Filtering – On.
4. Make sure that the PC sub-Network is the same as the system devices.

Fast switching configuration

To configure fast switching:

1. Access the various encoders' and decoders' web pages.
2. For each encoder, in the AV Routing page, set a unique Channel ID and Channel Name.

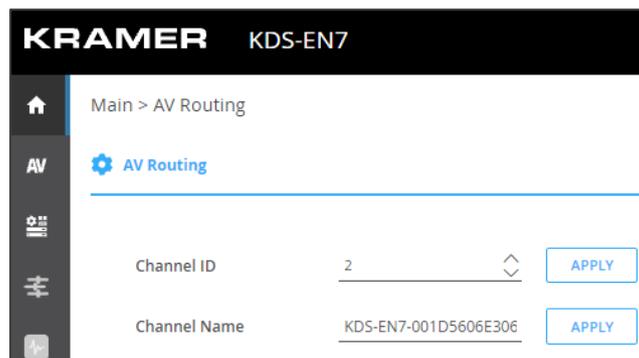


Figure 40: Setting Channel ID and Name on the Encoder Device

3. To configure fast switching between different encoders, the following settings need to be identical on the input sources:
 - **HDCP Encryption**
 - **Resolution and Refresh rate**
4. The following settings needs to be uniform on all the encoders and on the decoder:
 - **Maximum Resolution** (set on the **AV Settings** page).

Fast switching is configured.

Upgrading Firmware

Upgrade the firmware, view the date of the last upgrade, or rollback to the previous firmware revision in case of a problem.



Click **ROLLBACK** to update to the previous FW version.



If the device firmware version is lower than 0.6.3, contact Kramer tech support team at support@kramerav.com or go to our Web site at k.kramerav.com/support/downloads.asp.

To upgrade the firmware:

1. In the Navigation pane, Select **Device Settings**. The General tab in the Device Settings page appears.

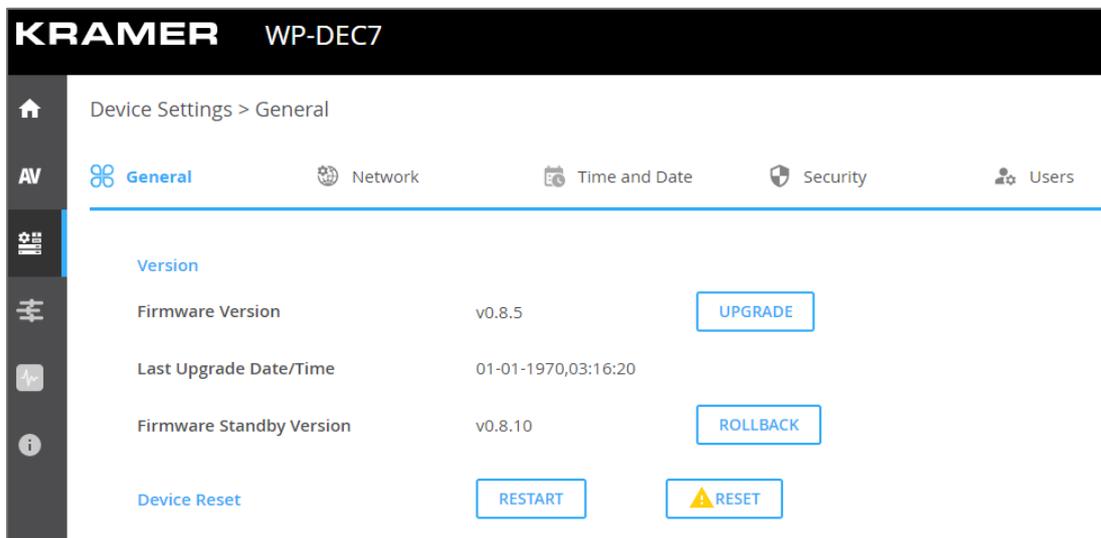


Figure 41: General Tab – Upgrading the Firmware

2. Next to Firmware Version, click **UPGRADE**. The Open window appears.
3. Select the firmware file and click **Open**. The firmware upgrade pop-up window appears. Wait for upgrade completion.
4. Once completed, refresh the web page and log-in.

Firmware upgrade is complete.

Technical Specifications

Outputs	1 HDMI	On a female HDMI connector
Ports	2 Ethernet	On RJ-45 female connectors
	1 Balanced Audio	On a 5-pin terminal block connector
	1 RS-232	On a 3-pin terminal block connector
Video	Compression Standard	JPEG based, private stream
	Max Resolution	4K@60Hz (4:2:0)
User Interface	Indicators	HDMI and ON LEDs, front panel LCD Display
	Recessed Buttons	CH+/CH- and factory reset
	Controls	Embedded web pages, P3K API commands via Ethernet
Power	Consumption	12V DC, 280mA
	Source	20V DC, 1A (optional, purchased separately)
Environmental Conditions	Operating Temperature	0° to +45°C (32° to 113°F)
	Storage Temperature	-20° to +70°C (-4° to 158°F)
	Humidity	10% to 90%, RHL non-condensing
Regulatory Compliance	Safety	CE, FCC
	Environmental	RoHs, WEEE
Enclosure	Size	2 Gang
	Type	Metal (SGCC)
	Cooling	Convection Ventilation
General	Net Dimensions (W, D, H)	US: 12.1cm x 4.56cm x 12.1cm (4.8" x 1.8" x 4.8") EU, UK: 15.1cm x 4.56cm x 8.6cm (5.9" x 1.8" x 3.4")
	Shipping Dimensions (W, D, H)	US: 20cm x 13.7cm x 7.5cm (7.9" x 5.4" x 2.95") EU, UK: 23.8cm x 13.7cm x 7.5cm (9.4" x 5.4" x 2.95")
	Net Weight	US, EU, UK: 0.4kg (0.9lbs) approx.
	Shipping Weight	US: 0.6kg (1.3lbs) approx. EU, UK: 0.65kg (1.4lbs) approx.
Specifications are subject to change without notice at www.kramerav.com		

Default Communication Parameters

P3K	
Example (stop encoder decoder activity)	#WP-ACTION 0<CR>
Ethernet	
To reset the IP settings to the factory reset values go to: Menu->Setup -> Factory Reset-> press Enter to confirm	
DHCP	Default
IP Address:	192.168.1.40
Subnet mask:	255.255.0.0
Default gateway:	0.0.0.0
TCP Port #:	5000
UDP Port #:	50000
Default username:	admin
Default password:	admin
Full Factory Reset	
Embedded web pages	Device Settings > General > RESET
Front panel recessed buttons	Press the RESET button for 10 seconds

Default Parameters

Page Name	Tab Name	Fields	Editable Field	Exportable Field	Default Values	
Main	AV Routing	Channel ID	Yes	Yes	1	
		Channel Name	Yes	Yes	ch_001	
		Volume	Yes	Yes	80	
		Mute	Yes	Yes	Off	
		Play/Stop	Yes	Yes	Play	
	OSD Configuration	Menu Timeout (sec)	Yes	Yes	30	
		Channels per Page	Yes	Yes	5	
		Maximum Channels	Yes	Yes	999	
		Channel List	Yes	Yes	50 items display	
		Display Device Information	Yes	Yes	Off	
		Device Information Timeout(min)	Yes	Yes	2	
		Video Wall	Horizontal	Yes	Yes	1
	Vertical		Yes	Yes	1	
	Stretch Type		Yes	Yes	Fit In	
	Video Rotation		Yes	Yes	0	
	Viewable Width		Yes	Yes	0	
	Outside Width		Yes	Yes	0	
	Viewable Height		Yes	Yes	0	
	Outside Height		Yes	Yes	0	
	Video Wall Test		Yes	Yes	Stop	
	Overlay	Image	Yes	Yes	logo.png	
		Image Settings Align	Yes	Yes	Top Center	
		Image Settings Transparency%	Yes	Yes	50	
		Image Settings Show	Yes	Yes	Unchecked	
		Text Settings Text	Yes	Yes	Hello KRAMER	
		Text Settings Size	Yes	Yes	Small	
		Text Settings Align	Yes	Yes	Top Center	
		Text Settings Color	Yes	Yes	#ffffff	
		Text Settings Transparency%	Yes	Yes	50	
		Text Settings Show	Yes	Yes	Unchecked	
		AV Settings	Video	Maximum Resolution	Yes	Yes
	Sleep (5V-off) Delay On Video Signal Loss (sec)			Yes	Yes	0
	Shutdown (CEC) Delay On Video Signal Loss (sec)			Yes	Yes	0
Wake-up (CEC) Delay On Video Signal Detection (sec)	Yes			Yes	0	
Force RGB	Yes			Yes	Checked	
Device Settings	General	Host Name	Yes	Yes	WP-DEC7-xxxxxxxxxxxx ("xxxxxxxxxxxx" is the device's MAC address)	
		Front Panel Lock	Yes	Yes	Off	
		Import/Export Device Settings	Yes	Yes	All including IP	
		Front Panel Lock	Yes	Yes	Off	
	Network	Stream Port	No	Yes	Media	
		Stream 802.1Q	No	Yes	N/A	
		Stream VLAN Tag	No	Yes	N/A	
		Stream DHCP	Yes	Yes	On	
		P3K & Gateway Port	Yes	Yes	Media	
		P3K & Gateway 802.1Q	Yes	Yes	Off	
		P3K & Gateway VLAN Tag	Yes	Yes	N/A	
		P3K & Gateway DHCP	Yes	Yes	N/A	
		Daisy Chain	Yes	Yes	Off	
		IP Casting Mode	Yes	Yes	Multicast	
		TTL	Yes	Yes	64	
TCP Port	Yes	Yes	5,000			
UDP Port	Yes	Yes	50,000			

