USER MANUAL

MODEL:

KIT-500
5x2 Matrix/Scaler Kit

Contents

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/KIT-500 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 **KIT-500** 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 GPI\O 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 https://www.kramerav.com/social-responsibility/environment/.

Overview

Congratulations on purchasing your Kramer **KIT-500 5x2 Matrix/Scaler Kit**.

KIT-500 is a high-performance integrated matrix scaler kit, consisting of the **KIT-500T** matrix transmitter with two USB-C and two HDMI/USB inputs independently routable to HDMI and HDBT outputs, and the **KIT-500R** auto-switcher scaler receiver with an HDMI input for routing a local signal and an HDBT input for routing a remote signal (from the **KIT-500T** transmitter). The remote USB peripherals (such as a room camera) are extended for use of local USB host for convenient hybrid meeting operation with both room and online participants.

KIT-500 provides exceptional quality, advanced and user-friendly operation, and flexible control.

Exceptional Quality

- Hybrid-Meetings – Designed to support switching of both AV inputs and USB host ports, for concurrent connection to AV outputs and room USB devices. The product facilitates collaborative hybrid meetings where participants can switch to share their content with both room and online meeting participants.
- High-Performance Scaling for Valuable End-user Presentation Experience – Built-in ProcAmp high-resolution scaling technology for optimal image display, and advanced video processing with clean, glitch-free source switching.
- Powerful Audio Handling – Integrated DSP for intelligent microphone talk-over, audio signal equalization, mixing, and delay processing, together with flexible audio insertion and extraction capabilities, ensure unsurpassed experience for the presenter and end-user.
- HDMI Signal Switching – HDCP 2.2 compliant, supporting deep color, x.v.Color™, CEC, HDMI uncompressed audio channels, Dolby TrueHD, DTS-HD, 2K, 4K, and 3D as specified in HDMI 2.0.
- I-EDIDPro™ Kramer Intelligent EDID Processing™ – Intelligent EDID handling, processing, locking and pass-through algorithm ensures plug & play operation for HDMI source and display systems.

Advanced and User-friendly Operation

- BYOD Ease and Convenience – Connect any DP−Alt−Mode−capable USB−C device as an AV presentation source, while providing the connected device with USB and Ethernet connection, and up to 60 watts of power, via a single USB−C cable connection only
- Wired and Wireless Auto Switcher – When the receiver is connected to a wireless connectivity device such as Kramer VIA, can automatically select between a wired source at the transmitter or the wireless source at the receiver.
- Simple Control – Remote IP-controller connection, browser operation webpage, local panel buttons, or remotely connected contact-closure buttons, for easy and fully flexible user ports selection, signals routing, and matrix control.
- Built-in Intelligent Control Gateway – Remote IP-driven intelligent control of connected AV and motorized devices via relay, RS-232 and CEC, eliminating the need for an external control gateway and reducing installation complexity and costs to enable easy integration with control systems such as Kramer Control.
- Comprehensive Management – Flexible service options – including local panel status LED indicators and OSD menu operation, remote IP-driven firmware upgrade and management via user-friendly embedded web pages, and remote IP or local serial service and management via API commands – ensure lasting, field-proven deployment.
- Easy and Elegant Installation – Single cable connectivity for both HDBaseT signals and PoC power distribution with only a single power mains connection. Compact fan-less enclosures for flexible under-table or podium, dropped-ceiling, and display-adjacent mounting.

Flexible Connectivity

- Audio De-embedding – The digital audio signal passing-through to the output is also available on the stereo balanced analog audio output. This enables playing the audio on a locally connected professional audio system (such as DSP) and speakers, in parallel to playing it on the speakers connected to the AV acceptor device (such as TVs with speakers).
- USB 2.0 Extension – USB 2.0 signals are extended between the transmitter and the receiver, enabling connection of the active USB host to both local and remote USB devices, such as a camera and audio devices, or HID (Human Interface Devices) mouse or keyboard devices.
- Bi-directional RS-232 Extension – Serial interface data flows in both directions, allowing data transmission and device control.

Typical Applications

KIT-500 is ideal for applications where the user needs to switch between local AV sources and a remote HDMI source:

- Enterprise hybrid meeting rooms.
- Education hybrid learning classrooms.
- Advanced meeting rooms with combined wired and wireless connectivity demands.

Controlling your KIT-500

Control your **KIT-500** directly via the front panel push buttons (with on-screen menus, or:

- By RS-232 serial commands transmitted by a PC or a controller.
- Via IP browsing to the built-in user-friendly Web pages.

Defining KIT-500 5x2 Matrix/Scaler Kit

This section defines **KIT-500T** and **KIT-500R**.

Defining KIT-500T

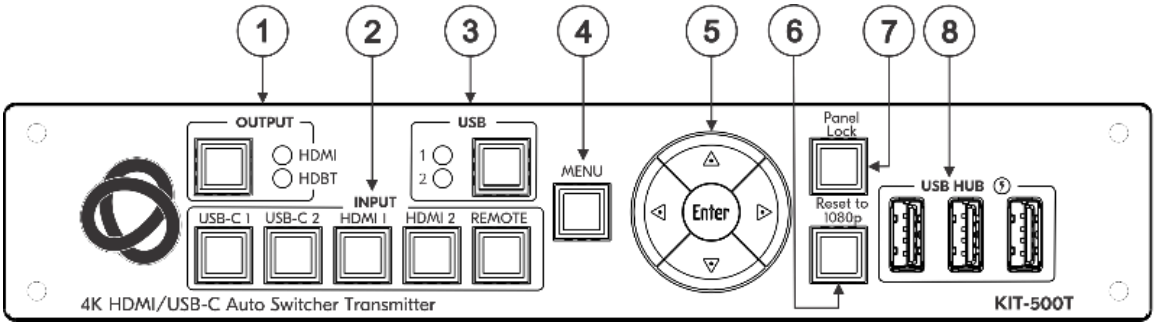


Figure 1: KIT-500T 4K HDMI/USB-C Auto Transmitter Front Panel

#	Feature		Function
1	OUTPUT	Select Button	Press to select the output to which a selected input will be switched when an input button is pressed. The output button is illuminated when a sink/link is detected on the selected output.
		HDMI/HDBT LEDs	LED lights green when selected.
2	INPUT Buttons	USB-C (1 and 2)	Press to select a USB-C input. Button illuminates when that input is selected.
		HDMI (1 and 2)	Press to select an HDMI input. Button illuminates when that input is selected.
		REMOTE	Press to select the remote HDMI input on the **KIT-500R**. Button illuminates when that input is selected. This button is only functional when HDBT is selected via the OUTPUT button.
3	USB	Select Button	Press to select the USB HOST port to connect to the USB HUB devices. This button is only functional when the USB switching is not "linked" to the HDMI selection (see Defining USB Switching Policy on page 46).
		1/2 LEDs	Lights green when selected.
4	MENU Button		Press to display the **KIT-500** OSD menu. The OSD menu can be viewed on the acceptor that is connected to the **KIT-500R**.
5	Navigation Buttons	◄	Press to decrease numerical values or select from several definitions. When not in the OSD menu, press to reduce the output volume.
		▲	Press to move up the menu list values.
		►	Press to increase numerical values or select from several definitions. When not in the OSD menu, press to increase the output volume.
		▼	Press to move down the menu list.
		ENTER	Press to accept changes and change the SETUP parameters.
6	RESET TO 1080p Button		Press and hold to toggle between XGA and 1080p resolutions.

#	Feature	Function
7	PANEL LOCK Button	Press and hold for about 5 seconds to lock/unlock the front panel buttons.
8	USB HUB USB 3.0 Ports (3)	Connect to USB devices. The user can select which USB host (USB 1, USB 2, USB-C 1 or USB-C 2 on the transmitter) is connected to the USB devices.

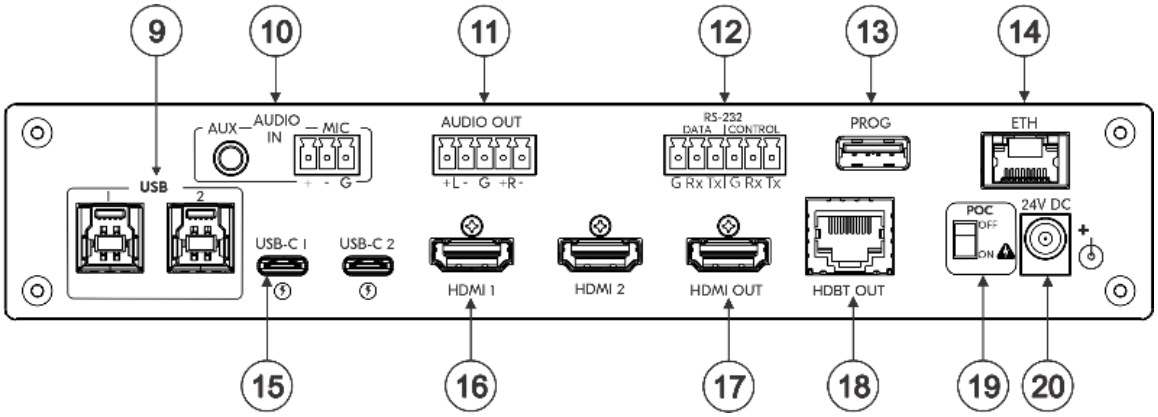


Figure 2: KIT-500T 4K HDMI/USB-C Auto Transmitter Rear Panel

#	Feature		Function
9	USB 3.0 Host Port (1 and 2)		Connect to USB hosts.
10	AUDIO IN	AUX 3.5mm Mini Jack	Connect to an unbalanced, analog audio source (for example, the audio output of the laptop).
		MIC 3-pin Terminal Block	Connect to a dynamic or condenser (with 48V phantom power) microphone.
11	AUDIO OUT 5-pin Terminal Block		Connect to a balanced, stereo audio acceptor (for example, active speakers).
12	RS-232	DATA 3-pin Terminal Block Connector	Connect to a serial data source or acceptor to extend RS-232 between **KIT-500T** and **KIT-500R**.
		CONTROL 3-pin Terminal Block Connector	Connect to a serial controller or PC to control **KIT-500** or for **KIT-500** to control an external device.
13	PROG USB Connector		Connect to a PC to perform a firmware upgrade.
14	ETH RJ-45 Connector		Connect to the LAN (Ethernet traffic or PC controller).
15	USB-C Port Inputs (1 and 2)		Connect to USB-C sources. Both USB-C ports support DP Alt mode, Ethernet and USB data transfer. USB-C 1 supports up to 60W charging. Power delivery to USB-C 1 is not supported when **KIT-500R** delivers power to **KIT-500T** via PoC.
16	HDMI Connector		Connect to an HDMI source.
17	HDMI OUT Connector		Connect to an HDMI acceptor.
18	HDBT OUT RJ-45 Connector		Connect to **KIT-500R**.
	Follow powering instructions in (see Connecting KIT-500 on page 10). Failure to use PoC and power connector correctly may destroy the devices!		
19	PoC (Power over Cable) Switch		Set the PoC switch to ON on both **KIT-500T** and **KIT-500R**.
20	24V DC Connector		Connect to the supplied power adapter unless the power adapter is connected to **KIT-500R**.

Defining KIT-500R

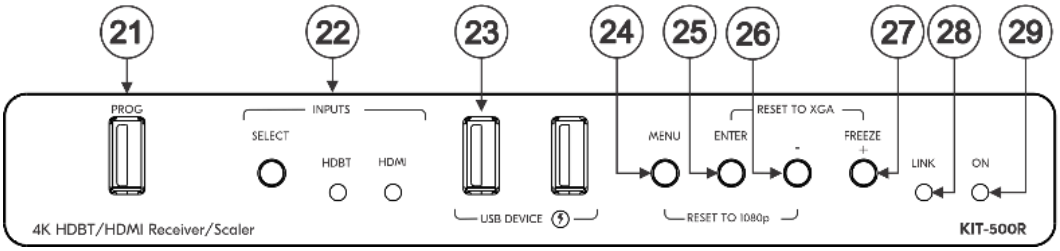


Figure 3: KIT-500R 4K HDBT/HDMI Receiver/Scaler Front Panel

#	Feature		Function
21	PROG USB Connector		Connect to a USB stick to perform firmware upgrades.
22	INPUTS	SELECT Button	Press to toggle between the HDBT and HDMI inputs to select the input (HDBT or HDMI). By default, the SELECT button is locked. You can unlock it via the ADVANCED menu in the OSD.
		HDBT LED	Lights blue when the HDBT input is selected.
		HDMI LED	Lights blue when the HDMI input is selected.
23	USB DEVICE USB 3.0 Ports (2)		Connect to USB devices. The user can select which USB host (USB 1 or USB 2 on the transmitter) is connected to the USB devices.
24	MENU Button		Press to enter/exit the on-screen display (OSD) menu. Press together with the **–** button to reset to 1080p.
25	ENTER Button		In OSD, press to choose the highlighted menu item. Press together with the FREEZE/+ button to reset to XGA.
26	–		In OSD, press to move back through menus or decrement parameter values.
27	FREEZE/+ Button		In OSD, press to move forward through menus or increment parameter values. When not in OSD, press to freeze the display.
28	LINK LED		Lights blue when a link is established with the transmitter.
29	ON LED		Lights green when device is powered.

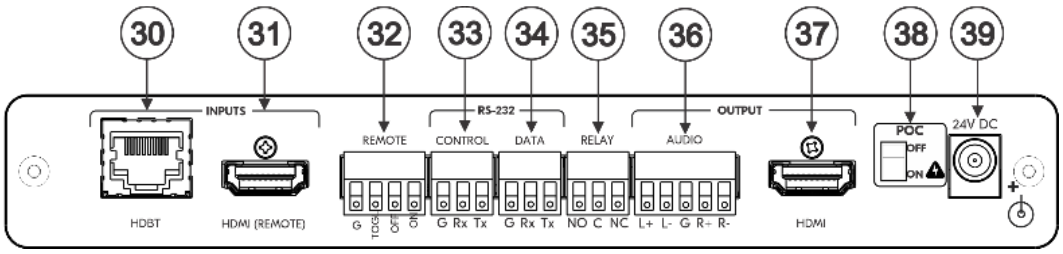


Figure 4: KIT-500R 4K HDBT/HDMI Receiver/Scaler Rear Panel

#	Feature		Function
30	INPUTS	HDBT RJ-45 Connector	Connect to **KIT-500T**.
31		HDMI (REMOTE) Connector	Connect to an HDMI source.
32	REMOTE Contact-Closure 4-pin Terminal Block Connector		Connect to contact closure switches to turn the display on and off (e.g., via CEC). The TOGGLE pin may be configured for toggling (edge-triggered), or for ON / OFF (level-triggered).See Using Remote Control Switches on page 17.
33	RS-232	CONTROL 3-pin Terminal Block Connector	Connect to a serial controller or PC to control **KIT-500T** using P3K, or for **KIT-500R** to control an external device.
34		DATA 3-pin Terminal Block Connector	Connect to a serial data source or acceptor for extending RS-232 between **KIT-500T** and **KIT-500R** via HDBT.
35	RELAY SPDT 3-pin Terminal Block Connector		Connections to the internal relay's contact terminals: Normally open (NO), normally closed (NC), and common (C). Connect to devices to be controlled by relay (for example, a motorized projection screen).
36	OUTPUT	AUDIO 5-pin Terminal Block Connector	Connect to a balanced analog stereo audio acceptor.
37		HDMI Connector	Connect to an HDMI acceptor.

Follow powering instructions in (see Connecting KIT-500 on page 10).
Failure to use PoC and power connector correctly may destroy the devices!

38	PoC (Power Over Cable) Switch	Set the PoC switch to ON on both **KIT-500T** and **KIT-500R**.
39	24V DC Connector	Connect to the supplied power adapter, unless the power adapter is connected to **KIT-500T**.

Mounting KIT-500

This section provides instructions for mounting **KIT-500**. 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 **KIT-500** before connecting any cables or power.

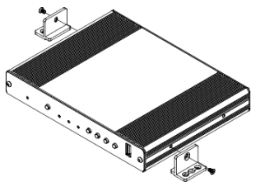
Warning:

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

Mount KIT-500R in a rack:

- Use the recommended rack adapter (see www.kramerav.com/product/KIT-500).

Mount KIT-500 on a surface using one of the following methods:



- Attach the rubber feet and place the unit on a flat surface.
- For **KIT-500R**, fasten 1 bracket (included) on each side of the unit and attach it to a flat surface. For more information go to www.kramerav.com/downloads/KIT-500.

On customer request, USA&CA UL Listed Power supply: Input 100-240VAC 50-60Hz, output 24VDC 5A with the appropriate AC plugs could be delivered in the same package with KIT-500/MTX2-42-T.

Connecting KIT-500

Always switch off the power to each device before connecting it to your **KIT-500**. After connecting your **KIT-500**, connect its power and then switch on the power to each device.

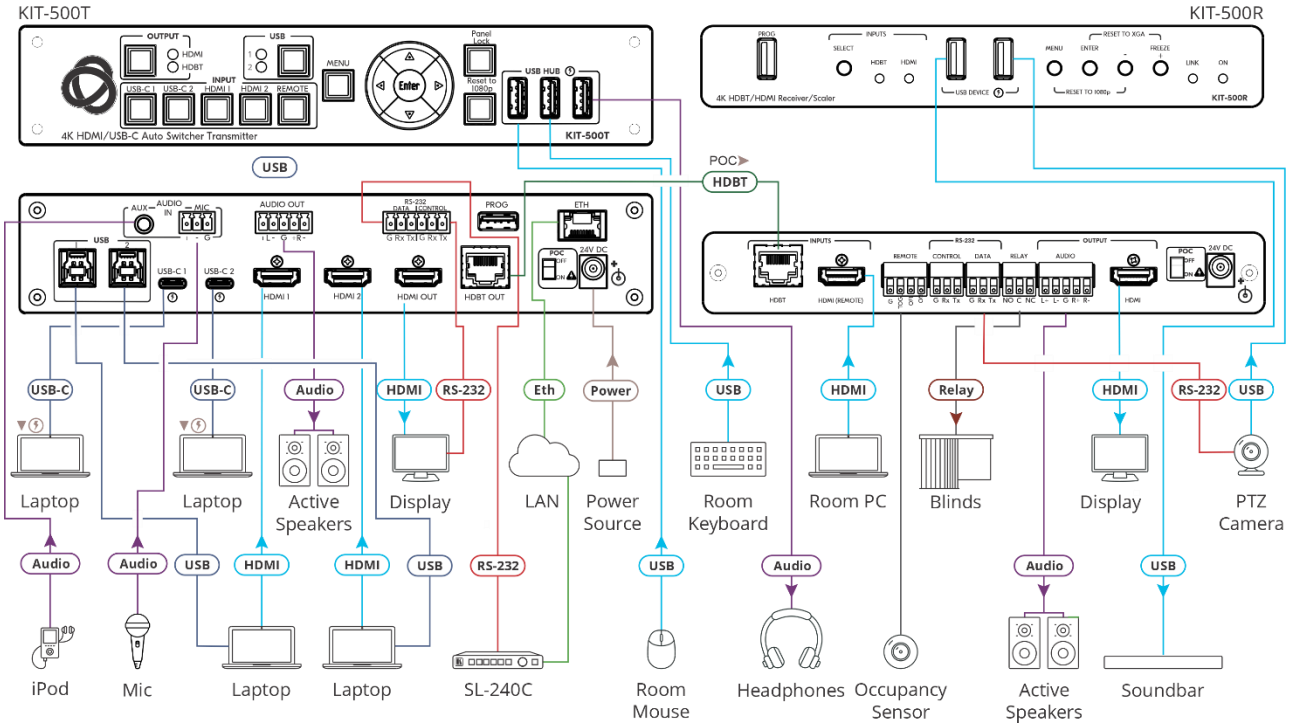


Figure 5: Connecting to the KIT-500 Rear Panel

To connect KIT-500 as illustrated in the example in Figure 5:

1. Connect the inputs:
   - Connect USB-C sources (15) (for example, laptops) to the USB-C 1 and USB-C 2 ports on the **KIT-500T**.
   - Connect HDMI sources (16) (for example, laptops) to HDMI 1 and HDMI 2 connectors on the **KIT-500T** and connect the USB 3.0 Host ports (2) to the HDMI sources that are connected to the HDMI inputs.
   - Connect an HDMI source (31) (for example, a room PC) to the HDMI (REMOTE) connector on the **KIT-500R**.
   - Connect an unbalanced analog audio source to the AUX 3.5mm jack (10) (for example, an iPod).
   - Connect a dynamic or condenser (with 48V phantom power) microphone (10) to the MIC 3-pin terminal block connector.
2. Connect the outputs:
   - Connect the HDMI output (17) on the **KIT-500T** to an HDMI acceptor (for example, a display).
   - Connect the HDMI output (37) on the **KIT-500R** to an HDMI acceptor (for example, a display).

- Connect the AUDIO OUT 5-pin terminal block connector (11) on the **KIT-500T** to an audio acceptor (for example, an active speaker).
- Connect the AUDIO OUTPUT 5-pin terminal block connector (36) on the **KIT-500R** to an audio acceptor (for example, an active speaker).

3. Connect the HDBT OUT (18) port on the **KIT-500T** to the HDBT INPUT (30) on the **KIT-500R**.
4. Connect the USB type A ports:
   - Connect the USB HUB ports (8) on the **KIT-500T** to USB devices (for example, a keyboard, mouse and headphones).
   - Connect the USB DEVICE ports (23) on the **KIT-500R** to USB devices (for example, a soundbar and PTZ camera).
5. Connect TOGL on the REMOTE contact closure 4-pin terminal block connector (32) on the **KIT-500R** to an occupancy sensor.
6. Connect the RELAY 3-pin terminal block connector to a relay-controlled device (for example, to open and close the room blinds).
7. Connect the control ports:
   - Connect the ETH RJ-45 port (18) on the **KIT-500T** to a LAN.
   - Connect the CONTROL RS-232 3-pin terminal block connector (12) on the **KIT-500T** to an RS-232 controlled device (for example, the display on the **KIT-500T** output).
   - Connect the **KIT-500T** DATA RS-232 3-pin terminal block connector (12) to a controller (for example, Kramer **SL-240C**).
   - Connect the **KIT-500R** DATA RS-232 3-pin terminal block connector (34) to an RS-232 controlled device (for example, the PTZ camera).
8. Set POC switches on **KIT-500T** (20) and **KIT-500R** (40) to ON.

