



# USER MANUAL

## MODEL:

MTX2-42-T

4x2 USB C/HDMI Matrix Transmitter



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# Introduction

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

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## Getting Started

We recommend that you:

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



Go to <https://www.kramerav.com/downloads/MTX2-42-T> 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 MTX2-42-T away from moisture, excessive sunlight and dust.

## Safety Instructions

### Caution:

- This equipment is to be used only inside a building. It may only be connected to other equipment that is installed inside a building.
- For products with relay terminals and GPIO ports, please refer to the permitted rating for an external connection, located next to the terminal or in the User Manual.



- There are no operator serviceable parts inside the unit.

### Warning:

- If using a power cord, only use the Kramer approved power cord.
- 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/>.

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## Overview

MTX2-42-T is a high-performance integrated matrix transmitter with two USB-C and two HDMI/USB inputs independently routable to HDMI and HDBT outputs. With a compatible receiver, the remote USB peripherals (such as a room camera) are extended for use with a local USB host, for convenient hybrid meeting operation with both room and online participants.

MTX2-42-T provides exceptional quality, advanced and user-friendly operation, and flexible control.

## Exception 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.
- 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.
- 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 USB devices via 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

## 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 over the HDBT link to a paired 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.
- Comprehensive Management – Flexible service options – including local panel status LED indicators, 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 – Compact fan-less enclosure for flexible under-table or podium mounting.

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## Typical Applications

MTX2-42-T is ideal for the following typical applications:

- Classrooms and lecture halls
- Meeting rooms
- Training facilities
- Collaborative classrooms
- Any space where BYOD support is required

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## Controlling your MTX2-42-T device

Control your MTX2-42-T directly via the front panel push buttons, or:

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

# Defining MTX2-42-T

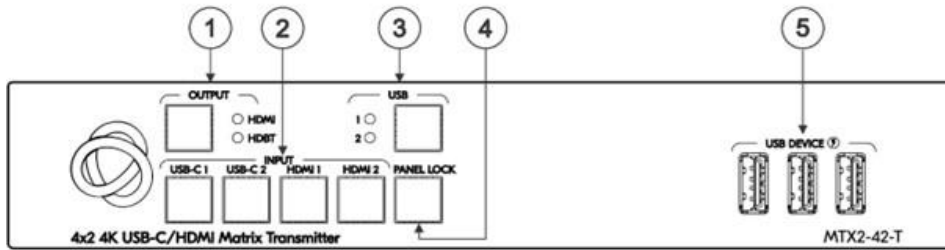


Figure 1: MTX2-42-T Matrix Transmitter Front Panel

#	Feature	Function
①	OUTPUT button	Select Button Press to select to which output to route when an INPUT selection button is pressed
	HDMI/HDBT LEDs	LED lights green when selected.
②	INPUT buttons	USB-C (1 and 2) <ul style="list-style-type: none"> <li>Press to select a USB-C input. Button illuminates when that input is selected.</li> <li>Press and hold the OUTPUT and the USB-C-1 buttons simultaneously, for 3 seconds, to update the FW.</li> <li>Press and hold the OUTPUT and the USB-C-2 buttons simultaneously, for 3 seconds, for FACTORY RESET.</li> </ul>
		HDMI (1 and 2) Press to select an HDMI input. Button illuminates when that input is selected.
③	USB	Select button Press to select the USB HOST port to connect to the USB devices.
		1 & 2 LEDs Lights green when selected.
④	PANEL LOCK Button	Press and hold to lock/unlock the front panel buttons. Button illuminates when front panel is locked.
⑤	USB 3.0 DEVICES Type A Connectors (3)	Connect to USB devices. The user can select which USB host is connected to the USB devices.

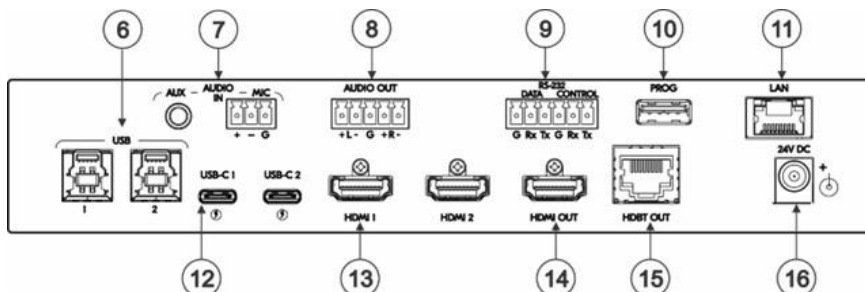


Figure 2: MTX2-42-T Matrix Transmitter Rear Panel

#	Feature	Function
⑥	USB 3.0 Host Connectors (1 and 2)	Connect to USB hosts.

⑦	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.
⑧	AUDIO OUT 5-pin Terminal Block		Connect to a balanced stereo audio acceptor (for example, active speakers).
⑨	RS-232	DATA 3-pin Terminal Block Connector	Connect to a control device serial port for extension over the HDBT connection.
		CONTROL 3-pin Terminal Block Connector	Connect to a serial controller or PC to control MTX2-42-T or to a serially-controlled device port for its control via the MTX2-42-T.
⑩	PROGRAM USB Type-A Connector	Connect to a PC to perform a firmware upgrade.	
⑪	LAN RJ-45 Connector	Connect to the LAN.	
⑫	USB-C Connectors (1 and 2)	<p>Connect to USB-C AV sources:</p> <ul style="list-style-type: none"> <li>- that support DisplayPort Alternate Mode, for example, a laptop) to share content.</li> <li>- to communicate with the USB devices (for example, a PTZ camera) that are connected to the device,</li> <li>- to connect the selected source to the LAN.</li> <li>- to charge the selected / connected source(s).</li> </ul>	
⑬	HDMI Connectors (1 and 2)	Connect to HDMI sources.	
⑭	HDMI OUT Connector	Connect to an HDMI acceptor.	
⑮	HDBT OUT RJ-45 Connector	Connect to a compatible HDBT RJ-45 connector on a paired receiver device.	
⑯	24V DC Connector	Connect to the supplied power adapter.	

# Mounting the MTX2-42-T Devices

This section provides instructions for mounting MTX2-42-T. 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 MTX2-42-T before connecting any cables or power.

## Warning:

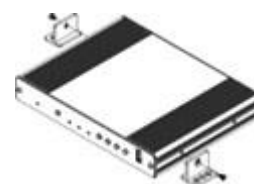


- Ensure that the environment (e.g., maximum ambient temperature & air flow) is compatible for the device.
- Avoid uneven mechanical loading.
- Appropriate consideration of equipment nameplate ratings should be used for avoiding overloading of the circuits.
- Reliable earthing of rack-mounted equipment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

Mount MTX2-42-T in a rack:

- Use the recommended rack adapter

<http://www.kramerav.com/product/MTX2-42-T>



Mount MTX2-42-T on a surface using one of the following methods:

- Attach the rubber feet and place the unit on a flat surface.
- Fasten a bracket (included) on each side of the unit and attach it to a flat surface For more information go to

<http://www.kramerav.com/product/MTX2-42-T>



# Connecting MTX2-42-T

**i** Always switch off the power to each device before connecting it to your MTX2-42-T. After connecting your MTX2-42-T, connect its power and then switch on the power to each device.

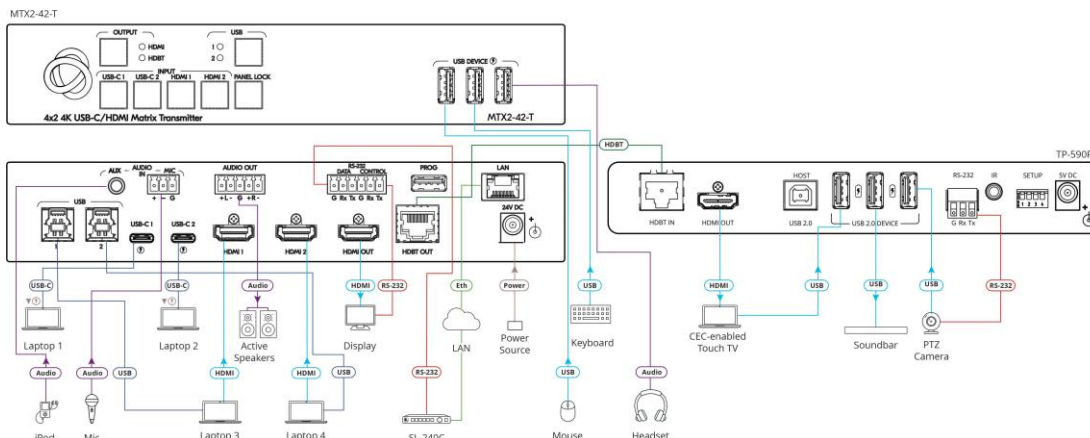


Figure 3: Connecting to the MTX2-42-T Rear Panel

**To connect MTX2-42-T as illustrated in the example in Figure 3:**

## 1. Connect the inputs:

- Connect USB-C sources <sup>(12)</sup> (for example, laptops) to the USB-C 1 and USB-C 2 ports on the MTX2-42-T.
- Connect HDMI sources <sup>(13)</sup> (for example, laptops) to HDMI 1 and HDMI 2 connectors on the MTX2-42-T and connect the USB 3.0 Host ports <sup>(6)</sup> to the HDMI sources that are connected to the HDMI inputs.
- Connect an unbalanced analog audio source to the AUX 3.5mm jack <sup>(7)</sup> (for example, an iPod).
- Connect a dynamic or condenser (with 48V phantom power) microphone <sup>(7)</sup> to the MIC 3-pin terminal block connector.

## 2. Connect the outputs:

- Connect the HDMI output <sup>(14)</sup> on the MTX2-42-T to an HDMI acceptor (for example, a display).
- Connect the HDBT OUT <sup>(15)</sup> port on the MTX2-42-T to the HDBT IN on the TP-590R receiver.
- Connect an HDMI display (for example, a CEC-enabled Touch TV) to the HDMI output connector on the TP-590R receiver.
- Connect the AUDIO OUT 5-pin terminal block connector <sup>(8)</sup> on the MTX2-42-T to an audio acceptor (for example, an active speaker).