Page Name	Tab Name	Fields	Editable Field	Exportable Field	Default Values
	Time and Date	Date	Yes	Yes	01-01-1970
		Time	Yes	Yes	N/A
		Time Zone	Yes	Yes	00:00 Greenwich
		NTP Time Server Usage	Yes	Yes	No
		NTP Time Server Address	Yes	Yes	N/A
		NTP Daily Sync Hour	Yes	Yes	N/A
	Security	HTTPS Server	Yes	Yes	On; Internal Certificate
		IEE 802.1x Authentication	Yes	Yes	Off
		Server Certificate	Yes	Yes	Off
	Users	Security Status	Yes	Yes	Off
		Inactivity auto-logout time	Yes	Yes	10
Control	Settings	CEC Gateway	Yes	Yes	Enable
		RS232 Gateway	Yes	Yes	Enable
		RS232 Port	Yes	Yes	5001
		RS232 Baud rate	Yes	Yes	115200
		RS232 Data Bits	Yes	Yes	8
		Parity	Yes	Yes	None
		Stop Bits	Yes	Yes	1
Diagnostics	Advanced	Active Syslog	Yes	Yes	Off

Protocol 3000

Kramer devices can be operated using Kramer Protocol 3000 commands sent via serial or Ethernet ports.

Understanding Protocol 3000

Protocol 3000 commands are a sequence of ASCII letters, structured according to the following.

- **Command format:**

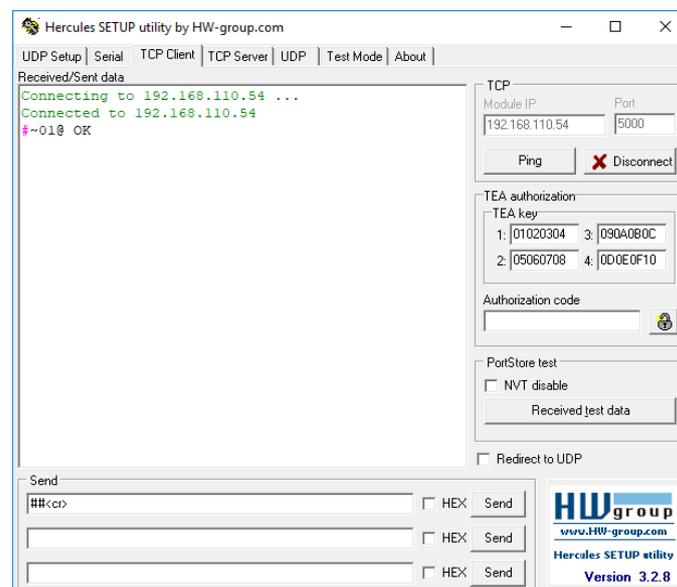
Prefix	Command Name	Constant (Space)	Parameter(s)	Suffix
#	Command	_	Parameter	<CR>

- **Feedback format:**

Prefix	Device ID	Constant	Command Name	Parameter(s)	Suffix
~	nn	@	Command	Parameter	<CR><LF>

- **Command parameters** – Multiple parameters must be separated by a comma (,). In addition, multiple parameters can be grouped as a single parameter using brackets ([and]).
- **Command chain separator character** – Multiple commands can be chained in the same string. Each command is delimited by a pipe character (|).
- **Parameters attributes** – Parameters may contain multiple attributes. Attributes are indicated with pointy brackets (<...>) and must be separated by a period (.).

The command framing varies according to how you interface with **WP-DEC7**. The following figure displays how the # command is framed using terminal communication software (such as Hercules):



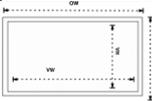
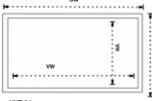
Protocol 3000 Commands

Function	Description	Syntax	Response	Parameters/Attributes	Example
#	Protocol handshaking. NOTE: Validates the Protocol 3000 connection and gets the machine number. Step-in master products use this command to identify the availability of a device.	#<CR>	~nn@_OK<CR><LF>		#<CR>
BEACON-EN	Set beacon rate.	#BEACON-EN_port_id, status,rate<CR>	~nn@BEACON-EN_port_id, status,rate<CR><LF>	port_id – ID of the Ethernet port, and must be same as KDS-GW-ETH's netw_id 0 – Media Port 1 – Service Port status – Enable/Disable beacon 0 – Disable (default) 1 – Enable rate – Repetition rate in seconds 1 – 1 second (minimum) 10 – 10 seconds (default) 1800 – 30 minutes (maximum)	Set beacon information: #BEACON-EN,0,1,10<CR>
#BEACON-EN?	Get beacon rate.	#BEACON-EN?<CR>	~nn@BEACON-EN_port_id, status,rate<CR><LF>	port_id – ID of the Ethernet port, and must be same as KDS-GW-ETH's netw_id 0 – Media Port 1 – Service Port status – Enable/Disable beacon 0 – Disable (default) 1 – Enable rate – Repetition rate in seconds 1 – 1 second (minimum) 10 – 10 seconds (default) 1800 – 30 minutes (maximum)	Get beacon information: #BEACON-EN?<CR>
BEACON-INFO?	Get beacon information, including IP address, UDP control port, TCP control port, MAC address, model, name. NOTE: + There is no Set command. Get command initiates a notification. + 'port_id' must be same as 'KDS-GW-ETH' used	#BEACON-INFO? port_id<CR>	~nn@BEACON-INFO_port_id, ip_string, udp_port, tcp_port, mac_address, model, name<CR><LF>	port_id – ID of the Ethernet port 0 – Media Port 1 – Service Port ip_string – Dot-separated representation of the IP address udp_port – UDP control port tcp_port – TCP control port mac_address – Dash-separated mac address model – Device model name – Device name	Get beacon information: #BEACON-INFO?,0<CR>
BUILD-DATE?	Get device build date	#BUILD-DATE?<CR>	~nn@BUILD-DATE_date, time<CR><LF>	date – Format: YYYY/MM/DD time – Format: hh:mm:ss	Get the device build date: #BUILD-DATE?<CR>
CEC-GW-PORT-ACTIVE	Set CEC Gateway mode - Whether CEC commands coming from HDMI stream to LAN	#CEC-GW-PORT-ACTIVE gw_mode<CR>	~nn@CEC-GW-PORT-ACTIVE_gw_mode<CR><LF>	gw_mode: 0 – CEC Passthrough mode 1 – CEC Gateway mode – command to be sent to HDMI Input. 2 – CEC Gateway mode – command to be sent to HDMI Output	Set CEC Gateway mode: #CEC-GW-PORT-ACTIVE 1<CR>
CEC-GW-PORT-ACTIVE?	Get CEC Gateway mode - Whether CEC commands coming from HDMI stream to LAN	#CEC-GW-PORT-ACTIVE?<CR>	~nn@CEC-GW-PORT-ACTIVE_gw_mode<CR><LF>	gw_mode: 0 – CEC Passthrough mode 1 – CEC Gateway mode – command to be sent to HDMI Input. 2 – CEC Gateway mode – command to be sent to HDMI Output.	Get CEC Gateway mode: #CEC-GW-PORT-ACTIVE?<CR>
CEC-NTFY	Notify about CEC command retrieved from bus. NOTE: Notification is sent to all com ports upon CEC message retrieval from CEC bus	N/A	~nn@CEC-NTFY_port_index, len,<cec_command...><CR><LF>	port_index – CEC port notifying the command len – 1–16 cec_command – CEC format command (in HEX format, no leading zeros, no '0x' prefix)	Notify about CEC command retrieved from bus.: ~01@CEC-NTFY 1,2,0F36<CR>
CEC-SND	Send CEC command to port.	#CEC-SND_port_index, sn_id, cmd_name, cec_len, cec_command<CR>	~nn@CEC-SND_port_index, sn_id, cmd_name, cec_mode<CR><LF>	port_index – CEC port transmitting the command (1 – number of ports) sn_id – serial number of command for flow control and response commands from device cmd_name – command name cec_len – 1–16 cec_command – CEC format command (in HEX format, no leading zeros, no '0x' prefix) cec_mode – CEC mode 0 – Sent (Only support Sent, other error feedback with common P3K error code)	Send CEC command to port: #CEC-SND_1,1,1,2, E004<CR>
COM-ROUTE-ADD	Add a communication route tunnel connection	#COM-ROUTE-ADD com_id, port_type, port_id, eth_rep_en, timeout<CR>	~nn@COM-ROUTE-ADD com_id, port_type, port_id, eth_rep_en, timeout<CR><LF>	com_id – Machine dependent (number of ports, only 1 accepted) port_type – TCP/UDP 0 – TCP port_id –port number (5000 to 5999) eth_rep_en – Ethernet Reply 0 – COM port does not send replies to new clients 1 – COM port sends replies to new clients. timeout – Keep alive timeout in seconds (1 to 3600)	Add a communication route tunnel connection: #COM-ROUTE-ADD 1,0,5001,1,1,<CR>