Failure to use PoC and power connector correctly may destroy the devices!

9. Connect the power adapter to one of the devices (**KIT-500T** or **KIT-500R**) and to the mains electricity (for example, to **KIT-500T**).

Connecting the Output to a Balanced/Unbalanced Stereo Audio Acceptor

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

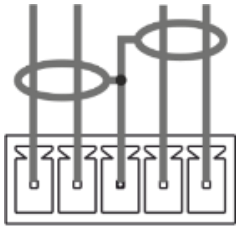


Figure 6: Connecting to a Balanced Stereo Audio Acceptor

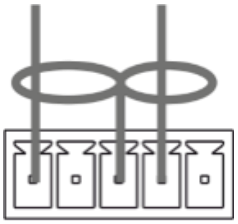


Figure 7: Connecting to an Unbalanced Stereo Audio Acceptor

Connecting to KIT-500 via RS-232

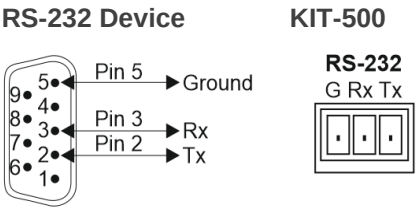
You can connect to **KIT-500** via an RS-232 connection (13) using, for example, a PC.

KIT-500 features an RS-232 3-pin terminal block connector allowing the RS-232 to control **KIT-500**.

Connect the RS-232 terminal block on the rear panel of **KIT-500** 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 **KIT-500** RS-232 terminal block
- Pin 3 to the RX pin on the **KIT-500** RS-232 terminal block
- Pin 5 to the G pin on the **KIT-500** RS-232 terminal block



Connecting an Occupancy Sensor to the TOGL Pin

The **KIT-500R** TOGL pin (36) function is defined via the **KIT-500R** OSD menu (see Defining the REMOTE TOGGLE PIN on **KIT-500R** on page 23). By default, the display toggles on or off when momentarily connected. By setting the Toggle function, you can set the pin for level-triggering rather than edge-triggering (i.e., constant contact connection rather than momentary connection), allowing, for example, connection to an occupancy sensor that triggers the toggle commands.

Instead of a push-to-make switch, TOGL may be configured to operate with a standard SPST switch or for TTL level detection (for example, to use with an occupancy sensor).

You can use an occupancy sensor to turn on the display and auto sync off to turn it off once it is not used, as described in the following example:

- An occupancy sensor is connected to the TOGL pin.
- The TOGL pin is set to ON (see Defining the REMOTE TOGGLE PIN on KIT-500R on page 23) so that the display is turned on when the occupancy sensor detects the presence of people in the room. (Set the sensor to short the TOGL pin to ground upon detecting occupancy).
- Auto SYNC OFF is set to Enable (see Setting Sleep Mode on KIT-500R on page 21) so that when the room is no longer in use, the display turns off 2 minutes after an input signal is no longer detected.

You can also set the TOGL pin to OFF so that when the sensor detects no people in the room the display turns off. (Set the sensor to short the TOGL pin to ground when occupancy is not detected).

Connecting to USB Hosts

KIT-500T includes 4 USB Hosts:

- 2 USB 3.0 host ports – Connect your PC to both an HDMI port and a USB Host port.
- 2 USB-C ports – Connect one cable to your PC.

When connecting to the USB Host port, you can choose to link it to the HDMI video port, meaning that the USB 1/USB 2 host port is switched together with the HDMI 1/HDMI 2 port respectively.

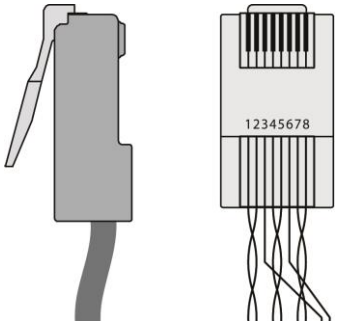
By default, USB 1 and USB 2 ports are linked to the HDMI 1 and HDMI 2 inputs, respectively and the USB selection button on **KIT-500T**.

Wiring RJ-45 Connectors

This section defines the HDBT pinout, using a straight pin-to-pin cable with RJ-45 connectors.

It is recommended that the cable ground shielding be connected/soldered to the connector shield.

EIA /TIA 568B	
PIN	**Wire Color**
1	Orange / White
2	Orange
3	Green / White
4	Blue
5	Blue / White
6	Green
7	Brown / White
8	Brown



Principles of Operation

This section describes the **KIT-500T** powerful operation principles:

KIT-500T Input Auto-Switching

Set **KIT-500T** switching mode via the UI (see Configuring Automatic Switching Settings on page 44) or P3K (see KIT-500T Protocol Commands on page 57) to any of the following modes:

- Manual
- Auto – Auto Scan
- Auto – Last Connected

By-default, switching is set to Manual.

In Manual mode, select an input by:

- Pressing the front-panel input selection buttons.
- Sending RS-232 serial commands control (see Protocol 3000 Commands on page 57).
- Using the embedded web pages (see Configuring Automatic Switching Settings on page 44).

In auto-switching mode, the input is selected as follows:

- In Auto Scan mode, when the currently selected input sync signal is lost, the **KIT-500T** automatically scans and selects an input with a live signal.
- In Last Connected mode, when the currently selected input signal is lost, **KIT-500T** automatically selects the last connected input.

USB Host Switching

KIT-500T includes 4 inputs: 2 USB-C inputs that can operate as hosts in addition to passing AV signals, and 2 HDMI inputs which can be linked with Host ports 1 and 2 via the **KIT-500** UI. A single active USB host is connected to both local and remote **KIT-500** USB devices, while other hosts are inactive. The active USB host is selected either automatically to follow the selected video input (default), or manually as independently-selected USB host (see Defining USB Switching Policy on page 46).

CEC Signaling

KIT-500T sends CEC commands from a control system, connected by LAN, via the **KIT-500T** built-in control gateway, to control devices that are connected to the **KIT-500T** HDMI output and the selected input.

KIT-500 sends CEC in the following way:

- On **KIT-500T**, when Local Auto Sync Off is set to On, **KIT-500T** sends a Power Off command to its display when no signal is detected on the selected input (see Defining Auto Sync Mode on page 45). When a valid signal is detected, **KIT-500T** will then send a Power On command.
- On **KIT-500R**, if Remote Auto Sync Off is enabled (Slow or Fast), **KIT-500R** sends power off command to its display when no signal is detected on the selected input. When a valid signal is detected, **KIT-500R** will then send a Power On command. If Output CEC Bypass is enabled, **KIT-500R** passes the data from the **KIT-500R** HDMI input.

Controlling via RS-232 Ports

KIT-500T and **KIT-500R** each have 2 RS-232 control ports:

- RS-232 CONTROL for controlling the device via RS-232 Protocol 3000 commands (for example, connecting an **SL-240C** Kramer Controller to **KIT-500R** to control it), and RS-232
- RS-232 DATA for passing RS-232 commands between the devices via HDBT. For example, sending commands to the PTZ Camera, that is connected to the RS-232 DATA port on **KIT-500R**, via an **SL-240C** Kramer controller that is connected to the RS-232 DATA port on **KIT-500T**.

In addition, you define the **KIT-500T** RS-232 CONTROL port to operate in any of the following ways (see Managing RS-232 Control on page 40):

- By default, control the device itself via a room controller.
- Control an external device that is connected to **KIT-500T**.
- Control an external device on **KIT-500T** via Ethernet control gateway.
- Control **KIT-500T** from a controller (for example SL-240C) connected to **KIT-500T** via LAN

For further detail, refer to the Kramer website and select Resources>Technical Note.

Operating and Controlling KIT-500

Operate **KIT-500** in any of the following ways:

Using Front Panel Buttons

Press the **KIT-500T** front panel buttons to:

- Select the output to which a selected input is routed (HDMI or HDBT).
- Select the required input: USB-C 1, USB-C 2, HDMI 1, HDMI 2 or REMOTE (2) (HDMI input on **KIT-500R**).
- Select the USB host (3) to connect to the USB HUB devices.

  When USB Host selection is not set to follow the HDMI ports.the HDMI ports

- Lock the front panel (7).
- Reset the device resolution (6).
- Control the **KIT-500R** operation, using the OSD MENU (4) and navigation keys (5) (not available when the REMOTE HDMI input is selected as the **KIT-500R** source. See Controlling and Operating Via the OSD Menu on page 17).
- When not in the OSD mode, use the Left and right OSD arrow buttons to adjust the output volume.

Press the **KIT-500R** front panel buttons to:

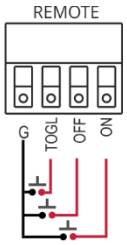
- Locally select (23) the HDMI or HDBT inputs (when the SELECT button is not locked).
- Control device operation, using the MENU (26) and navigation keys (27) (when in the OSD menu), + (29) and – (28),buttons (see Controlling and Operating Via the OSD Menu on page 17).
- Freeze the image on the output, using FREEZE button.
- Reset to XGA resolution, using ENTER and FREEZE+ buttons.
- Reset to 1080p resolution, using MENU and – buttons.

Using Remote Control Switches

The following table describes the function of the remote contact closure switches on **KIT-500T** (14) and **KIT-500R** (36).

Pin Name	Function
KIT-500R	
TOGL	For connection to an occupancy sensor, or to a single ON/OFF switch. Configurable via the OSD for connection to a button which toggles between display on and display off (instead of using two separate buttons for on and off); or turning the display on and off according to whether a switch is open or closed (for example, when using an occupancy sensor). See Defining the REMOTE TOGGLE PIN on **KIT-500R** on page 23.
OFF	Turn off the display.
ON	Turn on the display.

KIT-500R



Controlling and Operating Via the OSD Menu

KIT-500 enables controlling and defining the device parameters via the OSD, using the front panel MENU buttons.

The OSD menu can be accessed via:

- The OSD navigation buttons on **KIT-500R**.
- The OSD navigation buttons on **KIT-500T** when HDBT is selected as the input to **KIT-500R**.

To enter and use the OSD menu buttons:

1. Press MENU.
2. Press:
   - **ENTER** to accept changes and to change the menu settings.
   - **Arrow buttons** to move through the OSD menu, which is displayed on the video output.
   - **EXIT** to exit the menu.

The default OSD timeout is set to 10 seconds.

Use the OSD menu to perform the following operations:

- Adjusting Image Parameters on page 18.
- Selecting an Input Signal on page 18.
- Locking KIT-500R Input Select Buttons on page 19.
- Setting Output Parameters on page 19.

Adjusting Image Parameters

KIT-500R enables adjusting the image parameters such as contrast, brightness and so on.

To adjust the image parameters:

1. On the front panel press **MENU**. The menu appears.
2. Click **Picture** and define the image parameters according to the information in the following table:

Menu Item	Function	
Contrast	Set the contrast.	
Brightness	Set the brightness.	
Finetune	Video	Hue – set the color hue.
		Saturation – set the color saturation.
		Sharpness – set the sharpness of the picture.
		Noise Reduction – select the noise reduction filter: Off (default), Low, Middle, or High.
Color	Set the Red, Green and Blue shades.	

Image parameters are adjusted.

Selecting an Input Signal

Select the **KIT-500R** input source via the OSD menu.

To set the input source:w

1. On the front panel press **MENU**. The menu appears.
2. Click **INPUT** and select the **SOURCE**.
3. Press **ENTER** and select HDMI or HDBT.

An input signal is selected.

Locking KIT-500R Input Select Buttons

Lock the **KIT-500R** input select buttons.

To lock input buttons:

1. On the front panel press **MENU**. The menu appears.
2. Click **INPUT** and select **INPUT BUTTON LOCK**.
3. Press **ENTER** and select **ON** or **OFF**.

Input select buttons are locked.

Setting Output Parameters

KIT-500R enables setting output parameters such as the size of the image and output resolution via the OSD MENU buttons.

To set the output parameters:

1. On the front panel press **MENU**. The menu appears.
2. Click **OUTPUT** and define the output parameters according to the information in the following table:

Menu Item	Function			
Size	Set the size of the image: Over Scan, Full, Best Fit (default), Pan Scan, Letter Box, Under 2, Under 1, Follow In.			
Resolution	Select the output resolution (default, 1920x1080P @60Hz):			
	640x480 @60Hz	1440x900 @60Hz	720x480P @60Hz	1920x1080P @60Hz
	800x600 @60Hz	1600x1200 @60Hz	720x576P @50Hz	3840x2160P @24Hz
	1024x768 @60Hz	1680x1050 @60Hz	1280x720P @50Hz	3840x2160P @25Hz
	1280x768 @60Hz	1920x1200 @60Hz RB	1280x720P @60Hz	3840x2160P @30Hz
	1280x800 @60Hz	2560x1600 @60Hz RB	1920x1080P @24Hz	3840x2160P @50Hz
	1280x1024 @60Hz	1920x1080 @60Hz	1920x1080P @25Hz	3840x2160P @60Hz
	1360x768 @60Hz	1280x720 @60Hz	1920x1080P @30Hz	Native
	1400x1050 @60Hz	2560x1440 @60Hz RB	1920x1080P @50Hz	

Output parameters are defined.

Setting Audio Parameters

KIT-500R enables defining the audio delay time and the output volume.

To set the audio:

1. On the front panel press **MENU**. The menu appears.
2. Click **Audio** and define the audio parameters according to the information in the following table:

Menu Item	Function
DELAY	Set the audio delay time (lip sync) to off, 40ms (default),110ms or 150ms.
AUDIO VOLUME	Set the AUDIO OUT output volume (default is 80 = 0dB).

Audio parameters are defined.

Setting OSD Parameters

KIT-500R enables adjusting OSD parameters for your convenience via the OSD MENU buttons.

To set the OSD parameters:

1. On the front panel press **MENU**. The menu appears.
2. Click **OSD** and define the OSD parameters according to the information in the following table:

Menu Item	Function
H-POSITION	Set the horizontal position of the OSD.
V-POSITION	Set the vertical position of the OSD.
TIMER	Set the timeout period to Off or up to 60 seconds (default 10).
TRANSPARENCY	Set the OSD background between 100 (transparent) and 0 (opaque).
DISPLAY	Select the information displayed on-screen during operation: Info (default) –Information appears for 10 seconds. On –Information appears constantly. Off – Information does not appear.

OSD parameters are set.

Managing EDID via OSD

KIT-500R enables managing the EDID via the OSD menu buttons.

To manage the EDID:

1. On the front panel press **MENU**. The menu appears.
2. Click **EDID**.
3. Press **ENTER** and define the EDID parameters according to the information in the following table:

Menu Item	Function
EDID on HDBT	For the HDBT input, select a built-in EDID file and press enter: Def. 1080P, Def. 1080P(AUD), Def. 4K(3G), Def. 4K(3G-AUD), HDMI OUT or USER.
EDID on HDMI	For the HDMI input, select a built-in EDID file and press enter: Def. 1080P, Def. 1080P(AUD), Def. 4K(3G), Def. 4K(3G-AUD), Def. 4K(6G) (default), Def. 4K(6G-AUD), HDMI OUT or USER.

The selected built-in EDID file is saved on the selected input.

Uploading EDID from an External File

To select the EDID from an external file:

1. Upload the EDID file to a memory stick.
   The EDID file name should be USER_EDID1.bin or USER_EDID2.
2. On the front panel press **MENU**. The OSD menu appears.
3. Click **ADVANCED** and select **EDID Upload**.
4. Select **USER EDID**.

The external EDID file is saved to the device.

Setting HDCP

KIT-500R enables setting the HDCP on the input and on the output via the front panel MENU buttons.

To set the HDCP on the inputs and output:

1. On the front panel press **MENU**. The menu appears.
2. Click **Advanced** and define the HDCP parameters according to the information in the following table:

Menu Item	Function
HDCP on Input (HDBT)	Set HDCP support On (default) or Off. Note that: 1. HDCP must be enabled (On) to support HDCP encrypted sources. 2. Sources such as Mac computers always encrypt their outputs when detecting that the sink supports HDCP. If the content does not require HDCP, you can prevent these sources from encrypting by disabling (OFF) HDCP on the input.
HDCP on Input (HDMI)	
HDCP on Output	Select **Follow Output** (default) or **Follow Input**. Select FOLLOW OUTPUT (recommended) for the scaler to encrypt HDCP on the output according to the HDCP requirements of the acceptor to which it is connected. Select FOLLOW INPUT to change its HDCP output setting according to the HDCP of the input (recommended when the output is connected to a splitter/switcher).

HDCP is set on the input/output.

Setting Sleep Mode on KIT-500R

Auto Sync Off turns off the output after a period of not detecting a valid video signal on the input(s) until a valid input is again detected or any keypad button is pressed.

Configure the Auto Sync Off delay time when a connected display enters sleep mode.

To set Auto Sync Off:

1. On the front panel press **MENU**. The menu appears.
2. Click **Advanced** and select **Auto Sync Off**.
3. Define Auto Sync Off according to the information in the following table:

Menu Item	Function
Off	Leave outputs active always.
Slow	Disable outputs after ~ 2 minutes of no input detection.
Fast	Disable outputs after a few seconds of no input detection.

Sleep mode is defined.

Setting Switching Mode

KIT-500 enables configuring for automatic switching of the input source upon signal loss or when a source is plugged in.

To set the switching mode:

1. On the front panel press **MENU**. The menu appears.
2. Click **Advanced** and select **Auto Switching**.
3. Click **ENTER** and select **On** to allow auto scanning or **Off** (default) for manual switching.

Switching mode is defined.

Setting FREEZE Button Functionality

KIT-500 enables defining the function of the FREEZE front panel button (29). For example, the FREEZE button can be defined to freeze the image and mute the audio or only freeze the image.

To set the functionality of the FREEZE front panel button:

1. On the front panel press **MENU**. The menu appears.
2. Click **Advanced** and select **Freeze**.
3. Set panel lock mode according to the information in the following table:

Menu Item	Function
Freeze + Mute	Press **Freeze** to mute the audio output and freeze the image.
Only Freeze	Press **Freeze** to freeze the image.
Only Mute	Press **Freeze** to mute the output audio.

Freeze button mode is defined.

Manually Switching Relay

You can manually set the state of the relay (39) in **KIT-500R** via the OSD.

To define the relay functionality:

1. On the front panel press **MENU**. The menu appears.
2. Click **Advanced**.
3. Click **Relay** and define its state according to the information in the following table:

Menu Item	Function
ON	Turn the relay ON. When on, the relay's coil is energized, meaning C and NO are shorted, and there is an open circuit between C and NC.
OFF	Turn the relay OFF When off, the relay's coil is not energized, meaning C and NC are shorted, and there is an open circuit between C and NO.

The relay is manually switched.

Defining CEC

KIT-500R can be set to initiate and send CEC commands to the connected display, or to pass CEC commands from its HDMI input to the connected display.

To set the CEC (Consumer Electronic Control) functionality:

1. On the front panel press **MENU**. The menu appears.
2. Click **Advanced** and select **Output CEC Bypass**.
3. Press **ENTER** and select:
   - **OFF** – **KIT-500R** automatically sends CEC commands to shut down the output display after a timeout period when no input signal is found and to power up the display when the input returns.
   - **ON** – CEC commands pass from the HDMI input to the display. (**KIT-500R** does not automatically send CEC on and off commands).

KIT-500R either passes CEC commands between its HDMI input and the display, or it initiates and sends on and off commands to the display.

CEC is enabled/disabled.

Defining the REMOTE TOGGLE PIN on KIT-500R

KIT-500R enables defining the TOGL pin (36) functionality. For example, you can define this pin to select one of the 2 inputs, turn the display on or off and so on.

To define the TOGGLE PIN functionality:

1. On the front panel press **MENU**. The menu appears.
2. Click **Toggle Pin** and define the TOGGLE pin functionality according to the information in the following table:

Menu Item	Function
EDGE=ON/OFF	Set for edge triggering (momentary connection): Toggles between switching the display on and off (using CEC commands) each time the TOGL pin is momentarily connected to ground.
ON	Turns the display ON when the TOGL pin is shorted to ground. Select ON when using together with an occupancy sensor that is set up to short the sensor wire to ground when detecting the presence of people in the room (see Connecting an Occupancy Sensor to the TOGL Pin on page 12).
OFF	Turns the display OFF when the TOGL pin is shorted to the ground. Select OFF when using together with an occupancy sensor that is set up to short the sensor wire to ground when detecting no people in the room (see Connecting an Occupancy Sensor to the TOGL Pin on page 12).
INPUT SELECT	Set to select between the **KIT-500R** inputs (HDBT or HDMI).

TOGGLE pin functionality is defined.

Viewing Device Information

Device information includes the selected source, the input and output resolutions, and the software version.

To view the information:

1. On the front panel press **MENU**. The menu appears.
2. Click **INFORMATION** and view the input source selection and its resolution, the output resolution, and the software version.

Performing a Reset

KIT-500R enables performing factory reset via the front panel MENU buttons.

To reset the device:

1. On the front panel press **MENU**. The menu appears.
2. Click **Factory** and select RESET ALL.
   Wait for completion of factory reset (resolution is set to Native and all parameters are set to their default values).

Device is reset.

Operating via Ethernet

You can connect to **KIT-500** via Ethernet using either of the following methods:

- Directly to the PC using a crossover cable (see Connecting Ethernet Port Directly to a PC on page 24).
- Via a network hub, switch, or router, using a straight-through cable (see Connecting Ethernet Port via a Network Hub on page 26).

If you want to connect via a router and your IT system is based on IPv6, speak to your IT department for specific installation instructions.

Connecting Ethernet Port Directly to a PC

You can connect the Ethernet port of **KIT-500** directly to the Ethernet port on your PC using a crossover cable with RJ-45 connectors.

This type of connection is recommended for identifying **KIT-500** with the factory configured default IP address

After connecting **KIT-500** to the Ethernet port, configure your PC as follows:

1. Click **Start** > **Control Panel** > **Network and Sharing Center**.
2. Click **Change Adapter Settings**.

3. 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 adapter appears as shown in Figure 8.