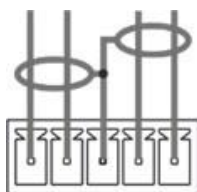
## 3. Connect the USB type A ports:

- Connect the USB DEVICES ports (5) on the MTX2-42-T to local USB devices (for example, a keyboard, mouse and headphones).
  - Connect the USB DEVICE ports on the **TP-590R** receiver to remote USB devices (for example, a soundbar and PTZ camera).
4. Connect the control ports:
- Connect the LAN RJ-45 port (11) on the MTX2-42-T to a LAN.
  - Connect the CONTROLS RS-232 3-pin terminal block connector (9) on the MTX2-42-T to an RS-232 controlled device (for example, the display on the MTX2-42-T output).
  - Connect the MTX2-42-TDATA RS-232 3-pin terminal block connector (9) to a controller (for example, Kramer **SL-240C**).
  - Connect the **590R** receiver DATA RS-232 3-pin terminal block connector to an RS-232 controlled device (for example, the PTZ camera).
5. Connect the power adapter to the MTX2-42-T device and to the mains electricity.

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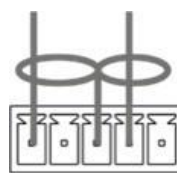
## Connecting the Output to a Balanced/Unbalanced Stereo Audio Acceptor

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



L+ L- G R+ R-

Figure 4: Connecting to a Balanced Stereo Audio Acceptor



L+ L- G R+ R-

Figure 5: Connecting to an Unbalanced Stereo Audio Acceptor

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## Connecting to MTX2-42-T with RS-232

You can connect to MTX2-42-T via an RS-232 connection using, for example, a PC.

MTX2-42-T features an RS-232 3-pin terminal block connector allowing the RS-232 to control MTX2-42-T.

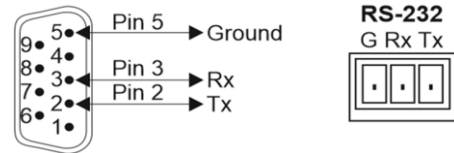
Connect the RS-232 terminal block on the rear panel of MTX2-42-T the to a PC/controller, as follows:

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

S-232 Device

MTX2-42-T

- Pin 2 to the TX pin on the MTX2-42-T RS-232 terminal block
- Pin 3 to the RX pin on the MTX2-42-T RS-232 terminal block
- Pin 5 to the G pin on the MTX2-42-T RS-232 terminal block



## Connecting to USB Hosts

MTX2-42-T 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.

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

# Operating and Controlling MTX2-42-T

## Principles of Operation

This section describes the following actions:

• <a href="#">MTX2-42-T Input Auto-Switching</a>	12
• <a href="#">USB Host Switching</a>	12
• <a href="#">CEC Signaling</a>	13
• <a href="#">Controlling via RS-232 Ports</a>	13

### MTX2-42-T Input Auto-Switching

Set MTX2-42-T switching mode via the UI or P3K (see [Protocol 3000 on page 39](#)) to any of the following modes:

- Manual – Select an input manually and switching occurs whether a live signal is present on the input or not.
- 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 ([Protocol 3000 on page 39](#)).
- Using the embedded web pages

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

- In Auto Scan mode, when the currently selected input sync signal is lost, MTX2-42-T automatically scans and selects an input with a live signal.
- In Last connected mode:
  - When detecting that a source is connected to an input (which previously had no signal), automatically switches that input to the outputs.
  - Switches to the previously selected input when the current input signal is lost.

### USB Host Switching

MTX2-42-T 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 MTX2-42-T UI. A single active USB host is connected to both local and remote (when paired with HDBT receiver) MTX2-42-T USB devices, while other hosts are inactive. The active USB host is selected either automatically to follow the selected video input (default), or manually (to allow independent selection of the USB host). (see [Defining USB Switching Policy on page 32](#))

## CEC Signaling

According to control messages received from a LAN-connected control system, or automatically per device settings (see [Defining Auto Sync Mode on page 31](#)), the MTX2-42-T sends CEC commands via the MTX2-42-T built-in control gateway, to control CEC-enabled devices that are connected to the MTX2-42-T HDMI and HDBT output ports.

## Controlling via RS-232 Ports

MTX2-42-T has 2 RS-232 control ports:

- RS-232 DATA for extending RS-232 commands between the devices via HDBT. For example, sending commands from a controller connected to the RS-232 DATA port on MTX2-42-T to a PTZ Camera connected to the RS-232 DATA port on a paired TP-590R receiver. RS-232 CONTROL for controlling the device via RS-232 Protocol 3000 commands (for example, connecting an SL-240C Kramer Controller to MTX2-42-T to control it), or an external RS-232-connected controlled device, as configured via web pages (see [Managing RS-232 Control on page 27](#)):
  - By default, control the device itself via a room controller.
  - Auto-control an external device that is connected to MTX2-42-T.
  - Control an external device on MTX2-42-T via Ethernet control gateway.

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## Using Front Panel Buttons

Press the MTX2-42-T 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.
- Select the USB host <sup>⑤</sup> to connect to the USB devices (when USB Host selection is not set to follow the HDMI port selection).
- Press and hold the OUTPUT <sup>①</sup> and the USB-C-1 <sup>②</sup> buttons simultaneously for 3 seconds for USB FW Update.
- Press and hold the OUTPUT <sup>①</sup> and the USB-C-2 <sup>②</sup> buttons simultaneously for 3 seconds for Factory Reset.
- Lock the front panel .

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## Operating via Ethernet

You can connect to MTX2-42-T via Ethernet using either of the following methods:

- Directly to the PC using a crossover cable [Connecting Ethernet Port Directly to a PC on the next page](#).
- Via a network switch or router, using a straight through cable [Operating and Controlling MTX2-42-T on the previous page](#)



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 MTX2-42-T directly to the Ethernet port on your PC using a crossover cable with RJ 45 connectors.



This type of connection is recommended for identifying MTX2-42-T with the factory configured default IP address.

After connecting MTX2-42-T to the Ethernet port, configure your PC as follows:

1. Click **Start > Settings > 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 [Local Area Connection Properties Window](#)



Figure 6: 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 7](#) and [Figure 8](#).



Figure 7: Internet Protocol Version 4 Properties Window

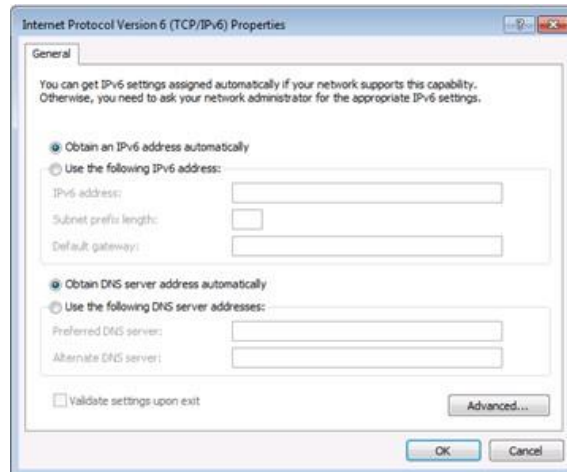


Figure 8: Internet Protocol Version 6 Properties Window

6. Select **Use the following IP Address** for static IP addressing and fill in the details as shown in [Figure 9](#).

For TCP/IPv4 you can use any IP address in the range 192.168.1.1 to 192.168.1.255 (excluding default 192.168.1.39 fallback address) that is provided by your IT department.



Figure 9: 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 MTX2-42-T to the Ethernet port on a network switch or router using a straight through cable with RJ 45 connectors.

## **Configuring the Ethernet Port**

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

## **Discovering and acquiring IP address**

MTX2-42-T includes IP address auto acquiring policy via LAN-connected DHCP server by default. When no DHCP server is detected, a default fallback static IP address and subnet mask is assigned until an IP address is acquired via the DHCP server.

information, refer to Product Page Technical Note in <http://www.kramerav.com/product/MTX2-42-T>



# Using Embedded Web Pages

MTX2-42-T 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 MTX2-42-T via Protocol 3000 commands (see Protocol 300 commands)

Before attempting to connect:

- Perform the procedure in [Operating via Ethernet on page 13](#)
- Ensure that your browser is supported.

The following operating systems and Web browsers are supported:

Operating Systems	Browser
Windows 7	Chrome
Windows 10	Edge
	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 = 1DHCP).

If security is enabled, the Login window appears.

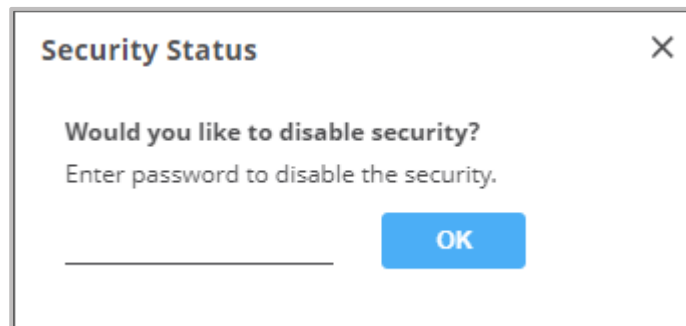



Figure 10: Embedded Web Pages Login Window

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.

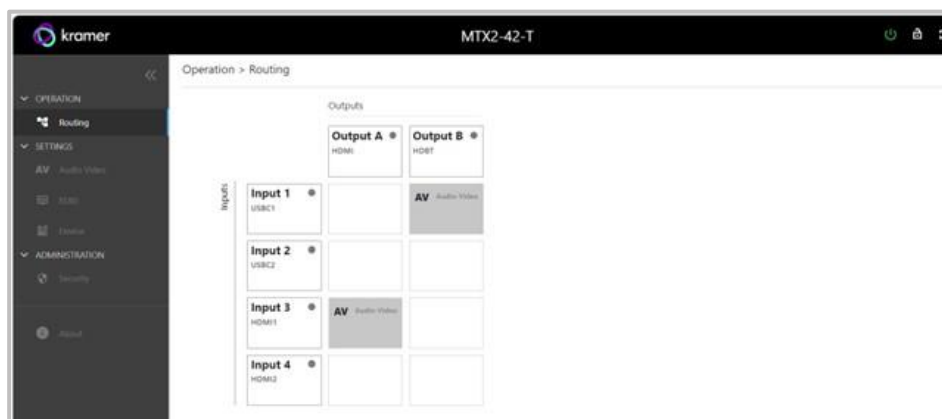


Figure 11: Routing Page

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

MTX2-42-T web pages enable performing the following actions:

• <a href="#">Routing Operations</a>	18
• <a href="#">Setting Audio Video Parameters</a>	19
• <a href="#">Setting Device Properties</a>	24
• <a href="#">Managing RS-232 Control</a>	27
• <a href="#">Defining Advanced Settings</a>	30
• <a href="#">Setting Authentication</a>	33
• <a href="#">Viewing the About Page</a>	35

## Routing Operations

### Routing Inputs to Outputs

Route any of the input signals to the outputs on the MTX2-42-T. A green indication light next to an input or output indicates that an active signal is present on these ports.