Function	Description	Syntax	Response	Parameters/Attributes	Example
COM-ROUTE-REMOVE	Remove a communication route tunnel connection.	#COM-ROUTE-REMOVE com_id<CR>	~nn@COM-ROUTE-REMOVE com_id<CR><LF>	com_id – Machine dependent (number of ports, only 1 accepted)	Remove a communication route tunnel connection: #COM-ROUTE-REMOVE 1<CR>
COM-ROUTE?	Get communication route tunnel connection state	#COM-ROUTE? com_id<CR>	~nn@COM-ROUTE_com_id, port_type, port_id, eth_rep_en, timeout<CR><LF>	com_id – Machine dependent (number of ports, only 1 accepted), * (get all route tunnels) port_type – TCP/UDP 0 – TCP 1 – UDP port_id – TCP/UDP port number eth_rep_en – Ethernet Reply 0 – COM port does not send replies to new clients 1 – COM port sends replies to new clients. timeout – Keep alive timeout in seconds (1 to 3600)	Get tunneling port routing for all route tunnels: #COM-ROUTE?_1<CR>
CS-CONVERT	Set the "force RGB color space" convert mode.	#CS-CONVERT_out_index, cs_mode<CR>	~nn@CS-CONVERT out_index, cs_mode<CR><LF>	out_index – Number that indicates the specific output: 1-N (N= the total number of outputs) cs_mode – Index in resolution table: 0 – Color space pass (default) 1 – Enable "force RGB color space" convert mode	Enable "force RGB color space" convert mode for channel 1: #CS-CONVERT_1,1<CR>
CS-CONVERT?	Get the "force RGB color space" convert mode.	#CS-CONVERT? out_index<CR>	~nn@CS-CONVERT out_index, cs_mode<CR><LF>	out_index – Number that indicates the specific output: 1-N (N= the total number of outputs) cs_mode – Index in resolution table: 0 – Color space pass (default) 1 – Enable "force RGB color space" convert mode	Get the "force RGB color space" convert mode status for channel 1: #CS-CONVERT?_1<CR>
ETH-PORT	Set Ethernet port protocol. NOTE: If the port number you enter is already in use, an error is returned. The port number must be within the following range: 0-(2 ¹⁶ -1).	#ETH-PORT_port_type, port_id<CR>	~nn@ETH-PORT_port_type, port_id<CR><LF>	port_type: – TCP – UDP port_id – when port_type = TCP: 5000-5099 when port_type = UDP: 50000-50999	Set the Ethernet port protocol for TCP to port 5000: #ETH-PORT_TCP,5000<CR>
ETH-PORT?	Get Ethernet port protocol.	#ETH-PORT? port_type<CR>	~nn@ETH-PORT_port_type, port_id<CR><LF>	port_type: – TCP – UDP port_id – when port_type = TCP: 5000-5099 when port_type = UDP: 50000-50999	Get the Ethernet port protocol for TCP: #ETH-PORT_TCP<CR>
ETH-TUNNEL?	Get an open tunnel's parameters.	#ETH-TUNNEL? tunnel_id<CR>	~nn@ETH-TUNNEL [[tunnel_id,com_id,port_type,p ort_id,eth_ip,remote_port_id,et h_rep_en,connection_type],...] <CR><LF>	tunnel_id – Tunnel ID number, * (get all open tunnels) com_id – Machine dependent 1 – First COM Port port_type – TCP/UDP 0 – TCP port_id – TCP/UDP port number eth_ip – Client IP address remote_port_id – Remote port number eth_rep_en – Ethernet Reply 0 – COM port does not send replies to new clients 1 – COM port sends replies to new clients connection_type – Connection type 1 – wired connection	Get all open tunnel parameters: #ETH-TUNNEL?_1<CR>
FACTORY	Reset device to factory default configuration NOTE: This command deletes all user data from the device. The deletion can take some time. Your device may require powering off and powering on for the changes to take effect.	#FACTORY<CR>	~nn@FACTORY_ok<CR><LF>		Reset the device to factory default configuration: #FACTORY<CR>
GTW-MSG-NUM?	Get Control Gateway Messages Counter from the device boot done. Add Recv_Count and Send_Count NOTE: <date> is a legacy parameter and is ignored.	#GTW-MSG-NUM? message_type, date<CR>	~nn@GTW-MSG-NUM message_type, date, recv_counter, send_count<CR><LF>	message_type - 1 = CEC 2 = IR 3 = RS232 date – Format: DD-MM-YYYY. Recv_counter – counter of receive messages Send_counter – counter of send messages	Get Control Gateway Messages Counter from certain period #GTW-MSG-NUM?_1,01-01-1970<CR>
HDCP-STAT?	Get HDCP signal status. NOTE: io_mode = 1 – get the HDCP signal status of the sink device connected to the specified output. io_mode = 0 – get the HDCP signal status of the source device connected to the specified input.	#HDCP-STAT?_io_mode, in_index<CR>	~nn@HDCP-STAT_io_mode, io_index, status<CR><LF>	io_mode – Input/Output 0 – Input 1 – Output io_index – Number that indicates the specific number of inputs or outputs (based on io_mode): 1-N (N=total number of inputs or outputs) status – Signal encryption status - valid values On/Off 0 – HDCP Off 1 – HDCP On	Get the output HDCP-STATUS of IN 1: #HDCP-STAT?_0,1<CR>

Function	Description	Syntax	Response	Parameters/Attributes	Example
HELP	Get command list or help for specific command.	#HELP<CR>	1. Multi-line: ~nn@Device_cmd_name, cmd_name<CR><LF>	cmd_name – Name of a specific command	Get the command list: #HELP<CR>
HW-TEMP?	Get device heat	#HW-TEMP? mode<CR>	~nn@HW-TEMP_region_id, temperature<CR><LF>	mode – Celsius or Fahrenheit 0 – Celsius 1 – Fahrenheit temperature – Temperature of the region, rounded down to the closest integer	Get temperature in Celsius of first CPU #HW-TEMP?_0,0<CR>
HW-VERSION?	Get hardware version	#HW-VERSION?<CR>	~nn@HW-VERSION hardware_version<CR><LF>	hardware_version – XX.XX.XXXX where the digit groups are: major. minor. version	Get hardware version #HW-VERSION?<CR>
IDV	Set visual indication from device. NOTE: Using this command, some devices can light a sequence of buttons or LEDs to allow identification of a specific device from similar devices.	#IDV<CR>	~nn@IDV_ok<CR><LF>		#IDV<CR>
KDS-ACTION	Set action to perform by encoder/decoder.	#KDS-ACTION kds_mode<CR>	~nn@KDS-ACTION kds_mode<CR><LF>	kds_mode – Action (state) for encoder/decoder 0 – Stop 1 – Play 2 – Save config	Stop the encoder/decoder: #KDS-ACTION_0<CR>
KDS-ACTION?	Get last action (state) performed by encoder/decoder.	#KDS-ACTION?<CR>	~nn@KDS-ACTION kds_mode<CR><LF>	kds_mode – Action (state) for encoder/decoder 0 – Stop 1 – Play 2 – Save config	Get the last action performed by the encoder/decoder: #KDS-ACTION?<CR>
KDS-CHANNEL-SELECT	Set decoder AV or IR channel. Add signal_type	#KDS-CHANNEL-SELECT [signal_type_1, signal_type_2...], ch_id<CR>	~nn@KDS-CHANNEL-SELECT [signal_type_1, signal_type_2...], ch_id<CR><LF>	<signal_type> – Signal ID attribute: VIDEO AUDIO RS232 CEC ch_id – Number that indicates the specific input 0-999. 0 is to cancel the channel select.	Tune the decoder to ch_id 1 #KDS-CHANNEL-SELECT [video,audio,rs232,ir,usb,cec], 1<CR>
KDS-CHANNEL-SELECT?	Get decoder AV or IR channel.. Add signal_type	#KDS-CHANNEL-SELECT? signal_type<CR>	~nn@KDS-CHANNEL-SELECT signal_type, ch_id<CR><LF>	<signal_type> – Signal ID attribute: VIDEO AUDIO RS232 CEC ch_id – Number that indicates the specific input 0-999. 0 cancels the channel selection.	Get channel ID #KDS-CHANNEL-SELECT? video<CR>
KDS-DAISY-CHAIN	Set daisy chain mode.	#KDS-DAISY-CHAIN daisy_mode<CR>	~nn@KDS-DAISY-CHAIN daisy_mode<CR><LF>	daisy_mode 0 – OFF (disables daisy chain) 1 – ON (enables daisy chain)	Enable DAISY mode #KDS-DAISY-CHAIN_1<CR>
KDS-DAISY-CHAIN?	Get daisy chain mode.	#KDS-DAISY-CHAIN?<CR>	~nn@KDS-DAISY-CHAIN daisy_mode<CR><LF>	daisy_mode 0 – OFF (disables daisy chain) 1 – ON (enables daisy chain)	Get DAISY mode #KDS-DAISY-CHAIN?<CR>
KDS-GW-ETH	Set gateway network port	#KDS-GW-ETH_gw_type, netw_id<CR>	~nn@KDS-GW-ETH_gw_type ,netw_id<CR><LF>	gw_type: 0 – Control netw_id – Network ID–the device network interface (if there are more than one): 0 – Media Port 1 – Service Port	Set control port to eth1 #KDS-GW-ETH_0,1<CR>
KDS-GW-ETH?	Get gateway network port.	#KDS-GW-ETH? gw_type<CR>	~nn@KDS-GW-ETH_gw_type, netw_id<CR><LF>	gw_type: 0 – Control netw_id – Network ID–the device network interface (if there are more than one). 0 – Media Port 1 – Service Port	Get Control port #KDS-GW-ETH?_0<CR>
KDS-METHOD	Set unicast / multicast . Add Set Command ; Add Multicast	#KDS-METHOD_1<CR>	~nn@KDS-METHOD method<CR><LF>	method – Streaming method – 1 Unicast 2 Multicast	Set current streaming method of encoder/decoder: #KDS-METHOD_1<CR>
KDS-METHOD?	Get unicast / multicast Add Multicast.	#KDS-METHOD?<CR>	~nn@KDS-METHOD method<CR><LF>	method – Streaming method 1 – Unicast 2 – Multicast	Get current streaming method of encoder/decoder: #KDS-METHOD<CR>
KDS-MULTICAST	Set multicast group address and TTL value.	#KDS-MULTICAST group_ip, ttl<CR>	~nn@KDS-MULTICAST group_ip, ttl<CR><LF>	group-ip – Multicast group IP is ignored. ttl - Time to Live of the streamed packets.	Set multicast group address and TTL value #KDS-MULTICAST 0.0.0.64<CR>
KDS-MULTICAST?	Get multicast group address and TTL value.	#KDS-MULTICAST?<CR>	~nn@KDS-MULTICAST group_ip, ttl<CR><LF>	group-ip – Multicast group IP is ignored, so the response is always 0.0.0.0 ttl - Time to Live of the streamed packets.	Get multicast group address and TTL value #KDS-MULTICAST?<CR>
KDS-OSD-DISPLAY	Set decoder OSD display.	#KDS-OSD-DISPLAY mode<CR>	~nn@KDS-OSD_DISPLAY mode<CR><LF>	osd mode 0 – off 1 – on 2 – display now + on	Set OSD Display mode on #KDS-OSD-DISPLAY_1<CR>
KDS-OSD-DISPLAY?	Get decoder OSD display status.	#KDS-OSD-DISPLAY?<CR>	~nn@KDS-OSD_DISPLAY mode<CR><LF>	osd mode { 0 – off 1 – on }	Get OSD display mode #KDS-OSD-DISPLAY?<CR>
KDS-RATIO?	Get aspect ratio.	#KDS-RATIO?<CR>	~nn@KDS-RATIO value<CR><LF>	value – Streamer Decoder Aspect Ratio width:height, for example "16:9"	Get Aspect Ratio #KDS-RATIO?<CR>