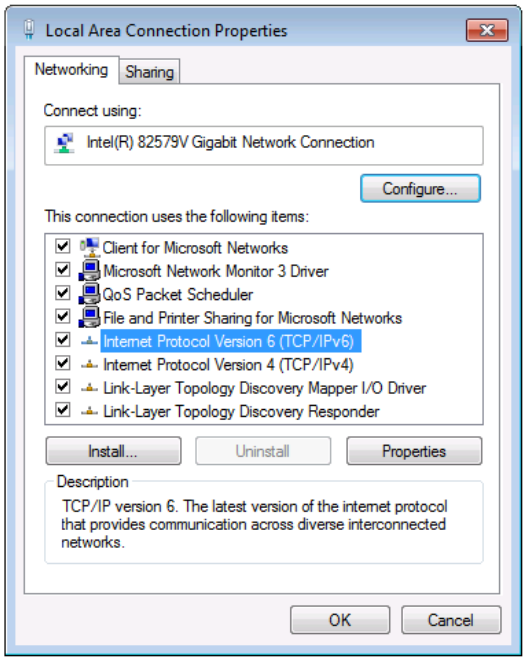


Figure 8: Local Area Connection Properties Window

4. Highlight either **Internet Protocol Version 6 (TCP/IPv6)** or **Internet Protocol Version 4 (TCP/IPv4)** depending on the requirements of your IT system.
5. Click **Properties**.
   The Internet Protocol Properties window relevant to your IT system appears as shown in Figure 9 or Figure 10.

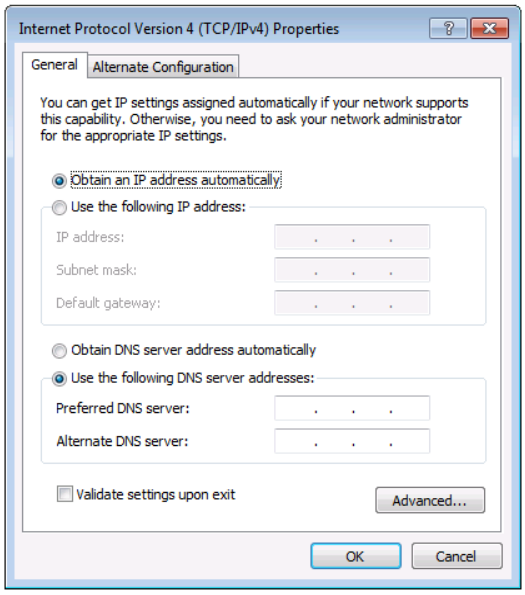


Figure 9: Internet Protocol Version 4 Properties Window

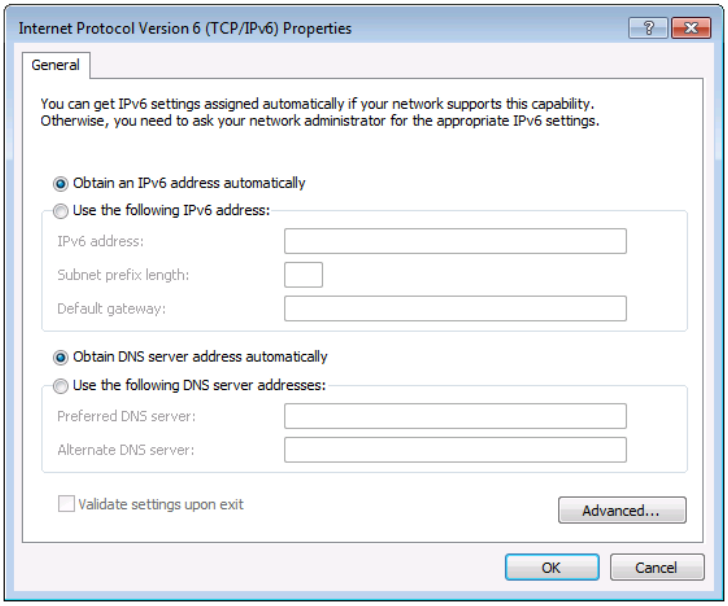


Figure 10: Internet Protocol Version 6 Properties Window

6. Select **Use the following IP Address** for static IP addressing and fill in the details as shown in Figure 11.
   For TCP/IPv4 you can use any IP address in the range 192.168.1.1 to 192.168.1.255 (excluding 192.168.1.39) that is provided by your IT department.

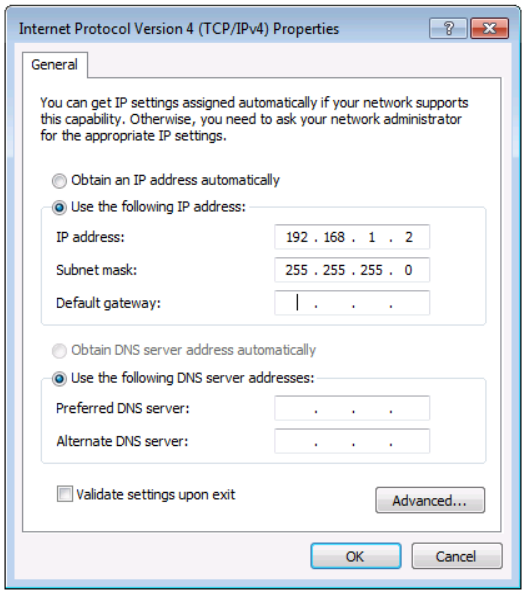


Figure 11: Internet Protocol Properties Window

7. Click **OK**.
8. Click **Close**.

Connecting Ethernet Port via a Network Hub or Switch

You can connect the Ethernet port of **KIT-500** to the Ethernet port on a network hub or using a straight-through cable with RJ-45 connectors.

Configuring Ethernet Port

You can set the Ethernet parameters via the embedded Web pages.

Using Embedded Web Pages

KIT-500 enables you to configure settings via Ethernet using built-in, user-friendly web pages. The Web pages are accessed using a Web browser and an Ethernet connection.

You can also configure **KIT-500** via Protocol 3000 commands (see Protocol 3000 Commands on page 57).

Before attempting to connect:

- Perform the procedure in (see Operating via Ethernet on page 24).
- Ensure that your browser is supported.

The following operating systems and Web browsers are supported:

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

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

Check that Security/firewalls are not blocking HTTP traffic between the device and the user PC.

To access the web pages:

1. Enter the IP address of the device in the address bar of your internet browser (default = DHCP).

   If security is enabled, the Login window appears.

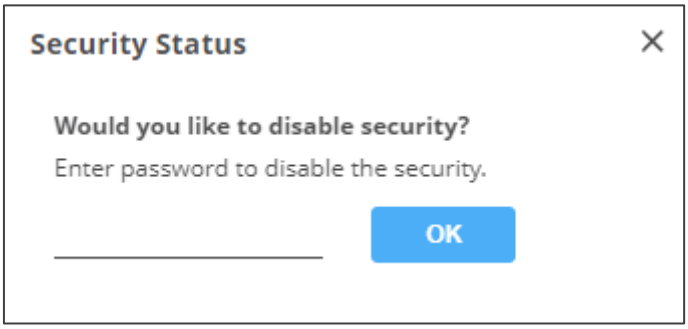


Figure 12: Embedded Web Pages Login Window

2. Enter the Username (default = admin) and Password (default = admin) and click **Sign in**. The default web page appears.
   On the webpage top right-hand side, you can press:
   - , to access stand-by mode.
   - , to set web page security.
   - , to enlarge web page view to full page.

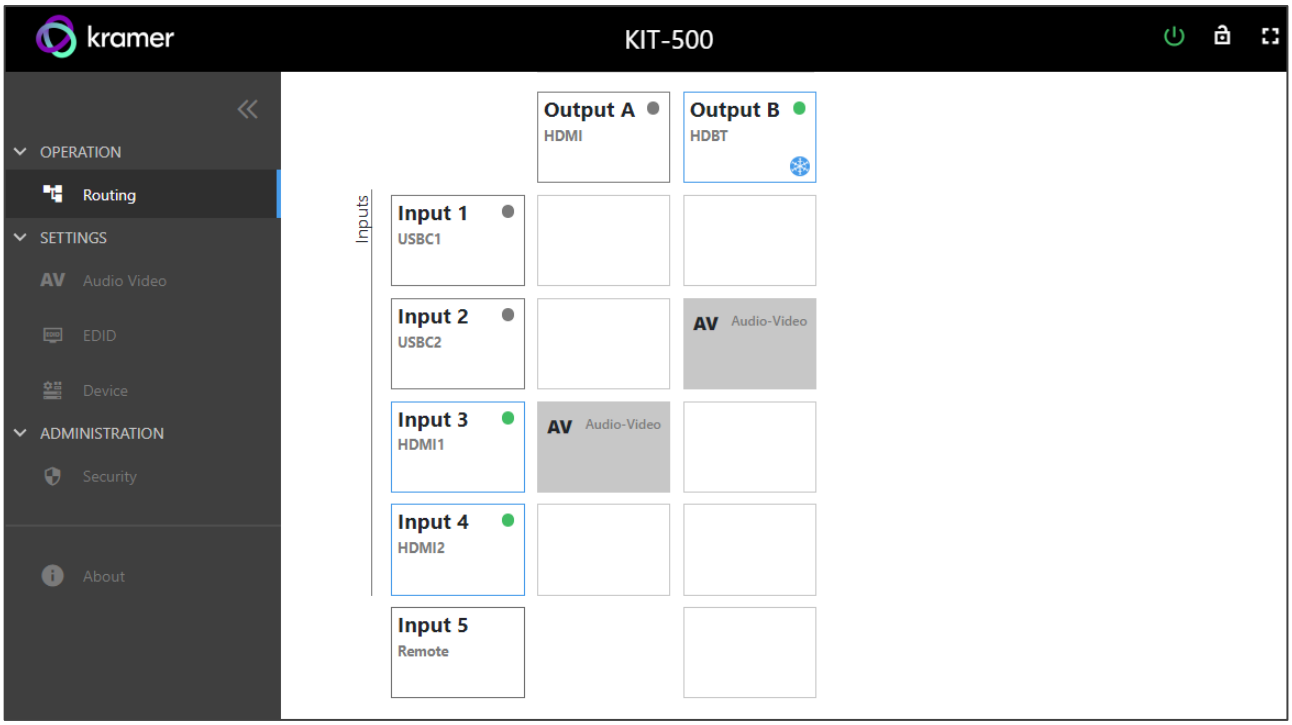


Figure 13: Routing Page

3. Click the Navigation Pane on the left side of the screen to access the relevant web page.

KIT-500 web pages enable performing the following actions:

Routing Inputs to Outputs

Route any of the input signals to the outputs on the **KIT-500T**. A green indication light next to an input or output indicates that an active signal is present on these ports.

To switch KIT-500T inputs to the outputs:

1. In the Navigation List, click the **OPERATIONS** drop-down arrow and select Routing. The Routing page appears (see Figure 13).
2. Select an input-output cross-point (for example, between Input 3 (HDMI 1) and Output B, and Input 4 (HDMI 2) and Output A.
3. If required, toggle (freeze button) to freeze the image on the **KIT-500R** output.
4. Click **Input 5 (Remote)** to route the HDMI input on **KIT-500R** to the output.

Inputs are switched to the outputs.

Setting Audio Video Parameters

KIT-500 enables setting the following audio and video parameters:

- Adjusting Audio Parameters on page 30.
- Adjusting Microphone Settings on page 31.
- Adjusting Input Parameters on page 33.
- Adjusting Output Parameters on page 34.

Adjusting Audio Parameters

Adjust the audio parameters.

To adjust the analog audio parameters:

1. In the Navigation list, click the **SETTINGS** drop-down arrow and select AV Audio Video. The Analog Audio tab in the AV page appears.

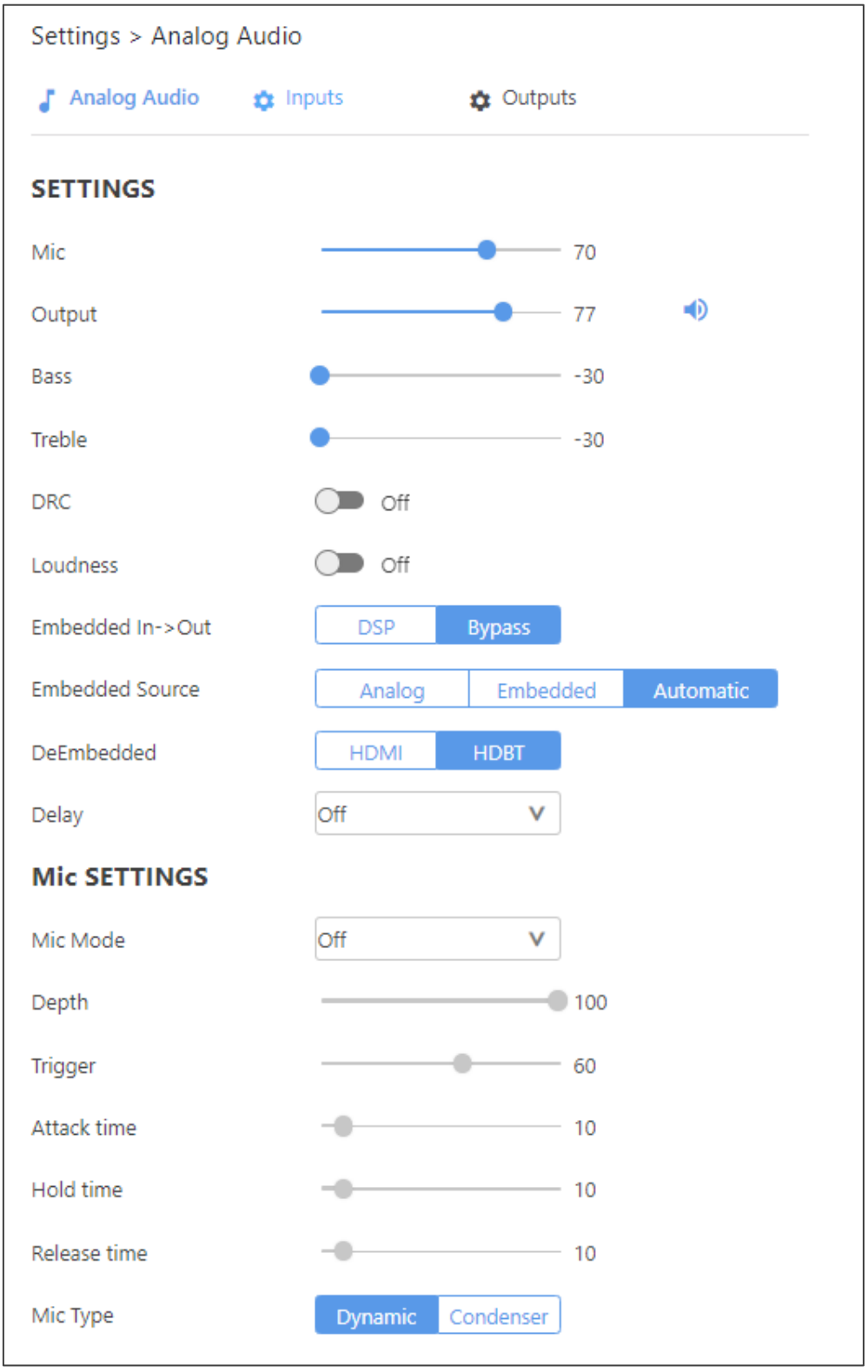


Figure 14: AV – Analog Audio Settings

2. Use the **Mic** slider to set the microphone audio level.
3. Use the **Output** slider to set the audio output level.
4. Use the **Bass/Treble** slider to adjust the bass/treble level.
5. Switch **DRC** (Dynamic Range Compression) On or Off.
6. Switch **Loudness** On or Off.
7. Click the Embedded In -> Out audio to **DSP** or **Bypass**.
   Apply DSP (default) to the embedded audio or ByPass it. Bypassed signals are routed directly to the HDMI and HDBT outputs and are not processed by the DSP circuitry.

   Select ByPass for compressed audio sources, for example, sources with Dolby or DTS encoding.

   In DSP audio mode, the embedded audio output on **KIT-500T** follows the audio sent to **KIT-500R**.
8. Open **Delay** drop-down box to select the audio delay time in milliseconds.
9. Set the analog audio output source (Output A or Output B).
10. Adjust the audio output volume, or mute audio.

Audio settings are adjusted.

Adjusting Microphone Settings

To adjust microphone settings:

1. In the Navigation List, click the **SETTINGS** drop-down arrow and select AV Audio Video. The Analog Audio tab in the AV page appears.
2. Scroll down to Mic Settings.
3. In the Mic Settings area, open the drop-down box and select one of the following mic modes:
   - Mixer – microphone audio plays together with the main output audio.
   - Talkover – decreases the main output audio volume when the microphone is active (see Setting Talkover Mode on page 32).

     When Talkover mode is selected, use the slider controls or enter a number in the fields to adjust the microphone settings (see Figure 15).
   - Mic only – microphone audio overrides the main output audio.
   - Off – microphone is disabled (default).
4. Click **Dynamic** or **Condenser** to set microphone type.

Microphone settings are adjusted.

Setting Talkover Mode

When Mic Mode is set to Talkover, set the following:

Depth [%]	Set the depth value to determine the decrease of the audio level during microphone takeover (press + to further decrease the talkover audio output level; press – to lessen the talkover output audio decrease level).
Trigger [dB]	Set the trigger value to determine the microphone threshold level that triggers the audio output level decrease.
Attack Time	Set the attack time to set the transition time of the audio level reduction after the signal rises above the threshold level.
Hold Time	Set the hold time to define the time-period talkover remains active although the signal falls below the threshold level (for a short period of time).
Release Time	Set the release time to define the transition time for the audio level to return from its reduced level to its normal level after the Hold Time period.

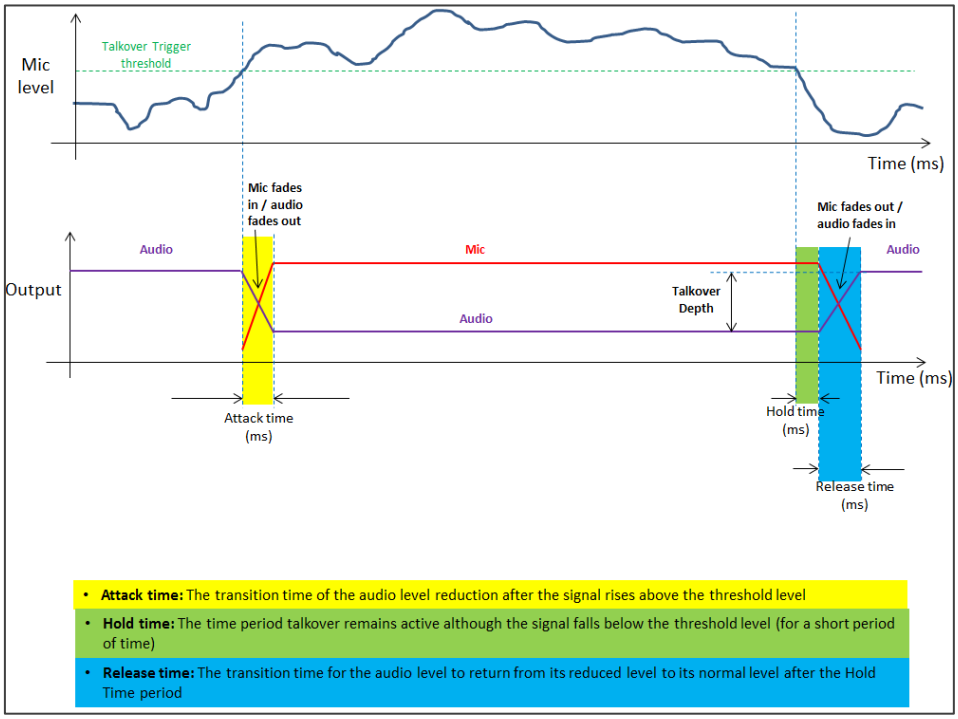


Figure 15: Talkover Mode

Adjusting Input Parameters

For each operation mode you can adjust the input settings. Not all parameters are available for each operation mode.

To adjust input parameters:

1. Click **AV** on the Navigation List. The AV Settings page appears (see Figure 13).
2. Click **Inputs** tab.

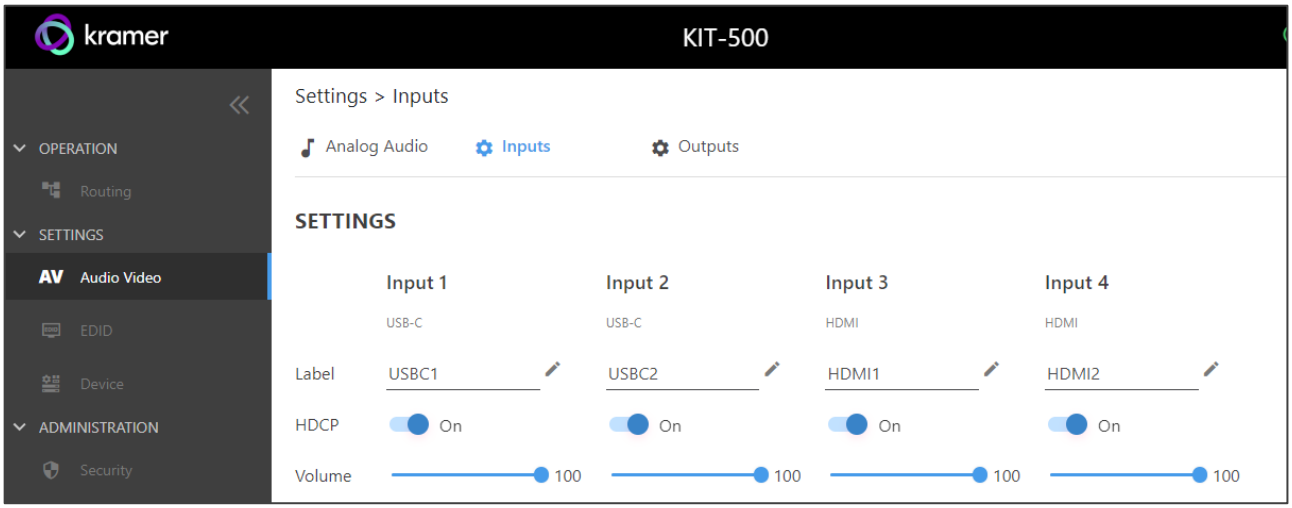


Figure 16: AV Settings – Inputs Tab

3. For each input you can perform the following:
   - Change the input name label.
   - Set HDCP on each input **On** or **Off**.
4. Use the **Volume** slider to adjust the volume for each input.