#### To switch MTX2-42-T inputs to the outputs::

1. In the Navigation List, click the **OPERATIONS** drop-down arrow and select Routing. The Routing page appears (see [Routing Page above](#)).
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).

Inputs are switched to the outputs.

## Setting Audio Video Parameters

### Routing AV and USB Host Signals

MTX2-42-T enables setting the following audio and video parameters:

### 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.

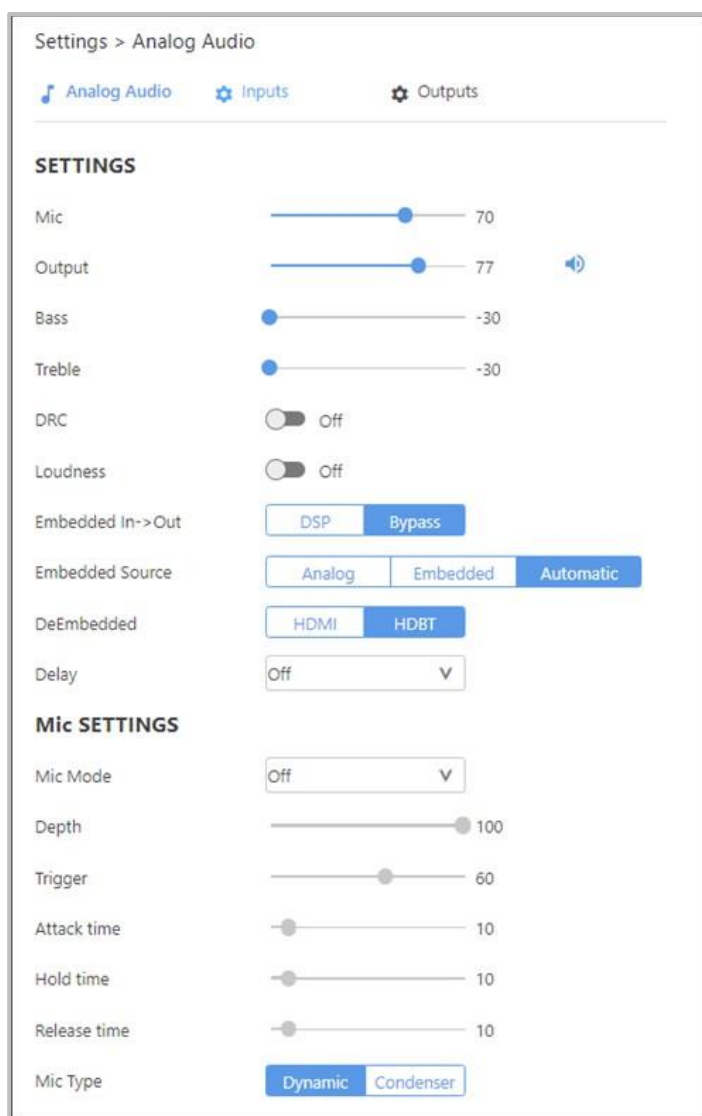


Figure 12: AV – Analog Audio Settings

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.

8. Open the Delay drop-down box to select the audio delay time in milliseconds.
9. Set the analog audio output source (Output A or Output B).  
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 below](#)).



When Talkover mode is selected, use the slider controls or enter a number in the fields to adjust the microphone settings (see [Talkover Mode on the next page](#)).

- 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.

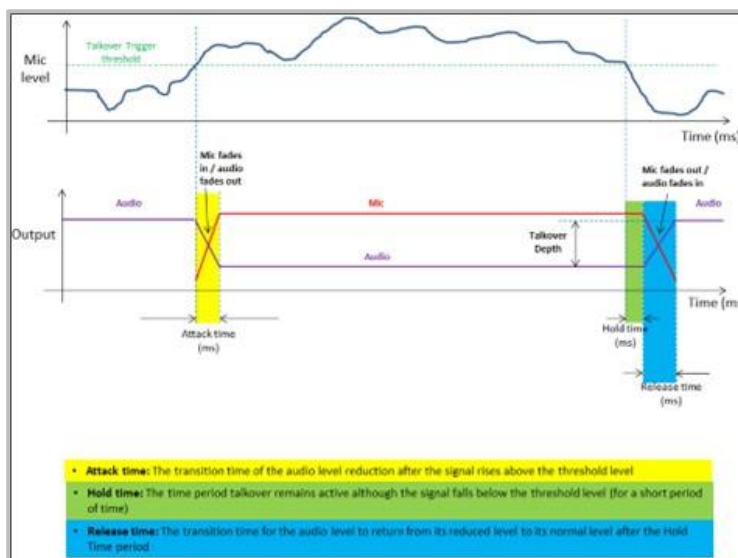


Figure 13: Talkover Mode

## 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 [AV Settings – Inputs Tab below](#)).
2. Click **Inputs** tab.

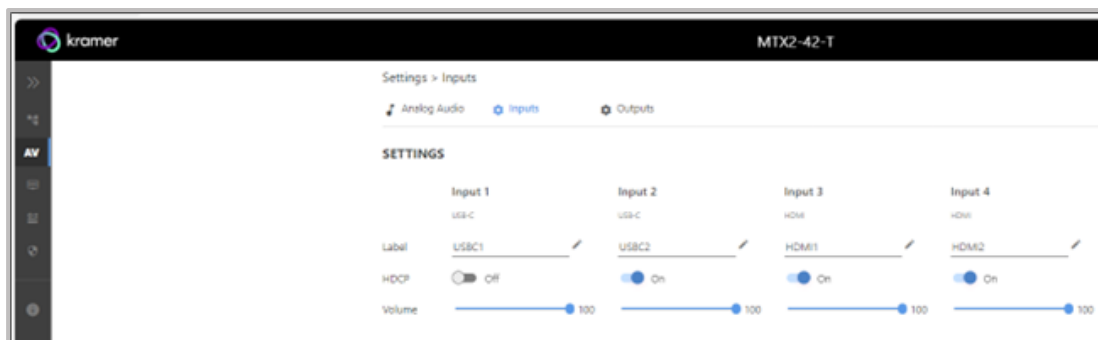


Figure 14: AV Settings – Inputs Tab

5. For each input you can perform the following:
  - Change the input name label.
  - Set HDCP on each input **On** or **Off**.
6. Use the **Volume** (percent) 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 [AV Settings – Inputs Tab on the previous page](#)).
2. Click **Outputs** tab.

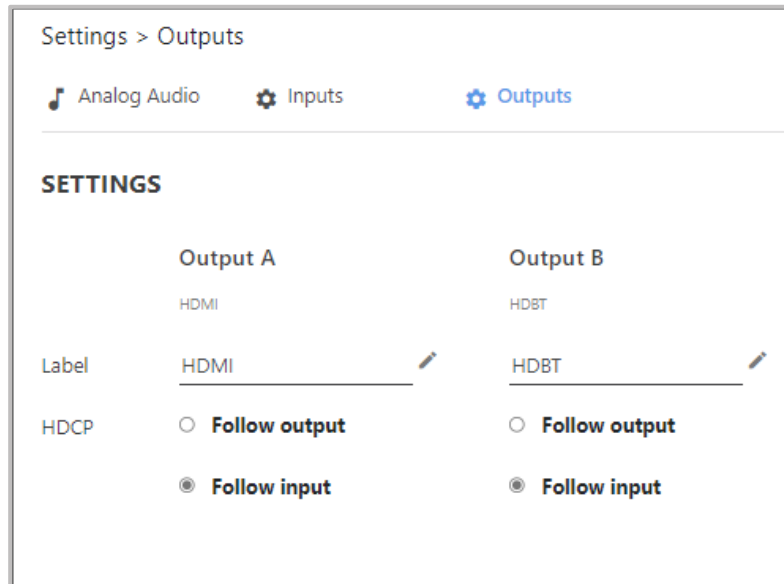


Figure 15: AV Settings – Outputs Tab

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

Outputs are adjusted

## Managing MTX2-42-T EDID

MTX2-42-T 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.

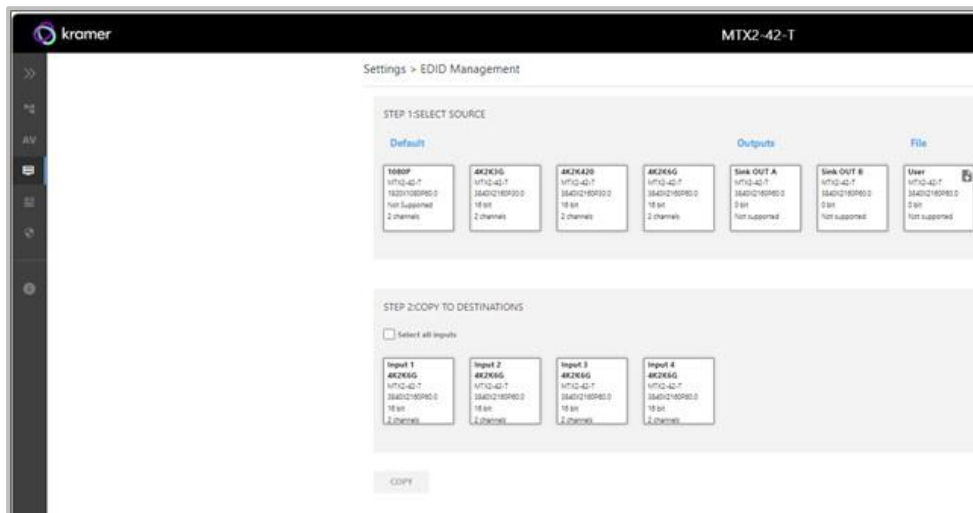


Figure 16: EDID Management Page

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).