RDS-RESOL?	Get actual AV stream resolution.	#KDS-RESOL?_jo_mode, io_index, is_native<CR>	~nn@KDS-RESOL?_jo_mode, io_index, is_native, resolution<CR><LF>	io_mode – Input/Output 0 – Input 1 – Output io_index – Number that indicates the specific input or output port: 1-N (N= the total number of input or output ports) is_native – Native resolution flag 0 – Off 1 – On resolution – Resolution index 0=No Signal 1=640x480p@59.94Hz/60Hz 2=720x480p@59.94Hz/60Hz 3=(Reserved) 4=1280x720p@59.94Hz/60Hz 5=1920x1080i@59.94Hz/60Hz 6=720(1440)x480i@59.94Hz/60Hz 7-15=(Reserved) 16=1920x1080p@59.94Hz/60Hz 17=720x576p@50Hz 18=(Reserved) 19=1280x720p@50Hz 20=1920x1080i@50Hz 21-30=(Reserved) 31=1920x1080p@50Hz 32=1920x1080p@23.97Hz/24Hz 33=1920x1080p@25Hz 34=1920x1080p@29.97Hz/30Hz 35-38=(Reserved) 39=1920x1080i@50Hz 40-64=(Reserved) 65=800x600p@60Hz 66=1024x768@60Hz 67=1280x768p@60Hz 68=1280x1024p@60Hz 69=1600x1200p@60Hz 70=1680x1050p@60Hz 71=1920x1200@60Hz 72=3840x2160p@24Hz 73=3840x2160p@25Hz 74=3840x2160p@30Hz 75=3840x2160p@50Hz 76=3840x2160p@60Hz 77-97=(Reserved) 98=4096x2160p@24Hz 99=4096x2160p@25Hz 100=4096x2160p@30Hz 101=4096x2160p@50Hz 102=4096x2160p@60Hz 103-1000=(Reserved) 1000=640x350@85Hz 1001=640x400p@85Hz 1002=720x400p@85Hz 1003=(Reserved) 1004=640x480p@72Hz 1005=640x480p@75Hz 1006=640x480p@85Hz 1007=(Reserved) 1008=(Reserved) 1009=800x600p@72Hz 1010=800x600p@75Hz 1011=800x600p@85Hz 1012=848x480p@60Hz 1013=1024x768i@43Hz 1014=(Reserved) 1015=1024x768p@70Hz 1016=1024x768p@75Hz 1017=1024x768p@85Hz 1018=1152x864p@75Hz 1019=(Reserved) 1020=(Reserved) 1021=1280x768p@85Hz 1022=1280x800p@60Hz 1023=1280x800p@75Hz 1024=1280x800p@85Hz 1025=1280x800p@120Hz 1026=1280x960p@60Hz 1027=1280x960p@85Hz 1028=(Reserved) 1029=1280x1024p@75Hz 1030=1280x1024p@85Hz 1031=1360x768p@60Hz 1032=1366x768p@60Hz 1033=1400x1050p@60Hz 1034=1400x1050p@75Hz 1035=1400x1050p@85Hz 1036=1440x900p@60Hz 1037=1440x900p@75Hz 1038=1440x900p@85Hz 1039=1600x900p@60Hz 1040=(Reserved) 1041=1600x1200p@65Hz 1042=(Reserved) 1043=1600x1200p@75Hz 1044=1600x1200p@85Hz 1045=(Reserved) 1046=1680x1050p@75Hz 1047=1680x1050p@85Hz 1048=1792x1344p@60Hz 1049=1792x1344p@75Hz 1050=1856x1392p@60Hz 1051=1856x1392p@75Hz 1052=1920x1200p@50Hz 1053=(Reserved) 1054=1920x1200p@75Hz
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Function	Description	Syntax	Response	Parameters/Attributes	Example										
				1055=1920x1200p@85Hz 1056=1920x1440p@60Hz 1057=1920x1440p@75Hz 1058=(Reserved) 1059=2048x1152p@60Hz 1060=2560x1600p@60Hz 1061=2560x1600p@75Hz 1062=2560x1600p@80Hz											
KDS-SCALE	Set scaling mode Add res_type.	#KDS-SCALE_value, res_type<CR>	~nn@KDS-SCALE_value, res_type<CR><LF>	value – Streamer Decoder Scaling Mode 0 – Pass Thru 1 – Scaling res_type[option] – Resolution index 0-3=(Reserved) 4=1280x720p@59.94Hz/60Hz 5-15=(Reserved) 16=1920x1080p@59.94Hz/60Hz 17-30=(Reserved) 31=1920x1080p@50Hz 32-72=(Reserved) 73=3840x2160p@25Hz 74=3840x2160p@30Hz 75-9999=(Reserved)	Set scale to scaling, resolution is 1080P60 #KDS-SCALE_1,16<CR>										
KDS-SCALE?	Get scaling mode Add res_type.	#KDS-SCALE?<CR>	~nn@KDS-SCALE_value, res_type<CR><LF>	value – Streamer Decoder Scaling Mode 0 – Pass Thru 1 – Scaling res_type[option] – res_type refer to #KDS-SCALE	Get scaling mode #KDS-SCALE?<CR>										
KDS-VLAN-TAG	Set vlan tag of gateway port.	#KDS-VLAN-TAG_gw_type, tag_id<CR>	~nn@KDS-VLAN-TAG gw_type, tag_id<CR><LF>	gw_type: 0 – Control tag_id – vlan tag (1 to 4093) 1 – No VLAN tag	Set vlan tag #KDS-VLAN-TAG_0,33<CR>										
KDS-VLAN-TAG?	Get vlan tag of gateway port.	#KDS-VLAN-TAG? gw_type<CR>	~nn@KDS-VLAN-TAG gw_type, tag_id<CR><LF>	gw_type: 0 – Control tag_id – vlan tag (1 to 4093) 1 – No VLAN tag	Get vlan tag #KDS-VLAN-TAG?_0<CR>										
KDS-VW-BEZEL	Set Video Wall bezel compensation.	#KDS-VW-BEZEL_vw, ow, vh, oh<CR>	~nn@KDS-VW-BEZEL_vw, ow, vh, oh<CR><LF>	 vw: 0-100000 ow: 0-100000 vh: 0-100000 oh: 0-100000	Set bezel compensation #KDS-VW-BEZEL 12210,12310,6860,6960<CR>										
KDS-VW-BEZEL?	Get Video Wall bezel compensation.	#KDS-VW-BEZEL?<CR>	~nn@KDS-VW-BEZEL_vw, ow, vh, oh<CR><LF>	 vw: 0-100000 ow: 0-100000 vh: 0-100000 oh: 0-100000	Get bezel compensation #KDS-VW-BEZEL?<CR>										
KDS-VW-PATTERN	Set test pattern mode of video wall	#KDS-VW-PATTERN mode<CR>	~nn@KDS-VW-PATTERN mode<CR><LF>	mode 0 – OFF (Disable test pattern) 1 – On (Enable test pattern)	Set video wall test pattern on #KDS-VW-PATTERN_1<CR>										
KDS-VW-PATTERN?	Get test pattern mode of video wall	#KDS-VW-PATTERN? mode<CR>	~nn@KDS-VW-PATTERN mode<CR><LF>	mode 0 – OFF (Disable test pattern) 1 – On (Enable test pattern)	Get video wall test pattern on #KDS-VW-PATTERN?<CR>										
LDFW	Load new firmware file. NOTE: In most devices firmware data is saved to flash memory, but the memory does not update until receiving the "UPGRADE" command and is restarted.	Step 1: #LDFW_size<CR> Step 2: If ready was received, send FIRMWARE_DATA	Response 1: ~nn@LDFW_size ready<CR><LF> Response 2: ~nn@LDFW_size ok<CR><LF>	size – Size of firmware data that is sent firmware_data – HEX or KFW file in protocol packets Using the Packet Protocol Send a command: LDRV, LOAD, IROUT, LDEDID Receive Ready or ERR### If Ready: a. Send a packet, b. Receive OK on the last packet, c. Receive OK for the command Packet structure: Packet ID (1, 2, 3...) (2 bytes in length) Length (data length + 2 for CRC) – (2 bytes in length) Data (data length - 2 bytes) CRC – 2 bytes <table border="1" data-bbox="965 1635 1236 1691"> <tr> <td>01</td> <td>02</td> <td>03</td> <td>04</td> <td>05</td> </tr> <tr> <td>Packet ID</td> <td>Length</td> <td>Data</td> <td colspan="2">CRC</td> </tr> </table> Response: ~nnn_pk<CR><LF> (Where NNNN is the received packet ID in ASCII hex digits.)	01	02	03	04	05	Packet ID	Length	Data	CRC		
01	02	03	04	05											
Packet ID	Length	Data	CRC												
LOCK-FP	Lock the front panel.	#LOCK-FP lock/unlock<CR>	~nn@LOCK-FP lock/unlock<CR><LF>	Lock/Unlock – On/Off 0 – (Off) Unlocks 1 – (On) Locks	Unlock front panel: #LOCK-FP_0<CR>										
LOCK-FP?	Get the front panel lock state.	#LOCK-FP?<CR>	~nn@LOCK-FP lock/unlock<CR><LF>	Lock/Unlock – On/Off 0 - Unlocked 1 - Locked	Get the front panel lock state: #LOCK-FP?<CR>										
LOG-ACTION	Reset events log.	#LOG-ACTION_action, period<CR>	~nn@LOG-ACTION_action, period<CR><LF>	action - One of 1 - Start, start logging 2 - Pause, pause logging but keep log content 3 - Resume, resume the logging 4 - Reset, clear all current logs, keep logging period - Relevant for "start" 1 - Keep current 2 - Daily 3 - Weekly (default)	Reset events log : #LOG-ACTION_4,1<CR>										