Inputs are adjusted.

Adjusting Output Parameters

For each operation mode you can adjust the output settings. The controllable parameters are dependent on the operation mode.

To adjust output parameters:

1. Click **AV** on the Navigation List. The AV Settings page appears (see Figure 13).
2. Click **Outputs** tab.

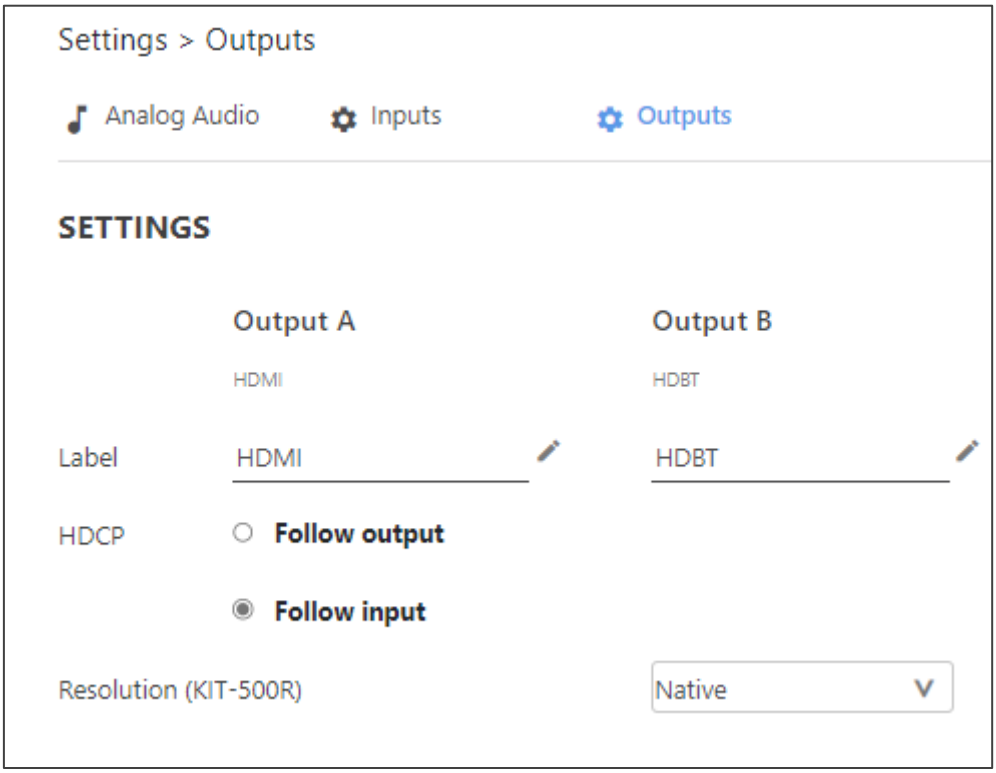


Figure 17: AV Settings – Outputs Tab

3. For each output:
   - Change the label name.
   - Set HDCP to **Follow input** (default) or **Follow output**.
4. Select the **KIT-500R** output resolution from the drop-down list.

Outputs are adjusted.

Managing KIT-500T EDID

- Uploading a User EDID File on page 36.

KIT-500 provides the option of 4 default EDIDs, 1 sink sourced EDID and 1 user uploaded EDID that can be assigned to all inputs at the same time, or to each input independently.

First time setup: Note that the default EDID settings of the device is optimized for high resolution (4K@60 4.4.4.). If you encounter a black monitor display when using a lower resolution input device, acquire the EDID from your connected output.

To manage EDID:

1. Click **EDID** on the Navigation List. The EDID page appears.

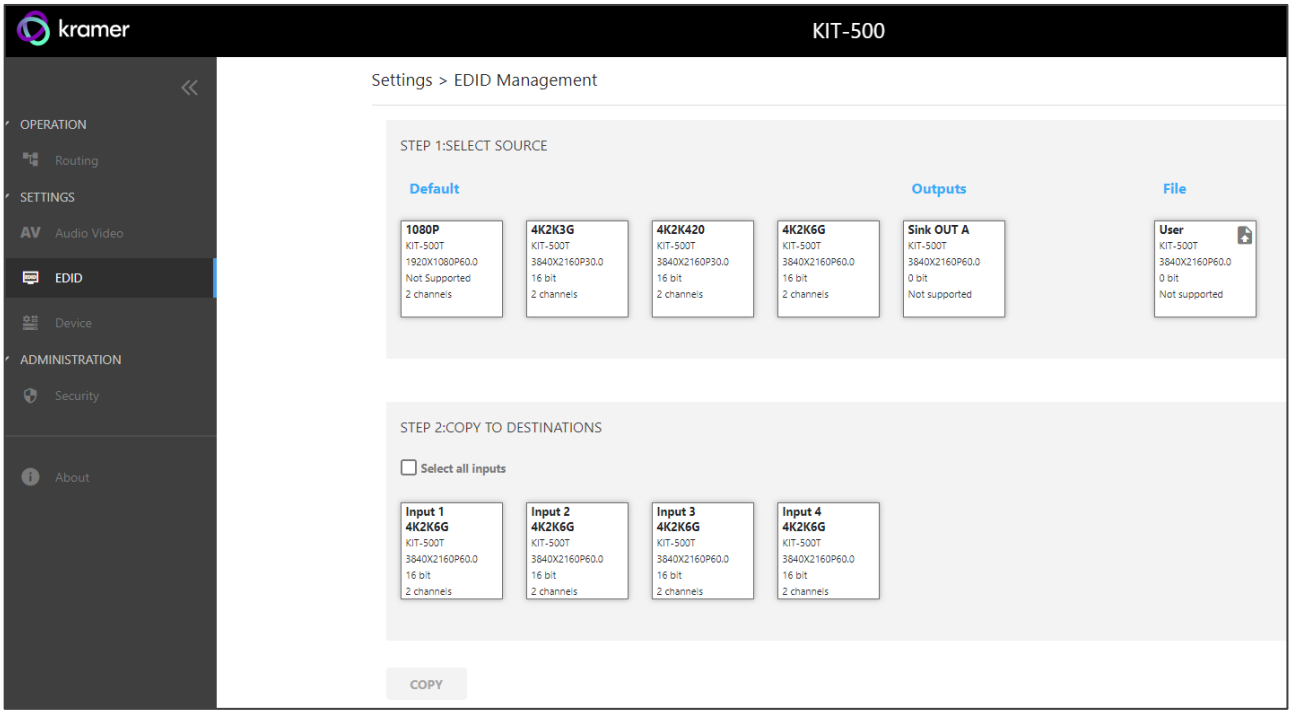


Figure 18: EDID Management Page

2. Under STEP 1: SELECT SOURCE, click the required EDID source from the default EDID options, the outputs, or select a User uploaded EDID configuration (for example, the default EDID file).

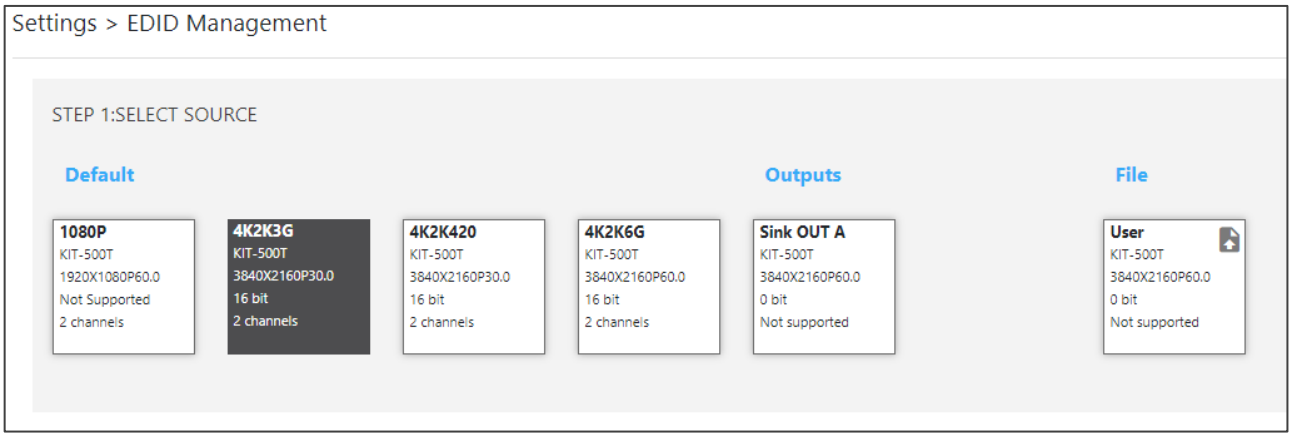


Figure 19: Selecting the EDID Source

3. Under STEP 2: SELECT DESTINATIONS, click the input/s to copy the selected EDID to. The Copy button is enabled.

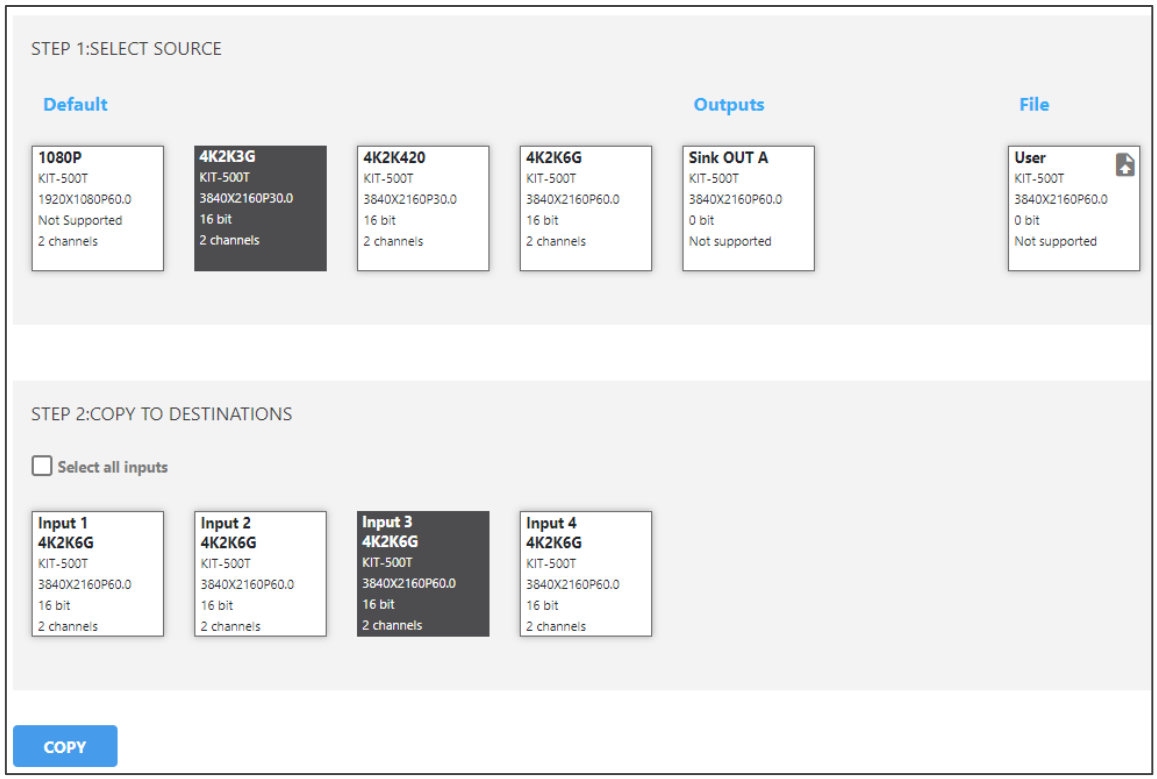


Figure 20: Selecting EDID Input Destinations

4. Click **COPY**. After EDID is copied, a success message appears.

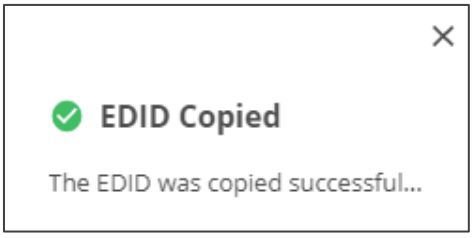


Figure 21: EDID Message

EDID is copied to the selected inputs.

Uploading a User EDID File

User EDID files are uploaded from your PC.

To upload a User EDID:

1. Click **EDID** on the Navigation List. The EDID page appears.
2. Click  to open the EDID file selection window.
3. Select the EDID file (*.bin file) from your PC.
4. Click **Open**.

The EDID file is uploaded to the User.

In some cases, an uploaded EDID may cause compatibility issues with certain sources. If this happens, we recommended that you copy a default EDID to the input.

Defining KIT-500T General Settings

KIT-500 enables performing the following actions via the General Settings tab:

- Changing Device Name on page 37.
- Updating KIT-500T Firmware on page 38.
- Restarting and Resetting the Device on page 38.

Changing Device Name

You can change the **KIT-500** name.

To change the device name:

1. In the Navigation list, click **Device Settings**. The General tab in the Device Settings page appears.

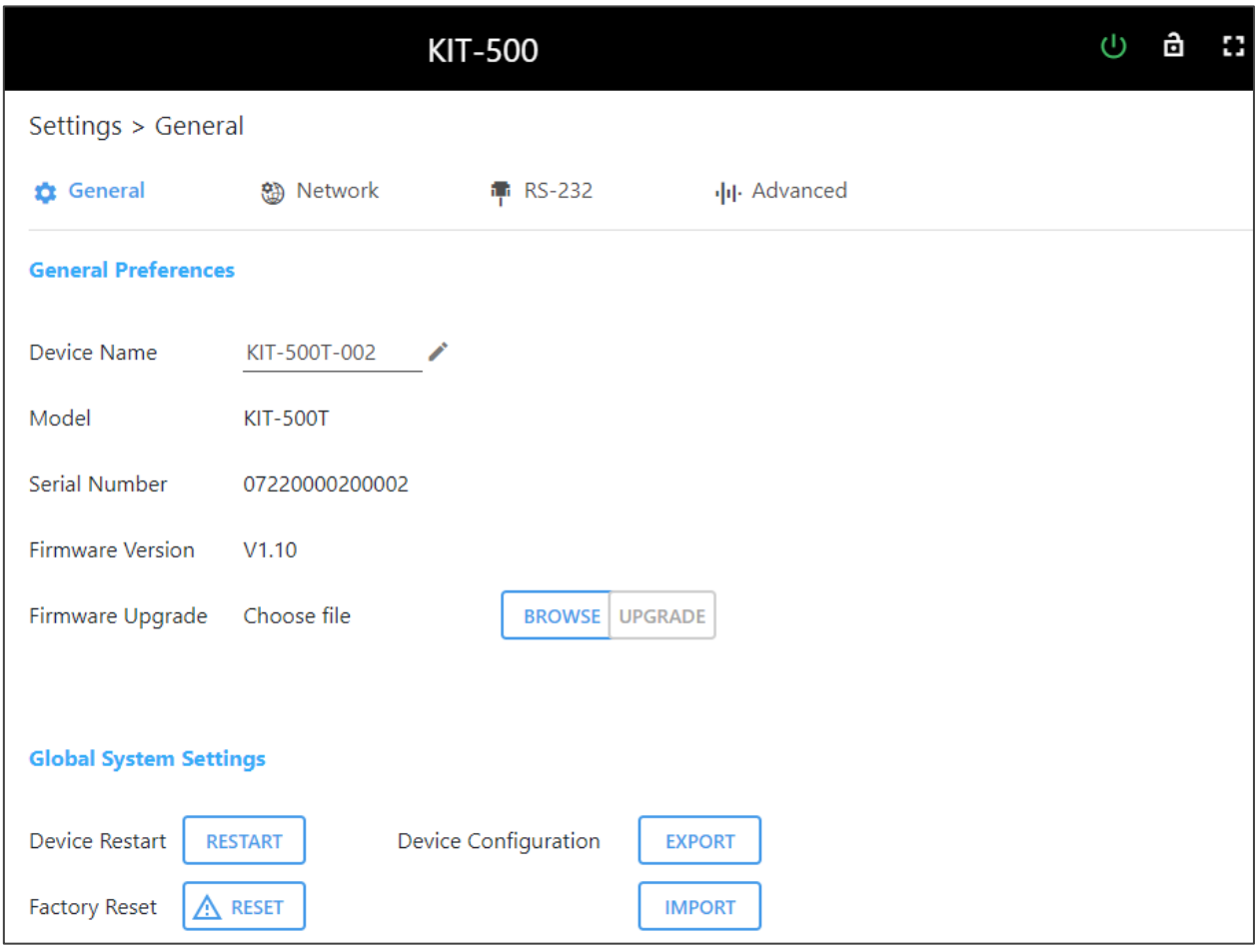


Figure 22: KIT-500 Device Settings – General

2. Next to Device Name, click .
3. Enter a new device name (Max. 14 characters).

Device name is changed.

Updating KIT-500T Firmware

To update the firmware:

1. In the navigation bar, click the **Device Settings** tab.

   The Device General Settings page appears (Figure 22).

2. Click **BROWSE** to select the new firmware file.
3. Open the relevant firmware file.
4. Click **UPGRADE**.

   A warning message appears.

5. Click **OK**.

The firmware uploads to the device.

Restarting and Resetting the Device

Use the embedded web pages to restart the device and/or reset it to its default parameters.

To restart/reset the device:

1. In the navigation bar, click the **Device Settings** tab.

   The Device General Settings page appears (Figure 22).

2. Click **RESTART/RESET**.

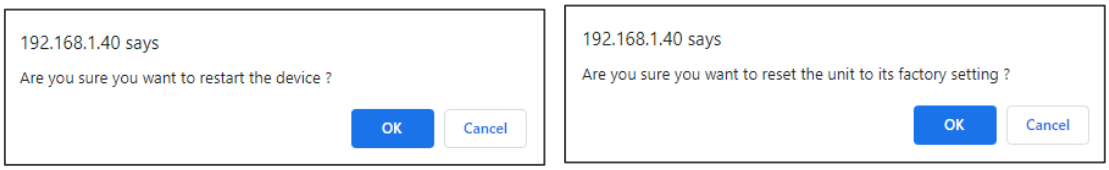


Figure 23: Restart/Reset the Device

3. Click **OK**.

The device restarts/resets.

Importing /Exporting a Configuration File

Use the **KIT-500** web UI to export and back-up configuration settings for future use.

The exported configuration file includes routing information, audio settings, input and output settings, network and RS-232 settings, sleep mode and USB type.

To export or import the KIT-500 configuration file:

1. In the navigation bar, click the **Device Settings** tab.

   The Device General Settings page appears (Figure 22).

2. Select an option:

   - Click **EXPORT** and select a destination for the file to export a configuration file. The configuration file is saved in your Download folder.

- Click **IMPORT** to import a (previously saved) configuration file and continue to the next step.

3. Select a file to import.
4. Confirm that you want the **KIT-500** settings to be replaced.

The imported configuration file parameters are uploaded.

Defining Network Settings

Define the network settings.

To define network settings:

1. In the navigation bar, click the **Device Settings** tab. The Device General Settings page appears (Figure 22).
2. Select the **Network** tab. The Network tab appears.

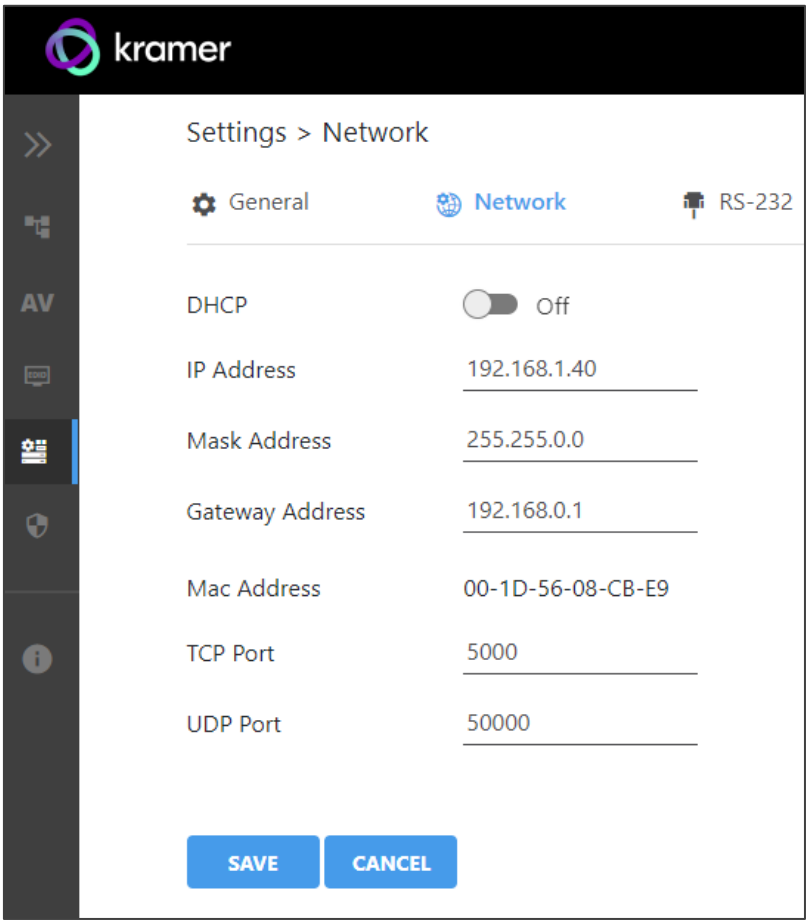


Figure 24: Device Settings – Network Tab

3. Set the Media port Stream service parameters:
   - **DHCP mode** – Set DHCP to **Off** or **On** (default).
   - **IP Address** – When DHCP mode is set to Off, the device uses a static IP address. This requires entering mask and gateway addresses.
   - **Mask Address** – Enter subnet mask.

- **Gateway address** – Enter the gateway address.

4. Define TCP (default, 5000) and UDP (default, 50000) ports.
5. Click **SAVE**.

Interface settings are defined.

Managing RS-232 Control

The **KIT-500T** RS-232 CONTROL port (12) can be defined to control the **KIT-500T**, to control an external device, via RS-232 commands or for RS-232 tunneling via Ethernet. Use the RS-232 tab in the Device Settings page to define the RS-232 port operation:

- **Local**: Controlling KIT-500T on page 40.
- **External**: Controlling an External Device via RS-232 on page 41.
- **Ethernet**: Controlling an External Device via Ethernet Control Gateway for RS-232 Commands on page 43.