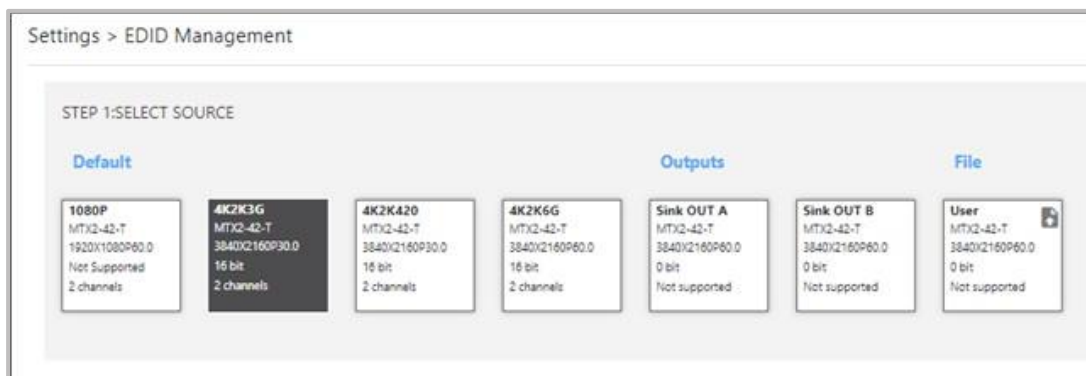


Figure 17: Selecting the EDID Source

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

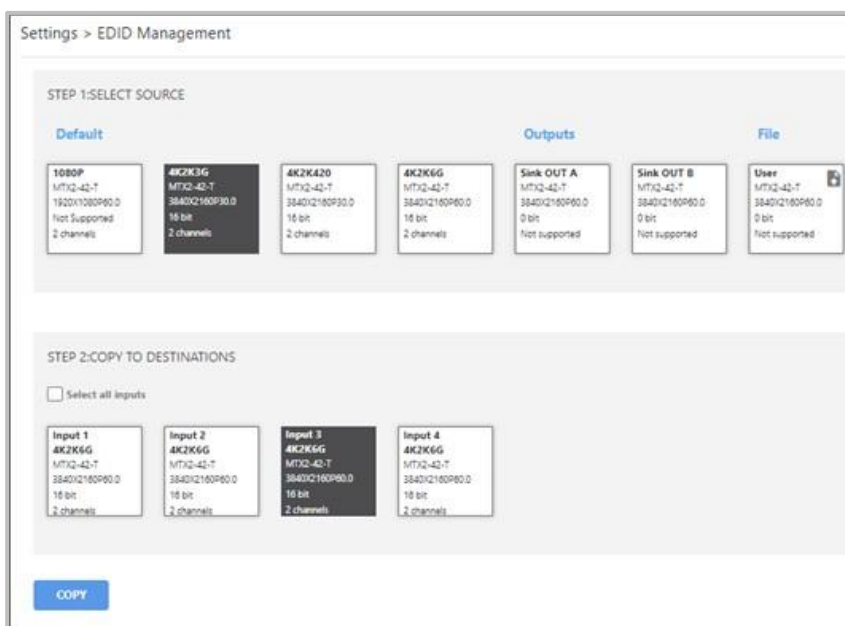


Figure 18: Selecting EDID Input Destinations

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

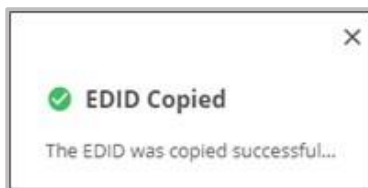



Figure 19: EDID Message

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.

## Setting Device Properties

This section details the following actions:

- [Device Profile and Maintenance](#) \_\_\_\_\_ 24
- [Setting Networking Properties](#) \_\_\_\_\_ 26

### Device Profile and Maintenance

#### Changing Device Name (hostname)

**To change the device name:**

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



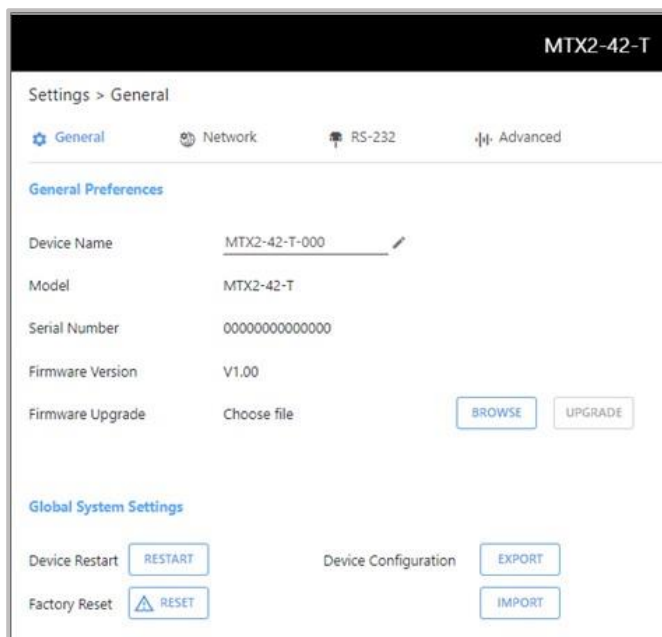



Figure 20: MTX2-42-T Device Settings – General

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

## Updating MTX2-42-T Firmware

To update the firmware:



Updating the FW can also be done using the front panel buttons:

Press and hold the OUTPUT <sup>①</sup> and the USB-C-1 <sup>②</sup> buttons simultaneously for 3 seconds.

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

The Device General Settings page appears ([MTX2-42-T Device Settings – General above](#))

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



Updating the FW can also be done using the front panel buttons:

Press and hold the OUTPUT <sup>①</sup> and the USB-C-2 <sup>②</sup> buttons simultaneously for 3 seconds for Factory Reset.

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 ([MTX2-42-T Device Settings – General on the previous page](#))

2. Click **RESTART/RESET**.



Figure 21: Restart/Reset the Device

3. Click **OK**.

The device restarts/resets.

## Importing / Exporting a Configuration File

Use the MTX2-42-T 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 MTX2-42-T configuration file:

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

The Device General Settings page appears ([MTX2-42-T Device Settings – General on the previous page](#))

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 MTX2-42-T settings to be replaced.

The imported configuration file parameters are uploaded.

## Setting Networking Properties

Define the network settings.

### To define network settings:

1. In the navigation bar, click the **Device Settings** tab. The Device General Settings page appears ([MTX2-42-T Device Settings – General on the previous page](#))
2. Select the **Network** tab. The Network tab appears.

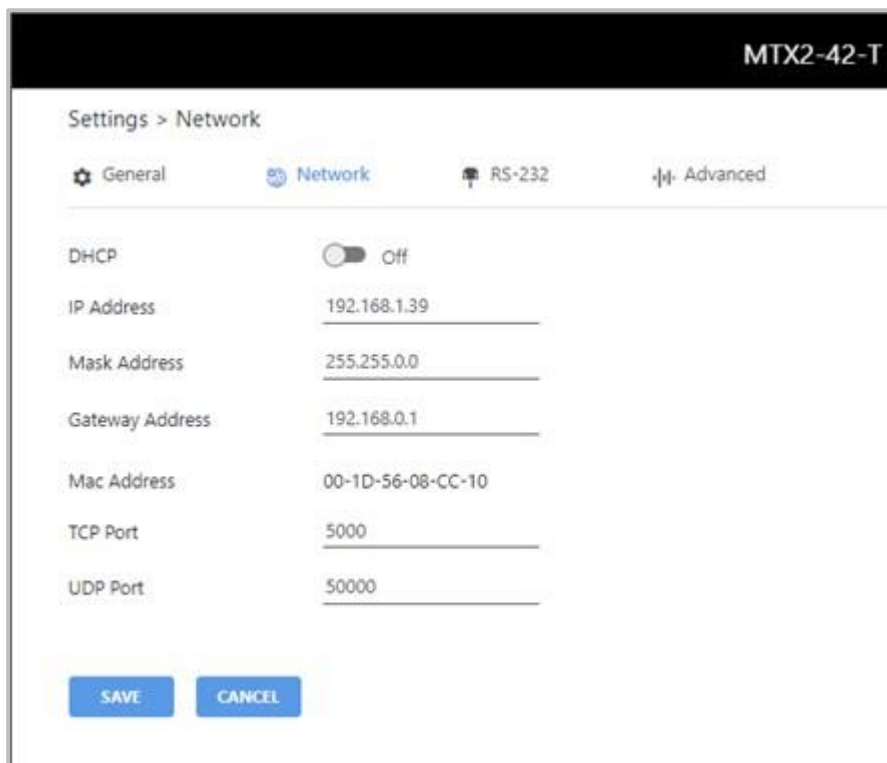


Figure 22: Device Settings – Network Tab

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 MTX2-42-T RS-232 CONTROL port can be defined to control the MTX2 42 T, to control an external device, via RS-232 commands or for RS-232 IP control gateway tunneling via Ethernet. Use the RS 232 tab in the Device Settings page to define the RS-232 port operation:

- [Controlling MTX2-42-T](#) \_\_\_\_\_ 27
- [Auto-controlling an External Device via RS-232](#) \_\_\_\_\_ 28
- [Controlling an External Device via IP Control Gateway for RS-232 Commands](#) \_\_\_\_\_ 30

## Controlling MTX2-42-T

Connect the RS-232 port to a system controller to control the MTX2-42-T.

**To control MTX2 42 T via CONTROL RS-232 Port:**

1. Connect the CONTROL RS-232 port on the MTX2-42-T to a system controller the RS-232 port of an external device (for example, Kramer **SL-240C** as shown in [Connecting to the MTX2-42-T Rear Panel on page 9](#)).
2. Click **Device** under **Settings** on the Navigation List.
3. Select the RS-232 tab on the Device Settings page.