Function	Description	Syntax	Response	Parameters/Attributes	Example
LOGIN	Set protocol permission. NOTE: Works only if security is enabled with the "SECUR" command. LOGIN allows the user to run commands with an End User or Administrator permission level. When the permission system is enabled, LOGIN enables running commands with the User or Administrator permission level. When set, login must be performed upon each connection. It is not mandatory to enable the permission system in order to use the device. In each device, some connections allow logging in to different levels. Some do not work with security at all. Connection may logout after timeout.	#LOGIN_login_level, password<CR>	~nn@LOGIN_login_level, password_ok<CR><LF>	login_level – Level of permissions required (User or Admin: only 'admin' is acceptable on this device). password – Predefined password (by PASS command). Default password is 'admin'.	Set the protocol permission level to Admin (when the password defined in the PASS command is 33333): #LOGIN_admin,33333<CR>
LOGIN?	Get current protocol permission level. NOTE: Works only if security is enabled with the "SECUR" command. For devices that support security, LOGIN allows the user to run commands with an End User or Administrator permission level. In each device, some connections allow logging in to different levels. Some do not work with security at all. Connection may logout after timeout.	#LOGIN?<CR>	~nn@LOGIN_login_level<CR><LF>	login_level – Level of permissions required (User or Admin, only 'admin' is acceptable on this device).	Get current protocol permission level: #LOGIN?<CR>
LOGOUT	Cancel current permission level. NOTE: Logs out of End User or Administrator permission levels to Not Secure.	#LOGOUT<CR>	~nn@LOGOUT_ok<CR><LF>		#LOGOUT<CR>
LOGOUT-TIMEOUT	Set inactivity auto-logout time.	# LOGOUT-TIMEOUT time<CR>	~nn@ LOGOUT-TIMEOUT time<CR><LF>	time – minutes of logout time	Set Inactivity auto-logout time to 10 #LOGOUT-TIMEOUT 10<CR>
LOGOUT-TIMEOUT?	Get inactivity auto-logout time.	#LOGOUT-TIMEOUT?<CR>	~nn@LOGOUT-TIMEOUT time<CR><LF>	time – minutes of logout time	Get Inactivity auto-logout time #LOGOUT-TIMEOUT?<CR>
MODEL?	Get device model.	#MODEL?<CR>	~nn@MODEL model_name<CR><LF>	model_name – String of up to 24 printable ASCII chars	Get the device model: #MODEL?<CR>
NAME	Set machine DNS name. NOTE: The machine name is not the same as the model name. The machine name is used to identify a specific machine or a network in use (with DNS feature on).	#NAME_interface_id, host_name<CR>	~nn@NAME_interface_id, host_name<CR><LF>	interface_id: 0 – machine name host_name – String of up to 24 alpha-numeric chars (can include hyphen, underscore, not at the beginning or end)	Set the machine DNS name of the device to room-442: #NAME_0,room-442<CR>
NAME?	Get machine DNS name. NOTE: The machine name is not the same as the model name. The machine name is used to identify a specific machine or a network in use (with DNS feature on).	#NAME?_interface_id<CR>	~nn@NAME_interface_id, host_name<CR><LF>	interface_id: 0 – machine name host_name – String of up to 24 alpha-numeric chars (can include hyphen, not at the beginning or end)	Get the DNS name of the device: #NAME?_0<CR>
NAME-RST	Reset machine (DNS) name to factory default. NOTE: Factory default of machine (DNS) name is "KRAMER_" + 4 last digits of device serial number.	#NAME-RST<CR>	~nn@NAME-RST OK<CR><LF>		Reset the machine name (S/N last digits are 0102): #NAME-RST<CR>

Function	Description	Syntax	Response	Parameters/Attributes	Example
NET-CONFIG	Set a network configuration. NOTE: For Backward compatibility, the id parameter can be omitted. In this case, the Network ID, by default, is 0, which is the Ethernet control port. NOTE: If the gateway address is not compliant to the subnet mask used for the host IP, the command will return an error. Subnet and gateway compliancy specified by RFC950. NOTE: This set the device to DHCP OFF automatically.	#NET-CONFIG_netw_id, net_ip, net_mask, gateway<CR>	~nn@NET-CONFIG_netw_id, net_ip, net_mask, gateway<CR><LF>	netw_id – Network ID–ID of the Ethernet port: 0 – Media Port 1 – Service Port net_ip – Network IP net_mask – Network mask gateway – Network gateway	Set the device network parameters to IP address 192.168.113.10, net mask 255.255.0.0, and gateway 192.168.0.1: #NET-CONFIG 0,192.168.113.10,255.255.0.0,192.168.0.1<CR>
NET-CONFIG?	Get a network configuration.	#NET-CONFIG? netw_id<CR>	~nn@NET-CONFIG_netw_id, net_ip, net_mask, gateway<CR><LF>	netw_id – Network ID–ID of the Ethernet port: 0 – Media Port 1 – Service Port net_ip – Network IP net_mask – Network mask gateway – Network gateway	Get network configuration: #NET-CONFIG?_0<CR>
NET-DHCP	Set DHCP mode. NOTE: Only 1 is relevant for the mode value. To disable DHCP, the user must configure a static IP address for the device. Connecting Ethernet to devices with DHCP may take more time in some networks. To connect with a randomly assigned IP by DHCP, specify the device DNS name (if available) using the NAME command. You can also get an assigned IP by direct connection to USB or RS-232 protocol port, if available. For proper settings consult your network administrator. NOTE: For Backward compatibility, the id parameter can be omitted. In this case, the Network ID, by default, is 0, which is the Ethernet control port.	#NET-DHCP_netw_id, dhcp_state<CR>	~nn@NET-DHCP_netw_id, dhcp_state<CR><LF>	netw_id – Network ID–the device network interface (if there are more than one). Counting is 0 based, meaning the control port is '0', additional ports are 1,2,3.... dhcp_state – 1 – Try to use DHCP. (If unavailable, use the IP address set by the factory or the net-ip command).	Enable DHCP mode for port 1, if available: #NET-DHCP_1,1<CR>
NET-DHCP?	Get DHCP mode NOTE: For Backward compatibility, the id parameter can be omitted. In this case, the Network ID, by default, is 0, which is the Ethernet control port.	#NET-DHCP? netw_id<CR>	~nn@NET-DHCP_netw_id, dhcp_state<CR><LF>	netw_id – Network ID–the device network interface (if there are more than one). Counting is 0 based, meaning the control port is '0', additional ports are 1,2,3.... dhcp_state – 1 – Try to use DHCP. (If unavailable, use the IP address set by the factory or the net-ip command).	Get DHCP mode for port 1, if available: #NET-DHCP?_1<CR>
NET-MAC?	Get MAC address.	#NET-MAC?<CR>	~nn@NET-MAC mac_address<CR><LF>	mac_address – Unique MAC address. Format: XX-XX-XX-XX-XX-XX where X is hex digit	#NET-MAC?<CR>
NET-STAT?	Get net connection list of this machine. NOTE: The response is returned in one line and terminated with<CR><LF>. The response format lists signal IDs separated by commas. This is an Extended Protocol 3000 command.	#NET-STAT?<CR>	~nn@NET-STAT [(<port_type>: <port_index>, <client_ip>:<client_port>),state],...<CR><LF>	port_type – TCP/UDP 0 – TCP 1 – UDP port_index - Device port client_ip – Dot-separated representation of the IP address client_port - Client port state – listen or established	Get net connection list of this machine: #NET-STATE?<CR> -01@NETSTAT [(TCP:80,0.0.0.0:0),LISTEN],[(TCP:5000,0.0.0.0:0), LISTEN], [(TCP:80,192.168.114.3:5240 0),ESTABLISHED],[(TCP:500 0,192.168.1.100:51647) ,ESTABLISHED]<CR><LF>
NET-IP?	Get the device's network IP address. For UDP protocol only.	#NET-IP?<CR>	~nn@NET-IP net_ip<CR><LF>	net_ip – Network IP	Get network ip address: #NET-IP?<CR>