Controlling KIT-500T

Connect the RS-232 port to a system controller to control the **KIT-500T**.

To control KIT-500T via CONTROL RS-232 Port:

1. Connect the CONTROL RS-232 port on the **KIT-500T** to a system controller the RS-232 port of an external device (for example, Kramer **SL-240C** as shown in Figure 5).
2. Click **Device** under **Settings** on the Navigation List.
3. Select the RS-232 tab on the Device Settings page.

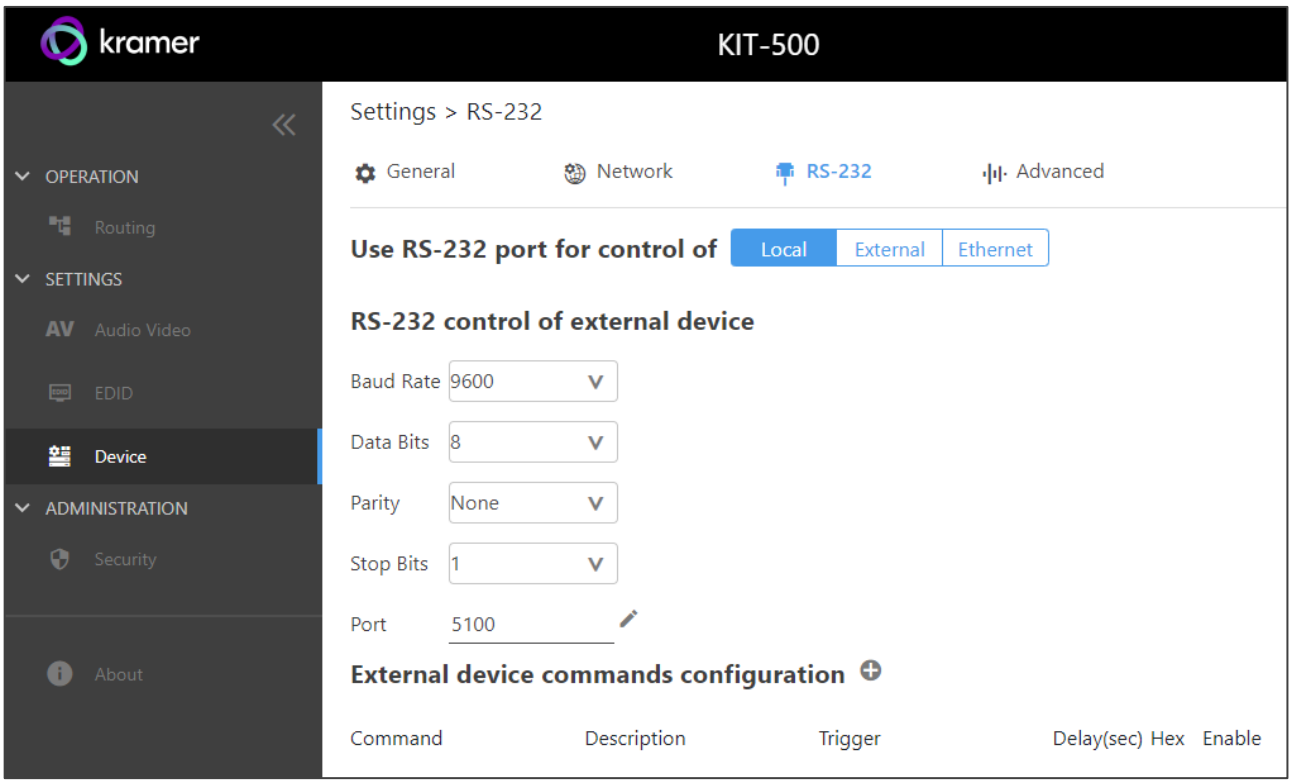


Figure 25: Device Settings – RS-232 Tab

4. Click **Local** or make sure that it's selected.

CONTROL RS-232 port is used to control the **KIT-500T**.

Controlling an External Device via RS-232

Control any external device via RS-232 commands triggered by **KIT-500T**.

To set up KIT-500T to control an external device via RS-232:

1. Connect the CONTROL RS-232 port on the **KIT-500T** to the RS-232 port of an external device (for example, a display connected to HDMI OUT).
2. Click **Device** under **Settings** on the Navigation List.
3. Select the RS-232 tab.
4. Click **External**.

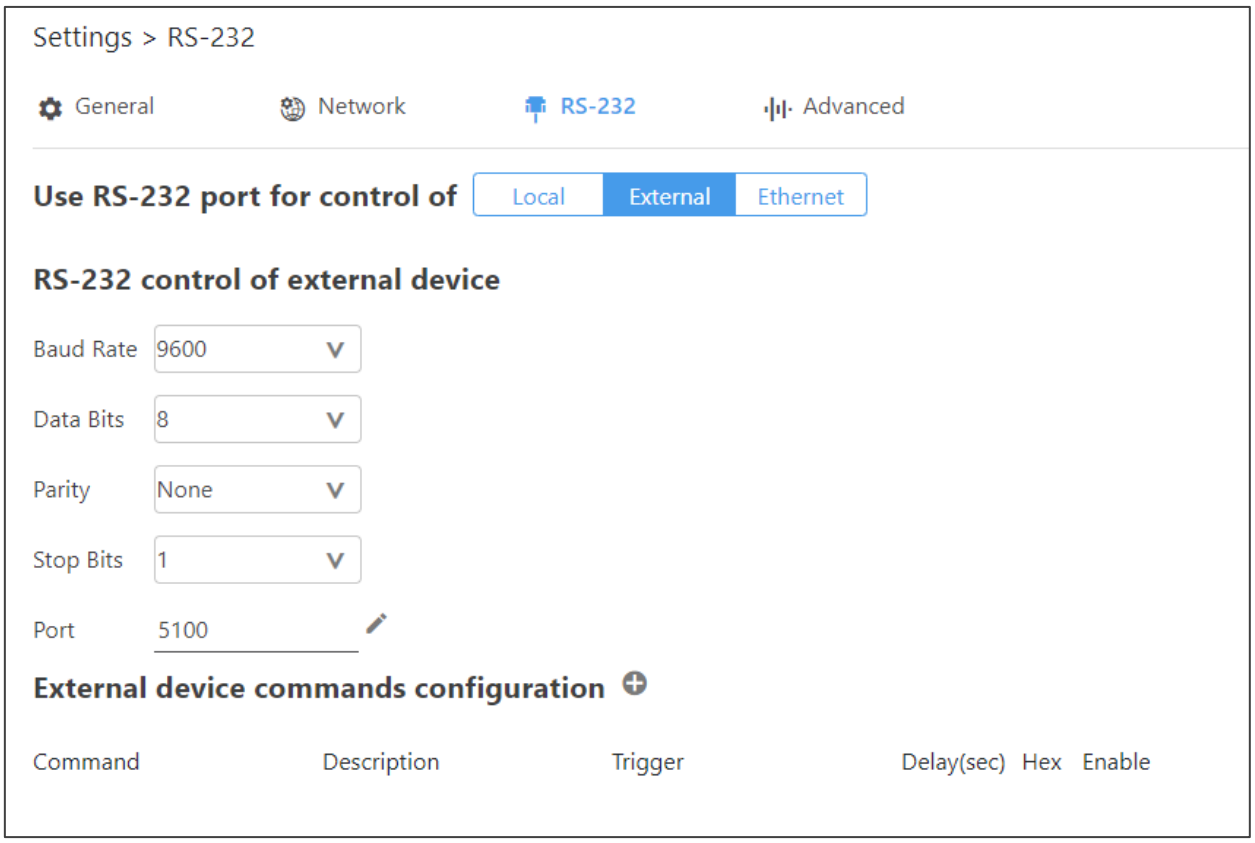


Figure 26: RS-232 Page – Controlling an External Device

5. Set RS-232 control of external device configuration parameters to enable communication with the display connected to the acceptor: Baud Rate, Data Bits, Parity, Stop Bits and Ports (5100 by default).
6. Configure the external device commands as follows:
   - Click ⊕ to add an RS-232 command.
   - Enter a device command (for example, turn POWER OFF).
   - Enter the command description (for example, Turn Display Off).
   - Select a trigger from the drop-down box to carry out the command (**5V On**, **5V Off**, **Sync/Clock**, **No Sync/No Clock**).
   - Enter a delay time, if required.
   - Check Hex for command Hex format, if required.
   - Check **Enable** to enable the command.

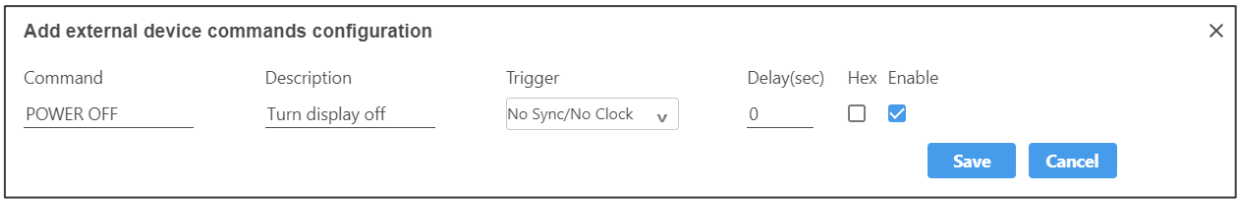


Figure 27: RS-232 Page – Creating a Command

7. Click **Save**.

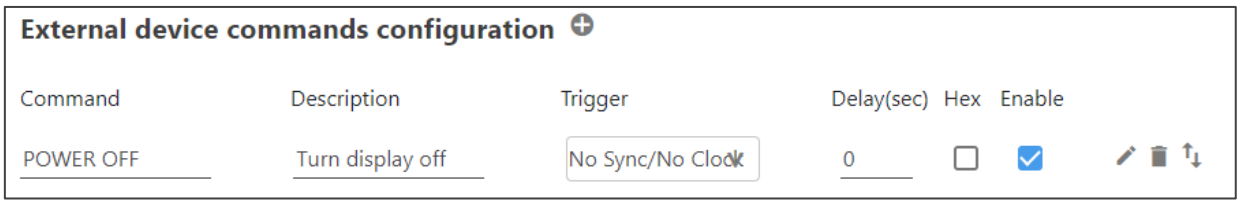


Figure 28: RS-232 Page – Command Added

8. You can:
   - Enable or disable the command.
   - Click to change any of the command configurations.
   - Click to delete the command.
   - Click to test the command.

Control the display via the RS-232 port by enabling the command.

Controlling an External Device via Ethernet Control Gateway for RS-232 Commands

You can tunnel serial commands via LAN to **KIT-500T**'s RS-232 CONTROL port, for example to control a device that is connected to the **KIT-500T** RS-232 port.

To control an external device via Ethernet:

1. Connect the CONTROL RS-232 port on the **KIT-500T** to an external device.
2. Click **Device** under **Settings** on the Navigation List.
3. Select the RS-232 tab on the Device Settings page.
4. Click **Ethernet** or make sure that it's selected.

Figure 29: Device Settings – Controlling via Ethernet

CONTROL RS-232 port is used to control an external device that is connected to the **KIT-500T** via IP messages from LAN-connected controller.

Defining Advanced Settings

This section describes the following actions:

Configuring Automatic Switching Settings

Select auto switching options.

To configure automatic switching settings:

1. In the navigation bar, click the **Device Settings** tab. The Device General Settings page appears (Figure 22).
2. Select the Advanced tab.

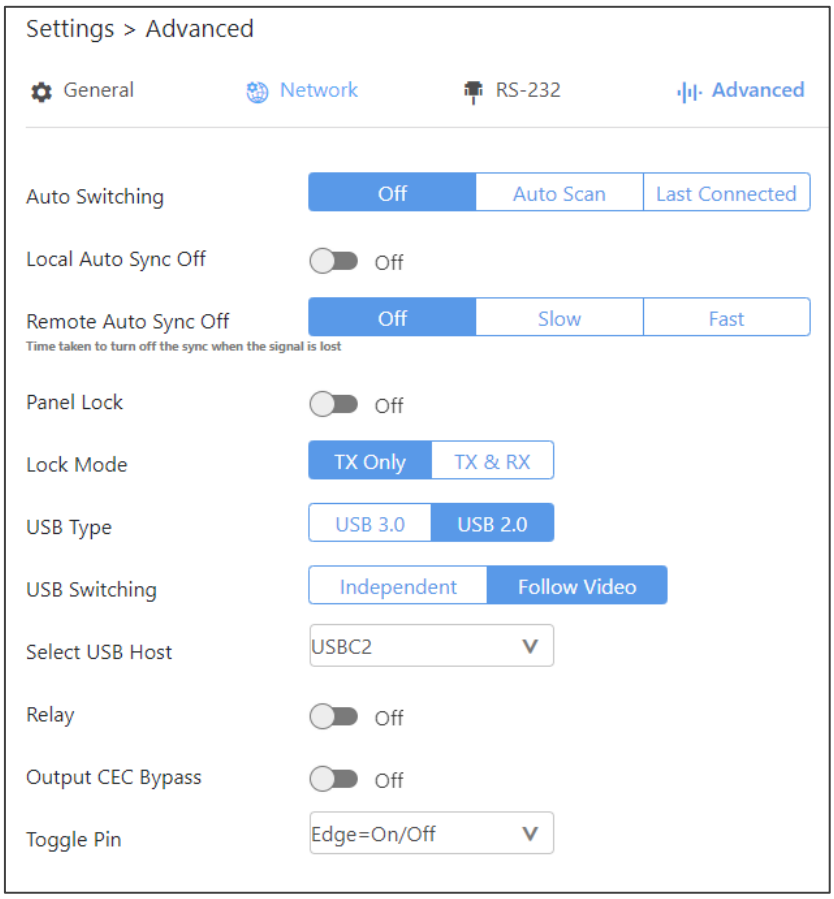


Figure 30: Settings Page – Advanced Tab

3. Next to Auto Switching select one of the following options:
   - **Off** – Manual switching (disable auto switching).
   - **Auto Scan** – Set auto-scanning to search for an active input to switch to the output.
   - **Last connected** – When detecting that a source is connected to an input (which previously had no signal), automatically switch to that input.

Automatic switching is defined.

Defining Auto Sync Mode

Define device behavior when the signal is lost (also set via the OSD menu, see Setting Sleep Mode on **KIT-500R** on page 21). See also CEC Signaling on page 15.

To define auto-sync off:

1. In the navigation bar, click the **Device Settings** tab. The Device General Settings page appears (Figure 22).
2. Select the Advanced tab (Figure 30).
3. For:
   - **KIT-500T** (Local Auto Sync Off) – Switch to **On** or **Off** (default).
   - **KIT-500R** (Remote Auto Sync Off) – Select the sync mode (**Off**-default, **Slow** or **Fast**).

Auto Sync Off mode is set.

Locking Front Panel Buttons

Lock the front panel buttons.

To lock the front panel buttons:

1. In the navigation bar, click the **Device Settings** tab. The Device General Settings page appears (Figure 22).
2. Select the Advanced tab (Figure 30).
3. Set Panel Lock **On** or **Off** (default).

Front panels are locked.

Selecting USB Type

Select the USB type to set USB-C USB support.

To select the USB type:

1. In the navigation bar, click the **Device Settings** tab. The Device General Settings page appears (Figure 22).
2. Select the Advanced tab (Figure 30).
3. Set USB type to **USB 3.0** or **USB 2.0** (default).

USB support is selected for the USB-C ports.

Defining USB Switching Policy

By default, USB host switching follows HDMI switching when switching to the HDBT output. (When a USB-C input is selected, that USB-C source is the host). For example, if your laptop is connected to HDMI 1, you can connect the USB 1 host port to your laptop to be the USB host when HDMI 1 is switched to the HDBT output. This is very useful when your laptop does not have a USB-C port and you need to connect it to both an HDMI port and a USB host.

Note that when switching mode is defined as Follow Video, the USB front panel buttons on the **KIT-500T** are disabled.

To select USB switching:

1. In the navigation bar, click the **Device Settings** tab. The Device General Settings page appears (Figure 22).
2. Select the Advanced tab (Figure 30).
3. Click
   - **Independent** to select independent USB port switching.
   - **Follow Video** (default) for USB ports to follow HDMI switching.

USB switching behavior is defined.

Selecting USB Host

Select the USB host.

To select the USB Host:

1. In the navigation bar, click the **Device Settings** tab. The Device General Settings page appears (Figure 22).
2. Select the Advanced tab (Figure 30).
3. Next to the USB Host drop-down box, select an active USB host port.

USB host port is selected.

Defining KIT-500R Relay Activity

Control the relay on the **KIT-500R**.

To define KIT-500R relay activity:

1. In the navigation bar, click the **Device Settings** tab. The Device General Settings page appears (Figure 22).
2. Select the Advanced tab (Figure 30).
3. Click **ON** (default) or **OFF** to energize or release the relay.

KIT-500R relay activity state is set.

Setting Output CEC Bypass

To set the output CEC bypass:

1. In the navigation bar, click the **Device Settings** tab. The Device General Settings page appears (Figure 22).
2. Select the Advanced tab (Figure 30).
3. Select:
   - **OFF** – **KIT-500R** automatically sends CEC commands to shut down the output display after a timeout period when no input signal is detected and to power up the display when the input signal is detected.
   - **ON** (default) – CEC commands pass from the HDMI input to the display. (**KIT-500R** does not automatically send CEC on and off commands).

KIT-500R either passes CEC commands between its HDMI input and the display, or it initiates and sends on and off commands to the display.

CEC bypass is enabled/disabled.

Setting Toggle Pin Behavior

Set the toggle pin behavior.

To set toggle pin behavior:

1. In the navigation bar, click the **Device Settings** tab. The Device General Settings page appears (Figure 22).
2. Select the Advanced tab (Figure 30).
3. Next to Toggle Pin drop-down box, select Toggle pin behavior (see Defining the REMOTE TOGGLE PIN on KIT-500R on page 23).

Toggle pin behavior is defined.

Setting Authentication

KIT-500T enables activating device security and defining logon authentication details. The upper right corner of the webpage displays or indicating whether authentication is required.

By default, the webpages are not secured and can be accessed without the username and password (when locked, the default username and password are both: **admin**).

Enabling Authentication and Changing Password

To set authentication:

1. In the Navigation pane, click **Security**. The Security page appears.

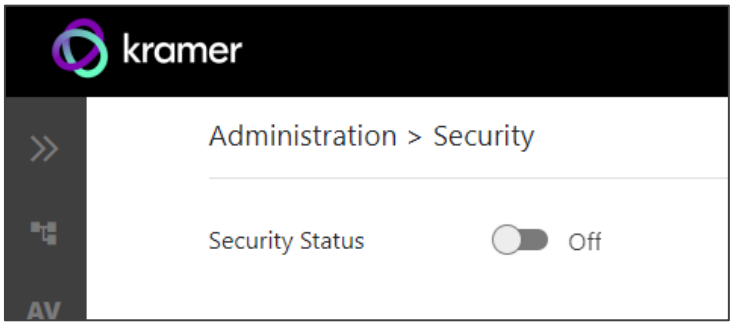


Figure 31: Security Page

2. Switch the **Security Status** to On to activate security. Security status turns on.

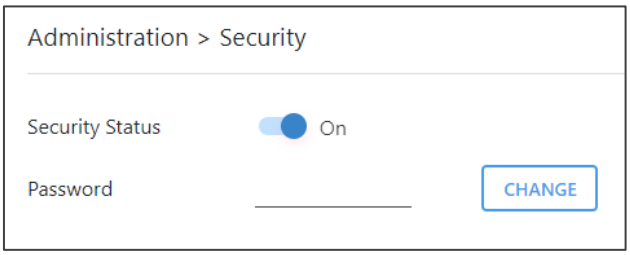


Figure 32: Security Page – Security On.

3. If required, change the password.
   - Enter the current password and click **CHANGE**.
   - Enter the new password twice.
4. Click **SAVE**. The upper right icon changes to  .

Security is enabled and password has been changed.

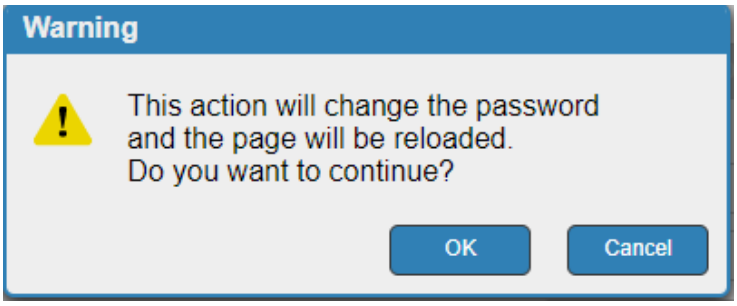


Figure 33: Authentication Page – Changing the Password Message

The webpage refreshes, the password fields are visible, and a confirmation message appears.

5. Click **OK**.

The password has changed, and the page is reloaded.

Disabling Authentication

To undo authentication:

1. In the Navigation pane, click **Security**. The Security page appears.

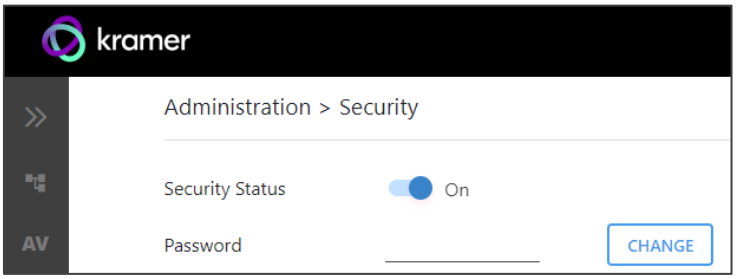


Figure 34: Security Page – Security Enabled

2. Set Security Status to Off.

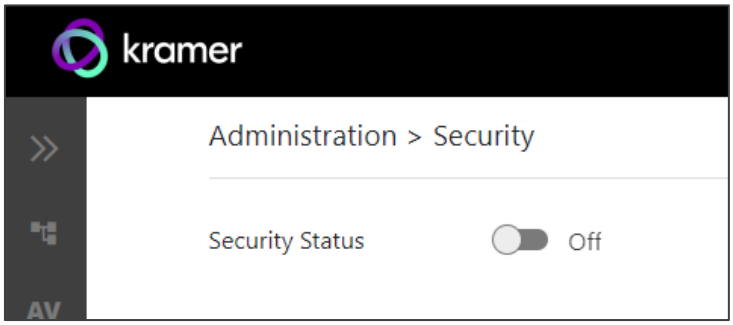


Figure 35: Security Page – Security Disabled

3. Click the **Disabled** button for Active Security. A confirmation message appears.

Figure 36: Authentication Tab – Confirmation Message.