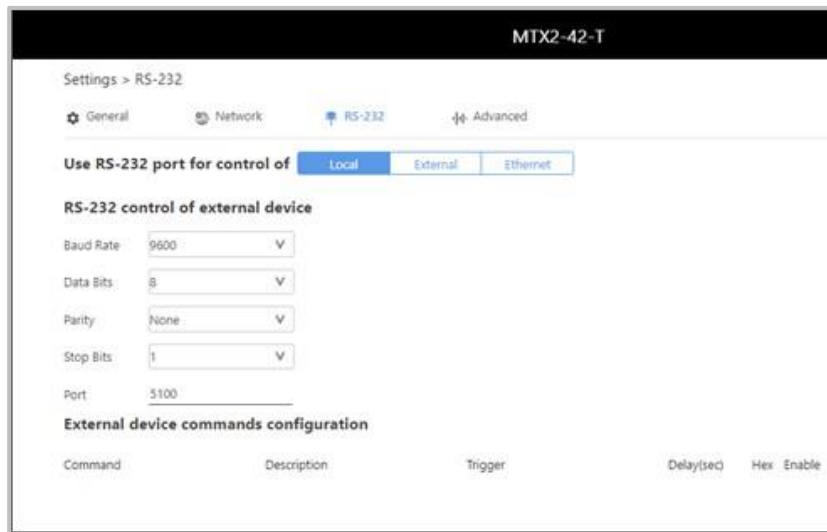


Figure 23: Device Settings – RS-232 Tab

4. Click Local or make sure that it's selected.  
CONTROL RS-232 port with default RS-232 settings, is used to control the MTX2-42-T.

## Auto-controlling an External Device via RS-232

Auto-control any external device via RS-232 commands triggered by MTX2-42-T.

To set up MTX2-42-T to auto-control an external device via RS-232:

1. Connect the CONTROL RS-232 port on the MTX2-42-T 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**.

Settings > RS-232

General Network **RS-232** Advanced

Use RS-232 port for control of Local **External** Ethernet

**RS-232 control of external device**

Baud Rate: 9600  
Data Bits: 8  
Parity: None  
Stop Bits: 1  
Port: 5100

**External device commands configuration**

Command	Description	Trigger	Delay(sec)	Hex	Enable
---------	-------------	---------	------------	-----	--------

Figure 24: RS-232 Page – Auto-controlling an External Device

Set RS-232 control of external device configuration parameters to enable communication with the display connected to the acceptor: Baud Rate, Data Bits, Parity, and Stop Bits.

5. 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.

Add external device commands configuration

Command: POWER OFF    Description: Turn display off    Trigger: No Sync/No Clock    Delay(sec): 0    Hex:     Enable:

Save Cancel

Figure 25: RS-232 Page – Creating a Command




6. Click **Save**.

**External device commands configuration**

Command	Description	Trigger	Delay(sec)	Hex	Enable
POWER OFF	Turn display off	No Sync/No Clock	0	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Figure 26: 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.

Auto-control the display via the RS-232 port by enabling the command.

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

You can send serial commands via LAN to MTX2-42-T's RS-232 CONTROL port, for example to control a device that is connected to the MTX2-42-T RS-232 port.

**To control an external device via LAN:**

1. Connect the CONTROL RS-232 port on the MTX2-42-T 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 27: Device Settings – Controlling via Ethernet

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 TCP Port (5100 by default).

CONTROL RS-232 port is used to control an external device that is connected to the MTX2-42-T via IP messages from LAN-connected controller.

---

## Defining Advanced Settings

This section describes the following actions:

- [Configuring Automatic Switching Settings](#) \_\_\_\_\_ 30
- [Defining Auto Sync Mode](#) \_\_\_\_\_ 31
- [Locking Front Panel Buttons](#) \_\_\_\_\_ 31
- [Selecting USB Type of USB-C Ports](#) \_\_\_\_\_ 32
- [Defining USB Switching Policy](#) \_\_\_\_\_ 32
- [Selecting USB Host](#) \_\_\_\_\_ 32
- [Selecting USB-C Charging Policy](#) \_\_\_\_\_ 33

## 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 ([MTX2-42-T Device Settings – General on page 25](#)).
2. Select the Advanced tab.

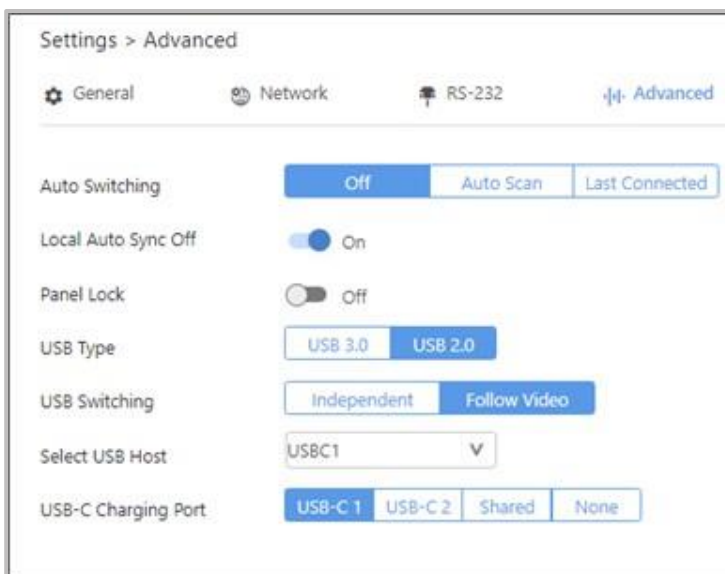


Figure 28: Settings Page – Advanced Tab

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 mode:
    - When detecting that a source is connected to an input (which previously had no signal), automatically switches that input to the outputs.
    - Switches to the previously selected input when the current input signal is lost.

Automatic switching is defined.

## Defining Auto Sync Mode

Define device behavior when the input signal is lost.

To define auto-sync off:

1. In the navigation bar, click the **Device Settings** tab. The Device General Settings page appears ([MTX2-42-T Device Settings – General on page 25](#)).
2. Select the Advanced tab ([Settings Page – Advanced Tab above](#)).
3. Set **Local Auto Sync Off** – to **On** or **Off** (default).

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 ([MTX2-42-T Device Settings – General on page 25](#)).
2. Select the Advanced tab ([Settings Page – Advanced Tab on the previous page](#)).
3. Set Panel Lock **On** or **Off** (default).

Front panels are locked.

## Selecting USB Type of USB-C Ports

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 20).
2. Select the Advanced tab (Figure 28).
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 MTX2-42-T are disabled.

### To select USB switching:

1. In the navigation bar, click the **Device Settings** tab. The Device General Settings page appears ([MTX2-42-T Device Settings – General on page 25](#)).
2. Select the Advanced tab ([Settings Page – Advanced Tab on the previous page](#)).
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 ([MTX2-42-T Device Settings – General on page 25](#)).
2. Select the Advanced tab ([Settings Page – Advanced Tab on the previous page](#)).
3. Next to the USB Host drop-down box, select an active USB host port.

USB host port is selected.



## Selecting USB-C Charging Policy

Select the USB-C charging policy.



To select the USB-C Charging Policy:


1. In the navigation bar, click the **Device Settings** tab. The Device General Settings page appears ([MTX2-42-T Device Settings – General on page 25](#)).
2. Select the Advanced tab ([Settings Page – Advanced Tab on page 31](#)).
3. Next to the USB-C Charging Port options, click:
  - **USB-C 1 / 2** for max 60W charging power to selected USB-C port.
  - **Shared** for max 18W shared charging power to each USB-C port.
  - **None** for disabling USB-C charging on any USB-C port.

USB-C charging policy is selected.

---

## Setting Authentication

MTX2-42-T 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.

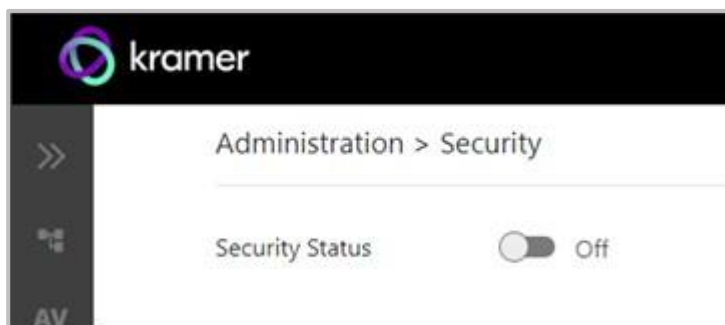


Figure 29: Security Page

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

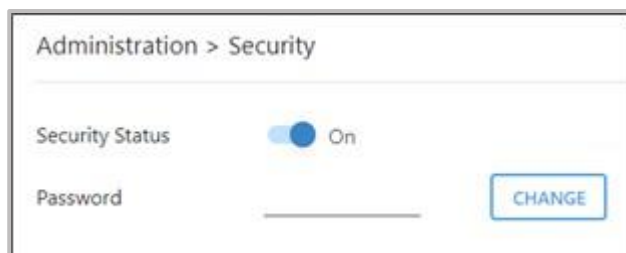



Figure 30: Security Page – Security On.

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.

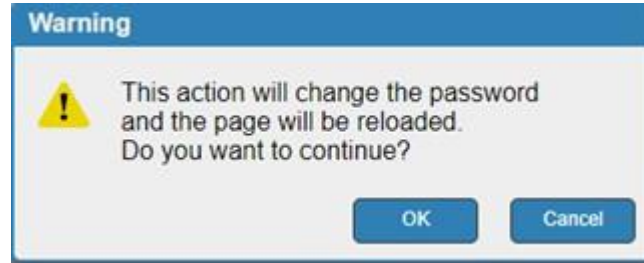


Figure 31: Authentication Page – Changing the Password Message

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 32: Security Page – Security Enabled

2. Set Security Status to Off.



Figure 33: Security Page – Security Disabled

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

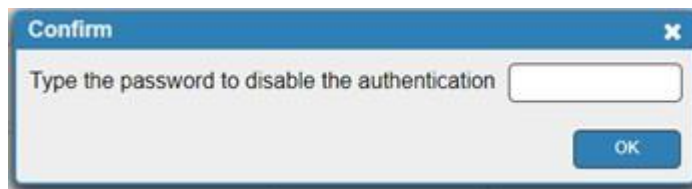


Figure 34: Authentication Tab – Confirmation Message.

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.