Function	Description	Syntax	Response	Parameters/Attributes	Example
PASS	Set password for login level. The default password is "admin".	#PASS_login_level, password<CR>	~nn@PASS_login_level, password<CR><LF>	login_level – Level of login to set (admin support only). password – Password for the login_level. 8 to 24 characters (letters, numbers, and symbols without spaces or commas), at least including one number, one symbols without spaces or commas, one uppercase letter and one lowercase letter.	Set the password for the admin protocol permission level to 33333: #PASS_admin,33333<CR>
PASS?	Get password for login level. The default password is "admin".	#PASS?_login_level<CR>	~nn@PASS_login_level, password<CR><LF>	login_level – Level of login to set (End User or Administrator). password – Password for the login_level.	Get the password for the admin protocol permission level: #PASS?_admin<CR>
PORT-DIRECTION	Set port direction as input or output.	#PORT-DIRECTION <direction_type>.<port_format>.<port_index>.<signal_type>.<direction><CR>	~nn@PORT-DIRECTION <direction_type>.<port_format>.<port_index>.<signal_type>.<direction><CR><LF>	The following attributes comprise the signal ID: <direction_type> – Direction of the port: IN – Input OUT – Output BOTH – Bi-directional <port_format> – Type of signal on the port: ANALOG_AUDIO <port_index> – The port number as printed on the front or rear panel <signal_type> – Signal ID attribute: AUDIO <direction> – Direction of the port: IN – Input OUT – Output	Set audio analog port direction as input #PORT-DIRECTION both.analog.1.audio,IN<CR>
PORT-DIRECTION?	Get port direction.	#PORT-DIRECTION? <direction_type>.<port_format>.<port_index>.<signal_type><CR>	~nn@PORT-DIRECTION <direction_type>.<port_format>.<port_index>.<signal_type>.<direction><CR><LF>	The following attributes comprise the signal ID: <direction_type> – Direction of the port: IN – Input OUT – Output BOTH – Bi-directional <port_format> – Type of signal on the port: ANALOG_AUDIO <port_index> – The port number as printed on the front or rear panel <signal_type> – Signal ID attribute: AUDIO <direction> – Direction of the port: IN – Input OUT – Output	Get audio analog port direction #PORT-DIRECTION? both.analog.1.audio<CR>
PORTS-LIST?	Get the port list of this machine. NOTE: The response is returned in one line and terminated with<CR><LF>. The response format lists port IDs separated by commas. This is an Extended Protocol 3000 command.	#PORTS-LIST?<CR>	~nn@PORTS-LIST [<direction_type>.<port_format>.<port_index>,...]<CR><LF>	The following attributes comprise the port ID: <direction_type> – Direction of the port: IN OUT BOTH <port_format> – Type of signal on the port: HDMI ANALOG_AUDIO RS-232 STREAM <port_index> – The port number as printed on the front or rear panel	Get the ports list: #PORTS-LIST?<CR>
RESET	Reset device NOTE: To avoid locking the port due to a USB bug in Windows, disconnect USB connections immediately after running this command. If the port was locked, disconnect and reconnect the cable to reopen the port.	#RESET<CR>	~nn@RESET_ok<CR><LF>		Reset the device: #RESET<CR>
ROLLBACK	Rollback firmware to standby version.	#ROLLBACK<CR>	~nn@ROLLBACK ok<CR><LF>		Perform firmware rollback: #ROLLBACK<CR>
SECUR	Start/stop security. NOTE: The permission system works only if security is enabled with the "SECUR" command.	#SECUR security_state<CR>	~nn@SECUR security_state<CR><LF>	security_state – Security state 0 – OFF (disables security) 1 – ON (enables security)	Enable the permission system: #SECUR_0<CR>

Function	Description	Syntax	Response	Parameters/Attributes	Example
SIGNALS-LIST?	Get signal ID list of this machine. NOTE: The response is returned in one line and terminated with<CR><LF>. The response format lists signal IDs separated by commas. This is an Extended Protocol 3000 command.	#SIGNALS-LIST?<CR><LF> >	~nn@SIGNALS-LIST [<direction_type>.<port_format> >.<port_label>.<signal_type>.<index>.]<CR><LF>	The following attributes comprise the signal ID: <direction_type> – Direction of the port: IN – Input OUT – Output BOTH – Bi-directional (e.g. for RS-232) <port_format> – Type of signal on the port: HDMI ANALOG_AUDIO RS-232 STREAM <port_index> – The port number as printed on the front or rear panel <signal_type> – Signal ID attribute: VIDEO AUDIO RS232 <index> – Indicates a specific channel number when there are multiple channels of the same type	Get signal ID list: #SIGNALS-LIST?<CR>
SN?	Get device serial number.	#SN?<CR>	~nn@SN serial_num<CR><LF>	serial_num – 14 decimal digits, factory assigned	Get the device serial number: #SN?<CR>
STANDBY-VERSION?	Get standby firmware version.	#STANDBY-VERSION?<CR>	~nn@STANDBY-VERSION? standby_version<CR><LF>	standby_version – XX.XX.XXXX where the digit groups are: major.minor.build version	Get standby version #STANDBY-VERSION?<CR>
TIME	Set device time and date. NOTE: The year must be 4 digits. The device does not validate the day of week from the date. Time format - 24 hours. Date format - Day, Month, Year.	#TIME_day_of_week, date,<CR>	~nn@TIME_day_of_week, date, data<CR><LF>	day_of_week – One of {SUN,MON,TUE,WED,THU,FRI,SAT} date – Format: DD-MM-YYYY where YYYY = Year MM = Month DD = Day data – Format: hh:mm:ss where hh = hours mm = minutes ss = seconds	Set device time and date to December 5, 2018 at 2:30pm: #TIME_mon_05-12-2018,14:30:00<CR>
TIME?	Get device time and date. NOTE: The year must be 4 digits. The device does not validate the day of week from the date. Time format - 24 hours. Date format - Day, Month, Year.	#TIME?<CR>	~nn@TIME_day_of_week, date, data<CR><LF>	day_of_week – One of {SUN,MON,TUE,WED,THU,FRI,SAT} date – Format: YYYY/MM/DD where YYYY = Year MM = Month DD = Day data – Format: hh:mm:ss where hh = hours mm = minutes ss = seconds	Get device time and date: #TIME?<CR>
TIME-LOC	Set local time offset from UTC/GMT. NOTE: If the time server is configured, device time calculates by adding UTC_off to UTC time (that it got from the time server) + 1 hour if daylight savings time is in effect. TIME command sets the device time without considering these settings. NOTE: Daylight saving time not support NOTE: Restart unit to take effect	#TIME-LOC_utc_off, dst_state<CR>	~nn@TIME-LOC_utc_off, dst_state<CR><LF>	utc_off – Offset of device time from UTC/GMT (without daylight time correction), Format HH:MM ('MM' is optional) HH – Hours, -12 ~ 13 MM – Minutes, 00 ~ 59 dst_state – Daylight saving time state 0 – no daylight saving time	Set local time offset to 3 with no daylight-saving time: #TIME-LOC_3,0<CR> or #TIME-LOC_03:00,0<CR>
TIME-LOC?	Get local time offset from UTC/GMT. NOTE: If the time server is configured, device time calculates by adding UTC_off to UTC time (that it got from the time server) + 1 hour if daylight savings time is in effect. TIME command sets the device time without considering these settings. NOTE: Daylight saving time not support	#TIME-LOC?<CR>	~nn@TIME-LOC_utc_off, dst_state<CR><LF>	utc_off – Offset of device time from UTC/GMT (without daylight time correction), Format HH:MM ('MM' is optional) HH – Hours, -12 ~ 13 MM – Minutes, 00 ~ 59 dst_state – Daylight saving time state 0 – no daylight saving time	Get local time offset from UTC/GMT: #TIME-LOC?<CR>
TIME-SRV	Set time server. NOTE: This command is needed for setting UDP timeout for the current client list.	#TIME-SRV_mode, time_server_ip, sync_hour<CR>	~nn@TIME-SRV_mode, time_server_ip, sync_hour, server_status<CR><LF>	mode – On/Off 0 – Off 1 – On time_server_ip – Time server IP address sync_hour – Hour in day for time server sync server_status – On/Off	Set time server with IP address of 128.138.140.44 to ON: #TIME-SRV 1,128.138.140.44,0,1<CR>