4. Enter current password.
5. Click **OK**.

The webpage refreshes, the password fields disappear, and the upper right icon changes to .

Viewing the About Page

View the firmware version and Kramer Electronics Ltd details in the About page.

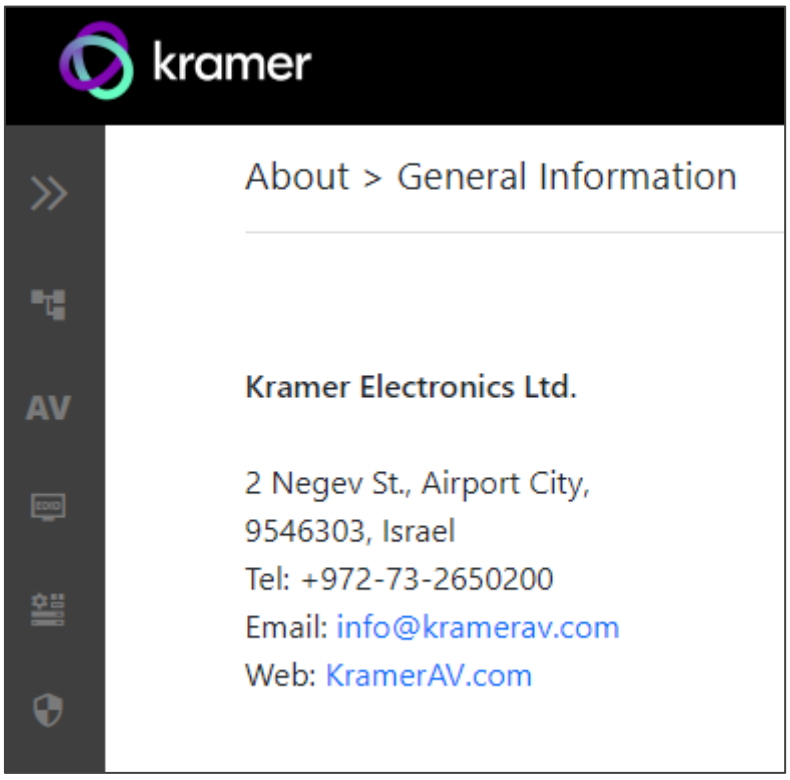


Figure 37: About Page

Upgrading Firmware

Use the Kramer **K-UPLOAD** software to upgrade the firmware via the **KIT-500** PROG USB port (13 for **KIT-500T** and 21 for **KIT-500R**), and for **KIT-500T** via the UI (see Updating KIT-500T Firmware on page 38).

The latest version of **K-UPLOAD** and installation instructions can be downloaded from our website at: www.kramerav.com/support/product_downloads.asp.

Output Coupling: DC
Max Input Signal Level: 3.5Vp-p/4.2dBu
Max Output Signal Level: 10Vp-p/13dBu
Frequency Response: 20Hz to 20kHz ±0.1dB
THD+N (A-weighted): 76dB
Output Impedance: 500Ω
For Embedded Audio – Number of Supported Channels: 2CH
Supported Audio Formats: LPCM

Technical Specifications

KIT-500T		
Inputs	2 HDMI	On HDMI female connectors
	2 DP Alt Mode & PD 2.0 USB-C	On USB-C female connectors
	1 Mic/Unbalanced Stereo Audio	On a 3-pin terminal block connector
	1 AUX Unbalanced Stereo Audio	On a 3.5mm mini jack
Outputs	1 HDMI	On a female HDMI connector
	1 HDBaseT	On an RJ-45 connector
	1 Balanced Stereo Audio	On a 5-pin terminal block connector
Ports	1 Ethernet	On an RJ-45 connector
	1 Control RS-232	On a 3-pin terminal block connector
	1 Data RS-232	On a 3-pin terminal block connector
	1 Program USB	On a USB type A connector for firmware upgrade
	3 USB (HUB)	On USB 3.0 type A connectors
	2 USB (Host)	On USB 3.0 type B connectors
Analog Audio	Input Coupling	AC
	Output Coupling	DC
	Max Input Signal Level	5.5Vp-p/8dBu
	Max Output Signal Level	6Vp-p/8.7dBu
	Frequency Response	20Hz to 20kHz ±0.1dB
	THD+N (A-weighted)	76dB
	Input Impedance	14KΩ
	Output Impedance	500Ω
	For Embedded Audio – Number of Supported Channels	Up to 8CH
	Supported Audio Formats	Dolby, DTS
KIT-500R		
Inputs	1 HDBaseT	On an RJ-45 connector
	1 HDMI	On an HDMI female connector
Outputs	1 HDMI	On an HDMI female connector
	1 Balanced Stereo Audio	On a 5-pin terminal block connector
Ports	1 Control RS-232	On a 3-pin terminal block connector
	1 Data RS-232	On a 3-pin terminal block connector
	3 Remote Contact-Closure	On a 4-pin terminal block connector
	1 Relay	On a 3-pin terminal block connector
	2 USB (DEVICE)	On USB 3.0 type A connectors
	1 Program USB	On a USB type A connector for firmware upgrade
Analog Audio	Output Coupling	DC
	Max Input Signal Level	3.5Vp-p/4.2dBu
	Max Output Signal Level	10Vp-p/13dBu
	Frequency Response	20Hz to 20kHz ±0.1dB
	THD+N (A-weighted)	76dB
	Output Impedance	500Ω
	For Embedded Audio – Number of Supported Channels	2CH
	Supported Audio Formats	LPCM

KIT-500T and **KIT-500R**		
Video	Max Data Rate	USB-C and HDMI ports: 18Gbps HDBT ports: 10.2Gbps
	Max Resolution	USB-C and HDMI ports: 4K@60Hz (4:4:4) HDBT ports: 4K@60Hz (4:2:0)
	HDMI Support	4K60, CEC, xvYCC color
	Content Protection	HDCP 1.4 and 2.2
USB	Data Rate	USB 3.0 ports: 5Gbps USB over HDBT: 480Mbps
	Integrated USB Hubs	500T: 2
		500R: 1
Extension Line	Up to 40m (130ft)	At 4K@60Hz (4:2:0)
	Up to 70m (230ft)	At full HD (1080p@60Hz)
	Compliance	HDBaseT 2.0
Extended RS-232	Baud Rate	300 to 115200
Power	Consumption (for both units)	24V DC, 3.7A
	Source	24V DC, 5A
Environmental Conditions	Operating Temperature	0° to +40°C (32° to 104°F)
	Storage Temperature	-40° to +70°C (-40° to 158°F)
	Humidity	10% to 90%, RHL non-condensing
Standards Compliance	Safety	CE, FCC, UCKA
	Environmental	RoHs, WEEE
Enclosure	Size	**KIT-500T**: ½-1U **KIT-500R**: MegaTOOLS®
	Type	Aluminum
	Cooling	Convection Ventilation
General	Net Dimensions (W, D, H)	**KIT-500T**: 18.8cm x 11.5 cm x 2.5 cm (7.38" x 4.53" x 1.00") **KIT-500R**: 18.8cm x 14.5 cm x 2.5 cm (7.38" x 4.53" x 1.00")
	Shipping Dimensions (W, D, H)	45.4cm x 23.6cm x 5.4cm (17.9" x 9.3" x 2.1")
	Net Weight	**KIT-500**: 1.2 kg (2.7lbs)
	Shipping Weight	**KIT-500**: 2kg (4.4lbs)
Accessories	Included	1 Power adapter, 2 power cords (EU and US), 1 multi-signal 1m USB-C cable, 8 rubber feet, 1 bracket set
Specifications are subject to change without notice at www.kramerav.com		

Default Communication Parameters

RS-232 (for Local)	
Baud Rate:	9600
Data Bits:	8
Stop Bits:	1
Parity:	None
Command Format:	ASCII
Port:	5100
Example (route video IN 2 to video HDBT OUT):	#ROUTE␣1,2,2<CR>
KIT-500 IP	
DHCP	On
Fall-back IP Address:	192.168.1.39
Subnet mask:	255.255.0.0
Default gateway:	192.168.0.1
Default TCP Port #:	5000
Default UDP Port #:	50000
Default username:	admin
Default password:	admin
Factory Reset: KIT-500T	
RS-232:	Protocol 3000 command: #factory <CR>
Webpages:	Settings page, General tab: • Reset button: To reset all parameters except network parameters to factory default values Factory button: To reset all parameters including network parameters to factory default values
Front panel buttons:	Press and hold left arrow and right arrow keys for several seconds (until all panel LEDs illuminate simultaneously)
Factory Reset: KIT-500R	
RS-232:	Protocol 3000 command: #factory <CR>
OSD menu:	Press MENU>Factory>Reset>ON>ENTER

KIT-500R Output Resolution Support

KIT-500R supports scaling to the following resolutions.

640x480 @60Hz	1600x1200 @60Hz	3440x1440 @30Hz	1920x1080P @50Hz
800x600 @60Hz	1680x1050 @60Hz	3440x1440 @60Hz	1920x1080P @60Hz
1024x768 @60Hz	1920x1200 @60Hz RB	720x480P @60Hz	2560x1080P @50Hz
1280x768 @60Hz	2560x1600 @60Hz RB	720x576P @50Hz	2560x1080P @60Hz
1280x800 @60Hz	1920x1080 @60Hz	1280x720P @50Hz	3840x2160P @24Hz
1280x1024 @60Hz	1280x720 @60Hz	1280x720P @60Hz	3840x2160P @25Hz
1360x768 @60Hz	2048x1080 @50Hz	1920x1080P @24Hz	3840x2160P @30Hz
1400x1050 @60Hz	2048x1080 @60Hz	1920x1080P @25Hz	3840x2160P @50Hz
1440x900 @60Hz	2560x1440 @60Hz RB	1920x1080P @30Hz	3840x2160P @60Hz

Input Resolution Support

KIT-500 supports the following input resolution.

480I/576I	1024x768@(60/70/75)	1360x768@60
480P/576P	1280x1024@(60/75)	1366x768@60
720P@(60/50)	1280X960@60	1400x1050@60
1080I@(60/50)	1280X720@60	1600X900@60 RB
1080P@(60/50)	1920X1080@60	1680x1050@60
1080P@(24/25/30)	1600X1200@60	1920x1200@60 RB
640x480@(60/67/72/75/85)	1280x768@60	2560x1400@60 RB
800x600@(56/60/72/75)	1280x800@60	

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**:

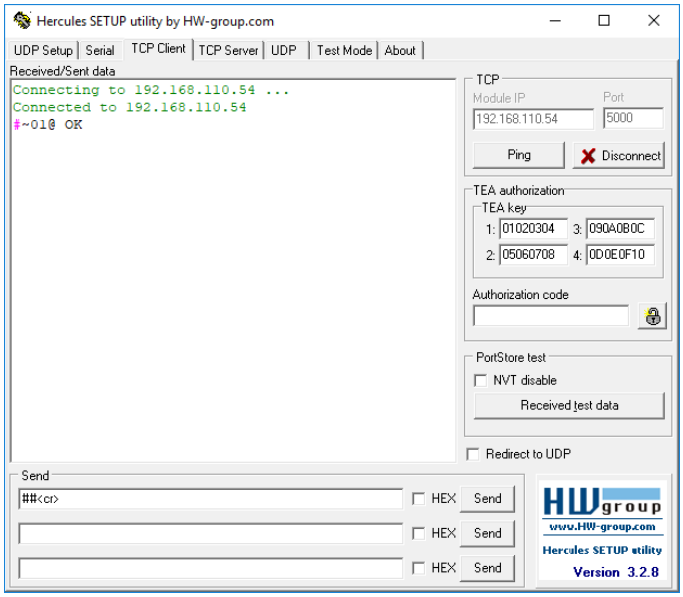
Prefix	Command Name	Constant (Space)	Parameter(s)	Suffix
#	Command	␣	Parameter	<CR>

- **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 **KIT-500**. The following figure displays how the # command is framed using terminal communication software (such as Hercules):



Protocol 3000 Commands

KIT-500T Protocol Commands

Function	Description	Syntax	Parameters/Attributes	Example
#	Protocol handshaking. ⓘ Validates the Protocol 3000 connection and gets the machine number. Step-in master products use this command to identify the availability of a device.	COMMAND #<CR> FEEDBACK ~nn@ ok<CR><LF>		#<CR>
AUD-DEEMB	Set analog audio output deembedding on video status.	COMMAND #AUD-DEEMB in_index,out_index,emb_mode<CR> FEEDBACK ~nn@AUD-DEEMB in_index,out_index,emb_mode<CR><LF>	in_index – 1 out_index – 1– HDMI Out 2– HDBT Out deemb_mode – Embedding status 1– Dembedded	Set audio in video embedding status for the input and output 2 to analog: #AUD-DEEMB 1,2,1<CR>
AUD-DEEMB?	Get audio in video deembedding status.	COMMAND #AUD-DEEMB? in_index,out_index<CR> FEEDBACK ~nn@AUD-DEEMB in_index,out_index,emb_mode<CR><LF>	in_index – 1 out_index – 1– HDMI Out 2– HDBT Out deemb_mode – Embedding status 1– Dembedded	#AUD-DEEMB? 1,2<CR>
AUD-EMB	Set audio in video embedding status.	COMMAND #AUD-EMB in_index,out_index,emb_mode<CR> FEEDBACK ~nn@AUD-EMB in_index,out_index,emb_mode<CR><LF>	in_index – 0 out_index – 0 emb_mode – Embedding status 0– Analog 1– Embedded 2– Auto	Set audio in video embedding status for input 2 and output 1 to analog: #AUD-EMB 2,1,0<CR>
AUD-EMB?	Get audio in video embedding status.	COMMAND #AUD-EMB? in_index,out_index<CR> FEEDBACK ~nn@AUD-EMB in_index,out_index,emb_mode<CR><LF>	in_index – 0 out_index – 0 emb_mode – Embedding status 0– Analog 1– Embedded 2– Auto	#AUD-EMB? 1,1<CR>
AUD-LVL	Set volume level.	COMMAND #AUD-LVL io_mode,io_index,vol_level<CR> FEEDBACK ~nn@AUD-LVL io_mode,io_index,vol_level<CR><LF>	io_mode – Input/Output 0– Input 1– Output io_index: For inputs: 0– USBC1 1– USBC2 2– HDMI 1 3– HDMI 2 For the output: 0- Output vol_level – Volume level 0 to100 ++ increase current value, -- decrease current value	Set AUDIO OUT 1 level to -50: #AUD-LVL 1,1,50<CR>
AUD-LVL?	Get volume level.	COMMAND #AUD-LVL? io_mode,io_index<CR> FEEDBACK ~nn@AUD-LVL io_mode,io_index,vol_level<CR><LF>	io_mode – Input/Output 0– Input 1– Output io_index: For inputs: 0– USBC1 1– USBC2 2– HDMI 1 3– HDMI 2 For the output: 0- Output vol_level – Volume level 0 to100 ++ increase current value, -- decrease current value	Get AUDIO OUT 1 level #AUD-LVL? 1,1<CR>
AUDIO-BYPASS	Set audio bypass status.	COMMAND #AUDIO-BYPASS status<CR> FEEDBACK ~nn@AUDIO-BYPASS status<CR><LF>	status – On/Off 0 – Off (DSP) 1 – On	Set audio-bypass to off: #AUDIO-BYPASS 0<CR>
AUDIO-BYPASS?	Get audio bypass status.	COMMAND #AUDIO-BYPASS <CR> FEEDBACK ~nn@AUDIO-BYPASS status<CR><LF>	status – On/Off 0 – Off (DSP) 1 – On	Set audio-bypass to off: #AUDIO-BYPASS? <CR>
AV-SW-MODE	Set input auto switch mode (per output).	COMMAND #AV-SW-MODE layer_type,out_index,connection_mode<CR> FEEDBACK ~nn@AV-SW-MODE layer_type,out_index,connection_mode<CR><LF>	layer_type – Number that indicates the signal type: 1– Video + Audio out_index: 1- Video outputs connection_mode – Connection mode 0– Manual 1– Auto scan 2– Last connected switch	Set input auto switch mode to manual: #AV-SW-MODE 1,1,0<CR>

Function	Description	Syntax	Parameters/Attributes	Example
AV-SW-MODE?	Get input auto switch mode (per output).	COMMAND **#AV-SW-MODE?** layer_type,out_index**<CR>** FEEDBACK **~nn@AV-SW-MODE** layer_type,out_index,connection_mode**<CR><LF>**	**layer_type** – Number that indicates the signal type: 1– Video + Audio **out_index**: 1- Video outputs **connection_mode** – Connection mode 0– Manual 1– Auto scan 2– Last connected switch	Get the input audio switch mode for HDBT Out: **#AV-SW-MODE?** 1,1**<CR>**
BASS	Set audio bass level.	COMMAND **#BASS** io_index,bass_level**<CR>** FEEDBACK **~nn@BASS** io_index,bass_level**<CR><LF>**	**io_index** 1- Video output **bass_level** – Audio parameter in Kramer units: -30 to 30	Set audio bass level of channel 1 to 5: **#BASS** 1,5**<CR>**
BASS?	Get audio bass level.	COMMAND **#BASS?** io_index**<CR>** FEEDBACK **~nn@BASS** io_index,bass_level**<CR><LF>**	**io_index** 1- Video output **bass_level** – Audio parameter in Kramer units: -30 to 30	Get audio bass level of channel 1: **#BASS?** 1**<CR>**
BUILD-DATE?	Get device build date.	COMMAND **#BUILD-DATE?** **<CR>** FEEDBACK **~nn@BUILD-DATE** date,time**<CR><LF>**	**date** – Format: YYYY/MM/DD where YYYY = Year MM = Month DD = Day **time** – Format: hh:mm:ss where hh = hours mm = minutes ss = seconds	Get the device build date: **#BUILD-DATE?<CR>**
CEC	Set the CEC mode status.	COMMAND **#CEC** cec_mode**<CR>** FEEDBACK **~nn@CEC** cec_mode**<CR><LF>**	**cec_mode** – CEC mode On – CEC mode switched on Off – CEC mode switched Off.	Set the CEC mode to on: **#CEC** on**<CR>**
CPEDID	Copy EDID data from the output to the input EEPROM. ⓘ Destination bitmap size depends on device properties (for 64 inputs it is a 64-bit word). Example: bitmap 0x0013 means inputs 1,2 and 5 are loaded with the new EDID. In certain products Safe_mode is an optional parameter. See the HELP command for its availability.	COMMAND **#CPEDID** edid_io,src_id,edid_io,dest_bitmap**<CR>** or **#CPEDID** edid_io,src_id,edid_io,dest_bitmap,safe_mode**<CR>** FEEDBACK **~nn@CPEDID** edid_io,src_id,edid_io,dest_bitmap**<CR><LF>** **~nn@CPEDID** edid_io,src_id,edid_io,dest_bitmap,safe_mode**<CR><LF>**	**edid_io** – *EDID* source type (usually output) 1– Output **src_id** – Number of chosen source stage 1– HDMI Out 2– HDBT Out **edid_io** – *EDID destination* type (usually input) 0– Input **dest_bitmap** – Bitmap representing destination IDs. 0x01: USBC1 0x02: USBC2 0x04: HDMI1 0x08: HDMI2 Format: XXXX…X, where X is hex digit. The binary form of every hex digit represents corresponding destinations. 0– indicates that EDID data is not copied to this destination. 1– indicates that EDID data is copied to this destination. **safe_mode** – Safe mode 0– device accepts the EDID as is without trying to adjust 1– device tries to adjust the EDID (default value if no parameter is sent)	Copy the EDID data from the Output 1 (EDID source) to the Input: **#CPEDID** 1,1,0,0x1**<CR>** Copy the EDID data from the default EDID source to the Input: **#CPEDID** 2,0,0,0x1**<CR>**
DISPLAY?	Get output HPD status.	COMMAND **#DISPLAY?** out_index**<CR>** FEEDBACK **~nn@DISPLAY** out_index,status**<CR><LF>**	**out_index**: 1 – HDMI Out 2 – HDBT Out **status** – HPD status according to signal validation 0– Signal or sink is not valid 1– Signal or sink is valid	Get the output HPD status of Output 1: **#DISPLAY?** 1**<CR>**
DPSW-STATUS	Set the DIP-switch state.	COMMAND **#DPSW-STATUS** dip_id,status**<CR>** FEEDBACK **~nn@DPSW-STATUS** dip_id,status**<CR><LF>**	**dip_id** – 0– Mic **status** – Up/down 0– 0V 1– 48V	Set the DIP-switch 2 status to 48V: **#DPSW-STATUS** 0,1**<CR>**
DPSW-STATUS?	Get the DIP-switch state.	COMMAND **#DPSW-STATUS?** dip_id**<CR>** FEEDBACK **~nn@DPSW-STATUS** dip_id,status**<CR><LF>**	**dip_id** – 0– Mic **status** – Up/down 0– 0V 1– 48V	Get the DIP-switch 2 status: **#DPSW-STATUS?** 2**<CR>**
ETH-PORT	Set Ethernet port protocol. ⓘ 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).	COMMAND **#ETH-PORT** port_type,port_id**<CR>** FEEDBACK **~nn@ETH-PORT** port_type,port_id**<CR><LF>**	**port_type** – TCP/UDP **port_id** – TCP/UDP port number TCP: 5000~5099 UDP: 50000~50999	Set the Ethernet port protocol for TCP to port 12457: **#ETH-PORT** 0,12457**<CR>**