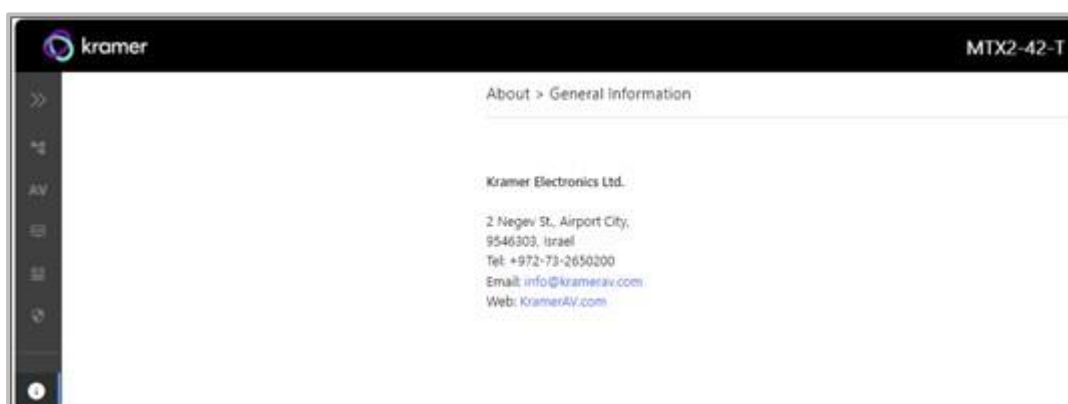


Figure 35: About Page

## Upgrading Firmware

Use the Kramer **K-UPLOAD** software to upgrade the firmware via the MTX2-42-T PROG USB port or via the UI (see Updating MTX2 42 T Firmware on page 31).

The latest version of **K-UPLOAD** and installation instructions can be downloaded from our website at: [www.kramerav.com/support/product\\_downloads.asp](http://www.kramerav.com/support/product_downloads.asp).

# Technical Specifications

Inputs	2 HDMI	On a USB type-C female connector
	2 USB-C	On an HDMI female connector
	1 Mic	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
Video	Max Data Rate	USB-C and HDMI ports: 18Gbps HDBT ports: 10.2Gbps
	HDMI Support	4K@60Hz (4:4:4) resolution
	Content Protection	4K60, CEC, xvYCC color
USB Features	Data Rate	USB 3.0 ports: 5Gbps
		USB 2.0 over HDBT: Up to 127Mbps (out of max 480Mbps)
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
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 $\pm$ 0.1dB
	THD+N (A-weighted)	76dB
	Input Impedance	14K $\Omega$
	Output Impedance	500 $\Omega$
	For Embedded Audio – Number of Supported Channels	Up to 8CH
	Supported Audio Formats	Dolby, DTS
Power	Source	24V DC, 5A

	Consumption	24V DC, 4.9A
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
	Environmental	FCC, UCKA
Enclosure	Size	Half 19" rack, 1U
	Material	Aluminum
	Cooling	Convection Ventilation
General	Net Dimensions (W, D, H)	21.46cm x 16.3cm x 4.36cm (8.4" x 6.4" x 1.71")
	Shipping Dimensions (W, D, H)	39.4cm x 29.6cm x 9.1cm (15.5" x 11.6" x 3.58")
	Net Weight	1.29kg (2.84lbs)
	Shipping Weight	1.84kg (4.8lbs)
Accessories	Included	1 Power adapter and cord, 1 multi-signal USB-C 1m cable

Specifications are subject to change without notice at [www.kramerav.com](http://www.kramerav.com)

## Default Communication Parameters

RS-232	
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, 1, 2<CR>
IP	
DHCP	ON
Fallback IP Address:	192.168.1.39
Subnet mask:	255.255.255.0
Default gateway:	192.168.0.1
Default TCP Port #:	5000
Default UDP Port #:	50000
Default username:	Admin
Default password:	Admin

<b>Full Factory Reset</b>	
Protocol 3000:	"#factory" command.
Embedded webpages	Settings page, General tab: Reset all parameters to factory default except for network parameters.
Front panel buttons	Press OUTPUT button + USB-C 2 button for 3 seconds until input LEDs illuminate.
<b>USB FW Update</b>	
Front panel buttons	Press OUTPUT button + USB-C 1 button for 3 seconds until input LEDs illuminate.

---

## Input Resolution Support

MTX2-42-T 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:**

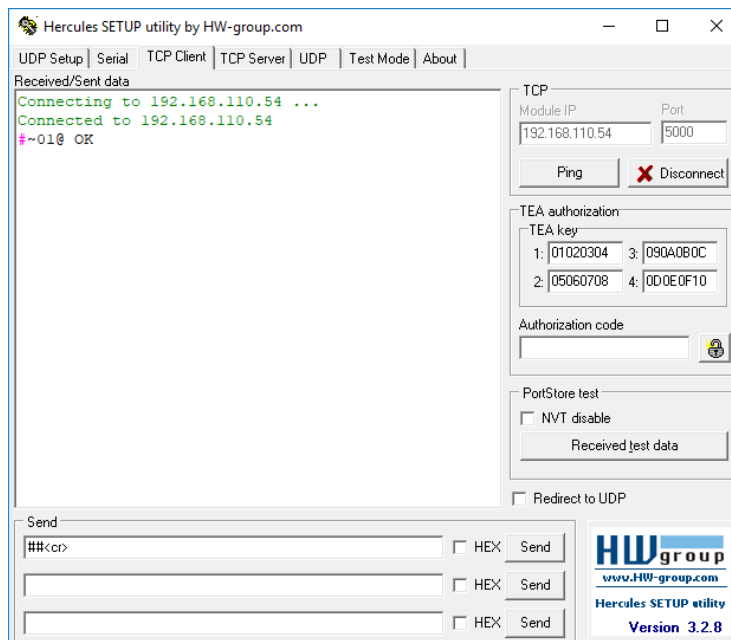
Prefix	Command Name	Constant (Space)	Parameter(s)	Suffix
#	Command	␣	Parameter	<CR>

- **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 MTX2-42-T. The following figure displays how the # command is framed using terminal communication software (such as Hercules):



## 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
RR_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_FW_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

# Protocol 3000 Commands

## MTX-2-42-T 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.	<b>COMMAND</b> #<CR> <b>FEEDBACK</b> ~nn@_ok<CR><LF>		#<CR>
AUD-DEEMB	Set analog audio output deembedding on video status.	<b>COMMAND</b> #AUD-DEEMB_in_index,out_index,emb_mode<CR> <b>FEEDBACK</b> ~nn@AUD-DEEMB_in_index,out_index,emb_mode<CR><LF>	<b>in_index</b> – 1 <b>out_index</b> – 1 – HDMI Out 2 – HDBT Out <b>deemb_mode</b> – Embedding status 1 – Dembedded	Set audio in video embedding status for the input and output 2 to analog: #AUD-DEEMB_u1,2,1<CR>
AUD-DEEMB?	Get audio in video deembedding status.	<b>COMMAND</b> #AUD-DEEMB?_in_index,out_index<CR> <b>FEEDBACK</b> ~nn@AUD-DEEMB_in_index,out_index,emb_mode<CR><LF>	<b>in_index</b> – 1 <b>out_index</b> – 1 – HDMI Out 2 – HDBT Out <b>deemb_mode</b> – Embedding status 1 – Dembedded	#AUD-DEEMB?_u1,2<CR>
AUD-EMB	Set audio in video embedding status.	<b>COMMAND</b> #AUD-EMB_in_index,out_index,emb_mode<CR> <b>FEEDBACK</b> ~nn@AUD-EMB_in_index,out_index,emb_mode<CR><LF>	<b>in_index</b> – 0 <b>out_index</b> – 0 <b>emb_mode</b> – Embedding status 0 – Analog 1 – Embedded 2 – Auto	Set audio in video embedding status for input 2 and output 1 to analog: #AUD-EMB_u2,1,0<CR>
AUD-EMB?	Get audio in video embedding status.	<b>COMMAND</b> #AUD-EMB?_in_index,out_index<CR> <b>FEEDBACK</b> ~nn@AUD-EMB_in_index,out_index,emb_mode<CR><LF>	<b>in_index</b> – 0 <b>out_index</b> – 0 <b>emb_mode</b> – Embedding status 0 – Analog 1 – Embedded 2 – Auto	#AUD-EMB?_u1,1<CR>
AUD-LVL	Set volume level.	<b>COMMAND</b> #AUD-LVL_io_mode,io_index,vol_level<CR> <b>FEEDBACK</b> ~nn@AUD-LVL_io_mode,io_index,vol_level<CR><LF>	<b>io_mode</b> – Input/Output 0 – Input 1 – Output <b>io_index</b> : For inputs: 0 – USBC1 1 – USBC2 2 – HDMI 1 3 – HDMI 2 For the output: 0 – Output <b>vol_level</b> – Volume level 0 to 100 ++ increase current value, -- decrease current value	Set AUDIO OUT 1 level to -50: #AUD-LVL_u1,1,50<CR>
AUD-LVL?	Get volume level.	<b>COMMAND</b> #AUD-LVL?_io_mode,io_index<CR> <b>FEEDBACK</b> ~nn@AUD-LVL_io_mode,io_index,vol_level<CR><LF>	<b>io_mode</b> – Input/Output 0 – Input 1 – Output <b>io_index</b> : For inputs: 0 – USBC1 1 – USBC2 2 – HDMI 1 3 – HDMI 2 For the output: 0 – Output <b>vol_level</b> – Volume level 0 to 100 ++ increase current value, -- decrease current value	Get AUDIO OUT 1 level #AUD-LVL_u1,1<CR>
AUDIO-BYPASS	Set audio bypass status.	<b>COMMAND</b> #AUDIO-BYPASS_ustatus<CR> <b>FEEDBACK</b> ~nn@AUDIO-BYPASS_ustatus<CR><LF>	<b>status</b> – On/Off 0 – Off (DSP) 1 – On	Set audio-bypass to off: #AUDIO-BYPASS_u0<CR>
AUDIO-BYPASS?	Get audio bypass status.	<b>COMMAND</b> #AUDIO-BYPASS_u<CR> <b>FEEDBACK</b> ~nn@AUDIO-BYPASS_ustatus<CR><LF>	<b>status</b> – On/Off 0 – Off (DSP) 1 – On	Set audio-bypass to off: #AUDIO-BYPASS?_u<CR>
AV-SW-MODE	Set input auto switch mode (per output).	<b>COMMAND</b> #AV-SW-MODE_layer_type,out_index,connection_mode<CR> <b>FEEDBACK</b> ~nn@AV-SW-MODE_layer_type,out_index,connection_mode<CR><LF>	<b>layer_type</b> – Number that indicates the signal type: 1 – Video + Audio <b>out_index</b> : 1 – Video outputs <b>connection_mode</b> – Connection mode 0 – Manual 1 – Auto scan 2 – Last connected switch	Set input auto switch mode to manual: #AV-SW-MODE_u1,1,0<CR>