Function	Description	Syntax	Response	Parameters/Attributes	Example
TIME-SRV?	Get time server. NOTE: This command is needed for setting UDP timeout for the current client list.	#TIME-SRV?<CR>	~nn@TIME-SRV_mode, time_server_ip, server_status<CR><LF>	mode – On/Off 0 – Off 1 – On time_server_ip – Time server IP address sync_hour – Hour in day for time server sync server_status – On/Off	Get time server: #TIME-SRV?<CR>
UART	Set com port configuration. NOTE: In the FC-2x the serial port is selectable to RS-232 or RS-485 (usually serial port 1). If Serial is configured when RS-485 is selected, the RS-485 UART port automatically changes. The command is backward compatible, meaning that if the extra parameters do not exist, FW goes to RS-232. Stop_bits 1.5 is only relevant for 5 data_bits.	#UART_com_id, baud_rate, data_bits, parity, stop_bits_mode, serial_type, 485_term<CR>	~nn@UART com_id,baud_rate,data_bits,parity,stop_bits_mode,serial_type ,485_term<CR><LF>	com_id – 1 to n (machine dependent) baud_rate – 9600 - 115200 data_bits – 5-8 parity – Parity Type 0 – No 1 – Odd 2 – Even stop_bits_mode – 1/1.5/2 serial_type – 232/485 0 – 232 1 – 485 485_term – 485 termination state 0 – disable 1 – enable (optional - this exists only when serial_type is 485)	Set baud rate to 9600, 8 data bits, parity to none and stop bit to 1: #UART_9600,8,node,1<CR>
UART?	Get com port configuration. NOTE: In the FC-2x the serial port is selectable to RS-232 or RS-485 (usually serial port 1). If Serial is configured when RS-485 is selected, the RS-485 UART port automatically changes. The command is backward compatible, meaning that if the extra parameters do not exist, FW goes to RS-232. Stop_bits 1.5 is only relevant for 5 data_bits.	#UART?_com_id<CR>	~nn@UART com_id,baud_rate,data_bits,parity,stop_bits_mode,serial_type ,485_term<CR><LF>	com_id – 1 to n (machine dependent) baud_rate – 9600 - 115200 data_bits – 5-8 parity – Parity Type 0 – No 1 – Odd 2 – Even 3 – Mark 4 – Space stop_bits_mode – 1/1.5/2 serial_type – 232/485 0 – 232 1 – 485 485_term – 485 termination state 0 – disable 1 – enable (optional - this exists only when serial_type is 485)	Set baud rate to 9600, 8 data bits, parity to none and stop bit to 1: #UART 1,9600,8,node,1<CR>
UPG-TIME?	Get firmware version last upgrade date/time Add New Command for KDS-7	#UPG-TIME?<CR>	~nn@UPG-TIME_date, data<CR><LF>	date – Format: DD-MM-YYYY. data – Format: hh:mm:ss where	Get last upgrade date/time #UPG-TIME?<CR>
UPGRADE	Perform firmware upgrade. NOTE: Not necessary for some devices. Firmware usually uploads to a device via a command like LDFW. Reset the device to complete the process.	#UPGRADE<CR>	~nn@UPGRADE ok<CR><LF>		Perform firmware upgrade: #UPGRADE<CR>
VERSION?	Get firmware version number.	#VERSION?<CR>	~nn@VERSION firmware_version<CR><LF>	firmware_version – XX.XX.XXXX where the digit groups are: major.minor.build version	Get the device firmware version number: #VERSION?<CR>
VIDEO-WALL-SETUP	Define device video wall relative position and video alignment. NOTE: MUST setup with "#VIEW-MOD 15" to video wall mode firstly	#VIDEO-WALL-SETUP out_id, rotation<CR>	~nn@VIDEO-WALL-SETUP out_id, rotation<CR><LF>	out_id – Number of output (1-256) rotation – Repetition rate in seconds 0 – 0 degrees 1 – 90 degrees 2 – 180 degrees 3 – 270 degrees	Set video alignment: #VIDEO-WALL-SETUP 10,1<CR>
VIDEO-WALL-SETUP?	Get device video wall relative position and video alignment.	#VIDEO-WALL-SETUP? out_id<CR>	~nn@VIDEO-WALL-SETUP out_id, rotation<CR><LF>	out_id – Number of output (1-256) rotation – Repetition rate in seconds 0 – 0 degrees 1 – 90 degrees 2 – 180 degrees 3 – 270 degrees	Get video alignment: #VIDEO-WALL-SETUP?<CR>
VIEW-MOD	Set view mode. In case of KDS-7 only Video wall mode is supported. Second and third parameters are "mode" specific. In case of video wall, they define video wall layout. use "VIEW-MOD 15,1,1" to disable the -video wall.	#VIEW-MOD_mode, vw_hsize, vw_vsize<CR>	~nn@VIEW-MOD mode<CR><LF>	mode – View Modes 15 – Video wall vw_hsize – video wall horrible size, only required when mode is 15 vw_vsize – video wall vertical size, only required when mode is 15	Set view mode: #VIEW-MOD_15,2,2<CR>

Function	Description	Syntax	Response	Parameters/Attributes	Example
VIEW-MOD?	Get view mode. In case of KDS-7 only Video wall mode is supported.	#VIEW-MOD?<CR>	~nn@VIEW-MOD_mode, vw_hsize, vw_vsize <CR><LF>	mode – View Modes 15 – Video wall vw_hsize – video wall horrible size, only required when mode is 15 vw_vsize – video wall vertical size, only required when mode is 15	Get view mode: #VIEW-MOD?<CR>
WND-STRETCH	Set video wall stretch type Add New Command for KDS-7	#WND-STRETCH out_index, mode<CR>	~nn@WND-STRETCH out_index, mode<CR><LF>	out_index - Number that indicates the specific output 1-256: 1-N (N= the total number of outputs) mode - Stretch mode: 0 - fit in 1 - fit out	Set Video Wall Stretch Type is Fit In #WND-STRETCH_1, 0<CR>
WND-STRETCH?	Get video wall stretch type Add New Command for KDS-7	#WND-STRETCH? out_index<CR>	~nn@WND-STRETCH out_index, mode<CR><LF>	out_index - Number that indicates the specific output 1-256: 1-N (N= the total number of outputs) mode - Stretch mode: 0 - fit in 1 - fit out	Get Video Wall Stretch Type #WND-STRETCH?_1<CR>
X-AUD-DESC?	Get audio signal info NOTE: + This is an Extended Protocol 3000 command.	#X-AUD-DESC? <direction_type>.<port_for mat>.<port_index><CR>	~nn@X-AUD-DESC? <direction_type>.<port_format >.<port_label>.<signal_type>. <index>.ch_tot, samp_rate, aud_format<CR><LF>	The following attributes comprise the signal ID: <direction_type> – Direction of the port: IN – Input OUT – Output BOTH – Bi-directional (e.g. for RS-232) <port_format> – Type of signal on the port: HDMI ANALOG_AUDIO STREAM <port_index> – The port number as printed on the front or rear panel <signal_type> – Signal ID attribute: AUDIO <index> – Indicates a specific channel number when there are multiple ch_tot – Total number of channels samp_rate – Sample rate aud_format – Audio Format: LPCM – Linear Pulse Code Modulation audio Non-LPCM – None Linear Pulse Code Modulation audio, like Dolby Digital, DTS, etc. HBR – High Bitrate Audio, like Dolby TrueHD, DTS HD Master Audio	Get the audio signal info: #X-AUD-DESC? out.hDMI.1<CR>
X-AUD-LVL	Set audio level of a specific signal. NOTE: This is an Extended Protocol 3000 command.	#X-AUD-LVL <direction_type>.<port_for mat>.<port_index>.<signal _type>.<index>.<audio_level ><CR>	~nn@X-AUD-LVL <direction_type>.<port_format >.<port_index>.<signal_type>.<i ndex>.<audio_level><CR><LF>	The following attributes comprise the signal ID: <direction_type> – Direction of the port: OUT – Output <port_format> – Type of signal on the port: ANALOG_AUDIO <port_index> – The port number as printed on the front or rear panel <signal_type> – Signal ID attribute: AUDIO <index> – Indicates a specific channel number when there are multiple channels of the same type. audio_level – Audio level in dB (range between -60 to +30) depending of the ability of the product.	Set the audio level of a specific signal to 10: #X-AUD-LVL in.analog_audio.1.audio.1,10 <CR>
X-AUD-LVL?	Get audio level of a specific signal. NOTE: This is an Extended Protocol 3000 command.	#X-AUD-LVL? <direction_type>.<port_for mat>.<port_index>.<signal _type>.<index><CR>	~nn@X-AUD-LVL <direction_type>.<port_format >.<port_index>.<signal_type>.<i ndex>.<audio_level><CR><LF >	The following attributes comprise the signal ID: <direction_type> – Direction of the port: OUT – Output <port_format> – Type of signal on the port: ANALOG_AUDIO <port_index> – The port number as printed on the front or rear panel <signal_type> – Signal ID attribute: AUDIO <index> – Indicates a specific channel number when there are multiple channels of the same type. audio_level – Audio level in dB (range between -60 to +30) depending of the ability of the product.	Get the audio level of a specific signal: #X-AUD-LVL? out.analog_audio.1.audio.1< CR>