Function	Description	Syntax	Parameters/Attributes	Example
ETH-PORT?	Get Ethernet port protocol.	COMMAND **#ETH-PORT?** port_type<CR> FEEDBACK **~nn@ETH-PORT** port_type,port_id<CR><LF>	**port_type** – TCP/UDP **port_id** – TCP/UDP port number TCP: 5000~5099 UDP: 50000~50999	Get the Ethernet port protocol for UDP: **#ETH-PORT?** udp<CR>
FACTORY	Reset device to factory default configuration. ⓘ 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.	COMMAND **#FACTORY**<CR> FEEDBACK **~nn@FACTORY** ok<CR><LF>		Reset the device to factory default configuration: **#FACTORY**<CR>
HDCP-MOD	Set HDCP mode. ⓘ Set HDCP working mode on the device input: HDCP supported - HDCP_ON [default]. HDCP not supported - HDCP OFF. HDCP support changes following detected sink - MIRROR OUTPUT. When you define 3 as the mode, the HDCP status is defined according to the connected output in the following priority: OUT 1, OUT 2. If the connected display on OUT 2 supports HDCP, but OUT 1 does not, then HDCP is defined as not supported. If OUT 1 is not connected, then HDCP is defined by OUT 2.	COMMAND **#HDCP-MOD** io_mode,index,mode<CR> FEEDBACK **~nn@HDCP-MOD** io_mode,index,mode<CR><LF>	io_index – Input/Output 0 – Input 1 – Output **index** – Input: 1 – USBC1 2 – USBC2 3 – HDMI 3 4 – HDMI 4 Output 1 – HDMI Out 2 – HDBT Out **mode** – HDCP mode: Input: 0 – HDCP Off 1 – HDCP On Output: 2 – Follow Input 3 – Follow Output	Set the input HDCP-MODE of HDMI 3 to Off: **#HDCP-MOD** 0,3,0<CR>
HDCP-MOD?	Get HDCP mode. ⓘ Set HDCP working mode on the device input: HDCP supported - HDCP_ON [default]. HDCP not supported - HDCP OFF. HDCP support changes following detected sink - MIRROR OUTPUT.	COMMAND **#HDCP-MOD?** io_mode,index<CR> FEEDBACK **~nn@HDCP-MOD** io_mode,index,mode<CR><LF>	io_index – Input/Output 0 – Input 1 – Output **index** – Input: 1 – USBC1 2 – USBC2 3 – HDMI 3 4 – HDMI 4 Output 1 – HDMI Out 2 – HDBT Out **mode** – HDCP mode: Input: 0 – HDCP Off 1 – HDCP On Output: 2 – Follow Input 3 – Follow Output	Get the input HDCP-MODE of HDMI Out: **#HDCP-MOD?** 1,1<CR>
HELP	Get command list or help for specific command.	COMMAND **#HELP**<CR> **#HELP** cmd_name<CR> FEEDBACK 1. Multi-line: **~nn@Device** cmd_name, cmd_name…<CR><LF> To get help for command use: HELP (COMMAND_NAME)<CR><LF> **~nn@HELP** cmd_name:<CR><LF> **description**<CR><LF> **USAGE:usage**<CR><LF>	**cmd_name** – Name of a specific command	Get the command list: **#HELP**<CR> To get help for AV-SW-TIMEOUT: HELP **av-sw-timeout**<CR>
LOCK-FP	Lock the front panel.	COMMAND **#LOCK-FP** lock/unlock<CR> FEEDBACK **~nn@LOCK-FP** lock/unlock<CR><LF>	**lock/unlock** – On/Off 0 – Off unlocks front panel buttons or keyboard 1 – On locks front panel buttons or keyboard	Unlock front panel: **#LOCK-FP** 0<CR>
LOCK-FP?	Get the front panel lock state.	COMMAND **#LOCK-FP?** <CR> FEEDBACK **~nn@LOCK-FP** lock/unlock<CR><LF>	**lock/unlock** – On/Off 0 – Off unlocks front panel buttons or keyboard 1 – On locks front panel buttons or keyboard	Get the front panel lock state: **#LOCK-FP?**<CR>
LOUDNESS	Set audio loudness.	COMMAND **#LOUDNESS** io_index,enabled<CR> FEEDBACK **~nn@LOUDNESS** io_index,enabled<CR><LF>	**io_index** – 1 **enabled** – On/Off 0 – Off 1 – On	Set audio loudness to ON: **#LOUDNESS** 1,1<CR>
LOUDNESS?	Get audio loudness.	COMMAND **#LOUDNESS?** io_index<CR> FEEDBACK **~nn@LOUDNESS** io_index,enabled<CR><LF>	**io_index** – 1 **enabled** – On/Off 0 – Off 1 – On	Get audio loudness: **#LOUDNESS?** 1<CR>

Function	Description	Syntax	Parameters/Attributes	Example
MIC-GAIN	Set the microphone gain. ⓘ Sets the microphone input audio gain.	COMMAND **#MIC-GAIN** layer,mic_id,level**<CR>** FEEDBACK **~nn@MIC-GAIN** layer,mic_id,level**<CR><LF>**	**layer** – 0 **mic_id** – 0 **level** – Level – 0 to 100 ++ increase current value, -- decrease current value	Set the microphone gain to 58: **#MIC-GAIN** 0,0,58**<CR>**
MIC-GAIN?	Get the microphone gain. ⓘ Gets the microphone input audio gain.	COMMAND **#MIC-GAIN?** layer,mic_id**<CR>** FEEDBACK **~nn@MIC-GAIN** layer,mic_id,level**<CR><LF>**	**layer** – 0 **mic_id** – 0 **level** – Level – 0 to 100 ++ increase current value, -- decrease current value	Get the microphone gain: **#MIC-GAIN?** 0,0**<CR>**
MODEL?	Get device model.	COMMAND **#MODEL?** **<CR>** FEEDBACK **~nn@MODEL** model_name**<CR><LF>**	**model_name** – String of up to 19 printable ASCII chars	Get the device model: **#MODEL?** **<CR>**
MUTE	Set audio mute.	COMMAND **#MUTE** out_index,mute_mode**<CR>** FEEDBACK **~nn@MUTE** out_index,mute_mode**<CR><LF>**	**out_index** – 0 **mute_mode** – On/Off 0– Off 1– On	Set audio output to mute: **#MUTE** 0,1**<CR>**
MUTE?	Get audio mute.	COMMAND **#MUTE?** out_index**<CR>** FEEDBACK **~nn@MUTE** out_index,mute_mode**<CR><LF>**	**out_index** – 0 **mute_mode** – On/Off 0– Off 1– On	Get audio output mute status: **#MUTE** 0?**<CR>**
NAME	Set machine (DNS) name. ⓘ 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).	COMMAND **#NAME** machine_name**<CR>** FEEDBACK **~nn@NAME** machine_name**<CR><LF>**	**machine_name** – String of up to 15 alpha-numeric chars (can include hyphen, not at the beginning or end)	Set the DNS name of the device to room-442: **#NAME** room-442**<CR>**
NAME?	Get machine (DNS) name. ⓘ 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).	COMMAND **#NAME?** **<CR>** FEEDBACK **~nn@NAME** machine_name**<CR><LF>**	**machine_name** – String of up to 15 alpha-numeric chars (can include hyphen, not at the beginning or end)	Get the DNS name of the device: **#NAME?** **<CR>**
NAME-RST	Reset machine (DNS) name to factory default. ⓘ Factory default of machine (DNS) name is "KRAMER_" + 4 last digits of device serial number.	COMMAND **#NAME-RST<CR>** FEEDBACK **~nn@NAME-RST** ok**<CR><LF>**		Reset the machine name (S/N last digits are 0102): **#NAME-RST** kramer_0102**<CR>**
NET-DHCP	Set DHCP mode. ⓘ 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. ⓘ 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.	COMMAND **#NET-DHCP** dhcp_state**<CR>** FEEDBACK **~nn@NET-DHCP** dhcp_state**<CR><LF>**	**dhcp_state** – 0– Do not use DHCP. Use the IP set by the factory or using the **net-ip** or **net-config** command. 1– Try to use DHCP. If unavailable, use the IP set by the factory or using the **net-ip** or **net-config** command.	**Enable DHCP mode #NET-DHCP** 1**<CR>**
NET-DHCP?	Get DHCP mode. ⓘ 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.	COMMAND **#NET-DHCP?** **<CR>** FEEDBACK **~nn@NET-DHCP** dhcp_mode**<CR><LF>**	**dhcp_mode** – 0– Do not use DHCP. Use the IP set by the factory or using the **net-ip** or **net-config** command. 1– Try to use DHCP. If unavailable, use the IP set by the factory or using the **net-ip** or **net-config** command.	Get DHCP mode : **#NET-DHCP?** **<CR>**
NET-GATE	Set gateway IP. ⓘ A network gateway connects the device via another network and maybe over the Internet. Be careful of security issues. For proper settings consult your network administrator.	COMMAND **#NET-GATE** ip_address**<CR>** FEEDBACK **~nn@NET-GATE** ip_address**<CR><LF>**	**ip_address** – Format: xxx.xxx.xxx.xxx	Set the gateway IP address to 192.168.0.1: **#NET-GATE** 192.168.000.001**<CR>**

Function	Description	Syntax	Parameters/Attributes	Example
NET-GATE?	Get gateway IP. ⓘ A network gateway connects the device via another network and maybe over the Internet. Be aware of security problems.	COMMAND **#NET-GATE?␣<CR>** FEEDBACK **~nn@NET-GATE␣**ip_address**<CR><LF>**	**ip_address** – Format: xxx.xxx.xxx.xxx	Get the gateway IP address: **#NET-GATE?␣<CR>**
NET-IP	Set IP address. ⓘ For proper settings consult your network administrator.	COMMAND **#NET-IP␣**ip_address**<CR>** FEEDBACK **~nn@NET-IP␣**ip_address**<CR><LF>**	**ip_address** – Format: xxx.xxx.xxx.xxx	Set the IP address to 192.168.1.39: **#NET-IP␣**192.168.001.039**<CR>**
NET-IP?	Get IP address.	COMMAND **#NET-IP?␣<CR>** FEEDBACK **~nn@NET-IP␣**ip_address**<CR><LF>**	**ip_address** – Format: xxx.xxx.xxx.xxx	Get the IP address: **#NET-IP?␣<CR>**
NET-MAC?	Get MAC address. ⓘ 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.	COMMAND **#NET-MAC?␣**id**<CR>** FEEDBACK **~nn@NET-MAC␣**id,mac_address**<CR><LF>**	**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…. **mac_address** – Unique MAC address. Format: XX-XX-XX-XX-XX-XX where X is hex digit	**#NET-MAC?␣**id**<CR>**
NET-MASK	Set subnet mask. ⓘ For proper settings consult your network administrator.	COMMAND **#NET-MASK␣**net_mask**<CR>** FEEDBACK **~nn@NET-MASK␣**net_mask**<CR><LF>**	**net_mask** – Format: xxx.xxx.xxx.xxx	Set the subnet mask to 255.255.0.0: **#NET-MASK␣**255.255.000.000**<CR>**
NET-MASK?	Get subnet mask.	COMMAND **#NET-MASK?␣<CR>** FEEDBACK **~nn@NET-MASK␣**net_mask**<CR><LF>**	**net_mask** – Format: xxx.xxx.xxx.xxx	Get the subnet mask: **#NET-MASK?<CR>**
PROT-VER?	Get device protocol version.	COMMAND **#PROT-VER?␣<CR>** FEEDBACK **~nn@PROT-VER␣**3000:version**<CR><LF>**	**version** – XX.XX where X is a decimal digit	Get the device protocol version: **#PROT-VER?␣<CR>**
RELAY-STATE	Set relay state.	COMMAND **#RELAY-STATE␣**relay_id,state**<CR>** FEEDBACK **~nn@RELAY-STATE␣**relay_id,state**<CR><LF>**	**relay_id** – 1 – Relay number **state** – Relay state 0 – Open 1 – Close	Set relay 1 to closed: **#RELAY-STATE␣**1,0**<CR>**
RELAY-STATE?	Get relay state.	COMMAND **#RELAY-STATE?␣**relay_id**<CR>** FEEDBACK **~nn@RELAY-STATE␣**relay_id,relay_state**<CR><LF>**	**relay_id** – 1 – Relay number **state** – Relay state 0 – Open 1 – Close	Get relay state: **#RELAY-STATE?␣**1**<CR>**
RESET	Reset device. ⓘ 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.	COMMAND **#RESET<CR>** FEEDBACK **~nn@RESET␣**ok**<CR><LF>**		Reset the device: **#RESET<CR>**
ROUTE	Set layer routing. ⓘ This command replaces all other routing commands.	COMMAND **#ROUTE␣**layer_type,out_index,in_index**<CR>** FEEDBACK **~nn@ROUTE␣**layer_type,out_index**<CR><LF>**	**layer_type** Layer Enumeration 1 – Video+Audio **out_index** 1 – **KIT-500T**: HDMI OUT 2 – **KIT-500R**: HDMI Out **in_index** – Source id For **out_index** = 1 1 – USBC1 2 – USBC2 3 – HDMI 1 4 – HDMI 2 For **out_index** = 2 1 – USBC1 2 – USBC2 3 – HDMI 1 4 – HDMI 2 5 – HDMI (REMOTE)	Route video USBC2 to HDMI output: **#ROUTE␣**1,2,2**<CR>**
ROUTE?	Get layer routing. ⓘ This command replaces all other routing commands.	COMMAND **#ROUTE?␣**layer_type,out_index**<CR>** FEEDBACK **~nn@ROUTE␣**layer_type,out_index,in_index**<CR><LF>**	**layer_type** Layer Enumeration 1 – Video+Audio **out_index** 1 – HDMI Out 2 – HDBT Out **in_index** – Source id 1 – USBC1 2 – USBC2 3 – HDMI 1 4 – HDMI 2	Get the layer routing: **#ROUTE?␣**1,1**<CR>**

Function	Description	Syntax	Parameters/Attributes	Example
SCLR-AS	Set auto-sync features. ⓘ Sets the auto sync features for the selected scaler.	COMMAND **#SCLR-AS** scaler_index,sync_speed<CR> FEEDBACK **~nn@SCLR-AS** scaler_index,sync_speed<CR><LF>	**scaler_index** – Scaler Number – 1 **sync_speed** – 0– Off 1– On	Set auto-sync features Off: **#SCLR-AS** 1,0<CR>
SCLR-AS?	Get auto-sync features. ⓘ Gets the auto sync features for the selected scaler.	COMMAND **#SCLR-AS?** scaler_index<CR> FEEDBACK **~nn@SCLR-AS** scaler_index,sync_speed<CR><LF>	**scaler_index** – Scaler Number – 1 **sync_speed** – 0– Off 1– On	Get auto-sync features: **#SCLR-AS?** 1<CR>
SCLR-AUDIO-DELAY	Set the scaler audio delay. ⓘ Sets the audio delay for the selected audio output.	COMMAND **#SCLR-AUDIO-DELAY** scaler_index,delay<CR> FEEDBACK **~nn@SCLR-AUDIO-DELAY** scaler_index,delay<CR><LF>	**scaler_index** – Audio output number – 1 **delay** – 0– Off 1– 40ms 2– 110ms 3– 150ms	Set the scaler audio delay to 40ms: **#SCLR-AUDIO-DELAY** 1,1<CR>
SCLR-AUDIO-DELAY?	Get the scaler audio delay. ⓘ Gets the audio delay for the selected audio output.	COMMAND **#SCLR-AUDIO-DELAY?** scaler_index<CR> FEEDBACK **~nn@SCLR-AUDIO-DELAY** scaler_index,delay<CR><LF>	**scaler_index** – Audio output number – 1 **delay** – 0– Off 1– 40ms 2– 110ms 3– 150ms	Get the scaler audio delay: **#SCLR-AUDIO-DELAY?** 1<CR>
SIGNAL?	Get input signal status.	COMMAND **#SIGNAL?** in_index<CR> FEEDBACK **~nn@SIGNAL** in_index,status<CR><LF>	**in_index** – input: 1– USBC1 2– USBC2 3– HDMI 1 4– HDMI 2 **status** – Signal status according to signal validation: 0– Off, signal or sink is not valid 1– On, signal or sink is valid	Get the input signal lock status of IN 1: **#SIGNAL?** 1<CR>
SN?	Get device serial number.	COMMAND **#SN?** <CR> FEEDBACK **~nn@SN** serial_num<CR><LF>	**serial_num** – 14 decimal digits, factory assigned	Get the device serial number: **#SN?** <CR>
STANDBY	Set standby mode.	COMMAND **#STANDBY** value<CR> FEEDBACK **~nn@STANDBY** value<CR><LF>	**value** – On/Off 0– Off 1– On (set to standby mode)	Set standby mode: **#STANDBY** 1<CR>
STANDBY?	Get standby mode status.	COMMAND **#STANDBY?** <CR> FEEDBACK **~nn@STANDBY** value<CR><LF>	**value** – On/Off 0– Off 1– On	Get standby mode status: **#STANDBY?** <CR>
TLK	Set audio talkover mode status.	COMMAND **#TLK** io_index,talkover_mode<CR> FEEDBACK **~nn@TLK** io_index,talkover_mode<CR><LF>	**io_index** – 1 **talkover_mode** – Talkover mode 0– Off 1– Mixer 2– Talkover 3– Mic only	Set audio talkover mode status to Mixer: **#TLK** 1,1<CR>
TLK?	Get audio talkover mode status.	COMMAND **#TLK?** io_index<CR> FEEDBACK **~nn@TLK** io_index,talkover_mode<CR><LF>	**io_index** – 1 **talkover_mode** – Talkover mode 0– Off 1– Mixer 2– Talkover 3– Mic only	Get audio talkover mode status: **#TLK?** 1<CR>
TREBLE	Set audio treble level.	COMMAND **#TREBLE** io_index,treble_level<CR> FEEDBACK **~nn@TREBLE** io_index,treble_level<CR><LF>	**io_index** – 1 **treble_level** – Audio parameter in Kramer units, -30-30	Set audio treble level: **#TREBLE** 1,1<CR>
TREBLE?	Get audio treble level.	COMMAND **#TREBLE?** io_index<CR> FEEDBACK **~nn@TREBLE** io_index,treble_level<CR><LF>	**io_index** – 1 **treble_level** – Audio parameter in Kramer units, -30-30	Get audio treble level: **#TREBLE?** 1<CR>
VERSION?	Get firmware version number.	COMMAND **#VERSION?** <CR> FEEDBACK **~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>
VFRZ	Freeze/Unfreeze the Kit-500R output.	COMMAND **#VFRZ** out_index,freeze_flag<CR> FEEDBACK **~nn@VFRZ** out_index,freeze_flag<CR><LF>	**out_index** – 1 **freeze_flag** – On/Off 0– Off (unfreeze) 1– On (freeze)	Freeze the picture on the Kit-500R output: **#VFRZ** 1,1<CR>
VFRZ?	Get output freeze status.	COMMAND **#VFRZ?** out_index<CR> FEEDBACK **~nn@VFRZ** out_index,freeze_flag<CR><LF>	**out_index** – 1 **freeze_flag** – On/Off 0– Off 1– On	Get output freeze status: **#VFRZ?** 1<CR>

KIT-500R Protocol Commands

Function	Description	Syntax	Parameters/Attributes	Example
#	Protocol handshaking. ⓘ Validates the Protocol 3000 connection and gets the machine number. Step-in master products use this command to identify the availability of a device.	COMMAND #<CR> FEEDBACK ~nn@ ok<CR><LF>		#<CR>
AUD-LVL	Set volume level.	COMMAND #AUD-LVL io_mode,io_index,vol_level<CR> FEEDBACK ~nn@AUD-LVL io_mode,io_index,vol_level<CR><LF>	io_mode – Input/Output 0 – Input 1 – Output io_index: For inputs: 0 – USBC1 1 – USBC2 2 – HDMI 1 3 – HDMI 2 For the output: 0- Output vol_level – Volume level 0 to100 ++ increase current value, -- decrease current value	Set AUDIO OUT 1 level to -50: #AUD-LVL 1,1,50<CR>
AUD-LVL?	Get volume level.	COMMAND #AUD-LVL? io_mode,io_index<CR> FEEDBACK ~nn@AUD-LVL io_mode,io_index,vol_level<CR><LF>	io_mode – Input/Output 0 – Input 1 – Output io_index: For inputs: 0 – USBC1 1 – USBC2 2 – HDMI 1 3 – HDMI 2 For the output: 0- Output vol_level – Volume level 0 to100 ++ increase current value, -- decrease current value	Get AUDIO OUT 1 level #AUD-LVL? 1,1<CR>
AV-SW-MODE	Set switching mode.	COMMAND #AV-SW-MODE layer,out_id,mode<CR> FEEDBACK ~nn@AV-SW-MODE layer,out_id,mode<CR><LF>	layer – 1 – Video out_id: 1 mode – 0 – Disable 1 – Enable	Set switching mode to Disable: #AV-SW-MODE 1,0<CR>
AV-SW-MODE?	Get switching mode.	COMMAND #AV-SW-MODE? layer,out_id<CR> FEEDBACK ~nn@AV-SW-MODE layer,out_id,mode<CR><LF>	layer – 1 – Video out_id: 1 mode – 0 – Disable 1 – Enable	Get switching mode #AV-SW-MODE? 1<CR>
BUILD-DATE?	Get device build date.	COMMAND #BUILD-DATE? <CR> FEEDBACK ~nn@BUILD-DATE date,time<CR><LF>	date – Format: YYYY/MM/DD where YYYY = Year MM = Month DD = Day time – Format: hh:mm:ss where hh = hours mm = minutes ss = seconds	Get the device build date: #BUILD-DATE?<CR>
CEC	Set the CEC mode status.	COMMAND #CEC cec_mode<CR> FEEDBACK ~nn@CEC cec_mode<CR><LF>	cec_mode – CEC mode On – CEC mode switched on Off – CEC mode switched Off.	Set the CEC mode to on: #CEC on<CR>
CEC-PASS	Set CEC bypass.	COMMAND #CEC-PASS cec_bypass<CR> FEEDBACK ~nn@CEC-PASS cec_bypass<CR><LF>	cec_bypass – CEC mode 0 – Off 1 – On	Set the CEC bypass to on: #CEC-PASS 1<CR>
CEC-PASS?	Get CEC bypass state.	COMMAND #CEC-PASS? <CR> FEEDBACK ~nn@CEC-PASS cec_bypass<CR><LF>	cec_bypass – CEC mode 0 – Off 1 – On	Get the CEC bypass: #CEC-PASS 1<CR>