Function	Description	Syntax	Parameters/Attributes	Example
AV-SW-MODE?	Get input auto switch mode (per output).	<b>COMMAND</b> #AV-SW-MODE?_layer_type,out_index<CR> <b>FEEDBACK</b> ~nn@AV-SW-MODE_layer_type,out_index,connection_mode<CR><LF>	<b>layer_type</b> – Number that indicates the signal type: 1 – Video + Audio <b>out_index</b> : 1- Video outputs <b>connection_mode</b> – 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.	<b>COMMAND</b> #BASS_io_index,bass_level<CR> <b>FEEDBACK</b> ~nn@BASS_io_index,bass_level<CR><LF>	<b>io_index</b> 1- Video output <b>bass_level</b> – 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.	<b>COMMAND</b> #BASS_io_index<CR> <b>FEEDBACK</b> ~nn@BASS_io_index,bass_level<CR><LF>	<b>io_index</b> 1- Video output <b>bass_level</b> – Audio parameter in Kramer units: -30 to 30	Get audio bass level of channel 1: #BASS?_1<CR>
BUILD-DATE?	Get device build date.	<b>COMMAND</b> #BUILD-DATE?_date,time<CR> <b>FEEDBACK</b> ~nn@BUILD-DATE_date,time<CR><LF>	<b>date</b> – Format: YYYY/MM/DD where YYYY = Year MM = Month DD = Day <b>time</b> – 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.	<b>COMMAND</b> #CEC_cec_mode<CR> <b>FEEDBACK</b> ~nn@CEC_cec_mode<CR><LF>	<b>cec_mode</b> – 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.	<b>COMMAND</b> #CPEDID_edid_io,src_id,edid_io,dest_bitmap<CR> or #CPEDID_edid_io,src_id,edid_io,dest_bitmap,safe_mode<CR> <b>FEEDBACK</b> ~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>	<b>edid_io</b> – EDID source type (usually output) 1 – Output <b>src_id</b> – Number of chosen source stage 1 – HDMI Out 2 – HDBT Out <b>edid_io</b> – EDID destination type (usually input) 0 – Input <b>dest_bitmap</b> – 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. <b>safe_mode</b> – 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.	<b>COMMAND</b> #DISPLAY?_out_index<CR> <b>FEEDBACK</b> ~nn@DISPLAY_out_index,status<CR><LF>	<b>out_index</b> : 1 – HDMI Out 2 – HDBT Out <b>status</b> – 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.	<b>COMMAND</b> #DPSW-STATUS_dip_id,status<CR> <b>FEEDBACK</b> ~nn@DPSW-STATUS_dip_id,status<CR><LF>	<b>dip_id</b> – 0 – Mic <b>status</b> – 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.	<b>COMMAND</b> #DPSW-STATUS_dip_id<CR> <b>FEEDBACK</b> ~nn@DPSW-STATUS_dip_id,status<CR><LF>	<b>dip_id</b> – 0 – Mic <b>status</b> – 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 <sup>16</sup> -1).	<b>COMMAND</b> #ETH-PORT_port_type,port_id<CR> <b>FEEDBACK</b> ~nn@ETH-PORT_port_type,port_id<CR><LF>	<b>port_type</b> – TCP/UDP <b>port_id</b> – 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>
ETH-PORT?	Get Ethernet port protocol.	<b>COMMAND</b> #ETH-PORT?_port_type<CR> <b>FEEDBACK</b> ~nn@ETH-PORT_port_type,port_id<CR><LF>	<b>port_type</b> – TCP/UDP <b>port_id</b> – TCP/UDP port number TCP: 5000-5099 UDP: 50000-50999	Get the Ethernet port protocol for UDP: #ETH-PORT?_udp<CR>

Function	Description	Syntax	Parameters/Attributes	Example
<b>FACTORY</b>	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.	<b>COMMAND</b> #FACTORY<CR> <b>FEEDBACK</b> ~nn@FACTORY_ok<CR><LF>		Reset the device to factory default configuration: #FACTORY<CR>
<b>HDCP-MOD</b>	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.	<b>COMMAND</b> #HDCP-MOD_io_mode,index,mode<CR> <b>FEEDBACK</b> ~nn@HDCP-MOD_io_mode,index,mode<CR><LF>	<b>io_index</b> – Input/Output 0 – Input 1 – Output <b>index</b> – Input: 1 – USBC1 2 – USBC2 3 – HDMI 3 4 – HDMI 4 Output 1 – HDMI Out 2 – HDBT Out <b>mode</b> – 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>
<b>HDCP-MOD?</b>	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.	<b>COMMAND</b> #HDCP-MOD?_io_mode,index<CR> <b>FEEDBACK</b> ~nn@HDCP-MOD_io_mode,index,mode<CR><LF>	<b>io_index</b> – Input/Output 0 – Input 1 – Output <b>index</b> – Input: 1 – USBC1 2 – USBC2 3 – HDMI 3 4 – HDMI 4 Output 1 – HDMI Out 2 – HDBT Out <b>mode</b> – 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>
<b>HELP</b>	Get command list or help for specific command.	<b>COMMAND</b> #HELP<CR> #HELP_cmd_name<CR> <b>FEEDBACK</b> 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>	<b>cmd_name</b> – Name of a specific command	Get the command list: #HELP<CR>  To get help for AV-SW-TIMEOUT: HELP_av-sw-timeout<CR>
<b>LOCK-FP</b>	Lock the front panel.	<b>COMMAND</b> #LOCK-FP_lock/unlock<CR> <b>FEEDBACK</b> ~nn@LOCK-FP_lock/unlock<CR>><LF>	<b>lock/unlock</b> – 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>
<b>LOCK-FP?</b>	Get the front panel lock state.	<b>COMMAND</b> #LOCK-FP?_<CR> <b>FEEDBACK</b> ~nn@LOCK-FP_lock/unlock<CR>><LF>	<b>lock/unlock</b> – 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>
<b>LOUDNESS</b>	Set audio loudness.	<b>COMMAND</b> #LOUDNESS_io_index,enabled<CR> <b>FEEDBACK</b> ~nn@LOUDNESS_io_index,enabled<CR><LF>	<b>io_index</b> – 1 <b>enabled</b> – On/Off 0 – Off 1 – On	Set audio loudness to ON: #LOUDNESS_1,1<CR>
<b>LOUDNESS?</b>	Get audio loudness.	<b>COMMAND</b> #LOUDNESS?_io_index<CR> <b>FEEDBACK</b> ~nn@LOUDNESS_io_index,enabled<CR><LF>	<b>io_index</b> – 1 <b>enabled</b> – On/Off 0 – Off 1 – On	Get audio loudness: #LOUDNESS?_1<CR>
<b>MIC-GAIN</b>	Set the microphone gain.  ⓘ Sets the microphone input audio gain.	<b>COMMAND</b> #MIC-GAIN_layer,mic_id,level<CR> <b>FEEDBACK</b> ~nn@MIC-GAIN_layer,mic_id,level<CR><LF>	<b>layer</b> – 0 <b>mic_id</b> – 0 <b>level</b> – Level – 0 to 100 ++ increase current value, -- decrease current value	Set the microphone gain to 58: #MIC-GAIN_0,0,58<CR>

Function	Description	Syntax	Parameters/Attributes	Example
MIC-GAIN?	Get the microphone gain.  ① Gets the microphone input audio gain.	<b>COMMAND</b> #MIC-GAIN?_layer,mic_id<CR> <b>FEEDBACK</b> ~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>
MUTE	Set audio mute.	<b>COMMAND</b> #MUTE_out_index,mute_mode<CR> <b>FEEDBACK</b> ~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.	<b>COMMAND</b> #MUTE?_out_index<CR> <b>FEEDBACK</b> ~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.  ① 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).	<b>COMMAND</b> #NAME_machine_name<CR> <b>FEEDBACK</b> ~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.  ① 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).	<b>COMMAND</b> #NAME?_<CR> <b>FEEDBACK</b> ~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.  ① Factory default of machine (DNS) name is "KRAMER_" + 4 last digits of device serial number.	<b>COMMAND</b> #NAME-RST<CR> <b>FEEDBACK</b> ~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.  ① 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 <b>NAME</b> 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.  ① For Backward compatibility, the <b>id</b> parameter can be omitted. In this case, the Network ID, by default, is 0, which is the Ethernet control port.	<b>COMMAND</b> #NET-DHCP_dhcp_state<CR> <b>FEEDBACK</b> ~nn@NET-DHCP_dhcp_state<CR><LF>	dhcp_state – 0 – Do not use DHCP. Use the IP set by the factory or using the <b>net-ip</b> or <b>net-config</b> command. 1 – Try to use DHCP. If unavailable, use the IP set by the factory or using the <b>net-ip</b> or <b>net-config</b> command.	Enable DHCP mode #NET-DHCP_1<CR>
NET-DHCP?	Get DHCP mode.  ① For Backward compatibility, the <b>id</b> parameter can be omitted. In this case, the Network ID, by default, is 0, which is the Ethernet control port.	<b>COMMAND</b> #NET-DHCP?_<CR> <b>FEEDBACK</b> ~nn@NET-DHCP_dhcp_mode<CR><LF>	dhcp_mode – 0 – Do not use DHCP. Use the IP set by the factory or using the <b>net-ip</b> or <b>net-config</b> command. 1 – Try to use DHCP. If unavailable, use the IP set by the factory or using the <b>net-ip</b> or <b>net-config</b> command.	Get DHCP mode : #NET-DHCP?_<CR>
NET-GATE	Set gateway IP.  ① 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.	<b>COMMAND</b> #NET-GATE_ip_address<CR> <b>FEEDBACK</b> ~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>
NET-GATE?	Get gateway IP.  ① A network gateway connects the device via another network and maybe over the Internet. Be aware of security problems.	<b>COMMAND</b> #NET-GATE?_<CR> <b>FEEDBACK</b> ~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.  ① For proper settings consult your network administrator.	<b>COMMAND</b> #NET-IP_ip_address<CR> <b>FEEDBACK</b> ~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.	<b>COMMAND</b> #NET-IP?_<CR> <b>FEEDBACK</b> ~nn@NET-IP_ip_address<CR><LF>	ip_address – Format: xxx.xxx.xxx.xxx	Get the IP address: #NET-IP?_<CR>