Function	Description	Syntax	Response	Parameters/Attributes	Example
X-MUTE	Set mute ON/OFF on a specific signal.	#X-MUTE <direction_type>.<port_format>.<port_index>.<signal_type>.<index>,<state><CR>	~nn@ X-MUTE <direction_type>.<port_format>.<port_index>.<signal_type>.<index>,<state><CR><LF>	<direction_type> – Direction of the port: OUT – Output <port_format> – Type of signal on the port: HDMI ANALOG_AUDIO STREAM ALL – All audio output <port_index> – The port number as printed on the front or rear panel <signal_type> – Signal ID attribute: AUDIO <index> – Indicates a specific channel number when there are multiple channels of the same type state – OFF/ON (not case sensitive)	Mute the audio on HDMI OUT 1: #X-MUTE out.hdmi.1.audio.1,on<CR> Mute the audio on ALL OUT: #X-MUTE out.all.1.audio.1,on<CR>
X-MUTE?	Get mute ON/OFF on a specific signal.	#X-MUTE? <direction_type>.<port_format>.<port_index>.<signal_type>.<index><CR>	~nn@ X-MUTE <direction_type>.<port_format>.<port_index>.<signal_type>.<index>,<state><CR><LF>	<direction_type> – Direction of the port: OUT – Output <port_format> – Type of signal on the port: HDMI ANALOG_AUDIO STREAM ALL – All audio output <port_index> – The port number as printed on the front or rear panel <signal_type> – Signal ID attribute: AUDIO <index> – Indicates a specific channel number when there are multiple channels of the same type state – OFF/ON (not case sensitive)	Get the mute the video on HDMI OUT 1: #X-MUTE? out.hdmi.1.video.1<CR>
X-ROUTE	Send routing command. NOTE: It is recommended to use the command #SIGNALS-LIST to get the list of all signal IDs available in the system and which can be used in this command. Video 1 is the default port in this command and is implied even if not written: #X-ROUTE out.sdi.5,in.sdi.1<CR> > is interpreted as: #X-ROUTE out.sdi.5.video.1,in.sdi.1.video.1<CR> This is an Extended Protocol 3000 command. Brackets '[' and ']' are reserved Protocol 3000 characters that define a list of parameters as in [a,b,c,d].	#X-ROUTE [<direction_type1>.<port_type1>.<port_index1>.<signal_type1>.<index1>,...].<direction_type2>.<port_type2>.<port_index2>.<signal_type2>.<index2><CR>	~nn@X-ROUTE [<direction_type1>.<port_type1>.<port_index1>.<signal_type1>.<index1>,...].<direction_type2>.<port_type2>.<port_index2>.<signal_type2>.<index2><CR><LF>	The following attributes comprise the signal ID: <direction_type> – Direction of the port: IN – Input OUT – Output BOTH – Bi-directional (e.g. for RS-232) <port_format> – Type of signal on the port: HDMI ANALOG_AUDIO STREAM <port_index> – The port number as printed on the front or rear panel <signal_type> – Signal ID attribute: VIDEO AUDIO <index> – Indicates a specific channel number when there are multiple channels of the same type	Route HDMI IN 2 to HDMI OUT 3: #X-ROUTE out.hdmi.3.video.1,in.hdmi.2.video.1<CR> Route an ARC audio signal to HDBT input #1 from HDMI output #1: #X-ROUTE in.hdbt.1.arc.1,out.hdmi.1.arc.1<CR> Route of audio hdmi.1.audio.1 signal to HDMI output, analog: #X-ROUTE [out.hdmi.1.audio.1,out.analog_audio.1.audio.1,in.hdmi.1.audio.1<CR>
X-ROUTE?	Get routing status. NOTE: It is recommended to use the command #SIGNALS-LIST to get the list of all signal IDs available in the system and which can be used in this command. VIDEO.1 are the default <signal_type> and <index> in this command and are implied even if not written: #X-ROUTE out.sdi.5,in.sdi.1<CR> > is interpreted as: #X-ROUTE out.sdi.5.video.1,in.sdi.1.video.1<CR> This is an Extended Protocol 3000 command.	#X-ROUTE? <direction_type1>.<port_type1>.<port_index1>.<signal_type1>.<index1><CR>	~nn@X-ROUTE <direction_type1>.<port_type1>.<port_index1>.<signal_type1>.<index1>.<direction_type2>.<port_type2>.<port_index2>.<signal_type2>.<index2><CR><LF>	The following attributes comprise the signal ID: <direction_type> – Direction of the port: IN – Input OUT – Output BOTH – Bi-directional (e.g. for RS-232) <port_format> – Type of signal on the port: HDMI ANALOG_AUDIO STREAM <port_index> – The port number as printed on the front or rear panel <signal_type> – Signal ID attribute: VIDEO AUDIO <index> – Indicates a specific channel number when there are multiple channels of the same type	Get the routing status: #X-ROUTE? out.hdmi.5.video.1<CR>

Result and Error Codes

Syntax

In case of an error, the device responds with an error message. The error message syntax:

- **~NN@ERR XXX<CR><LF>** – when general error, no specific command
- **~NN@CMD ERR XXX<CR><LF>** – for specific command
- **NN** – machine number of device, default = 01
- **XXX** – error code

Error Codes

Error Name	Error Code	Description
P3K_NO_ERROR	0	No error
ERR_PROTOCOL_SYNTAX	1	Protocol syntax
ERR_COMMAND_NOT_AVAILABLE	2	Command not available
ERR_PARAMETER_OUT_OF_RANGE	3	Parameter out of range
ERR_UNAUTHORIZED_ACCESS	4	Unauthorized access
ERR_INTERNAL_FW_ERROR	5	Internal FW error
ERR_BUSY	6	Protocol busy
ERR_WRONG_CRC	7	Wrong CRC
ERR_TIMEDOUT	8	Timeout
ERR_RESERVED	9	(Reserved)
ERR_FW_NOT_ENOUGH_SPACE	10	Not enough space for data (firmware, FPGA...)
ERR_FS_NOT_ENOUGH_SPACE	11	Not enough space – file system
ERR_FS_FILE_NOT_EXISTS	12	File does not exist
ERR_FS_FILE_CANT_CREATED	13	File can't be created
ERR_FS_FILE_CANT_OPEN	14	File can't open
ERR_FEATURE_NOT_SUPPORTED	15	Feature is not supported
ERR_RESERVED_2	16	(Reserved)
ERR_RESERVED_3	17	(Reserved)
ERR_RESERVED_4	18	(Reserved)
ERR_RESERVED_5	19	(Reserved)
ERR_RESERVED_6	20	(Reserved)
ERR_PACKET_CRC	21	Packet CRC error
ERR_PACKET_MISSED	22	Packet number isn't expected (missing packet)
ERR_PACKET_SIZE	23	Packet size is wrong
ERR_RESERVED_7	24	(Reserved)
ERR_RESERVED_8	25	(Reserved)
ERR_RESERVED_9	26	(Reserved)
ERR_RESERVED_10	27	(Reserved)
ERR_RESERVED_11	28	(Reserved)
ERR_RESERVED_12	29	(Reserved)
ERR_EDID_CORRUPTED	30	EDID corrupted
ERR_NON_LISTED	31	Device specific errors
ERR_SAME_CRC	32	File has the same CRC – not changed
ERR_WRONG_MODE	33	Wrong operation mode
ERR_NOT_CONFIGURED	34	Device/chip was not initialized

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.

How Long this Coverage Lasts

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 covered by a standard one (1) year warranty. Kramer 7-inch touch panels purchased on or after April 1st, 2020 are covered by a standard two (2) year warranty.
3. 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 lifetime 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.

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, visit our web site at www.kramerav.com or contact the Kramer Electronics office nearest you.

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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This limited warranty gives you specific legal rights, and you may have other rights which vary from country to country or state to state.

This limited warranty is void if (i) the label bearing the serial number of this product has been removed or defaced, (ii) the product is not distributed by Kramer Electronics or (iii) this product is not purchased from an authorized Kramer Electronics reseller. If you are unsure whether a reseller is an authorized Kramer Electronics reseller, visit our web site at www.kramerav.com or contact a Kramer Electronics office from the list at the end of this document.

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.



HDMI™
HIGH-DEFINITION MULTIMEDIA INTERFACE



P/N: 2900-301574

Rev: 1



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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