Function	Description	Syntax	Parameters/Attributes	Example
CPEDID	Copy EDID data from the output to the input EEPROM. ⓘ Destination bitmap size depends on device properties (for 64 inputs it is a 64-bit word). Example: bitmap 0x0013 means inputs 1,2 and 5 are loaded with the new EDID. In certain products Safe_mode is an optional parameter. See the HELP command for its availability.	COMMAND **#CPEDID** edid_io,src_id,edid_io,dest_bitmap<CR> or **#CPEDID** edid_io,src_id,edid_io,dest_bitmap,safe_mode<CR> FEEDBACK **~nn@CPEDID** edid_io,src_id,edid_io,dest_bitmap<CR><LF> **~nn@CPEDID** edid_io,src_id,edid_io,dest_bitmap,safe_mode<CR><LF>	**edid_io** – *EDID* source type (usually output) 1 – Output **src_id** – Number of chosen source stage for HDBT: 1 – Def. 1080P 2 – Def. 1080P(Aud) 3 – Def. 4K2K(3G) 4 – Def. 4K2K(3G Aud) 5 –Output 6 – User for HDMI: 1 – Def. 1080P 2 – Def. 1080P(Aud) 3 – Def. 4K2K(3G) 4 – Def. 4K2K(3G Aud) 5 – Def. 4K2K(6G) 6 – Def. 4K2K(6G Aud) 7 –Output 8 – User **edid_io** – *EDID destination* type (usually input) 0 – Input **dest_bitmap** – Bitmap representing destination IDs. 0x01: HDBT 0x02: HDMI Format: XXXX…X, where X is hex digit. The binary form of every hex digit represents corresponding destinations. 0 – indicates that EDID data is not copied to this destination. 1 – indicates that EDID data is copied to this destination. **safe_mode** – Safe mode 0 – device accepts the EDID as is without trying to adjust 1 – device tries to adjust the EDID (default value if no parameter is sent)	Copy the EDID data from the Output 1 (EDID source) to the Input: **#CPEDID** 1,1,0,0x1<CR> Copy the EDID data from the default EDID source to the Input: **#CPEDID** 2,0,0,0x1<CR>
DISPLAY?	Get output HPD status.	COMMAND **#DISPLAY?** out_index<CR> FEEDBACK **~nn@DISPLAY** out_index,status<CR><LF>	**out_index**: 1 – HDMI Out **status** – HPD status according to signal validation 0 – Signal or sink is not valid 1 – Signal or sink is valid	Get the output HPD status of Output 1: **#DISPLAY?** 1<CR>
FACTORY	Reset device to factory default configuration. ⓘ 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.	COMMAND **#FACTORY**<CR> FEEDBACK **~nn@FACTORY** ok<CR><LF>		Reset the device to factory default configuration: **#FACTORY**<CR>
GPIO-CFG	Set HW GPIO configuration.	COMMAND **#GPIO-CFG** gpio_id,gpio_type<CR> FEEDBACK **~nn@GPIO-CFG** gpio_id,gpio_type<CR><LF>	**gpio_id** – 2 **gpio_type** – Hardware GPIO type 10 – Edge=On/Off 11 – GND=On 12 – GND=Off 13 – Hi=On 14 – Hi=Off 15 – GND=On;Hi=Off 16 – GND=Off;Hi=On 17 – Input Select	Set HW GPIO configuration to GND=Off: **#GPIO-CFG** 2,11<CR>
GPIO-CFG?	Get HW GPIO configuration.	COMMAND **#GPIO-CFG?** gpio_id<CR> FEEDBACK **~nn@GPIO-CFG** gpio_id,gpio_type<CR><LF>	**gpio_id** – 2 **gpio_type** – Hardware GPIO type 10 – Edge=On/Off 11 – GND=On 12 – GND=Off 13 – Hi=On 14 – Hi=Off 15 – GND=On;Hi=Off 16 – GND=Off;Hi=On 17 – Input Select	Get HW GPIO configuration: **#GPIO-CFG?** 1<CR>

Function	Description	Syntax	Parameters/Attributes	Example
HDCP-MOD	Set HDCP mode. ⓘ Set HDCP working mode on the device input: HDCP supported - HDCP_ON [default]. HDCP not supported - HDCP OFF. HDCP support changes following detected sink - MIRROR OUTPUT. When you define 3 as the mode, the HDCP status is defined according to the connected output in the following priority: OUT 1, OUT 2. If the connected display on OUT 2 supports HDCP, but OUT 1 does not, then HDCP is defined as not supported. If OUT 1 is not connected, then HDCP is defined by OUT 2.	COMMAND **#HDCP-MOD** io_mode,index,mode<CR> FEEDBACK **~nn@HDCP-MOD** io_mode,index,mode<CR><LF>	io_index – Input/Output 0 – Input 1 – Output **index** – Input: 1 – HDBT In 2 – HDMI In Output 1 – HDMI Out **mode** – HDCP mode: Input: 0 – HDCP Off 1 – HDCP On Output: 2 – Follow Input 3 – Follow Output	Set the input HDCP-MODE of HDBT In to Off: **#HDCP-MOD** 0,1,0<CR>
HDCP-MOD?	Get HDCP mode. ⓘ Set HDCP working mode on the device input: HDCP supported - HDCP_ON [default]. HDCP not supported - HDCP OFF. HDCP support changes following detected sink - MIRROR OUTPUT.	COMMAND **#HDCP-MOD?** io_mode,index <CR> FEEDBACK **~nn@HDCP-MOD** io_mode,index,mode<CR><LF>	io_index – Input/Output 0 – Input 1 – Output **index** – Input: 1 – HDBT In 2 – HDMI In Output 1 – HDMI Out **mode** – HDCP mode: Input: 0 – HDCP Off 1 – HDCP On Output: 2 – Follow Input 3 – Follow Output	Get the input HDCP-MODE of HDMI Out: **#HDCP-MOD?** 1,1<CR>
HELP	Get command list or help for specific command.	COMMAND **#HELP**<CR> **#HELP** cmd_name<CR> FEEDBACK 1. Multi-line: **~nn@Device** cmd_name, cmd_name…<CR><LF> To get help for command use: HELP (COMMAND_NAME)<CR><LF> **~nn@HELP** cmd_name:<CR><LF> **description**<CR><LF> **USAGE:usage**<CR><LF>	**cmd_name** – Name of a specific command	Get the command list: **#HELP**<CR> To get help for AV-SW-TIMEOUT: HELP **av-sw-timeout**<CR>
IMAGE-PROP	Set the image size. ⓘ Sets the image properties of the selected scaler.	COMMAND **#IMAGE-PROP** scaler_id,video_mode<CR> FEEDBACK **~nn@IMAGE-PROP** scaler_id,video_mode<CR><LF>	**scaler_id** – Scaler number – 1 – Scaler1 **video_mode** – Status 0 – Overscan 1 – Full 2 – Best fit 3 – Panscan 4 – Letterbox 5 – Under 2 6 – Under 1 7 – Follow in	Set the image size to Best fit: **#IMAGE-PROP** 1,2<CR>
IMAGE-PROP?	Get the image size. ⓘ Gets the image properties of the selected scaler.	COMMAND **#IMAGE-PROP?** scaler_id<CR> FEEDBACK **~nn@IMAGE-PROP** scaler_id,video_mode…<CR><LF>	**scaler_id** – Scaler number – 1 – Scaler1 **video_mode** – Status 0 – Overscan 1 – Full 2 – Best fit 3 – Panscan 4 – Letterbox 5 – Under 2 6 – Under 1 7 – Follow in	Get the image size: **#IMAGE-PROP?** 1<CR>
MODEL?	Get device model.	COMMAND **#MODEL?** <CR> FEEDBACK **~nn@MODEL** model_name<CR><LF>	**model_name** – String of up to 19 printable ASCII chars	Get the device model: **#MODEL?** <CR>
MUTE	Set audio mute.	COMMAND **#MUTE** out_index,mute_mode<CR> FEEDBACK **~nn@MUTE** out_index,mute_mode<CR><LF>	**out_index** – 1 **mute_mode** – On/Off 0 – Off 1 – On	Set the audio output to mute: **#MUTE** 1,1<CR>
MUTE?	Get audio mute.	COMMAND **#MUTE?** out_index<CR> FEEDBACK **~nn@MUTE** out_index,mute_mode<CR><LF>	**out_index** – 1 **mute_mode** – On/Off 0 – Off 1 – On	Get audio mute status of the output: **#MUTE** 1?<CR>

Function	Description	Syntax	Parameters/Attributes	Example
PROT-VER?	Get device protocol version.	COMMAND #PROT-VER?␣<CR> FEEDBACK ~nn@PROT-VER␣3000:version<CR><LF>	version – XX.XX where X is a decimal digit	Get the device protocol version: #PROT-VER?␣<CR>
RELAY-STATE	Set relay state.	COMMAND #RELAY-STATE␣relay_id,state<CR> FEEDBACK ~nn@RELAY-STATE␣relay_id,state<CR><LF>	relay_id – 1 – Relay number state – Relay state 0 – Open 1 – Close	Set relay 1 to closed: #RELAY-STATE␣1,0<CR>
RELAY-STATE?	Get relay state.	COMMAND #RELAY-STATE?␣relay_id<CR> FEEDBACK ~nn@RELAY-STATE␣relay_id,relay_state<CR><LF>	relay_id – 1 – Relay number state – Relay state 0 – Open 1 – Close	Get relay state: #RELAY-STATE?␣1<CR>
RESET	Reset device. ⓘ 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.	COMMAND #RESET<CR> FEEDBACK ~nn@RESET␣ok<CR><LF>		Reset the device: #RESET<CR>
ROUTE	Set layer routing. ⓘ This command replaces all other routing commands.	COMMAND #ROUTE␣layer_type,out_index,in_index<CR> FEEDBACK ~nn@ROUTE␣layer_type,out_index<CR><LF>	layer_type Layer Enumeration 1 – Video out_index 1 – HDMI Out in_index – Source id 1 – HDBT In 2 – HDMI In	Route HDMI IN to the output: #ROUTE␣1,1,2<CR>
ROUTE?	Get layer routing. ⓘ This command replaces all other routing commands.	COMMAND #ROUTE?␣layer_type,out_index<CR> FEEDBACK ~nn@ROUTE␣layer_type,out_index,in_index<CR><LF>	layer_type Layer Enumeration 1 – Video out_index 1 – HDMI Out in_index – Source id 1 – HDBT In 2 – HDMI In	Get the layer routing: #ROUTE?␣1,1<CR>
SCLR-AS	Set auto-sync features. ⓘ Sets the auto sync features for the selected scaler.	COMMAND #SCLR-AS␣scaler_index,sync_speed<CR> FEEDBACK ~nn@SCLR-AS␣scaler_index,sync_speed<CR><LF>	scaler_index – Scaler Number – 1 sync_speed – 0 – Off 1 – Fast 2 – Slow	Set auto-sync features Off: #SCLR-AS␣1,0<CR>
SCLR-AS?	Get auto-sync features. ⓘ Gets the auto sync features for the selected scaler.	COMMAND #SCLR-AS?␣scaler_index<CR> FEEDBACK ~nn@SCLR-AS␣scaler_index,sync_speed<CR><LF>	scaler_index – Scaler Number – 1 sync_speed – 0 – Off 1 – Fast 2 – Slow	Get auto-sync features: #SCLR-AS?␣1<CR>
SCLR-AUDIO-DELAY	Set the scaler audio delay. ⓘ Sets the audio delay for the selected audio output.	COMMAND #SCLR-AUDIO-DELAY␣scaler_index,delay<CR> FEEDBACK ~nn@SCLR-AUDIO-DELAY␣scaler_index,delay<CR><LF>	scaler_index – Audio output number – 1 delay – 0 – Off 1 – 40ms 2 – 110ms 3 – 150ms	Set the scaler audio delay to 40ms: #SCLR-AUDIO-DELAY␣1,1<CR>
SCLR-AUDIO-DELAY?	Get the scaler audio delay. ⓘ Gets the audio delay for the selected audio output.	COMMAND #SCLR-AUDIO-DELAY?␣scaler_index<CR> FEEDBACK ~nn@SCLR-AUDIO-DELAY␣scaler_index,delay<CR><LF>	scaler_index – Audio output number – 1 delay – 0 – Off 1 – 40ms 2 – 110ms 3 – 150ms	Get the scaler audio delay: #SCLR-AUDIO-DELAY?␣1<CR>
SIGNAL?	Get input signal status.	COMMAND #SIGNAL?␣in_index<CR> FEEDBACK ~nn@SIGNAL␣in_index,status<CR><LF>	in_index – input: 1 – HDBT In 2 – HDMI In status – Signal status according to signal validation: 0 – Off, signal or sink is not valid 1 – On, signal or sink is valid	Get the input signal lock status of IN 1: #SIGNAL?␣1<CR>
SN?	Get device serial number.	COMMAND #SN?␣<CR> FEEDBACK ~nn@SN␣serial_num<CR><LF>	serial_num – 14 decimal digits, factory assigned	Get the device serial number: #SN?␣<CR>
VERSION?	Get firmware version number.	COMMAND #VERSION?␣<CR> FEEDBACK ~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>
VFRZ	Set freeze on selected output.	COMMAND #VFRZ␣out_index,freeze_flag<CR> FEEDBACK ~nn@VFRZ␣out_index,freeze_flag<CR><LF>	out_index – 1 freeze_flag – On/Off 0 – Off 1 – On	Set freeze flag on the output: #VFRZ␣1,1<CR>
VFRZ?	Get output freeze status.	COMMAND #VFRZ?␣out_index<CR> FEEDBACK ~nn@VFRZ␣out_index,freeze_flag<CR><LF>	out_index – 1 freeze_flag – On/Off 0 – Off 1 – On	Get output freeze status: #VFRZ?␣1<CR>

Function	Description	Syntax	Parameters/Attributes	Example
VID-RES	Set output resolution. ⓘ "Set" command with is_native=ON sets native resolution on selected output (resolution index sent = 0). Device sends as answer actual VIC ID of native resolution. To use "custom resolutions" (entries 100-105 In View Modes), define them using the DEF-RES command.	**COMMAND** **#VID-RES** io_mode,io_index,is_native,resolution**<CR>** **FEEDBACK** **~nn@VID-RES** io_mode,io_index,is_native,resolution**<CR><LF>**	**io_mode** – Input/Output 1– Output **io_index** – 1– Output **is_native** – Native resolution flag 0– Off **resolution** – Resolution index 0=NATIVE 1=640x480 60 2=800x600 60 3=1024x768 60 4=1280x768 60 5=1280x800 60 6=1280x1024 60 7=1360x768 60 8=1400x1050 60 9=1440x900 60 10=1600x1200 60 11=1680x1050 60 12=1920x1200 60 RB 13=2560x1600 60 RB 14=1920x1080 60 15=1280x720 60 16=2560x1440 60 RB 17=720x480P 60 18=1280x720P 60 19=1920x1080P 60 20=720x576P 50 21=1280x720P 50 22=1920x1080P 50 23=1920x1080P 24 24=1920x1080P 25 25=1920x1080P 30 26=3840x2160P 24 27=3840x2160P 25 28=3840x2160P 30 29=3840x2160P 50 30=3840x2160P 60	Set output resolution to native: **#VID-RES** 1,1,0,0**<CR>**
VID-RES?	Get output resolution. ⓘ "Get" command with is_native=ON returns native resolution VIC, with is_native=OFF returns current resolution. To use "custom resolutions" (entries 100-105 In View Modes), define them using the DEF-RES command.	**COMMAND** **#VID-RES?** io_mode,io_index,is_native**<CR>** **FEEDBACK** **~nn@VID-RES?** io_mode,io_index,is_native,resolution**<CR><LF>**	**io_mode** – Input/Output 1– Output **io_index** – 1– Output **is_native** – Native resolution flag 0– Off **resolution** – Resolution index 0=NATIVE 1=640x480 60 2=800x600 60 3=1024x768 60 4=1280x768 60 5=1280x800 60 6=1280x1024 60 7=1360x768 60 8=1400x1050 60 9=1440x900 60 10=1600x1200 60 11=1680x1050 60 12=1920x1200 60 RB 13=2560x1600 60 RB 14=1920x1080 60 15=1280x720 60 16=2560x1440 60 RB 17=720x480P 60 18=1280x720P 60 19=1920x1080P 60 20=720x576P 50 21=1280x720P 50 22=1920x1080P 50 23=1920x1080P 24 24=1920x1080P 25 25=1920x1080P 30 26=3840x2160P 24 27=3840x2160P 25 28=3840x2160P 30 29=3840x2160P 50 30=3840x2160P 60	Get output resolution: **#VID-RES?** 1,1,0**<CR>**
VMUTE	Set enable/disable video on output.	**COMMAND** **#VMUTE** out_index,flag**<CR>** **FEEDBACK** **~nn@VMUTE** out_index,flag**<CR><LF>**	**out_index** – 1 **flag** – Video Mute 0– Video enabled + Audio enabled 1– Video disabled + Audio enabled	Disable the video output t: **#VMUTE** 1,1**<CR>**
VMUTE?	Get video on output status.	**COMMAND** **#VMUTE?** out_index**<CR>** **FEEDBACK** **~nn@VMUTE** out_index,flag**<CR><LF>**	**out_index** – 1 **flag** – Video Mute 0– Video enabled + Audio enabled 1– Video disabled + Audio enabled	Get video on output status: **#VMUTE?** 1**<CR>**

Function	Description	Syntax	Parameters/Attributes	Example
X-AUD-LVL	Set audio level of a specific signal. ⓘ This is an Extended Protocol 3000 command.	**COMMAND** **#X-AUD-LVL** <direction_type>.<port_format>.<port_index>.<signal_type>.<index>,audio_level**<CR>** **FEEDBACK** **~nn@X-AUD-LVL** <direction_type>.<port_format>.<port_index>.<signal_type>.<index>,audio_level**<CR><LF>**	The following attributes comprise the signal ID: ▪ **<direction_type>** – Direction of the port: o OUT – Output ▪ **<port_format>** – Type of signal on the port: o ANALOG_AUDIO ▪ **<port_index>** – 1 ▪ **<signal_type>** – Signal ID attribute: o AUDIO ▪ **<index>** – 1 **audio_level** – Audio level in dB (range between 0 to 100) depending of the ability of the product	Set the audio level of the output to 10: **#X-AUD-LVL** out.analog_audio.1.audio.1,10**<CR>**
X-AUD-LVL?	Get audio level of a specific signal. ⓘ This is an Extended Protocol 3000 command.	**COMMAND** **#X-AUD-LVL?** <direction_type>.<port_format>.<port_index>.<signal_type>.<index>**<CR>** **FEEDBACK** **~nn@X-AUD-LVL** <direction_type>.<port_format>.<port_index>.<signal_type>.<index>,audio_level**<CR><LF>**	The following attributes comprise the signal ID: ▪ **<direction_type>** – Direction of the port: o OUT – Output ▪ **<port_format>** – Type of signal on the port: o ANALOG_AUDIO ▪ **<port_index>** – 1 ▪ **<signal_type>** – Signal ID attribute: o AUDIO ▪ **<index>** – 1 **audio_level** – Audio level in dB (range between 0 to 100) depending of the ability of the product	Get the audio level of the output: **#X-AUD-LVL?** out.analog_audio.1.audio.1**<CR>**
X-ROUTE	Send routing command to matrix. ⓘ 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. This is an Extended Protocol 3000 command.	**COMMAND** **#X-ROUTE** <direction_type1>.<port_type1>.<port_index1>.<signal_type1>.<index1>,<direction_type2>.<port_type2>.<port_index2>.<signal_type2>.<index2>**<CR>** **FEEDBACK** **~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: o IN – Input o OUT – Output ▪ **<port_format>** – Type of signal on the port: o HDMI o HDBT ▪ **<port_index>** – The port number as printed on the front or rear panel: ▪ **For output:** o 1 = HDMI ▪ **For input:** o 1 = HDBT o 2 0 HDMI ▪ **<signal_type>** – Signal ID attribute: o VIDEO ▪ **<index>** – 1	Route HDMI IN 2 to HDMI OUT: **#X-ROUTE** out.hdmi.1.video.1,in.hdmi.2.video.1**<CR>**
X-ROUTE?	Get routing status. ⓘ 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. This is an Extended Protocol 3000 command.	**COMMAND** **#X-ROUTE?** <direction_type1>.<port_type1>.<port_index1>.<signal_type1>.<index1>**<CR>** **FEEDBACK** **~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: o IN – Input o OUT – Output ▪ **<port_format>** – Type of signal on the port: o HDMI o HDBT ▪ **<port_index>** – The port number as printed on the front or rear panel: ▪ **For output:** o 1 = HDMI ▪ **For input:** o 1 = HDBT o 2 0 HDMI ▪ **<signal_type>** – Signal ID attribute: o VIDEO ▪ **<index>** – 1	Get the routing status: **#X-ROUTE?** out.hdmi.1.video.1**<CR>**

Function	Description	Syntax	Parameters/Attributes	Example
X-SIGNAL?	Get input signal status. ⓘ This is an Extended Protocol 3000 command.	COMMAND #X-SIGNAL? <direction_type>.<port_format>.<port_index>.<signal_type>.<index><CR> FEEDBACK ~nn@X-SIGNAL <direction_type>.<port_format>.<port_index>.<signal_type>.<index>,status<CR><LF>	The following attributes comprise the signal ID: ▪ <direction_type> – Direction of the port: o IN – Input ▪ <port_format> – Type of signal on the port: o HDMI o HDBT ▪ <port_index> – The port number as printed on the front or rear panel: ▪ **For input:** o 1 = HDBT o 2 0 HDMI ▪ <signal_type> – Signal ID attribute: o VIDEO <index> – 1	Get HDMI input routing status: #X-SIGNAL? in.hdmi.2.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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THE MAXIMUM LIABILITY OF KRAMER ELECTRONICS UNDER THIS LIMITED WARRANTY SHALL NOT EXCEED THE ACTUAL PURCHASE PRICE PAID FOR THE PRODUCT. TO THE MAXIMUM EXTENT PERMITTED BY LAW, KRAMER ELECTRONICS IS NOT RESPONSIBLE FOR DIRECT, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES RESULTING FROM ANY BREACH OF WARRANTY OR CONDITION, OR UNDER ANY OTHER LEGAL THEORY. Some countries, districts or states do not allow the exclusion or limitation of relief, special, incidental, consequential or indirect damages, or the limitation of liability to specified amounts, so the above limitations or exclusions may not apply to you.

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

P/N: 2900-301628 Rev: 5

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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