Function	Description	Syntax	Parameters/Attributes	Example
NET-MAC?	Get MAC address. <b>i</b> For backward compatibility, the <b>id</b> parameter can be omitted. In this case, the Network ID, by default, is 0, which is the Ethernet control port.	<b>COMMAND</b> #NET-MAC?_id<CR> <b>FEEDBACK</b> ~nn@NET-MAC_id,mac_address<CR><LF>	<b>id</b> – 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.... <b>mac_address</b> – Unique MAC address. Format: XX-XX-XX-XX-XX-XX where X is hex digit	#NET-MAC?_id<CR>
NET-MASK	Set subnet mask. <b>i</b> For proper settings consult your network administrator.	<b>COMMAND</b> #NET-MASK_net_mask<CR> <b>FEEDBACK</b> ~nn@NET-MASK_net_mask<CR><LF>	<b>net_mask</b> – 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.	<b>COMMAND</b> #NET-MASK?_<CR> <b>FEEDBACK</b> ~nn@NET-MASK_net_mask<CR><LF>	<b>net_mask</b> – Format: xxx.xxx.xxx.xxx	Get the subnet mask: #NET-MASK?<CR>
PROT-VER?	Get device protocol version.	<b>COMMAND</b> #PROT-VER?_<CR> <b>FEEDBACK</b> ~nn@PROT-VER_3000:version<CR><LF>	<b>version</b> – XX.XX where X is a decimal digit	Get the device protocol version: #PROT-VER?_<CR>
RESET	Reset device. <b>i</b> 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.	<b>COMMAND</b> #RESET<CR> <b>FEEDBACK</b> ~nn@RESET_ok<CR><LF>		Reset the device: #RESET<CR>
ROUTE	Set layer routing. <b>i</b> This command replaces all other routing commands.	<b>COMMAND</b> #ROUTE_layer_type,out_index,in_index<CR> <b>FEEDBACK</b> ~nn@ROUTE_layer_type,out_index<CR><LF>	<b>layer_type</b> Layer Enumeration 1 – Video+Audio <b>out_index</b> 1 – KIT-500T: HDMI OUT 2 – KIT-500R: HDMI Out <b>in_index</b> – Source id For <b>out_index</b> = 1 1 – USBC1 2 – USBC2 3 – HDMI 1 4 – HDMI 2 For <b>out_index</b> = 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. <b>i</b> This command replaces all other routing commands.	<b>COMMAND</b> #ROUTE?_layer_type,out_index<CR> <b>FEEDBACK</b> ~nn@ROUTE_layer_type,out_index,in_index<CR><LF>	<b>layer_type</b> Layer Enumeration 1 – Video+Audio <b>out_index</b> 1 – HDMI Out 2 – HDBT Out <b>in_index</b> – Source id 1 – USBC1 2 – USBC2 3 – HDMI 1 4 – HDMI 2	Get the layer routing: #ROUTE?_1,1<CR>
SCLR-AS	Set auto-sync features. <b>i</b> Sets the auto sync features for the selected scaler.	<b>COMMAND</b> #SCLR-AS_scaler_index,sync_speed<CR> <b>FEEDBACK</b> ~nn@SCLR-AS_scaler_index,sync_speed<CR><LF>	<b>scaler_index</b> – Scaler Number – 1 <b>sync_speed</b> – 0 – Off 1 – On	Set auto-sync features Off: #SCLR-AS_1,0<CR>
SCLR-AS?	Get auto-sync features. <b>i</b> Gets the auto sync features for the selected scaler.	<b>COMMAND</b> #SCLR-AS?_scaler_index<CR> <b>FEEDBACK</b> ~nn@SCLR-AS_scaler_index,sync_speed<CR><LF>	<b>scaler_index</b> – Scaler Number – 1 <b>sync_speed</b> – 0 – Off 1 – On	Get auto-sync features: #SCLR-AS?_1<CR>
SCLR-AUDIO-DELAY	Set the scaler audio delay. <b>i</b> Sets the audio delay for the selected audio output.	<b>COMMAND</b> #SCLR-AUDIO-DELAY_scaler_index,delay<CR> <b>FEEDBACK</b> ~nn@SCLR-AUDIO-DELAY_scaler_index,delay<CR><LF>	<b>scaler_index</b> – Audio output number – 1 <b>delay</b> – 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. <b>i</b> Gets the audio delay for the selected audio output.	<b>COMMAND</b> #SCLR-AUDIO-DELAY?_scaler_index<CR> <b>FEEDBACK</b> ~nn@SCLR-AUDIO-DELAY_scaler_index,delay<CR><LF>	<b>scaler_index</b> – Audio output number – 1 <b>delay</b> – 0 – Off 1 – 40ms 2 – 110ms 3 – 150ms	Get the scaler audio delay: #SCLR-AUDIO-DELAY?_1<CR>
SIGNAL?	Get input signal status.	<b>COMMAND</b> #SIGNAL?_in_index<CR> <b>FEEDBACK</b> ~nn@SIGNAL_in_index,status<CR><LF>	<b>in_index</b> – input: 1 – USBC1 2 – USBC2 3 – HDMI 1 4 – HDMI 2 <b>status</b> – 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>

Function	Description	Syntax	Parameters/Attributes	Example
SN?	Get device serial number.	<b>COMMAND</b> #SN?_<CR> <b>FEEDBACK</b> ~nn@SN_serial_num<CR><LF>	<b>serial_num</b> – 14 decimal digits, factory assigned	Get the device serial number: #SN?_<CR>
STANDBY	Set standby mode.	<b>COMMAND</b> #STANDBY_value<CR> <b>FEEDBACK</b> ~nn@STANDBY_value<CR><LF>	<b>value</b> – On/Off 0 – Off 1 – On (set to standby mode)	Set standby mode: #STANDBY_1<CR>
STANDBY?	Get standby mode status.	<b>COMMAND</b> #STANDBY?_<CR> <b>FEEDBACK</b> ~nn@STANDBY_value<CR><LF>	<b>value</b> – On/Off 0 – Off 1 – On	Get standby mode status: #STANDBY?_<CR>
TEST-MODE	Perform device test according to defined test parameters. This command starts device test procedure.	<b>COMMAND</b> #TEST-MODE_<CR> <b>FEEDBACK</b> ~nn@TEST-MODE_result<CR><LF>	<b>result</b> – Test Results 0 – OK 1 – Failed (general) 2 – N – Device specific failed error code	Perform device test according to defined test parameters: #TEST-MODE_<CR>
TLK	Set audio talkover mode status.	<b>COMMAND</b> #TLK_io_index,talkover_mode<CR> <b>FEEDBACK</b> ~nn@TLK_io_index,talkover_mode<CR><LF>	<b>io_index</b> – 1 <b>talkover_mode</b> – 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.	<b>COMMAND</b> #TLK?_io_index<CR> <b>FEEDBACK</b> ~nn@TLK_io_index,talkover_mode<CR><LF>	<b>io_index</b> – 1 <b>talkover_mode</b> – Talkover mode 0 – Off 1 – Mixer 2 – Talkover 3 – Mic only	Get audio talkover mode status: #TLK?_1<CR>
TREBLE	Set audio treble level.	<b>COMMAND</b> #TREBLE_io_index,treble_level<CR> <b>FEEDBACK</b> ~nn@TREBLE_io_index,treble_level<CR><LF>	<b>io_index</b> – 1 <b>treble_level</b> – Audio parameter in Kramer units, -30-30	Set audio treble level: #TREBLE_1,1<CR>
TREBLE?	Get audio treble level.	<b>COMMAND</b> #TREBLE?_io_index<CR> <b>FEEDBACK</b> ~nn@TREBLE_io_index,treble_level<CR><LF>	<b>io_index</b> – 1 <b>treble_level</b> – Audio parameter in Kramer units, -30-30	Get audio treble level: #TREBLE?_1<CR>
USBC-ETH	Set USBC to Ethernet connection.	<b>COMMAND</b> #USBC-ETH_Mode<CR> <b>FEEDBACK</b> ~nn@USBC-ETH_Mode<CR><LF>	<b>Mode</b> – Disabled, Enabled 0 – Disabled 1 – Enabled	Set USBC to Ethernet connection state to ON: #USBC-ETH_1<CR>
USBC-ETH?	Get USBC to Ethernet connection.	<b>COMMAND</b> #USBC-ETH?_<CR> <b>FEEDBACK</b> ~nn@USBC-ETH_Mode<CR><LF>	<b>Mode</b> – Disabled, Enabled 0 – Disabled 1 – Enabled	Get USBC to Ethernet connection state to ON: #USBC-ETH?_1<CR>
USBC-CHARGE	Set the USBC charging port	<b>COMMAND</b> #USBC-CHARGE_index<CR> <b>FEEDBACK</b> ~nn@USBC-CHARGE_index<CR><LF>	<b>index</b> – USB-C port device index 0 – None (disable charging) 1 – USB-C 1 2 – USB-C 2 3 – USBC 1 & USBC 2 (shared)	Set USBC charging port to USB-C 1 #USBC-CHARGE_1<CR>
USBC-CHARGE?	Get the USBC charging port.	<b>COMMAND</b> #USBC-CHARGE?_<CR> <b>FEEDBACK</b> ~nn@USBC-CHARGE?_index<CR><LF>	<b>index</b> – USB-C port device index 0 – None (disable charging) 1 – USB-C 1 2 – USB-C 2 3 – USBC 1 & USBC 2 (shared)	Get USBC charging port: #USBC-CHARGE_<CR>
VERSION?	Get firmware version number.	<b>COMMAND</b> #VERSION?_<CR> <b>FEEDBACK</b> ~nn@VERSION_firmware_version<CR><LF>	<b>firmware version</b> – XX.XX.XXXX where the digit groups are: major.minor.build version	Get the device firmware version number: #VERSION?_<CR>

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](http://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.

### **Limitation of Liability**

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.

### **Exclusive Remedy**

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### **Other Conditions**

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

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

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





**HDMI™**  
HIGH DEFINITION MULTIMEDIA INTERFACE

	P/N: 2900-301654QS		Rev: 1
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	<p><b>SAFETY WARNING</b></p> <p>Disconnect the unit from the power supply before opening and servicing</p>
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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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